

# Rodime RO352

1983 Rodime RO351/RO352

First drive in 3.5-inch floppy form factor

## Why it's important:

While technically the first commercial Hard Disk Drive (HDD) to fit into a 3.5-inch form factor, the chosen media diameter, 96 mm x 40 mm, along with its open loop positioning technology, limited the product's capacity and its market acceptance.

## Discussion:

Rodime Limited was formed in 1980 by several key managers from the Burroughs disk drive manufacturing facility in Glenrothes, Scotland. It became a successful 5.25-inch HDD manufacturer of OEM disk drives in 1981 and achieved a healthy growth rate. In the 3rd quarter of 1983, Rodime became the first manufacturer of 3.5-inch HDD products, with unformatted capacities of 6.38 (RO351) and 12.75 (RO352) megabytes, using disks with a 96 mm outer diameter. In the second half of the 1980s, numerous disk drive manufacturers entered the 3.5-inch HDD market, but most used disks with a 95 mm outer diameter and a smaller inner diameter, which became an industry standard. In the meantime, Rodime had expanded manufacturing from its Scotland plant to additional facilities in Boca Raton, Florida, and Singapore. Sales of its 5.25-inch drives were declining due to competition from the 3.5-inch drives now aggressively sold by the dozens of manufacturers which had followed Rodime into that market. Rodime was not able to keep up with its 3.5-inch HDD competitors' continuous improvements in drive performance and capacity. By 1989, Rodime was approaching bankruptcy, top management was replaced, and in 1991 the company announced it was filing for bankruptcy and stopping the manufacture of disk drives.

It is an urban legend that Rodime invented and patented the 3.5-inch form factor. The first products to use the 3.5-inch form factor were 3.5-inch floppy disk drives announced by Tandon and Shugart Associates at the Fall Joint Computer Conference in November 1982, and first shipped in 1983. Neither company was ever issued a patent on the form factor and it is not clear that the set of dimensions that are a part of a form factor definition could or should be patentable. What Rodime did disclose and claim was hard disk drives having, in part, a disk with an outer diameter in the range of 92 to 96 mm (3.6 - 3.8"), see U.S. Patents [4,568,988](#) (filed February 22, 1984) and [4,638,383](#) (filed November 19, 1985). As it turned out, the industry, led by Seagate and MiniScribe, had agreed upon an industry standard disk for 3.5-inch drives having an OD of 95 mm and an ID of 25 mm as early as 1984 (MiniScribe 8425) and well before the patents issued in February 1986 and January 1987, respectively. The first Rodime product used a disk of 96 mm OD and 40 mm ID, which has a substantially smaller recording surface than the industry standard disk and this deficiency was one cause of the product's lack of success.

Rodime sued most of the disk drive industry for infringement of these patents and collected substantial settlements from many, notably an estimated \$10M from Conner Peripherals [EN, June 10, 1991, p. 27] and supposedly \$26M from IBM. In the end, both patents were found to be invalid by courts - with regard to high performance (i.e., servo mechanism) drives in *Quantum v. Rodime* (1995) and with regard to low performance (i.e., open loop mechanism) drives in *Rodime v. Seagate* (1997). This latter case was reversed on appeal and Seagate then settled without a new trial.

Quantum was sustained on appeal and therefore Rodime had no legitimate claim on the high performance drives such as produced by Conner and IBM. Unfortunately for them, there is typically no refund if a licensed patent is subsequently found invalid.

After Rodime ceased manufacturing disk drives in 1991, it became a patent troll, litigating its disk diameter patents until they were invalidated and litigating other purchased patents. . In 2000 using funds from its settlement with Seagate, Rodime acquired Littlewoods Leisure, the UKs leading gambling pools promoter, changed its name to Sportech PLC and thus exited the HDD industry.

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Wetpaint link: <http://chmhdd.wikifoundry.com/page/Rodime+RO352>

# United States Patent [19]

McGinlay et al.

[11] Patent Number: **4,568,988**

[45] Date of Patent: **Feb. 4, 1986**

[54] **MICRO HARD-DISK DRIVE SYSTEM**

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[73] Assignee: **Rodime plc, Glenrothes, Scotland**

[21] Appl. No.: **582,554**

[22] Filed: **Feb. 22, 1984**

[51] Int. Cl.<sup>4</sup> ..... **G11B 5/012; G11B 5/55;**  
**G11B 5/56**

[52] U.S. Cl. .... **360/77; 360/78**

[58] Field of Search ..... **318/611, 634; 360/77,**  
**360/78, 97, 98, 135**

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[57] **ABSTRACT**

A micro-Winchester disk drive system particularly suited to meet the demands of a portable computer system. The micro-Winchester disk is a Winchester disk of 85-100 mm in diameter. This disk drive system by virtue of its small size and vibration isolation is ideally suited for use in portable computer systems. The micro-Winchester disk drive system was developed to store data at a density of 600 tracks per inch utilizing open-loop positioning mechanism. This disk drive system provides fast access data storage for use with small business computers, terminals and microprocessor based systems, portable or otherwise, and many other areas where compact, rugged light-weight hard-disk storage is required. The disk drive system of the present invention normally utilizes either one or two hard disks such as Winchester disks and provides data storage on each disk in excess of 5 Megabytes, once the disks are formatted.

**45 Claims, 16 Drawing Figures**

