I R T Electronics Pty Ltd A.B.N. 35 000 832 575
26 Hotham Parade, ARTARMON N.S.W. 2064 AUSTRALIA
National: Phone: (02) 9439 3744 Fax: (02) 9439 7439
International: +61 2 9439 3744 +61 2 9439 7439
Email: sales@irtelectronics.com
Web: www.irtelectronics.com

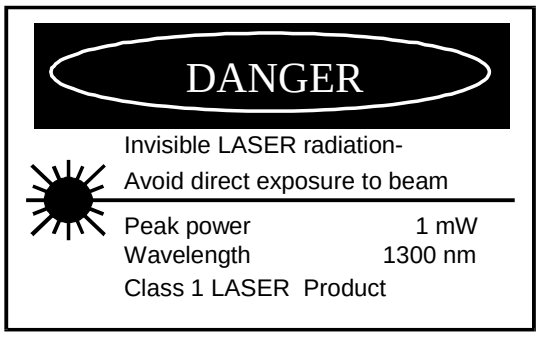
IRT Eurocard Types

AVT-3070/xxx
Analogue Video Fibre Optic LASER Transmitter
&
AVR-3070/xxx
Analogue Video Fibre Optic Receiver

(/xxx = /APC or /PC)

Telstra Serial Items
352/105 & 106 (/APC)

(This handbook Serial item 352/107)



Designed and manufactured in Australia

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

AVT-3070/xxx & AVR-3070/xxx

Analogue Video Fibre Optic Link

(/xxx = /APC or /PC)

Instruction Manual

Table of Contents

This instruction book applies to AVT-3070 units later than S/N 9601001
and AVR-3070C units later than S/N 0108001.

Operational Safety:

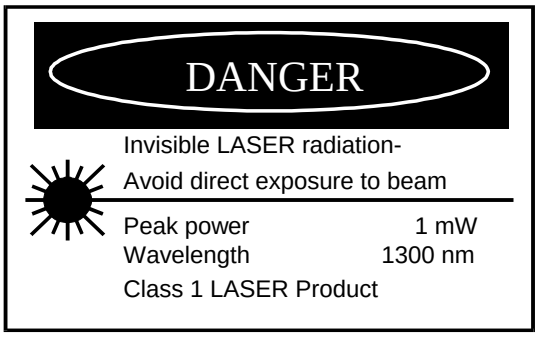
WARNING

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.

Optical Safety

The light emitted from the LASER diode used in this system is invisible and may be harmful to the human eye. Avoid looking directly into the fibre optic cable or connectors or into the collimated beam along their axis when the device is in operation. Operating the LASER diode outside of its maximum ratings may cause device failure or a safety hazard.



AVT-3070/xxx & AVR-3070/xxx

Analogue Video Fibre Optic Link

(/xxx = /APC or /PC)

General Description

The IRT AVT-3070 / AVR-3070 analogue video fibre optic link provides a channel bandwidth of 14 MHz allowing for a 6 MHz bandwidth video signal plus addition of several audio or data signals on subcarriers between 7 and 12 MHz.

The video signal is handled directly by the AVT-3070 and AVR-3070 modules. Additional signals are added using a subcarrier mixing input on the AVT-3070 and are extracted from a subcarrier output on the AVR-3070. Separate modules are available to modulate and demodulate subcarrier signals for stereo audio and data.

The use of fibre optic cable provides low signal attenuation with no gain or cable equalisation requirements and the added benefit of immunity to RFI and EMI and protection against lightning strikes.

The system uses single mode fibre (9/125μm) operating in the 1300 nm window with an allowable path loss of up to 24 dB. The operating distance depends upon the actual cable and connector losses.

AVT-3070 LASER transmitter

The AVT-3070 Transmitter uses a 1300 nm LASER diode with a launch power of between -7 and -10 dBm. The 6 MHz LPF can be by-passed to allow full use of the channel bandwidth of 14 MHz.

A LASER power alarm and LED indicator are provided.

If preferred, a 1500 nm LASER is available on request.

AVR-3070 PINTIA detector receiver

This receiver contains of an PINTIA Diode detector, which allows for a 24 dB path loss. The detected optical signal is demodulated and the audio & data subcarriers split. The signal is then passed through a 6.0 MHz LPF to recover the base band video signal.

Outputs are on the rear assembly of the module with a monitoring output on the front panel.

Alarms and LED's to indicate optical carrier failure and video failure are provided.

Modules may be installed in an IRT 1 RU or 3 RU Eurocard frames. The modules may be categorised as follows:

Applications:

- **Single channel broadcast quality analogue video link.**
- **Meets full broadcast CCIR or RS 250C Medium Haul Specifications up to a 24 dB optical path loss.**
- **Audio & data channels can be carried above the video channel**

Fibre optic link benefits include:

- **Immunity from RFI.**
- **Low signal attenuation.**
- **Lightning immunity.**
- **Electrical isolation eliminates ground loop problems.**
- **Elimination of equalisers & amplifiers over the link path.**

System Examples

Transmit end	Receive end
1300 nm Fibre systems: (Maximum optical path loss 24 dB.)	
Video only	
AVT-3070 1300 nm LASER transmitter	AVR-3070 1300 nm APD receiver
Video + 2 audio:	
AVT-3070 1300 nm LASER transmitter	AVR-3070 1300 nm APD receiver
AAT-3140 Dual channel audio modulator	AAR-3140 Dual channel audio demodulator.
Video + 4 audio:	
AVT-3070 1300 nm LASER transmitter	AVR-3070 1300 nm APD receiver
AAT-3140 Dual channel audio modulator	AAR-3140 Dual channel audio demodulator.
AAT-3140 Dual channel audio modulator	AAR-3140 Dual channel audio demodulator.
Video + 2 audio + RS232:	
AVT-3070 1300 nm LASER transmitter	AVR-3070 1300 nm APD receiver
AAT-3140 Dual channel audio modulator	AAR-3140 Dual channel audio demodulator.
DDT-3140 RS232 modulator	DDR-3140 RS232 demodulator.

Equipment provided:

Standard:	AVT-3070	1300 nm LASER transmitter (Single mode)
	AVR-3070	1300 nm APD receiver
Optional:	AAT-3140	Dual channel audio modulator.
	AAR-3140	Dual channel audio demodulator.
	ADT-3180	Alarm/control interface FSK encoder.
	ADR-3180	Alarm/control interface FSK decoder.
	DDT-3140	Asynchronous serial data encoder.
	DDR-3140	Asynchronous serial data decoder.

Technical Specifications

NOTE : **All performance figures are for Optical Path losses of 24 dB.**

Video: (Link performance)

Input & output connectors		BNC.
Specified input level		1 Vp-p (Luminance).
Input / output impedance		75 Ω.
Input signal		Composite PAL / NTSC or MAC style signal.
Noise (To CCIR Rec. 567-1)		< -63 dBrms.
Overall gain (adjustable from front panel)		< Unity ±3 dB.
Frequency response		±0. 1 dB to 5 MHz. ±0. 5 dB to 10 MHz (no audio).
Differential gain at 4. 43 MHz (3. 58 MHz)		<1. 0%.
Differential phase at 4. 43 MHz (3. 58 MHz)		<1. 0°.
Pulse to bar K-factor		<=0. 5%K.
Luminance/chrominance inequality:	Delay	<20 ns.
	Gain	<2%.

Optical:

Input & output connectors		SC/PC or SC/APC (specify when ordering)
LASER:	Wavelength	1300 nm.
	Launch power	-7 to -10 dBm - single mode (9/125 μm) cable.
Path loss:		Up to 24 dB to meet published specifications.

Other:

Temperature range		0 - 50° C ambient.
Power requirements		28 Vac CT (14-0-14) or ±16 Vdc.
Mechanical		Suitable for mounting in IRT 19" rack chassis with optical, RF & alarm connections at the rear.
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		6 HP x 3 U x 220 mm IRT Eurocard.
Supplied accessories		AVT-3070 and AVR-3070 rear connector assembly.
Related modules		AAT-3140 & AAR-3140 stereo audio subcarrier modulator / demodulator. DDT-3140 & DDR-3140 RS232/422 subcarrier modulator / demodulator.

NOTE : All the parameters specified are only applicable when using single mode (9/125 μm) fibre cable.

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

Technical Description

A detailed circuit description is beyond the scope of this manual. The following description is intended to give the user only a basic understanding of the principles involved. If detailed information is required for servicing purposes, please contact the factory.

Please refer to the diagrams provided at the rear of this manual as noted:

AVT-3070: (dwg: 803801)
The video input is equalised and amplified. Although the system is capable of a full 14 MHz bandwidth, frequencies above 5.5 MHz are not normally required for visual information. Frequencies above this are normally used for carrying supplementary signals by the use of subcarriers.

In order to provide a clean signal for the inclusion of subcarriers, the video signal is passed through a low pass filter. The Faraday filter used is a plug in type and may be bypassed if full 14 MHz bandwidth is required for the video signal.

Subcarriers for the audio channels are generated in separate modules for addition to the video signal. See separate manual for details.

The video and the audio subcarriers are then pre-emphasised and back porch clamped. The resultant signal is used to modulate a wide band modulator, which has excellent linearity over the full modulation bandwidth. The modulator frequency, without deviation, is approximately 30 MHz.

The modulated signal then drives the low powered LASER. The optical power output is set to -10 dBm and connected to the external fibre cable via an SC fibre optic connector.

AVR-3070: (dwg: 804588)

The optical signal received at the receiver is connected to a PINTIA diode. The signal detected by the photodiode is then amplified and fed to an AGC amplifier, which maintains a constant RF output level over the received optical signal range. The signal is then fed to a limiter and demodulator.

The output from the discriminator is band limited to 14 MHz. It is then amplified and de-emphasised to provide a full bandwidth video signal containing both video signal and audio subcarriers.

The video signal is split to provide a subcarrier output for de-modulation of audio and or data signals in their separate modules.

The video signal is low pass filtered to remove any subcarriers and passed to the video output via the mute switch.

Configuration & Controls

Operational Adjustments

AVT-3070
Input Gain.
The video input level has been factory aligned for a 1 Vp-p video signal at the input to the AVT-3070. The signal level to the AVT-3070 must be properly set for the video channel noise and linearity specifications to be met. Therefore if the video level into the AVT-3070 is different, the gain should be adjusted so that the VID. MON. output is 1 Vp-p.

Cable Equalisation.
If a long run of cable is used to feed the input to the transmitter then the EQ. should be adjusted to give a properly equalised video signal at the VIDEO MON. output on the AVT-3070.

AVR-3070
Output Gain: The GAIN on the AVR-3070 front panel should be adjusted so that the video signal at the VIDEO MON. output is 1 Vp-p.

AUDIO
The AVT-3070 & AVR-3070 support the inclusion of audio or data signals on suitable subcarriers of the video signal. See separate manuals for details of these modulators and de-modulators.

Internal Adjustments

The following adjustable controls are factory set and should not be adjusted. They are not 'operational' controls.
Correct adjustment requires the use of calibrated standards and must be carried out in correct sequence.
Any adjustment by the user is likely to, at best, degrade the performance and make the module incompatible with other modules or systems.
The following list of controls is for information purposes ONLY as an aid to understanding the principles of the transmission system.
Some controls and components are deliberately omitted from production units; provision for these on the PCB is for factory test purposes and custom configurations.

AVT-3070
C 4 Video frequency response.
C 6 Video frequency response.
C 8 Video frequency response.
C 10 Video frequency response.
C 12 Video frequency response.
C 29 Not used.
C 35 Pre-emphasis.
C 40 Video frequency response.
C 43 Carrier centre frequency. *

RV 1 Input cable equalisation. (Front panel adjustment)
RV 2 Input common mode.
RV 3 Video output level. (Front panel adjustment)
RV 4 Not used
RV 5 Blanking frequency adjustment. *
RV 6 Modulation linearity. *
RV 7 2nd harmonic null. *
RV 8 LASER drive. *
RV 9 LASER temperature. *
RV 10 LASER power control. *
RV 11 High power alarm reference.
RV 12 Low power alarm reference.

* Critical adjustment - DO NOT ADJUST.

LK 1 Video clamp on/off Clamped: link out.
Not clamped: link installed.
LK 2 Pre-emphasis on/off - normally linked.

Wideband operation:
Where no audio is to be used the AVT-3070 may be set for full video bandwidth output (≈14 MHz) as follows:

1. Remove the Faraday low pass filter from its DIL socket.
2. Insert a dummy DIL header into the socket with pin 1 connected to pin 20.
3. Re-adjust front panel video gain for 1 Vp-p at VIDEO MON. socket on front panel.

Note that for this to be effective the same modification must be made to the connected receiver module.

AVR-3070
C 31 Not used
C 107 Video frequency response.

RV 1 AGC level.
RV 2 Video output level (Front Panel Adjustment)
RV 3 Carrier 2nd harmonic balance. *
RV 4 DC offset null.
RV 5 Not used
RV 6 Video frequency response.
RV 7 De-emphasis EQ 1.
RV 8 De-emphasis EQ 2.
RV 9 Video pre-set gain.

LK 1 Receive loss alarm disable - normally linked.
LK 2 Video clamp on/off Clamped: link out
Not clamped: link installed
LK 3 Audio subcarrier out - normally linked.
LK 4 De-emphasis on/off - normally linked.

* Critical adjustment - DO NOT ADJUST.

Wideband operation:
Where no audio is to be used the AVR-3070 may be set for full video bandwidth output (≈14 MHz) as follows:

1. Remove the Faraday low pass filter from its DIL socket.
2. Insert a dummy DIL header into the socket with pin 1 connected to pin 20.
3. Re-adjust front panel video gain for 1 Vp-p at VIDEO MON. socket on front panel.
4. Remove link LK 3 to disable S/C output signal.

Note that for this to be effective the same modification must be made to the connected transmitter module.

Monitor points and indicators:

There are a number of indicators on the AVT-3070 series that can aid fault detection:

ALL Modules:
DC green LED indicates the presence of ±12V on each module as appropriate.

AVR-3070:
RX LOSS red LED indicates that the received carrier level is not present or below the range of the AGC.
VID. FAIL red LED indicates the absence of video on the demodulator output.

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 also details in separate manual for selected frame type.

Warning

Optical Connections

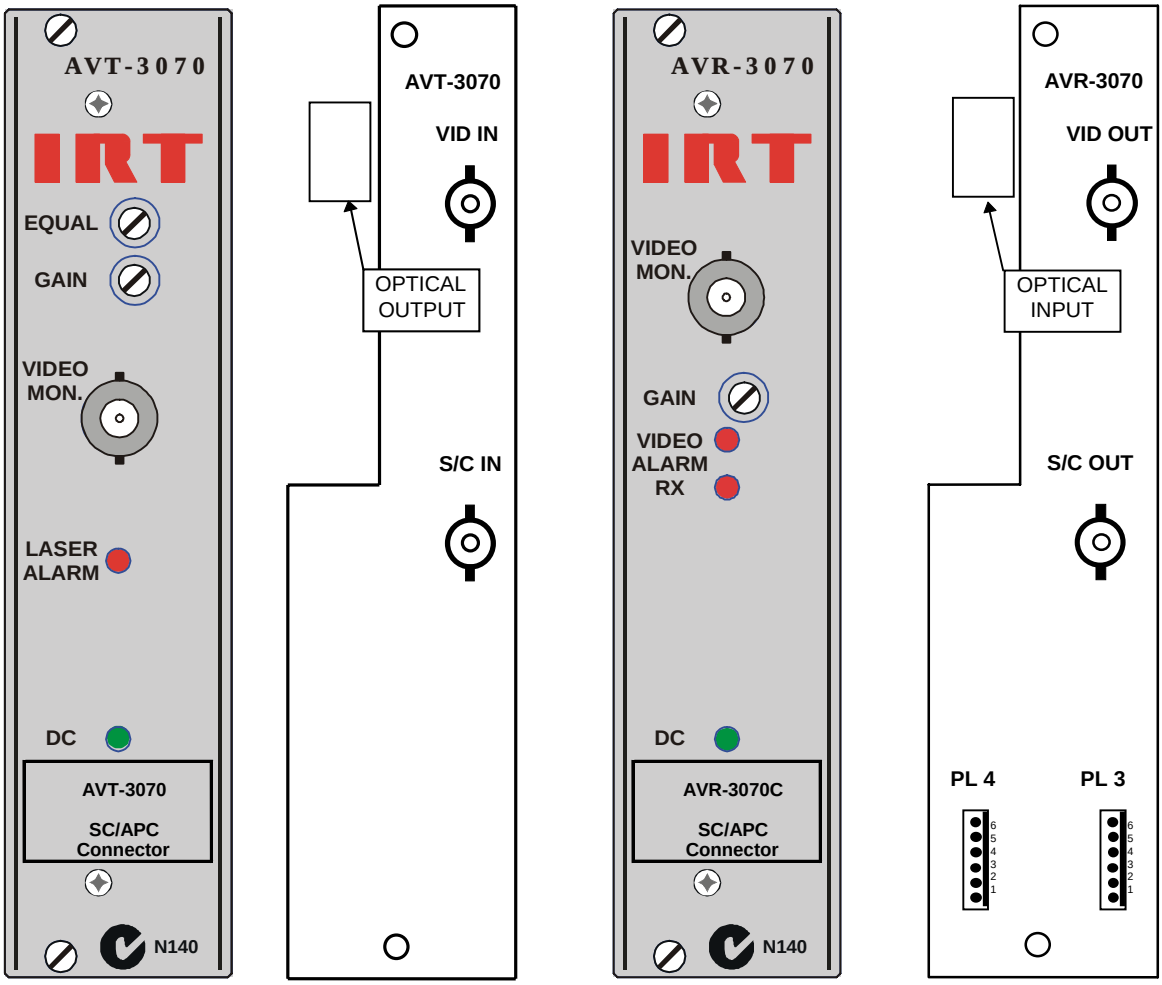
The optical connectors on the AVT-3070 & AVR-3070 are attached to the main module PCB, NOT the rear connector assembly.

When installing the optical fibre sufficient slack should be allowed for the module to be withdrawn with the optical fibre attached until the connector is clear of the frame and can be disconnected.

If this is not done, the module will not be able to be removed without first disconnecting the optical fibre at the rear. Attempting to remove the module without first disconnecting the fibre may result in damage to the fibre and / or the module.

Front and rear panel diagrams.

The following drawings are not to scale and are intended to show relative positions of controls, indicators and connectors only.



Inter-module connections:

See interconnection diagram following.

Audio muting:

The AAR-3140 dual audio de-modulator is provided with a muting input on PL 3, which may be used to mute the output audio when no video carrier is present.

To enable this function PL 3 on the AAR-3140 must be connected to PL 4 on the AVR-3070.

PL 4 on the AAR-3140 provides a loop through of this connection for use by another AAR-3140 where more than two channels of audio are fitted.

Note:
PL 3 & PL 4 on the AAT-3140 need not be connected and are included only for compatibility with previous systems.

Subcarriers: (S/C in & S/C out)

Audio and data signals that are required to be carried on the link are first modulated onto subcarrier frequencies between 6.5 MHz and 12 MHz. For actual subcarrier frequencies used, consult the manual for the appropriate modules.

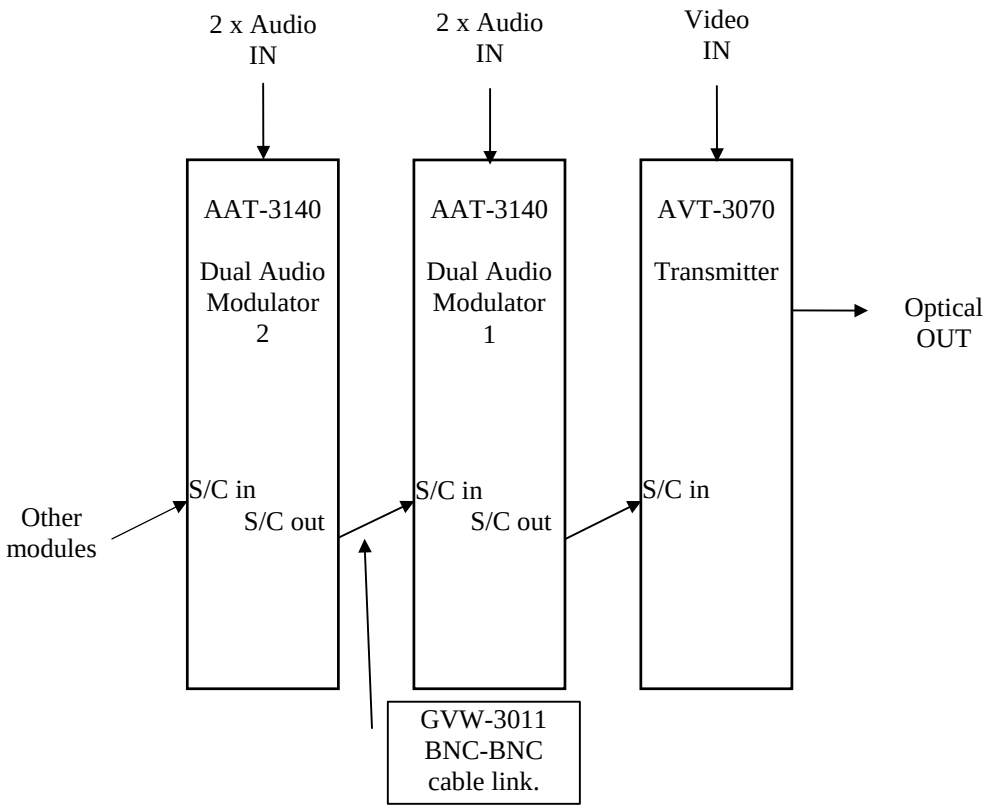
Each audio or data module provides a S/C out connection, which is adjusted to a suitable level for addition to the video signal.

The S/C in connection on the AAT-3140 provides a means of adding subcarriers from other modules to those of the AAT-3140 so that only one S/C input is required on the AVT-3070. The converse connections apply at the receive end of the link with the AVR-3070 and AAR-3140's.

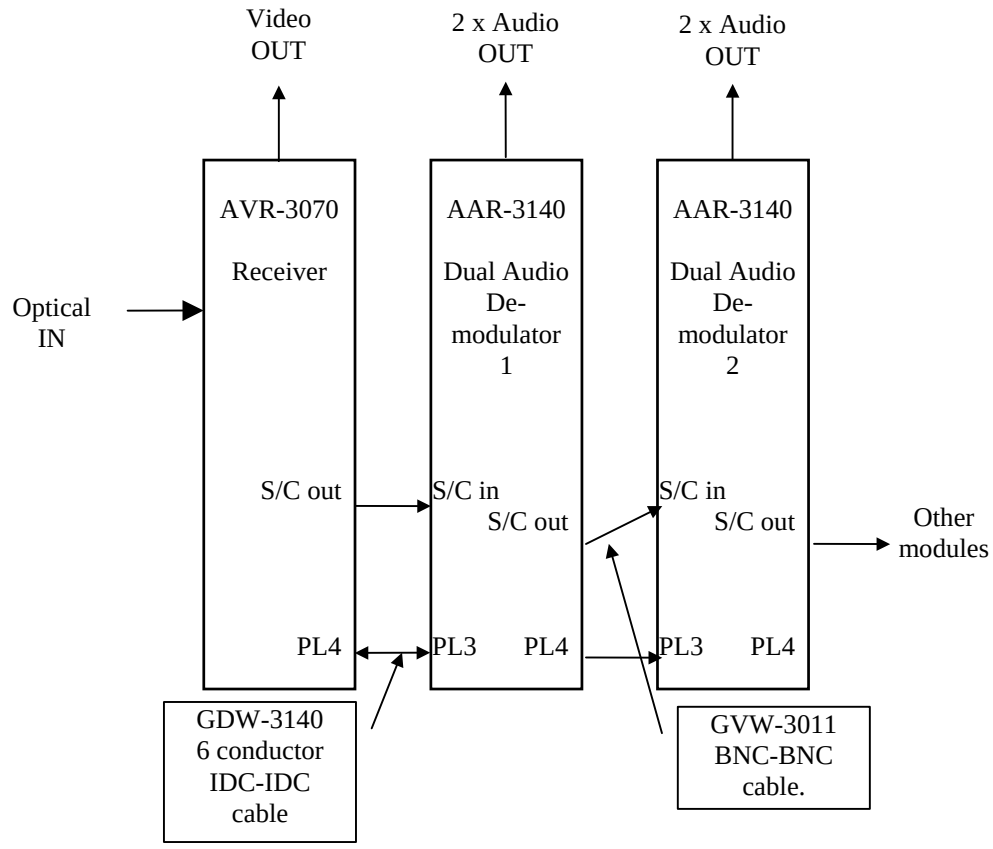
Connection of the subcarriers may be made using the accessory cable type GVW-3011 (150 mm BNC – BNC) where the modules are located side by side in a 3 RU frame or GVW-3012 (300 mm BNC – BNC) for 1 RU frames.

Module interconnection diagrams:

Transmitter



Receiver



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.

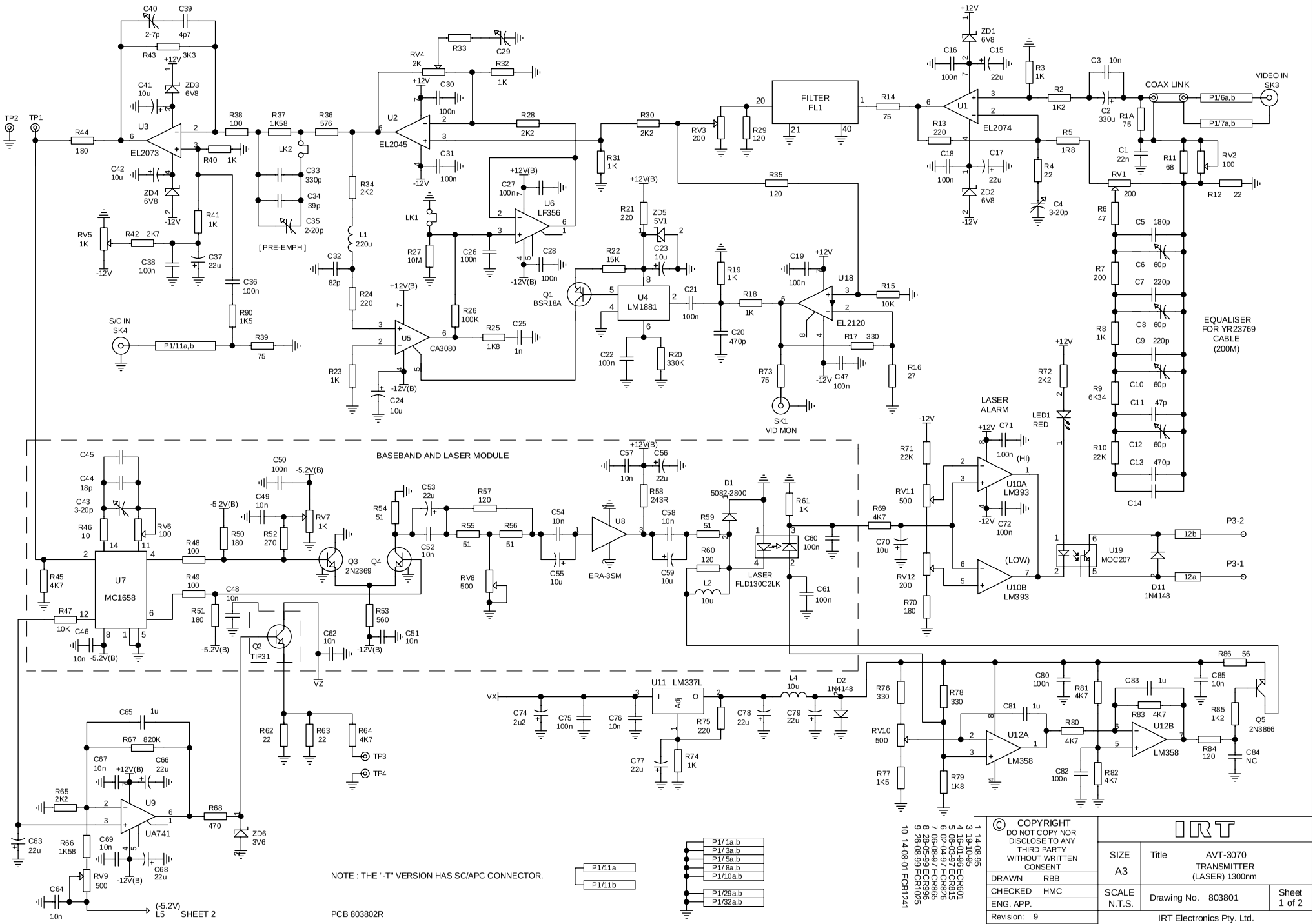
The equipment should be returned **to the agent who originally supplied the equipment** or, where this is not possible, to IRT direct as follows.

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 index

Drawing #	Sheet #	Description
803801	1	AVT-3070 Optical Transmitter (LASER) 1300 nm.
803801	2	AVT-3070 PSU schematic.
804588	1	AVR-3070C 1300nm Receiver schematic
804588	2	AVR-3070C De-modulator and de-emphasis schematic
804588	3	AVR-3070C PSU schematic

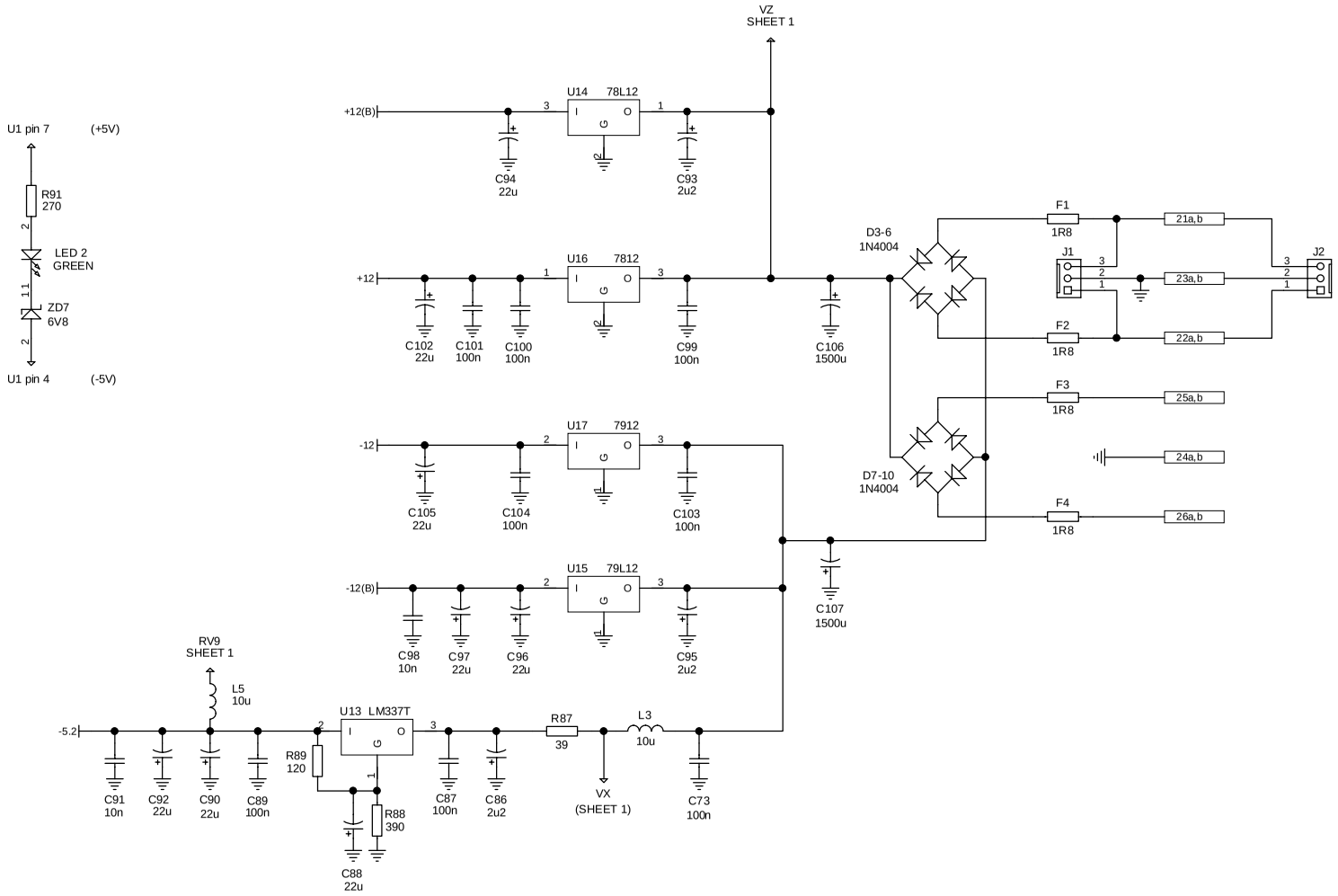


1	14-08-95	
3	19-10-95	
4	16-01-96	ECR601
5	06-03-97	ECR815
6	02-04-97	ECR826
7	06-08-97	ECR865
8	28-05-99	ECR996
9	26-08-99	ECR1025
10	14-08-01	ECR1241

IRT

SIZE A3	Title	AVT-3070 TRANSMITTER (LASER) 1300nm	
DRAWN RBB			
CHECKED HMC			
ENG. APP.			
Revision: 9			
Date: 25-Jan-2002	SCALE N.T.S.	Drawing No. 803801	Sheet 1 of 2

IRT Electronics Pty. Ltd.
ARTARMON NSW AUSTRALIA 2064



1 14-09-95
3 19-10-95
4 16-01-96 ECR601
5 06-03-97 ECR815
6 02-04-97 ECR826
7 06-08-97 ECR865
8 28-05-99 ECR996
9 26-08-99 ECR1025

DRAWN
CHECKED
ENG. APP.
Revision: 9
Date: 25-Jan-2002

IRT

SIZE A3

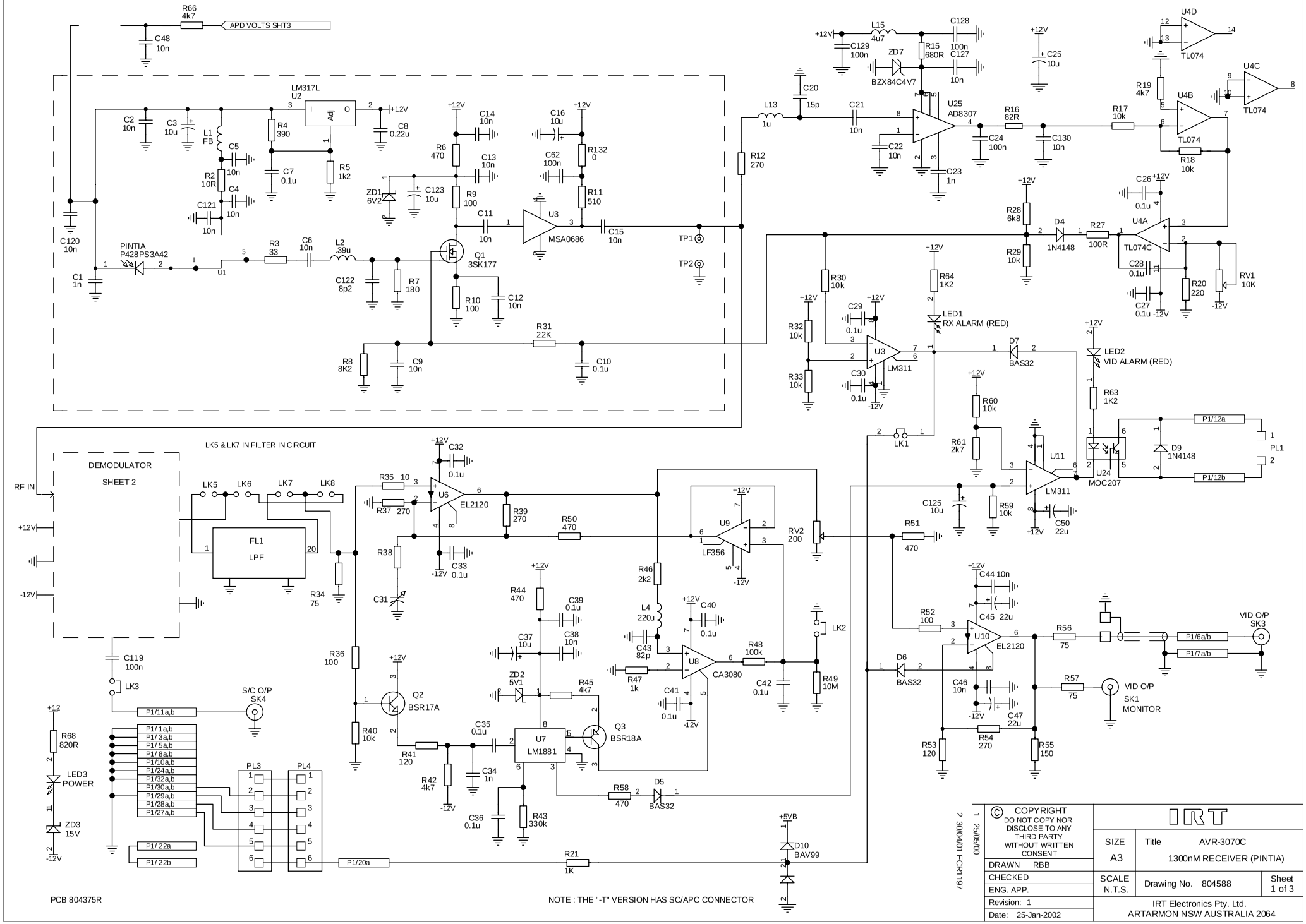
Title AVT-3070
TRANSMITTER
POWER INPUTS

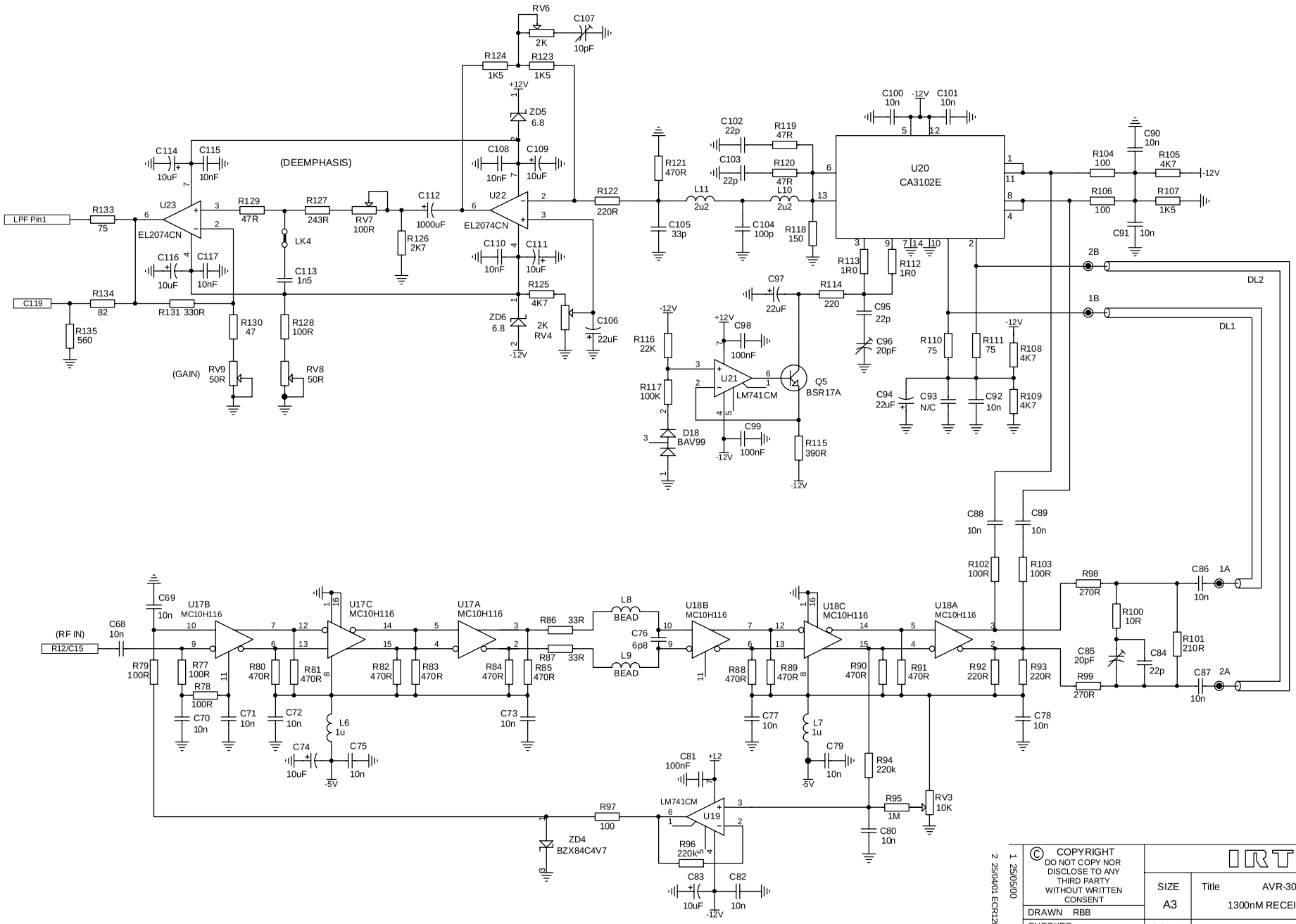
SCALE N.T.S.

Drawing No. 803801

Sheet 2 of 2

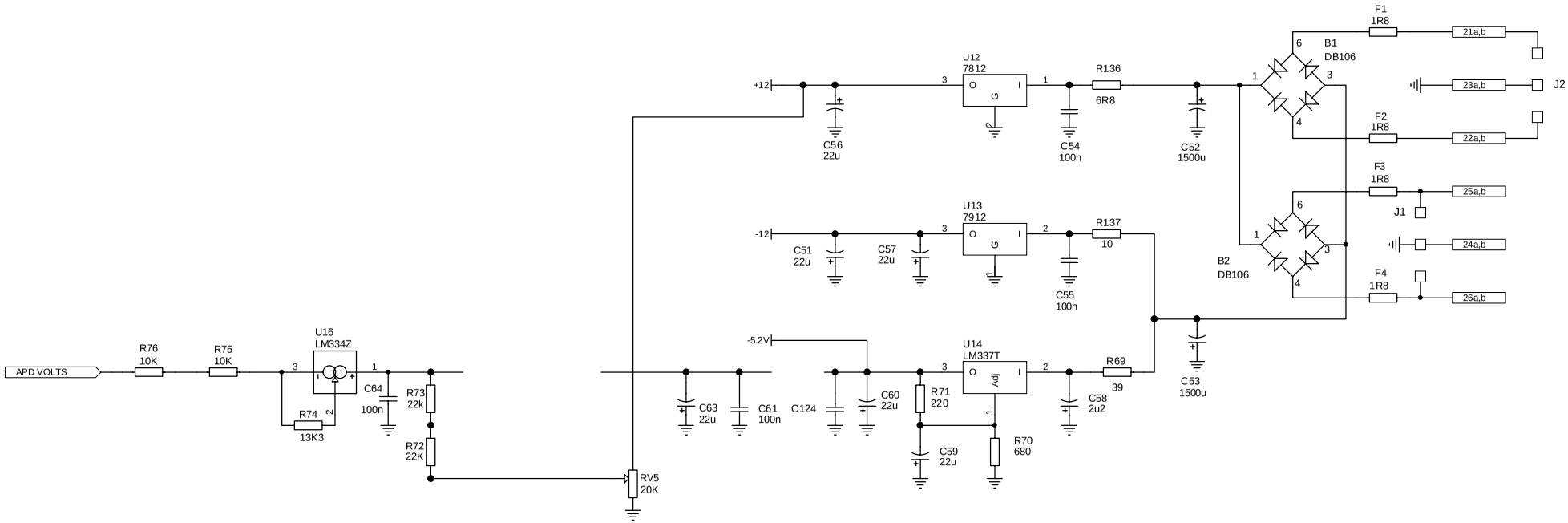
IRT Electronics Pty. Ltd.
ARTARMON NSW AUSTRALIA 2064


R66 4k7
APD VOLTS SHT3
C48 10n
LM317L U2
C2 10n
C3 10u
L1 FB
C5 10n
R2 10R
C4 10n
C121 10n
R4 390
C7 0.1u
R5 1k2
C8 0.22u
+12V
C120 10n
C1 1n
PINTIA P428PS3A42
U1
R3 33
C6 10n
L2 .39u
C122 8p2
R7 180
R6 470
C14 10n
C13 10n
ZD1 6V2
C123 10u
R9 100
C11 10n
Q1 3SK177
R10 100
C12 10n
C16 10u
C62 100n
R132 0
R11 510
U3 MSA0686
C15 10n
TP1
TP2
R12 270
R8 8K2
C9 10n
R31 22K
C10 0.1u
L13 1u
C20 15p
C21 10n
U25 AD8307
C22 10n
C23 1n
L15 4u7
C129 100n
ZD7 BZX84C4V7
C128 100n
R15 680R
C127 10n
C25 10u
R16 82R
C24 100n
C130 10n
R17 10k
U4D TL074
U4C TL074
U4B TL074
R19 4k7
R18 10k
R28 6k8
D4 1N4148
R27 100R
R29 10k
U4A TL074C
C26 0.1u
C28 0.1u
C27 0.1u
R20 220
RV1 10K
R30 10k
R32 10k
R33 10k
C29 0.1u
C30 0.1u
U3 LM311
R64 1K2
LED1 RX ALARM (RED)
D7 BAS32
LED2 VID ALARM (RED)
R63 1K2
U24 MOC207
D9 1N4148
P1/12a
P1/12b
PL1
LK1
R60 10k
R61 2k7
U11 LM311
C125 10u
R59 10k
C50 22u
LK2
LK5 & LK7 IN FILTER IN CIRCUIT
DEMODULATOR
SHEET 2
RF IN
LK5
LK6
LK7
LK8
FL1 LPF
R34 75
C32 0.1u
R35 10
R37 270
U6 EL2120
R39 270
R50 470
C33 0.1u
R38
C31
RV2 200
R51 470
U9 LF356
R46 2k2
L4 220u
C43 82p
R47 1k
U8 CA3080
C40 0.1u
C41 0.1u
R48 100k
C42 0.1u
R49 10M
R44 470
C39 0.1u
C37 10u
C38 10n
R36 100
Q2 BSR17A
R40 10k
R41 120
ZD2 5V1
R45 4k7
Q3 BSR18A
C35 0.1u
U7 LM1881
R42 4k7
C34 1n
C36 0.1u
R43 330k
R58 470
D5 BAS32
C44 10n
C45 22u
R52 100
U10 EL2120
R56 75
VID O/P SK3
P1/6a/b
P1/7a/b
D6 BAS32
C46 10n
C47 22u
R57 75
VID O/P SK1 MONITOR
R53 120
R54 270
R55 150
C119 100n
LK3
S/C O/P SK4
P1/11a,b
P1/ 1a,b
P1/ 3a,b
P1/ 5a,b
P1/ 8a,b
P1/10a,b
P1/24a,b
P1/32a,b
P1/30a,b
P1/29a,b
P1/28a,b
P1/27a,b
P1/ 22a
P1/ 22b
PL3
PL4
+12
R68 820R
LED3 POWER
ZD3 15V
-12V
P1/20a
R21 1K
+5VB
D10 BAV99
PCB 804375R
NOTE : THE "-T" VERSION HAS SC/APC CONNECTOR
2 30/04/01 ECR1197
1 25/05/00
© COPYRIGHT
DO NOT COPY NOR DISCLOSE TO ANY THIRD PARTY WITHOUT WRITTEN CONSENT
DRAWN RBB
CHECKED
ENG. APP.
Revision: 1
Date: 25-Jan-2002
IRT
SIZE A3
Title AVR-3070C
1300nM RECEIVER (PINTIA)
SCALE N.T.S.
Drawing No. 804588
Sheet 1 of 3
IRT Electronics Pty. Ltd.
ARTARMON NSW AUSTRALIA 2064



DRAWN RBB	SIZE A3	Title	AVR-3070C 1300nM RECEIVER (PINTIA)
CHECKED	SCALE N.T.S.	Drawing No. 804588	Sheet 2 of 3
ENG. APP.			
Revision: 1		IRT Electronics Pty. Ltd. ARTARMON NSW AUSTRALIA 2064	
Date: 25-Jan-2002			

1 25/05/00
2 25/04/01 ECR1204



1 25/05/00	© COPYRIGHT DO NOT COPY NOR DISCLOSE TO ANY THIRD PARTY WITHOUT WRITTEN CONSENT	IRT	
	DRAWN RBB	SIZE A3	Title AVR-3070C 1300nM RECEIVER (PINTIA)
	CHECKED	SCALE N.T.S.	Drawing No. 804588 — Sheet 3 of 3
	ENG. APP.		
	Revision: 1	IRT Electronics Pty. Ltd. ARTARMON NSW AUSTRALIA 2064	
	Date: 25-Jan-2002		