

DESCRIPTION OF TELETYPE MODEL 17 RADIO PRINTING SYSTEM  
USING 7-LINE CHARACTER PATTERN

The Teletype Model 17 radio printer system is a non-start-stop printer system requiring only approximate synchronization of motor speeds at the transmitting and receiving stations. The printer records the message on a tape, and prints the message in two lines exactly alike, one located above the other. If the printer and transmitter are running exactly in synchronism, the lines of printed characters will be parallel to the edges of the tape; if they are slightly out of synchronism, the printed lines will drift toward the edge of the tape at a rate directly proportional to the speed difference. A speed difference of one per cent will cause the copy to drift a height equal to the center distance between the two printed lines of characters (.277") in approximately 1-1/2" of tape. Since two characters are recorded on the tape, one above the other, one of the two will always be entirely on the tape as the pair drifts upward or downward due to an off-speed condition.

Inasmuch as this printer system does not use the start-stop principle, false pulses in the signal received by the printer, such as may be caused by radio static interference, cannot cause an incorrect character to be recorded. If such false pulses are received, they may result in additional marks appearing on the tape.

The model 17 distributor which originates the character pattern signals for radio transmission is controlled by means of a five-unit code perforated tape. This control tape can be prepared locally on a standard Teletype perforator; or, by using a standard Teletype reperforator, the control tape can be reproduced automatically from five-unit start-stop signals received from distant points over regular telegraph channels.

The printer and transmitting apparatus are arranged to operate at a speed of 50 words per minute. The shortest pulse transmitted is approximately .004 second long, which corresponds to a frequency of 122.5 cycles per second; the longest pulse is approximately .020 second long, which corresponds to a frequency of 24.5 cycles.

Photograph 391113-38 shows a Model 17 radio printer. Standard ticker tape is supplied from a roll at the right of the printer, and is fed through the printer at a uniform speed between friction rollers driven by the printer motor. Printing is accomplished by moving a knife-edged printing hammer in accordance with electrical pulses sent out by the transmitter, and causing this printing hammer to press the tape against a motor driven scanning wheel carrying a raised spiral ridge on its periphery. This ridge is inked by an ink roll so that the action of the printing hammer causes dots of various lengths to be marked on the tape to form characters. The characters are thus built up, or scanned, in 5

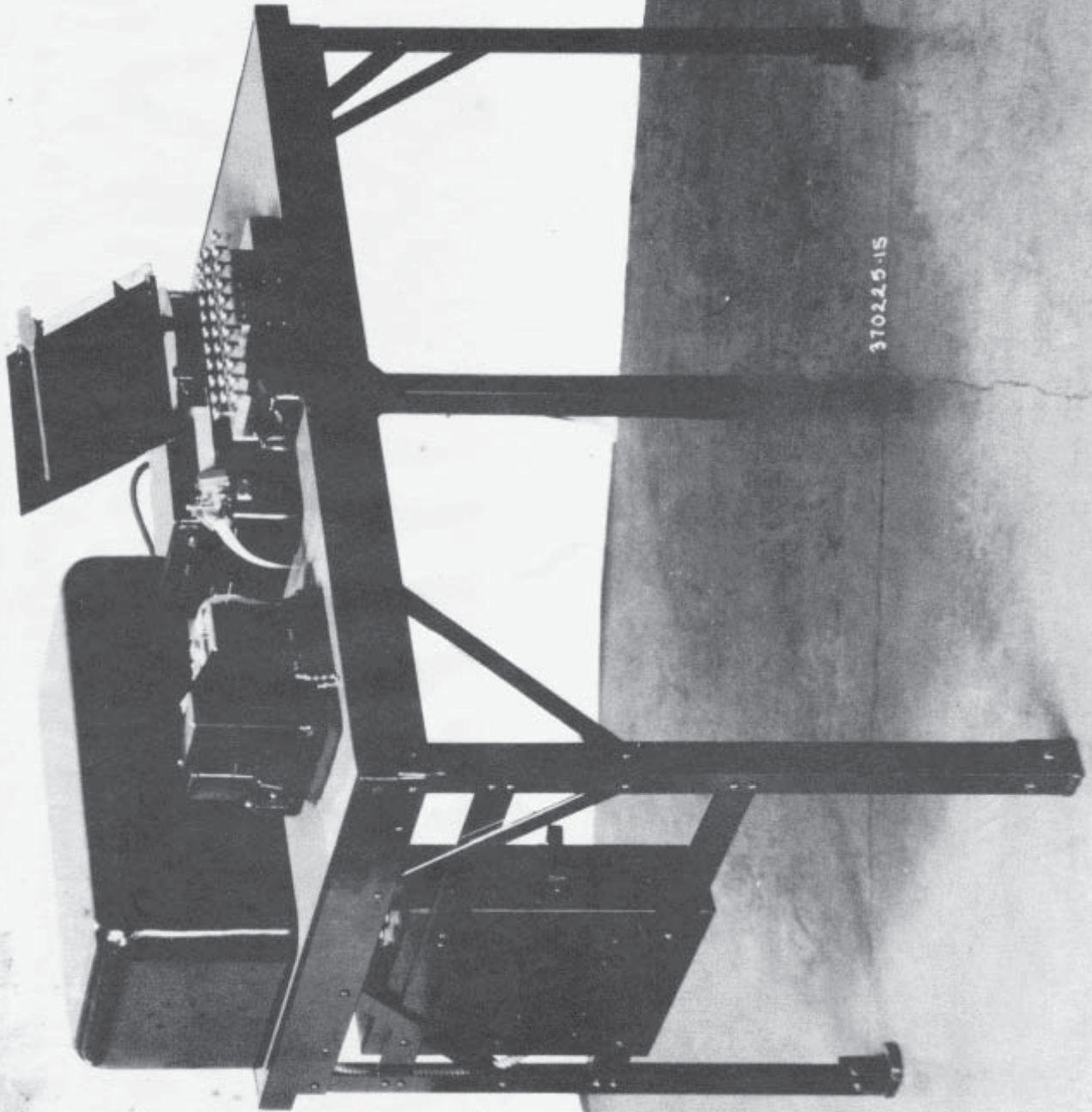
vertical lines on the tape. Two additional lines are allotted to each character space (making a total of 7 lines per character) for horizontal spacing between characters. The scanning is performed from the bottom toward the top of the tape, and, therefore, if the printer is running faster than the transmitter, the copy will drift toward the top of the tape, and if the printer is running slower than the transmitter, the copy will drift toward the bottom of the tape. Character pulses for only one character are transmitted during each seven revolutions of the scanning wheel, but two characters are recorded on the tape because the spiral on the scanning wheel is  $720^{\circ}$  in length and the print hammer engages the spiral at two points simultaneously.

The printer is equipped with a motor control mechanism which is arranged to open the circuit to the motor when no signals are being received. Approximately three inches of blank tape is fed out of the printer at the end of a message before the motor stops. This motor control mechanism is arranged to close the circuit to the motor upon receipt of a motor start signal. The motor start signal is automatically transmitted before the start of character signal transmission from the transmitting station.

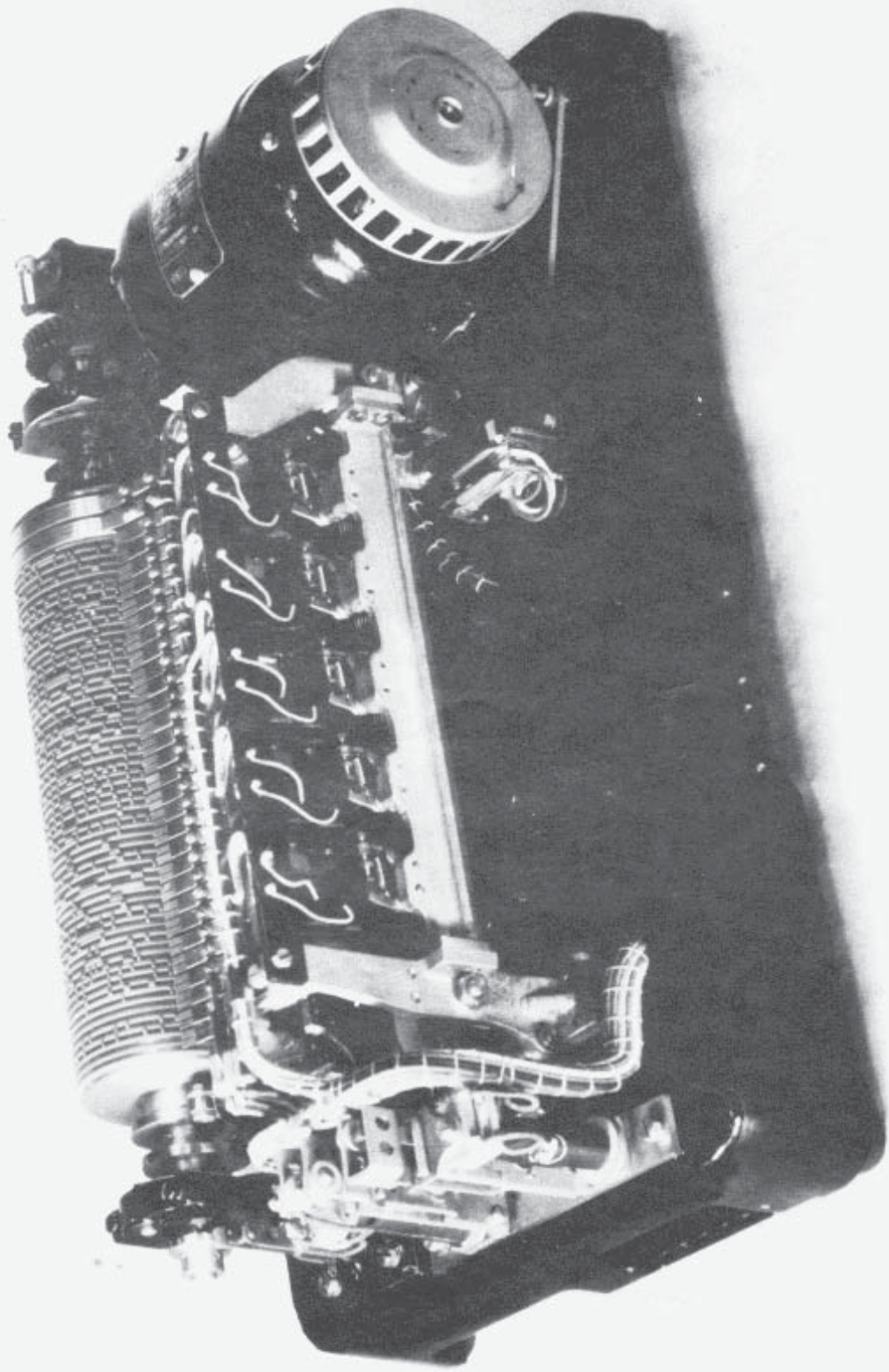
The power requirements for the printer are approximately 25 watts for the motor, and 2 watts for the motor control magnet.

Photograph 370225-15 shows 17 type transmitting apparatus consisting of a 5-unit tape perforator, tape transmitter, and a 17 type distributor mounted on a transmitting table. When the control tape is to be reproduced automatically from 5-unit start-stop signals originated at distant points, a tape re-perforator may replace the perforator shown on the table.

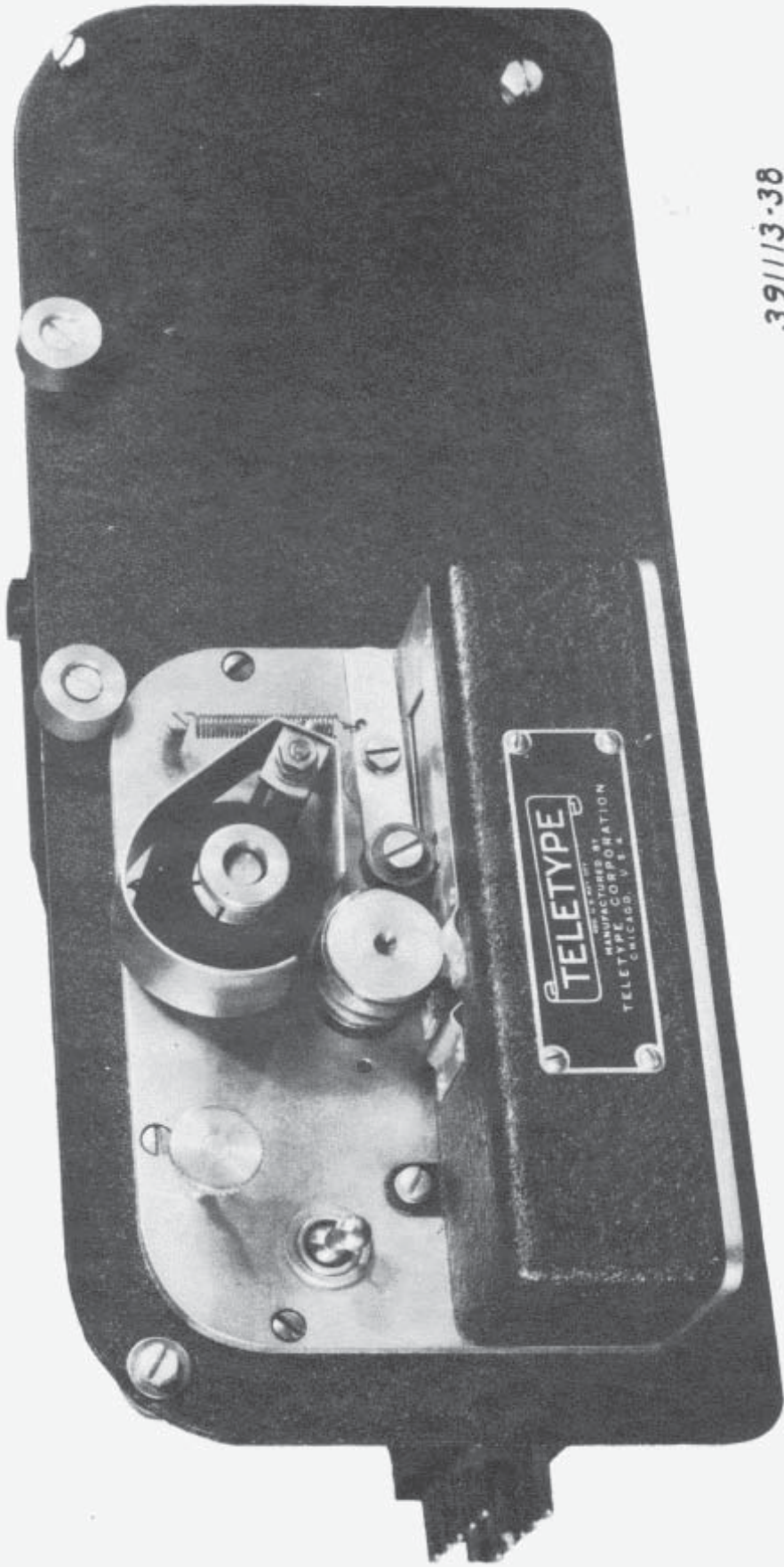
Photograph 370225-16 shows the 17 type distributor which translates the 5-unit telegraph code to the radio printer character pattern. The signal combinations appearing in the perforated tape are used to select brush levers on the 17 type distributor. A brush lever is provided for each character. Each brush lever has a corresponding character disc mounted on a drum which is rotated by the distributor motor, and on the periphery of each character disc are projections of varying length proportional to the pulses required to form the character on the receiving printer. As the brush levers are selected successively, the brushes wipe the raised projections on the character discs associated with them and in so doing transmit the character pulses.



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