VG5000

DISK CONTROLLER

1. SCOPE

1.1 A 'devil's advocate' maximum feature / minimum component design just for VG5000.

2. FEATURES

2.1 The controller is I/O mapped as follows:

PORT	READ	WRITE
01	Status	Selection
00	Status Reg.	Command Reg.
20	Track Reg.	Track Reg.
40	Sector Reg.	Sector Reg.
60	Data Reg.	Data Reg.

2.2 Ports x0 address the TMS 1770. Port 01 addresses additional features:

READ:
- D0 Data request (1770)
- D1 Command request (1770)
- D2 Disk READY status
- D3 Disk MOTOR status

WRITE:
- D0, D1, D2, D3 } Select 1 of 4 drives
- D4 Double sided media (side select)
- D5 Double density media *
- D6 Head-load facility *
- D7 ROM/RAM enable/disable

2.3 The features can be simplified by using a 6-bit latch for port 01 rather than 8. Items to omit are bits D5 and D6. Omitting other features does not give any component saving.

2.4 All drives can be daisy-chained onto a single cable.

3. COMPONENTS

3.1 The I.C. count is as follows:

1	x	TMS1770
1	x	HN27128
1	x	74S04
2	x	7406
1	x	74LS08
1	x	74LS32
1	x	74LS244
1	x	74LS245
1	x	74LS138
1	x	74LS273

.... 11 I.C.s.

3.2 Spare gates are as follows

74S04 : 

7406 : 

74LS32: 

½'LS244: (4 x )

3.3 The 244 could be used to buffer some lines:

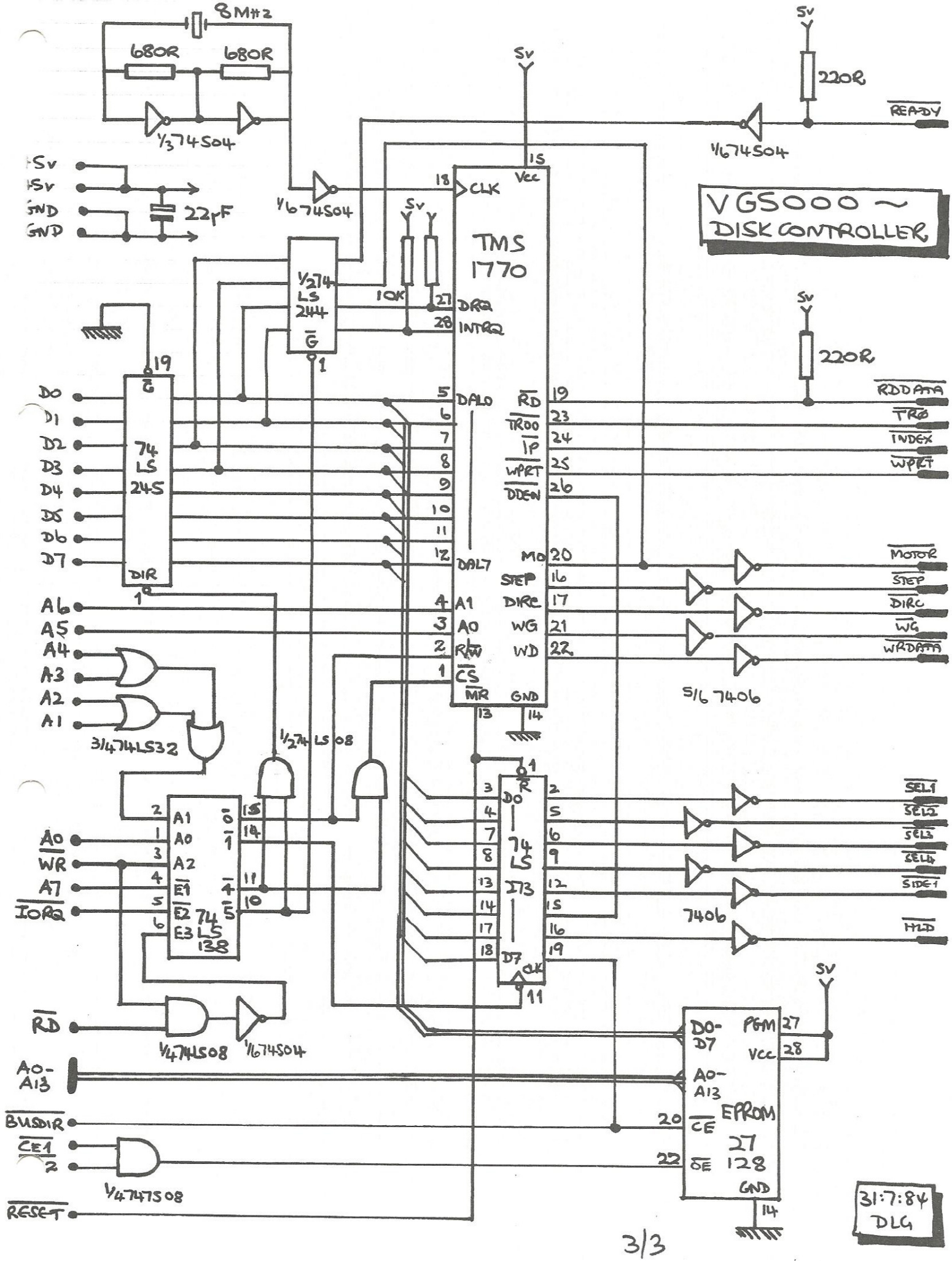
AS → TMS1770
A6 → TMS1770
$\overline{\text{RESET}}$ →
BUSDIR ←

3.4 Note that DRQ and INTRQ can be read via the TMS1770 status register. If no additional status is required via port 01, and no buffering is used, the 74LS244 can be omitted. In this case one further gate is freed-up:

74LS08: 

1984:07:31

D L Greatham


8MHz
680R
680R
1/3 74S04
5V
220R
READY
1/6 74S04
5V
5V
GND
GND
22pF
1/6 74S04
VGS000 ~
DISK CONTROLLER
TMS
1770
CLK
Vcc
1/2 74 LS 244
10K
DRQ
INTRQ
5V
220R
RDDATA
TR0
INDEX
WPRT
74 LS 245
DIR
D0
D1
D2
D3
D4
D5
D6
D7
DAL0
DAL7
RD
TR00
IP
WPRT
DDEN
MO
STEP
DIRC
WG
WD
CS
MR
GND
MOTOR
STEP
DIRC
WG
WRDATA
A6
A5
A4
A3
A2
A1
A1
A0
R/W
5/6 7406
3/4 74LS32
1/2 74 LS 08
74 LS 138
A0
WR
A7
IORQ
E1
E2
E3
74 LS 273
SEL1
SEL2
SEL3
SEL4
SIDE1
7406
HLD
RD
1/4 74LS08
1/6 74S04
A0-A13
BUSDIR
CE1
2
1/4 74LS08
RESET
D0-D7
A0-A13
PGM
Vcc
CE
OE
EPROM 27 128
GND
5V
31:7:84
DLG
3/3