WM200 WORD COUNTER

DESCRIPTION AND PRINCIPLES OF OPERATION

1. GENERAL

1.01 This section contains the description and principles of operation for the WM200 online word counter. Unlike earlier types of word counters which require close physical association with the teletypewriter, this counter connects in series with the loop circuit and counts the words transmitted over the circuit. Six 5-unit code combinations are counted as one word.

2. DESCRIPTION

2.01 WM200 type word counters are available for 60, 75, or 100 wpm operation. They are coded WM200AB60, WM200AB75, or WM-200AB100, depending on the speed (indicated by the last 2 or 3 digits). A word counter for operation at one speed may be converted to any other speed by changing to the appropriate pair of gears for that speed. These gears are as follows:

	60 speed	75 speed	100 speed
Drive gear	TP122408	TP122424	TP136722
Driven gear	TP122410	TP122425	TP136723

2.02 The counter is designed to operate on a start-stop basis in a 0.060-ampere neutral telegraph loop carrying 5-unit code signals. Special arrangements would be required for a 0.020-ampere loop or for polar signals. The counter is driven by a small 110-volt 60-cycle synchronous motor through gears and an escapement mechanism controlled by a magnet similar to a selector magnet which responds to the teletypewriter signals passing through it. It counts up to 99,999 words and may be reset manually to zero from any point.

2.03 If the motor is run from an unregulated 60-cycle power source, some errors in counting may be expected. They will depend on the variation in the power frequency and the distortion in the signal circuit.

2.04 The counter is approximately 5-1/2 inches wide, 6 inches high, and 7 inches deep (including the small mechanical counter unit which projects from the front about 1-1/2 inches). The cover of each unit has three depressions spaced to match the spacing of the feet so that one unit may be placed on top of another. If the feet are removed, the unit may be fastened to a horizontal surface. It is not arranged to mount on a vertical surface.

2.05 The word counter is equipped with a terminal block for the power and line connections. For convenient and flexible use it may be wired to jacks so that it can be patched to any one of a group of circuits. It is not necessary to locate the counter near the teletypewriter, since only the loop circuit and ac power are required for the operation of the mechanism.

3. PRINCIPLES OF OPERATION

3.01 Reference should be made to the various figures in the section covering the requirements and adjustments for the WM200 word counter for the identification of the parts referred to hereinafter.

3.02 The counting operation is controlled by the interaction of the escapement (ratchet) wheel with the extension of the armature of the selector magnet. This extension is bifurcated to form a marking stop-arm and a spacing stop-arm. The ratchet wheel has six stop-lugs which are held or released by the stop-arms. The speed of rotation of the wheel is such that each lug corresponds to a single character and a complete revolution of the wheel, which registers one on the counter, to a word.

3.03 Under the normal closed line condition (marking), the ratchet wheel is stopped by the engagement of one of its lugs with the marking stop-arm of the armature extension. The start element (spacing) of a character releases the armature which moves to its spacing position. The stop-lug passes through the slot in the armature extension and the wheel turns

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freely, regardless of whether the signal elements are marks or spaces, until the next stop-lug approaches the armature extension. At that time the magnet is energized by the stop element of the signal and the marking stop-arm blocks the lug and stops the wheel. When the next start element is received, the process is repeated, the mechanism moving 1/6 of a word count for each stop.

3.04 The spacing stop-arm of the armature extension is not normally used. This arm has a yield-spring stop, bowed away from the arm. If a long break signal is sent or if the line goes open so that the armature remains in the spacing position, a stop-lug on the wheel comes up to the spring, pushes it against the solid portion of the spacing stop-arm and stops rotation of the wheel. The spring closes the spacing side of the slot in the armature extension so that the stop-lug cannot pass through as it did in normal operation.

3.05 When line current is restored the armature is drawn to the magnet and the spacing stop-arm, with spring, is moved out of the way of the stop-lug. The wheel does not turn, however, because the stop-lug is immediately blocked by the marking stop-arm where it rests in readiness for the next start element. In the meantime, the bowed spring moves back out of the way so that it will not interfere with the next movement of the armature to spacing. On the next start element the slot is free and the wheel can turn.

3.06 The ratio of the gears between the motor and the main-shaft of the counter is such that for 60-speed operation, the ratchet wheel turns at about 70 rpm, and for 75-speed, at about 87-1/2 rpm. This is one-sixth of the speed of the receiving shaft of the teletypewriter.