

The direction of dome rotation determines which direction the registers are shifted, and the distance moved determines the number of shifts that occur. For each incremental tick of motion, the registers are shifted by 1 bit. The two registers can be shifted in either direction, but both registers perform the identical shift sequence. The registers are not connected in cascade, so the contents of one register will never shift into the other. In fact, none of the four serial shift outputs is connected to anything, so the bits which shift out of the registers are shifted into oblivion. The two registers share a common serial input, namely, the signal from the optical sensor that scans the data track.

The actual operation of these registers proceeds as follows. On power up, the registers are set to zero. The dome must be moved a small amount (at least 24 incremental ticks) in either direction to initialize either one of the registers. When the dome rotates right by one incremental encoder tick, both registers are shifted right one bit. The bit from the data track is shifted into the "dome right motion shift register," while a zero is shifted into the "dome left motion shift register." When the dome moves left, the converse is true.

When an absolute position tag shifts into either register and becomes properly framed (i.e., the tag is centered in the register and surrounded on both sides by a start bit and zeroes), the framing gating generates a "tag-framed" strobe (see Figure 3). This signals the tag decoder (which is implemented as a look-up table) to check the tag for parity and adjacency (see section on fault detection below). If the tag fails either test, an error signal is generated and the tag is ignored. If the tag is valid, it is decoded into an absolute position, and a "valid tag decoded" strobe is generated. This latches the absolute position into the absolute position register, and signals the position comparator to compare the absolute position to the incremental position. If they do not match, an error signal is generated, and the incremental position is reset to the absolute position.

Note that a given tag will decode to one of two different absolute positions, depending on whether it is framed in the "dome right motion" or the "dome left motion" shift register. The positions correspond, respectively, to the tag being positioned either just to the right or just to the left of the read head.

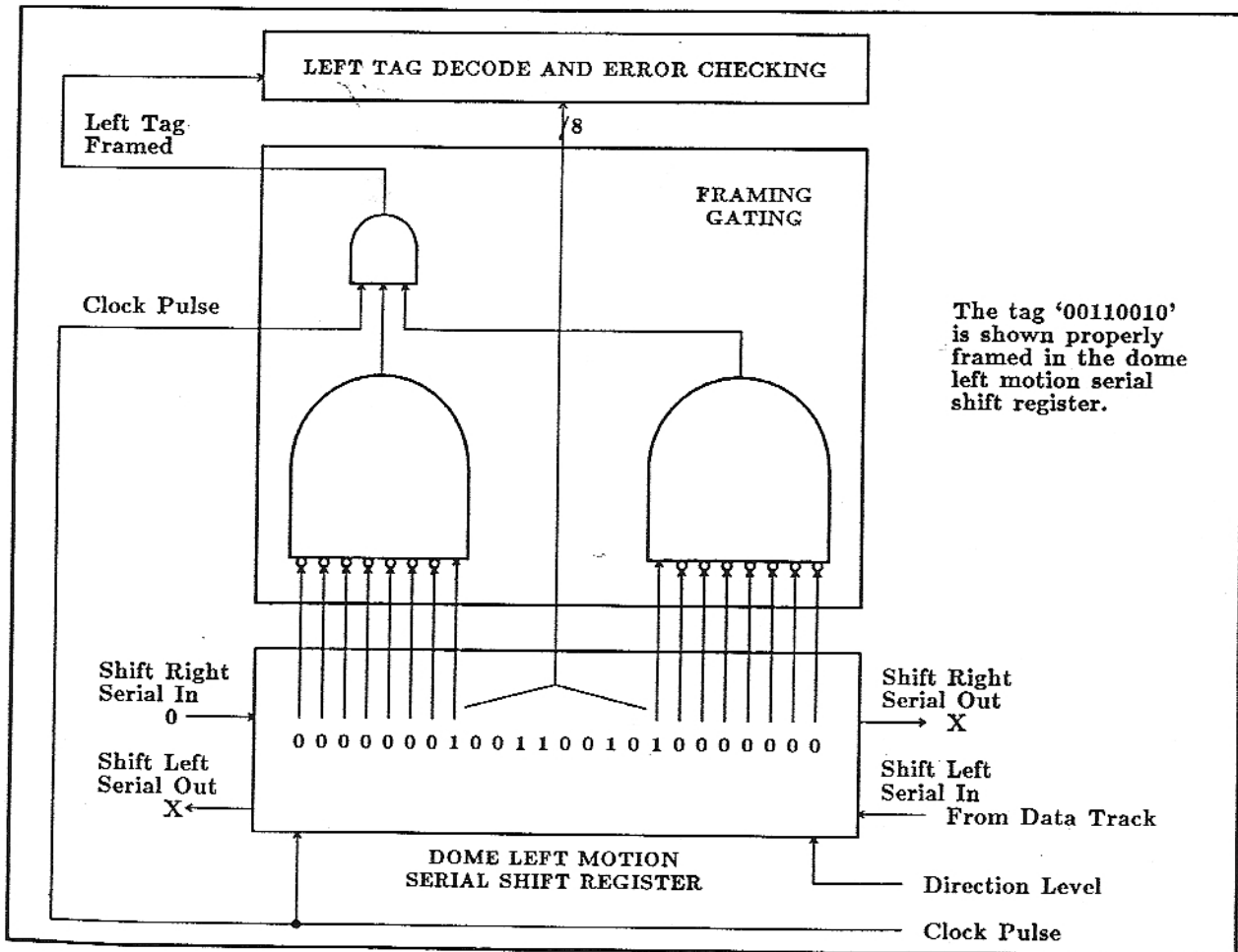


Figure 3. Detail of framing gating logic.