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IRT Eurocard

Type DDC-3335

ASI/SPI Network Interface Adapter with RS Encoding

Designed and manufactured in Australia

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

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ASI/SPI Network Interface Adapter with RS Encoding

Instruction Book

Table of Contents

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
Type DDC-3335
ASI/SPI Network Interface Adapter
with RS Encoding

GENERAL DESCRIPTION

The DDC-3335 is part of a family of data transcoders for converting between the commonly used MPEG2 Transport Stream formats in the broadcast industry for video distribution.

The DDC-3335 accepts any ASI input data rate within the range of 1.5 Mb/s to 50 Mb/s.

The DDC-3335 accepts either a 188 or 204 byte packet format ASI signal. For a 188 byte packet ASI input, Reed Solomon check bytes are automatically added to convert the signal to a 204 byte packet signal. For a 204 byte packet ASI input, existing RS check bytes are over-written.

Interleaving and Energy Dispersal (Scrambling) of the signal is also performed. These two functions may be disabled by the insertion of on board links.

188 to 204 byte conversion & RS encoding are also link enabled/disabled. Disabling 188 to 204 byte conversion disables RS insertion and interleaving automatically.

Two ASI and 1 SPI outputs conforming to the DVB standard are provided.

The addition of RS encoding and optional Interleaving and Scrambling make the DDC-3335 suitable for preparing an ASI signal for transport over Telecom type lines or, in conjunction with IRT's MDT-3510 QPSK modulator, microwave links compatible .with the ETS-300-421 standard.

The signal is also monitored for MPEG2 transport stream sync errors and provides front panel LED indications for input packet byte length, loss of input and loss of sync. Alarm relay contacts are also provided on the rear connector for remote monitoring of alarm status.

The DDC-3335 is fabricated in IRT's standard Eurocard format and may be housed in a variety of IRT Eurocard frames alongside other standard modules.

Standard features:

- **Standard 75 Ω ASI-C input**
- **188 to 204 byte packet conversion**
- **Rate independent from 1.5 Mb/s to 50 Mb/s**
- **Automatic Reed Solomon encoding**
- **Interleaving and Energy Dispersal (Scrambling)**
- **Two ASI outputs plus serial to parallel conversion for output as SPI**
- **Automatic input equaliser to >250 m**
- **IRT Eurocard format**

TECHNICAL SPECIFICATIONS

IRT Eurocard module
Type/s DDC-3335

Input :

Type	1 x ASI-C
Input byte packet length	188 or 204 byte
Impedance	75 Ω.
Connector	BNC.
Return Loss	>15 dB 5 MHz to 270 MHz
Equalisation	Automatic, better than 250 metres at 270 Mb/s for belden 1505A, 8281 or PSFI/2 cable.

ASI-C Output :

Number	2
Output byte packet length	188 byte / 204 byte (link settable)
Impedance	75 Ω.
Level	800 mV p-p.
Connector	BNC.

SPI Output :

Number	1 (Conforming to the DVB standard)
Electrical characteristics	LVDS drivers.
Connector	25 pin ‘D’ female.

Other:

Power requirements		28 Vac CT (14-0-14) or ± 16 Vdc.
Power consumption		<7 VA.
Temperature range		0 - 50° C ambient.
Connectors		Phoenix plug in terminal blocks unless otherwise noted.
Mechanical		Suitable for mounting in IRT 19” rack chassis with input output and power connections on the rear panel.
Finish:	Front panel	Grey enamel, silk screened black lettering & red IRT logo
	Rear assembly	Detachable silk screened PCB with direct mount connectors to Eurocard and external signals
Dimensions		30 mm x 3 U x 220 mm IRT Eurocard
Standard accessories		Rear connector assembly including matching connectors for audio, alarms and controls.
Optional accessories		TME-6 module extender card. Instruction manual.

CIRCUIT DESCRIPTION

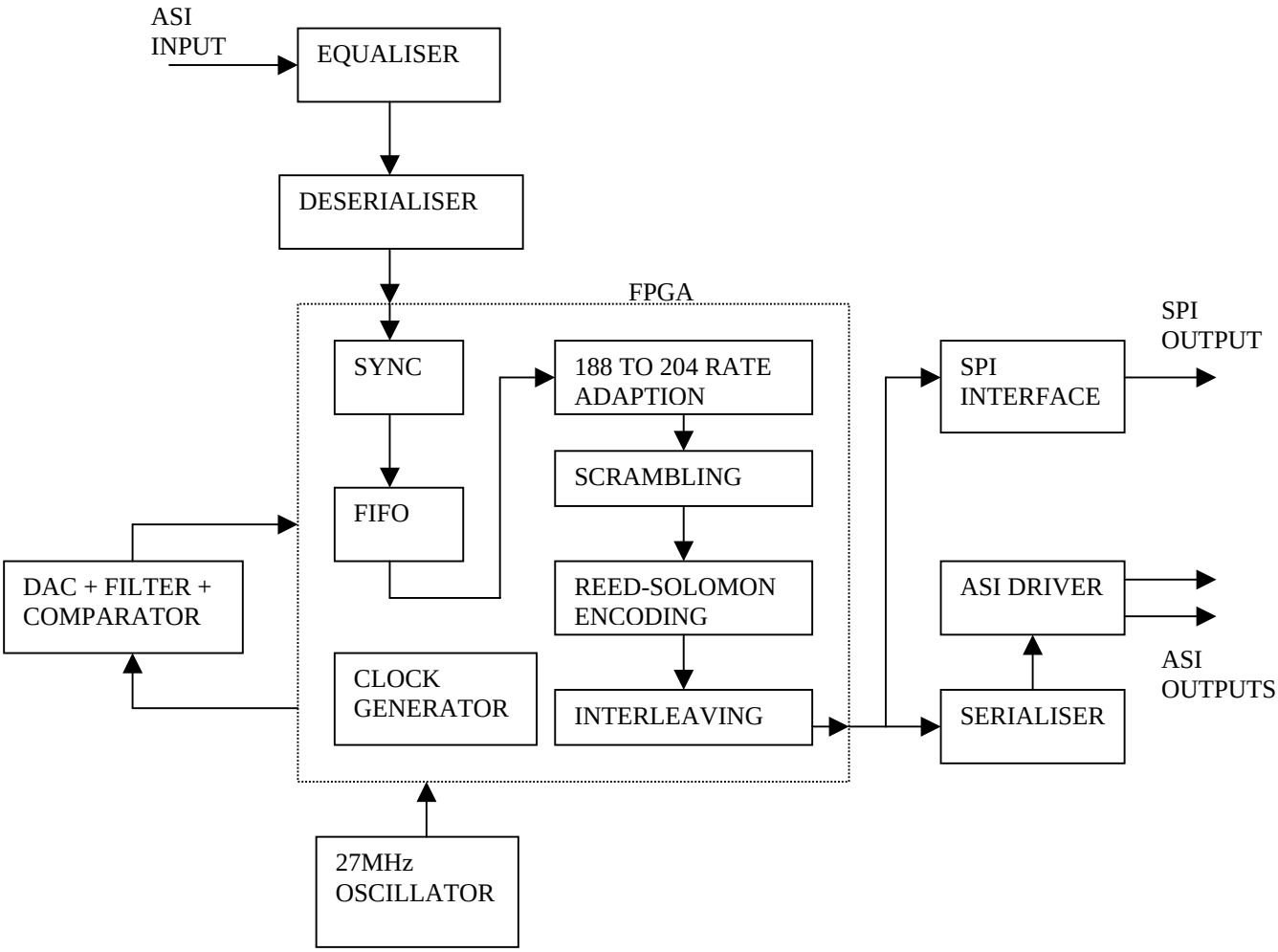
ASI input is fed via SK4, a BNC connector on the rear connector. This signal is passed to an equaliser chip, IC12, which then feeds a deserialiser chip, IC9, for inputting into the Field Programmable Gate Array (FPGA) chip, IC8, where processing of the input signal takes place. Rate conversion from 188 to 204 byte, scrambling, Reed Solomon encoding and interleaving are performed dependent on the settings of links LK1-LK4. IC10 provides the configuration settings for the FPGA.

The FPGA uses a DDS (direct digital synthesis) to recover the original signal rate clock from the ASI input. IC6, IC5 and IC7 form a DAC, filter and comparator, which convert the DDS output into a square wave. X01 is a crystal oscillator, which is used as the reference frequency for the DDS.

Outputs from the FPGA feed IC13, IC14 and IC15, which are SPI driver chips, to give an SPI output signal on the D25 connector on the rear connector. The FPGA also feeds a serialiser chip, IC11, which in turn feeds an ASI driver chip, IC16, to provide the two ASI outputs on the rear connector.

IC1 is a switch mode power supply and IC2 and IC3 are voltage regulators providing the relevant driving voltages required.

A relay with its contact positions to a 4 pin phoenix connector on the rear connector is activated on loss of signal or loss of sync for alarm applications.



CONFIGURATION

Link settings:

Issue 1 PCBs:

Issue 1 PCBs have only 2 link settings, J2 and J3. An insertion of a link acts to disable its relevant function.

J2 – IN Disable energy dispersal scrambling;
J2 – OUT Enable energy dispersal scrambling;
J3 – IN Disable interleaving performed;
J3 – OUT Enable interleaving performed.

Issue 2 (and above) PCBs:

This corresponds with all serial numbers 0301001 and above.

Issue 2 (and above) PCBs have 4 link settings, LK1 – LK4. An insertion of a link acts to disable its relevant function.

LK1 – IN Disable energy dispersal scrambling;
LK1 – OUT Enable energy dispersal scrambling;
LK2 – IN Disable interleaving performed;
LK2 – OUT Enable interleaving performed;
LK3 – IN Disable Reed Solomon added;
LK3 – OUT Enable Reed Solomon added;
LK4 – IN Disable 188 to 204 byte conversion;
LK4 – OUT Enable 188 to 204 byte conversion.

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.

ASI Input and Outputs:

ASI Input and outputs are by BNC connectors on the rear of the rear connector unit.

SPI Output:

SPI output is by a D25 female connector on the rear of the rear connector unit. Pins correspond to the standard SPI interface. Connect using a D25 male connector.

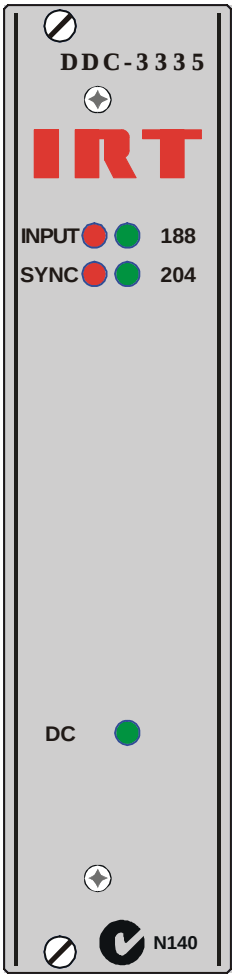
Alarm Relay:

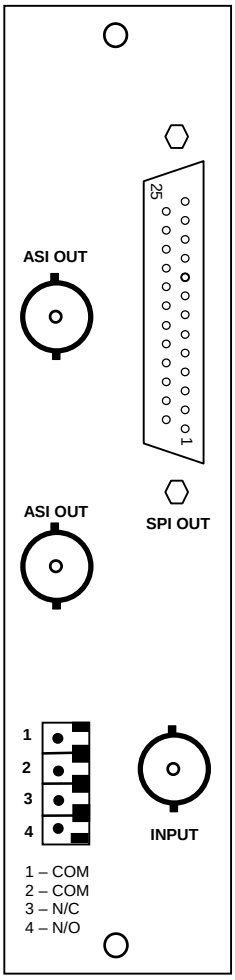
On loss of signal or loss of sync, alarm output is provided by front panel LEDs and a relay whose contacts appear on a 4 pin phoenix connector on the rear connector unit.

Pin 1 – Common;
Pin 2 – Common;
Pin 3 – Normally Closed (N/C);
Pin 4 – Normally Open (N/O).

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.





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.

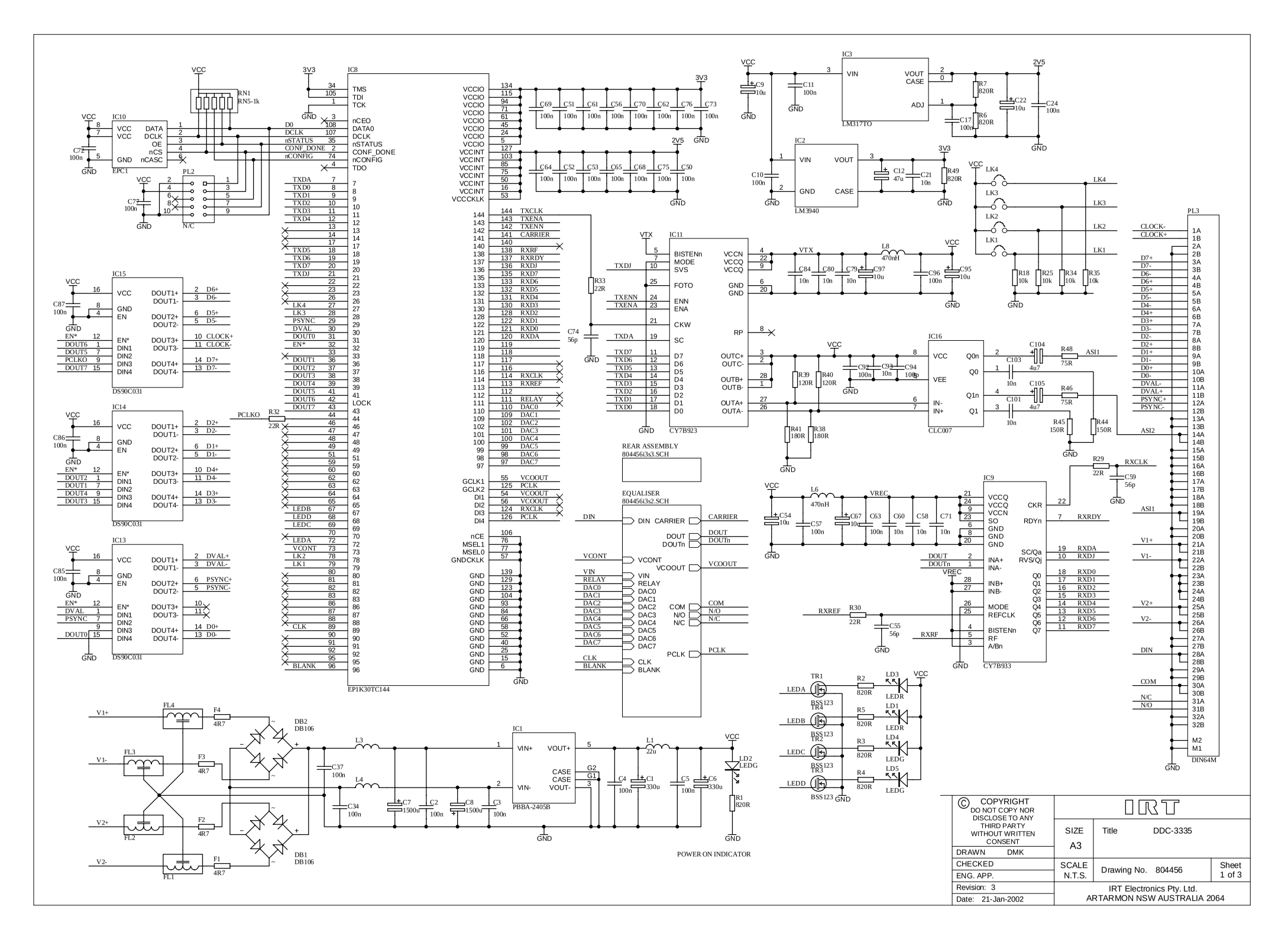
The equipment should be returned **to the agent who originally supplied the equipment** or, where this is not possible, to IRT direct as follows.

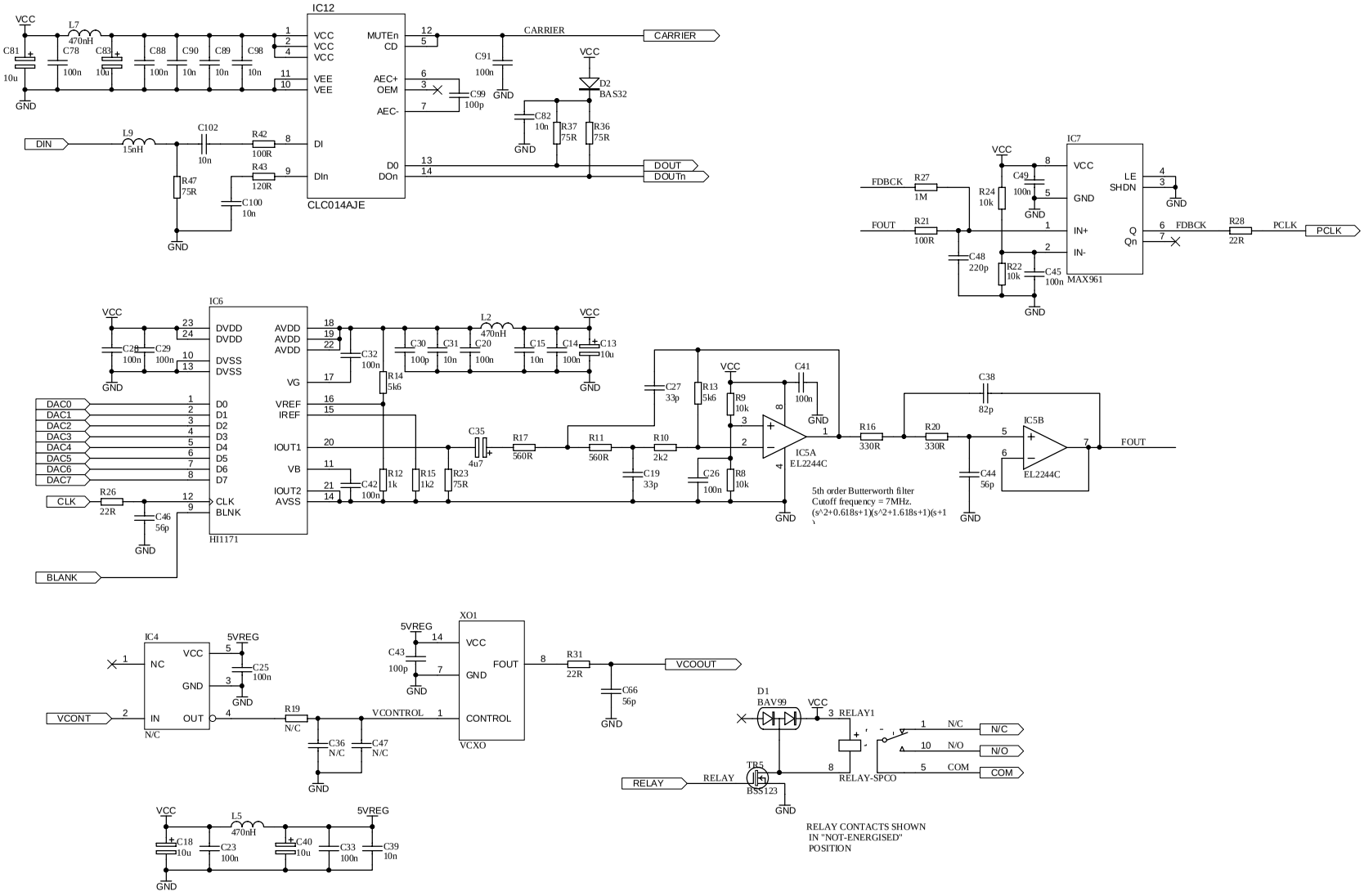
Equipment Service
IRT Electronics Pty Ltd
26 Hotham Parade
ARTARMON
N.S.W. 2064
AUSTRALIA

Phone: 61 2 9439 3744 Fax: 61 2 9439 7439
Email: service@irtelectronics.com

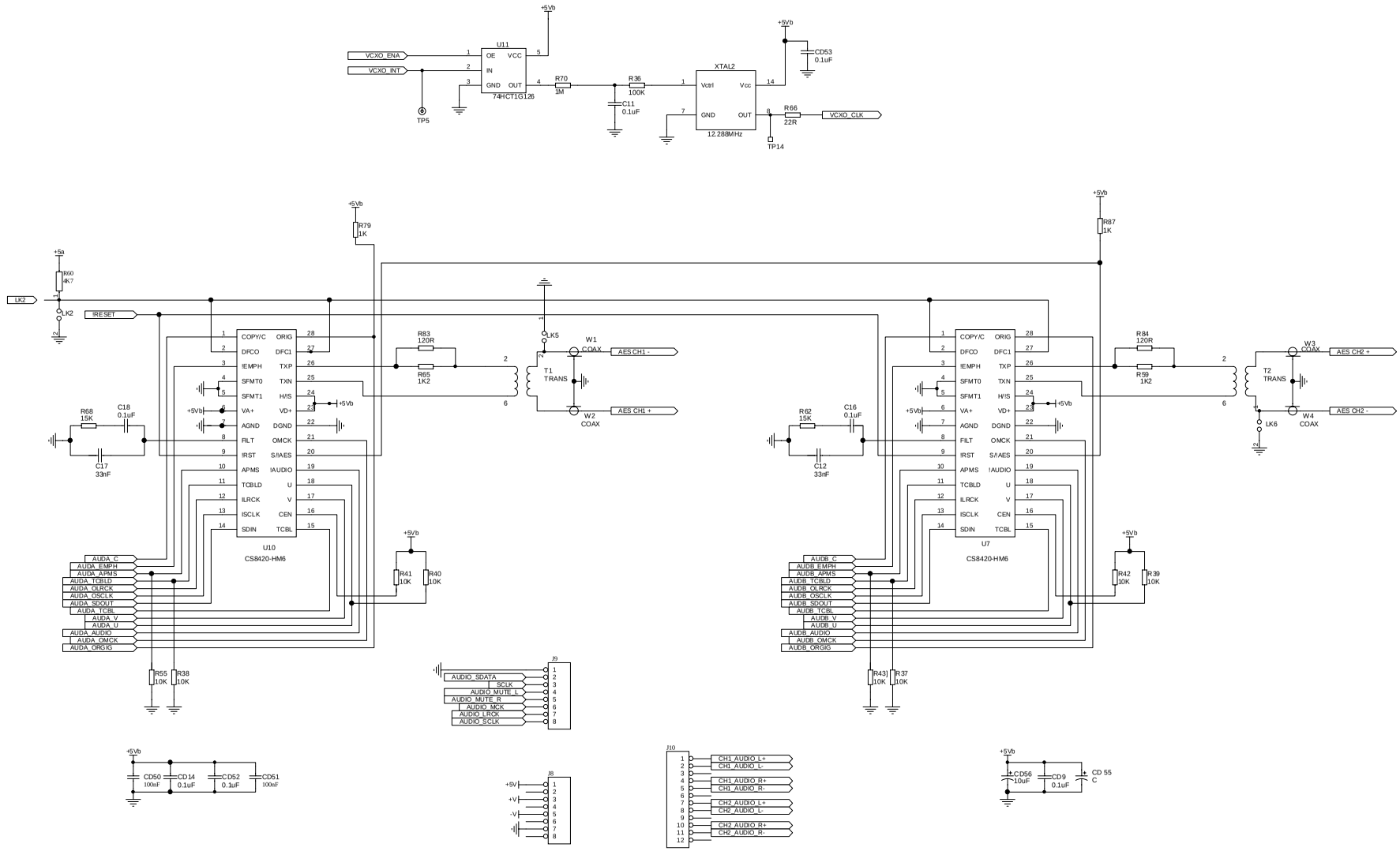
Drawing List Index

Drawing #	Sheet #	Description
804456	1	ASI to SPI with RSENC, INT, SCRAM, 188/204
804456	2	ASI to SPI with RSENC, INT, SCRAM, 188/204
804456	3	ASI to SPI with RSENC, INT, SCRAM, 188/204





DRAWN DMK	SIZE A3	Title DDC-3335 RECLOCKING SERIAL D.A.
CHECKED	SCALE N.T.S.	Drawing No. 804456 — Sheet 2 of 3
ENG. APP.		
Revision: 3		IRT Electronics Pty. Ltd. ARTARMON NSW AUSTRALIA 2064
Date: 21-Jan-2002		



1	9-03-2000	
2	25-08-2001	ECR1253

IRT

SIZE A2	Title	DAX-3206 SERIAL DIGITAL DECODER with AES and Analog Audio
DRAWN S.W.		
ENG.APR.		
CHECKED		
SCALE N.T.S.	Drawing No.	804556
	Sheet	3 of 6
Revision: 1		
Date: 12-Jun-2002		

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