

Alpha 10 DAVE Module Service Manual**Issue 1 Paul Newton/Richard Martin May 99****CONTENTS**

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Summary

Using the Alpha 10's modular design concept, the DAVE Module is designed so that you can just plug it into an existing Alpha 10 integrated amplifier and it will convert that unit into a Digital Home Cinema System.

The DAVE Module consists of a bought in module from Sample Rate Systems (SRS) in Finland which is capable of decoding SPDIF information to extract Dolby Digital or DTS Digital for Surround sound information or Stereo information. It is also capable of analogue to digital conversion so that either Sub Woofer information or Dolby Pro-Logic information can be extracted and outputted.

The rest of the module consists of a PSU, microprocessor, fan for cooling, audio/video switching and muting, on screen display generator which is tapped into the video monitor out lines and digital inputs for both optical and coaxial digital audio.

Circuit description**Supplies and Start Up**

In Standby and Soft Power Down of the Alpha 10 the Micro Processor, Temperature Sensor and Fan Circuits are powered up due to the fact that these supplies are derived from the Standby power supply of the Alpha 10 Integrated Amplifier.

When the unit is brought out of Standby or Soft Power Down, the rest of the rails come on except for the positive and negative 5V rails. The positive 5V rail will not start up until the ON/OFF pin of the switching regulator (Z25) goes low. This is at approximately the same time that the Relays on the out-put of the Alpha 10 Amplifier un-mute. The negative 5V switching regulator (Z24) will not power up until the positive 5V rail gets to about 4.2V. These switching regulators are not powered up until then, due to

the high switch on currents. It should be noted that the two switching regulators are fairly sensitive and disruption of the 52kHz switching signal will may cause damage to both the Alpha 10 and the DAVE Module.

Fan Control Circuit

The fan circuit is controlled by a temperature sensor (Z21), the output pins of which are normally high. There is normally a voltage across the fan connected to SK19 but it is not normally enough to turn the fan motor. When the temperature rises above 55 deg.C (set by the resistor network on Z21), the Out1 pin goes LOW and the voltage across SK19 is increased so that the fan motor will turn over at a relatively low speed. To make sure the fan starts, the effect of C58 charging causes there to be approximately 12V across the fan. Out2 will go low at 65 deg. C and this informs the H8 micro as well as causing the voltage across the fan, and hence the fan speed, to increase by switching Q6 on. If the the temperature of the unit remains at this point for too long a period then the H8 will intervene. It should be noted that this circuit is running during Standby and Soft Power Down and hence the fan can operate during these modes.

Audio and the SRS Digital Audio Surround Processor Module

The audio types on the DAVE Module comes in two types:-

- 1 Analogue audio can be fed into the module from the input connectors of the Alpha 10's pre-amplifier. It is routed through a pair of Analogue Multiplexers (Z1 for Right and Z2 for Left hand channels), and then on through to the SRS Digital Surround Module.
- 2 Digital audio from CD, DVD, Laser Disc or other SPDIF generating sources can be fed in through either one of the two coaxial or two optical inputs and through a Digital Multiplexer (Z3) to the SRS Digital Surround Module.

The SRS Module performs the following functions :-

- It takes in the analogue audio and converts it into digital audio and bass signal.
- It takes in SPDIF information and works out what encoding system if any is being used and decodes the information into one of the Digital Surround Modes or Digital Stereo and bass signals.
- If it is in a stereo mode then further processing can be done on the signal which includes Dolby Pro-Logic decoding.
- The digital channels are then converted back to

analogue and the bass is dealt with separately to the rest of the audio.

- Volume and muting is dealt with after this and then the bass is added back to the appropriate channels and the output is buffered before being passed out of the module.

The Left and Right audio channels are passed back down to the pre-amplifier of the Alpha 10. The Surround, Centre and Sub channels are fed through a Muting relay (RLY1) and on to a set of RCA Phono connectors on the back of the module. This relay can be controlled by either the H8 Micro or by the PROT1 line which goes High during any startup or shut down of the Alpha 10 causing a mute.

Video and On Screen Display (OSD) Generation

The Video for the module comes in a number of formats and standards which the board is capable of dealing with.

Composite Video is where the video information of colour, luma. and syncs. are combined. The inputs are fed in from the back of the module via RCA Phono connectors and through a set of analogue multiplexers. The one is for output to a VCR (Z11) and the other to a Monitor output (Z28). The Monitor output is Sync-tip Clamped before being fed both to the OSD section and another multiplexer (Z29) which inserts OSD information into the Video information. Both the VCR output and the Monitor output are buffered (Z10) before being fed through to their outputs.

The Sync-tip Clamping consists of a two transistor constant current source which is used to keep the luma signals a approximately ground reference although syncs, depending on content of signal, can drop below. This circuit gives a reference to which the OSD signal can be applied fairly accurately.

S-Video is where there are separate lines for the luma./sync. information and colour information. These are fed in on 4pin mini DIN connectors and are again fed through multiplexers to a VCR output (Z8) and Monitor output (Z27). The luma line is Sync-tip Clamped and the colour ac coupled before they are fed through another multiplexer (Z12) to have the OSD information added. In this case only the luma. (Y) line of the Monitor multiplexer is fed to the OSD IC. The Monitor and VCR outputs are buffered (Z13 and Z9 respectively) before being outputted.

Component video is very similar to S-Video except in this case the colour information line is further split into two separate colour difference signal lines R-Y and B-Y. As this input is only used so OSD can be inserted onto the video being viewed, there is no VCR output and no input multiplexers, as with the composite and S-video inputs. The luma line for the component video is dealt with as the luma in the S-video except its path is through multiplexer

Z12 and buffer Z30.

As the OSD generator (Z18) does not deal directly with R-Y and B-Y colour difference signals these, levels are generated by potential dividers on Z6 which will give a blue signal. These are only used in full page mode if there is a blue output (pin 16 Z18) but no character output (pin 18 Z18), such as the outline box, but no actual text output (pin 15 Z18). This is controlled by Z6 (gate1) and Z19 (gate3), inserted onto the R-Y and B-Y signals by Z29 and buffered by Z30. The rest of Z19 is used to Black Level Clamp the R-Y and B-Y input signals. This is done, because these signals are referenced to ground, by Z19 during the line blanking period, the signal for this being generated from the composite sync signal from Z20.

The OSD section can be split down into several sub sections:

- the input stage has a multiplexer (Z14) to select the relevant type of video to sync. onto. This is then buffered (Z15) before being fed through to the OSD generator IC and 50/60 Hz recognition system.
- the sync. separator IC (Z20) outputs a vertical sync. line to the H8 Micro which is checked to see if the timings are correct in which case the relevant clocks are switched, if the video is valid. This is so if the vertical sync. line is either pulsing at greater than equal to once per second or it is permanently high. If the timing between these pulses is either 16ms or 20ms then either 50Hz or 60Hz video is assumed or the last valid video standard is used. This IC also generates a composite sync signal which is used to time the Sync-tip Clamping of the R-Y and B-Y of the component video signal.
- the clock circuit has two crystals, the 14M31818Hz is for NTSC 60Hz and the 17M73447Hz is for PAL 50Hz. Most 50Hz and 60Hz video systems can be synchronised to but the OSD IC will not output the correct colour information. These are switched by Z7 and Z14 from the Micro.
- the OSD IC is controlled by a three wire SPI serial data bus and is completely software controlled. It may output spurious information until it is reset properly by the micro processor. It Guarantees OSD characters and insertion of both colour and luma. It is also capable of generating the correct sync. timings so that it can blank the screen when either a non-valid input is selected or if a no valid video information is available.

There are several pins to note on this chip which may affect performance. LSCREEN (approx. 1.3V) and LECHAR (approx. 1.5V) set the levels

for the OSD back ground and text during insertion onto video other wise the levels are set internally. RES is a reset timing pin for correct operation of the device after power up and FTR sets the phase lock loop response.

Micro Processor

The Micro Processor on the DAVE Module is 16Mz Hitachi H8 series with 60kB of Flash Programmable Memory and is initially supplied un-programmed. The connector (SK18) can be used to program or reprogram the H8 with the aid of a purchasable flash programming module (this is supplied as part of their emulator kit). On initial power up the HOLTEC micro synchronises the reset of the H8 micro with the PIC on the display panel by pulling MRES high causing the output of Z31 to go low and hence the reset pin (1) of the H8 micro.

The Micro has a number of functions which include:

- communicating with the PIC and HOLTEC micros on the Alpha 10 Integrated Amplifier via an I2C bus. As part of this it takes over some of the functionality of the PIC such as control of the Pre-amplifier, the front panel display information and error response to the Holtec Micro.
- communicating with the SRS Digital Surround Module via SPI bus and controlling its decoding modes, configuration volume and muting.
- communicating with the OSD via a 3 wire SPI bus and also monitoring the vertical sync. line for video timings and switching in the appropriate clock crystal.
- controlling the audio and video paths including relay muting functions.
- monitoring for a high temperature condition with the aid of the temperature sensor IC (Z21). The temperature sensor will automatically control the speed of the fan for temperatures of above 55 Deg. C and above 65 Deg. C will also tell the micro.
- has a number of embedded service and test modes which are listed below.

There are two embedded modes in the software which are of use for testing the unit.

- 1 If the PHONO/AUX and CONTROL buttons are pressed when the unit is brought out of stand-by then two extra pages appear in the set-up menu for the DAVE Module which is accessed by either

pressing RESTORE followed by MENU on the remote control or by pressing both MODE/ZONE and CONFIRM together on the front of the Alpha 10. The new pages of the menu are:-

Page 6 : a list of the micro processors and their reported software versions including those on the SRS Module.

Page 7 : a dump of the fault logs held in the eeprom of the A10 amplifier. Note : if you need to erase the values held in the erasable section then press VCR in this page.

- 2 A test mode which can be entered by simultaneously pressing the front panel CD and CONTROL buttons while switching out of stand-by. Hold the buttons down until "DAVE Self Test" appears on the display.

This mode puts the unit into full range speakers mode with no delays. The following table gives a list of the inputs and outputs selected and what the unit should do. The tests can be stepped through by either the use of the UP and DOWN codes or by entering the test number eg "01" using the CR9000 remote control handsets number keys when it is in ARCAM 'AUDIO' mode. It should be noted, that because in this mode 7 and 9 have the same code, the ENTER button becomes 9.

- NB: To exit this test mode you have to unplug the unit from the mains supply to rest it.

Test No.	Input Source	Video Input	Audio Input	Unit Function
1	None	None	None	Generate Full Page Blue Screen in PAL 50Hz. Audio to be Muted.
2	None	None	None	Generate Full Page Blue Screen in NTSC 60Hz. Muted Audio.
3	DVD	Component Only	None	Generate OSD on component video only. Muted Audio.
4	DVD	S-Video Only	Optical 1	Generate OSD on S-Video Only. Audio to Auto Detection on Digital Input
5	AV	S-Video Only	Optical 2	Generate OSD on S-Video Only. Audio to Auto Detection on Digital input
6	AUX	S-Video Only	Coaxial 1	Generate OSD on S-Video Only. Audio to Auto Detection on Digital Input
7	VCR	S-Video Only	Coaxial 2	Generate OSD on S-Video Only. Audio to Auto detection on Digital Input. No output on VCR Out
8	DVD	Composite Only	Analogue	Generate OSD on Composite Only. Audio to Analogue Stereo with SUB from SRS
9	AV	Composite Only	Analogue	Generate OSD on Composite Only. Audio to Analogue Stereo with SUB from SRS
10	AUX	Composite Only	Analogue	Generate OSD on Composite Only. Audio to Analogue Stereo with SUB from SRS
11	VCR (Tape2)	Composite Only	Analogue	Generate OSD on Composite Only. Audio to Analogue Stereo with SUB from SRS. No output on VCR Out
12	CD	None	Analogue	Generate OSD Blue Screen. Audio to Analogue Stereo with SUB from SRS. No output on any VCR Video Out
13	TUNER	None	Analogue	Generate OSD Blue Screen. Audio to Analogue Stereo with SUB from SRS. No output on any VCR Video Out
14	TAPE 1	None	Analogue	Generate OSD Blue Screen. Audio to Analogue Stereo with SUB from SRS. No output on any VCR Video Out

Test No.	Input Source	Video Input	Audio Input	Unit Function
15	DVD	Any with 60Hz Video	Coaxial 1	Auto Detect for 60Hz Video as Normal Detect and output Dolby Digital 5.1 Only
16	DVD	Any with 50Hz Video	Coaxial 1	Auto Detect to 50Hz Video as Normal Detect and output DTS Surround 5.1 Only
17	DVD	Any	Coaxial 1	Auto Detect Video as normal operation Detect and output Dolby Pro Logic encoded Dolby Digital Only
18	DVD	Any	Stereo Analogue Pro Logic	Auto Detect Video as normal Output Analogue Pro Logic decoded signal

Specifications

Input Supplies

Main A10 Amplifier Rails : +48V +/-7V (@60mA with No SRS @ 180mA Nominal)
 -48V +/-7V (@ 10mA with No SRS @ 30mA Nominal)

A10 Positive Unregulated Stand By Supply : 13V+/-2V (@20mA Nominal @ 80mA Max with Fan)

A10 +8V Stand By Supply : 8V +/-1V (@50mA Nominal)

Module Supplies

Micro Processor and Temperature Sensor : +5V +/- 0.25V @ 70mA
 (Can be on in Stand By and Soft Power Down)

Fan : <3V @ T<55 Deg C
 (Can be on in Stand By and Soft Power Down) 7V +/- 1.0V @ T>=55 Deg C
 11V +/- 1.5V @ T>=65 Deg C

+ 15V (for SRS Audio and +7V2 supply) : +15V +/- 0.5V @ 50mA typ.

- 15V (for SRS Audio and +7V2 supply) : -15V +/- 0.5V @ 50mA typ.

+ 7V2 (for Analogue Audio Switching Only)	:	+ 7.2V +/-5% @ 5mA typ.
- 7V2 (for Analogue Audio Switching Only)	:	- 7.2V +/- 5% @ 5mA typ.
+ 5V	:	+ 5V +/- 0.25V @ 1.2A Max.
- 5V	:	-5V +/- 0.25V @ 100mA Max.

Analogue Audio

Input Level @ Alpha 10 pre-amplifier	:	Nominally 1Vrms Maximum greater than 5Vrms for Multiplexers (Analogue Stereo only) Maximum greater than 2.9Vrms for SRS A/D (All other analogue modes)
Input Level @ DAVE Module	:	Nominally 850mVrms Maximum greater than 2.5Vrms (for SRS A/D)
Crosstalk at SRS Module Input	:	Better than -65dB @ 1kHz between any audio channel
Noise at SRS Module Input	:	Less than -95dBV
Distortion at SRS Module Input	:	Less than 0.01% @ 1kHz
Relative Levels for -20dB reference Stereo Dolby Pro Logic Signal (Maximum Output, Large Speakers and Flat Trims) on DVD player analogue output.	:	Typical Left and Right Levels 400 mVrms (DAVE Module Out) 450 mVrms(10 Pre Out) Surrounds and Centre +/- 1 dB (relative to Left Pre Out)
Maximum Output Levels from SRS Module @ 0.5%Distortion	:	>8Vrms for all channels except SUB >10Vrms for SUB in worst case
Frequency Response All speakers set to large and present	:	Left, Right, Surrounds and Centre 20Hz to 20kHz @ +/-0.2dB Sub 10Hz to 70Hz +/-3dB
Noise on Output of Module	:	Less than -95dBV except SUB Less than -85bBV for SUB
Crosstalk at Output of Module	:	Less than 65dB @ 1kHz between any audio channel.

Digital Audio

Input Level @ Coaxial Digital Inputs	:	Greater than 500mVp-p into 75R
Level @ SRS Module	:	Greater than 400mVp-p for any Digital Input
Relative Levels for -20dB Dolby Digital 5.1 Signal (Maximum Output, Large Speakers and Flat Trims)	:	Typical Left and Right Levels 650 mVrms (DAVE Module Out) 700 mVrms(10 Pre Out) Surrounds and Centre +/- 1 dB (relative to Left Pre Out) Sub +10dB +/-1 (relative to Left Pre Out)
Video		
Nominal Luma Input Level	:	1Vrms into 75R SYNC tip to White Level
S-Video OSD Nominal Colour levels	:	450mVp-p into 75R for Blue
Component Nominal Colour Difference Levels for Blue OSD relative to Black	:	330mV into 75R for B-Y -60mV into 75R for R-Y
Frequency Response	:	+0/-1dB to 4.8MHz
Cross Talk	:	Better than -60dB at 1Mz
OSD		
Frame Rate	:	50 or 60 Hz
Crystal Frequency @25degC	:	14.318180MHz+0/(-80ppm) for 60Hz 17.734470MHz(+0/-30ppm) for 50Hz
Colour Standards Supported	:	PAL 50Hz NTSC 60Hz (Most other 50 and 60Hz frame rate standards supported with B/W OSD)

Setup Menu

In order to use the DAVE unit you may need to re-configure the inputs using the setup menu. The basic instructions for using the setup menu are set out below. For more details please consult the DAVE owners manual and the CR9000 remote handset owners manual.

ENTERING THE SETUP MENU

USING THE CR9000 REMOTE CONTROL

N.B. The CR9000 must be in audio mode to control the unit. Press the AUD button to enter this mode.

Press **RESTORE** followed within 2 seconds by **MENU**.

You can also use the front panel controls if preferred.

Hold down the **MODE/ZONE** button and whilst still holding it down press the **CONFIRM** button.

Either method will bring up a menu on the on screen display (OSD) on the TV or monitor connected to the MON OUT (Monitor Out) sockets of the Alpha 10 DAVE module and also on the front panel display of the Alpha 10 integrated amplifier.

The menus have up to seven options per page when displayed on the TV or monitor. The rectangular boxes below are representations of the menus that will be displayed on your TV screen. The selected line of the menu will also be displayed on the front panel display of the Alpha 10.

NAVIGATING THE MENUS

USING THE CR9000 REMOTE CONTROL

Use **▲▼** keys to go up/down the menu, **◀▶** keys to alter the selection on the highlighted line, and to change menu pages when the menu heading is highlighted.

USING THE FRONT PANEL CONTROLS

To select a menu highlight it by moving the cursor using the front panel **CONTROL** button to step down through the choices. To select a new page highlight the menu title and press **CONTROL**. To select a choice rotate the volume control one click at a time to cycle through the available choices.

EXITING THE SETUP MENU

USING THE CR9000 REMOTE CONTROL

Press the **MENU** button at any time or highlight **Exit + Save** and press the RIGHT **▶** button.

USING THE FRONT PANEL CONTROLS

Either

Press the front panel **CONFIRM** button at anytime from any menu.

Or`

Go to the final page of menus and press the **CONTROL** button until **Exit + Save Off** is displayed. Rotate the volume control so the display shows **Exit + Save On**.

Both the OSD and front panel display will then show "Settings Saved" for a couple of seconds to confirm this.

Your unit now has the settings stored in memory as "Favourite Settings". You can choose to trim the centre and surround levels to suit a particular movie, then restore the stored settings at any time by pressing FAVOURITE (RESTORE) on the remote.

There are a number of test pads marked on the Circuit Diagrams. Their function is described below.

<u>Test Pad Name</u>	<u>Function</u>
AUX1L	Left Auxiliary (or Phono) Input (SK1 to Z2)
AUX1R	Right Auxiliary (or Phono) Input (SK1 to Z1)
CDL	Left CD Input (SK1 to Z2)
CDR	Right CD Input (SK1 to Z1)
TUNERL	Left Tuner Input (SK1 to Z2)
TUNERR	Right Tuner Input (SK1 to Z1)
AVL	Left AV Input (SK1 to Z2)
AVR	Right AV Input (SK1 to Z1)
AUX2L	Left DVD (or 2 nd Auxiliary) Input (SK1 to Z2)
AUX2R	Right DVD (or 2 nd Auxiliary) Input (SK1 to Z1)
TAPE1L	Left Tape1 (or Processor) Input (SK1 to Z2) (this is TAPE2L before issue 1)
TAPE1R	Right Tape1 (or Processor) Input (SK1 to Z1) (This is TAPE2R before issue1)
TAPE2L	Left Tape 2 (or VCR) Input (SK1 to Z2) (This is TAPE1L before issue 1)
TAPE2R	Right Tape 2 (or VCR) Input (SK1 to Z1) (This is TAPE1R before issue 1)
L_ANA	Left Analogue Input to SRS Module
R_ANA	Right Analogue Input to SRS Module
SRSL	Left Output from SRS Decoder Module
SRSR	Right Output from SRS Decoder Module
SRSSL	Left Surround Output from SRS Decoder Module
SRSSR	Right Surround Output from SRS Decoder Module
SRSC	Centre Output from SRS Decoder Module
SRSS	Sub Output from SRS Decoder Module
LAUD	Left Analogue Output from SRS Module
RAUD	Right Analogue Output from SRS Module
CTR	Centre Analogue Pre-out with Mute

<u>Test Pad Name</u>	<u>Function</u>
SUB	SUB Woofer Analogue Pre-out with Mute
SURL	Rear Left Analogue Pre-out with Mute
SURR	Rear Right Analogue Pre-out with Mute
COAX1	1 st Coaxial Digital Input
COAX2	2 nd Coaxial Digital Input
COAX1A	1 st Coaxial Digital Input with Load
COAX2A	2 nd Coaxial Digital Input with Load
COAX1B	1 st Coaxial Digital Input onto Main Board
COAX2B	2 nd Coaxial Digital Input onto Main Board
OPT1	First Optical Digital Input
OPT2	Second Optical Digital Input
OPT1A	First Optical Digital Input after Load resistors (to check operation of multiplexer)
OPT2A	Second Optical Digital Input after Load resistors (to check operation of multiplexer)
DAUD	Digital Audio Input to SRS Module
A2, A1 & A0	Analogue Audio Multiplexer Select Lines 0 0 0 Phono/Aux 0 0 1 CD 0 1 0 Tuner 0 1 1 AV 1 0 0 DVD 1 0 1 VCR 1 1 0 Tape 1 1 1 Mute
DAS1 & DAS0	Digital Audio Multiplexer Select Lines 0 0 Coaxial 1 0 1 Coaxial 2 1 0 Optical 1 1 1 Optical 2
SPI_CLK	SPI Bus Clock Line to SRS Decoder Module
SPI_DDE	SPI Bus Data Line from SRS Decoder Module
SPI_MCU	SPI Bus Data Line to SRS Decoder Module
SPI_SEL	SPI Bus Select Line to SRS Decoder Module
SPI_HREQ	SPI Bus Host Request to SRS Decoder Module
MUTE	Pre-out Mute (LOW for Mute)
RESET	Reset Pin for SRS Decoder Module (LOW for Reset)
AGND	Ground Reference Point for Audio Input
AOUT	Ground Reference Point for Audio Output

<u>Test Pad Name</u>	<u>Function</u>
DAGND	Ground Reference Point for Digital Audio Input
SRSAGND	Analogue Ground Reference for SRS Decoder Module
SRSDGND	Digital Data Ground Reference for SRS Decoder Module
DVD_I	DVD Composite Video Input
VCR_I	VCR Composite Video Input
AV_I	AV Composite Video Input
AUX_I	Auxiliary Composite Video Input
VCR	VCR Composite Video Output
MON	Composite Video with OSD Monitor Output
DVD_Y	DVD S-Video Luma Input
DVD_C	DVD S-Video Chrom Input
VCR_Y	VCR S-Video Luma Input
VCR_C	VCR S-Video Chrom Input
AV_Y	AV S-Video Luma Input
AV_C	AV S-Video Chroma Input
AUX_Y	Auxiliary S-Video Luma Input
AUX_C	Auxiliary S-Video Chroma Input
YVCR	VCR S-Video Luma Output
CVCR	VCR S-Video Chroma Output
YMON	S-Video Luma with OSD Monitor Output
CMON	S-Video Chroma with OSD Monitor Output
V2, V1 & V0	VCR Composite Video Select Lines 0 0 0 DVD 0 0 1 Mute 0 1 0 AV 0 1 1 Aux 1 0 0 Mute 1 0 1 Mute 1 1 0 Mute 1 1 1 Mute
M2, M1 & M0	Monitor Composite Video Select Lines 0 0 0 DVD 0 0 1 VCR 0 1 0 AV 0 1 1 Aux 1 0 0 Mute 1 0 1 Mute 1 1 0 Mute 1 1 1 Mute

<u>Test Pad Name</u>	<u>Function</u>
SVS1 & SVS0	VCR S-Video Select Lines 0 0 DVD 0 1 Mute 1 0 AV 1 1 Aux
SMS1 & SMS0	Monitor S-Video Select Line 0 0 DVD 0 1 VCR 1 0 AV 1 1 Aux
VGND	Ground Reference Point for Composite Video In/Out
SVGND	Ground Reference Point for S-Video In/Out
Y_IN	Component Video Luma Input
RY_IN	Component Video R-Y Colour Difference Signal Input
BY_IN	Component Video B-Y Colour Difference Signal Input
Y_OUT	Component Video Luma and OSD Output
RY_OUT	Component Video R-Y Chroma and OSD Colour Difference Signal
BY_OUT	Component Video B-Y Chroma and OSD Colour Difference Signal
OSD_Y	OSD Composite Video or Luma Input
OS1 & OS0	OSD Luma Select Lines 0 0 Composite 0 1 S-video 1 0 Component 1 1 Mute
NTSCPAL	This line is used to select the clock crystals HIGH for NTSC 60 and other 60Hz video modes LOW for PAL 50 and other 50Hz video modes
CLOCK	Crystal Oscillator Pin for OSD IC 14M3181Hz for NTSC 60 Hz and other 60 Hz Modes 17M73447Hz for PAL 50Hz and other 50 Hz Modes
VOSD	Valid Video Detection Pin (Wrong on issue E) N/R
OSD_INS	Insertion of OSD on Video Information High when inserting OSD. This line is permanently High for Full Page Mode
O/E	Odd / Even Frame Recognition N/R
VSYNC	Used for Valid Video Recognition Valid recognised video if one LOW pulse of 250us in 20ms(50Hz) or 16ms(60Hz) Not valid if not high or no pulses for more than 1second
CVGND	Ground Reference Point for Component Video

<u>Test Pad Name</u>	<u>Function</u>
P1	Flash Programming Point 1 (SK18 pin 1) Port 6/0 on H8 Micro Processor
P2	Flash Programming Point 2 (SK18 pin 2) FVPP pin of H8 Micro Processor
P3	Flash Programming Point 3 (SK18 pin 3) MD1 pin of H8 Micro Processor
P4	Flash Programming Point 4 (SK18 pin 4) RES pin of H8 Micro Processor (Reset on Low)
P5	Flash Programming Point 5 (SK20 pin 1) RXD1 pin of H8 Micro Processor
P6	Flash Programming Point 6 (SK20 pin 2) TXD1 pin of H8 Micro Processor
REQ1	Request Line for I2C Serial Data
SDA1	Data Line for I2C Serial Data
SCK1	Clock Line for I2C Serial Data
TEST	Test Routine Run Pin HIGH for Normal Operation LOW to Run the Built In Test Routine
CSN	Chip Select Line for OSD's Modified SPI Serial Data
CLK	Clock Line for OSD's Modified SPI Serial Data
DATA	Data Line for OSD's Modified SPI Serial Data
MRES	Used by Holtec to reset H8. High for reset
PROT1	(No test pad) Pin 10 of SK12. Used for muting and switcher power supply control. 48V +/-7 during power up and down of unit. 2V +/-0.5V during normal running.
P5M	Micro Processor Supply 5V +/- 0.25V (also used for flash programming module)
DGND	Digital Ground Reference Point (also used for flash programming module)
FAN	First fan point switching (approx 55°C) Normally high.
ON_OFF	If HIGH the 5V switching supply will be held in an off state. If LOW the 5V regulator will switch on.
PSUP	Main Amplifier Positive Supply

<u>Test Pad Name</u>	<u>Function</u>
NSUP	Main Amplifier Negative Supply
P15V	Main Amplifier Positive 15V Supply (Not used on this design)
N15V	Main Amplifier Negative 15V Supply (Not used on this design)
PUREG	Main Amplifier Unregulated Standby Supply
P8V	Main Amplifier Pre-regulated Standby Supply
P30V	Supply for Positive 15V Regulator +27.5V +/-1.5V @ 48V input from Alpha 10 Amp
N30V	Supply for Negative 15V Regulator -27.5V +/-1.5V @ -48V input from Alpha 10 Amp
P15VA	Positive 15V Supply for SRS Audio and +7V2 rail.
N15VA	Negative 15V Supply for SRS Audio and -7V2 rail.
P7V2	Positive 7V2 Supply for Audio Multiplexers Only.
N7V2	Negative 7V2 Supply for Audio Multiplexers Only.
P5VA	Positive 5V Supply for All Parts Except the Micro and Temperature Sensor.
P5VVID	Positive 5V Supply for All Video Switches Buffers and OSD.
P5VDIG	Positive 5V Supply for Digital Audio Switches and Optical Receivers.
N5VA	Negative 5V Supply for All Parts.
N5VVID	Negative 5V Supply for All Video Switches and Buffers.
N5VSRS	Negative 5V Supply for SRS analogue stages.
P5VMICRO	Positive 5V Supply for Temperature Sensor and Micro Processor This Rail is On in Stand By and Soft Power Down.
FANSUP	Supply Voltage Across Fan
GND	Ground Reference Point for Power Supply
PGND	Ground Reference Point for Input to Power Supply
MGND	Ground Reference Point for Micro Processor 5V Supply
SRS GND	Ground Reference Point for SRS Digital Power Supply
SRS GND2	Ground Reference Point for SRS Analogue Power Supply

Dave Board Parts List

Ref No.	Description	Part No
C1	ELEC 10U 25V CERAFINE	2P610CC
C2	ELEC 10U 25V CERAFINE	2P610CC
C3	ELST 22U 63V	2N622
C4	ELEC 10U 25V CERAFINE	2P610CC
C5	ELST NON POLAR 10UF 35V	2U610
C6	ELST NON POLAR 10UF 35V	2U610
C7	ELST 10U 50V	2N610
C8	ELST 10U 50V	2N610
C9	MLC 10N 50V X7R 10% SM	2C310
C10	MLC 100N 50V X7R 10% SM	2C410
C11	MLC 1N0 50V X7R 10% SM	2C210
C12	MLC 1N0 50V X7R 10% SM	2C210
C13	MLC 47N VP41BY473KB CAP	2B347
C14	MLC 1N0 50V X7R 10% SM	2C210
C15	MLC 1N0 50V X7R 10% SM	2C210
C16	MLC 10N 50V X7R 10% SM	2C310
C17	MLC 10N 50V X7R 10% SM	2C310
C18	ELST 470U 25V RA	2N747
C19	MLC 10N 50V X7R 10% SM	2C310
C20	MLC 10N 50V X7R 10% SM	2C310
C21	MLC 10P 50V NPO 10% SM	2C010A
C22	MLC 10P 50V NPO 10% SM	2C010A
C23	ELST 100U 25V	2N710
C24	ELST 10U 50V	2N610
C25	MLC 10P 50V NPO 10% SM	2C010A
C26	MLC 10N 50V X7R 10% SM	2C310
C27	MLC 10N 50V X7R 10% SM	2C310
C28	MLC 10N 50V X7R 10% SM	2C310
C29	MLC 10N 50V X7R 10% SM	2C310
C30	MLC 1N0 50V X7R 10% SM	2C210
C31	ELST 10U 50V	2N610
C32	MLC 10N 50V X7R 10% SM	2C310
C33	MLC 10N 50V X7R 10% SM	2C310

Ref No.	Description	Part No
C34	MLC 10N 50V X7R 10% SM	2C310
C35	MLC 10N 50V X7R 10% SM	2C310
C36	MLC 10N 50V X7R 10% SM	2C310
C37	MLC 10N 50V X7R 10% SM	2C310
C38	MLC 10P 50V NPO 10% SM	2C010A
C39	MLC 10P 50V NPO 10% SM	2C010A
C40	ELST 22U 63V	2N622
C41	ELST 10U 50V	2N610
C42	ELST 470U 25V RA	2N747
C43	ELST 10U 50V	2N610
C44	MLC 10P 50V NPO 10% SM	2C010A
C45	MLC 10P 50V NPO 10% SM	2C010A
C46	MLC 10P 50V NPO 10% SM	2C010A
C47	MLC 10N 50V X7R 10% SM	2C310
C48	MLC 10N 50V X7R 10% SM	2C310
C49	MLC 10N 50V X7R 10% SM	2C310
C50	ELST 10U 50V	2N610
C51	ELST 22U 63V	2N622
C52	ELST 10U 50V	2N610
C53	MLC 10P 50V NPO 10% SM	2C010A
C54	MLC 10N 50V X7R 10% SM	2C310
C55	ELST 10U 50V	2N610
C56	MLC 10N 50V X7R 10% SM	2C310
C57	MLC 10N 50V X7R 10% SM	2C310
C58	ELST 1M0 25V	2N810
C59	ELST 1M0 35V	2N810C
C60	MLC 10N 50V X7R 10% SM	2C310
C61	ELST 10U 50V	2N610
C62	MLC 10N 50V X7R 10% SM	2C310
C63	ELST 1M0 35V	2N810C
C64	MLC 100N 50V X7R 10% SM	2C410
C65	MLC 100N 50V X7R 10% SM	2C410
C66	MLC 100N 50V X7R 10% SM	2C410

Ref No.	Description	Part No
C67	MLC 100N 50V X7R 10% SM	2C410
C68	MLC 10P 50V NPO 10% SM	2C010A
C69	ELST 10U 50V	2N610
C70	CERD 220P 63V 20% RA	2A122
C71	PEST 22N 63V 10%	2K322
C72	MLC 100N 50V X7R 10% SM	2C410
C73	MLC 100N 50V X7R 10% SM	2C410
C74	MLC 27P 50V NPO 10% SM	2C027A
C75	MLC 33P 100V NPO 5% SM	2C033
C76	MLC 47P 100V NPO 5% SM	2C047
C77	MLC 82P 100V NPO 5% SM	2C082
C78	MLC 10N 50V X7R 10% SM	2C310
C79	MLC 10N 50V X7R 10% SM	2C310
C80	ELST 10U 50V	2N610
C81	MLC 10N 50V X7R 10% SM	2C310
C82	ELST 10U 50V	2N610
C83	ELST 100U 25V	2N710
C84	ELST 100U 100V	2N710B
C85	MLC 100N 50V X7R 10% SM	2C410
C86	ELST 1M0 25V	2N810
C87	ELST 1M0 25V	2N810
C88	ELST 100U 100V	2N710B
C89	MLC 100N 50V X7R 10% SM	2C410
C90	MLC 18P 50V X7R 10% SM	2C018
C91	MLC 18P 50V X7R 10% SM	2C018
C92	ELST 10U 50V	2N610
C93	ELST 1U0 50V	2N510
C94	ELST 1U0 50V	2N510
C95	MLC 10N 50V X7R 10% SM	2C310
C96	MLC 1N0 50V X7R 10% SM	2C210
C97	MLC 1N0 50V X7R 10% SM	2C210
C98	MLC 10N 50V X7R 10% SM	2C310
C99	MLC 1N0 50V X7R 10% SM	2C210

Ref No.	Description	Part No
C101	MLC 10P 50V NPO 10% SM	2C010A
C102	MLC 10P 50V NPO 10% SM	2C010A
C103	ELST 100U 25V	2N710
C104	ELST 22U 63V	2N622
C105	MLC 47P 100V NPO 5% SM	2C047
C107	ELST 10U 50V	2N610
C108	MLC 100N 50V X7R 10% SM	2C410
C109	MLC 1N0 50V X7R 10% SM	2C210
C111	MLC 82P 100V NPO 5% SM	2C082
C112	ELEC 10U 25V CERAFINE	2P610CC
C113	ELEC 10U 25V CERAFINE	2P610CC
C114	MLC 100N 50V X7R 10% SM	2C410
C115	MLC 100N 50V X7R 10% SM	2C410
C116	MLC 1N0 50V X7R 10% SM	2C210
C117	ELST NON POLAR 10UF 35V	2U610
D1	ZENER 6V8 400MW	3C06804
D2	ZENER 6V8 400MW	3C06804
D3	SSDIODE 1N4148 75V	3A4148
D4	RECTIFIER 1N4003F 1A 200V	3B4003
D5	ZENER 3V9 0W5 SM SOD123	3CW53V9
D6	SCHOTTKY SM 30BQ100 3A100V	3A30BQ
D7	SCHOTTKY SM 30BQ100 3A100V	3A30BQ
D8	DIODE SS SM BAS16W	3AS16W
D9	SSDIODE 1N4148 75V	3A4148
D10	SSDIODE 1N4148 75V	3A4148
D11	SSDIODE 1N4148 75V	3A4148
D12	ZENER 8V2 1W SM PTZ8.2	3CPTZ8V2
D13	ZENER 8V2 1W SM PTZ8.2	3CPTZ8V2
D14	DIODE SS SM BAS16W	3AS16W
D15	ZENER 8V2 1W SM PTZ8.2	3CPTZ8V2
D16	ZENER 8V2 1W SM PTZ8.2	3CPTZ8V2
D17	RECTIFIER 1N4003F 1A 200V	3B4003
HS1	HEATSINK CLIP TO220 13/8.6 DC/W	F006

Ref No.	Description	Part No
HS1	HEATSINK TO220 13 DEGC/W	F005
HS2	HEATSINK TO220 CLIP 30	F007
HS3	HEATSINK TO220 CLIP 30	F007
HS4	HEATSINK TO220 CLIP 30	F007
L1	400uH IND PLUS HOLDER	L806CL#A
L2	100uH IND PLUS HOLDER	L807CL
L3	2UH2 IND SM NL322522T-2R2J	7B822
L4	2UH2 IND SM NL322522T-2R2J	7B822
L5	2UH2 IND SM NL322522T-2R2J	7B822
L6	2UH2 IND SM NL322522T-2R2J	7B822
L7	R622LY 101K 100UH OA91 RAD IND	7D110
Q1	TRANS LF SS N SM BC849B	4A849B
Q2	TRANS LF SS N SM BC849B	4A849B
Q3	TRANS LF SS N SM BC849B	4A849B
Q4	TRANS LF SS N SM BC849B	4A849B
Q5	TRANS LF SS P SM BC859B	4A859B
Q6	TRANS LF SS P SM BC859B	4A859B
Q7	TRANS LF SS N SM BC849B	4A849B
Q8	TRANS LF SS N SM BC849B	4A849B
Q9	TRANS LF SS N SM BC849B	4A849B
Q10	TRANS LF SS N SM BC849B	4A849B
Q11	TRANS LF SS N SM BC849B	4A849B
Q12	TRANS LF SS N SM BC849B	4A849B
Q13	TRANS LF SS N SM BC849B	4A849B
Q14	TRANS LF SS P SM BC859B	4A859B
Q16	TRANS LF SS N SM BC849B	4A849B
Q17	TRANS LF SS N SM BC849B	4A849B
Q19	TRANS LF SS N SM BC849B	4A849B
R1	RES SM W4 2% 56R	1A056
R2	RES SM W4 2% 56R	1A056
R3	RES SM W4 2% 56R	1A056
R4	RES SM W4 2% 56R	1A056
R5	RES SM W4 2% 56R	1A056
R6	RES SM W4 2% 56R	1A056

Ref No.	Description	Part No
R7	RES SM W4 2% 100K	1A410
R8	RES SM W4 2% 100K	1A410
R9	RES SM W4 2% 100K	1A410
R10	RES SM W4 2% 100K	1A410
R11	RES SM W4 2% 100K	1A410
R12	RES SM W4 2% 100K	1A410
R13	RES SM W4 2% 1K0	1A210
R14	RES SM W4 2% 1K0	1A210
R15	RES SM W4 2% 470R	1A147
R16	RES SM W4 2% 470R	1A147
R17	RES SM W4 2% 470R	1A147
R18	RES SM W4 2% 470R	1A147
R19	RES SM W4 2% 75R	1A075
R20	RES SM W4 2% 75R	1A075
R21	RES SM W4 2% 56R	1A056
R22	RES SM W4 2% 56R	1A056
R23	RES SM W4 2% 75R	1A075
R24	RES SM W4 2% 75R	1A075
R25	RES SM W4 2% 75R	1A075
R26	RES SM W4 2% 75R	1A075
R27	RES SM W4 2% 75R	1A075
R28	RES SM W4 2% 75R	1A075
R29	RES SM W4 2% 75R	1A075
R30	RES SM W4 2% 75R	1A075
R31	RES SM W4 2% 470R	1A147
R32	RES SM W4 2% 470R	1A147
R33	RES SM W4 2% 470R	1A147
R34	RES SM W4 2% 470R	1A147
R35	RES SM W4 2% 75R	1A075
R36	RES SM W4 2% 75R	1A075
R37	RES SM W4 2% 10K	1A310
R38	RES MF FU W3 1R0 5% NFR25	1G810
R39	RES SM W4 2% 75R	1A075
R40	RES SM W4 2% 75R	1A075

Ref No.	Description	Part No
R41	RES SM W4 2% 75R	1A075
R42	RES SM W4 2% 75R	1A075
R43	RES SM W4 2% 75R	1A075
R44	RES SM W4 2% 470R	1A147
R45	RES SM W4 2% 470R	1A147
R46	RES SM W4 2% 470R	1A147
R47	RES SM W4 2% 470R	1A147
R48	RES SM W4 2% 75R	1A075
R49	RES SM W4 2% 75R	1A075
R50	RES MF FU W3 1R0 5% NFR25	1G810
R51	RES MF FU W3 100R 5% NFR25	1G110
R52	RES SM W4 2% 100R	1A110
R53	RES SM W4 2% 100R	1A110
R54	RES MF FU W3 1R0 5% NFR25	1G810
R55	RES SM W4 2% 1K0	1A210
R56	RES SM W4 2% 1K0	1A210
R57	RES SM W4 2% 4K7	1A247
R58	RES SM W4 2% 10K	1A310
R59	RES SM W4 2% 4K7	1A247
R60	RES SM W4 2% 2K2	1A222
R61	RES SM W4 2% 1K0	1A210
R62	RES SM W4 2% 2K2	1A222
R63	RES SM W4 2% 4K7	1A247
R64	RES SM W4 2% 4K7	1A247
R65	RES SM W4 2% 680K	1A468
R66	RES SM W4 2% 22K	1A322
R67	RES SM W4 2% 10K	1A310
R68	RES SM W4 1% 10K	1A310B
R69	RES SM W4 2% 470R	1A147
R70	RES SM W4 2% 10K	1A310
R71	RES SM W4 2% 10K	1A310
R72	RES SM W4 2% 22K	1A322
R73	RES SM W4 2% 22K	1A322
R74	RES SM W4 2% 10K	1A310

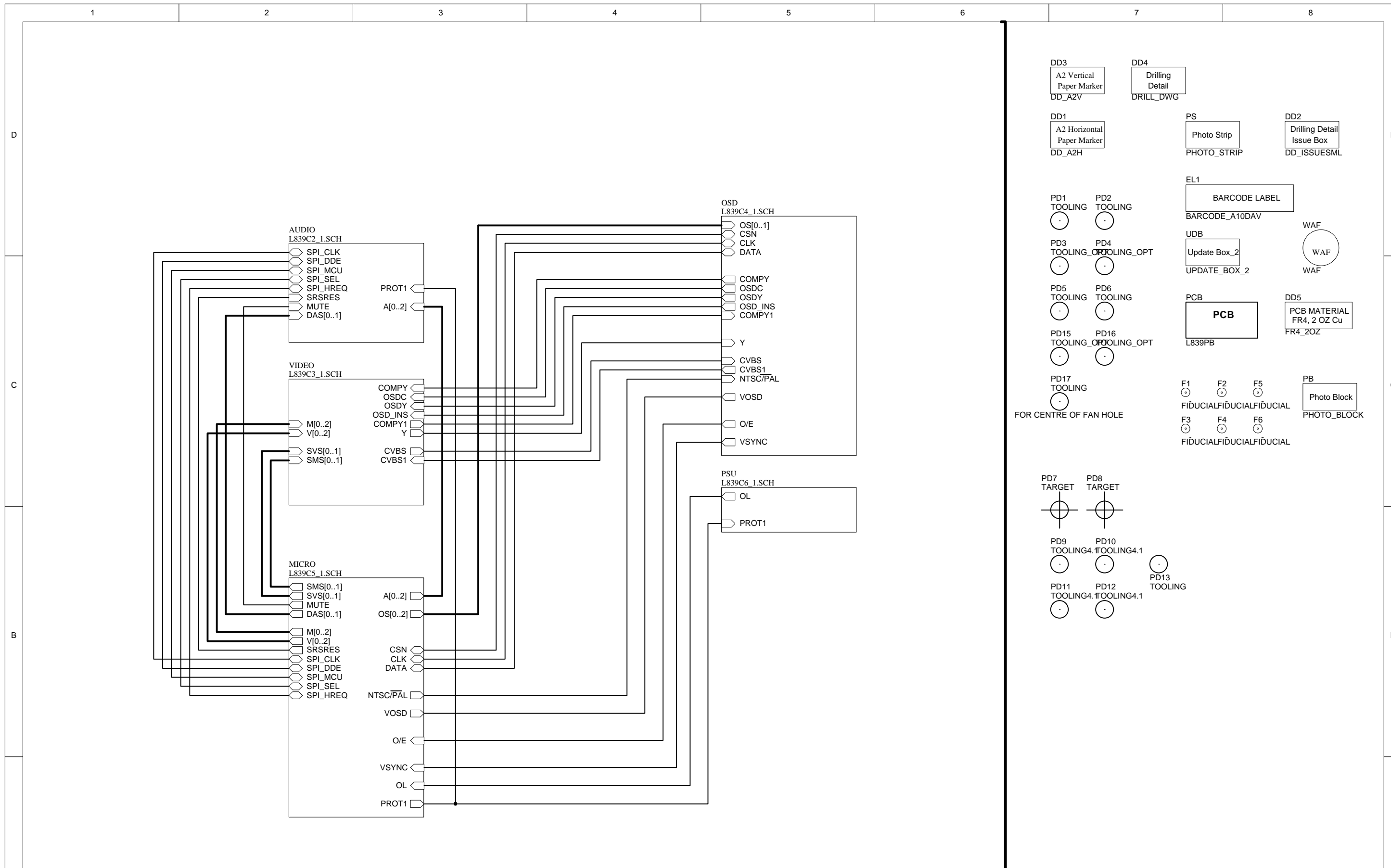
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R75	RES SM W4 2% 680R	1A168
R76	RES SM W4 2% 16K	1A316
R77	RES SM W4 2% 10K	1A310
R78	RES MF FU W3 1R0 5% NFR25	1G810
R79	RES MF FU W3 1R0 5% NFR25	1G810
R80	RES SM W4 2% 4K7	1A247
R81	RES SM W4 2% 100R	1A110
R82	RES SM W4 2% 470R	1A147
R83	RES SM W4 2% 470R	1A147
R84	RES SM W4 2% 470R	1A147
R85	RES SM W4 2% 75R	1A075
R86	RES SM W4 2% 180R	1A118
R87	RES SM W4 2% 180R	1A118
R88	RES SM W4 2% 470R	1A147
R89	RES SM W4 2% 470R	1A147
R90	RES SM W4 2% 470R	1A147
R91	RES SM W4 2% 470R	1A147
R92	RES SM W4 2% 75R	1A075
R93	RES SM W4 2% 75R	1A075
R94	RES SM W4 2% 75R	1A075
R95	RES MF W4 47R 1%	1H047
R96	RES SM W4 2% 22K	1A322
R97	RES SM W4 2% 22K	1A322
R98	RES SM W4 2% 470R	1A147
R99	RES SM W4 2% 470R	1A147
R100	RES SM W4 2% 470R	1A147
R101	RES SM W4 2% 75R	1A075
R102	RES SM W4 2% 75R	1A075
R103	RES SM W4 2% 75R	1A075
R104	RES SM W4 2% 10K	1A310
R105	RES SM W4 2% 10K	1A310
R106	RES SM W4 2% 10K	1A310
R107	RES SM W4 2% 4K7	1A247
R108	RES SM W4 2% 10K	1A310

Ref No.	Description	Part No
R109	RES SM W4 2% 4K7	1A247
R110	RES SM W4 2% 10K	1A310
R111	RES SM W4 2% 10K	1A310
R112	RES SM W4 2% 10K	1A310
R113	RES SM W4 2% 220K	1A422
R114	RES SM W4 2% 220K	1A422
R115	RES SM W4 2% 100K	1A410
R116	RES SM W4 2% 10K	1A310
R117	RES SM W4 2% 4K7	1A247
R118	RES SM W4 2% 10K	1A310
R119	RES SM W4 2% 10K	1A310
R120	RES SM W4 2% 4K7	1A247
R121	RES SM W4 1% 10K	1A310B
R122	RES MF FU W3 1R0 5% NFR25	1G810
R123	RES SM W4 2% 100K	1A410
R125	RES SM W8 1K5 1%	1A215A
R126	RES SM W4 2% 75R	1A075
R127	RES SM W4 2% 100K	1A410
R128	RES SM W4 2% 4K7	1A247
R129	RES MF FU W3 1R0 5% NFR25	1G810
R131	RES MF FU W3 10R 5% NFR25	1G010
R132	RES SM W4 2% 100R	1A110
R133	RES SM W4 2% 100R	1A110
R134	RES SM W4 2% 4K7	1A247
R135	RES SM W4 2% 10K	1A310
R136	RES SM W4 2% 4K7	1A247
R137	RES MF FU W3 100R 5% NFR25	1G110
R138	RES SM W4 2% 470R	1A147
R139	RES SM W4 2% 470R	1A147
R140	RES SM W4 1% 10K	1A310B
R141	RES MF W4 47R 1%	1H047
R142	RES SM W4 2% 100K	1A410
R143	RES SM W4 2% 100K	1A410
R144	RES SM W4 2% 100K	1A410

Ref No.	Description	Part No
R145	RES SM W4 2% 100K	1A410
R146	RES SM W4 2% 0R0	1A000
R147	RES SM W4 2% 47K	1A347
R148	RES MF FU W3 100R 5% NFR25	1G110
R149	RES MF FU W3 100R 5% NFR25	1G110
R150	RES SM W4 2% 4K7	1A247
R151	RES SM W4 2% 75R	1A075
R153	RES SM W4 2% 100K	1A410
R155	RES SM W4 1% 10K	1A310B
R156	RES MF FU W3 1R0 5% NFR25	1G810
R157	RES SM W4 2% 56R	1A056
R158	RES SM W4 2% 100K	1A410
R159	RES SM W4 2% 4K7	1A247
R160	RES SM W4 2% 4K7	1A247
R161	RES SM W4 2% 33K	1A333
R162	RES MF FU W3 100R 5% NFR25	1G110
R163	RES SM W4 2% 330R	1A133
R164	RES SM W4 2% 4K7	1A247
R165	RES MF FU W3 100R 5% NFR25	1G110
R166	RES MF FU W3 100R 5% NFR25	1G110
R167	RES MF FU W3 100R 5% NFR25	1G110
R168	RES MF W4 22R 1%	1H022
R169	RES CF W4 5% 2R2	1B822
R170	RES SM W4 2% 22K	1A322
RLY1	RELAY MAINS 4PCO 5V 83R	A214#A
SK1	32-WAY FFC CONN VERT	8K8032
SK2	10+10 WAY FEMALE VERT SKT	8K8020D
SK3	10+10 WAY FEMALE VERT SKT	8K8020D
SK4	PHONO SKT 2-WAY HOR EMC GOLD	8D230
SK5	PHONO SKT 4-WAY EMC GOLD	8D225
SK6A	5 WAY SIL FEMALE VERT PLUG	8K2051
SK7	SVHS 4 CONTACT 2WAY VERTICAL	8D227
SK8	SVHS 4 CONTACT 2WAY VERTICAL	8D227

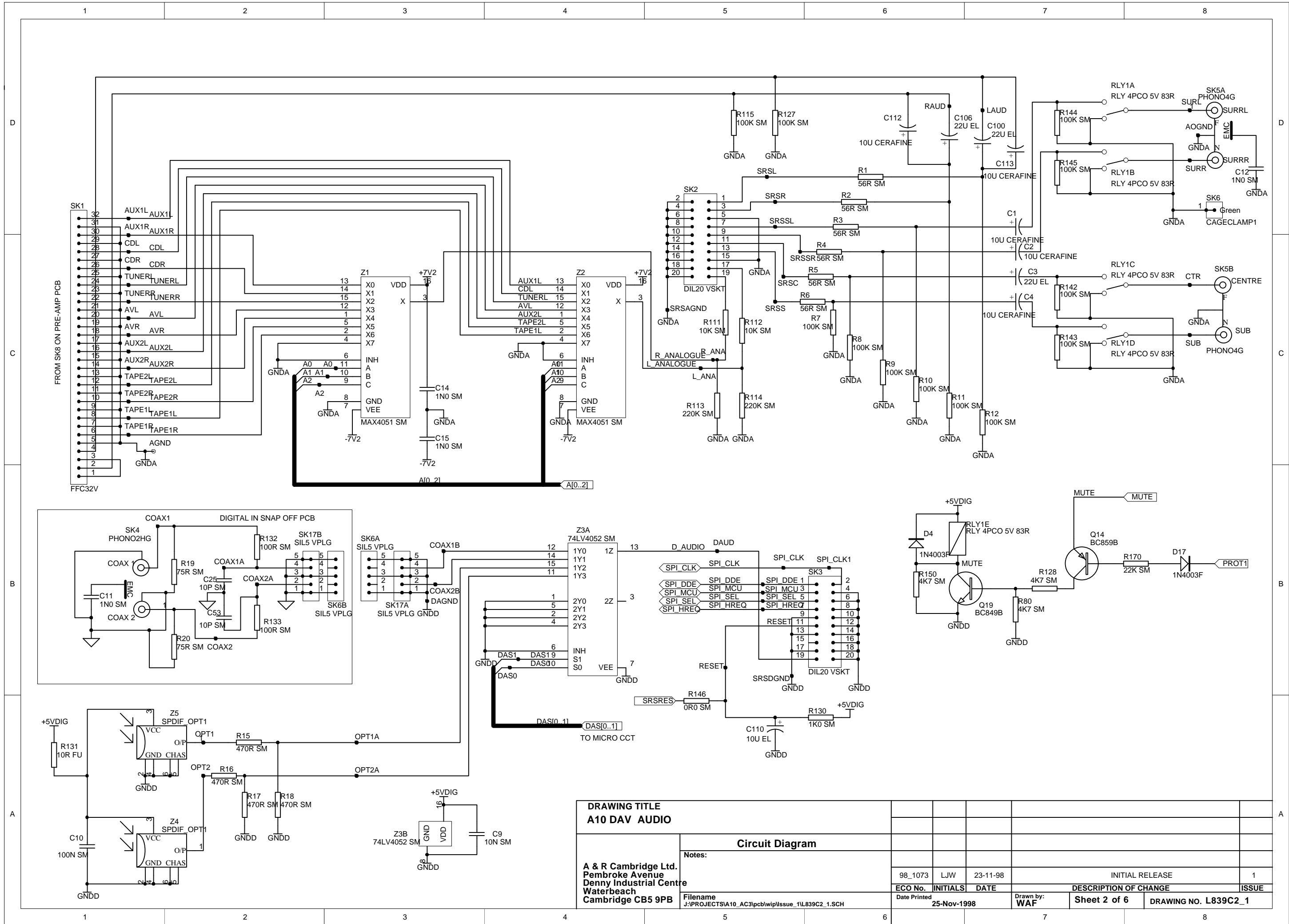
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SK9	SVHS 4 CONTACT 2WAY VERTICAL	8D227
SK10	PHONO SKT 4-WAY EMC GOLD	8D225
SK11	PHONO SKT 4-WAY EMC GOLD	8D225
SK12	22-WAY FFC CONN HORIZ	8K8122
SK13	CAGE CLAMP 16A 1 WAY	8Q003
SK14	10+10 WAY FEMALE VERT SKT	8K8020D
SK15	PHONO SKT 4-WAY EMC GOLD	8D225
SK16	CAGE CLAMP 16A 1 WAY	8Q003
SK17A	5 WAY SIL FEMALE VERT PLUG	8K2051
SK18	5-WAY FR LOCK CONN VERT	8K6605
SK19	2-WAY FR LOCK CONN VERT	8K6602
SK20	4-WAY FR LOCK CONN	8K6604
SK21	JST 6 WAY HEADER	8K709
X1	CRYSTAL 16.MHz PARALLEL	7X021
X2	CRYSTAL 14.31818MHz PARALLEL	7X020
X3	CRYSTAL 17.73447MHz PARALLEL	7X022
Z1	IC HCMOS SM MAX 4051	5K4051M
Z2	IC HCMOS SM MAX 4051	5K4051M
Z3	IC HCMOS 74LV4052 SM	5K4052
Z4	IC THERMOSTAT SM LM56CIM	5M56
Z5	IC THERMOSTAT SM LM56CIM	5M56
Z6	IC HCMOS 74LV4053 SM	5K4053
Z7	IC AHC SN74AHC1G00	5KA100

Ref No.	Description	Part No
Z8	IC HCMOS 74LV4052 SM	5K4052
Z9	IC AUDIO DUAL EL2244	5B2244
Z10	IC AUDIO DUAL EL2244	5B2244
Z11	IC HCMOS SM MAX 4051	5K4051M
Z12	IC HCMOS 74LV4053 SM	5K4053
Z13	IC AUDIO DUAL EL2244	5B2244
Z14	IC HCMOS 74LV4052 SM	5K4052
Z15	IC AUDIO DUAL EL2244	5B2244
Z16	IC VREG POS 7815	5D7815
Z17	IC AHC SN74AHC1G00	5KA100
Z18	STV5730A	5V5730
Z19	IC HCMOS 74LV4053 SM	5K4053
Z20	VIDEO SYNC SEPARATOR LM1881	5V1881
Z21	IC THERMOSTAT SM LM56CIM	5M56
Z22	IC VREG POS 7805	5D7805
Z23	IC VREG NEG 7915	5D7915
Z24	SIMPLE SWITCHER LM2576HV-5	5D2576A
Z25	SIMPLE SWITCHER LM2576HV-5	5D2576A
Z26	H8/3337MCU60kB16MHz	5H3337
Z27	IC HCMOS 74LV4052 SM	5K4052
Z28	IC HCMOS SM MAX 4051	5K4051M
Z29	IC HCMOS 74LV4053 SM	5K4053
Z30	IC AUDIO DUAL EL2244	5B2244
Z31	IC AHC SN74AHC1G00	5KA100

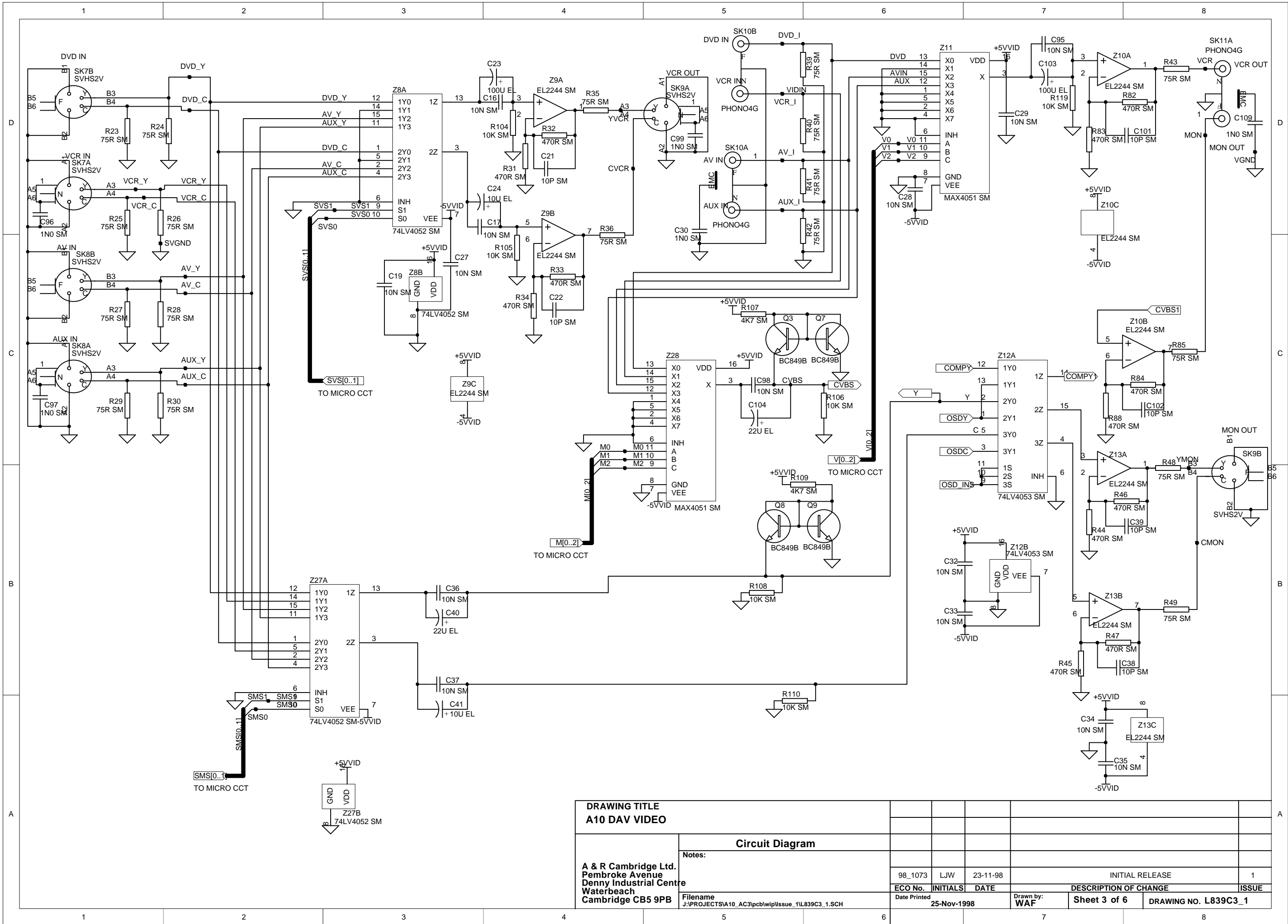


USE EXCLUDE NF ON ROS PROGRAM

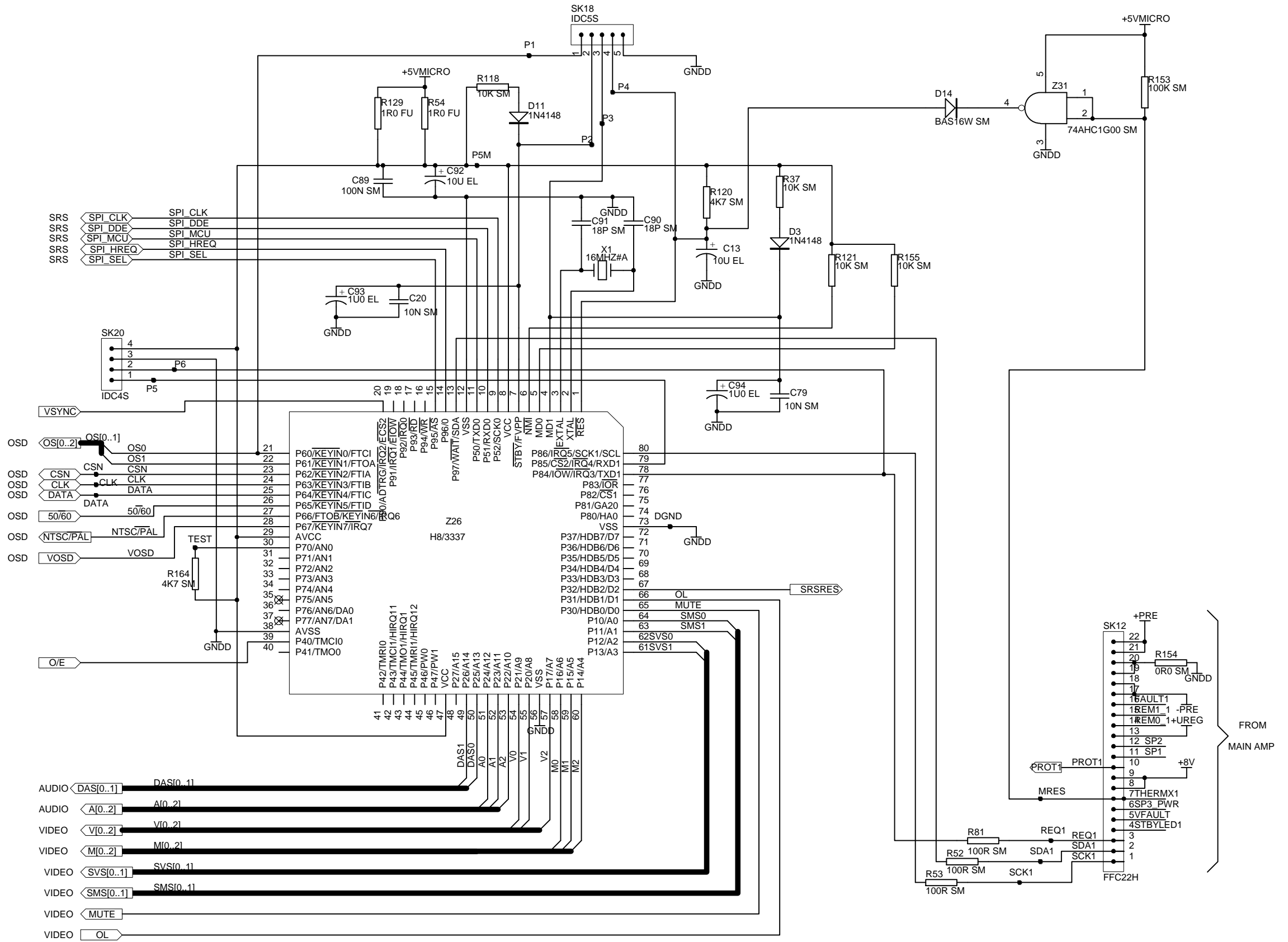
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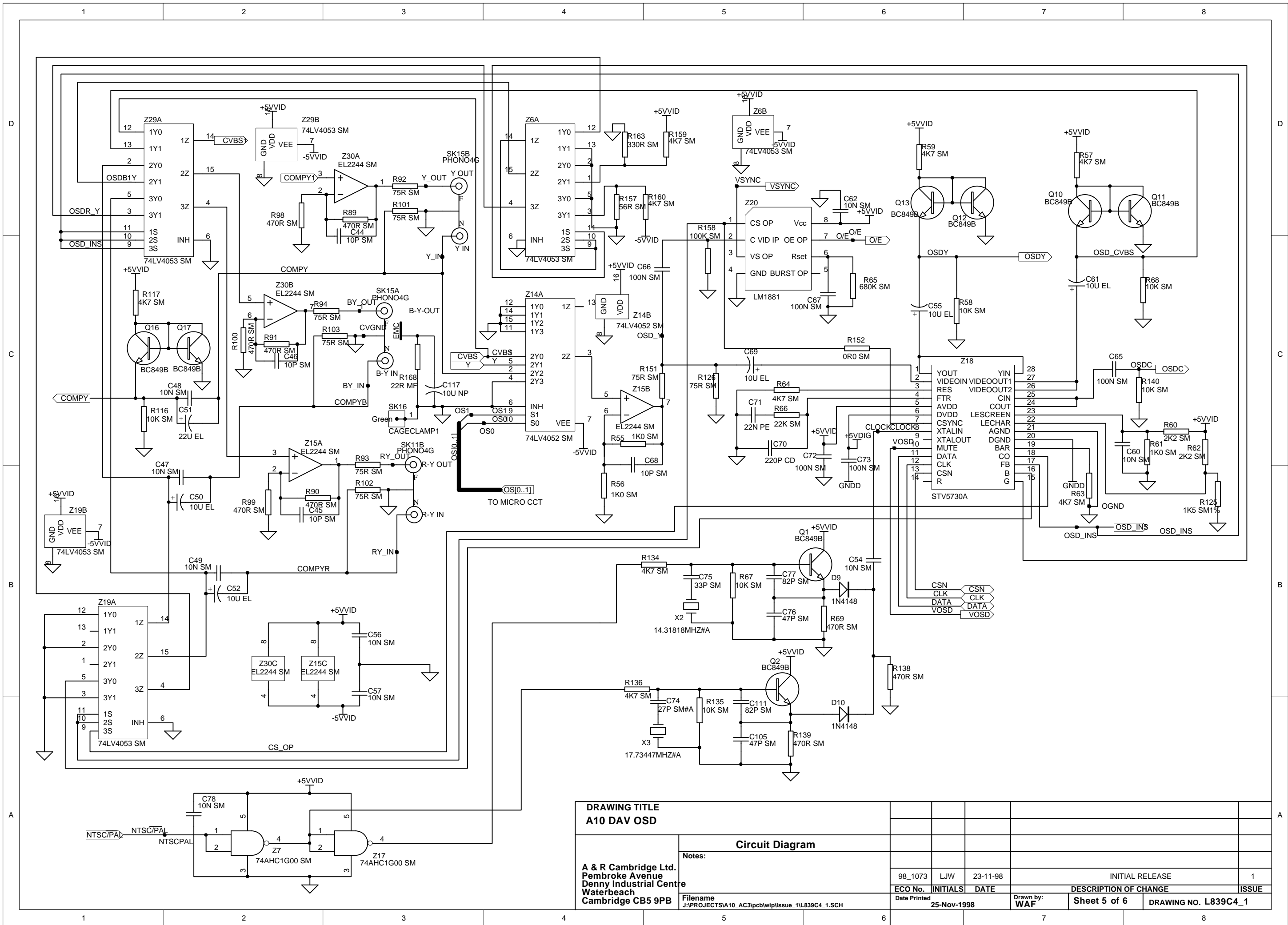
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								Sheet 2 of 6		DRAWING NO. L839C2_1



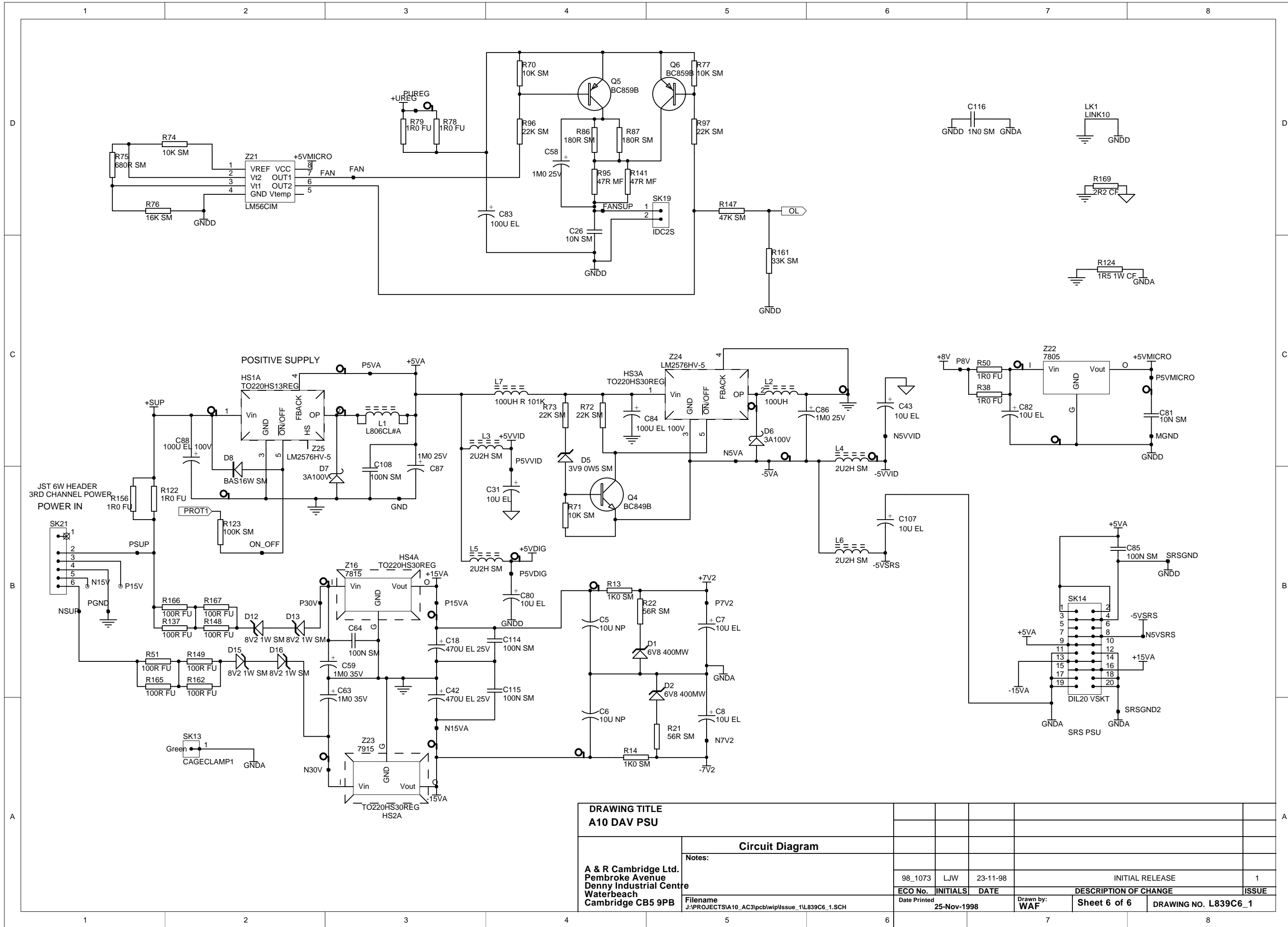
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Circuit Diagram Notes: A & R Cambridge Ltd. Pembroke Avenue Denny Industrial Centre Waterbeach Cambridge CB5 9PB										
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DRAWING TITLE A10 DAV MICRO									
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DRAWING TITLE A10 DAV OSD									
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A & R Cambridge Ltd. Pembroke Avenue Denny Industrial Centre Waterbeach Cambridge CB5 9PB					98_1073	LJW	23-11-98	INITIAL RELEASE	1
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Date Printed 25-Nov-1998								Sheet 5 of 6	DRAWING NO. L839C4_1



DRAWING TITLE A10 DAV PSU					
Circuit Diagram					
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A & R Cambridge Ltd. Pembroke Avenue Denny Industrial Centre Waterbeach Cambridge CB5 9PB		98_1073	LJW	23-11-98	INITIAL RELEASE 1
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Date Printed 25-Nov-1998		Drawn by: WAF		Sheet 6 of 6	DRAWING NO. L839C6_1