## *MACROVISION DECODER*
## *MVS51*

MVS51 is a development of MV41. It is a complete Macrovision decoder box that can be connected to a scart cable without any other accessories in addition to a power source. While MV41 only works with TS61 and its associated management links etc. can one assemble MVS51 in the middle of a truncated scart cable. The power consumption varies a little with the supply voltage and is 50mA at 9V DC and 70mA at 12V DC. A variation is to use an external power source, or you can take the supply voltage from pin 8 on a scart cable. From pin 8 expires a voltage of 12V, when a video signal is sent from the video player. If this voltage is used needs to verify that it can withstand being subjected to 70mA, before you plan to use it. As a rule, the voltage is too weak in the case of a DVD player. Another option is to download the feed from the VCR through any available scart pins. Pins 10 and 12 tend to be free. You can always use this specially prepared scart cable when you looking at rent-video, VHS cassettes or DVDs. Copying is not a problem.

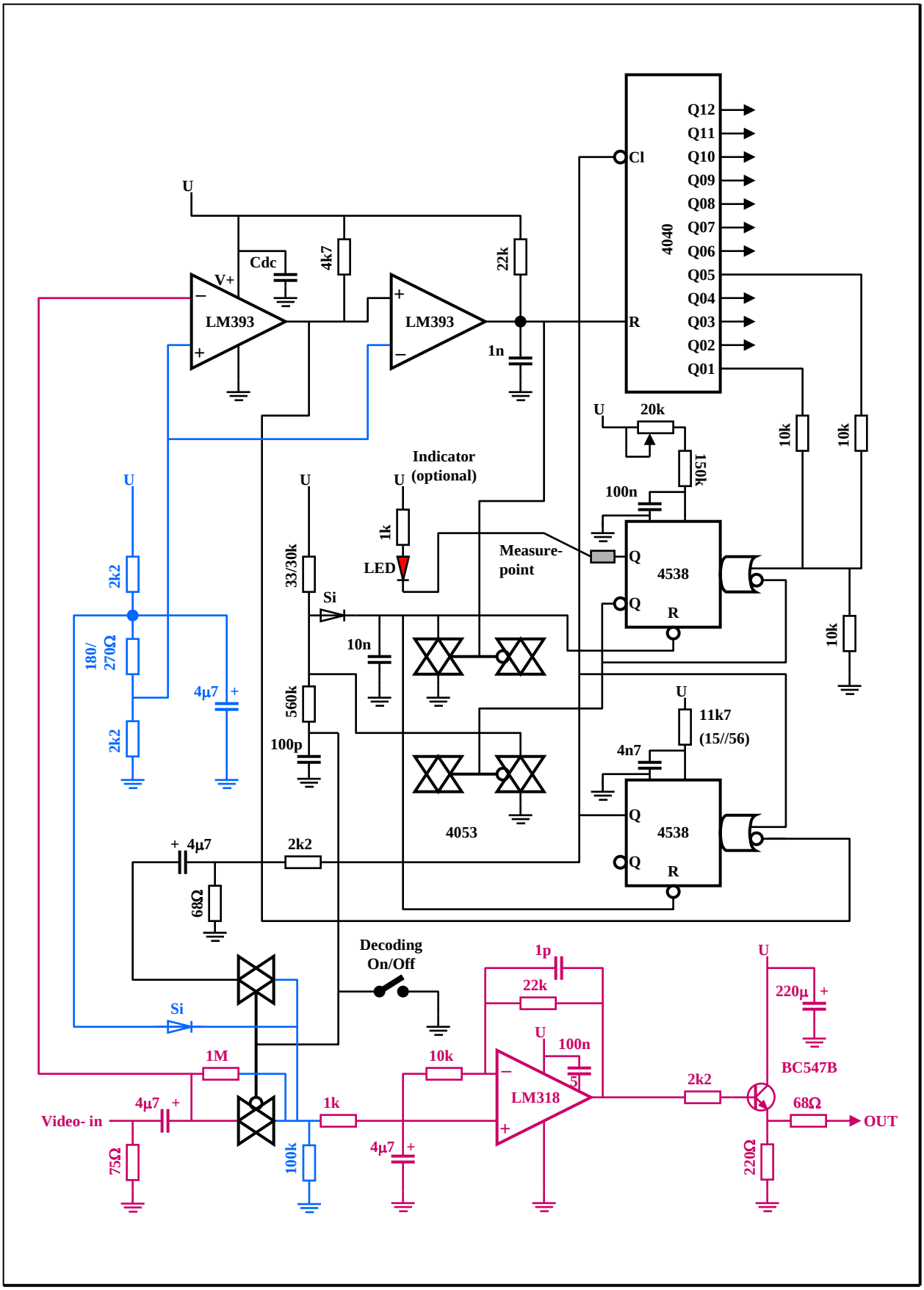
MVS51 synchronizes the video signal automatically. Although this decoder works with the vertical sync pulse but without a free wheel counter running. The counter 4040 is clocked through the synch pulses in the video signal, from a non retrigger able monostable flip-flop 4538. The same flip-flop produces bright lines, instead of Macrovision-encoded lines. Reset is done with the vertical sync pulse. The time interval in the picture blanking interval in which one need to decode is governed by 4040, the second monostable flip-flop and a circuit for zero-delay. When MVS51 is finished and connected you must trim P1. The tuning adjustment relates to the encoding interval before the vertical sync pulse. This is done by looking at a film that passes through MVS51. By turning P1 moves a dark stripe on the TV screens lower part. Adjust P1 until the “strip” disappears under the TV screen base.

If the intention is to copy VHS tapes, shall the mounting of P2 and P3 be implemented, which less advanced users can ignore. Since the signal strength and quality varies for VHS tapes as opposed to DVDs, is it an advantage if you can optimize the settings for each recording. Start by setting the gain to an appropriate level of P2. Drag the "strip" with P1 to make it visible. Screw on the P3 until the strip color is dark gray under normal lighting conditions or use an oscilloscope. Trim away the strip.

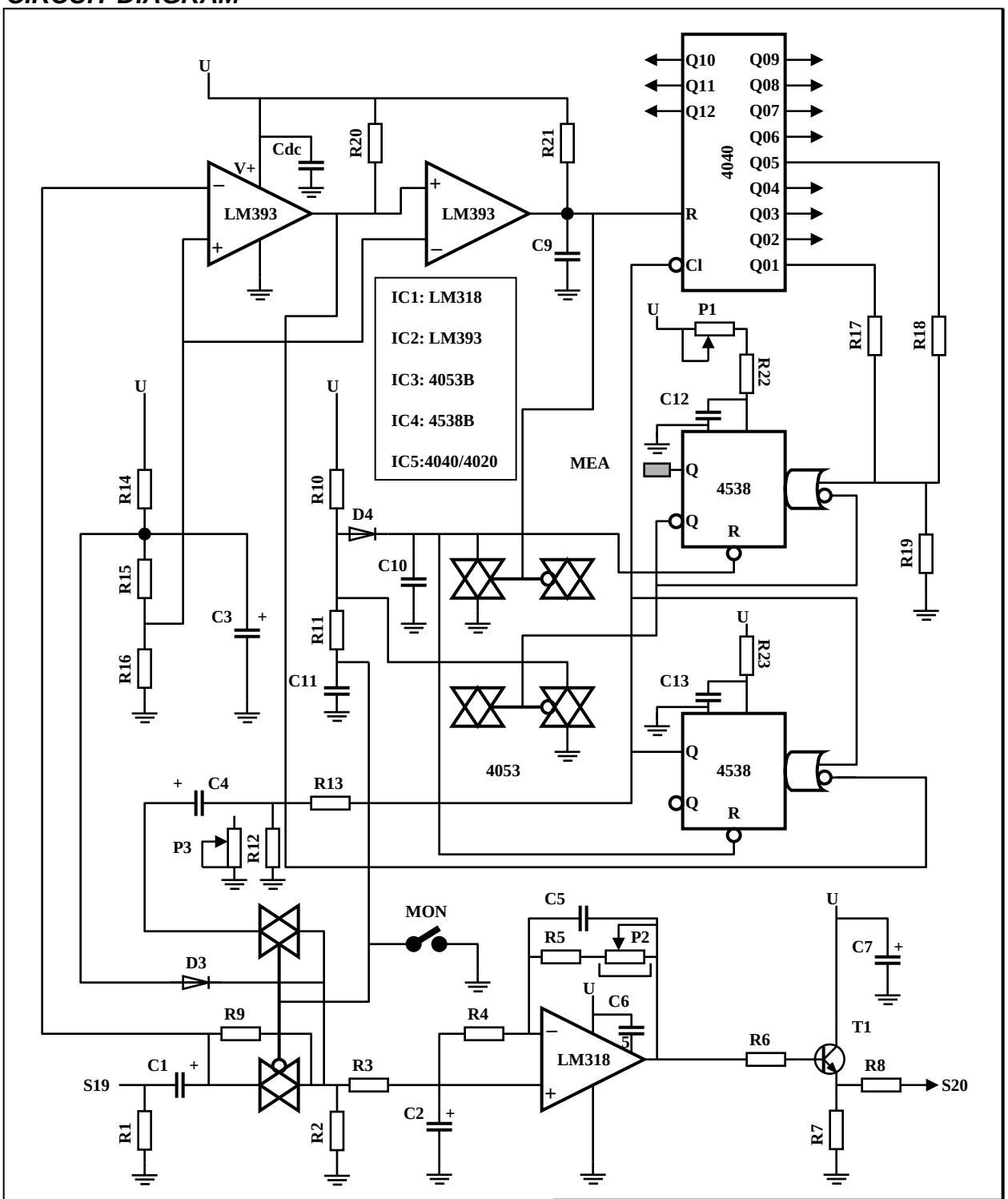
Macrovision is composed of a collection pulses that has been added to a standard video signal. The pulses are in the area between the vertical and the horizontal part of a CVBS signal - the so-called picture blanking interval. Additional pulses can be found just between the lines end and the vertical sync pulse. These large pulses have relatively nasty amplitude, which also varies continuously. The result when a VCR trying to read this type of signal is huge problems with both brightness and synchronization. A television receiver is not affected by these disturbing pulses, except for a slightly worse picture.

If you intent to manufacture and use a decoder for Macrovision, the law say:
**You are allowed to make one copy and only for your own use.**

## *SCHEMATIC DIAGRAM*

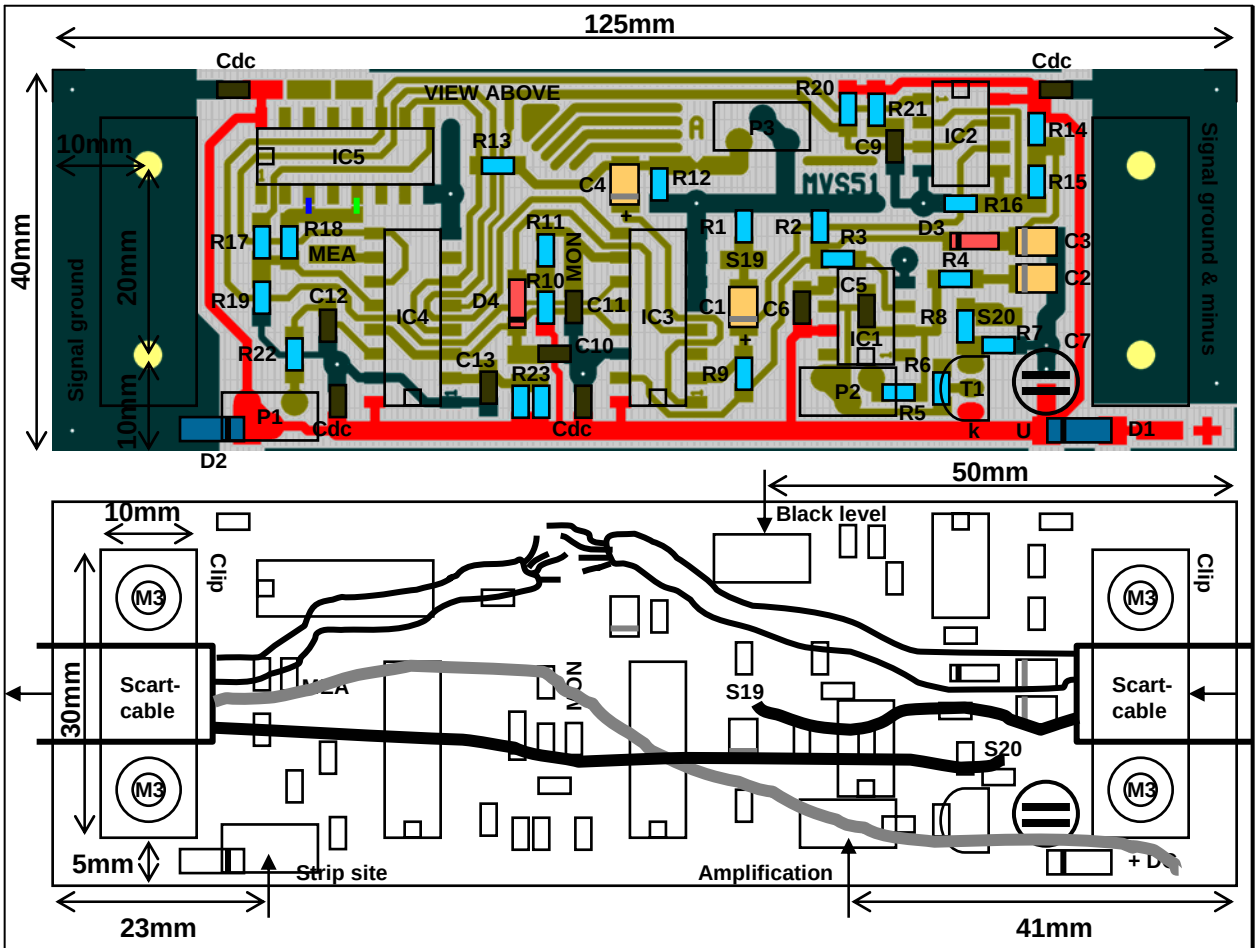


## *CIRCUIT DIAGRAM*




| | | |
|---|---|---|
| **PROJECT** | *Macrovision Decoder* | |
| **MODULE** | | |
| **MODEL** | **MVS51** | |
| **AUDIT** | A-1 | **DRAWING: 1 of 1** |
| **SUPPLY** | ≥ +8 VDC | ≤ +15 VDC |
| **CURRENT** | 50mA at 9V | 70mA at 12V |
| **OTHER** | - | |
| *B. Lindqvist* | | *2002-09* |

## *PLACING OF COMPONENTS*




*SMR1206:*
R1 = 75Ω
R2 = 100k
R3 = 1k
R4 = 10k
R6 = 2k2
R7 = 220Ω
R8 = 68Ω
R9 = 1M

*SMR1206:*
R11 = 680k
R13 = 2k2
R14 = 2k2
R16 = 2k2
R17 = 10k
R18 = 10k
R19 = 10k
R20 = 4k7
R21 = 22k
R22 = 150k
R23 = 11k7 <--- *15//56*

*SMC1206:*
C5 = 1p
C6 = 100n
C9 = 1n
C10 = 10n ±1%
C11 = 100p ±1%
C12 = 100n
C13 = 4n7 ±1%
Cdc = 10nx4

*Other Capacitors:*
C1-C4 = 4µ7, Tantal, surface mount
C7 = 220µ, E-lytic, Hole mount
C8 = Reserve

*IC (hole mount):*
1) LM318, broadband single op
2) LM393, 2x comparator
3) 4053B, 6x analogue switch
4) 4538B, 2x monostable flip-flop
5) 4040B or 4020B, binary counter

*Semiconductors:*
D1&D2 = LL5817, surface mount
D3&D4 = BAS32, surface mount
T1 = BC547B

*Other Components:*
R5 ≤ 22k. For analogue media: 22k + P2
R10 = 33k/12V or 30k/9V (33//330)
R12 = 56Ω /12V, 82Ω/9V or P3 = 100Ω
R15 = 180Ω (11- 15V) or 270Ω (7- 10V)
P1&P2 = 20- 30k

Double side board. Drill 11 holes through the pattern at the marketing into the ground plane. Drill four holes for the M3- screws and nuts for the two clips. All components except C7 shall be handled as SMD. The ground plane do not contain any tracks. The unit should be shielded with sheet metal. The pin for minus on C7 will have contact to both layers.

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