

DiVA

Service Manual

Issue 1.0

DV78 DVD Player



DV78

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Diva Dv78 circuit description

Overview

The **DiVa DV78** is a completely new design platform that share a similar circuit topology to the earlier released Vaddis V based players such as the Diva 88+, Diva 89, DV27.

The player is based around acclaimed **Zoran Vaddis V** chipset coupled to high specification Wolfson D to A converters for Left and Right channels.

Power supply board.

Non-switching

Mains power arrives at IEC inlet socket SKT1 and is filtered by EMC choke LI and Y caps C3 and C4, mains switch SW2a/b switches both Negative and Live phases before the power reaches the mains select switch at location SW1 the switch allows the primary windings of the transformer **TX1** to be wired in either Parallel or Series configuration.

The Bridge rectifying Diode package at location **D1** forms the basis of the conventional power stage and supplies a VN35V6 (-35.6v) to the Switch mode stage, transistor **TR1** is biased by 2v7 Zener diode **DZ1** and allows for the series Zener diodes DZ2, DZ3, **DZ3** to supply the VN13V5 and VN19V rails.

We will also see a simple **A.C present circuit** this is used for delayed output relay operation and fast relay closure under interrupted supply conditions thus preventing op-amp offsets from reaching the Audio output sockets.

Switch mode

The switch mode supply is formed around the **Driver/Control** chip **IC1** UC3843 (used in regulating mode). The chip is referenced the -36.5V supply line and the Digital ground DGND, the supply for the chip is formed by the 12v Zener at location **DZ6** and can be seen on Pin 7 as VCC. The power supply allows for the switch-mode to be tied the to Audio sampling frequency for any given compatible format.

Fig 1 PSU clock control

Fs Frequency select	PSUFS1 Pin 11 IC305a	PSUFS0 Pin 12 IC305a	PSUCLK Output Pin 5 of IC305a
44.1 kHz	0	0	44.1 kHz
48 kHz	0	0	48 kHz
88.2 kHz	0	1	44.1kHz
96 kHz	0	1	48 kHz
176.4 kHz	1	0	44.1 kHz
192 kHz	1	0	48 kHz
Others	1	1	OFF

The PSU sync signal is driven into the power supply via Resistor **R9** if no Sync is present the unit is set to free run x due to the RT/RC network attached to Pin 4.

IC1 is running in regulated mode and monitors the voltage output on the +5V and +3V3 D.C lines, the two voltages are summed by **TR8** and Driven into the VFB and Comp inputs of IC1, the Voltage is then regulated by changing the time base of the PWM output at pin 6 (longer the time base the lower the voltage), the **PWM switching frequency** is driven into the switch-mode transformer by the high speed Nmos device at position **M1**, R5 is used to sense the Current across the gate of the Nmosfet and in the event of a short circuit will safely shut the power supply down. We derive the 12v Mech supply from the output of M1 using the Ultra-fast Diode at location D8 to rectify the PWM line.

The D.C outputs from the switch mode have extensive switch mode noise removing filters these are seen as 100n caps down to ground and Wire wound inductors in series with the supply rail.

Power supply main board

All the power supply rails are supplied to the main board via the 32 way FFC connector at location **CON1001**.

The **Digital** supplies from the switch mode stage of the power supply arrive as 3V3D, +5VD and +12VD we also see the Display board power supplies arrive as -19V, -9 and -13.5V all of the supplies have a second stage of implemented on the board to remove all traces of ultra-sonic noise.

The 3V3D rail is the main 3V3 rail used to power the digital circuitry; +5VD is used for all 5v Digital/Video supplies the +12VD is used for Scart switching.

The 1V8 rail is derived from the 3V3 rail and is regulated by the adjustable regulator at location **REG1003**.

The **Analogue** supply stages arrive at the main board as +15V3 and -15V3 rails these are filtered L1002 and L1015 before being regulated by the adjustable regulators at locations **REG1000** and **REG1002** to provide +/- 12V rails for the Analogue output stage.

Regulator **REG1001** is fed from the +15V3 rail and forms the Audio DAC supply.

The **Display board** requires several supply voltages these are simply passed through the main board, being filtered on the way to prevent transmission of noise through to the surrounding electronics. The display takes the +5V, -19V, -13V5 and -9V the -13V5 and -9V form a floating 4.5V supply biased relative to the -19V grid voltage.

Display Board

The main component of the Display board is **IC1** this is a Vacuum Florescent Display driver with keyboard scan and a serial data in/out interface.

The Chip receives display drive serial data from the **Vaddis V** chip on the main board via Con1 on pins 12, 13 and 14 these will be seen a **DIN**, **STS** and **CLK** this data is used to drive the VFD a DOUT line interfaces with the VADDIS V and supplies Keyboard Scan information. The keyboard scan is a 6 x 4 matrix with the **Key Source** appearing at S3, S4, S5, S6 and the **Keyscan** data returns appearing a K2, K3 and K4.

Please see: above for **power supply** information.

The **Infra red** pick-up at location RX1 receives RC5 data and send the data to the Vaddis V on the main board via transistors TR2 and TR3, LED 2 is used to mix the rear panel RC5.

The **rear panel 3.5mm** input jack receives modulated RC5 code; this is filtered for ultra sonic noise by the inductors at locations L900 and L901 and then passed to the Infrared diode on the display at location LED2.

Main Board electronics DV78.

Zoran Vaddis V.

The main processor/control chip on the main board is the Zoran Vaddis V at location **IC202**, this is the latest incarnation of the very popular Vaddis range of processors and allows for a much lower component count when compared to our earlier players as many of the playback functions have moved onto the Vaddis V silicon.

Below you will see the **major functions** of the Vaddis V when used with the DV78.

- **Decoded Analogue Video output (internal DAC) used on the DV78 only.**
- **SPDIF output.**
- **Internal display interface.**
- **Internal ATAPI interface.**
- **Internal IR interface.**
- **Serial in/out for RS232 (Optional).**

A more detailed explanation of the Vaddis V and peripheral components follows.

Vaddis Power

The Vaddis V is powered by two separate supplies the Vaddis requires a 1.8v supply for the core, this is regulated from the 3.3v rail by REG1003, the 3.3v rail is used to supply power to the I/P – O/P ports of the chip.

ATAPI interface

CON203 is an ATAPI interface on a 40 way IDE connector. This is decoupled from the Drive via an array of decoupling resistors as required by the ATAPI spec.

Display Board interface

The display board interface is on the 16 way FFC flexi foil connector at location CON202. Power for the display also travels on the connector. There are 4 – wires to interface with the VFD driver chip these are seen as.

- **XFPDIN - Data to the display board**
- **FPOUT - Data from the display board**
- **XFPCLK - Clock**
- **XFPSEL - Chip select**

The above control lines are level shifted to 5v logic from 3.3v levels by **IC200** (74HCT125) these are the levels required by the VFD drive chip.

The IR output from the Display board arrives as **IRRCV** this is an open collector signal, which can be wire-Ord with the re-panel remote input.

Digital Audio

The Digital audio leaves the chip as 1 data line labelled as.

- **ADAT0 - Left and Right channel data**

Along with the ADAT line we will also see the **ABCLK** and **ALRCK** as required for IS2 data conversion.

The Vaddis V also supplies a direct SPDIF output for interfacing with ancillary processing equipment.

Flash/ SDRAM

IC203 is a 64Mbit (32 bit x 2Meg) SDRAM. It runs at 135MHz

IC205 is a 16Mbit (16 bit x 1Meg) intel type flash IC for program storage (Player software).

The flash interfaces to the Vaddis V using the SDRAM bus it may appear that the bus connects to the flash in a random manner, however this is simply because the Vaddis bus is multiplexed that way. The Flash will be accessed at power up and the contents are copied to the SDRAM the program will then be run from the SDRAM.

Series resistors are employed to isolate the flash bus from the main SDRAM bus.

EEPROM

IC204 is a 8kBit (1K x 8) Serial EEPROM. This is used for storage of non-volatile storage of player settings, region settings and bookmark data.

Clocks

CLK27MV is the 27Mhz clock for video. It is used to generate the 135Mhz clock for the Vaddis microprocessor and DSP. The **MCLKV** is the audio master clock for the Vaddis.

We run the Vaddis in **PLL bypass** mode and generate our own master clock (see main clock section of manual) for higher accuracy and improved performance across Audio and Video.

RESET

IC201 is a reset generator chip that monitors the +3.3V rail and ensures a reset signal **PWR_ON_RESET*** is generated on power up, or if the mains power dips below an operational level.

This signal is used to reset the Vaddis V and Flash micro only. The Vaddis V line labelled as **RESET*** resets the remaining circuitry of the player apart from the HDMI chip, this has it's own reset line labelled as **HDMI_RESET** this is necessary if we require to reset the HDMI chip only (for example when the HDMI sink is connected and then disconnected).

Serial Port

The VADDIS V can interface with the external world via the RS232 connector at location CON900 and the RS232 Transceiver at location IC900, the serial data lines are shown as SERIAL RX and SERIAL TX these lines allow for direct control over the unit via RS232.

Fig 2. GPIO control signals from the Vaddis V

Single Name	I/P-O/P	Function
PSUFSO-1	Output	Control PSU Clock divider
ENABLE_AV	Output	SCART control High in normal operation and low in standby
16/9	Output	Scart 16/9 anamorphic control line
GAIN_SCALING	Output	High for HDCD gain scaling
ML_8740_0-2	Output	SPI load signal for Audio DACs 0
MC	Output	SPI clock signal for DAC control
MD	Output	SPI data signal for DAC control
FSELE0-1	Output	Frequency select generator
MUTE*	Output	Active low audio mute signal
RESET*	Output	System reset

Clocks and SPDIF stage.

IC300 is a **PLL1700E** clock generator IC the chip is powered from the +5V(D) rail. The Chip runs in software mode and is slaved from the Vaddis V (data coming in on the MD line).

X300 is a **27Mhz** crystal that **IC300** uses to generate all the video and audio clocks required by the system the crystal sits on the XT1 and XTO pins of the chip, the 27Mhz output at Pin 10 (MCKO) is used to drive the Vaddis chip directly bypassing the internal PLL.

The frequency of the audio master is dependent on the on the current audio sample rate (I.e the sample rate required by the format CD=44.1Khz and DVD=48khz etc) and this is set by the system micro via the MD, MC and ML_1700 lines from the Vaddis V.

Clock Buffer

IC301 us used to buffer the audio master clock. The circuit is arranged so that each device that requires the audio master clock has it's own driver these are seen as.

- **MCLK_DAC0 - Pin 18**
- **MCLK_DAC1 – Pin 16**
- **MCLK_DAC2 – Pin 14**
- **MCLK_VADDIS – Pin 3**
- **MCLK_HDMI – Pin 9**

We also run the **Mute Line** from the Vaddis V **IC301** this can be seen on Pin 12 and drives transistor **TR401**, the transistor pulls the relays **RLY400**, **RLY500**, **RLY600** to ground and un-mutes the audio outputs.

IS2 Audio Data

IC302 and **IC309** are buffers for the 12S signals these ensure that the signals travelling to the DAC's are point to point. **IC302** deals with the **ALRCK** and **ABCLK** and **IC309(NF DV78)** the

ADAT0,1,2 all signal are split into three separate lines for the three stereo DACS.

PSU Clock Divider

IC304 a/b form a clock divide by 1, 2 or 4 to ensure the PSU clock is always either **44.1kHz** or **48Khz** (See **fig 1** within the power supply description section).

The circuit is fed from the **ALRCLK** (Audio clock) the selected PSUCLK is controlled by **PSUF50** and **PSUFS1**.

The output of the PSU circuit can be seen to leave **IC305** on pin 5 via R311. Please see **Fig 1** for PSU control information.

The circuit will also switch the **PSUCLK** off when switching between sample rates (the PSU will free run when the PSUCLK is not present).

SPDIF Output

The SPDIF output consists of **IC901** implemented as a inline buffer and parallel output buffer. Gate A buffers the signal so that the SPDIF line from the VADDIS sees fewer loads and form a feed to the Optical output transmitter, gates B,C and D drive the SPDIF in parallel so that we can drive a 75ohm load adequately. The resistors at the output of IC901 are arrange so that the output will be **500mV pk-pk** when the output is terminated with a 75 ohm load at the same time the output impedance of the circuit is 75ohms as required by the Sony Philips Digital Interface specification.

Left and Right channel D to A stages

The **Wolfson WM8740** stereo DAC ay location **IC403** requires +5V(A) and a +3V3 supply along with the Digital Audio data lines already described in this guide.

The Left channel output only will be described in this section.

IC400B and associated components form a 2nd order Bessel filter with a differential input and a gain of 1 this follow by a output buffer **IC401B**, the gain of IC401B is control by the switching chip at location **IC402**, in normal use the Gain of IC401B is set to 1.1 but in **HDCCD** mode the **IC402** switches a second 10k resistor in parele with R413 and the gain is set to 2.2 allowing for the higher audio output required by the HDCCD standard.

C436 is an A.C coupling capacitor used to remove the few mV of offset that the DAC produces; D400 provides protection against from ESD.

The all **output relays** are under control of the Vaddis V chip but will also mute the outputs instantly under mains failure conditions. Switching drive is provided by TR401 (MUTE_BUF) and TR400 (AC_PRES) the relays are in mute mode if either the input to TR401 is Low or if the input to TR400 is high.

Please note: The **Scart** left/right audio is fed from the outputs of the left/right audio stages.

Video Output stage

The DV78 video output stage makes use of the VADDIS V's on board video DAC stages and as such does not use the superior Analogue devices video encoder DV79/DV29 and is fed by the following video lines from the Vaddis V.

- **Composite**
- **SVID_C**
- **SVID_Y**
- **V or Red**
- **U or Blue**
- **Y or Green**

If we look at the Composite stage only, we will see that the Analogue video signal is filtered by C710, C711 and L705 before being passed through the Video Op-amp at location **IC701** the output is decoupled by capacitor C738 before reaching R714 this forms the 75 ohm load required. All other video outputs are identical.

SCART Output

RGB and Composite video signals as well as Left and right audio signals are all present on the SCART output socket. As the RGB and YUV signals share the same output port at the Vaddis V the player must be set to **RGB SCART** operation to have a RGB output on the SCART.

Please note: When in RGB SCART mode the RGB does not contain a Sync signal and the sync must be taken from the Composite out (4 wire RGB).

Also present at the Scart are a number of control flags for the monitor these include 2 GPIO control lines direct from the Vaddis.

- **ENABLE_AV**
- **16/9**

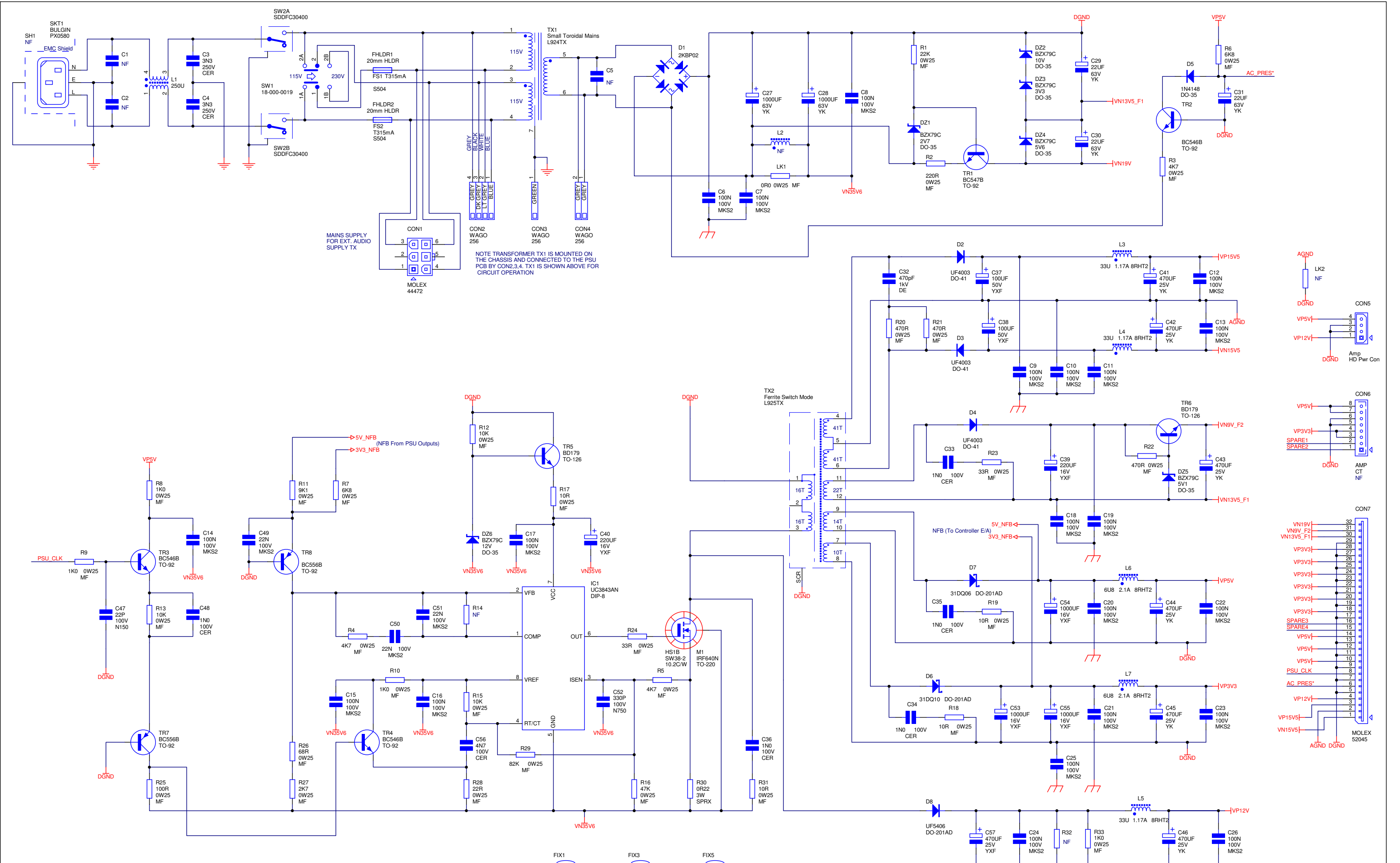
These are seen at the SCART output pins as.

- **O/6/12**
- **RGB STAT**

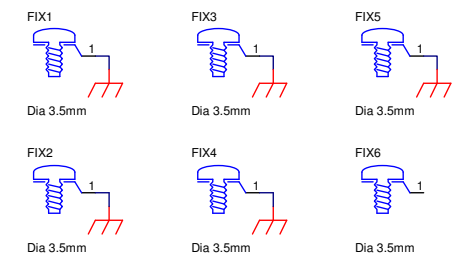
The O/6/12 line (SCART pin 8) is used to inform the monitor of the screen format being sent by the player as set in the video set-up section of the software.

- **Standby = 0V**
- **16:9 aspect ratio = 6V**
- **4:3 aspect ratio = 12V**

The RGB status line (SCART pin 16) will be seen as 0v = no RGB and >1v is RGB present.



ITEM	QTY	PART No.	DESCRIPTION	NOTES
ITEM1	1	F006	Clip For SW Profile Heatsink	
ITEM2	1	F082	Sil Pad For TO-220 HS Insulator	
ITEM3	2	F022	Fuseholder Cover For 20mm Fuseholder	
ITEM4	1	L959PB	Blank PCB DV78 PSU	
ITEM6	1	F044	Cable Tie 100MM X 2.5MM	USED TO SECURE TRANSFORMER CABLES TO PCB NEAR CON1
ITEM5	1	8M101	Earth Lead Assy 75MM	SAFETY EARTH WIRE FROM IEC INLET SK1 TO METAL CHASSIS
ITEM7	2	HP007S	Rivet Copper	RIVETS TO SECURE IEC INLET TO PCB



- FD1 TOOL1
- FD2 TOOL2
- TOOL3
- TOOL4

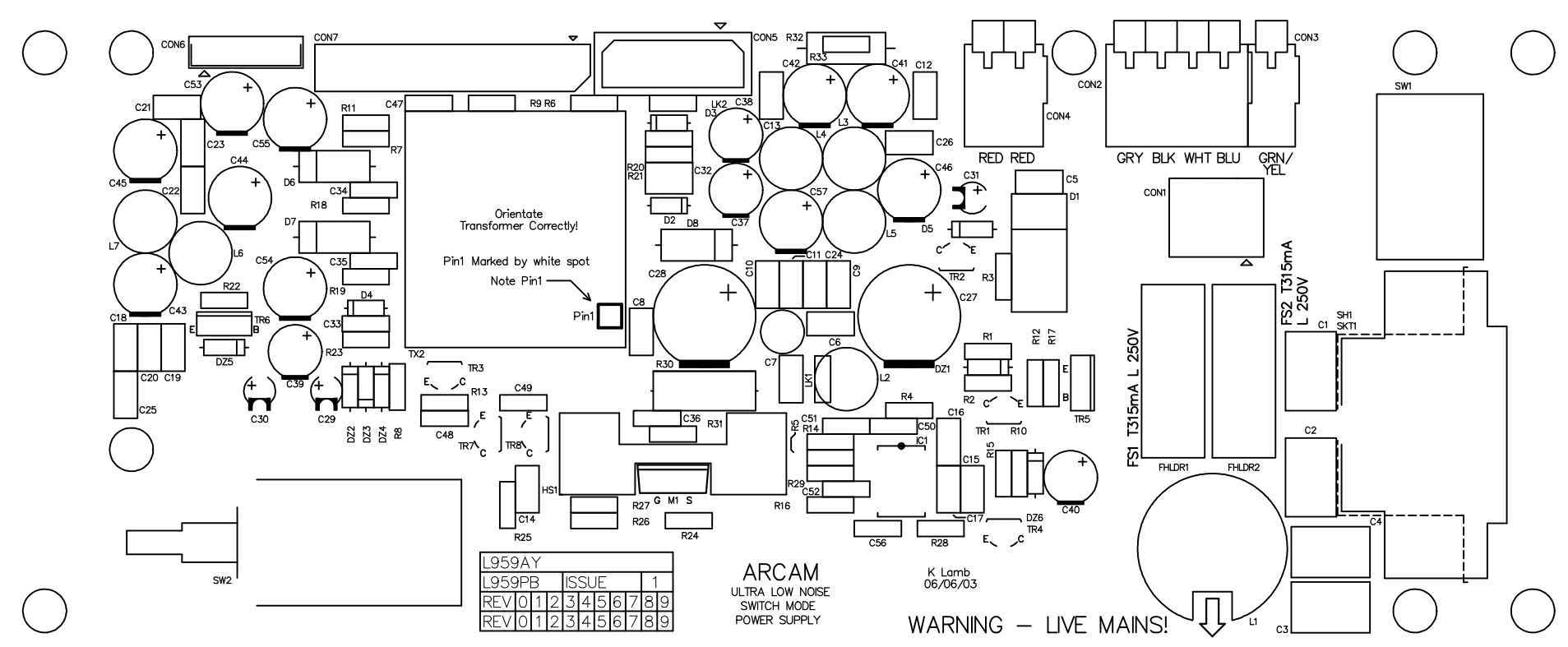
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DV78 SERIES PSU

ARCAM
 A & R Cambridge Ltd.
 Pembroke Avenue
 Waterbeach
 Cambridge CB5 9PB

File Name: L959_1.1.sch
 Notes:
 Contact Engineer: Kevin Lamb
 Contact Tel: (01223) 203200

ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
04_E046	PG	22/04/04	Make CON1 fitted (used in DV29)	1.1
03_E195	KAL	02/07/03	Production release	1.0

Printed: 22-Apr-2004
 Sheet 1 of 1
DRAWING NO. L959CT

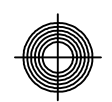


ARCAM
ULTRA LOW NOISE
SWITCH MODE
POWER SUPPLY

K Lamb
06/06/03

WARNING - LIVE MAINS!

Top Overlay
L959PB_1.pcb



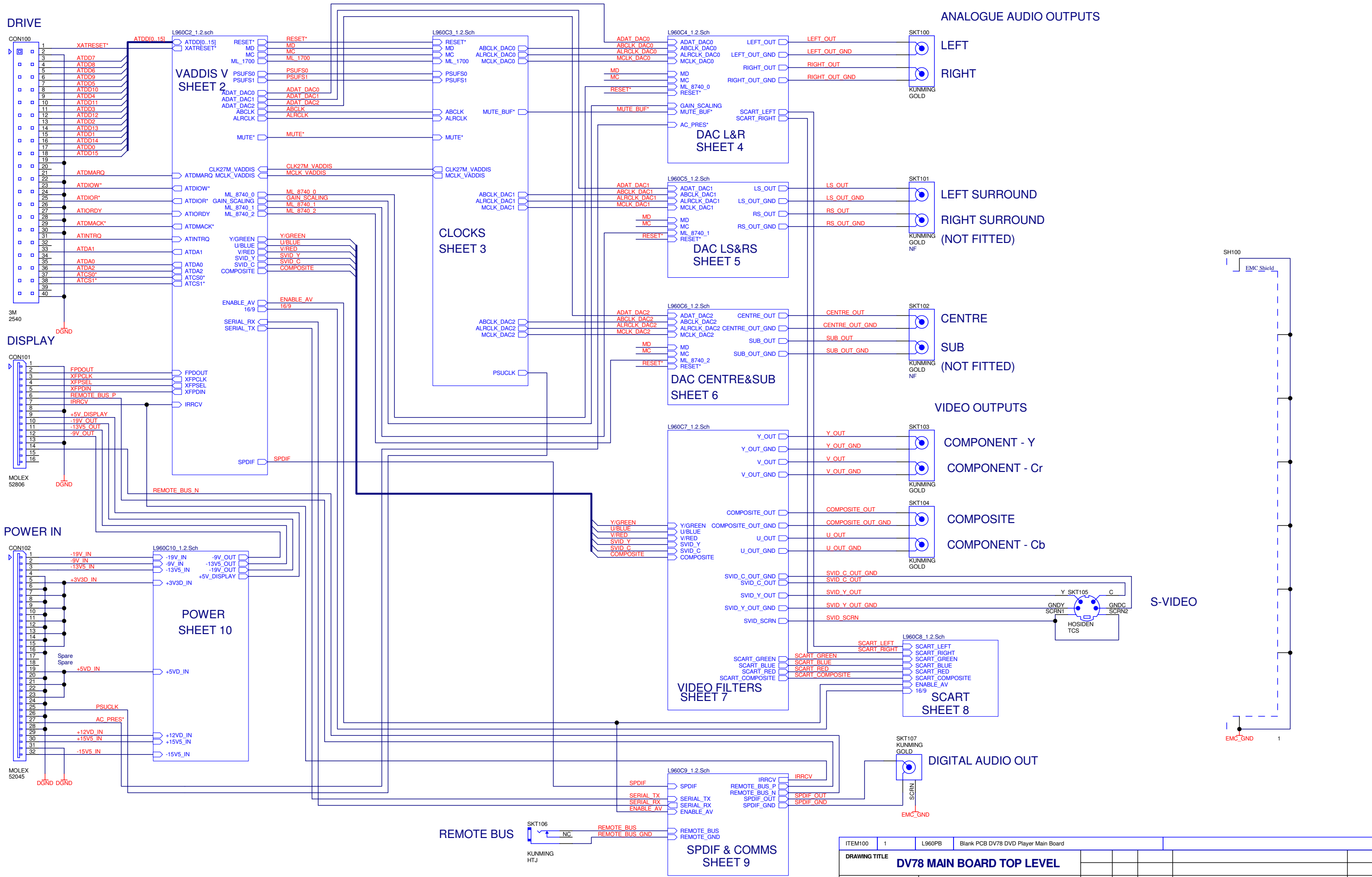
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LAYER STACKUP	
L959PB_1.GTO	Top Overlay

MATERIAL	FR4 1.6MM THICK	NOTES:- 1/ Manufacture in accordance with IPC-A-600F Class 1. 2/ Always use NC drill file as reference. NO undersized finished holes 3/ All routing 2.0mm unless otherwise shown on drill drawing. 4/ Mark month/year of manufacture on ident layer. 5/ Scoring denoted by >>>> on drill drawing.
COPPER WEIGHT	1oz	
HOLE SIZES	FINISHED (SEE NOTE 2)	
ROUTING	SEE NOTE 3	
COPPER LAYERS	TWO	
MINIMUM WIDTH	10 ML	GENERAL TOLERANCES PCB Dims. +/- 0.2mm Routing +/- 0.1mm All holes +0.1/-0mm ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED
MINIMUM GAP	10 ML	
RESIST	GREEN	
IDENT	WHITE	
VENDOR CODES	SEE NOTE 4	
FINISH	ENTEK OSP	
SCORING	SEE NOTE 5	

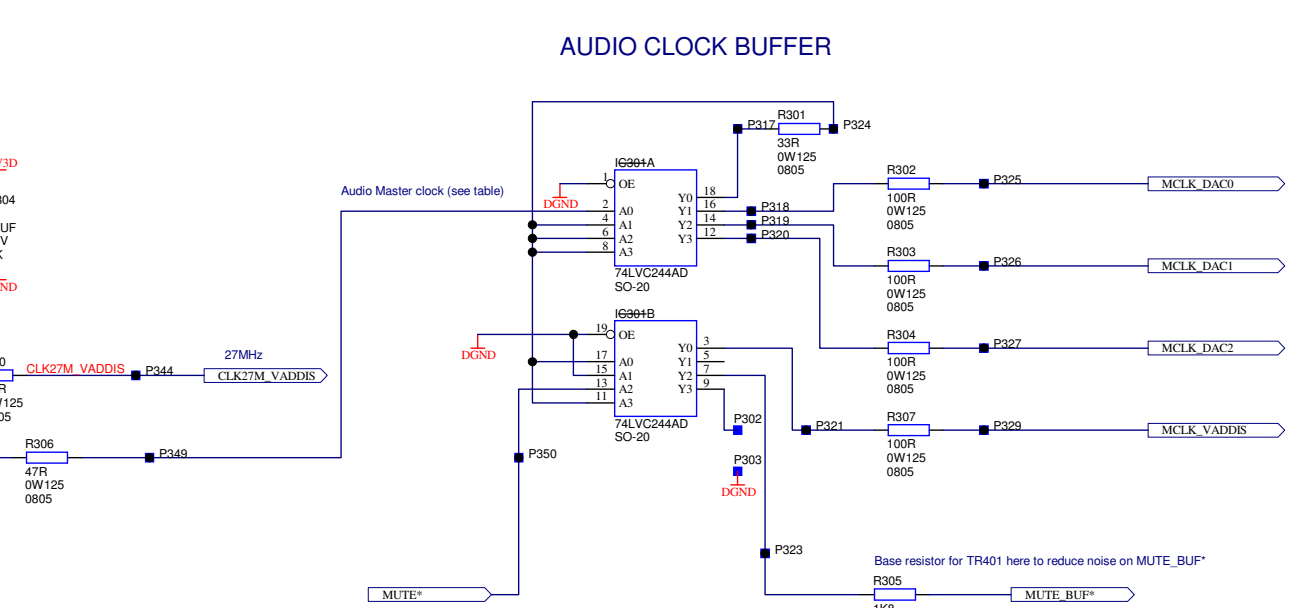
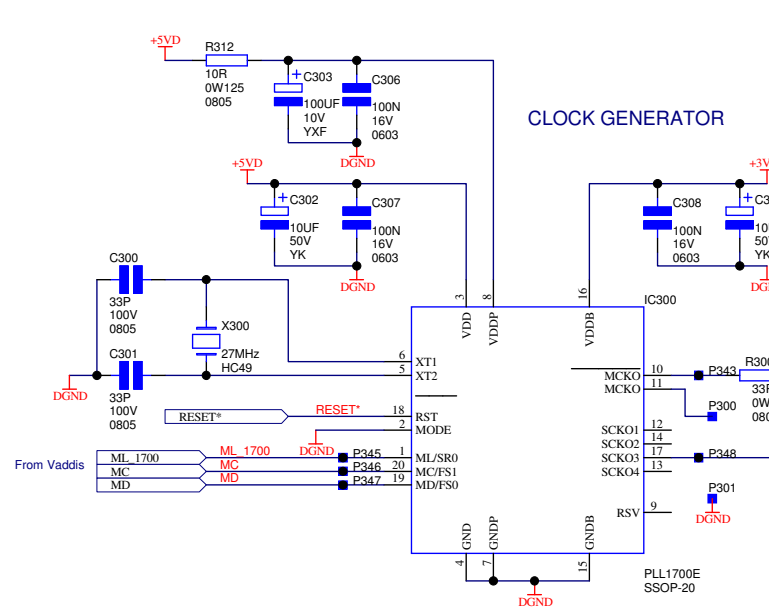
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	DRAWING NO. L959PB	03_E086	KAL	28/03/03	Minor Changes	B
		02_E336	KAL	15/01/03	Prototype Release	A
		E.C.O. No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
Contact Engineer: Kevin Lamb			Contact Tel: +44 (0) 1223 203200		Printed: 14-Jul-2003 Sheet 2 of 8	

DV78 DVD player PSU board L959AY issue 1.1.1

Designator	Part	Description
C1	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C2	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C3	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C4	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C5	2MA610	Capacitor Surface Mount Electrolytic 10UF 50V 6.3 X 4.5MM
C6	2MA610	Capacitor Surface Mount Electrolytic 10UF 50V 6.3 X 4.5MM
C7	2MA610	Capacitor Surface Mount Electrolytic 10UF 50V 6.3 X 4.5MM
C8	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C9	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C10	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C11	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
CON1	8K8616	Con 1.0MM Horiz FFC 16WAY 52807 Series
D1	3AS16W	Diode Surface Mount Small Signal BAS16W SOT-23 Package
D2	3AS16W	Diode Surface Mount Small Signal BAS16W SOT-23 Package
D3	3AS16W	Diode Surface Mount Small Signal BAS16W SOT-23 Package
D4	3AS16W	Diode Surface Mount Small Signal BAS16W SOT-23 Package
DISP1	B1014	Display DV88
IC1	5H6312	IC VFD Driver PT6312LQ SM LQFP-44 package
LED1	3D007	LED 3.1mm Green SLR-37MG3T
LED2	3D010	LED SM Red SML-010LT
LED3	3D007	LED 3.1mm Green SLR-37MG3T
LED5	3D006	LED 3mm Red/Green Tri-Colour L-93WEGW
R1	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R
R2	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R
R3	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R
R4	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R5	1M118	Resistor 0805 Surface Mount 0.125W 1% 180R
R6	1M139	Resistor 0805 Surface Mount 0.125W 1% 390R
R8	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R9	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R10	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R11	1M356	Resistor 0805 Surface Mount 0.125W 1% 56K
R13	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R14	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R15	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
RX1	B2109	IR Receiver Module Kodenshi KSM-902TM1N
SW1	A1511	Switch Tact Low Profile No Gnd Pin
SW2	A1511	Switch Tact Low Profile No Gnd Pin
SW3	A1511	Switch Tact Low Profile No Gnd Pin
SW4	A1511	Switch Tact Low Profile No Gnd Pin
SW5	A1511	Switch Tact Low Profile No Gnd Pin
SW6	A1511	Switch Tact Low Profile No Gnd Pin
SW7	A1511	Switch Tact Low Profile No Gnd Pin
SW8	A1511	Switch Tact Low Profile No Gnd Pin
SW9	A1511	Switch Tact Low Profile No Gnd Pin
TR2	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package
TR3	4A849B	Transistor BC849B SOT23 Package
TR4	4A849B	Transistor BC849B SOT23 Package
TR5	4D10KP	Digital Transistor MMUN2211LT1 SOT23 Package

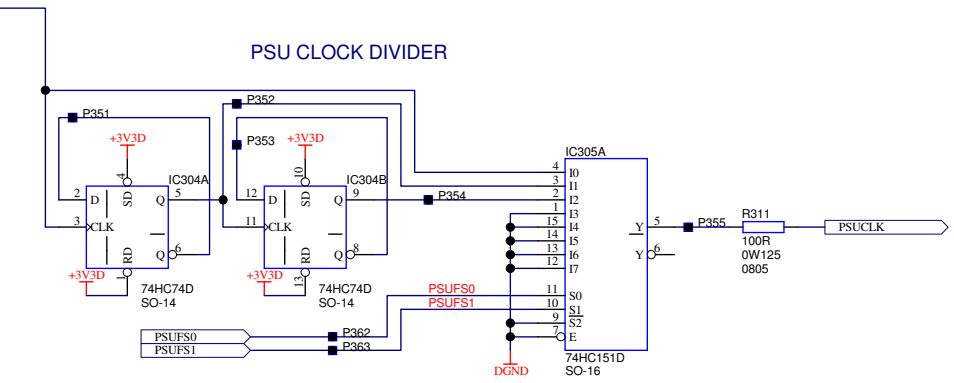
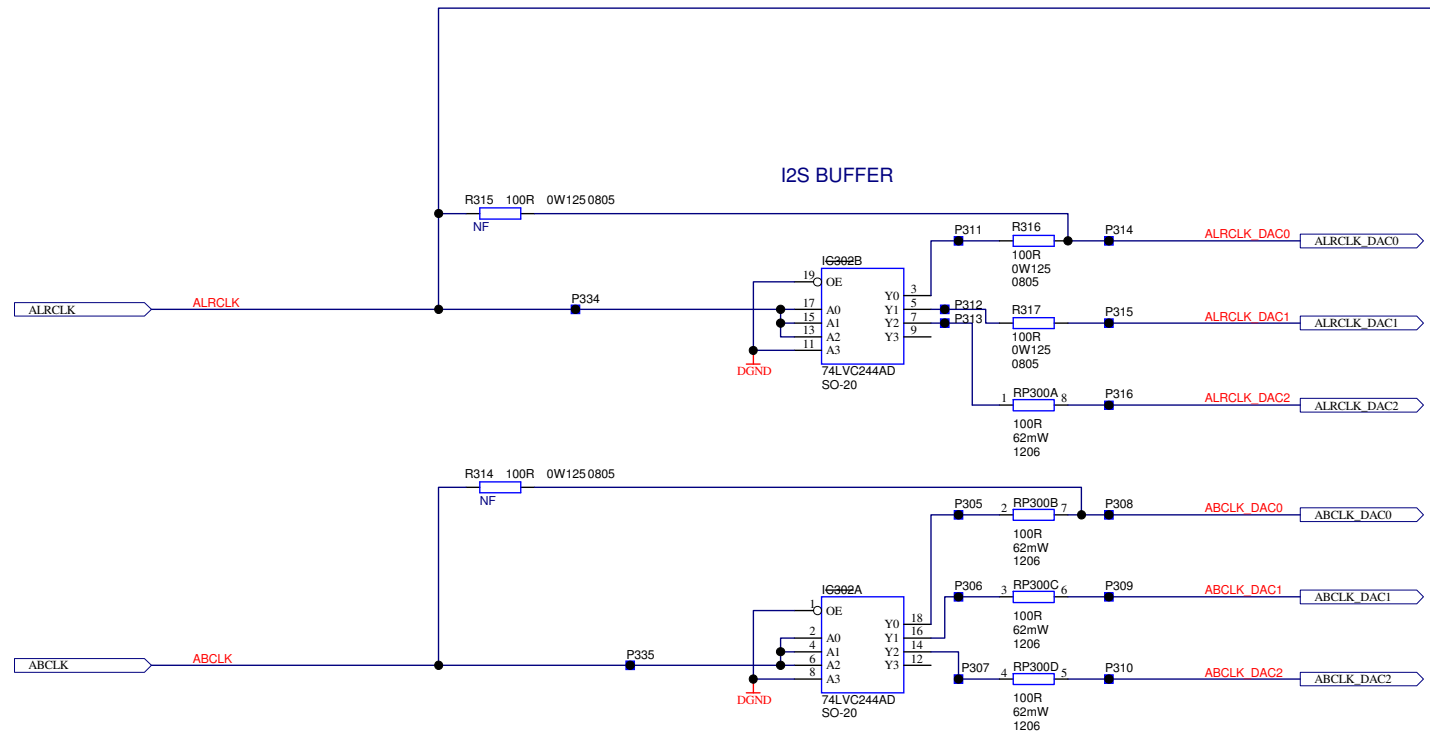


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	Contact Engineer: Peter Gaggas Contact Tel: (01223) 203270	Printed: 2-Dec-2003	Sheet 1 of 10	A2 DRAWING NO. L960C1		



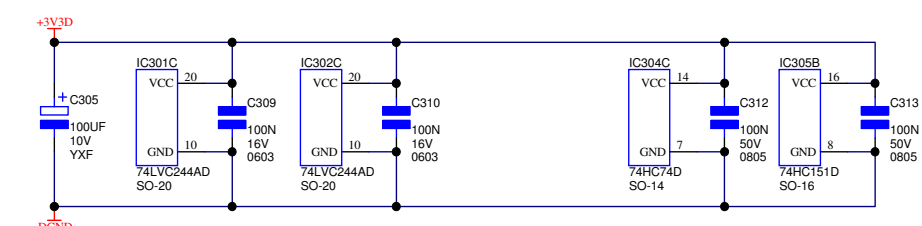
Audio Master clock frequency for different sample rates

Fs	Master clock frequency	(384 x Fs)
44.1kHz	16.9344MHz	(384 x Fs)
48kHz	18.432MHz	(384 x Fs)
88.2kHz	33.8688MHz	(384 x Fs)
96kHz	36.864MHz	(384 x Fs)
176.4kHz	33.8688MHz	(192 x Fs)
192kHz	36.864MHz	(192 x Fs)



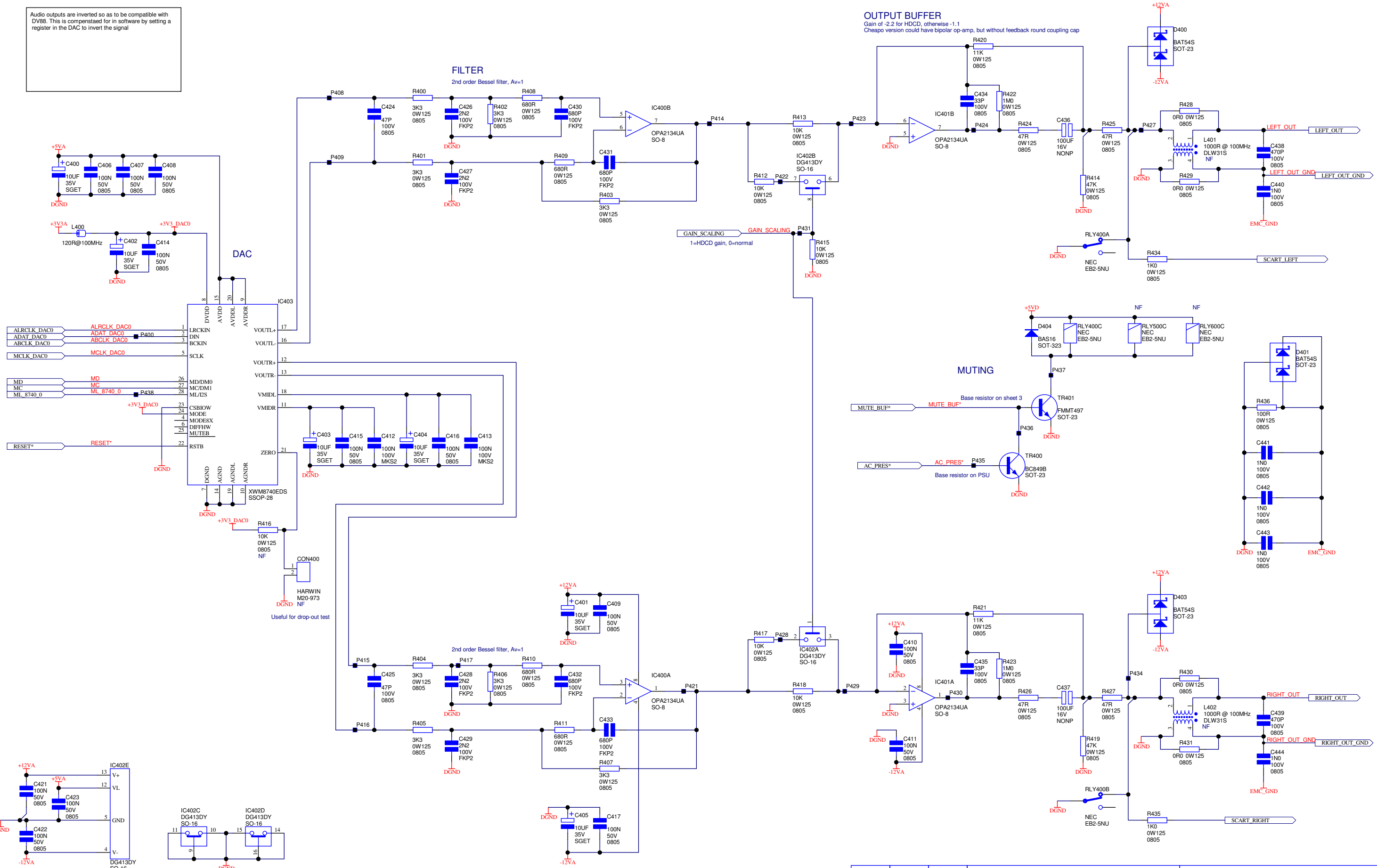
PSUCLK should be 44.1kHz or 48kHz

Fs	PSUFS1	PSUFS0	PSUCLK
44.1kHz	0	0	44.1kHz
48kHz	0	0	48kHz
88.2kHz	0	1	44.1kHz
96kHz	0	1	48kHz
176.4kHz	1	0	44.1kHz
192kHz	1	0	48kHz
others	1	1	OFF



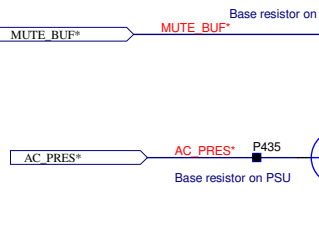
ITEM300	1	E828AP	Pad Damping 7.5x6x3MM Rubber	Fit on one side of X300			
ITEM301	1	E828AP	Pad Damping 7.5x6x3MM Rubber	Fit on the other side of X300			
ITEM302	1	E828AP	Pad Damping 7.5x6x3MM Rubber	Fit on top of IC300			
DRAWING TITLE							
DV78 MAIN CLOCKS							
ARCAM A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9QR	Filename:	L960C3_1.2.Sch	03_E322	PG	02-12-03	Component value changes to digital output	1.2
	Notes:		03_E214	PG	16-07-03	Change damping pads from Sorbothane to rubber	1.1
			03_E200	PG	03-07-03	Production Release	1.0
	ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE		
Contact Engineer: Peter Gaggis		Contact Tel: (01223) 203270	Printed: 2-Dec-2003	Sheet 3 of 10	A2	DRAWING NO. L960C3	

Audio outputs are inverted so as to be compatible with DV88. This is compensated for in software by setting a register in the DAC to invert the signal



OUTPUT BUFFER
Gain of -2.2 for HDCD, otherwise -1.1
Cheapo version could have bipolar op-amp, but without feedback round coupling cap

MUTING



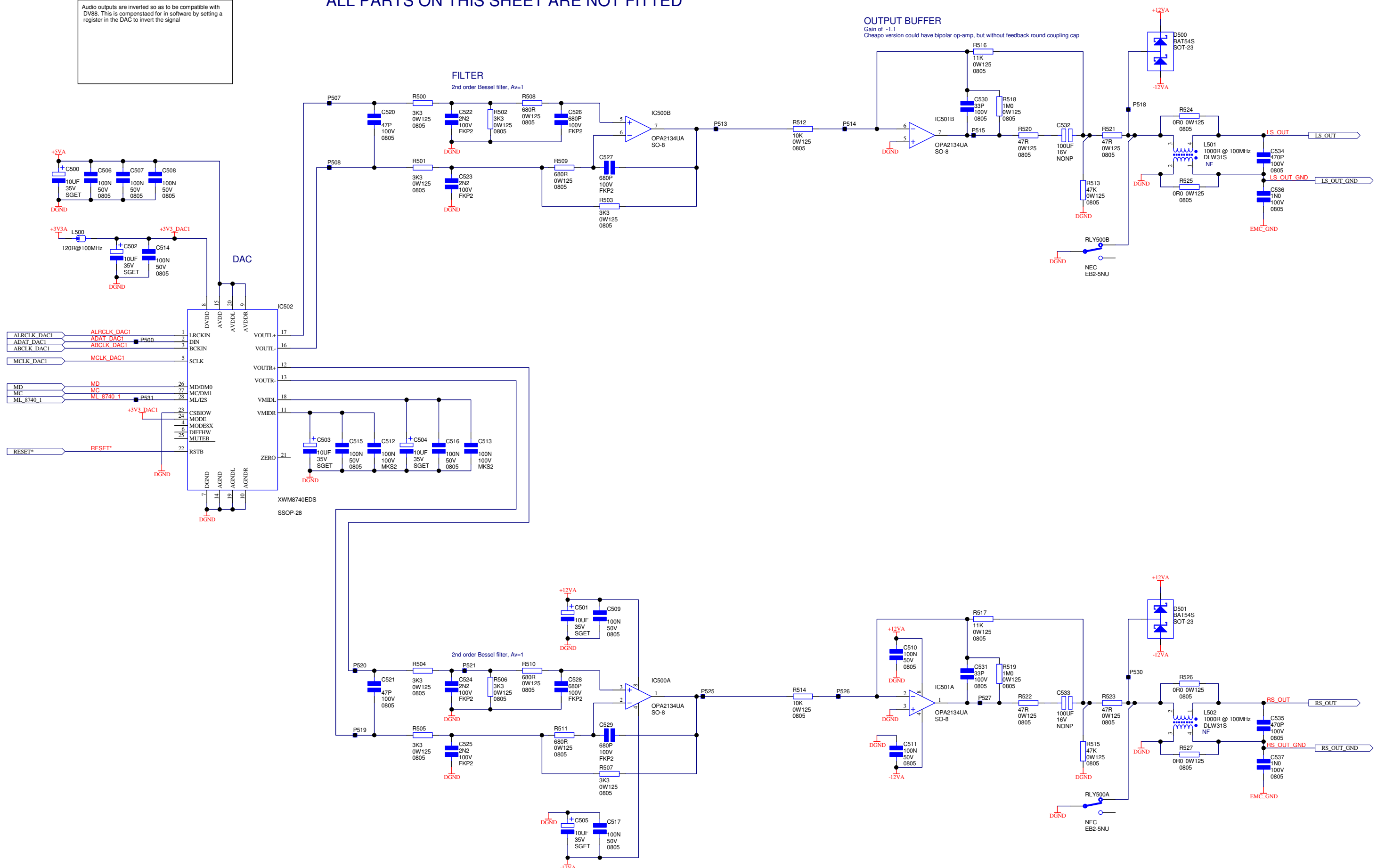
ITEM400	1	E827AP	Pad Damping 15x6x3MM Rubber	Fit on top of RLY400
ITEM401	1	E827AP	Pad Damping 15x6x3MM Rubber	Fit across the top of C436/C437
ITEM402	1	E828AP	Pad Damping 7.5x6x3MM Rubber	Fit on top of IC403

DRAWING TITLE
DV78 MAIN DAC L & R AUDIO

ARCAM A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9QR	File name:	L960C4_1.2.Sch	03_E322	PG	02-12-03	Component value changes to digital output	1.2
	Notes:		03_E214	PG	16-07-03	Change damping pads from Sorbothane to rubber	1.1
			03_E200	PG	03-07-03	Production Release	1.0
	ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE		

ALL PARTS ON THIS SHEET ARE NOT FITTED

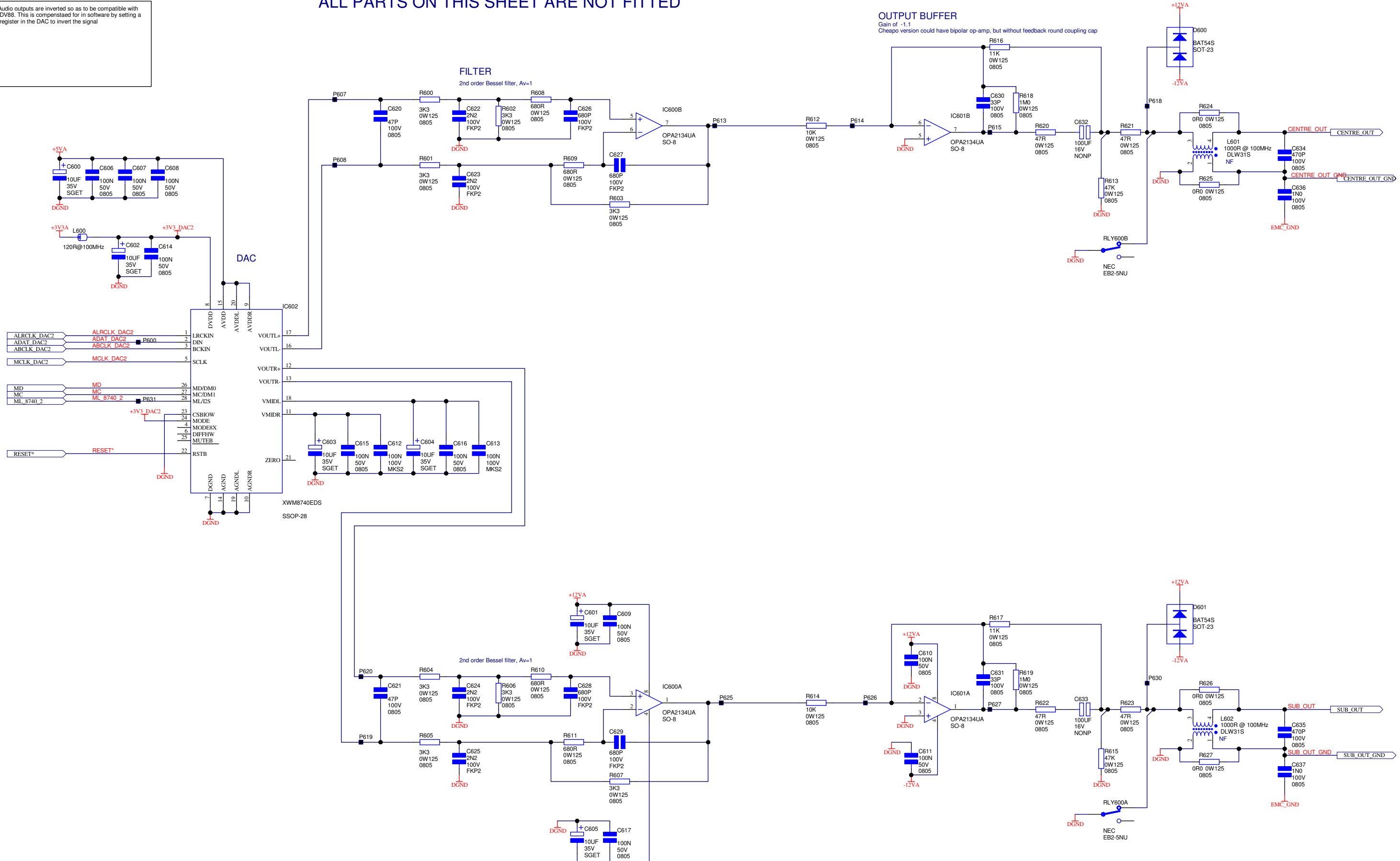
Audio outputs are inverted so as to be compatible with DV88. This is compensated for in software by setting a register in the DAC to invert the signal



ITEM500	1	E827AP	Pad Damping 15x6x3MM Rubber	Fit on top of RLY500			
ITEM501	1	E828AP	Pad Damping 7.5x6x3MM Rubber	Fit on top of IC502			
ITEM502	1	E828AP	Pad Damping 7.5x6x3MM Rubber	Fit on top of C532			
DRAWING TITLE							
DV78 MAIN DAC LS & RS AUDIO							
ARCAM		Filename: L960C5_1.2.Sch	03_E322	PG	02-12-03	Component value changes to digital output	1.2
A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9QR		Notes:	03_E214	PG	16-07-03	Change damping pads from Sorbothane to rubber	1.1
			03_E200	PG	03-07-03	Production Release	1.0
		ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE	
Contact Engineer: Peter Gaggis		Contact Tel: (01223) 203270	Printed: 2-Dec-2003	Sheet 5 of 10	A2	DRAWING NO. L960C5	

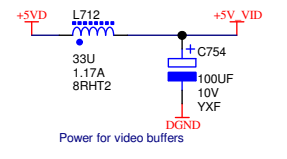
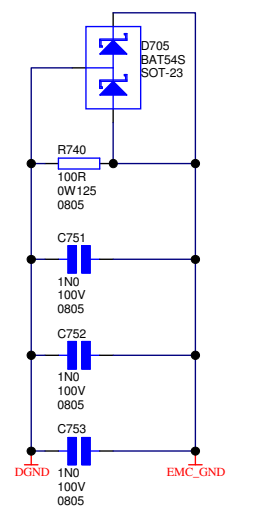
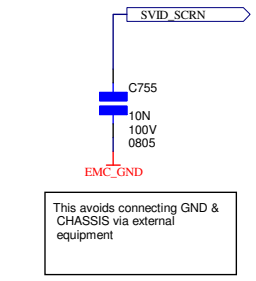
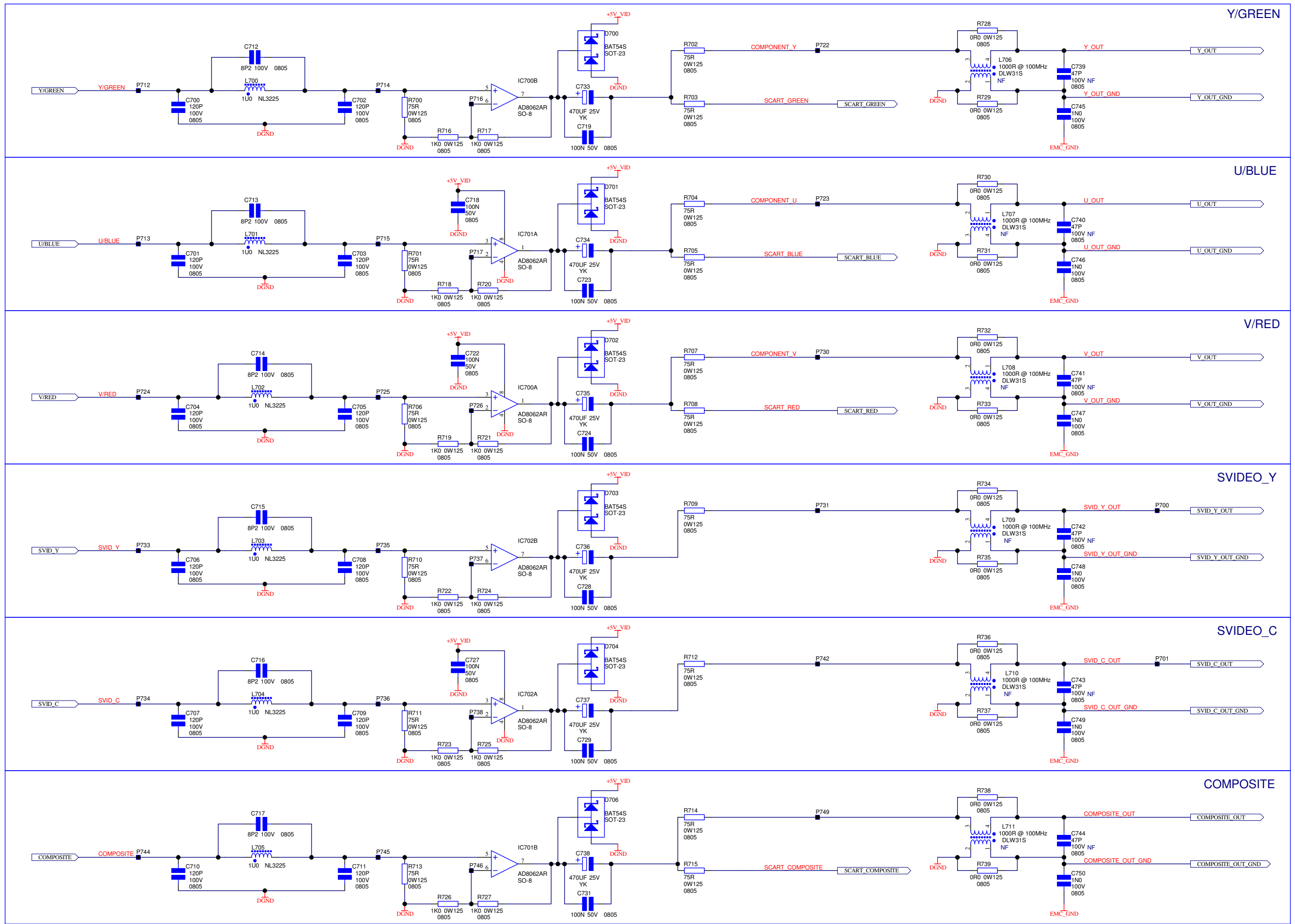
ALL PARTS ON THIS SHEET ARE NOT FITTED

Audio outputs are inverted so as to be compatible with DV88. This is compensated for in software by setting a register in the DAC to invert the signal



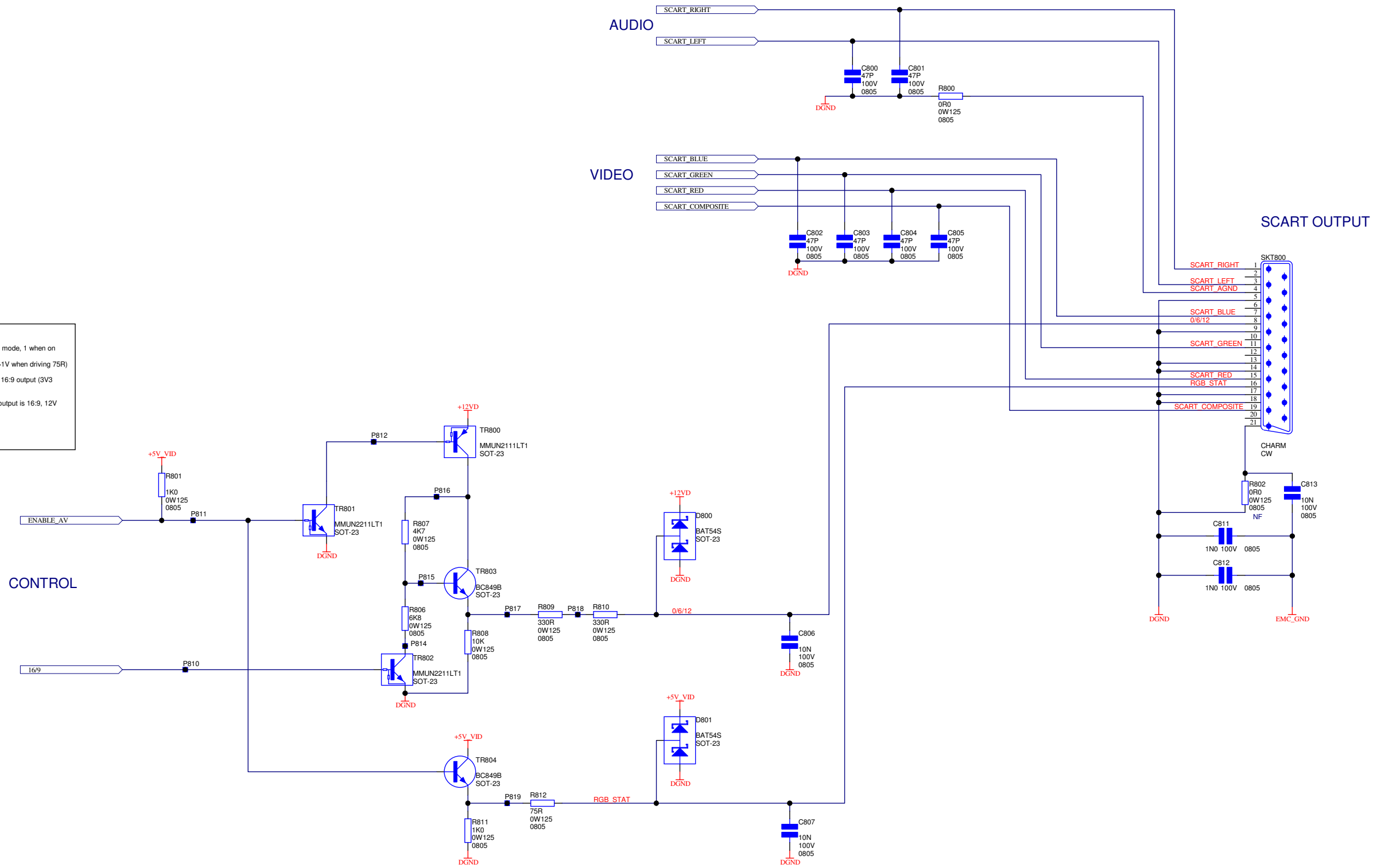
ITEM600	1	E827AP	Pad Damping 15x6x3MM Rubber	Fit on top of RLY600
ITEM601	1	E827AP	Pad Damping 15x6x3MM Rubber	Fit across top of C533/C632
ITEM602	1	E828AP	Pad Damping 7.5x6x3MM Rubber	Fit on top of IC602
ITEM603	1	E828AP	Pad Damping 7.5x6x3MM Rubber	Fit on top of C633

DRAWING TITLE							
DV88 MAIN DAC CENTRE & SUB							
ARCAM A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB3 9QR	Filename:	L960C6_1.2.Sch	03_E322	PG	02-12-03	Component value changes to digital output	1.2
	Notes:		03_E214	PG	16-07-03	Change damping pads from Sorbothane to rubber	1.1
			03_E200	PG	03-07-03	Production Release	1.0
	ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE		
Contact Engineer:	Peter Gagg	Contact Tel:	(01223) 203270	Printed:	2-Dec-2003	Sheet 6 of 10	A2 DRAWING NO. L960C6

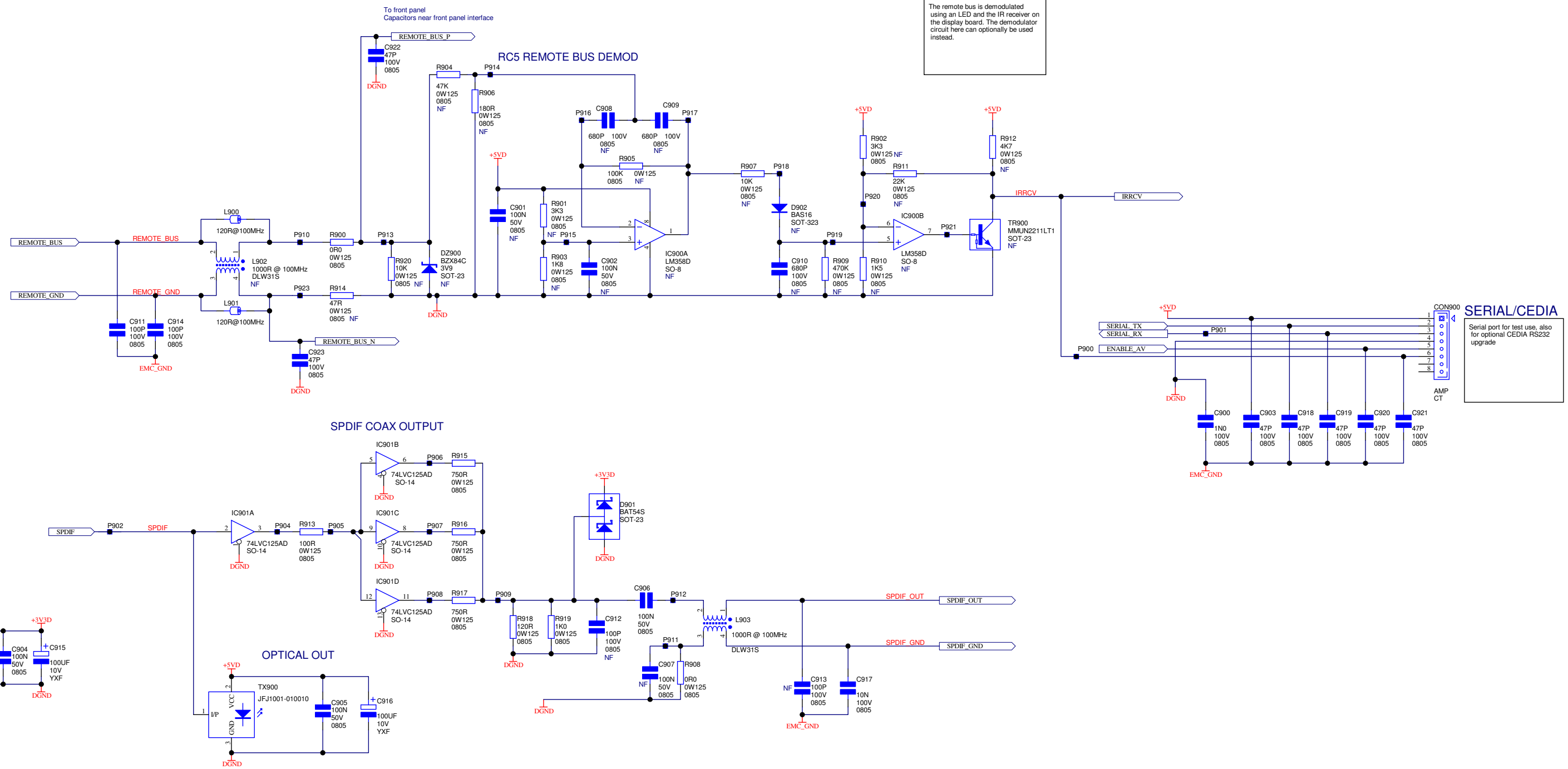


DRAWING TITLE							
DV78 MAIN Video filters & buffers							
Filename:	L960C7_1.2.Sch	03_E322	PG	02-12-03	Component value changes to digital output		1.2
Notes:		03_E214	PG	16-07-03	Change damping pads from Sorbothane to rubber		1.1
		03_E200	PG	03-07-03	Production Release		1.0
ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE		ISSUE		
Contact Engineer:	Peter Gaggs	Contact Tel:	(01223) 203270	Printed:	2-Dec-2003	Sheet 7 of 10	A2 DRAWING NO. L960C7

SCART control signals
 ENABLE_AV: 0 in when standby mode, 1 when on (3V3 levels)
 (RGB_STAT is supposed to be >1V when driving 75R)
 16/9: 0 when 4:3 output, 1 when 16:9 output (3V3 levels)
 0/6/12: 0V in standby, 6V when output is 16:9, 12V when output is 4:3



DRAWING TITLE		Filename:		ECO No.		INITIALS		DATE		DESCRIPTION OF CHANGE		ISSUE	
DV78 MAIN SCART OUTPUT		L960C8_1.2.Sch		03_E322		PG		02-12-03		Component value changes to digital output		1.2	
ARCAM A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9QR		Notes:		03_E214		PG		16-07-03		Change damping pads from Sorbothane to rubber		1.1	
				03_E200		PG		03-07-03		Production Release		1.0	
				03_E200		PG		03-07-03		Production Release		1.0	
Contact Engineer: Peter Gaggas		Contact Tel: (01223) 203270		Printed: 2-Dec-2003		Sheet 8 of 10		A2		DRAWING NO. L960C8			

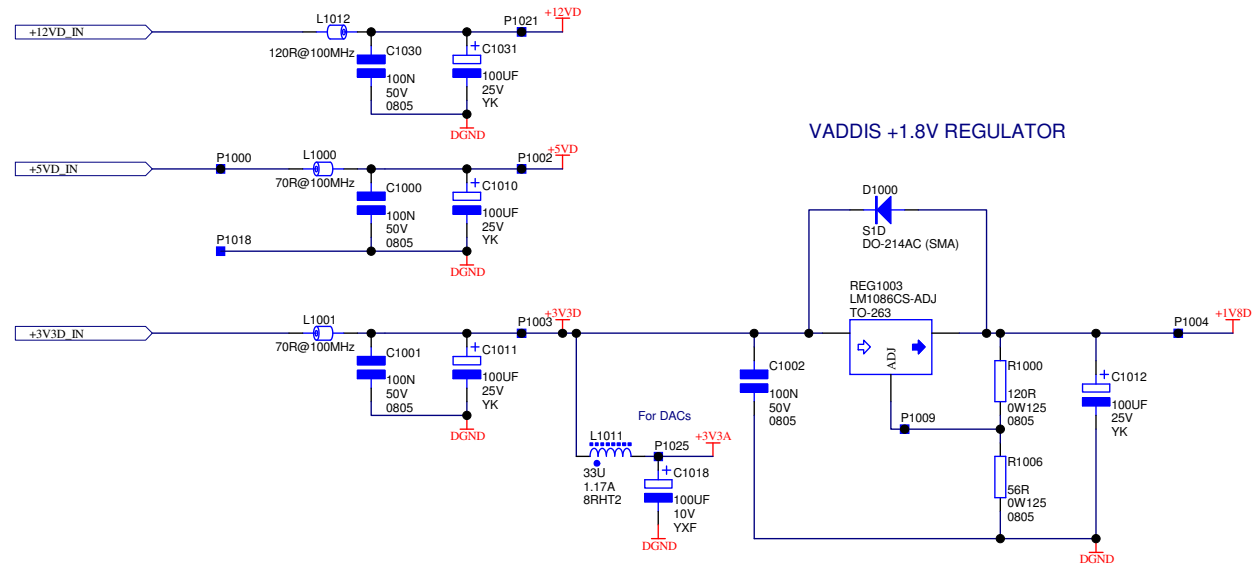


The remote bus is demodulated using an LED and the IR receiver on the display board. The demodulator circuit here can optionally be used instead.

SERIAL/CEDIA
 Serial port for test use, also for optional CEDIA RS232 upgrade

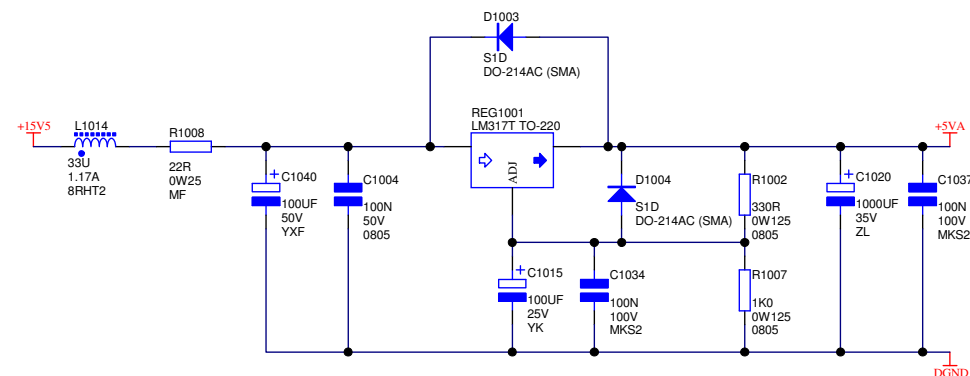
DRAWING TITLE		Revision		Date		Description of Change		Issue
DV78 MAIN DIG OUT & COMMS								
ARCAM A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9QR	Filename: L960C9_1.2.Sch	03_E322	PG	02-12-03	Component value changes to digital output		1.2	
	Notes:	03_E214	PG	16-07-03	Change damping pads from Sorbothane to rubber		1.1	
		03_E200	PG	03-07-03	Production Release		1.0	
	ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE		ISSUE		
Contact Engineer: Peter Gagg	Contact Tel: (01223) 203270	Printed: 2-Dec-2003	Sheet 9 of 10	A2	DRAWING NO. L960C9			

POWER IN

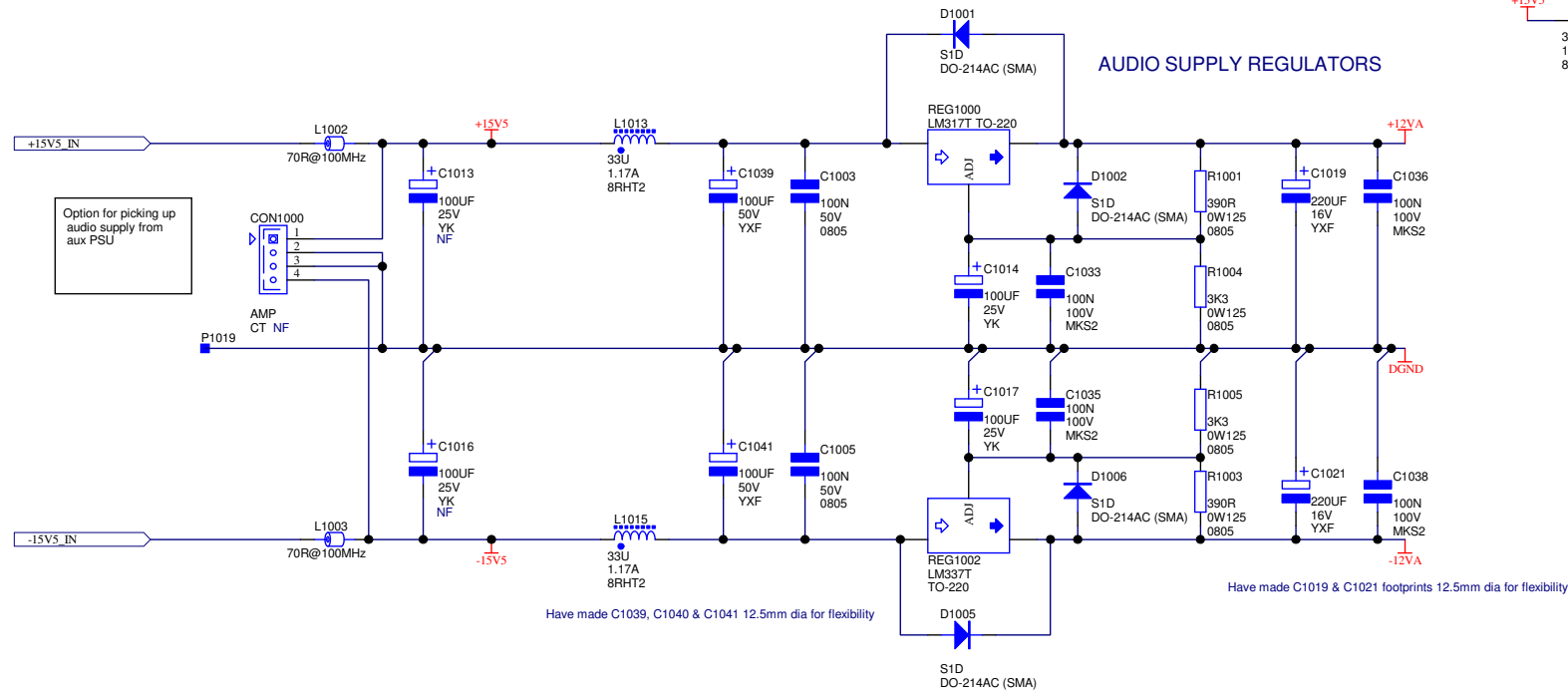


VADDIS +1.8V REGULATOR

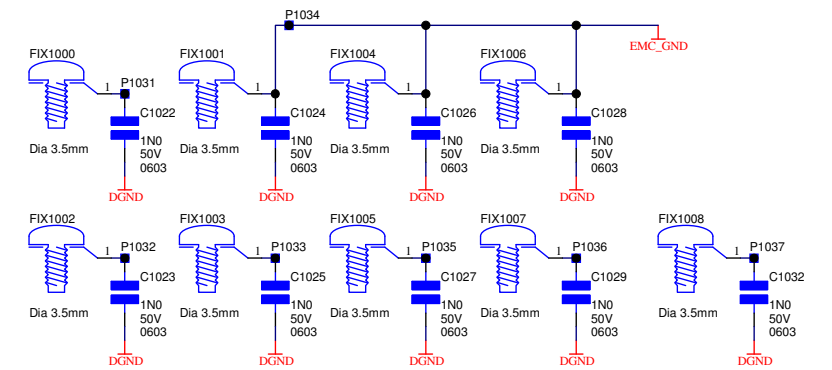
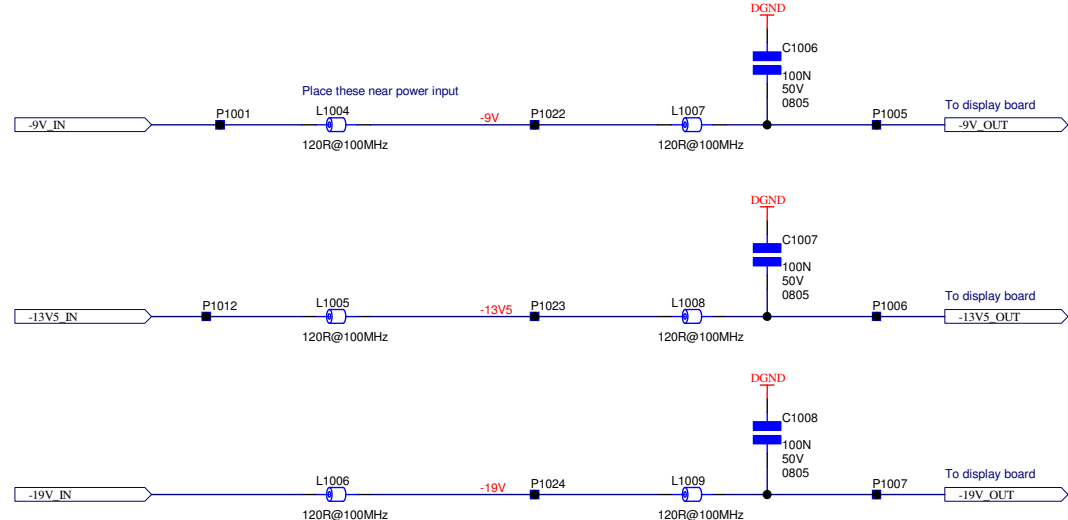
AUDIO DAC SUPPLY



AUDIO SUPPLY REGULATORS

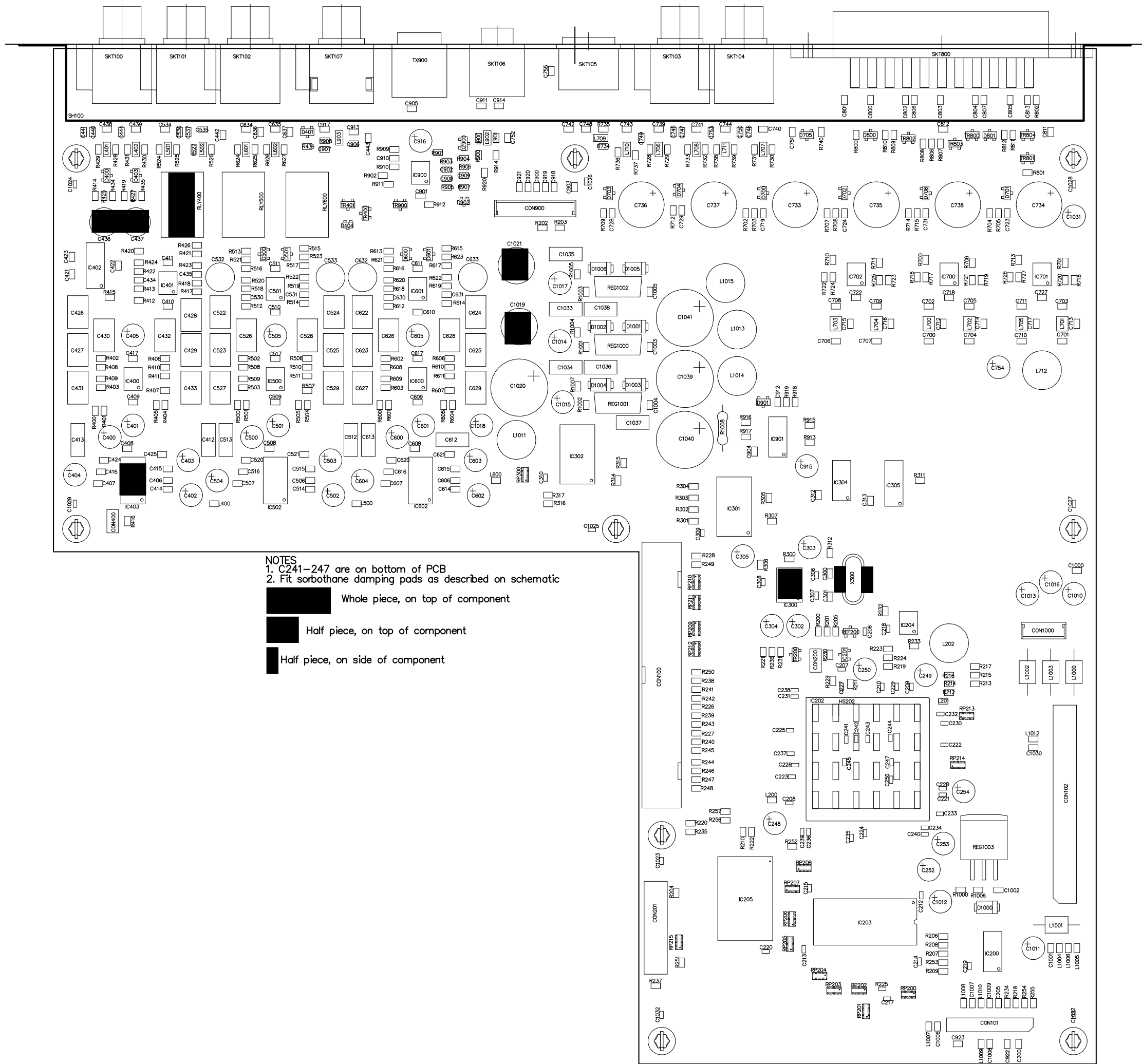


DISPLAY BOARD SUPPLIES

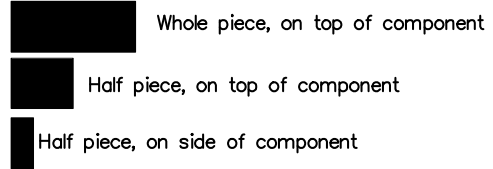


ITEM1000	1	E828AP	Pad Damping 7.5x6x3MM Rubber	Fit on top of C1019
ITEM1001	1	E828AP	Pad Damping 7.5x6x3MM Rubber	Fit on top of C1021
DRAWING TITLE				
DV78 MAIN Power				
ARCAM		Filename: L960C10_1.2.Sch	03_E322 PG	02-12-03
A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9QR		Notes:	03_E214 PG	16-07-03
Contact Engineer: Peter Gagg		03_E200 PG	03-07-03	Production Release
Contact Tel: (01223) 203270	Printed: 2-Dec-2003	ECO No.	INITIALS	DATE
	Sheet 10 of 10	A2	DRAWING NO. L960C10	ISSUE

Assembly Guide for L960AY



- NOTES
 1. C241-247 are on bottom of PCB
 2. Fit sorbothane damping pads as described on schematic



DV78 DVD player Main board L960AY issue 1.2.4

Designator	Part	Description
C200	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C205	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C206	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C207	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C208	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C209	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C210	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C212	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C213	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C214	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C215	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C217	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C218	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C219	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C220	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C221	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C222	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C223	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C224	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C225	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C226	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C227	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C228	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C229	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C230	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C231	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C232	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C233	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C234	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C235	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C236	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C237	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C238	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C239	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C240	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C241	2JC210	Capacitor SM 0603 X7R Ceramic 10% 50V 1N0
C242	2JC210	Capacitor SM 0603 X7R Ceramic 10% 50V 1N0
C243	2JC210	Capacitor SM 0603 X7R Ceramic 10% 50V 1N0
C244	2JC210	Capacitor SM 0603 X7R Ceramic 10% 50V 1N0
C245	2JC210	Capacitor SM 0603 X7R Ceramic 10% 50V 1N0
C246	2JC210	Capacitor SM 0603 X7R Ceramic 10% 50V 1N0
C247	2JC210	Capacitor SM 0603 X7R Ceramic 10% 50V 1N0
C248	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C249	2Z710B	Capacitor Low Impedance Radial Electrolytic Dia 5mm Pitch 5mm 100UF 10V
C250	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C252	2Z710B	Capacitor Low Impedance Radial Electrolytic Dia 5mm Pitch 5mm 100UF 10V
C253	2Z710B	Capacitor Low Impedance Radial Electrolytic Dia 5mm Pitch 5mm 100UF 10V
C254	2Z710B	Capacitor Low Impedance Radial Electrolytic Dia 5mm Pitch 5mm 100UF 10V
C300	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C301	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C302	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C303	2Z710B	Capacitor Low Impedance Radial Electrolytic Dia 5mm Pitch 5mm 100UF 10V
C304	2N610	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 10UF 50V
C305	2Z710B	Capacitor Low Impedance Radial Electrolytic Dia 5mm Pitch 5mm 100UF 10V
C306	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C307	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C308	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C309	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C310	2JD410	Capacitor SM 0603 X7R Ceramic 10% 16V 100N
C312	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C313	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C400	2P610	Capacitor Radial Electrolytic Elna ROD 10UF 35V

DV78 DVD player Main board L960AY issue 1.2.4

Designator	Part	Description
C401	2P610	Capacitor Radial Electrolytic Elna ROD 10UF 35V
C402	2P610	Capacitor Radial Electrolytic Elna ROD 10UF 35V
C403	2P610	Capacitor Radial Electrolytic Elna ROD 10UF 35V
C404	2P610	Capacitor Radial Electrolytic Elna ROD 10UF 35V
C405	2P610	Capacitor Radial Electrolytic Elna ROD 10UF 35V
C406	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C407	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C408	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C409	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C410	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C411	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C412	2KA410	Capacitor Boxed Polyester 5mm Pitch 5% 100VDC 100N
C413	2KA410	Capacitor Boxed Polyester 5mm Pitch 5% 100VDC 100N
C414	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C415	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C416	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C417	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C421	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C422	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C423	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C424	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C425	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C426	2DA222	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 2N2
C427	2DA222	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 2N2
C428	2DA222	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 2N2
C429	2DA222	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 2N2
C430	2DA168	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 680P
C431	2DA168	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 680P
C432	2DA168	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 680P
C433	2DA168	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 680P
C434	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C435	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C436	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C437	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C438	2L147	Capacitor SM 0805 NPO Ceramic 5% 100V 470P
C439	2L147	Capacitor SM 0805 NPO Ceramic 5% 100V 470P
C440	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C441	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C442	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C443	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C444	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C500	2P610	Capacitor Radial Electrolytic Elna ROD 10UF 35V
C501	2P610	Capacitor Radial Electrolytic Elna ROD 10UF 35V
C502	2P610	Capacitor Radial Electrolytic Elna ROD 10UF 35V
C503	2P610	Capacitor Radial Electrolytic Elna ROD 10UF 35V
C504	2P610	Capacitor Radial Electrolytic Elna ROD 10UF 35V
C505	2P610	Capacitor Radial Electrolytic Elna ROD 10UF 35V
C506	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C507	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C508	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C509	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C510	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C511	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C512	2KA410	Capacitor Boxed Polyester 5mm Pitch 5% 100VDC 100N
C513	2KA410	Capacitor Boxed Polyester 5mm Pitch 5% 100VDC 100N
C514	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C515	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C516	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C517	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C520	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C521	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C522	2DA222	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 2N2

DV78 DVD player Main board L960AY issue 1.2.4

Designator	Part	Description
C523	2DA222	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 2N2
C524	2DA222	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 2N2
C525	2DA222	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 2N2
C526	2DA168	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 680P
C527	2DA168	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 680P
C528	2DA168	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 680P
C529	2DA168	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 680P
C530	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C531	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C532	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C533	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C534	2L147	Capacitor SM 0805 NPO Ceramic 5% 100V 470P
C535	2L147	Capacitor SM 0805 NPO Ceramic 5% 100V 470P
C536	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C537	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C600	2P610	Capacitor Radial Electrolytic Elna ROD 10UF 35V
C601	2P610	Capacitor Radial Electrolytic Elna ROD 10UF 35V
C602	2P610	Capacitor Radial Electrolytic Elna ROD 10UF 35V
C603	2P610	Capacitor Radial Electrolytic Elna ROD 10UF 35V
C604	2P610	Capacitor Radial Electrolytic Elna ROD 10UF 35V
C605	2P610	Capacitor Radial Electrolytic Elna ROD 10UF 35V
C606	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C607	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C608	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C609	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C610	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C611	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C612	2KA410	Capacitor Boxed Polyester 5mm Pitch 5% 100VDC 100N
C613	2KA410	Capacitor Boxed Polyester 5mm Pitch 5% 100VDC 100N
C614	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C615	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C616	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C617	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C620	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C621	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C622	2DA222	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 2N2
C623	2DA222	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 2N2
C624	2DA222	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 2N2
C625	2DA222	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 2N2
C626	2DA168	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 680P
C627	2DA168	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 680P
C628	2DA168	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 680P
C629	2DA168	Capacitor Boxed Polypropylene 5mm Pitch 100V 5% 680P
C630	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C631	2L033	Capacitor SM 0805 NPO Ceramic 5% 100V 33P
C632	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C633	2V710	Capacitor Non-Polar Radial Electrolytic 100UF 16V
C634	2L147	Capacitor SM 0805 NPO Ceramic 5% 100V 470P
C635	2L147	Capacitor SM 0805 NPO Ceramic 5% 100V 470P
C636	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C637	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C700	2L112	Capacitor SM 0805 NPO Ceramic 5% 100V 120P
C701	2L112	Capacitor SM 0805 NPO Ceramic 5% 100V 120P
C702	2L112	Capacitor SM 0805 NPO Ceramic 5% 100V 120P
C703	2L112	Capacitor SM 0805 NPO Ceramic 5% 100V 120P
C704	2L112	Capacitor SM 0805 NPO Ceramic 5% 100V 120P
C705	2L112	Capacitor SM 0805 NPO Ceramic 5% 100V 120P
C706	2L112	Capacitor SM 0805 NPO Ceramic 5% 100V 120P
C707	2L112	Capacitor SM 0805 NPO Ceramic 5% 100V 120P
C708	2L112	Capacitor SM 0805 NPO Ceramic 5% 100V 120P
C709	2L112	Capacitor SM 0805 NPO Ceramic 5% 100V 120P
C710	2L112	Capacitor SM 0805 NPO Ceramic 5% 100V 120P

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Designator	Part	Description
C711	2L112	Capacitor SM 0805 NPO Ceramic 5% 100V 120P
C712	2L882	Capacitor SM 0805 NPO Ceramic +/-0.25pF 100V 8P2
C713	2L882	Capacitor SM 0805 NPO Ceramic +/-0.25pF 100V 8P2
C714	2L882	Capacitor SM 0805 NPO Ceramic +/-0.25pF 100V 8P2
C715	2L882	Capacitor SM 0805 NPO Ceramic +/-0.25pF 100V 8P2
C716	2L882	Capacitor SM 0805 NPO Ceramic +/-0.25pF 100V 8P2
C717	2L882	Capacitor SM 0805 NPO Ceramic +/-0.25pF 100V 8P2
C718	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C719	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C722	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C723	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C724	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C727	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C728	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C729	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C731	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C733	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C734	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C735	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C736	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C737	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C738	2N747	Capacitor Radial Electrolytic Dia 10mm Pitch 5mm 470UF 25V
C739	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C740	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C741	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C742	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C743	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C744	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C745	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C746	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C747	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C748	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C749	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C750	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C751	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C752	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C753	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C754	2Z710B	Capacitor Low Impedance Radial Electrolytic Dia 5mm Pitch 5mm 100UF 10V
C755	2JA310	Capacitor SM 0805 X7R Ceramic 10% 100V 10N
C800	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C801	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C802	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C803	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C804	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C805	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C806	2JA310	Capacitor SM 0805 X7R Ceramic 10% 100V 10N
C807	2JA310	Capacitor SM 0805 X7R Ceramic 10% 100V 10N
C811	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C812	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C813	2JA310	Capacitor SM 0805 X7R Ceramic 10% 100V 10N
C900	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C901	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C902	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C903	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C904	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C905	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C906	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C907	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C908	2L168	Capacitor SM 0805 NPO Ceramic 5% 100V 680P
C909	2L168	Capacitor SM 0805 NPO Ceramic 5% 100V 680P
C910	2L168	Capacitor SM 0805 NPO Ceramic 5% 100V 680P
C911	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P

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Designator	Part	Description
C912	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C913	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C914	2L110	Capacitor SM 0805 NPO Ceramic 5% 100V 100P
C915	2Z710B	Capacitor Low Impedance Radial Electrolytic Dia 5mm Pitch 5mm 100UF 10V
C916	2Z710B	Capacitor Low Impedance Radial Electrolytic Dia 5mm Pitch 5mm 100UF 10V
C917	2JA310	Capacitor SM 0805 X7R Ceramic 10% 100V 10N
C918	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C919	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C920	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C921	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C922	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C923	2L047	Capacitor SM 0805 NPO Ceramic 5% 100V 47P
C1000	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1001	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1002	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1003	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1004	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1005	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1006	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1007	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1008	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1009	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1010	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C1011	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C1012	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C1013	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C1014	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C1015	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C1016	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C1017	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C1018	2Z710B	Capacitor Low Impedance Radial Electrolytic Dia 5mm Pitch 5mm 100UF 10V
C1019	2Z722A	Capacitor Low Impedance Radial Electrolytic Dia 8mm Pitch 5mm 220UF 16V
C1020	2ZL810C	Capacitor Ultra Low Impedance Radial Electrolytic Dia 12.5mm Pitch 5mm 1000UF 35V
C1021	2Z722A	Capacitor Low Impedance Radial Electrolytic Dia 8mm Pitch 5mm 220UF 16V
C1022	2JC210	Capacitor SM 0603 X7R Ceramic 10% 50V 1N0
C1023	2JC210	Capacitor SM 0603 X7R Ceramic 10% 50V 1N0
C1024	2JC210	Capacitor SM 0603 X7R Ceramic 10% 50V 1N0
C1025	2JC210	Capacitor SM 0603 X7R Ceramic 10% 50V 1N0
C1026	2JC210	Capacitor SM 0603 X7R Ceramic 10% 50V 1N0
C1027	2JC210	Capacitor SM 0603 X7R Ceramic 10% 50V 1N0
C1028	2JC210	Capacitor SM 0603 X7R Ceramic 10% 50V 1N0
C1029	2JC210	Capacitor SM 0603 X7R Ceramic 10% 50V 1N0
C1030	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C1031	2N710	Capacitor Radial Electrolytic Dia 5mm Pitch 5mm 100UF 25V
C1032	2JC210	Capacitor SM 0603 X7R Ceramic 10% 50V 1N0
C1033	2KA410	Capacitor Boxed Polyester 5mm Pitch 5% 100VDC 100N
C1034	2KA410	Capacitor Boxed Polyester 5mm Pitch 5% 100VDC 100N
C1035	2KA410	Capacitor Boxed Polyester 5mm Pitch 5% 100VDC 100N
C1036	2KA410	Capacitor Boxed Polyester 5mm Pitch 5% 100VDC 100N
C1037	2KA410	Capacitor Boxed Polyester 5mm Pitch 5% 100VDC 100N
C1038	2KA410	Capacitor Boxed Polyester 5mm Pitch 5% 100VDC 100N
C1039	2Z710D	Capacitor Low Impedance Radial Electrolytic Dia 8mm Pitch 5mm 100UF 50V
C1040	2Z710D	Capacitor Low Impedance Radial Electrolytic Dia 8mm Pitch 5mm 100UF 50V
C1041	2Z710D	Capacitor Low Impedance Radial Electrolytic Dia 8mm Pitch 5mm 100UF 50V
CON100	8KB40	Con Boxed Header 0.1IN Dual ROW 40WAY
CON101	8K8516	Con 1.00MM Vertical FFC 16WAY 52806 Series
CON102	8K8032	Con 1.25MM Vertical FFC 32WAY
CON200	8K6201	Con Single ROW Hdr 0.1IN Vertical 2WAY
CON201	8K6316	Con Hdr Dual ROW 0.1IN Vertical 16WAY
CON400	8K6201	Con Single ROW Hdr 0.1IN Vertical 2WAY
CON900	8K2408	Con CT Series Vertical 8WAY
CON1000	8K2404	Con CT Series Vertical 4WAY

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Designator	Part	Description
D400	3F54S	Diode Schottky BAT54S SOT-23 Package
D401	3F54S	Diode Schottky BAT54S SOT-23 Package
D403	3F54S	Diode Schottky BAT54S SOT-23 Package
D404	3AS16W	Diode Surface Mount Small Signal BAS16W SOT-23 Package
D500	3F54S	Diode Schottky BAT54S SOT-23 Package
D501	3F54S	Diode Schottky BAT54S SOT-23 Package
D600	3F54S	Diode Schottky BAT54S SOT-23 Package
D601	3F54S	Diode Schottky BAT54S SOT-23 Package
D700	3F54S	Diode Schottky BAT54S SOT-23 Package
D701	3F54S	Diode Schottky BAT54S SOT-23 Package
D702	3F54S	Diode Schottky BAT54S SOT-23 Package
D703	3F54S	Diode Schottky BAT54S SOT-23 Package
D704	3F54S	Diode Schottky BAT54S SOT-23 Package
D705	3F54S	Diode Schottky BAT54S SOT-23 Package
D706	3F54S	Diode Schottky BAT54S SOT-23 Package
D800	3F54S	Diode Schottky BAT54S SOT-23 Package
D801	3F54S	Diode Schottky BAT54S SOT-23 Package
D901	3F54S	Diode Schottky BAT54S SOT-23 Package
D902	3AS16W	Diode Surface Mount Small Signal BAS16W SOT-23 Package
D1000	3BS1D	Diode Surface Mount S1D
D1001	3BS1D	Diode Surface Mount S1D
D1002	3BS1D	Diode Surface Mount S1D
D1003	3BS1D	Diode Surface Mount S1D
D1004	3BS1D	Diode Surface Mount S1D
D1005	3BS1D	Diode Surface Mount S1D
D1006	3BS1D	Diode Surface Mount S1D
DZ900	3CW33V9	Zener Diode 0.25W Surface Mount BZX84C3V9 SOT-23 Package
HS202	F013	Heatsink BGA 3319 20.9 Deg C/W
IC200	5K74125T	IC Quad Buffer 74HCT125D SMT
IC201	5H809263	IC Micro Reset LM809M3-2.63 SOT-23
IC202	5L36750	IC Vaddis V DVD ZR36750 BGA-316 Package
IC203	5H6432-7	IC Sdram 64Mbit K4S643232F-TC70
IC204	5G24LC08	IC Eeprom 24LC08BT/SN 8K SO-8 Package
IC205	L024AY	Programmed Flash 28F160 For Vaddis V DVD Player
IC300	5A1700	IC Multi Clock GENERATOR PLL1700E SSOP-20 Package
IC301	5KLVC244	IC Octal 3 State Buffer 5V Tol 74LVC244AD SMT
IC302	5KLVC244	IC Octal 3 State Buffer 5V Tol 74LVC244AD SMT
IC304	5K7474	IC Dual D Type Flip Flop 74HC74D SMT
IC305	5K151	IC 8-INPUT Mux 74HC151D SMT
IC400	5B2134	Opamp OPA2134UA SO-8 Package
IC401	5B2134	Opamp OPA2134UA SO-8 Package
IC402	5S413DY	IC Quad Analogue Switch DG413DY SO-16 Package
IC403	5A8740	IC Audio DAC XWM8740EDS SSOP-28 Package
IC500	5B2134	Opamp OPA2134UA SO-8 Package
IC501	5B2134	Opamp OPA2134UA SO-8 Package
IC502	5A8740	IC Audio DAC XWM8740EDS SSOP-28 Package
IC600	5B2134	Opamp OPA2134UA SO-8 Package
IC601	5B2134	Opamp OPA2134UA SO-8 Package
IC602	5A8740	IC Audio DAC XWM8740EDS SSOP-28 Package
IC700	5B8062	Opamp AD8062AR SO-8 Package
IC701	5B8062	Opamp AD8062AR SO-8 Package
IC702	5B8062	Opamp AD8062AR SO-8 Package
IC900	5B358	Opamp LM358AM SO-8 Package
IC901	5KLVC125	IC Quad Buffer 5V Tol 74LVC125AD SMT
L200	7F007	Ferrite Bead SM0805 120R@100MHz
L201	7F007	Ferrite Bead SM0805 120R@100MHz
L202	7C033B	Inductor 33UH 10% 1.17A A823LY-330K=R
L400	7F007	Ferrite Bead SM0805 120R@100MHz
L401	7E101	Common Mode Choke 1000R@100MHz
L402	7E101	Common Mode Choke 1000R@100MHz
L500	7F007	Ferrite Bead SM0805 120R@100MHz
L501	7E101	Common Mode Choke 1000R@100MHz

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Designator	Part	Description
L502	7E101	Common Mode Choke 1000R@100MHz
L600	7F007	Ferrite Bead SM0805 120R@100MHz
L601	7E101	Common Mode Choke 1000R@100MHz
L602	7E101	Common Mode Choke 1000R@100MHz
L700	7B810	Inductor Surface Mount 1U0
L701	7B810	Inductor Surface Mount 1U0
L702	7B810	Inductor Surface Mount 1U0
L703	7B810	Inductor Surface Mount 1U0
L704	7B810	Inductor Surface Mount 1U0
L705	7B810	Inductor Surface Mount 1U0
L706	7E101	Common Mode Choke 1000R@100MHz
L707	7E101	Common Mode Choke 1000R@100MHz
L708	7E101	Common Mode Choke 1000R@100MHz
L709	7E101	Common Mode Choke 1000R@100MHz
L710	7E101	Common Mode Choke 1000R@100MHz
L711	7E101	Common Mode Choke 1000R@100MHz
L712	7C033B	Inductor 33UH 10% 1.17A A823LY-330K=R
L900	7F007	Ferrite Bead SM0805 120R@100MHz
L901	7F007	Ferrite Bead SM0805 120R@100MHz
L902	7E101	Common Mode Choke 1000R@100MHz
L903	7E101	Common Mode Choke 1000R@100MHz
L1000	7F003	Ferrite Bead Axial 100MHz/20 Degree C
L1001	7F003	Ferrite Bead Axial 100MHz/20 Degree C
L1002	7F003	Ferrite Bead Axial 100MHz/20 Degree C
L1003	7F003	Ferrite Bead Axial 100MHz/20 Degree C
L1004	7F007	Ferrite Bead SM0805 120R@100MHz
L1005	7F007	Ferrite Bead SM0805 120R@100MHz
L1006	7F007	Ferrite Bead SM0805 120R@100MHz
L1007	7F007	Ferrite Bead SM0805 120R@100MHz
L1008	7F007	Ferrite Bead SM0805 120R@100MHz
L1009	7F007	Ferrite Bead SM0805 120R@100MHz
L1010	7F007	Ferrite Bead SM0805 120R@100MHz
L1011	7C033B	Inductor 33UH 10% 1.17A A823LY-330K=R
L1012	7F007	Ferrite Bead SM0805 120R@100MHz
L1013	7C033B	Inductor 33UH 10% 1.17A A823LY-330K=R
L1014	7C033B	Inductor 33UH 10% 1.17A A823LY-330K=R
L1015	7C033B	Inductor 33UH 10% 1.17A A823LY-330K=R
R200	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R201	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R202	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R203	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R204	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R205	1M056	Resistor 0805 Surface Mount 0.125W 1% 56R
R206	1M056	Resistor 0805 Surface Mount 0.125W 1% 56R
R207	1M056	Resistor 0805 Surface Mount 0.125W 1% 56R
R208	1M056	Resistor 0805 Surface Mount 0.125W 1% 56R
R209	1M056	Resistor 0805 Surface Mount 0.125W 1% 56R
R210	1M056	Resistor 0805 Surface Mount 0.125W 1% 56R
R211	1M139	Resistor 0805 Surface Mount 0.125W 1% 390R
R212	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R213	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R214	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R215	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R216	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R217	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R218	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R219	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R220	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R221	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R222	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R223	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R224	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0

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Designator	Part	Description
R225	1N210	Resistor 0603 Surface Mount 0.063W 1% 1K0
R226	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R227	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R228	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R229	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R230	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R231	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R232	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R233	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R234	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R235	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R236	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R237	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R238	1M082	Resistor 0805 Surface Mount 0.125W 1% 82R
R239	1M082	Resistor 0805 Surface Mount 0.125W 1% 82R
R240	1M082	Resistor 0805 Surface Mount 0.125W 1% 82R
R241	1M022	Resistor 0805 Surface Mount 0.125W 1% 22R
R242	1M022	Resistor 0805 Surface Mount 0.125W 1% 22R
R243	1M022	Resistor 0805 Surface Mount 0.125W 1% 22R
R244	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R245	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R246	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R247	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R248	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R249	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R250	1M256	Resistor 0805 Surface Mount 0.125W 1% 5K6
R251	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R252	1M056	Resistor 0805 Surface Mount 0.125W 1% 56R
R253	1M056	Resistor 0805 Surface Mount 0.125W 1% 56R
R254	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R255	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R256	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R257	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R300	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R301	1M033	Resistor 0805 Surface Mount 0.125W 1% 33R
R302	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R303	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R304	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R305	1M218	Resistor 0805 Surface Mount 0.125W 1% 1K8
R306	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R307	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R311	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R312	1M010	Resistor 0805 Surface Mount 0.125W 1% 10R
R314	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R315	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R316	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R317	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R400	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R401	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R402	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R403	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R404	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R405	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R406	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R407	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R408	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R409	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R410	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R411	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R412	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R413	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R414	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K

DV78 DVD player Main board L960AY issue 1.2.4

Designator	Part	Description
R415	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R416	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R417	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R418	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R419	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R420	1M311	Resistor 0805 Surface Mount 0.125W 1% 11K
R421	1M311	Resistor 0805 Surface Mount 0.125W 1% 11K
R422	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R423	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R424	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R425	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R426	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R427	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R428	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R429	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R430	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R431	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R434	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R435	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R436	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R500	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R501	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R502	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R503	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R504	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R505	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R506	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R507	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R508	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R509	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R510	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R511	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R512	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R513	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R514	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R515	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R516	1M311	Resistor 0805 Surface Mount 0.125W 1% 11K
R517	1M311	Resistor 0805 Surface Mount 0.125W 1% 11K
R518	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R519	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R520	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R521	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R522	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R523	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R524	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R525	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R526	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R527	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R600	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R601	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R602	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R603	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R604	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R605	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R606	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R607	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R608	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R609	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R610	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R611	1M168	Resistor 0805 Surface Mount 0.125W 1% 680R
R612	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R613	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K

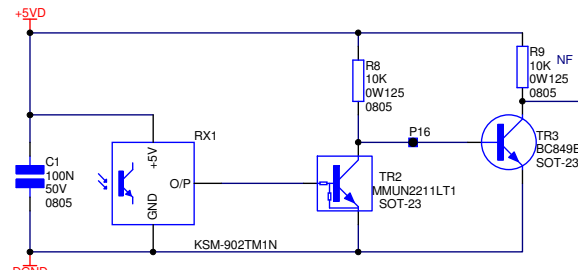
DV78 DVD player Main board L960AY issue 1.2.4

Designator	Part	Description
R614	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R615	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R616	1M311	Resistor 0805 Surface Mount 0.125W 1% 11K
R617	1M311	Resistor 0805 Surface Mount 0.125W 1% 11K
R618	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R619	1M510	Resistor 0805 Surface Mount 0.125W 1% 1M0
R620	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R621	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R622	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R623	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R624	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R625	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R626	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R627	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R700	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R701	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R702	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R703	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R704	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R705	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R706	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R707	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R708	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R709	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R710	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R711	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R712	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R713	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R714	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R715	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R716	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R717	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R718	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R719	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R720	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R721	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R722	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R723	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R724	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R725	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R726	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R727	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R728	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R729	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R730	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R731	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R732	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R733	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R734	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R735	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R736	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R737	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R738	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R739	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R740	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R800	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R801	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R802	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R806	1M268	Resistor 0805 Surface Mount 0.125W 1% 6K8
R807	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R808	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R809	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R

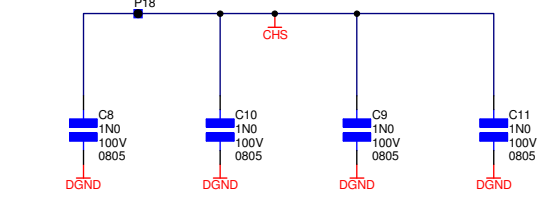
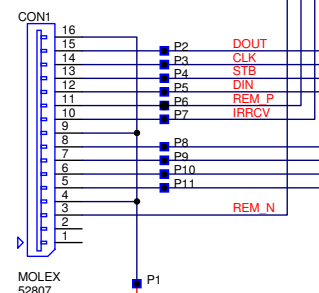
DV78 DVD player Main board L960AY issue 1.2.4

Designator	Part	Description
R810	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R
R811	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R812	1M075	Resistor 0805 Surface Mount 0.125W 1% 75R
R900	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R901	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R902	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R903	1M218	Resistor 0805 Surface Mount 0.125W 1% 1K8
R904	1M347	Resistor 0805 Surface Mount 0.125W 1% 47K
R905	1M410	Resistor 0805 Surface Mount 0.125W 1% 100K
R906	1M118	Resistor 0805 Surface Mount 0.125W 1% 180R
R907	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R908	1M000	Resistor 0805 Surface Mount 0.125W 1% 0R0
R909	1M447	Resistor 0805 Surface Mount 0.125W 1% 470K
R910	1M215	Resistor 0805 Surface Mount 0.125W 1% 1K5
R911	1M322	Resistor 0805 Surface Mount 0.125W 1% 22K
R912	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R913	1M110	Resistor 0805 Surface Mount 0.125W 1% 100R
R914	1M047	Resistor 0805 Surface Mount 0.125W 1% 47R
R915	1M175	Resistor 0805 Surface Mount 0.125W 1% 750R
R916	1M175	Resistor 0805 Surface Mount 0.125W 1% 750R
R917	1M175	Resistor 0805 Surface Mount 0.125W 1% 750R
R918	1M112	Resistor 0805 Surface Mount 0.125W 1% 120R
R919	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R920	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R1000	1M112	Resistor 0805 Surface Mount 0.125W 1% 120R
R1001	1M139	Resistor 0805 Surface Mount 0.125W 1% 390R
R1002	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R
R1003	1M139	Resistor 0805 Surface Mount 0.125W 1% 390R
R1004	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R1005	1M233	Resistor 0805 Surface Mount 0.125W 1% 3K3
R1006	1M056	Resistor 0805 Surface Mount 0.125W 1% 56R
R1007	1M210	Resistor 0805 Surface Mount 0.125W 1% 1K0
R1008	1H022	Resistor Metal Film 0.25W 1% 22R
REF200	5D4041	Voltage Reference Adjustable LM4041CEM3-ADJ SOT-23 Package
REG1001	5D317T	IC Voltage Regulator ADJ LM317T TO-220 Package
REG1000	5D317T	IC Voltage Regulator ADJ LM317T TO-220 Package
REG1002	5D337	IC Voltage Regulator Neg ADJ LM337T TO-220 Package
REG1003	5D1086AS	IC Voltage Regulator Adjustable LM1086CS-ADJ TO-263 Package
RLY600	A216	Relay 2P2T 5V SM
RLY400	A216	Relay 2P2T 5V SM
RLY500	A216	Relay 2P2T 5V SM
RP200	1V056B	Resistor Pack Surface Mount 4 Isolated Resistors 56R
RP201	1V056B	Resistor Pack Surface Mount 4 Isolated Resistors 56R
RP202	1V056B	Resistor Pack Surface Mount 4 Isolated Resistors 56R
RP203	1V056B	Resistor Pack Surface Mount 4 Isolated Resistors 56R
RP204	1V056B	Resistor Pack Surface Mount 4 Isolated Resistors 56R
RP205	1V056B	Resistor Pack Surface Mount 4 Isolated Resistors 56R
RP206	1V056B	Resistor Pack Surface Mount 4 Isolated Resistors 56R
RP207	1V056B	Resistor Pack Surface Mount 4 Isolated Resistors 56R
RP208	1V056B	Resistor Pack Surface Mount 4 Isolated Resistors 56R
RP209	1V033B	Resistor Pack Surface Mount 4 Isolated Resistors 33R
RP210	1V033B	Resistor Pack Surface Mount 4 Isolated Resistors 33R
RP211	1V033B	Resistor Pack Surface Mount 4 Isolated Resistors 33R
RP212	1V033B	Resistor Pack Surface Mount 4 Isolated Resistors 33R
RP213	1V110B	Resistor Pack Surface Mount 4 Isolated Resistors 100R
RP214	1V110B	Resistor Pack Surface Mount 4 Isolated Resistors 100R
RP215	1V247B	Resistor Pack Surface Mount 4 Isolated Resistors 4K7
RP300	1V110B	Resistor Pack Surface Mount 4 Isolated Resistors 100R
SH100	E965MC	Shield EMC for DV78 DVD Player Main PCB
SKT106	8D228	Con Jack 3.5mm Mono
SKT107	8D221	Phono Skt Single Gold
SKT103	8D232	Phono Skt 2 Way Vert Gold Individual Gnds

IR REMOTE SENSOR

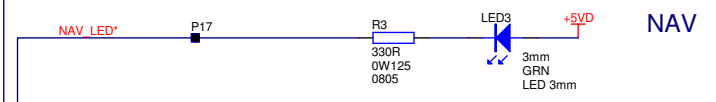
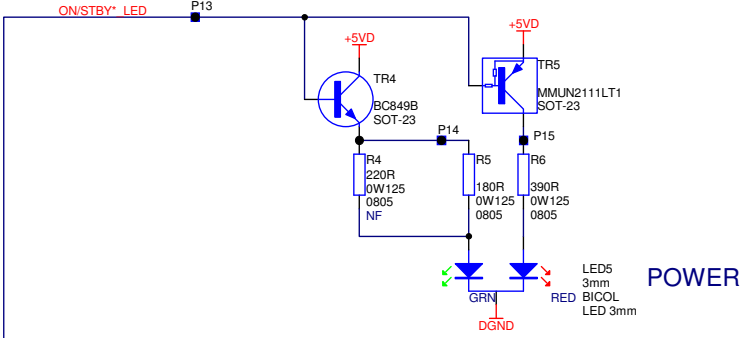
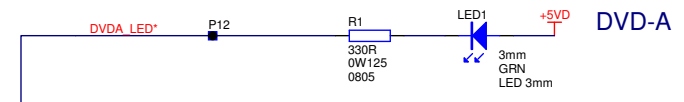
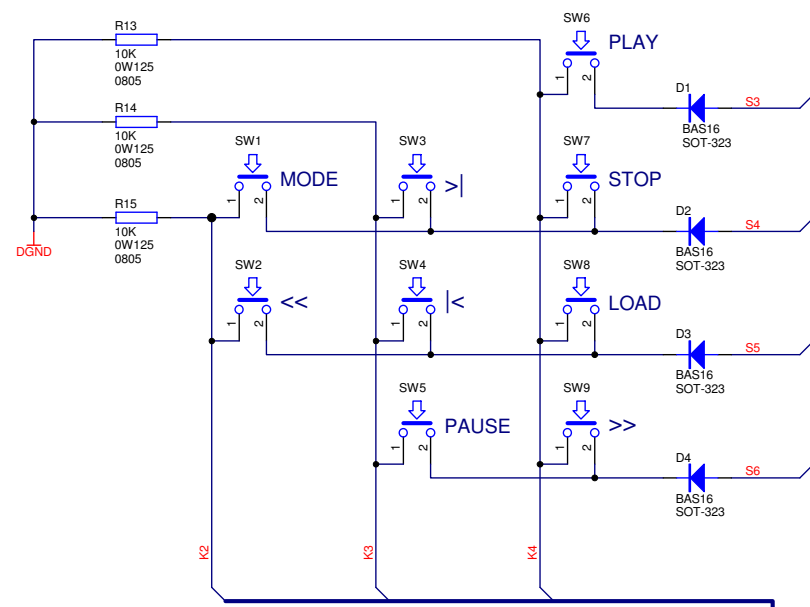


LED2 is underneath infra red receiver. The LED is lit by the remote bus signal, allowing the infra red receiver to demodulate the remote bus signal.



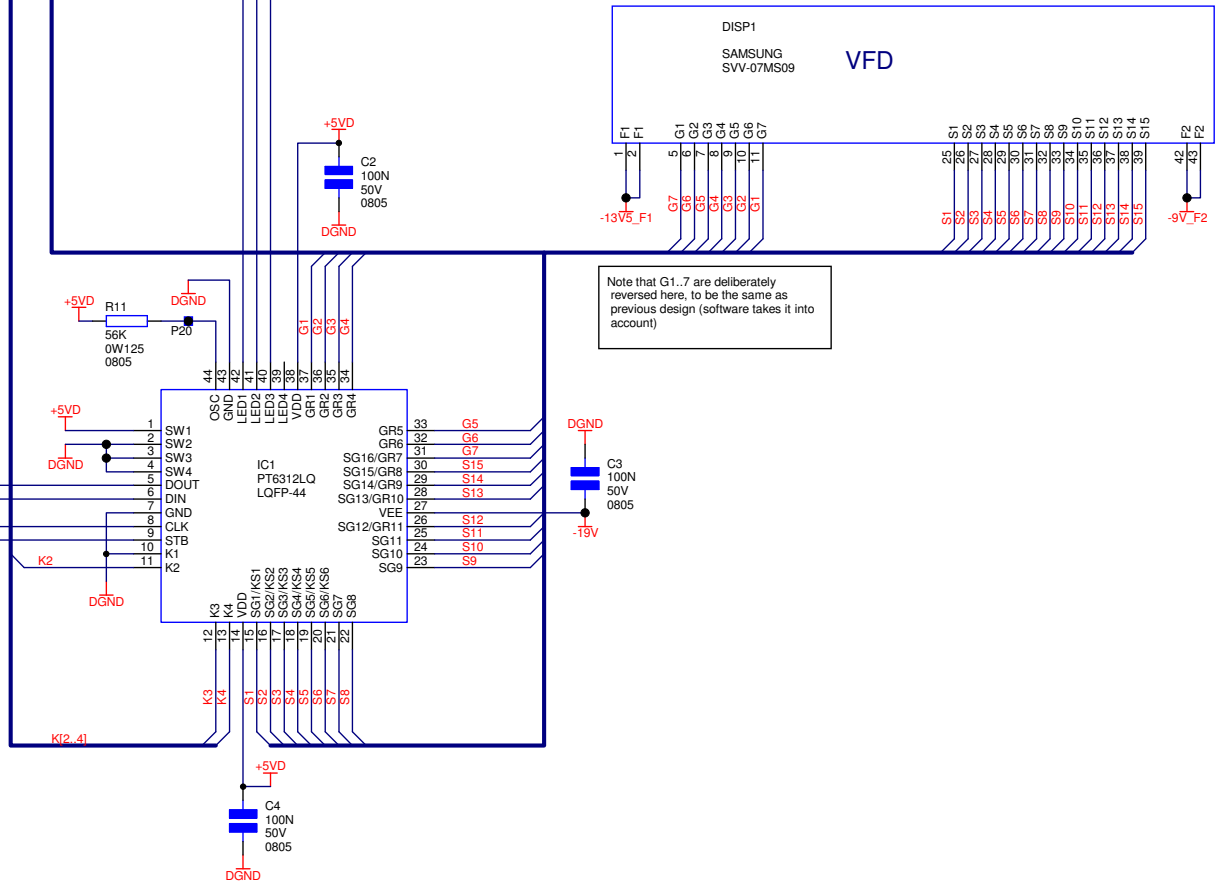
NOTE TO ENGINEERS:
When creating BOM, import CSV into database then manually change quantity to 0.07 for ITEM4 (F238 tape)
This is the only way to ensure it appears as 0.07m on the BOM report

ITEM1	1	L961PB	BLANK PCB DV78 DISPLAY BOARD	
ITEM2	1	F231	VFD CORNER LOCATOR	
ITEM3	1	F231	VFD CORNER LOCATOR	
ITEM4	1	F238	Foam D/S ADH BK 3MM Thk 10MM Wide RA106 10M Reel	70mm of 10mm wide double sided tape under VFD



Pins 1-4 (SW1-4) are set to read 0001, to be read by display self test in software

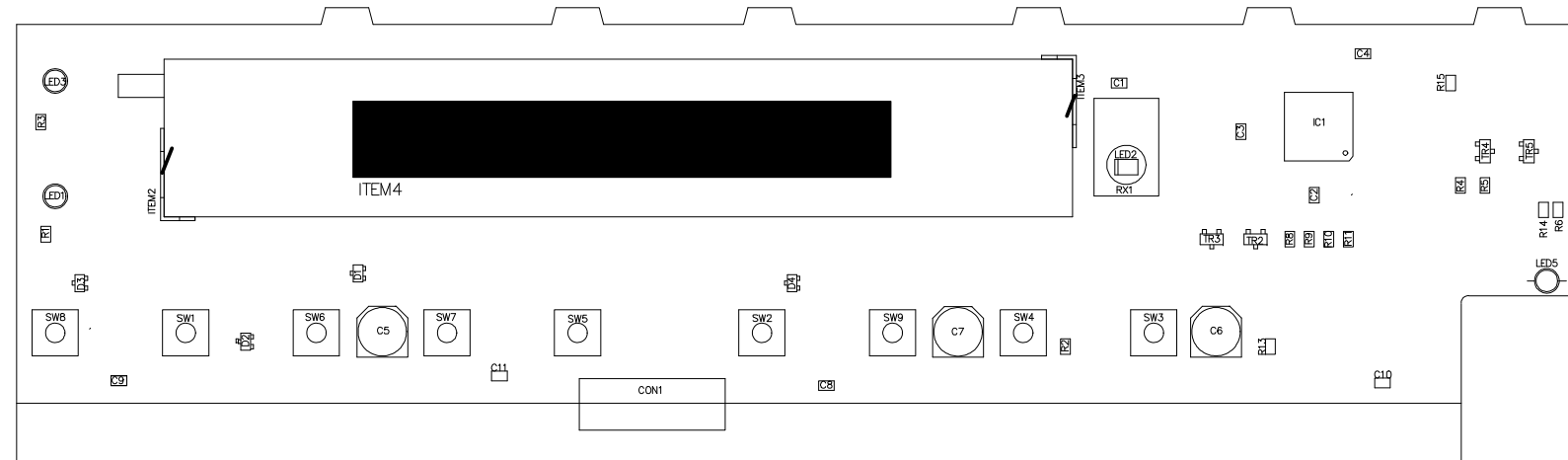
Note that G1..7 are deliberately reversed here, to be the same as previous design (software takes it into account)



DRAWING TITLE		DV78/DV79 DISPLAY BOARD			
ARCAM		File name:	L961_1.3.Sch	04_E140	PG
A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9QR		Notes:		04_E007	PG
Contact Engineer: Peter Gaggas		Contact Tel: (01223) 203270	Printed: 17-Sep-2004	03_E260	PG
				03_E202	PG
				ECO No.	INITIALS
				DATE	DESCRIPTION OF CHANGE
				ISSUE	



L961AY ASSEMBLY GUIDE



- NOTES
1. PLACE ITEM4 APPROX AS SHOWN UNDER VFD
 2. BEND LEG OF ITEM 2 & 3 TO HOLD IN PLACE AS SHOWN
 3. ENSURE DISP1 IS FITTED STRAIGHT
 4. RX1 IS FITTED ON TOP OF LED2



MECHANICAL DATA	
L961PB_1.GM1	Assembly Drawing
LAYER STACKUP	

MATERIAL	FR4 1.6MM THICK	NOTES:- 1/ Manufacture in accordance with IPC-A-600F Class 1. 2/ Always use NC drill file as reference. NO undersized finished holes. 3/ All routing 2.0mm unless otherwise shown on drill drawing. 4/ Mark month/year of manufacture on ident layer. 5/ Scoring denoted by ->>> on drill drawing.
COPPER WEIGHT	1oz	
HOLE SIZES	FINISHED (SEE NOTE 2)	
ROUTING	SEE NOTE 3	
COPPER LAYERS	TWO	
MINIMUM WIDTH	10 ML	GENERAL TOLERANCES PCB Dims. +/- 0.2mm Routing +/- 0.1mm All holes +0.1/-0mm ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED
MINIMUM GAP	10 ML	
RESIST	GREEN	
IDENT	WHITE	
VENDOR CODES	SEE NOTE 4	
FINISH	ENTEK OSP	
SCORING	SEE NOTE 5	

DRAWING TITLE						
DV78 DISPLAY PCB		--	--	--	--	--
Mechanical1		--	--	--	--	--
ARCAM A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9QR	Filename: L961PB_1.PCB	--	--	--	--	--
	DRAWING NO.	--	--	--	--	--
	L961PB	03_E202	PG	04/07/03	PRODUCTION RELEASE	1
	Contact Engineer: Peter Gaggs	E.C.O. No.	INITIALS	DATE	DESCRIPTION OF CHANGE	ISSUE
Contact Tel: +44 (0) 1223 203270		Printed: 8-Jul-2003		Sheet 8 of 10		

DV78 DVD player Display board L961AY issue 1.3.0

Designator	Part	Description
C1	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C2	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C3	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C4	2J410	Capacitor SM 0805 X7R Ceramic 10% 50V 100N
C5	2MA610	Capacitor Surface Mount Electrolytic 10UF 50V 6.3 X 4.5MM
C6	2MA610	Capacitor Surface Mount Electrolytic 10UF 50V 6.3 X 4.5MM
C7	2MA610	Capacitor Surface Mount Electrolytic 10UF 50V 6.3 X 4.5MM
C8	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C9	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C10	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
C11	2L210	Capacitor SM 0805 NPO Ceramic 5% 100V 1N0
CON1	8K8616	Con 1.0MM Horiz FFC 16WAY 52807 Series
D1	3AS16W	Diode Surface Mount Small Signal BAS16W SOT-23 Package
D2	3AS16W	Diode Surface Mount Small Signal BAS16W SOT-23 Package
D3	3AS16W	Diode Surface Mount Small Signal BAS16W SOT-23 Package
D4	3AS16W	Diode Surface Mount Small Signal BAS16W SOT-23 Package
DISP1	B1014	Display DV88
IC1	5H6312	IC VFD Driver PT6312LQ SM LQFP-44 package
LED1	3D007	LED 3.1mm Green SLR-37MG3T
LED2	3D010	LED SM Red SML-010LT
LED3	3D007	LED 3.1mm Green SLR-37MG3T
LED5	3D006	LED 3mm Red/Green Tri-Colour L-93WEGW
R1	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R
R2	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R
R3	1M133	Resistor 0805 Surface Mount 0.125W 1% 330R
R4	1M122	Resistor 0805 Surface Mount 0.125W 1% 220R
R5	1M118	Resistor 0805 Surface Mount 0.125W 1% 180R
R6	1M139	Resistor 0805 Surface Mount 0.125W 1% 390R
R8	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R9	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R10	1M247	Resistor 0805 Surface Mount 0.125W 1% 4K7
R11	1M356	Resistor 0805 Surface Mount 0.125W 1% 56K
R13	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R14	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
R15	1M310	Resistor 0805 Surface Mount 0.125W 1% 10K
RX1	B2109	IR Receiver Module Kodenshi KSM-902TM1N
SW1	A1511	Switch Tact Low Profile No Gnd Pin
SW2	A1511	Switch Tact Low Profile No Gnd Pin
SW3	A1511	Switch Tact Low Profile No Gnd Pin
SW4	A1511	Switch Tact Low Profile No Gnd Pin
SW5	A1511	Switch Tact Low Profile No Gnd Pin
SW6	A1511	Switch Tact Low Profile No Gnd Pin
SW7	A1511	Switch Tact Low Profile No Gnd Pin
SW8	A1511	Switch Tact Low Profile No Gnd Pin
SW9	A1511	Switch Tact Low Profile No Gnd Pin
TR2	4D10KN	Digital Transistor MMUN2211LT1 SOT23 Package
TR3	4A849B	Transistor BC849B SOT23 Package
TR4	4A849B	Transistor BC849B SOT23 Package
TR5	4D10KP	Digital Transistor MMUN2111LT1 SOT23 Package

Transformer Specification for 115/230V 50/60Hz mains transformer.

Arcam Part Number L924TX

The transformer is extremely cost sensitive. It is to employ the most cost effective techniques to achieve the specification.
The transformer output voltage will be regulated by a switch mode power supply.

The only essential specification is the fact that it must produce no acoustic noise either internally or by induced eddy currents in steel chassis etc..

All other specifications are negotiable in the interest of allowing cost reduction. Even the use of a frame TX rather than a toroid is negotiable providing it is silent.

1. The transformer MUST be silent when loaded to $P_o + 10\%$ and when supplied from $V_{in} = 270V$ r.m.s.

General Safety specification.

2. To standards BS415 / EN60065 - Class I / EN60742

3. Transformer to be used in equipment which will be sold worldwide and certified to CE, CB, UL and CSA Standards. All materials etc to be adequate for worldwide safety approvals.

Material Safety Specification

4. Winding Wire to be Grade 2 (130°C rating) to BS 60317-4 1995

5. Mylar Polyester Insulator Rated to 130°C

Electrical Specification

6. Transformer to have dual 115V primaries to allow parallel operation for 115V input and series operation with 230V input.

7. Transformer is required to provide a mains isolation barrier and provide a single secondary winding.

8. The secondary winding is to be full wave rectified and smoothed as shown in the below diagram.

9. The DC voltage so provided will be followed by a switch mode power supply which will provide a constant power load. (i.e. the current drawn by the load will increase as the DC output voltage falls- hence the capacitor ripple voltage will be higher at low input voltage)

10. The power drawn by the load has a maximum continuous rating (P_o) of 22W.

11. Transformer input voltage range as follows:

115V (85V to 132.5V) windings in parallel
230V (170V to 265V) windings in series

Note. Extended input voltage range 85V to 265V

12. At minimum input voltage (170V AC) the minimum voltage on the capacitor must be $> 22.5V$ with $P_o = 22W$

13. At maximum input voltage and minimum load of 6W the max voltage on output capacitor must be $< 63V$.

14. The secondary voltages and r.m.s currents have been calculated and are tabulated against input voltage. The model assumes the transformer regulation is made as poor as possible while meeting spec. The equivalent series resistance of the windings transformed to the secondary is 7ohms under this condition. Rms figures for voltages and currents are true rms figures measured with the specified bridge rectifier, Capacitor and load resistor connected to the transformer secondary.
In the case of the load regulation for lowest cost transformer being better than the worst case specification then the transformer voltages shall be modified so that the minimum 22.5V spec is met at 170V input and the output voltages at 230V and 265V input voltage are lower than the specified voltages.

15. Temperature rise to be such that transformer is safe when operated in an enclosure with 50C maximum internal temperature.

16. Toroid to be fitted with interwinding screen.

Mechanical Specification

17. Primary wires self-ended and individually sleeved for colour coding, then sleeved together.

18. Secondary wires self-ended and individually sleeved, then sleeved together.

19. Wire type used on the terminations must be such that the wire may be bent with a minimum bend radius of 10mm through an angle of 90degrees 10times without the wire fracturing. This will allow the wires to be dressed in production without risk of damage to terminations.

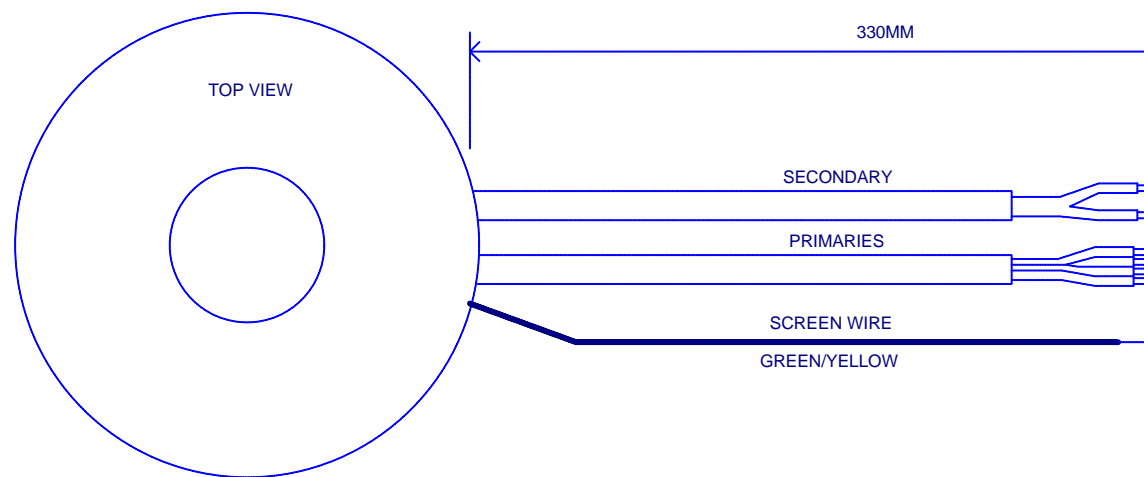
20. All wire lengths are $\pm 20, -0$ mm. All wires stripped 8 ± 2 mm and tinned.

21. Transformer to be marked with part number and issue number.

22. Toroidal transformer will be attached to the chassis by a dished washer and bolt (no potting required).

23. A frame transformer meeting the above spec will be chassis mounted with flying leads and should have clamp fitted to allow it to be screwed to chassis.

24. Toroidal transformer to be supplied with mounting kit consisting of metal dished washer and 2 neoprene or similar washers.



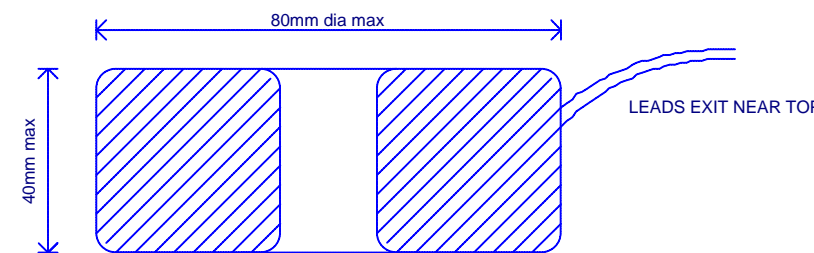
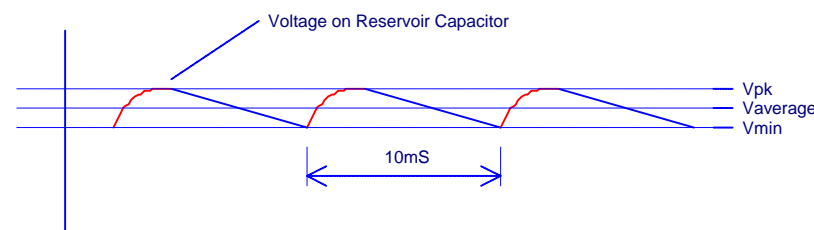
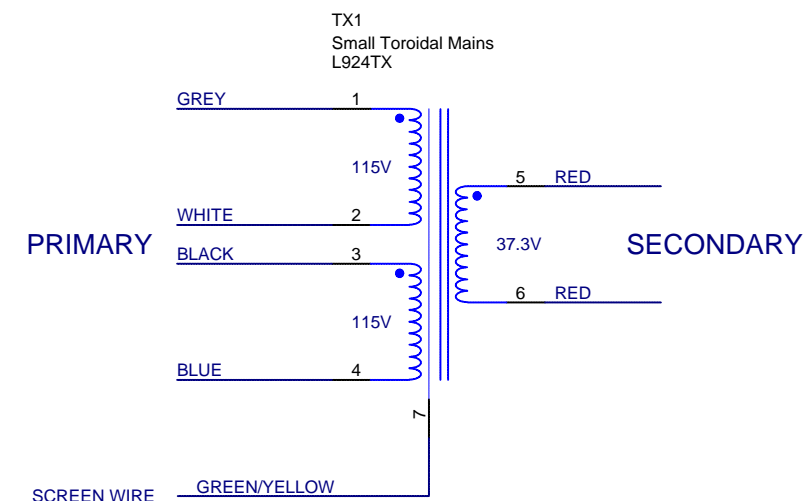
Secondary Winding Voltage and Current Specs

assuming $C=1360\mu F$, $f= 50Hz$ for $P_o = 22W$

Bridge Rectifier V_f diode = 1.1V per leg = 2.2V Total

Ideal TX assumed with 70ohm series resistor in secondary to simulate regulation.

AC Supply Voltage Pri in Series (V r.m.s.)	Loaded Secondary Voltage (V r.m.s.)	Capacitor Peak Voltage Vpk (Volt)	Capacitor Min Voltage Vmin (Volt)	Capacitor Average Voltage (Volt)	Load Resistor to simulate Load RL (Ohm)	Secondary Winding r.m.s. Current (A r.m.s.)
170	23.2	26.9	23.7	25.3	28	1.3
230	37.3	46.0	43.7	44.8	88	0.86
265	44.4	55.7	53.8	54.8	130	0.75

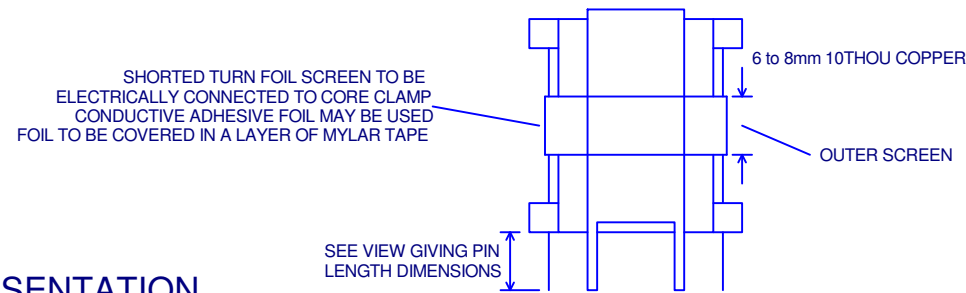


DRAWING TITLE		DV78 TRANSFORMER 115/230V					
ARCAM A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9PB	Filename:	L924TX_1.0.sch	03_E195	KAL	02-07-2003	Production Release	1.0
	Notes:		03_E086	KAL	21-03-2003	Corrected Wire Colours added notes re Clamp	B.0
			03_E042	KAL	4-02-2003	Reduced Power Output Spec, Reduced Load Regulation Spec	A.1
			02_E336	KAL	4-12-2003	Prototype Release	A.0
	ECO No.	INITIALS	DATE	DESCRIPTION OF CHANGE		ISSUE	
Contact Engineer:	Kevin Lamb	Contact Tel:	(01223) 203243	Printed:	7-Jul-2003	Sheet 1 of 1	A3 DRAWING NO. L924TX

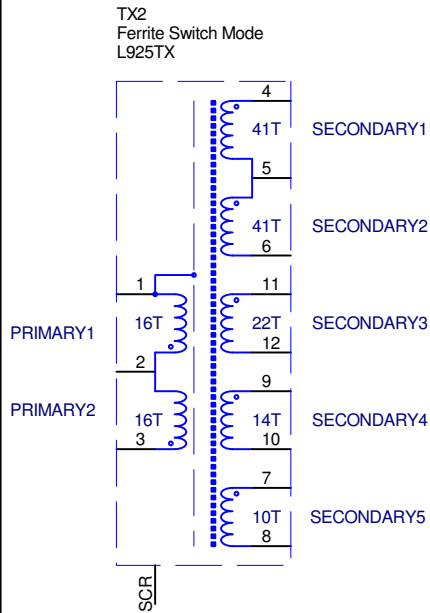
NOTE.

TRANSFORMER IS TO BE USED ON SECONDARY SIDE OF MAINS ISOLATION BARRIER (I.E. THIS TRANSFORMER IS NOT REQUIRED TO PROVIDE MAINS ISOLATION BARRIER)
 MAXIMUM VOLTAGE BETWEEN WINDINGS <60V

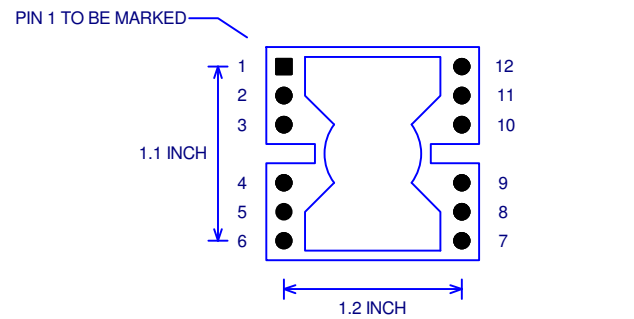
VIEW FROM SIDE OF PART SHOWING OUTER FOIL SCREEN



ELECTRICAL REPRESENTATION

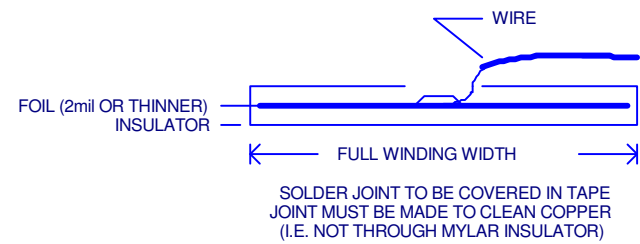


VIEW FROM TOP OF PART WITH PART INSTALLED IN PCB

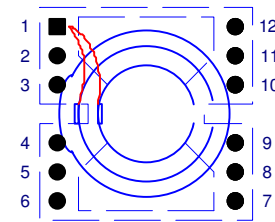


NOTE PIN NUMBERING CONVENTION

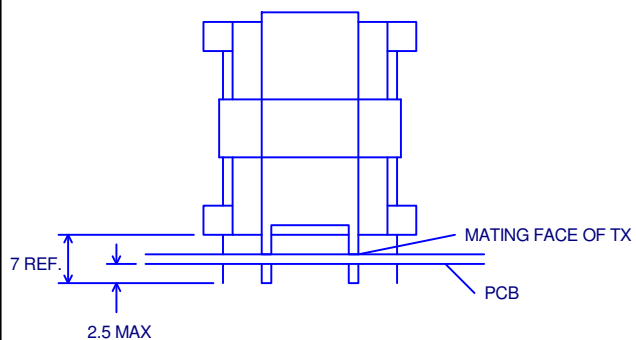
ARRANGEMENT OF INTERNAL FOIL SCREENS



- 1 BUMP FROM SCREEN JOINT TO BE ADJACENT TO CORE WINDOW TO MINIMISE LOSS OF WINDING HEIGHT
- 2 MAXIMUM OVERLAP ON ENDS OF SCREENS TO BE LESS THAN 1mm TO MINIMISE CAPACITIVE COUPLING WHICH WOULD PRODUCE SHORTED TURN FOR HIGH FREQUENCY CURRENTS
- 3 SOLDER JOINTS TO BE MADE HALF WAY ALONG LENGTH OF FOIL FOR REDUCED LOSSES



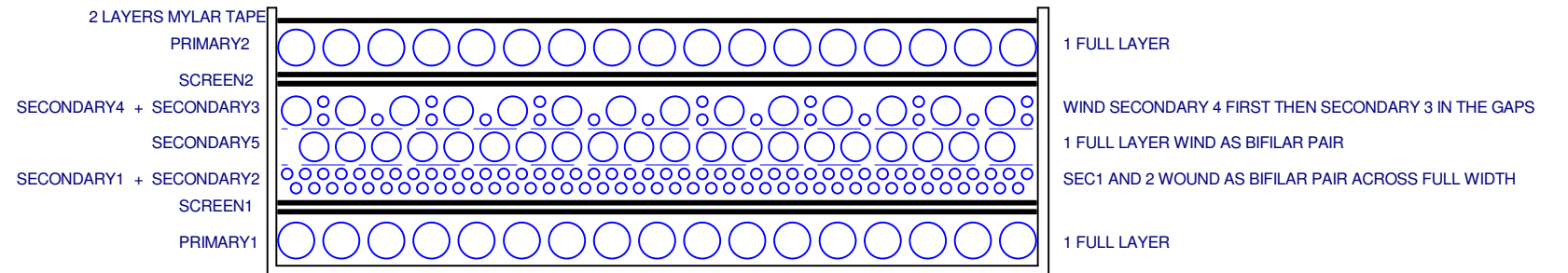
VIEW FROM SIDE OF PART SHOWING PIN LENGTH DIMENSIONS



WINDING DETAILS

WINDING	TURNS	WIRE DETAILS	No PER CABLE	ID	OD	START PIN #	END PIN #	NOTES
PRIMARY2	16	ENAMELLED COPPER WIRE	1	0.8mm	0.86mm	3	2	SPACE WINDING ACROSS WHOLE BOBBIN WIDTH
SCREEN 2		INSULATED 2mil COPPER FOIL				1		SCREEN TO HAVE NO OVERLAP AT ENDS
SECONDARY3	22	ENAMELLED COPPER WIRE	1	0.25mm	0.3mm	11	12	WIND ACROSS WHOLE BOBBIN WIDTH BETWEEN GAPS IN SEC4
SECONDARY4	14	ENAMELLED COPPER WIRE	1	0.66mm	0.72mm	9	10	SPACE WINDING ACROSS WHOLE BOBBIN WIDTH
SECONDARY5	10	ENAMELLED COPPER WIRE (BIFILAR)	2	0.66mm	0.72mm	7	8	WIND AS A BIFILAR PAIR ACROSS WHOLE BOBBIN WIDTH
SECONDARY1	41	ENAMELLED COPPER WIRE	1	0.25mm	0.3mm	4	5	WIND SEC1 AND SEC2 AS A BIFILAR PAIR ACROSS WHOLE BOBBIN WIDTH
SECONDARY2	41	ENAMELLED COPPER WIRE	1	0.25mm	0.3mm	5	6	
SCREEN 1		INSULATED 2mil COPPER FOIL				1		SCREEN TO HAVE NO OVERLAP AT ENDS
PRIMARY1	16	ENAMELLED COPPER WIRE	1	0.8mm	0.86mm	2	1	SPACE WINDING ACROSS WHOLE BOBBIN WIDTH

WINDING ARRANGEMENT ON BOBBIN



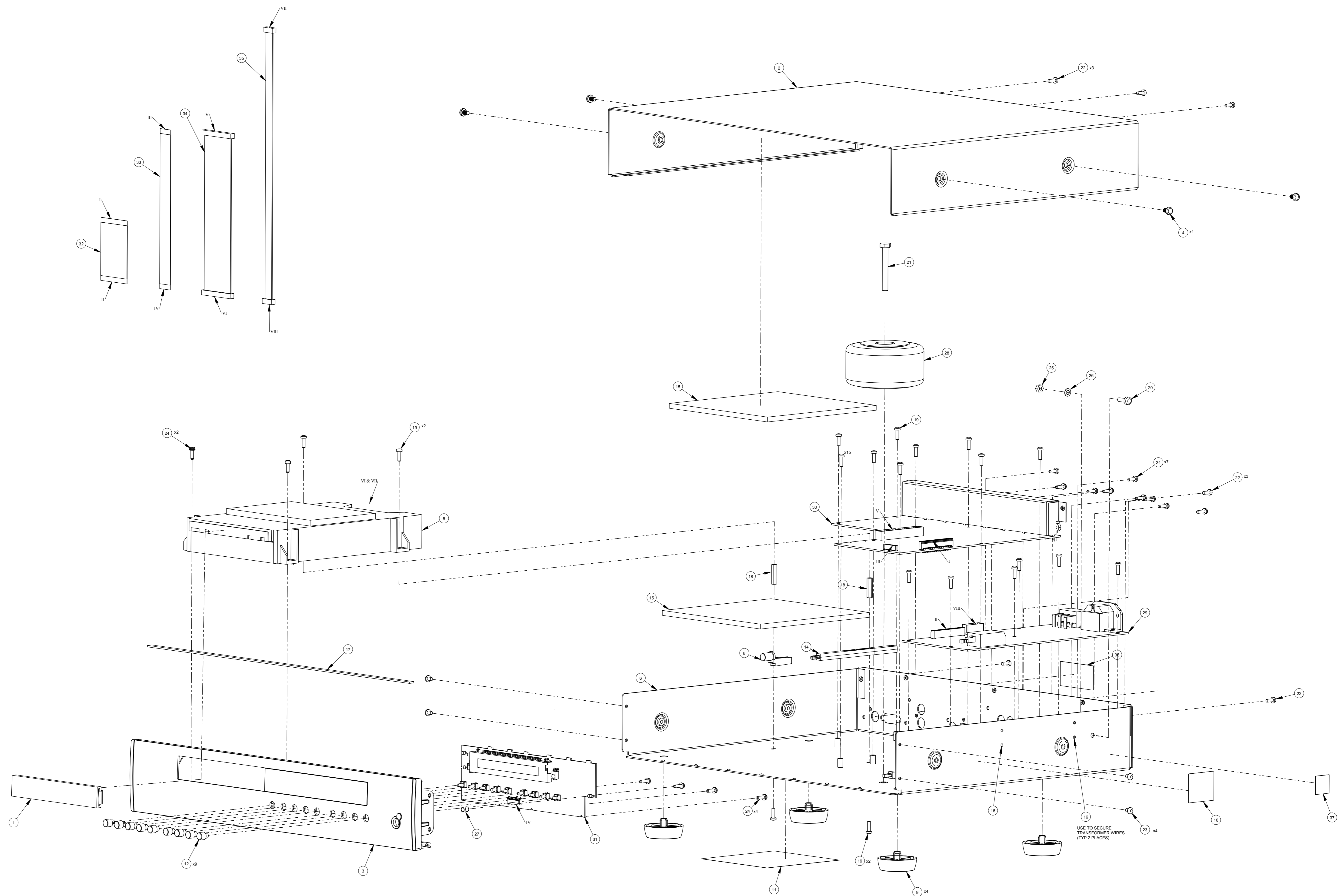
MATERIALS

- CORE** PQ32/30 in PC44 MATERIAL (OR EQUIVALENT)
 CORE TO BE GAPPED IN CENTRE LEG TO GIVE REQUIRED L_{pri} (GAP APPROX 0.4mm)
 $(L_{pri} = 450\mu H \pm 10\% \text{ PRIMARY INDUCTANCE MEASURED FROM PIN 1 TO 3})$
 PART NUMBER TDK PC44PQ32/30Z-12 (OR EQUIVALENT)
- BOBBIN CLAMP** PART NUMBER TDK BPO32/30-1112CP (OR EQUIVALENT)
 PART NUMBER TDK FPQ32/30-A (OR EQUIVALENT)

ASSEMBLY DETAILS

- 1 PART TO BE MARKED WITH PART NUMBER / ISSUE NUMBER
- 2 INTERNAL SCREENS TO BE FULL WIDTH. CONNECTION TO SCREEN VIA SOLDER JOINT TO COPPER (SEE DIAGRAM)
 SOLDER JOINT TO BE ARRANGED TO PRODUCE A LUMP IN THE CORE WINDOW
 SOLDER JOINT TO BE MADE TO CLEAN COPPER AND JOINT TO BE TAPED.
 SOLDER JOINT TO BE MADE HALF WAY ALONG LENGTH OF THE FOIL
 SCREEN TO BE HIGHEST POSSIBLE RESISTANCE FOIL FOR LOWEST LOSSES. (I.E. FOIL AS THIN AS POSSIBLE)
 SCREEN TO BE MADE FROM MAXIMUM 0.05mm (2MIL) FOIL
- 3 WINDINGS WILL BE A TIGHT FIT ON BOBBIN. NOTES AND WINDING ARRANGEMENT SPECIFIED TO BE ADOPTED.
- 4 TRANSFORMER TO BE FITTED WITH AN OUTER COPPER SCREEN WRAPPED AROUND THE OUTSIDE OF THE OF THE TRANSFORMER CORE AND CONTACTING THE METAL CORE CLAMP THUS FORMING A SHORTED TURN TO LEAKAGE FLUX. SEE DIAGRAM
 SCREEN TO BE 10THOU COPPER STRIP 6 to 8mm WIDE AND FITTED OVER THE JOIN OF THE CORE HALVES.
 SCREEN TO BE COVERED IN A LAYER OF TAPE.
- 5 PIN 1 ON BOBBIN TO BE MARKED WITH WHITE PAINT (OR OTHERWISE)
 THIS MARKING TO BE USED TO ORIENTATE TX DURING WINDING PHASE TEST
- 6 100% PHASE TEST AND ISOLATION TEST TO BE CARRIED OUT ON ALL WINDINGS.

DRAWING TITLE								
DV78 450uH FLYBACK TX		03_E290	SLS	06-10-03	'VIEW FROM SIDE OF PART SHOWING PIN LENGTH DIMS' added.	1.1		
ARCAM A & R Cambridge Ltd. Pembroke Avenue Waterbeach Cambridge CB5 9PB		File Name:	L925TX_1.1.Sch	02_E195	KAL	02-07-03	Production Release	1.0
		Notes:		02_E086	KAL	21-03-03	Changed Pri1,2 and Sec1,2 turns, Lpri & gap, Added outer screen	B.0
				02_E336	KAL	20-11-02	Prototype Release	A.0
Contact Engineer:	Kevin Lamb	Contact Tel:	(01223) 203200	Printed:	8-Oct-2003	Sheet 1 of 1	DRAWING NO. L925TX	ISSUE



DV78 Mechanical and packing parts list

Designator	Part	Description
5	B2014	DVD Drive Atapi DVS DSL-710A LT74
6	E214AY	Diva DV79 Chassis Assembly
7	E821BG	DiVA DV78 Blanking Gasket (75x32mm)
8	E870PM	Button Power Diva
9	E879PM	Foot Black Diva
10	E879SL	Label Mod State
11	E894SL	Label DVD Licensing
12	E897PM	Button DT81 Confirm Button (MODIFIED SHANK)
14	E919PM	Extended Button Adaptor Diva Power
15	E953MC	Adhesive Backed Foam Pad For Underneath And ON Top OF DV88 Mech
16	F044	Cable Tie 100MM X 2.5MM
17	F164	Tape 3509 BK 3M TESA.50M Per Roll x 6MM Wide
18	H031	M3X20MM Brass N/Ptited Hex Pillar FEMALE/FEMALE)
19	HA3V10A	M Screw Torx M3x10MM ST ZP
20	HA4A12B	M Screw Pan Supa M4x12MM ST BLK
21	HA6K45A	Bolt Hex HD M6x45MM Mczp
23	HE6V06B	Screw Sftp Torx No.6x6MM BLK
24	HF4V09B	Screw Self-Tapping-Sems NO.4 X 9MM Pan Torx-Slot Steel Zinc-Plate BLK
25	HJ4A00A	Nut M4 Full ST ZP
26	HL4SB	Washer M4 Int Shakeproof BLK
27	K5408	Diva Light Pipe Sleeve 6MM
28	L924TX	Transformer Toroid DV78 115/230V
29	L959AY	DV78 DVD Power Supply PCB
30	L960AY	DV78 DVD Main Board
31	L961AY	DV78/DV79 DVD Display Board
32	L961CA	Cable FFC 1.25mm 32 Way 65mm
33	L962CA	Cable FFC 1mm 16 Way 165mm
34	L963CA	DVD Drive Cable 40 Way IDC 160mm
35	L964CA	DVD Drive Power Cable 4 Way 275mm
36	SL025	SL025 Label Class 1 Laser Pro
37	SL158	SL158 Earth Symbol Label
38	HL6CA	Bright Washer M6 (Form C) to BS 4320
	E231AY	Rear Panel Assembly DiVA DV78
	E829AP	Adhesive Pad 50mm X 30mm 51587
	F241	Ferrite for Flexfoil
	F242	Ferrite Plate
Designator	Part	Silver Parts
1	E204AY	DV78 Silver Drawer Front Assembly
2	E229AY	Cover Assembly Silver DiVA long
3	E205AY	DiVA DV78 Silver Fascia Assembly
4	HA4V06S	M Screw Torx M4x6MM Stainless Steel
Designator	Part	Black Parts
1	E204AYB	DV78 Black Drawer Front Assembly
2	E229AYB	Cover Assembly Black DiVA long
3	E205AYB	DiVA DV78 Black Fascia Assembly
4	HA4V06B	M Screw Torx M4x6MM ST BLK
Designator	Part	Packing Accessories
	E966SL	Diva DV78 Carton Label
	SH131	Handbook Diva DV78 DVD Player Multi
	E822PK	Poly Sheet 915x900MM 350 Gauge
	L415RC	DVD Remote Control CR415
	P3020	Poly Bag 10x14 Grippa Seal Clear
	SH000	Product Registration Card
	SH000A	Envelope For Registration Card
	SM631	Sellotape
	E926PK	Single End Cap (Left/Right) DiVA DV78
	E927PK	Carton Inner DV78
	E978SL	Intertek Listing Label (printed in-house)
	SH146	Addendum: DVD V5 software menu change details, Multi

ARCAM

All parts can be ordered via spares@arcam.co.uk

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