



TIMING BASED SERVO SYSTEM FOR MAGNETIC TAPE SYSTEMS

ABSTRACT OF THE DISCLOSURE

A track following servo system is disclosed for use with magnetic tape systems in which magnetic servo track patterns contain transitions recorded at more than one azimuthal orientation across the width of the servo track. The timing of a signal derived from reading at any point across the width of such a pattern varies continuously as the read head is moved across the servo track. The pattern is read by a servo read head whose width is small compared to the servo track pattern. The combination of a wide servo pattern and a narrow servo read head offers excellent position sensing linearity and dynamic range. In the preferred embodiment, the servo read head is also narrow with respect to the data tracks, which provides the additional advantages of superior immunity to position sensing errors caused by defects or temporal variations in the servo read head, defects in the servo pattern on the tape, wear of the head or tape, or debris collection on the head or tape. Position sensing with this system is achieved by deriving a ratio of two servo pattern intervals and therefore is insensitive to tape speed during reading. The servo patterns may include spacing intervals recognizable for error detection and correction purposes. Servo tracks are recorded using a patterned multiple gap servo write head whose magnetic gaps have geometries appropriate to generate the desired servo patterns. The patterned gaps of the servo write head are produced by photolithographically defined electroplating of permalloy on a ferrite ring head structure.