United States Patent [19]

Clark

[11] Patent Number: 6,020,904

[45] Date of Patent: *Feb. 1, 2000

[54] **HIGH SPEED SIGNAL CONVERSION METHOD AND DEVICE**

[75] Inventor: **Iain Clark**, Newark, Calif.

[73] Assignee: **LSI Logic Corporation**, Milpitas, Calif.

[*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: **08/607,433**

[22] Filed: **Feb. 27, 1996**

Related U.S. Application Data

[63] Continuation of application No. 08/161,729, Dec. 3, 1993, Pat. No. 5,504,503.

[51] **Int. Cl.**[7] **B09G 5/00**
[52] **U.S. Cl.** **345/518**; 345/516; 345/507
[58] **Field of Search** 365/230.04, 230.05, 365/230.08, 230.09, 189.05; 345/185, 189, 186, 190, 200, 507, 509, 515, 516, 517, 518; 395/507, 509, 515, 516, 517, 518
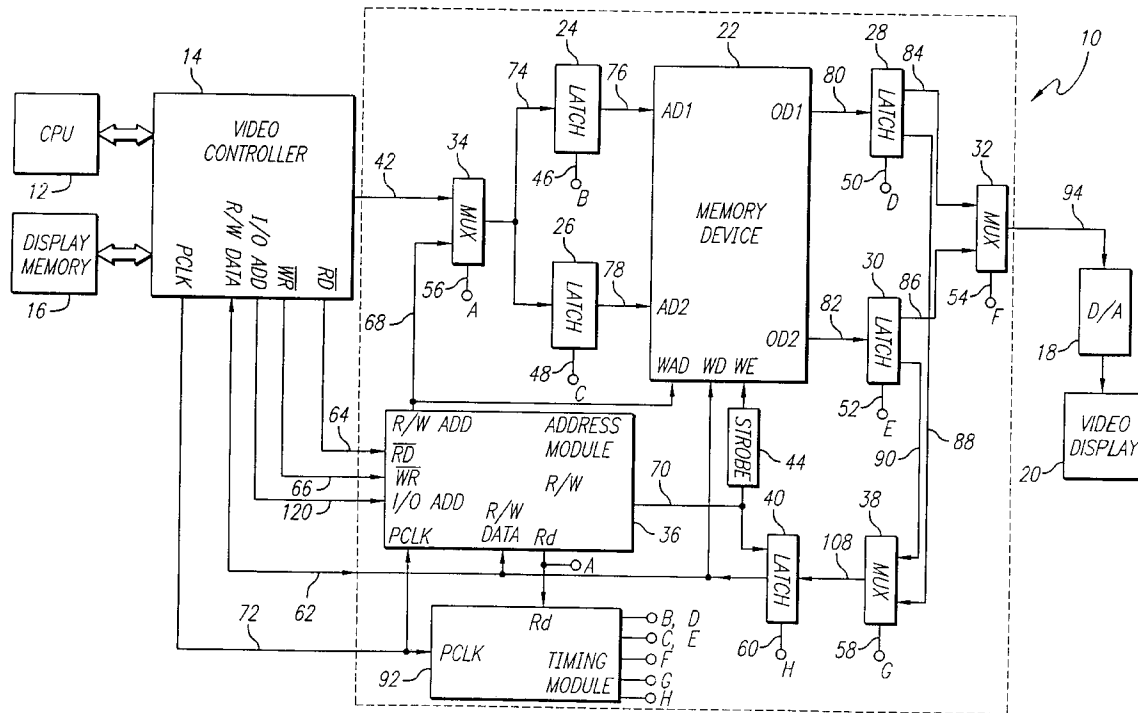
[56] **References Cited**

U.S. PATENT DOCUMENTS

4,503,429	3/1985	Schreiber .
4,742,350	5/1988	Ko et al. .
4,791,580	12/1988	Sherrill et al. .
4,849,937	7/1989	Yoshimoto .
4,860,263	8/1989	Mattausch 363/230.05
4,894,653	1/1990	Frankenbach .
4,905,189	2/1990	Brunolli .
5,097,256	3/1992	Eldridge et al. .
5,163,024	11/1992	Heilveil et al. .
5,204,664	4/1993	Hamakawa .
5,220,312	6/1993	Lumelsky et al. .
5,269,003	12/1993	Roskowski et al. .
5,276,803	1/1994	Iwase .
5,283,866	2/1994	Kumagai .

Primary Examiner—Dennis-Doon Chow

[57] **ABSTRACT**

A random access memory has an access time which is longer than the period of read input signals, for example digital video data signals, such that it cannot respond directly to the input signals. The memory has two read address inputs and two outputs which are arranged as separate channels, each of which can access any location in the memory. The access time of the memory is shorter than two input signal periods. The input signals are applied alternatingly to the read address inputs, and output signals constituted by data stored at addresses corresponding to the input signals are produced at the memory outputs by an arrangement of clocked latches such that, although two input signal periods are used for accessing each memory location, the alternating accessing using two channels enables the memory to produce output signals having the same period (at the same frequency) as the input signals. Additional elements are provided to enable writing to the memory using the alternating channel arrangement, and also to enable memory locations to be unconditionally interrogated while responding to a stream of read input signals.
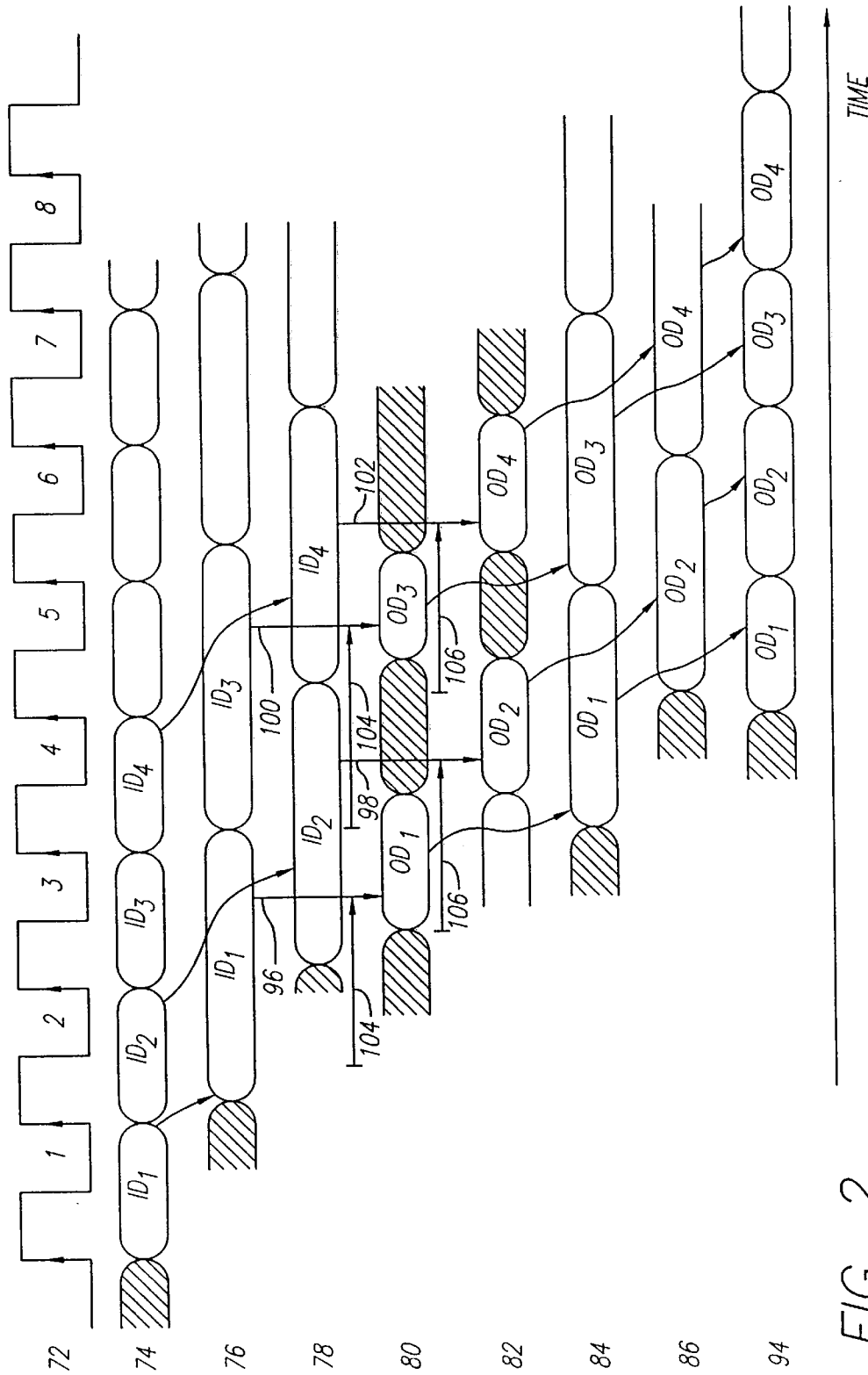
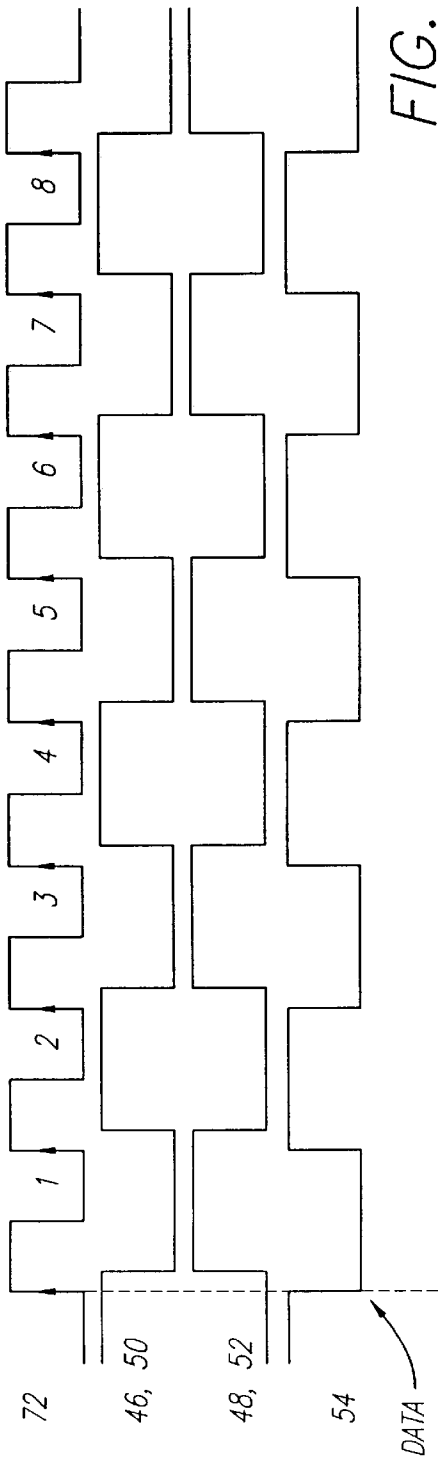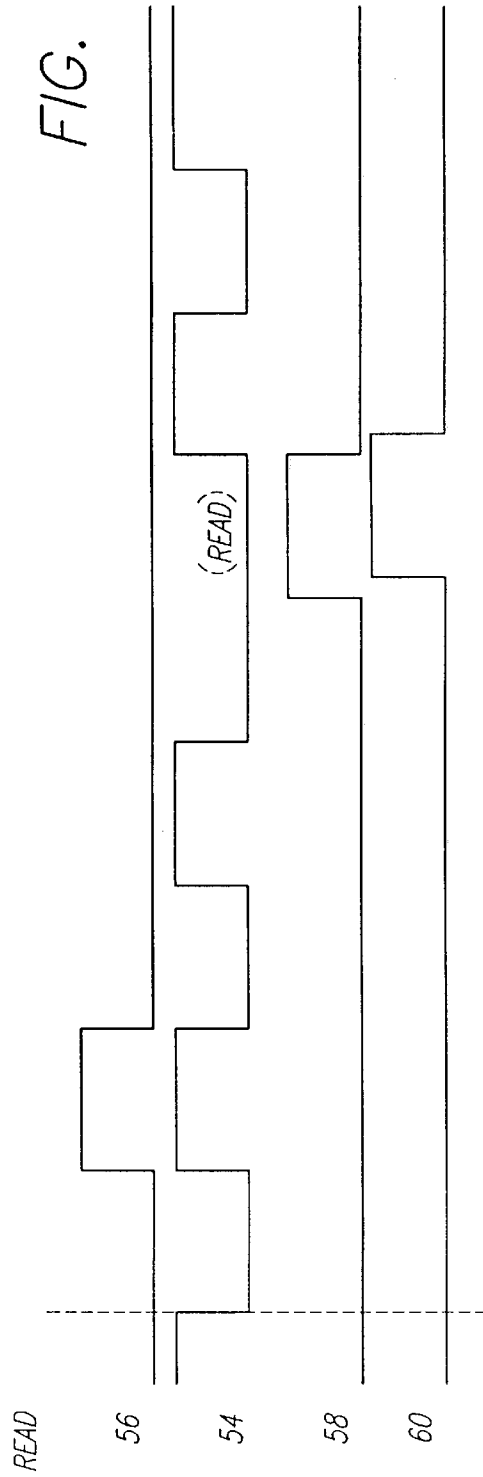**17 Claims, 4 Drawing Sheets**
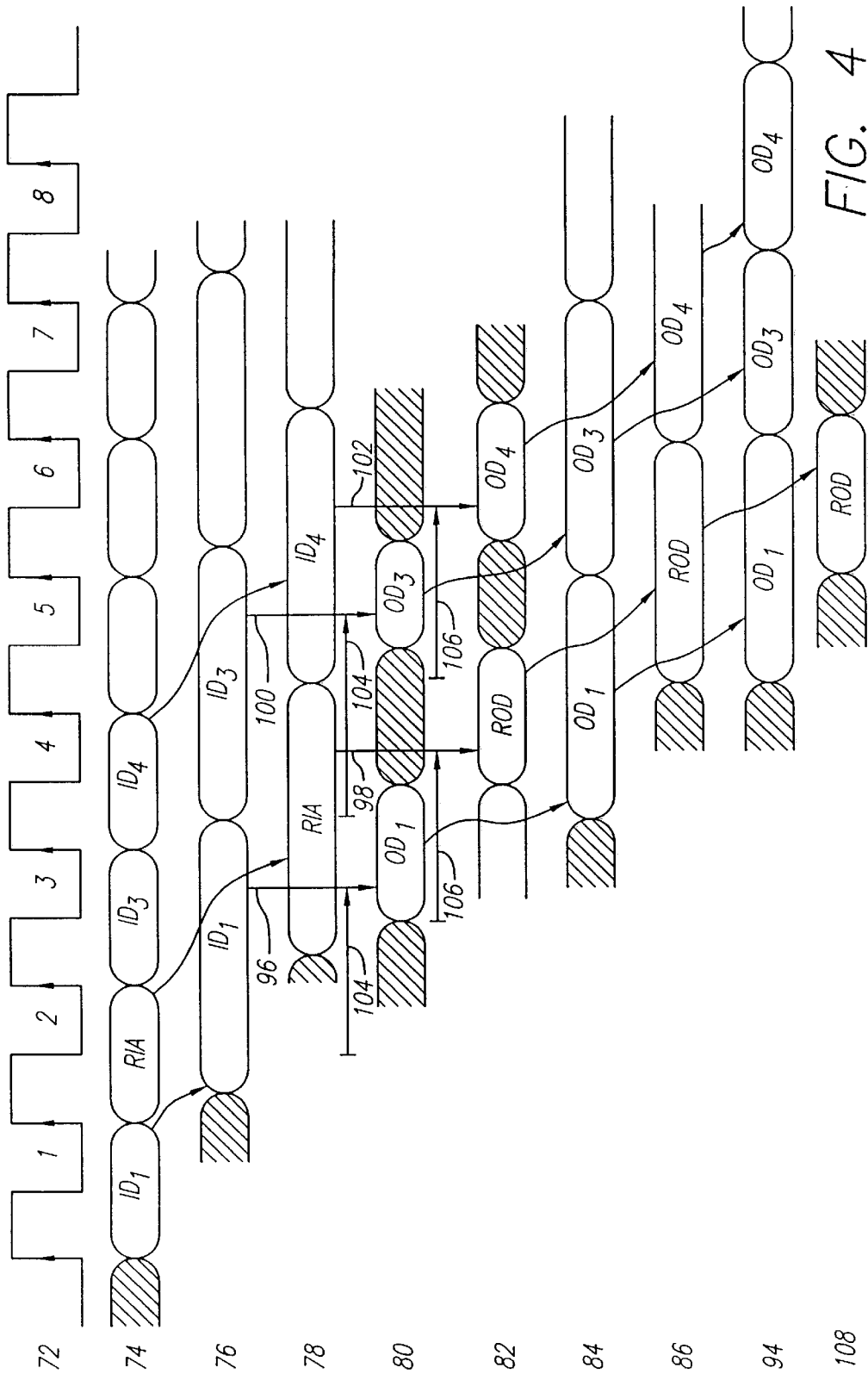
FIG. 1

FIG. 2

FIG. 3(a)

FIG. 3(b)

FIG. 4

DOCKET ALARM

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS
Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS
Sync your system to PACER to automate legal marketing.

fastcase
Smarter legal research.