

The IBM SELECTRIC Composer

Dead Key and Dead Key Disconnect Functions

Abstract: Because diacritical marks are needed for the Latin and French-Latin type fonts, the IBM SELECTRIC Composer required a means for printing certain characters without carrier escapement. This note discusses the "dead key" and "dead key disconnect" functions designed to fulfill this requirement.

The need for a dead key function stems from the fact that there are not enough positions on a typehead to accommodate all the accented characters found in certain languages,¹ e.g., the umlaut, "̈", the accents grave, "̀", and acute, "́", and the circumflex, "̂". If each of the vowel-symbol combinations were to appear as a single character on the keyboard and typehead, the total number of characters would exceed the capacity of the SELECTRIC Composer. The solution, also used on the basic IBM SELECTRIC Typewriter, is to place the symbols on separate keys and to literally construct the accented character, using two print operations. The accent symbol is printed first and, since the machine is coded not to escape on these symbol keys (i.e. "dead keys"), the vowel which is printed next is placed directly under the symbol. The four symbols require the use of two keyboard positions (each of these uses upper- and lowercase positions) to provide for the construction of all the accented characters required. Since this character construction technique is needed only in the French-Latin and Latin type fonts (others do not have the multiplicity of vowel-symbol combinations), a disconnect feature is added to enable the carrier to escape on the dead key positions when other type fonts are used, for multilingual capability.

From Figure 1, it can be seen that the dead key does not affect the keyboard selection of coded character width. This is important, since the proper width coding for these keyboard positions can be built into the machine, insuring proper operation with the other basic lingual type fonts when the disconnect keybutton is operated.

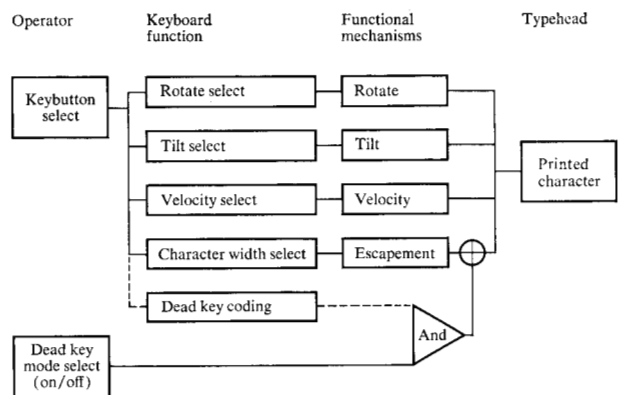


Figure 1 Block diagram of dead-key character selection.

The dead key mechanism utilizes an input signal from an added bail² in the Latin and French-Latin keyboards (Fig. 2). This signal is transferred to the escapement cam follower, and is used to disconnect the escapement trip linkage. The cam follower forms the basis for the mechanism. Since the escapement operation itself may not terminate until after the succeeding print cycle has begun, and since the input signal from the keyboard occurs early in each print cycle, it is possible for an input signal to arrive at the escape cam before the escape cam follower has returned to its normal position. This implies a need for a double set of

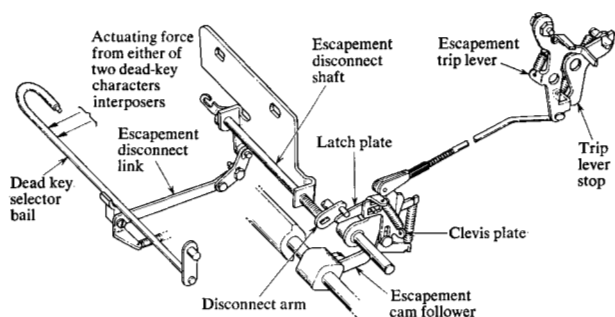


Figure 2 Dead key linkage to escapement trip mechanism.

latches on the cam follower: a primary latch, used to drive the escapement trip linkage itself, and a secondary latch which holds the primary latch open, regardless of the position or motion of the drive linkage at the time the input signal arrives. This secondary latch is a storage latch, which literally stores the input signal until completion of the "dead key" cycle, at which time both latches are restored to the normal escape trip mode. Typical operation of these latches during a dead key cycle is shown in Fig. 3. Figure 3a shows the position of all components before the input signal (and the position during the entire regular escapement cycle). Figure 3b shows the action of the input. The latch plate moves down, carrying the clevis plate by means of the pin-window combination, and moves forward (left) under the cam follower. Figure 3c shows the cam follower clearing the latch plate during the escape rise. The clevis plate which carries the escapement trip linkage is trapped under the cam follower and thus not driven. Figure 3d shows the escapement cam restoring at the end of the cycle, driving the latch plate back and allowing the clevis plate to relatch in anticipation of the next machine cycle.

Figure 4 shows the dead key disconnect device with its operator-controlled detenting keybutton located on the keyboard next to the left-hand margin release keybutton. The sheathed cable laterally shifts the escapement disconnect shaft (Figs. 2 and 4) out of contact with the latch plate, thereby interrupting the signal train to the cam follower. The dead keys function as normal (escaping) keys when the dead key disconnect keybutton is operated.

When added to the basic machine, the dead key/dead key disconnect system complements the designed-in position, velocity, and escapement compatibility of the Composer's multilingual type fonts. Intended primarily for machines that will use Latin or French-Latin as the basic language font, the mechanism permits two-step construction of special or accented characters without the operator inconvenience of backspacing or counting, and without affecting the Composer's justification capability.

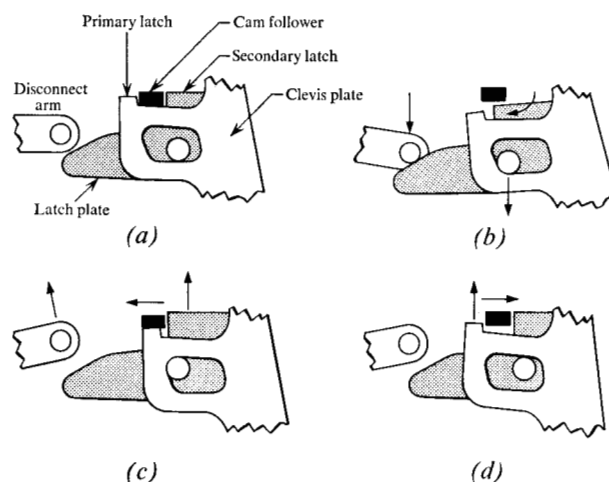
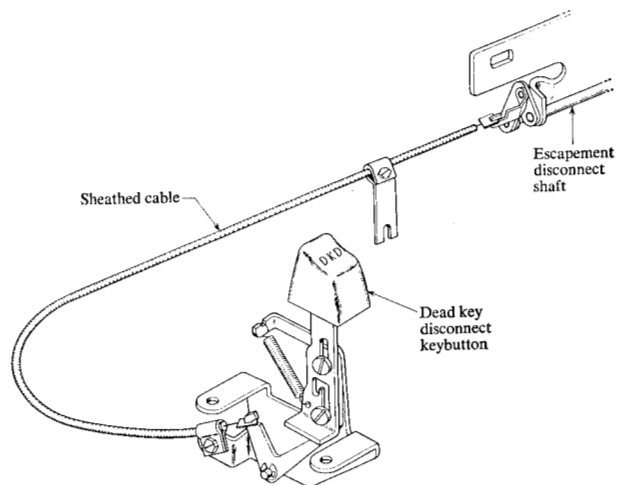


Figure 3 Detail of dead key latch: (a) inactive position; (b) action of signal input; (c) cam follower bypassing clevis plate; (d) restoring action.

Figure 4 Dead key disconnect mechanism.



Acknowledgments

The author extends his gratitude to D. E. Sederholm, B. W. Miles, C. N. Van Avery, and G. A. Holt, whose advice and guidance greatly simplified the work involved with the design of the dead key/dead key disconnect system.

References

1. H. Pijlman, "The IBM SELECTRIC Composer: Type Font Compatibility" *IBM Journal* 12, 26 (this issue).
2. B. T. Crutcher and D. E. Sederholm, "The IBM SELECTRIC Composer Letter Keyboard," *IBM Journal* 12, 15 (this issue).

Received January 19, 1967.