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## Floppy disk (MFM) data separator design?

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11-08-2003, 11:23 PM

Philip Pemberton  
Guest  
Posts: n/a

Hi,  
I'm trying to find a circuit diagram for an MFM data separator suitable for connecting to a NEC uPD765, Rockwell R6765 or Intel 8272 FDC. I've found loads of ICs capable of doing this, but all the ones I've found were listed as obsolete, i.e. no chance of getting a datasheet. Has anyone got a circuit that would work with my uPD765? I need this for a single-board computer I'm building - replacing the 765 with another IC is not an option.

Thanks.

--

Phil. | Acorn RiscPC600 Mk3, SA202, 64MB, 6GB,  
[\(E-Mail Removed\)](#) (valid address) | ViewFinder, Ethernet  
(Acorn AEH62),  
<http://www.philpem.dsl.pipex.com/> | 8xCD, framegrabber,  
Teletext  
.... Techs would rather pee on an electric fence for the light show



11-08-2003, 11:56 PM

Jim Thompson  
Guest  
Posts: n/a

On Sun, 09 Nov 2003 00:23:48 GMT, Philip Pemberton <[\(E-Mail Removed\)](#)> wrote:

>Hi,  
> I'm trying to find a circuit diagram for an MFM data separator suitable for

>connecting to a NEC uPD765, Rockwell R6765 or Intel 8272 FDC. I've found  
 >loads of ICs capable of doing this, but all the ones I've found were listed  
 >as obsolete, i.e. no chance of getting a datasheet.  
 > Has anyone got a circuit that would work with my uPD765? I need this for a  
 >single-board computer I'm building - replacing the 765 with another IC is not  
 >an option.  
 >  
 >Thanks.

What is the data rate? I have an ancient (as in ~25 years) design which I did as a lark to prove I could track floppy data while the floppy drive was being rotated in odd little ways (as in a swinging briefcase-based tester ;-)

...Jim Thompson

--

James E.Thompson, P.E.	mens
Analog Innovations, Inc.	et
Analog/Mixed-Signal ASIC's and Discrete Systems	manus
Phoenix, Arizona Voice ☎(480)460-2350	
E-mail Address at Website Fax ☎(480)460-2142	Brass Rat
<http://www.analog-innovations.com>	1962

I love to cook with wine. Sometimes I even put it in the food.



11-09-2003, 05:29 AM

Philip Pemberton  
 Guest  
 Posts: **n/a**

In message <(E-Mail Removed)>  
 Jim Thompson <(E-Mail Removed)> wrote:

> **What is the data rate?**  
 500 or 250kbits/second. 500kbits if the drive is reading a high density disk,  
 250 if it's reading a double-density disk.

Thanks.

--

Phil. | Acorn RiscPC600 Mk3, SA202, 64MB, 6GB,  
 ([E-Mail Removed](#)) (valid address)| ViewFinder, Ethernet (Acorn AEH62),  
<http://www.philpem.dsl.pipex.com/> | 8xCD, framegrabber, Teletext  
 Never underestimate the power of human stupidity -- Robert A. Heinlein



11-09-2003, 01:00 PM

Fred Abse  
Guest  
Posts: **n/a**

On Sun, 09 Nov 2003 06:29:07 +0000, Philip Pemberton wrote:

> In message <(E-Mail Removed)>  
> Jim Thompson <(E-Mail Removed)> wrote:  
>  
>> What is the data rate?  
> 500 or 250kbits/second. 500kbits if the drive is reading a high density  
> disk, 250 if it's reading a double-density disk.  
>  
> Thanks.

Weren't 5.25" HD disks 300k ? ISTR so.

--

Then there's duct tape ...  
(Garrison Keillor)  
(E-Mail Removed)



11-09-2003, 02:04 PM

Philip Pemberton  
Guest  
Posts: **n/a**

In message <(E-Mail Removed) t>  
Fred Abse <(E-Mail Removed)> wrote:

> > 500 or 250kbits/second. 500kbits if the drive is reading a high density  
> > disk, 250 if it's reading a double-density disk.  
> Weren't 5.25" HD disks 300k ? ISTR so.

In FM mode, yes, IIRC. I'm using 3.5" HD disks which are usually recorded at 500k/sec in MFM mode with a spindle speed of (IIRC) 360rpm.

The problem is, without a data separator, the controller ICs are useless. FM isn't too hard - I've got a schematic for that. MFM encoding, OTOH, is a total PIB. I spent most of this morning searching through Google and the EspaceNet patent information system. And what did I find? Nothing useful :-)

Thanks.

--

Phil. | Acorn RiscPC600 Mk3, SA202, 64MB, 6GB,  
(E-Mail Removed) (valid address) | ViewFinder, Ethernet  
(Acorn AEH62),  
<http://www.philpem.dsl.pipex.com/> | 8xCD, framegrabber,  
Teletext

The Klingon dictionary: 90% curses or your money back.



11-09-2003, 03:09 PM

Michael A. Terrell

Fred Abse wrote:

Guest  
Posts: n/a

>  
> On Sun, 09 Nov 2003 06:29:07 +0000, Philip Pemberton wrote:  
>  
> > In message <(E-Mail Removed)>  
> > Jim Thompson <(E-Mail Removed)> wrote:  
> >  
> > > What is the data rate?  
> > 500 or 250kbits/second. 500kbits if the drive is reading a high density  
> > disk, 250 if it's reading a double-density disk.  
> >  
> > Thanks.  
>  
> Weren't 5.25" HD disks 300k ? ISTR so.

1.2m on IBM format.

--

Michael A. Terrell  
Central Florida



11-09-2003, 03:18 PM

Michael A. Terrell  
Guest  
Posts: n/a

Philip Pemberton wrote:  
>  
> In message <(E-Mail Removed) t>  
> Fred Abse <(E-Mail Removed)> wrote:  
>  
> > > 500 or 250kbits/second. 500kbits if the drive is reading a high density  
> > > disk, 250 if it's reading a double-density disk.  
> > Weren't 5.25" HD disks 300k ? ISTR so.  
> In FM mode, yes, IIRC. I'm using 3.5" HD disks which are usually recorded at  
> 500k/sec in MFM mode with a spindle speed of (IIRC) 360rpm.  
> The problem is, without a data separator, the controller ICs are useless. FM  
> isn't too hard - I've got a schematic for that. MFM encoding, OTOH, is a  
> total PIB. I spent most of this morning searching through Google and the  
> EspaceNet patent information system. And what did I find? Nothing useful :-(  
>  
> Thanks.  
> --  
> Phil. | Acorn RiscPC600 Mk3, SA202, 64MB, 6GB,  
> (E-Mail Removed) (valid address) | ViewFinder, Ethernet (Acorn AEH62),  
> <http://www.philpem.dsl.pipex.com/> | 8xCD, framegrabber, Teletext  
> The Klingon dictionary: 90% curses or your money back.

Is this for a one up, or for production? If it is a single item, you can still find old IBM PC floppy disk controller cards to salvage the chips you need. there are companies that sell recycled ICs, as well. One is Fox: <http://www.foxelectronics.com/>

<<http://www.google.com/search?hl=en&ie=ISO-8859-1&q=recycled+iCs&btnG=Google+Search>> shows 15,800 hits.

--

Michael A. Terrell  
Central Florida



11-09-2003, 03:42 PM

Philip Pemberton  
Guest  
Posts: **n/a**

In message <(E-Mail Removed)>  
"Michael A. Terrell" <(E-Mail Removed)> wrote:

> [Is this for a one up, or for production?](#)  
One off.

> [If it is a single item, you](#)  
> [can still find old IBM PC floppy disk controller cards to](#)  
> [salvage the](#)  
> [chips you need.](#)

The catch is, most of the ones I've seen use the so-called "Super I/O" chips with built-in address decoding. I want a chip I can shove on the bus, add an address decoder, then just start sending commands to it. The 765 is perfect - it supports the IBM PC formats, it doesn't have a built in address decoder and - with a bit of glue logic - will sit on a 6502 CPU's bus with very little fuss. The only problem is that wretched data separator. 99.5% of the designs I've seen use a "black box" type data separator or an ASIC. The other 0.5% use 74TTL to implement the data separator, but they run in FM mode.

> [there are companies that sell recycled ICs, as well. One](#)  
> [is Fox: http://www.foxelectronics.com/](#)

I know about companies like that - IME most of them seem to charge a hell of a lot for just one or two ICs, though. Case in point: A few years ago I tried to buy a pair of Rockwell R6502A CPUs, shortly after RSS discontinued them

(just before they became Conexant). By this time, Farnell had run out of stock and none of my other suppliers could get any either. I contacted two obsolete IC distributors and got two quotes. One disti quoted £9.45 for a "board pull", £18.97 for a new chip. The other quoted £12.79 for a pull, £47.18 for a new chip.

If I knew anyone who had a pair of SMC (now SMsC) or UMC data separator chips for sale at a reasonable price, I'd buy them. Of course, the data separators are (at least in the UK) like hen's teeth. That's why I wanted something using 74TTL and (maybe) a PROM - they're common parts and I've got a PROM programmer. PROMs are getting hard to find now, but I've been able to program GALs to emulate FusePROMs. The GALBlast is a nice tool, even moreso if you know how to use it :-)

Later.

--

Phil. | Acorn RiscPC600 Mk3, SA202, 64MB, 6GB, [\(E-Mail Removed\)](#) (valid address) | ViewFinder, Ethernet (Acorn AEH62), <http://www.philpem.dsl.pipex.com/> | 8xCD, framegrabber, Teletext  
My other vehicle is a Galaxy Class Starship



11-09-2003, 03:44 PM

Philip Pemberton  
Guest  
Posts: n/a

In message <(E-Mail Removed)>  
"Michael A. Terrell" <(E-Mail Removed)> wrote:

> Fred Abse wrote:  
> > Weren't 5.25" HD disks 300k ? ISTR so.  
> 1.2m on IBM format.  
The formats were, IIRC:  
3.5" DD - 720k  
3.5" HD - 1.44MB  
3.5" QD - 2.88MB  
5.25" SD - 120k  
5.25" DD - 360k  
5.25" HD - 1.2MB

Later.

--

Phil. | Acorn RiscPC600 Mk3, SA202, 64MB, 6GB, [\(E-Mail Removed\)](#) (valid address) | ViewFinder, Ethernet (Acorn AEH62), <http://www.philpem.dsl.pipex.com/> | 8xCD, framegrabber,

Teletext

Seen on T-shirts at NASA: WILL BUILD SPACE STATION FOR FOOD.



11-09-2003, 03:53 PM

Fred Abse  
 Guest  
 Posts: **n/a**

On Sun, 09 Nov 2003 16:09:43 +0000, Michael A. Terrell wrote:

> Fred Abse wrote:

>>

>> On Sun, 09 Nov 2003 06:29:07 +0000, Philip Pemberton wrote:

>>

>> > In message <(E-Mail Removed)>

>> > Jim Thompson <(E-Mail Removed)> wrote:

>> >

>> >> What is the data rate?

>> > 500 or 250kbits/second. 500kbits if the drive is reading a high

>> > density disk, 250 if it's reading a double-density disk.

>> >

>> > Thanks.

>>

>> Weren't 5.25" HD disks 300k ? ISTR so.

>

> 1.2m on IBM format.

Sorry, Michael, I wasn't clear there, I meant 300kBPS write speed.

--

Then there's duct tape ...

(Garrison Keillor)

[\(E-Mail Removed\)](#)



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