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**IRT Eurocard**

**Types**

**ADC-3250/OPT**

**Analogue Video & Audio to 270 Mb/s**

**&**

**DAC-3250/OPT**

**270 Mb/s to Analogue Video & Audio**

**Fibre Optic Link**

**Designed and manufactured in Australia**

**IRT can be found on the Internet at:**  
**<http://www.irtelectronics.com>**

# IRT Eurocard

## Types ADC-3250/OPT & DAC-3250/OPT

### Analogue Video & Audio to 270 Mb/s Fibre Optic Link

#### Instruction Book

##### Table of Contents

Section	Page
Operational Safety	2
General Description	3
Technical Specifications	4
Configuration	5
Installation	6
Front and rear layouts	9
Operation	10
Maintenance & Storage	11
Warranty & Service	11
Equipment return	11
Drawing List Index	12

This instruction book applies to units later than S/N 0404001.

#### Operational Safety:

##### **WARNING**

Operation of electronic equipment involves the use of voltages and currents that may be dangerous to human life. Note that under certain conditions dangerous potentials may exist in some circuits when power controls are in the **OFF** position. Maintenance personnel should observe all safety regulations.

Do not make any adjustments inside equipment with power **ON** unless proper precautions are observed. All internal adjustments should only be made by suitably qualified personnel. All operational adjustments are available externally without the need for removing covers or use of extender cards.

# IRT Eurocard

## Types ADC-3250/OPT & DAC-3250/OPT

### Analogue Video & Audio to 270 Mb/s Fibre Optic Link

#### General Description

The ADC-3250/OPT and DAC-3250/OPT form an encoder / decoder pair for converting an analogue video, up to 4 channels of audio and an RS-232 data port to a 270 Mb/s digital signal suitable for transport over ASI/SDI paths.

This allows analogue signals to be passed through purely digital environments such as digital optical links and digital routers and switchers thus simplifying installations that are predominantly digital where some analogue signals still exist.

When used with IRT's fibre mux/demux system, both analogue and digital signals can be sent over the same link.

The ADC-3250/OPT encodes the analogue input signals to a 270 Mb/s digital stream. The inputs can either be a single video, up to 4 channels of audio or a combination of video and audio. There is also an RS-232 data input port, which can be used concurrently with the video and audio or by itself.

The DAC-3250/OPT decodes the 270 Mb/s digital stream to recover the original signals.

Front panel LED indicators on both units indicate the presence of the analogue and data input signals. The ADC-3250/OPT allows cable equalisation of various lengths by a front panel control. A front panel monitor output aids in setting this correctly.

Plug-in fibre optic boards are included on both the ADC-3250/OPT and DAC-3250/OPT for direct connection to a single mode fibre.

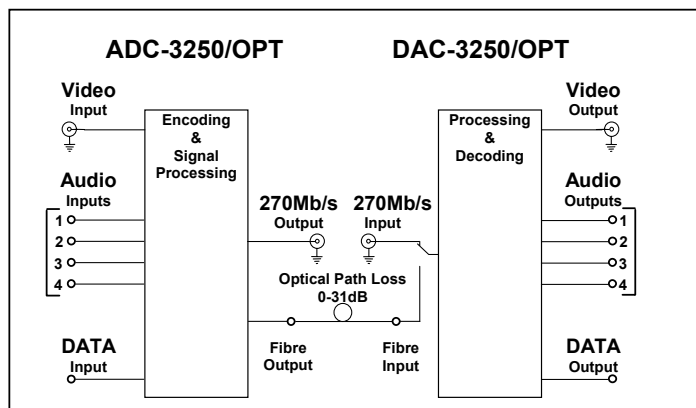
The 270 Mb/s digital signal is of the same data rate as ASI and SDI signals hence its ability to be sent over ASI/SDI paths. Although similar in structure to both ASI and SDI it is neither of these types of signals. Hence the ADC-3250/OPT and DAC-3250/OPT are designed to act as an encoder / decoder pair.

Both the ADC-3250/OPT and DAC-3250/OPT are manufactured on extended Eurocard boards and are suitable for mounting in IRT's 1RU and 3RU Eurocard frames with other analogue or digital modules.

#### Standard features:

- 1 analogue video, 4 audio and 1 data channel to 270 Mb/s digital stream suitable for transmission over 270 Mb/s systems, such as digital fibre systems, routers, etc.
- Plug-in Fibre Optic Link boards included.

#### Functional diagram:



**Technical Specifications**  
**IRT Eurocard modules**  
**Types ADC-3250/OPT & DAC-3250/OPT**

**ADC-3250/OPT & DAC-3250/OPT Technical Specifications**

**ADC-3250/OPT:**

**Input:** 1 x Analogue video, 75Ω BNC terminated.  
 4 x Hi Z Analogue audio, balanced 3 pin.  
 1 x RS-232 data (up to 115200 Baud).  
 Video Equalisation Up to 300 metres, adjustable from front panel.

**Output:**  
 Type 1 1 x 270 Mb/s digital, 75Ω BNC.  
 Type 2 1 x 270 Mb/s fibre optic digital, SC/PC.

**DAC-3250/OPT:**

**Input:**  
 Type 1 1 x 270 Mb/s digital, 75Ω BNC.  
 Type 2 1 x 270 Mb/s fibre optic digital, SC/PC.  
 Equalisation Automatic, up to 300 metres for Belden 8281 or equivalent cable.

**Output:** 1 x Analogue video, 75Ω BNC terminated.  
 4 x Lo Z Analogue audio, balanced 3 pin.  
 1 x RS-232 data.

**Optical:**  
 Optical path loss 31 dB maximum.  
 Optical fibre Designed for use with 9/125 single mode fibre.  
 Optical wavelength 1310nm ± 30nm.  
 Optical connector SC/PC.

**Power Requirements:**

Power Requirements 28 Vac CT (14-0-14) or ± 16 Vdc.  
 Power consumption ADC-3250/OPT < 6.5 VA, DAC-3250/OPT < 11VA.

**Other:**

Temperature range 0 - 50° C ambient.  
 Mechanical Suitable for mounting in IRT 19" rack chassis with input, output and power connections on the rear panel.  
 Finish: Front panel Grey background, silk-screened black lettering & red IRT logo.  
 Rear assembly Detachable silk-screened PCB with direct mount connectors to Eurocard and external signals.  
 Dimensions 6 HP x 3 U x 220 mm IRT Eurocard.  
 Supplied accessories Rear connector assembly.

**Due to our policy of continuing development, these specifications are subject to change without notice.**

## Configuration

### ADC-3250/OPT:

#### Link Settings

Link LK1	IN	Left Audio 2 600Ω input
	OUT	Left Audio 2 high impedance input (default position)
Link LK2	IN	Right Audio 2 600Ω input
	OUT	Right Audio 2 high impedance input (default position)
Link LK3	IN	Left Audio 1 600Ω input
	OUT	Left Audio 1 high impedance input (default position)
Link LK4	IN	Right Audio 1 600Ω input
	OUT	Right Audio 1 high impedance input (default position)

#### Switch Settings

SW1-1	ON	No audio alarm setting.
	OFF	Laser fail alarm setting.
SW1-2		Not used.
SW1-3		Not used.
SW1-4		Not used.

### DAC-3250/OPT:

#### Link Settings

Link LK1	Not used.
Link LK2	Not used.
Link LK3	Not used.

If optional optical sub board is fitted:

Link LK4	IN	Select optical input.
	OUT	Select electrical (coaxial) input.

If optional optical sub board is NOT fitted:

Link LK4	Not used.
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# Installation

## Pre-installation:

### Handling:

This equipment may contain or be connected to static sensitive devices and proper static free handling precautions should be observed.

Where individual circuit cards are stored, they should be placed in antistatic bags. Proper antistatic procedures should be followed when inserting or removing cards from these bags.

### Power:

AC mains supply: Ensure that operating voltage of unit and local supply voltage match and that correct rating fuse is installed for local supply.

DC supply: Ensure that the correct polarity is observed and that DC supply voltage is maintained within the operating range specified.

### Earthing:

The earth path is dependent on the type of frame selected. In every case particular care should be taken to ensure that the frame is connected to earth for safety reasons. See frame manual for details.

**Signal earth:** For safety reasons a connection is made between signal earth and chassis earth. No attempt should be made to break this connection.

## Installation in frame or chassis:

See details in separate manual for selected frame type.

## Connections:

### ADC-3250/OPT:

#### Video Input

The ADC-3250/OPT *Video In* port on the rear assembly is a 75Ω terminated BNC connector for analogue video only. Use of high quality 75Ω coaxial cable is recommended. Input equalisation and gain are set via front panel controls.

#### Video Mon

A front panel 75Ω output impedance analogue video monitoring port is provided for monitoring of input signal whilst adjusting front panel gain and equalisation controls.

#### 270 Mb/s Output

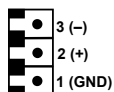
The ADC-3250/OPT *Output* port on the rear assembly is a 75Ω output impedance BNC connector, which has a 270 Mb/s encoded signal suitable for connection to an ASI or SDI circuit. Use of high quality coaxial cable such as Belden 8285, or equivalent, is recommended.

#### 270 Mb/s Optical Output

An optical output is available via the rear assembly fibre optic connector. The standard optical connector is an SC/PC type of connector for connection to single mode fibre terminated with the same SC/PC type of connector. If unit is ordered with a different type of connector, be sure that fibre is terminated with the suitable mating type of connector.

#### Audio Inputs

Four high impedance balanced audio inputs are provided via phoenix style 3-pin plugs labelled as Left Audio 1, Right Audio 1, Left Audio 2 and Right Audio 2. As per standard audio wiring standards, pin 1 is ground, pin 2 is (+) and pin 3 is (-). On board link settings allow direct connection to 600Ω systems.



### Alarm Outputs

Two relay alarm output states are provided via a phoenix style 4-pin plug. Pin 1 is designated as Major, pin 2 is designated as Minor, and both pins 3 & 4 are ground. Although alarms are designated as Major and Minor, it is probably better to think of them as Alarm 1 and Alarm 2.

Alarm conditions are as follows:

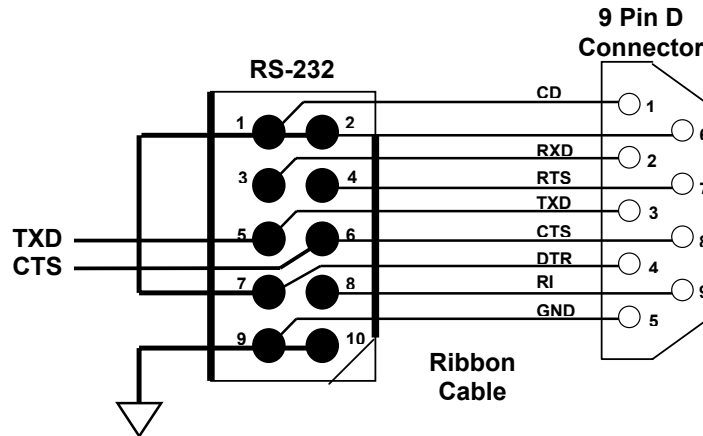
- Major switch to Open Circuit on no video input, or loss of power;
- Minor with on board switch SW1-1 on, switch to Open Circuit on no audio input, or loss of power, with on board switch SW1-1 off and optional fibre driver board fitted, switch to Open Circuit on laser failure, or loss of power.



### RS-232 Data Input

The RS-232 data input port is via a 10 pin HE14 style of header. Pins 1, 2 and 7 are connected together on the PCB. Pins 9 and 10 are both earthed. Pin 5 is the RS-232 *request to send* (RTS) connection and pin 6 is the RS-232 *transmit data* (TXD) connection. Data rates may be up to 115200 Baud. Note that data transfer is unidirectional only, i.e. there is no direct data return path.

For connection to a standard RS-232 9 pin D connector, wire as per the diagram below:



### DAC-3250/OPT:

#### 270 Mb/s Input

The DAC-3250/OPT *Input* port on the rear assembly is a 75Ω terminated BNC connector for a 270 Mb/s ADC-3250/OPT encoded signal only. Use of high quality coaxial cable such as Belden 1505A, 8281, or equivalent, is recommended.

#### 270 Mb/s Optical Input

The optical input signal should be connected to the rear assembly fibre optic connector. Ensure that link LK4 is fitted to use optical input rather than electrical (coaxial) input. The standard optical connector is an SC/PC type of connector for connection to single mode fibre terminated with the same SC/PC type of connector. If unit is ordered with a different type of connector, be sure that fibre is terminated with the suitable mating type of connector.

### Video Output

The DAC-3250/OPT *Video Out* port on the rear assembly is a 75Ω output impedance BNC connector, which has the decoded analogue video signal.

### Audio Outputs

Four balanced low impedance audio outputs are provided via phoenix style 3-pin plugs labelled as Left Audio 1, Right Audio 1, Left Audio 2 and Right Audio 2. As per standard audio wiring standards, pin 1 is ground, pin 2 is (+) and pin 3 is (-).



### Alarm Outputs

Two relay alarm output states are provided via a phoenix style 4-pin plug. Pin 1 is designated as Major, pin 2 is designated as Minor, and both pins 3 & 4 are ground. Although alarms are designated as Major and Minor, it is probably better to think of them as Alarm 1 and Alarm 2.

Alarm conditions are as follows:

- Major      switch to Open Circuit on loss of selected link input (optical or electrical), or loss of power;
- Minor      switch to Open Circuit if no encoded video present\*, or loss of power.

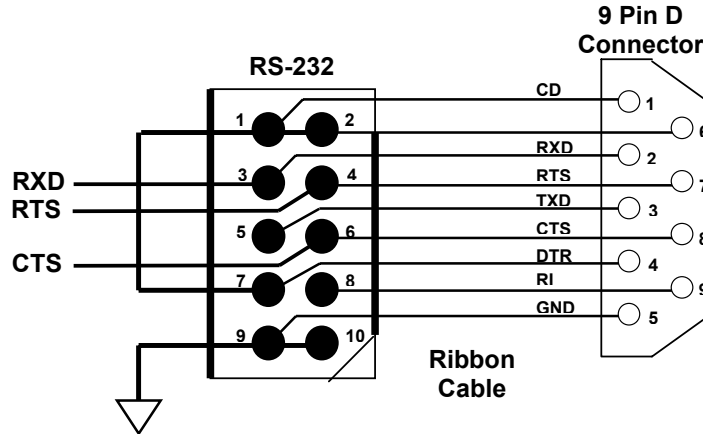


\* Note: If no video is inputted to the ADC-3250/OPT, system will still work with only audio present.

### RS-232 Data Output

The RS-232 data output port is via a 10 pin HE14 style of header. Pins 1, 2 and 7 are connected together on the PCB. Pins 9 and 10 are both earthed. Pin 3 is the RS-232 *receive data* (RXD) connection, pin 4 is the RS-232 *request to send* (RTS) connection and pin 6 is the RS-232 *clear to send* (CTS) connection. Data transfer is unidirectional only, this is a receive path only.

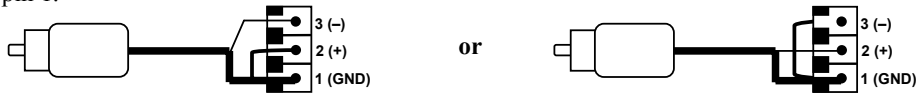
For connection to a standard RS-232 9 pin D connector, wire as per the diagram below:



### Unbalanced Audio Operation

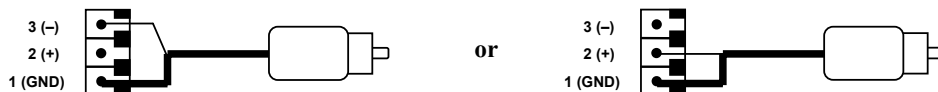
Audio inputs and outputs are balanced by default, however it is possible to wire the audio connectors for use with equipment using unbalanced interfaces.

On the ADC-3250/OPT connect the common (or shield) cable to pin 1 of the input audio connector, and the signal cable to either pin 2 or pin 3, but **not both**, of the audio connector. The unused pin, whether it be pin 2 or pin 3, connect to pin 1.



#### ADC-3250/OPT unbalanced input wiring

On the DAC-3250/OPT connect the common (or shield) cable to pin 1 of the corresponding output audio connector, and the signal cable to either pin 2 or pin 3, depending on what pin the signal cable was connected to on the encoder. **DO NOT** ground the unused pin. Leave the unused pin unconnected; else damage may occur to the audio driver chip.

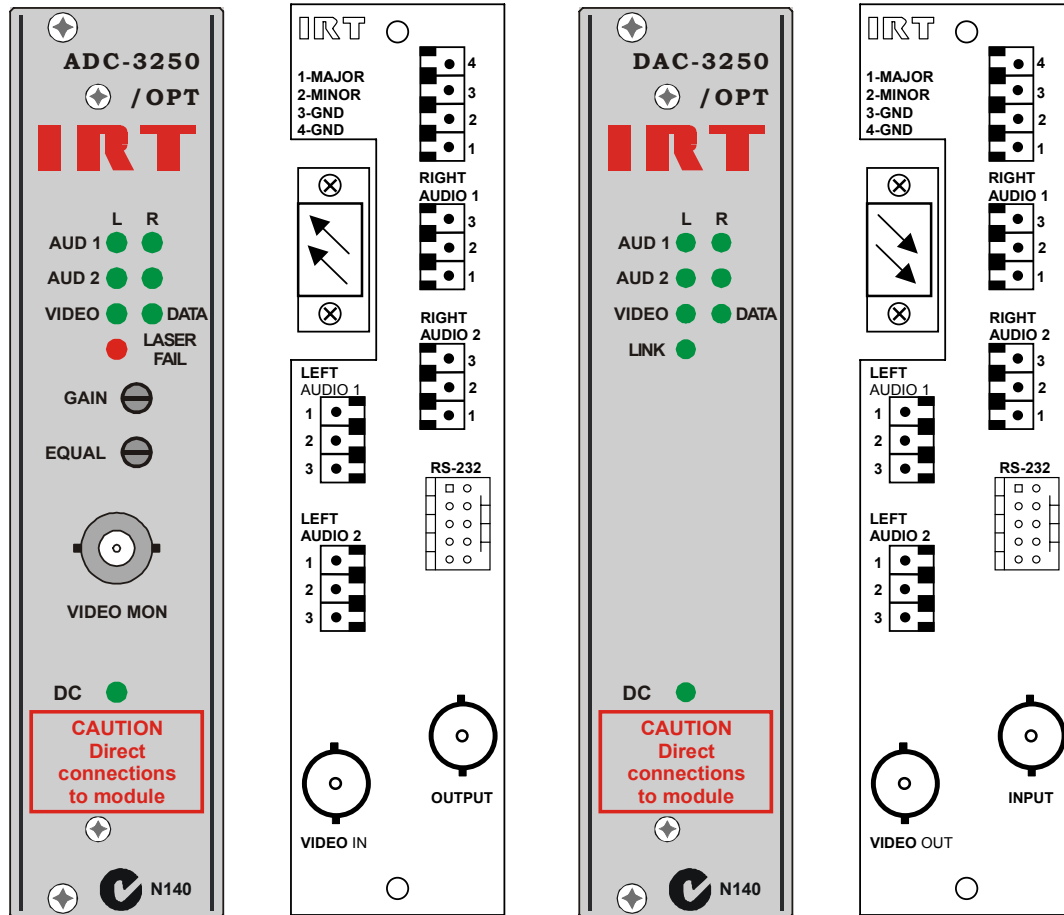


#### DAC-3250/OPT unbalanced output wiring



## Front & rear panel connector diagrams

The following front panel and rear assembly drawings are not to scale and are intended to show connection order and approximate layout only.



## Operation

The ADC-3250/OPT will take an analogue video input and up to four analogue audio inputs plus a unidirectional RS-232 data signal and encode them into a single 270 Mb/s data stream for interfacing with non-inverting ASI/SDI links. As with ASI signals, the 270 Mb/s output signal is phase dependent and so should only be used with non-inverting links.

Note that if the system is intended for audio or data use only, it is not necessary to also supply an input video signal, as all inputs are independent of each other.

With the link and switch settings correctly set as in the configuration section of this manual, and input and output connections correctly wired and cards installed in a suitable frame as in the installation section of this manual, operation is as simple as connect and turn on.

Front panel LED's on both the ADC-3250/OPT and DAC-3250/OPT indicate the presence of what inputs are connected to the ADC-3250/OPT. The DAC-3250/OPT also indicates the presence of a suitably encoded 270 Mb/s stream. If the optional optical sub board is also fitted to the ADC-3250/OPT, a front panel LED also indicates if there is a laser failure.

### Adjustments

With an ADC-3250/OPT & DAC-3250/OPT pair there is unity gain between the ADC-3250/OPT inputs and the DAC-3250/OPT outputs. The only user operational settings are on the ADC-3250/OPT front panel for compensating the analogue video for input cable losses.

With a waveform monitor connected to the *Video Mon* BNC connector on the front panel, input a known test signal such as colour bars down the intended input cable. Adjusting both the gain and equalisation controls through the front panel, using a small flat bladed tweaking screwdriver, can compensate for loss of gain and frequency roll off caused by the length of input coaxial cable.

## Maintenance & storage

### Maintenance:

No regular maintenance is required.

Care however should be taken to ensure that all connectors are kept clean and free from contamination of any kind. This is especially important in fibre optic equipment where cleanliness of optical connections is critical to performance.

### Storage:

If the equipment is not to be used for an extended period, it is recommended the whole unit be placed in a sealed plastic bag to prevent dust contamination. In areas of high humidity a suitably sized bag of silica gel should be included to deter corrosion.

Where individual circuit cards are stored, they should be placed in antistatic bags. Proper antistatic procedures should be followed when inserting or removing cards from these bags.

## Warranty & service

Equipment is covered by a limited warranty period of three years from date of first delivery unless contrary conditions apply under a particular contract of supply. For situations when “**No Fault Found**” for repairs, a minimum charge of 1 hour’s labour, at IRT’s current labour charge rate, will apply, whether the equipment is within the warranty period or not.

Equipment warranty is limited to faults attributable to defects in original design or manufacture. Warranty on components shall be extended by IRT only to the extent obtainable from the component supplier.

### Equipment return:

Before arranging service, ensure that the fault is in the unit to be serviced and not in associated equipment. If possible, confirm this by substitution.

Before returning equipment contact should be made with IRT or your local agent to determine whether the equipment can be serviced in the field or should be returned for repair.

The equipment should be properly packed for return observing antistatic procedures.

The following information should accompany the unit to be returned:

1. A fault report should be included indicating the nature of the fault
2. The operating conditions under which the fault initially occurred.
3. Any additional information, which may be of assistance in fault location and remedy.
4. A contact name and telephone and fax numbers.
5. Details of payment method for items not covered by warranty.
6. Full return address.
7. For situations when “**No Fault Found**” for repairs, a minimum charge of 1 hour’s labour will apply, whether the equipment is within the warranty period or not. Contact IRT for current hourly rate.

Please note that all freight charges are the responsibility of the customer.

The equipment should be returned **to the agent who originally supplied the equipment or, where this is not possible**, to IRT direct as follows.

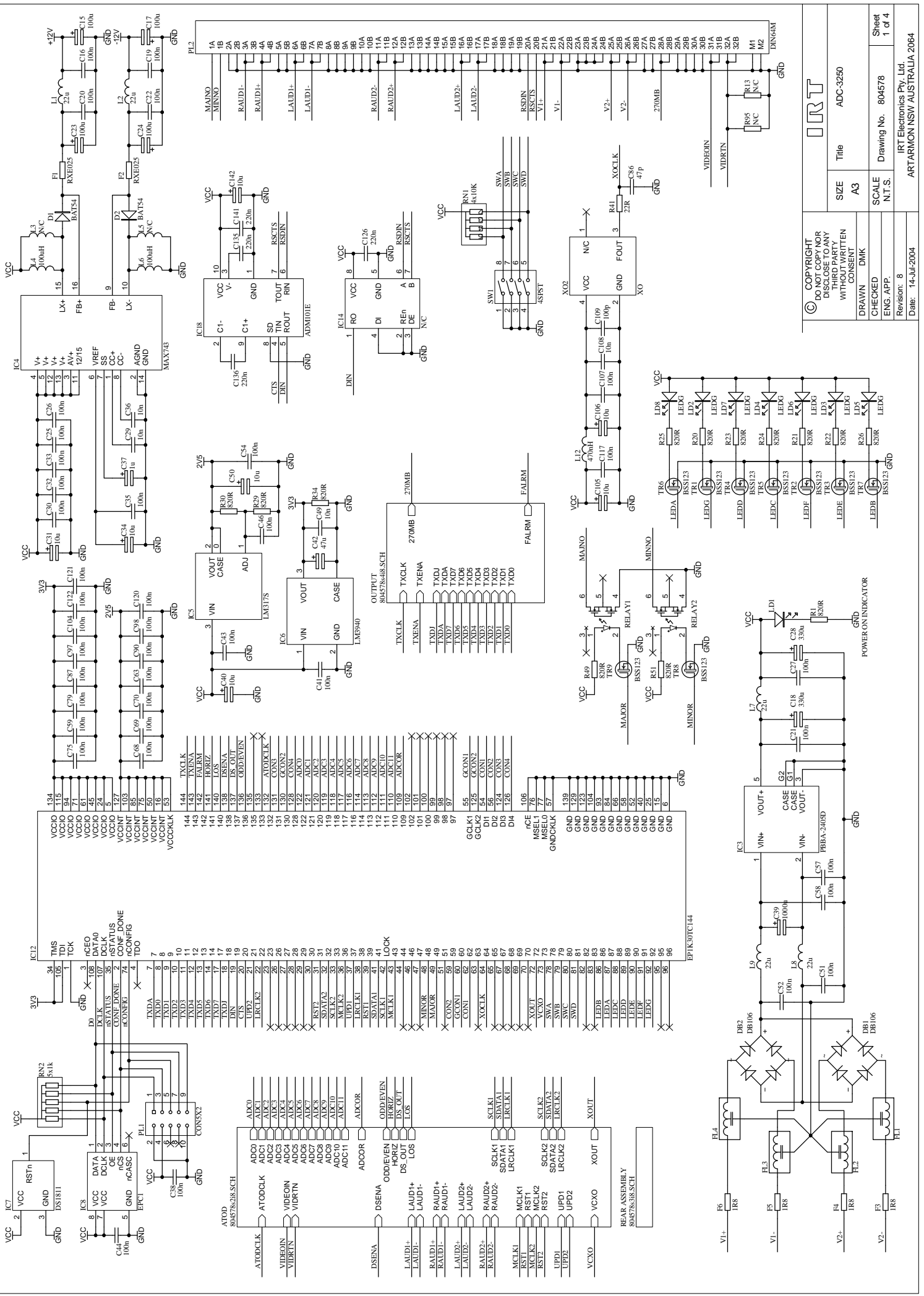
Equipment Service  
IRT Electronics Pty Ltd  
26 Hotham Parade  
ARTARMON  
N.S.W. 2064  
AUSTRALIA

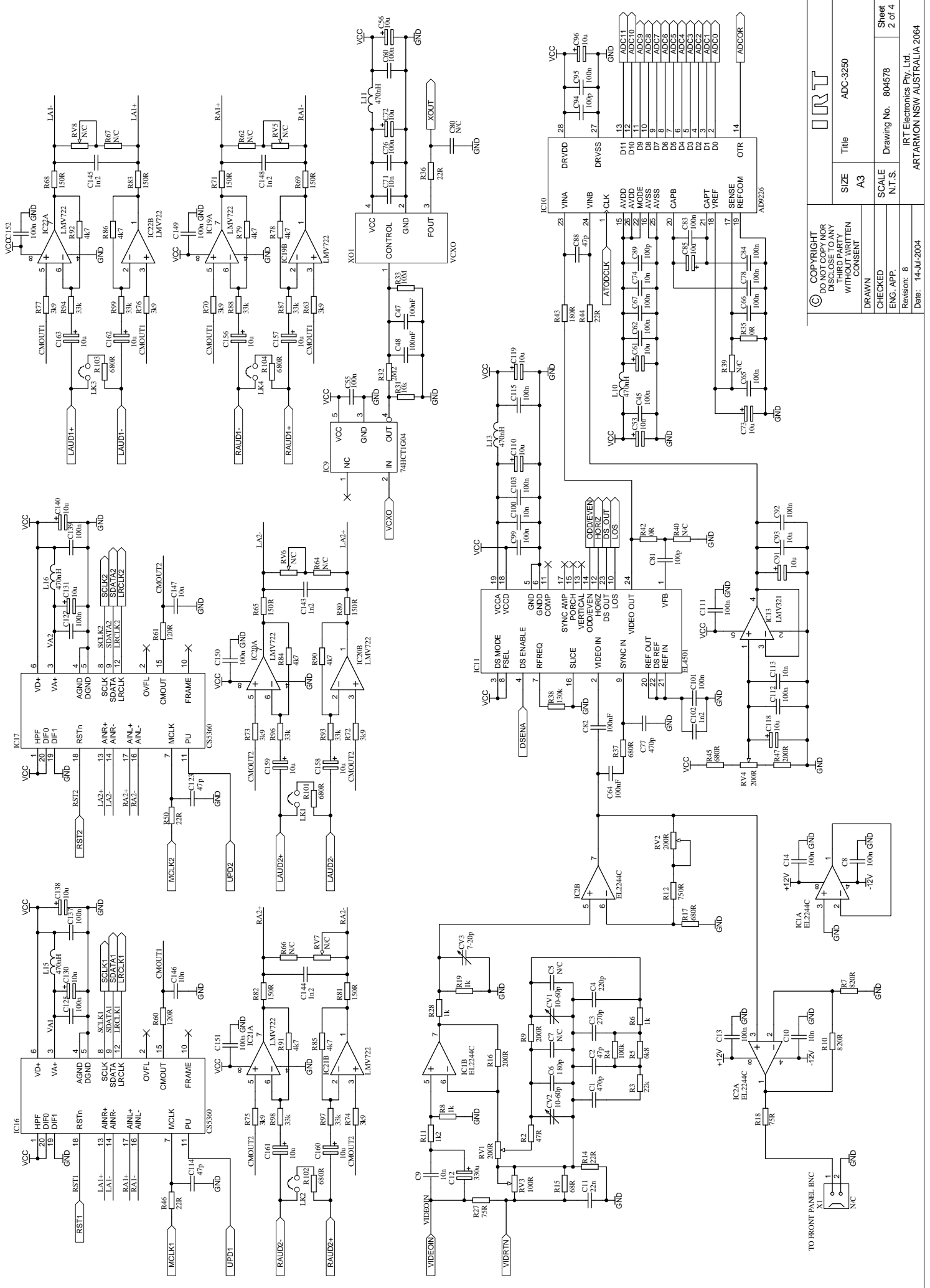
Phone: 61 2 9439 3744  
Email: [service@irtelectronics.com](mailto:service@irtelectronics.com)

Fax: 61 2 9439 7439

## Drawing List Index

Drawing #	Sheet #	Description
804578	1	ADC-3250 Analogue Video & Audio to 270 Mb/s encoder schematic – sheet 1.
804578	2	ADC-3250 Analogue Video & Audio to 270 Mb/s encoder schematic – sheet 2.
804578	3	ADC-3250 Analogue Video & Audio to 270 Mb/s encoder schematic – sheet 3.
804578	4	ADC-3250 Analogue Video & Audio to 270 Mb/s encoder schematic – sheet 4.
804597	1	DAC-3250 270 Mb/s to Analogue Video & Audio decoder schematic – sheet 1.
804597	2	DAC-3250 270 Mb/s to Analogue Video & Audio decoder schematic – sheet 2.
804597	3	DAC-3250 270 Mb/s to Analogue Video & Audio decoder schematic – sheet 3.
804597	4	DAC-3250 270 Mb/s to Analogue Video & Audio decoder schematic – sheet 4.

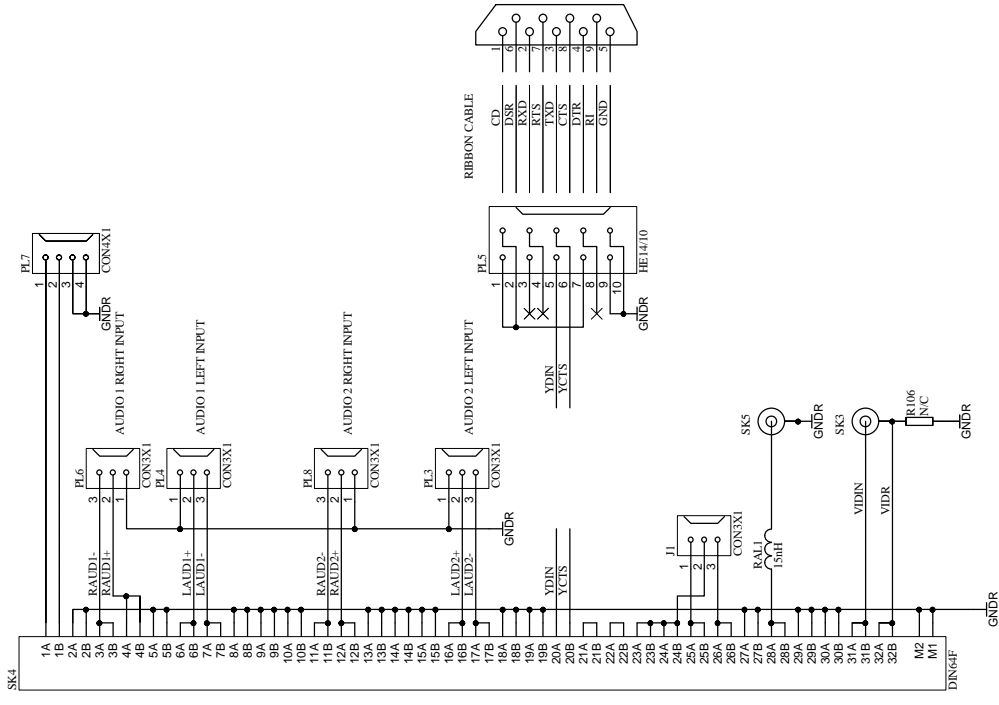




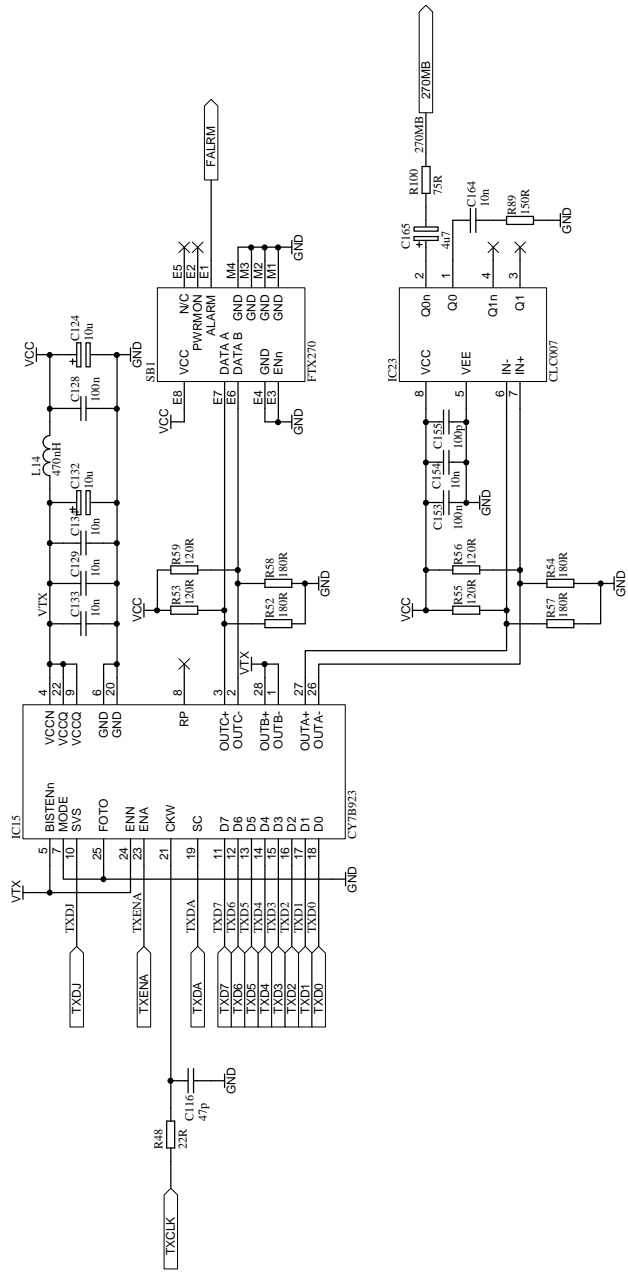
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ENG. APP.		ARTARMON NSW AUSTRALIA 2064	
Revision: 8		Date: 14-Jul-2004	

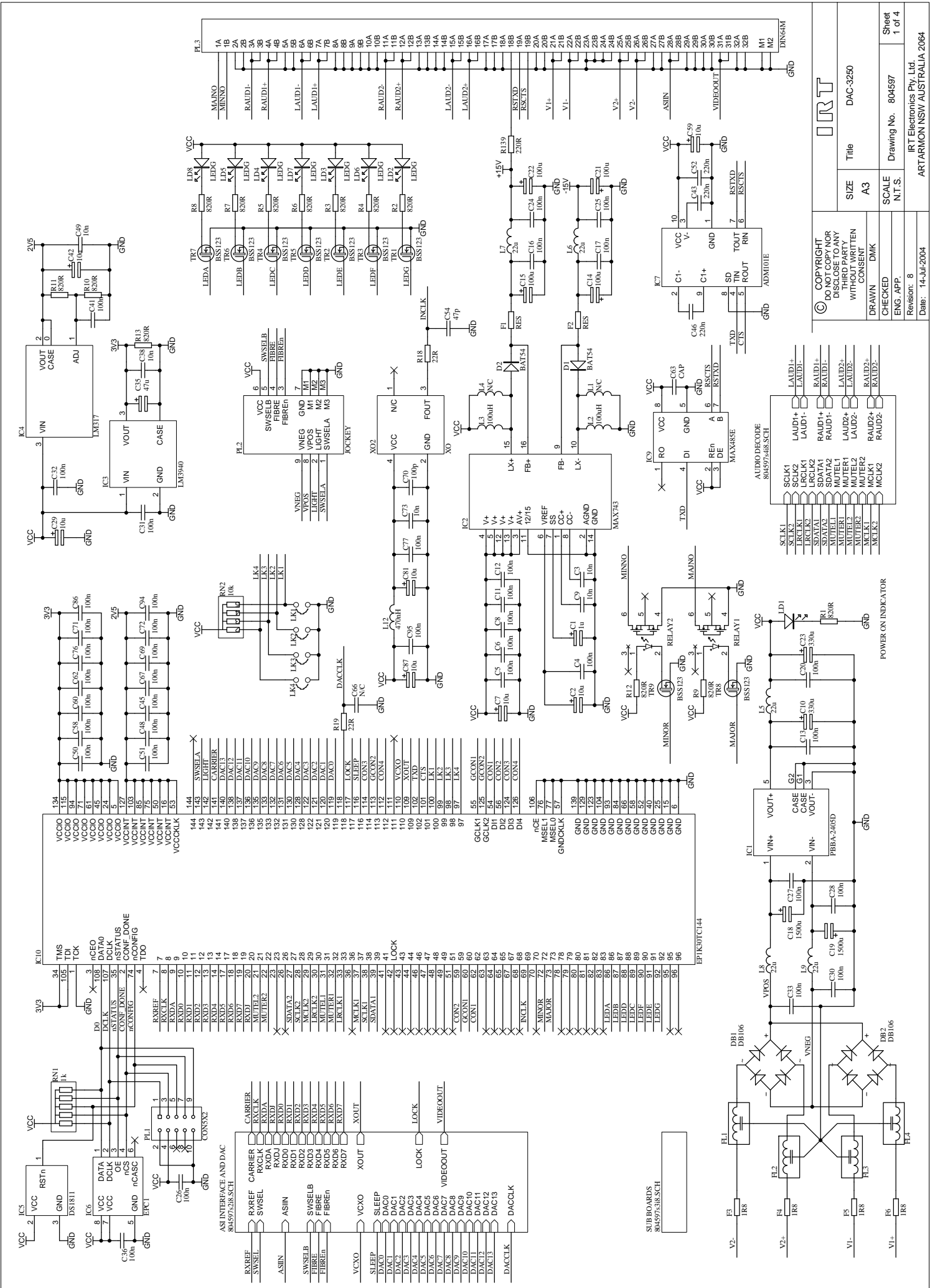


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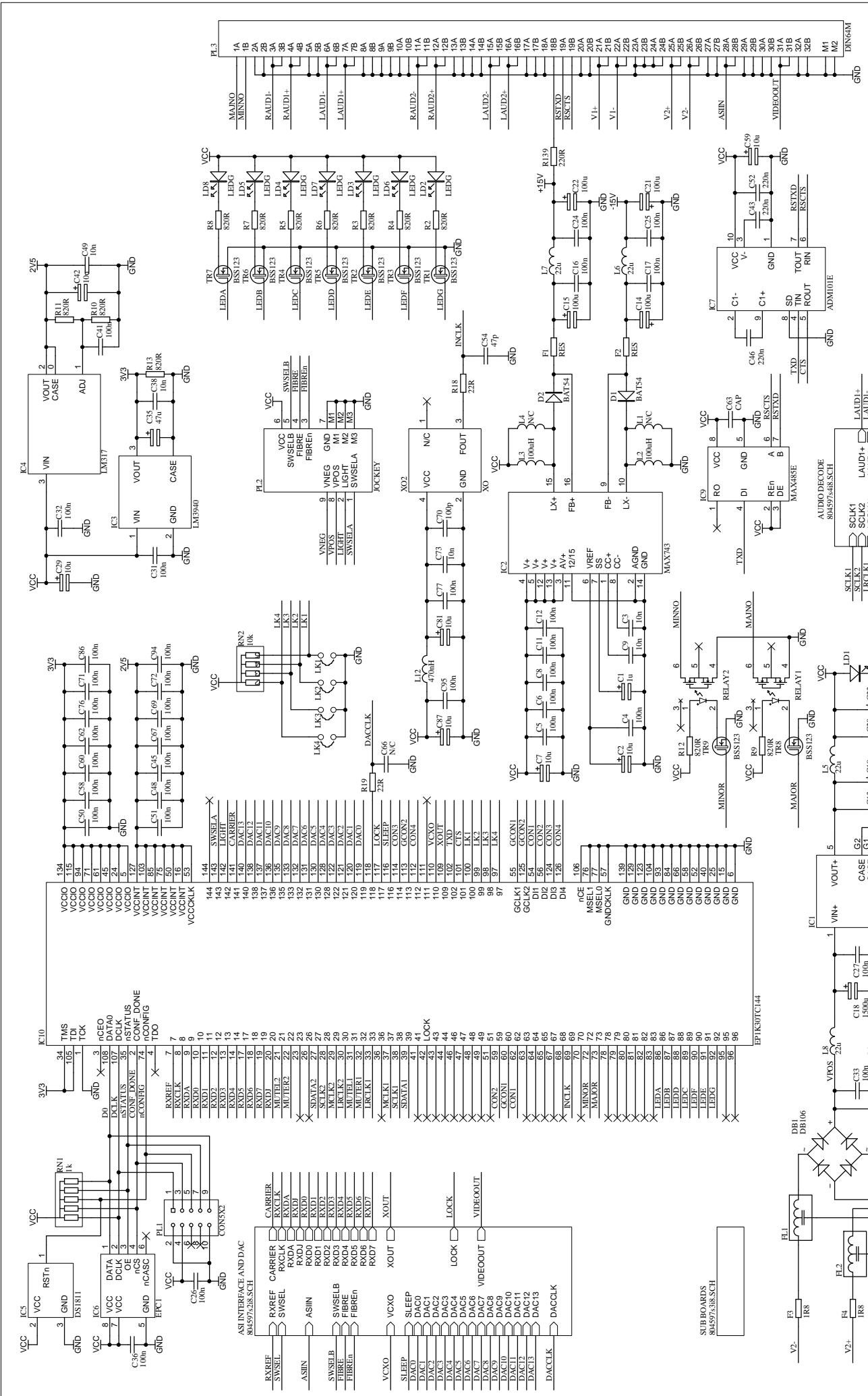
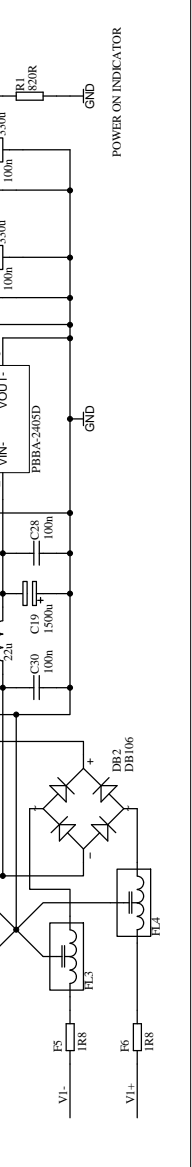
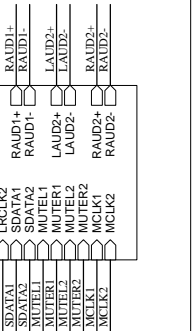


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		IRT Electronics Pty. Ltd.	
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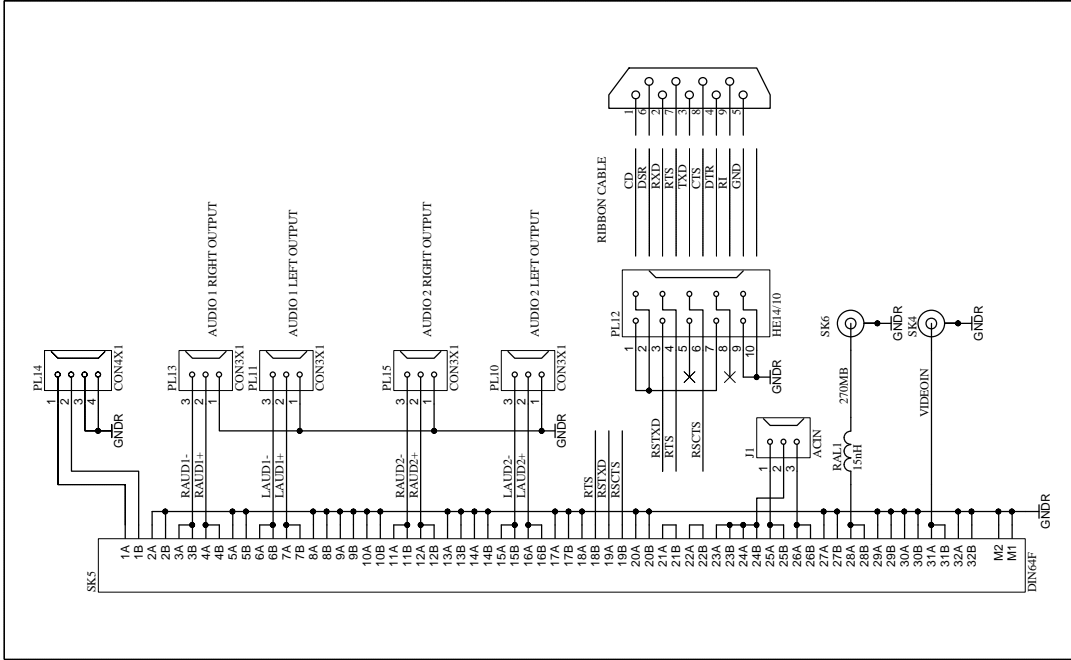




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 Sheet 1 of 4  
 Revision: 8  
 Date: 14-Jul-2004  
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Revision: 8

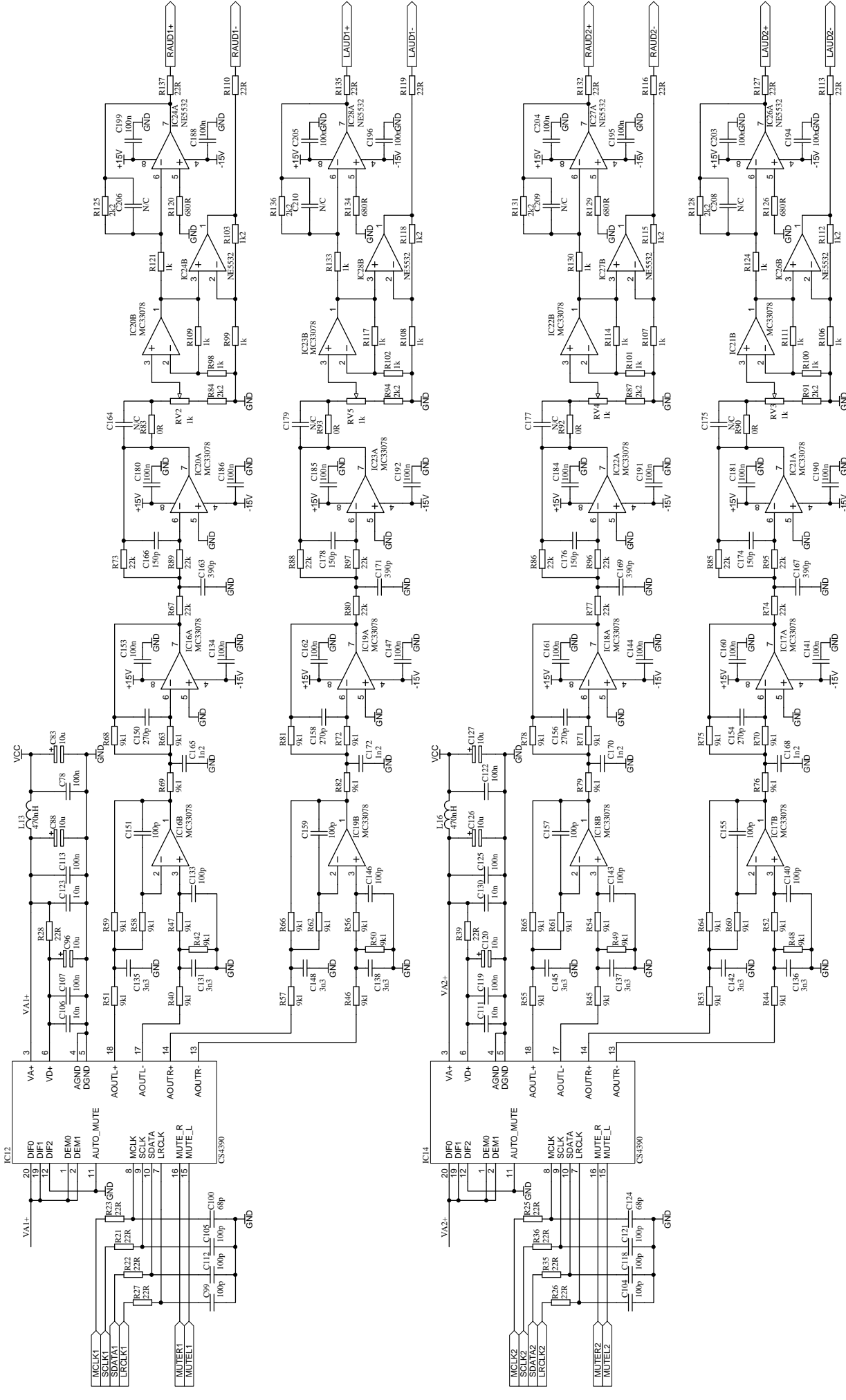
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Sheet 3 of 4

Drawing No. 804597

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Sheet 4 of 4

