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IRT Eurocard

Type AA-704 & AA-704T

Audio Distribution Amplifier

Designed and manufactured in Australia

IRT Eurocard

Type AA-704 & AA-704T

Audio Distribution Amplifier

Instruction Book

Table of Contents

This instruction book applies to units later than S/N 9404000.

IRT Eurocard
Type AA-704 & AA-704T
Audio Distribution Amplifier
GENERAL DESCRIPTION

The IRT AA-704 is a high performance Audio Distribution Amplifier which is manufactured on extended Eurocard boards. A total of 12 cards and a PT-700 Dual 28 Vac power module can be accommodated in an IRT **FR-700 3 Rack Unit Frame**.

Other mounting options are available including the **FR-722 1 Rack Unit Chassis/PSU** conversion and special frames for Telecom use.

The AA-704T is a special version of the AA-704 for Telecom use and is supplied with rear assembly type RB-733T. Except where noted all references to the AA-704 in this instruction book apply equally to the AA-704T.

The AA-704 can be used for **either mono or stereo** signals, a simple on board jumper change is all that is required to vary the mode of operation.

Front panel access is provided for the gain adjustment of Mono/Left and Right Channels. A green power on LED indicates the presence of both the supply rail voltages.

There are three internally selectable gain ranges, + 6 dB, + 12 dB, + 18 dB. The variable gain control provides adjustment from zero output to the maximum of the selected gain range.

The maximum output of the AA-704 is + 24 dBu.

The amplifier has space to accept plug in sub-module options:

AR-604:-	Remote Gain and Control module.
AG-604SW:-	Four Frequency Switched Oscillator module.
AG-604ST:-	FACTS stereo oscillator module. Left continuous & right interrupted.
AS-604:-	Stereo /mono and phase control module.

Standard features:

- Selectable stereo or mono mode.
- Ten outputs mono or five left and five right in stereo.
- Up to 12 ADA's per frame.
- Dual redundant low voltage AC supplies.
- Input common mode rejection.
- High impedance balanced or unbalanced, bridging input.
- Balanced 40 Ohm output source impedance.
- Three internally selected gain ranges +6 dB, +12 dB and +18 dB.
- Front panel left & right gain adjustment.
- Maximum output level +24 dBu.
- Excellent electrical characteristics.

Equipment provided:

AA-704:	AA-704 Audio Distribution Amplifier module. RB-733 Rear Assembly
or	
AA-704T:	AA-704T Audio Distribution Amplifier module. RB-733T Rear Assembly
Optional:	RB-704 Rear Assembly (RCA phono)

Accessories available:-

FR-700 Eurocard module mounting frame:-	Provides mounting for up to 12 AA-704 amplifiers and one PT-700 Dual AC power supply side by side in 134 mm of standard Rack space (3 Rack Units).
FR-722 1 RU chassis conversion/PSU	The FR-722 provides a means of converting Eurocards to a 1 rack unit format. The FR-722 can be fitted with either one or two Eurocards in a horizontal side by side format. A single AC power supply is included to power the cards.
AR-604 Remote gain control.	The **AR-604** can be used for the **remote gain control** or by varying the strapping on the board can provide stereo panning, audio over control and cross fading.
AG-604SW Four frequency switched oscillator module	The **AG-604SW** provides a remotely switchable fixed **400 Hz, 1 KHz, 4 KHz** or **10 KHz** tone signal.
AG-604ST FACTS stereo oscillator module	The **AG-604ST** provides a continuous **1 KHz** tone signal on the left channel and the same signal interrupted every second on the right channel.
AS-604 Remote mono/stereo & phase control.	The **AS-604** can be to remotely switch between mono and stereo modes or to reverse the phase of the left channel in stereo mode. Links on the board allow a choice of either a -3 dB or -6 dB mono mix.
TME-6 Eurocard extender board.	
Instruction Book.	

TECHNICAL SPECIFICATIONS
IRT Eurocard module type AA-704

Inputs: Left/Mono and Right

Type		Tranformerless, bridging.
Impedance	AA-704	> 10 KΩ.
	AA-704T	600 Ω or > 10 KΩ selectable by links on RB-733T.
Max. input level		+24 dBu (6 dB gain mode)
Input CMR		> 55 dB 20 Hz to 20 KHz

Outputs:

Type		Transformerless, balanced.
Number	RB-704, RB-733 & RB-733T	10 (10 mono or 5 left and 5 right).
	RB-367	26 (26 mono or 13 left and 13 right).
Impedance	RB-733 & RB-733T	< 40 Ω.
	RB-704 & RB-367	≈560 Ω.
Max. output level		+24 dBu into 10 loads each 600 Ω.
DC on output		< ±20 mV.

Performance:

Gain	Internally linked to a maximum gain of + 6, + 12 or +18 dB.
Frequency response	+ 0 / - 0.3 dB for 20 Hz to 20 KHz.
Harmonic distortion	< 0.005% 20 Hz to 20 KHz at +20 dBm.
Noise	-110 dB, Ref. +24 dBm 20 Hz to 20 KHz.
Crosstalk;	
Left/right	-75 dB 20 Hz to 20 KHz.
Amplifier/amplifier	-80 dB 20 Hz to 20 KHz.

Power Requirements:

28 Vac CT (14-0-14) or ± 16V DC

Power consumption: 55 mA (no signal) to 170 mA (+ 20 dBu, all outputs loaded in 600 Ω).

Connectors:

AA-704:	Plugable screw block connectors (RB-733)
AA-704T	Krone IDC (RB-733T)
Optional	RCA phono (RB-704 or RB-367)

Other:

Temperature range		0 - 50° C ambient
Mechanical		Suitable for mounting in IRT 19" rack chassis types FR-700 & FR-722 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		6 HP x 3 U x 220 mm IRT Eurocard
Standard accessories	AA-704:	RB-733 Rear connector assembly with plugable compression screw terminals. Matching connectors for audio inputs & outputs supplied.
	AA-704T:	RB-733T Rear connector assembly with Krone IDC terminals.
Optional accessories		RB-704 Rear connector assembly with 10 x RCA phono connectors.
		RB-367 Rear connector assembly with 26 x RCA phono connectors.
		TME-6 module extender card

TECHNICAL DESCRIPTION

The block diagram (ref.. 802827) shows that the AA-704 comprises:-

a) Two separate input stages, "Left" and "Right. Each input stage converts its balanced high impedance input to an unbalanced low impedance output. The gain of these stages can be varied by 12 dB in two 6 dB steps by changing the stage gain links.

b) A single optional 'plug-in' area. Should a plug-in option be installed Links 1 and 2 should be cut.

c) Two front panel adjustable gain controls. Links are provided after the gain controls to feed the Left or Right input to both output stages for Mono operation, or the Left input to the Left output and the Right input to the Right output for stereo.

d) Two separate output stages. Each converts its unbalanced input to 5 resistively isolated balanced outputs.

e) Power Supply:- See detailed description following.

Power supply:

Input power to the module may be fed by a number of means.

1. One or two 14 - 0 - 14 Vac supplies via connections on the 64 pin DIN rear connector of the module. (Used when module is mounted in FR-700 chassis or FR-748A chassis fitted with one or two PT-701 PSU's.)
2. Two ±16 Vdc supplies via connections on the 64 pin DIN rear connector of the module. (Used when module is mounted in FR-748A chassis fitted with one or two PT-748A PSU's.)
3. One 14 - 0 - 14 Vac supply and one ±16 Vdc supply via connections on the 64 pin DIN rear connector of the module. (Used when module is mounted in a FR-748A chassis fitted with 1 x PT-701 PSU and 1 x PT-748A PSU.)
4. A single 14 - 0 - 14 Vac supply connected to SK 2 on the rear assembly. (Used when module is mounted in FR-722 chassis.)

The input power is isolated by fusible resistors F 1 to F 4. Should these fail they should be only replaced by a similar type of the same value or protection of the common power supply will be compromised.

If an AC supply is provided, the isolated AC is full wave rectified by diodes D 1 to D4 and D5 to D 8 to provide a raw DC voltage of approximately 20 V at filter capacitors C 15 and C 16. The actual voltage will vary depending on the type of frame, loading of PSU by other modules and the local mains supply voltage.

If a DC supply is provided, the isolated DC passes through the diodes D 1 to D4 and D5 to D 8 which provide protection against accidental reverse polarity connection of the DC supply. Where a DC supply is used the input voltage must be at least ±15 Vdc under all conditions to ensure sufficient margin for the proper operation of the following voltage regulators and losses in the input fusible resistors and diodes.

The raw DC power is fed to three terminal regulator IC's which provide ±12 Vdc rails for the operating circuits.

The LED on the front panel is wired in series with a zener diode between +12 and -12 Volts. The zener is to ensure that the LED extinguishes if either one of the regulators fails.

Wideband modification:

(For use with timecode, composite stereo and other extended frequency response signals.)

Capacitors C 11 & C 13 in the feedback loops of U 3A & U 4A respectively provide high frequency rolloff above 20 KHz. If a higher frequency response is required the value of C 11 & C 13 may be decreased from 120 pF to 22 pF. This will provide a useful response to 100 KHz ±0.5 dB.

AA-704 Internal Adjustments

The following adjustable resistors are factory set and should not be adjusted unless a component has been changed. They are not 'operational' controls. Before adjusting any of these controls allow time for the AA-704 to reach temperature stability.

RV 1 "Left' Common Mode Rejection.
Adjusted to reduce input common mode signals to a minimum at the output of the AA-704.

RV 2 "Right' Common Mode Rejection.
Adjusted to reduce input common mode signals to a minimum at the output of the AA-704.

CONFIGURATION

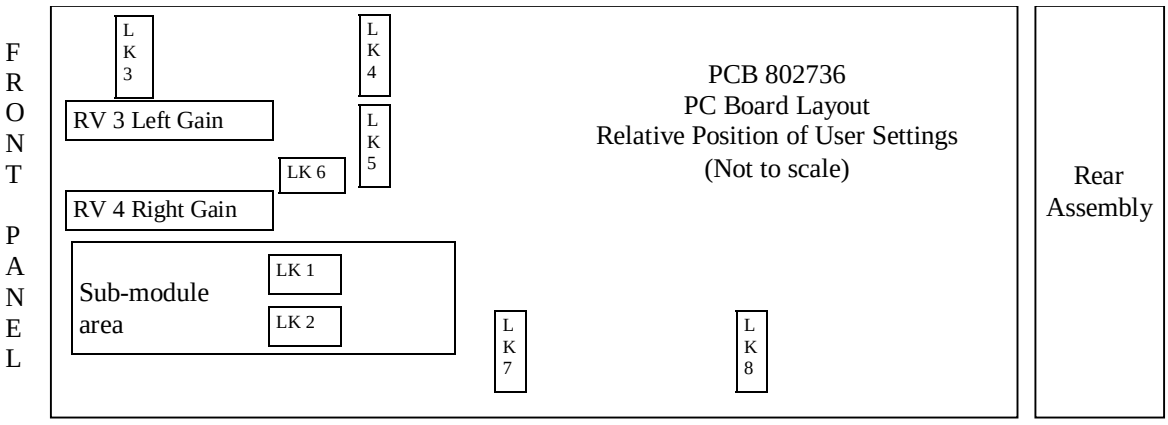
The AA-704 may be configured for several modes of operation including remote control and conversion to a multi output oscillator with the addition of sub-modules. This is achieved by various link settings as outlined below.

The AA-704 is normally delivered set for stereo operation, 6 dB maximum gain on both channels and no sub-modules fitted.

Note: AA-704T fitting of sub-modules.
The RB-733T is supplied without a connector for remote control of sub-modules. If a sub-module is to be fitted that requires remote control a 3 pin polarised header type 1100-8-103-01 should be fitted to the RB-733T PCB in the position provided between the left and right input sockets.

Configuration Summary:

1.	Sub-modules:	No sub-module	LK 1 & LK 2 soldered on board.
		Any sub-module:	Cut LK 1 & LK 2 on board.
		AR-604	Set to stereo mode as below.
		AG-604SW	Set to L mono mode as below. LK 7 & LK 8 are inoperative.
		AG-604ST	Set to stereo mode as below. LK 7 & LK 8 are inoperative.
		AS-604	Set to stereo mode as below.
2.	Stereo/mono:	Stereo	LK 3 & LK 6 installed. LK 4 not installed.
		Mono L Input	LK 3, LK 4 & LK 5 installed. LK 6 not installed. LK 8 sets maximum gain. Gain adjust is only by RV 3 L gain. LK 7 and RV 4 are inoperative.
		Mono R Input	LK 3, LK 5, & LK 6 installed. LK 4 not installed LK 7 sets maximum gain. Gain adjust is only by RV 4 R gain. LK 8 and RV 3 are inoperative.
3.	Maximum gain:	Left channel	LK 8 set as designated on PCB overlay for +6, 12 or 18 dB max.
		Right channel	LK 7 set as designated on PCB overlay for +6, 12 or 18 dB max.



INSTALLATION

Operational Safety

WARNING

Operation of electronic equipment involves the use of voltages and currents which may be dangerous to human life. Maintenance personnel should observe all safety regulations. Do not change components or make adjustments inside the equipment with power **ON** unless proper precautions are observed. Note that under certain conditions dangerous potentials may exist in some circuits even though power controls are in the **OFF** position.

Pre-Installation

Handling:

The modules used in this equipment contain 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 and 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 correct polarity is observed and that DC supply voltage is maintained within the operating range specified.

Earthing:

AC mains supply: Chassis earth connection of the equipment is via the earth connection on the three pin mains input. This is a safety earth and must be connected.

DC supply: Chassis earth connection of the equipment is via the positive terminal on the DC input. The DC positive supply should be connected to earth at the supply . A separate chassis earth connection is available on the centre connector of the DC input connector which may be connected if desired.

Signal earth:
Balanced audio signal Pin 1 of connector is connected to PSU earth for shielding purposes only.
Unbalanced audio signal outer of RCA phono connector is connected to PSU earth.

It is strongly recommended that where double insulated equipment is being used that a proper connection be made between the signal earth and true ground earth at some point in the external circuit.

Installation in frame or chassis:

See details in separate section for selected frame type.

Note: Fitting AA-704T with RB-733T into FR-722.
No AC input plug is provided on the rear of the RB-733T PCB and the AC input must be provided direct to the AA-704T main module PCB. This is accomplished by fitting a 3 pin polarised header type 1100-8-103-01 to the main PCB in the position provided next to AC input fuses FS 1 & FS 2.

RCA phono rear assemblies:

Types RB-704 - 10 output & RB-367 - 26 output.
Two types of rear assemblies are available with RCA phono connectors for use with domestic style equipment such as VHS machines where only unbalanced connections are provided.

Each is equipped with RCA connectors on all outputs with red and black bodies used to distinguish between left and right channels.
The two inputs may be equipped with either RCA phono connectors (for unbalanced input) or a 3 way Phoenix connector block (for either balanced or unbalanced input). Where the input is unbalanced the gain of the amplifier will be reduced by 6 dB and so the gain setting link for each channel should be adjusted to the next higher setting (normally from 6 dB, factory set, to 12 dB). See *Configuration* for details.

Where the rear assembly is equipped with the 3 way balanced Phoenix input connector it may be used for either balanced or unbalanced signal input. When unbalanced signals are used they may be connected either between the + input and - input or between the + input and Gnd terminals.
If connection on the RB-704 is made between the + input and - input then a slight improvement in noise performance may be achieved by fitting a 1K Ohm resistor between the -°input and Gnd on the connector. The RB-367 is factory fitted with these resistor s (R 1 & R 2 located next to input connectors) and these may be removed if balanced input operation is required.

RB-367 only:
The RB-367 may **only** be fitted to IRT 1 RU Eurocard frames such as the FR-722A. The frame can only accommodate one AA-704 with the RB-367 as the RB-367 covers the entire rear of the frame.
The AA-704 module must be mounted on the right hand side of the frame (next to the power switch) and a blank front panel should be secured in the unused position on the left hand side.

Audio Connections:

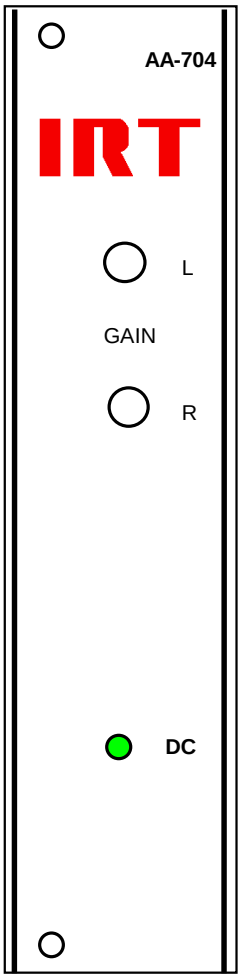
For mono operation it is usual to connect the input audio cable to the Left input pins. For stereo connect the Left input cable to the Left input and the Right input audio cable to the Right input.

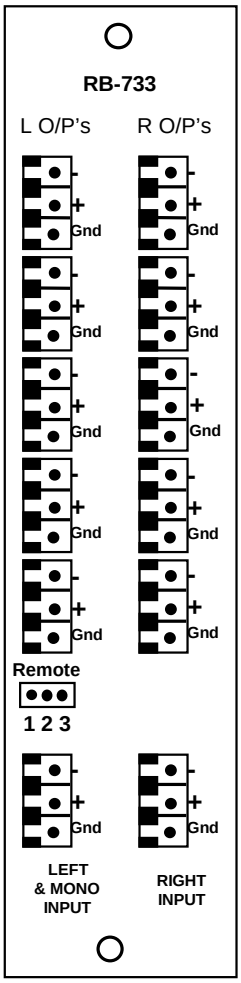
If input termination is required on the RB-733 then termination resistors should be fitted to the input sockets.
The RB-733T is fitted with 620 Ω termination resistors as standard with a link provided in series with the termination which should be removed if loop through or high input impedance operation is required. (The 620 Ω resistrors in parallel with the normal high input impedance provide an actual input impedance of 600 Ω.)

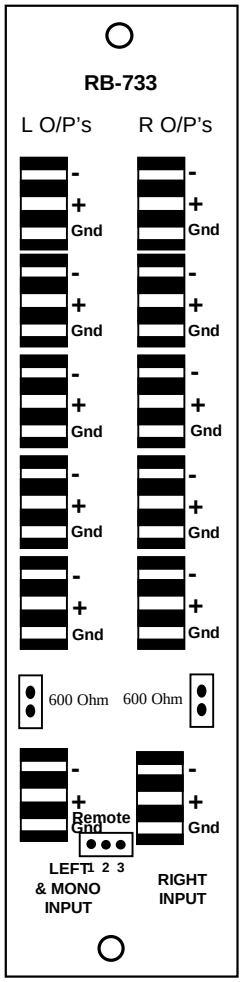
Connect as many outputs as required. Remember for stereo operation to observe the polarity markings on the rear assembly.

See also special comments above concerning RCA phono rear assemblies types RB-704 and RB-367.

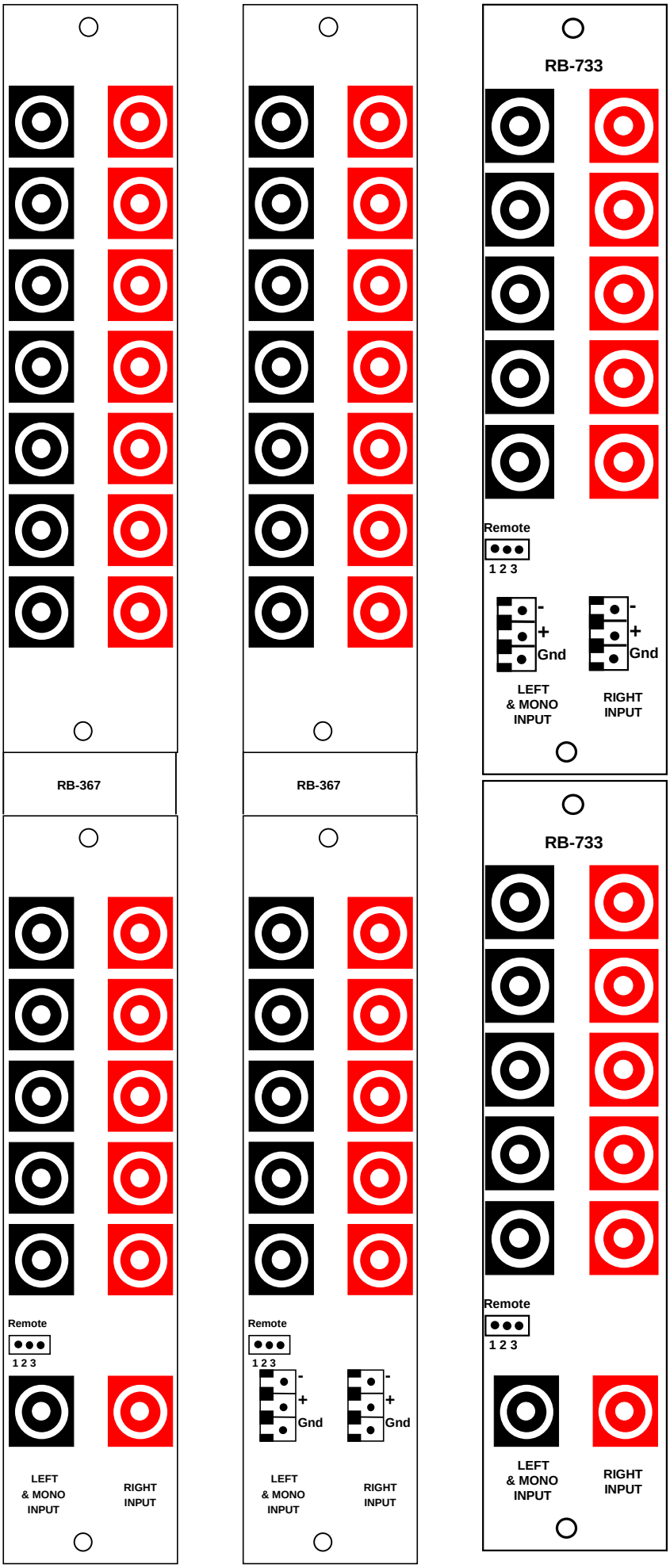
The following front panel and rear assembly drawings are not to scale and are intended to show approximate layout & connection order only.







Rear assemblies with RCA type output connectors. Note input connectors may be either RCA unbalanced or Phoenix balanced type.



IRT Eurocard Sub-board
Type CAA-3131

GENERAL DESCRIPTION

This plug-in option for selected IRT audio distribution amplifiers can be configured to provide one of the following modes of operation:

- STEREO FADE over 75 dB range
- STEREO TRIM of 6 dB
- CROSS FADE over 75 dB or 6 dB range
- MIX L+R & FADE both by up to 75 dB.

Only one mode of operation is possible at any time.

TECHNICAL SPECIFICATIONS
IRT Eurocard Sub-module
Type CAA-3131

Control input:

Remote gain component		100 KΩ potentiometer (Not supplied)
Connections:		On rear assembly of main module
		3 pin female polarised IDC # 1300-103-426
Pin	1	CCW connection of the potentiometer (GND)
	2	Rotor
	3	CW connection (1 KΩ in series with + 12 Vdc)

Performance:

(See main module specifications for other specifications)

Frequency Response	+0 / -0.5 dB 20 Hz to 20 KHz.
Harmonic Distortion	< 0.1% 20 Hz to 20 KHz at +20 dBm.
Noise	-100 dB, Ref. +24 dBm 20 Hz to 20 KHz.
Attenuation	> 75 dB.(Measurement for stereo fade mode)

Power requirements:

	± 12 Vdc from main module
Power consumption	See main module specifications

Other:

Temperature range	0 - 50° C ambient
Dimensions	65 mm x 48 mm
Standard accessories	Matching connector for control input type: 1300-103-426
Optional accessories	Instruction manual.

CIRCUIT DESCRIPTION

The circuit uses a TDA1074A variable gain control IC to perform the configured function. Configuration is by means of resistors which determine the function as shown on diagram 802739.

The input control circuit is isolated from the signal path and uses DC control which is filtered by the combination of R 2 & C 1 to provide immunity to noise, either in the external wiring or in the operation of the external potentiometer.

The operating range is determined by the type of cable used and the degree of noise in the environment.

For best results over long distances a low loss screened cable should be used and the route carefully chosen to avoid proximity to high level noise sources.
For short distances flat IDC ribbon cable will suffice.

CONFIGURATION

The main module must first be configured to accept the sub-module. This is achieved by various link settings as outlined in the main module manual.

The main module is normally delivered set for stereo operation and no sub-modules fitted. Before installing the CAA-3131 set the main module to stereo mode as detailed in main module instruction manual.

The AA-604 can be configured to provide one of the following modes of operation:-

1. Stereo Fade — Up to 75 dB attenuation on both channels simultaneously.
2. Trim — As above, but range limited to 6 dB.
3. Cross Fade — Fade down left, fade up right/ fade down right, fade up left. Up to 75 dB range.
4. Balance — As above but range limited to 6 dB.
5. Mix L+R & Fade — Add left to right and fade both by up to 75 dB.

To configure these options see Drawing 802739.

INSTALLATION

Module

To install the sub-module onto the main module first ensure that the proper mode of operation has been selected on both the main and sub-modules.

Then remove straps LK 1 and LK 2 on the main module.

Hold the sub-module so that the legends on the sub-board and the legends on the main module have the same orientation.

Place the sub-module over the connector pins of the main module. The 16 pins fit into 16 holes in the sub-module. Push the sub-board down until it rests on the orange insulation of the pins.

Remote control

To control the gain a remote 100 KΩ variable resistor should be wired between the pins marked Remote "1", "2" and "3" on the main module rear assembly.

Connect Pin 1 to the bottom of the potentiometer (CCW connection)
Pin 2 to the slider (rotor connection)
Pin 3 to the top (CW connection).

IRT Eurocard Sub-module

Type AG-604SW

GENERAL DESCRIPTION

The AG-604SW Four frequency switched oscillator sub-module converts the supporting main module audio distribution amplifier into a multi output reference oscillator for test or alignment purposes.

Provision is made to remotely switch the frequency to a fixed 400 Hz, 1 KHz, 4 KHz or 10 KHz tone.

TECHNICAL SPECIFICATIONS
IRT Eurocard Sub-module
Type AG-604SW

Control input:

Remote switch component		Single pole 4 position or equivalent (Not supplied)
Connections:		On rear assembly of main module 3 pin female polarised IDC # 1300-103-426
Pin	1	GND
	2	Relay 1 control
	3	Relay 2 control

Performance:

(See main module specifications for other specifications)

Distortion	< 0.01% at + 8 dBm.
Frequency	Remote selectable to: 400 Hz, 1 KHz, 4 KHz or 10 KHz.

Power requirements:

	± 12 Vdc from main module
Power consumption	See main module specifications

Other:

Temperature range	0 - 50° C ambient
Dimensions	65 mm x 48 mm
Standard accessories	Matching connector for control input type: 1300-103-426
Optional accessories	Instruction manual.

CIRCUIT DESCRIPTION

The circuit comprises of a low distortion Wein bridge oscillator with a remote control facility to select the operating frequency.

The normal input circuitry of the distribution amplifier is not used.

Control of frequency is by way of grounding contacts which activate relays on the sub-board to select the correct time constants in the circuit. These are arranged so that four commonly used frequencies may be obtained using only two control relays operated over a three wire circuit.

The output from the oscillator is fed to the left output gain control on the main circuit board which provides a single level control for all outputs.

The circuit does not contain a latch for the remote input and the external contact must therefore be maintained for as long as the selected frequency is required.

In the absence of any remote input both relays will turn off and the oscillator will default to 1 KHz.

CONFIGURATION

The main module must first be configured to accept the sub-module. This is achieved by various link settings as outlined in the main module manual.

The main module is normally delivered set for stereo operation and no sub-modules fitted. Before installing the AG-604SW set the main module to L mono mode as detailed in main module instruction manual. LK 7 & LK 8 are inoperative.

INSTALLATION

Module

To install the sub-module onto the main module first ensure that the proper mode of operation has been selected on both the main and sub-modules.

Then remove straps LK 1 and LK 2 on the main module.

Hold the sub-module so that the legends on the sub-board and the legends on the main module have the same orientation.

Place the sub-module over the connector pins of the main module. The 16 pins fit into 16 holes in the sub-module. Push the sub-board down until it rests on the orange insulation of the pins.

Remote control of frequency

The frequency of the oscillator may be set using the remote connector on the rear assembly of the main module.
If no connection is made the oscillator will default to 1 KHz operation.

As the remote switches and wiring carry the full relay current it is important that the losses in the external wiring be kept to a minimum.

No damping of the remote selection is provided and some instability of the output signal will result during switching. This should be considered when choosing the type of switch and when it will be operated.

Refer to Drawing 803006 for modes of operation.

Frequency	Connect to Pin 1 (GND)
400 Hz	2
1 KHz	Default N/C
4 KHz	2 & 3
10 KHz	3

IRT Eurocard Sub-board

Type AG-604ST

GENERAL DESCRIPTION

The **AG-604ST** provides a continuous **1 KHz** tone signal on the left channel and the same signal interrupted every second on the right channel.

This configuration conforms to the recommended practice of FACTS (Federation of Australian Commercial Television Stations) for channel identification.

TECHNICAL SPECIFICATIONS
IRT Eurocard Sub-module
Type AG-604ST

Performance:

(See main module specifications for other specifications)

AG-604ST FACTS stereo oscillator module:

Distortion	< 0.01% at + 8 dBm.
Frequency	1 KHz continuous left channel 1 KHz interrupted every second right channel

Power requirements:

	± 12 Vdc from main module
Power consumption	See main module specifications

Other:

Temperature range	0 - 50° C ambient
Dimensions	65 mm x 48 mm
Optional accessories	Instruction manual.

CIRCUIT DESCRIPTION

The normal input circuitry of the distribution amplifier is not used.

The circuit comprises of a low distortion Wein bridge oscillator, an astable multivibrator and a voltage controlled switch.

The oscillator output is passively split with one output fed directly to the left output.

The other output is fed via an FET which is gated on and off by a square wave oscillator to provide an output which is alternatively on and off. This if fed to the right output.

The gating frequency may be trimmed by adjusting potentiometer RV 1 which sets the frequency of the astable multivibrator U 2.

The outputs from the oscillator sub-board are fed directly to the left and right output gain controls on the main circuit board which provides level control for the left and right outputs respectively.

CONFIGURATION

The main module must first be configured to accept the sub-module. This is achieved by various link settings as outlined in the main module manual.

The main module is normally delivered set for stereo operation and no sub-modules fitted. Before installing the AG-604ST check that the main module is set to stereo mode as detailed in main module instruction manual.

Note that LK 7 & LK 8 are inoperative.

INSTALLATION

Module

To install the sub-module onto the main module first ensure that the proper mode of operation has been selected on the main module.

Then remove straps LK 1 and LK 2 on the main module.

Hold the sub-module so that the legends on the sub-board and the legends on the main module have the same orientation.

Place the sub-module over the connector pins of the main module. The 16 pins fit into 16 holes in the sub-module. Push the sub-board down until it rests on the orange insulation of the pins.

IRT Eurocard Sub-board

Type AS-604

GENERAL DESCRIPTION

The **AS-604** can remotely switch between mono and stereo modes or reverse the phase of the left channel in stereo mode. Links on the board allow a choice of either a -3 dB or -6 dB mono mix. :-(Only one mode is possible at any time.)

1. Normal stereo operation.
2. Reverse phase of left channel
3. Switch left channel input to mono output.
4. Mix left and right channels to mono output with selectable 3 dB or 6 dB cut in signal level.

TECHNICAL SPECIFICATIONS
IRT Eurocard Sub-module
Type AS-604

Control input:

Remote gain component		(Not supplied)
Connections:		On rear assembly of main module
		3 pin female polarised IDC # 1300-103-426
Pin	1	GND
	2	Relay 1 control
	3	Relay 2 control

Performance:

(See main module specifications for other specifications)

Operation modes	Remote selectable: (Only one mode is possible at any time) Stereo (normal) Invert left channel phase Mono output from left input Mix of stereo input to mono output
Frequency Response	+0 / -0.5 dB 20 Hz to 20 KHz.
Distortion	< 0.1% at +20 dBm.
Noise	-100 dB wrt +24 dBm.
Attenuation mono mix mode	-3 dB or -6 dB selectable by links.

Power requirements:

	± 12 Vdc from main module
Power consumption	See main module specifications

Other:

Temperature range	0 - 50° C ambient
Dimensions	65 mm x 48 mm
Standard accessories	Matching connector for control input type: 1300-103-426
Optional accessories	Instruction manual.

CIRCUIT DESCRIPTION

The AS-604 is comprised of a single operational amplifier in series with the left channel audio whose gain is determined by four relays which determine the path and thereby the amplitude of the signals in the circuit.

With no relays activated the amplifier functions as a voltage follower and has no effect on the phase or gain of either channel.

When RL 1 is activated the input to U 1 is switched from the non-inverting to the inverting input resulting in a phase reversal of the left channel signal.

When RL 2 is activated the right channel output is switched from the right input to the left output and both left and right channels receive the signal from the left channel input of the main module. In this mode the right channel input of the main module is disconnected from the circuit and gain control link LK 7 on the main board will have no effect.

When both RL 1 & RL 2 are activated simultaneously the right output signal is derived from the left output as described above.
However in this case the right and left input signals are also switched to the inverting input of U 1 and summed via resistors R 1, R 3, R 5 & R 6 which determine the gain of the resultant mono mix.

Links LK 1 & LK 2 are provided to bypass resistors R 3 & R 6 respectively.

> Both links should either be installed or removed. Operation with only one link installed will result in the gain of the two channels not being matched under some circumstances.

With the links installed the gain is unity for each signal with an overall result of +6 dB for the resultant mix.
With LK 1 & LK 2 removed the input signal from each channel is attenuated and the overall gain for each signal is reduced to 0.71 resulting in a +3 dB mix.

Note that if the links are removed for the +3 dB mix option, that operation of RL 1 on its own to provide phase reversal of the left channel will also result in a 1.5 dB attenuation of the left channel when the phase is reversed.

CONFIGURATION

The main module must first be configured to accept the sub-module. This is achieved by various link settings as outlined in the main module manual.

The main module is normally delivered set for stereo operation and no sub-modules fitted.
Before installing the AS-604 check that the main module is set to stereo mode as detailed in main module instruction manual.

INSTALLATION

Module

To install the sub-module onto the main module first ensure that the proper mode of operation has been selected on both the main and sub-modules.

Then remove straps LK 1 and LK 2 on the main module.

Hold the sub-module so that the legends on the sub-board and the legends on the main module have the same orientation.

Place the sub-module over the connector pins of the main module. The 16 pins fit into 16 holes in the sub-module. Push the sub-board down until it rests on the orange insulation of the pins.

Remote control

AS-604 can be remotely switched to provide one of the following modes of operation:-(Only one mode is possible at any time.)

1. Normal stereo operation.
2. Reverse phase of left channel
3. Switch left channel input to mono output.
4. Mix left and right channels to mono output with selectable 3 dB or 6 dB cut in signal level.

To configure these options see Drawing 803013.

To control the operation mode a switch should be wired between the pins marked Remote "1", "2" and "3" on the RB-733 rear assembly.
Pin connections are:

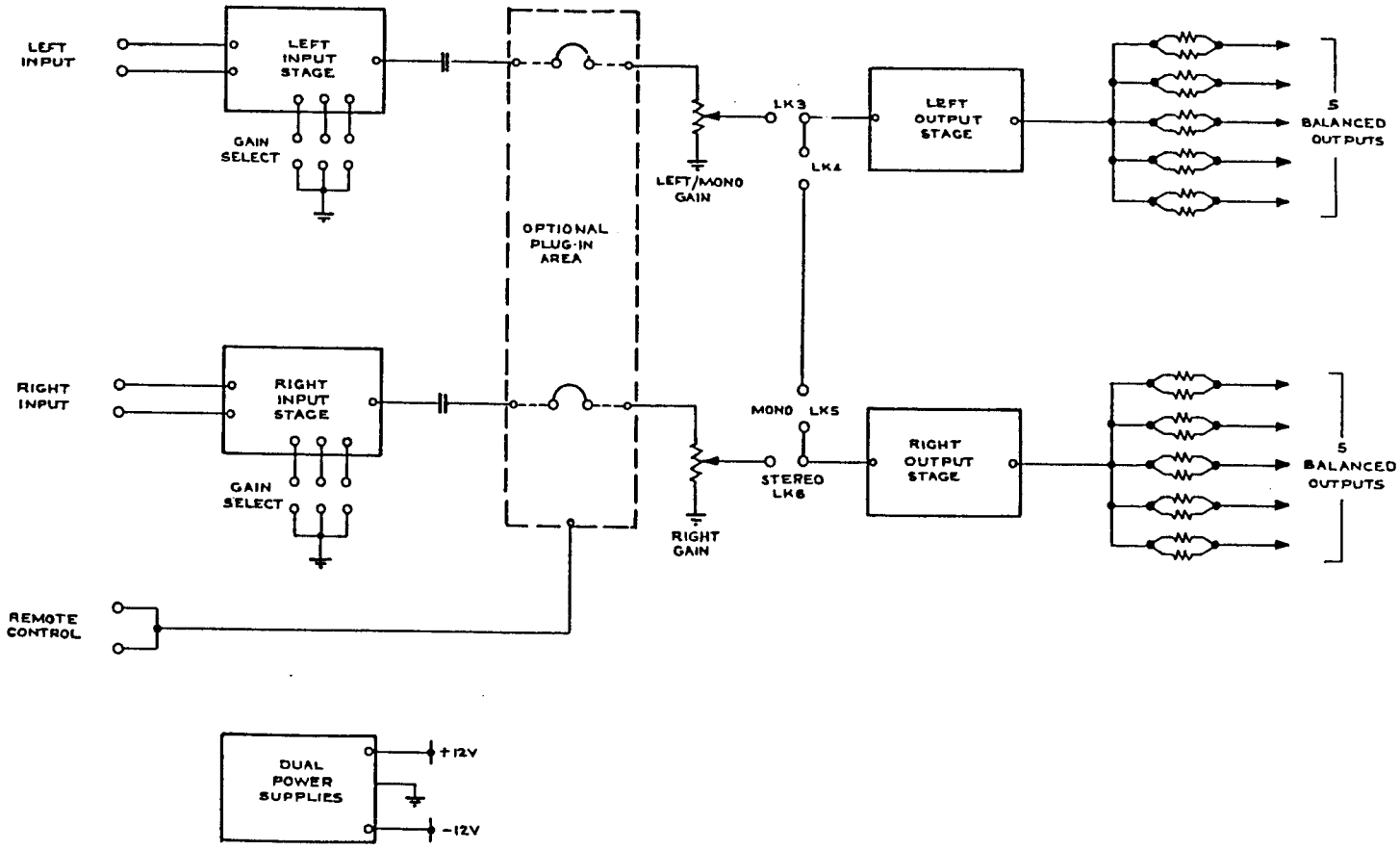
Pin 1	common ground
Pin 2	relay 1 control
Pin 3	relay 2 control

The AS-604 is supplied with two links LK 1 & LK 2 bridging resistors R3 and R6 respectively.
This configuration sets the gain to -6 dB in stereo to mono mix mode.
To change attenuation in this mode to -3 dB remove links LK 1 & LK 2.

Drawing list index

Unless otherwise specified all references on diagrams to AA-604 refer equally to the AA-704.

Drawing #	Sheet#	Description
802827		AA-604 block diagram
802735	1	AA-604 main circuit schematic
803538		RB-733 rear assembly with Phoenix connectors
803664		RB-733T rear assembly with Krone IDC connectors
803540		RB-704 rear assembly 10 x RCA phono connectors
802739		CAA-3131 Remote control sub-board
803006		AG-604SW Switched oscillator sub-module
803004		AG-604ST Stereo oscillator sub-module
803013		AS-604 Stereo control sub-module



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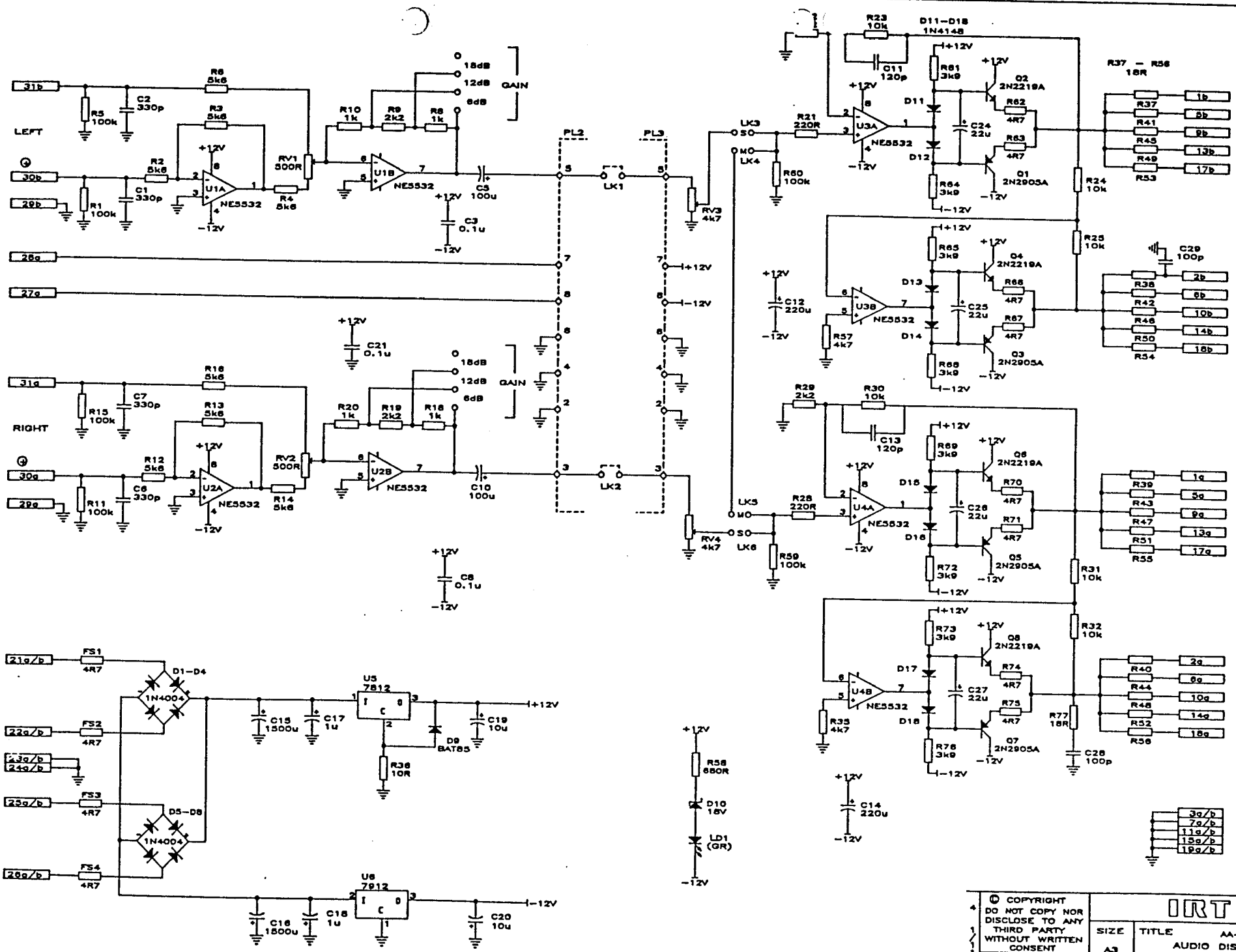
30-3-90	ORIGINAL ISSUE	DRAWN BAS DATE	TITLE AA-604 AUDIO DISTRIBUTION AMPLIFIER BLOCK DIAGRAM
DATE	DATE 16-11-86	TAPED	SIZE A2 SCALE :
		CHECKED	CONTRACT NO.
		ENG. APP	DRAWING NO. 802827 SHEET 6F
		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM FRACTIONS DECIMALS ANGLES : : :	IRT Electronics Pty. Ltd. 58 Hotham Pde., Artarmon, Australia 2064



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ENG. APP.	
CONTRACT No.	
4/11/1993	

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SIZE A3	TITLE AA–804 AUDIO DISTRIBUTION AMPLIFIER	
SCALE	DRAWING No. 802735	SHEET 1 OF 2

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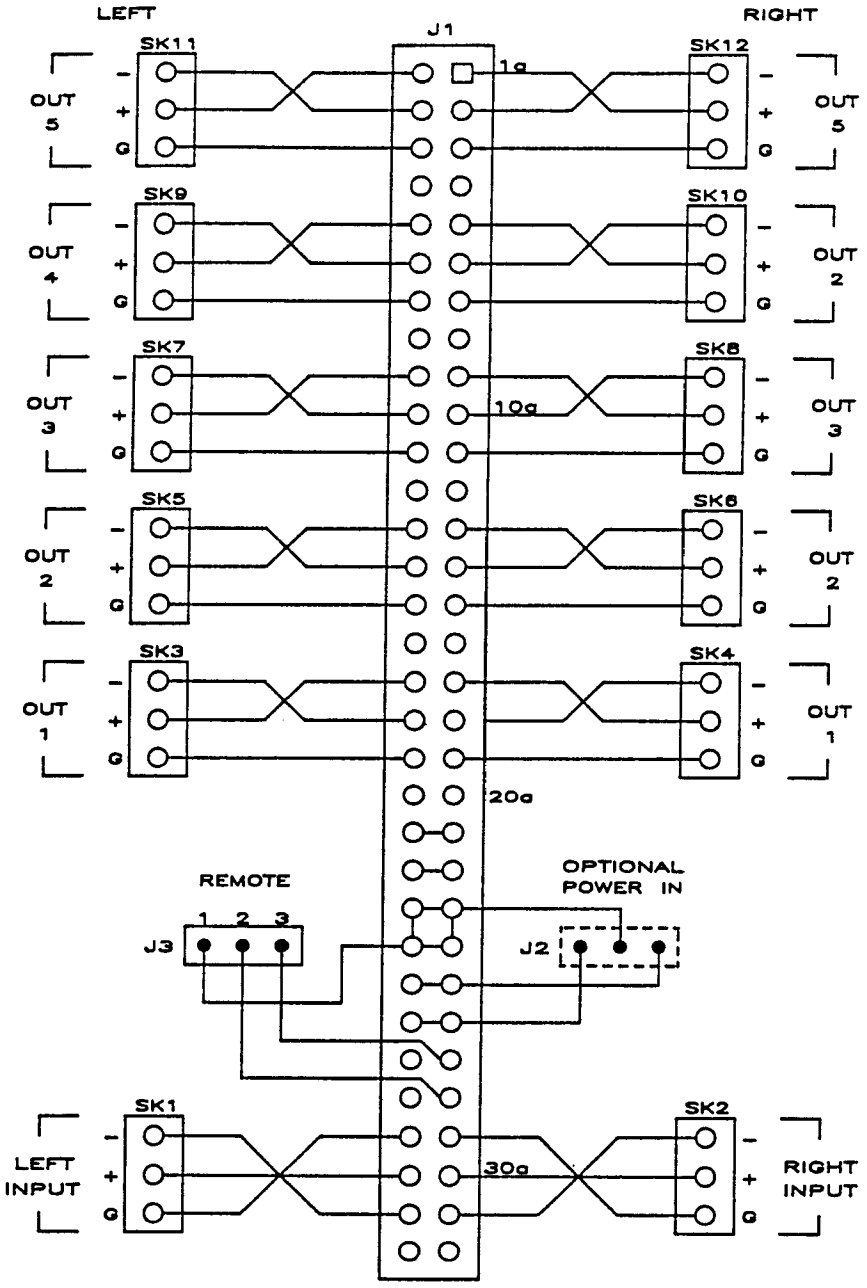

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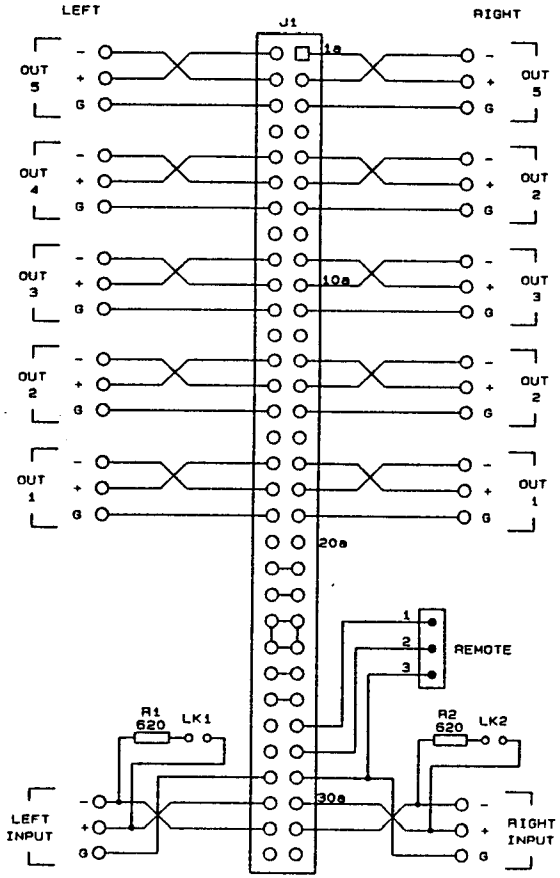
18/2/93	DRAWN K.N.	SIZE	TITLE RB-733 REAR ASSEMBLY
	CHECKED	SCALE	DRAWING No. 803538 SHEET 1 OF 1
	ENG. APP.		
	CONTRACT No.	IRT Electronics Pty. Ltd. ARTARMON NSW AUSTRALIA 2064	



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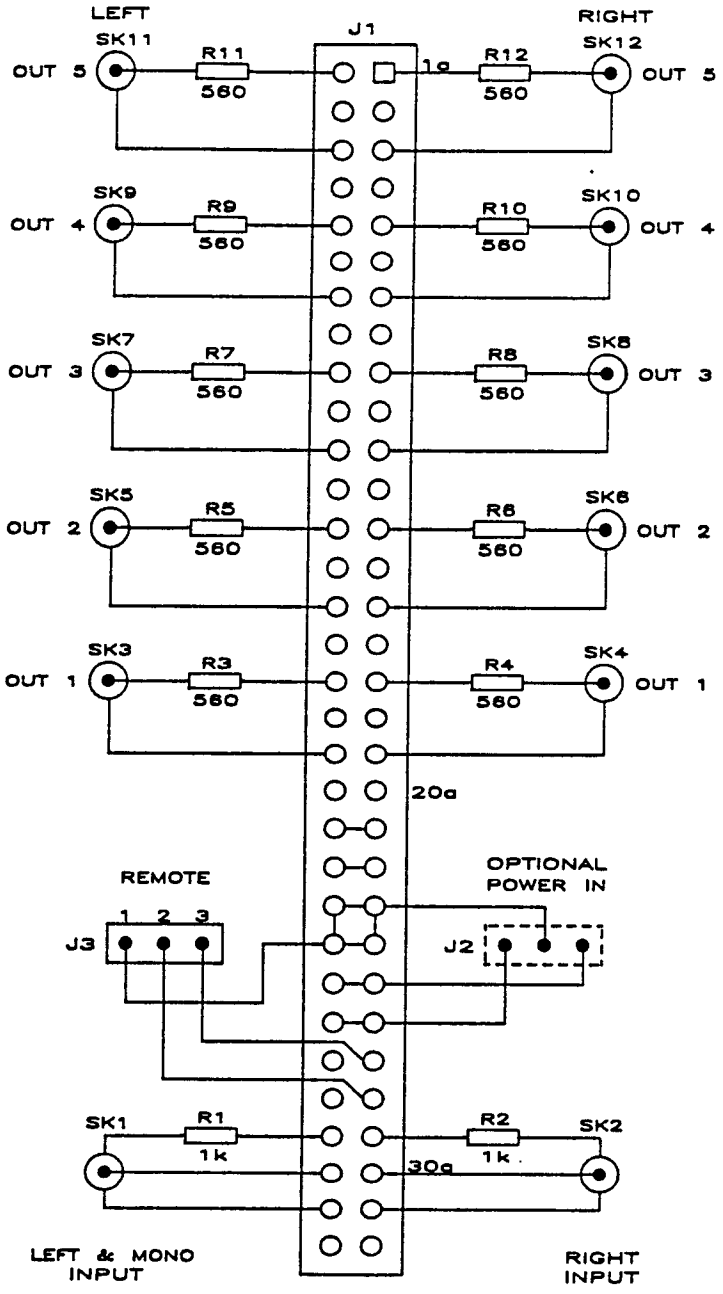
	DRAWN K.N.	SIZE / TITLE: R8-733T REAR ASSEMBLY
	CHECKED	SCALE / DRAWING No. 803664 / SHEET 1 OF 1
	ENG. APP.	
	CONTRACT No.	IRT Electronics Pty. Ltd. ARTARMON NSW AUSTRALIA 2064



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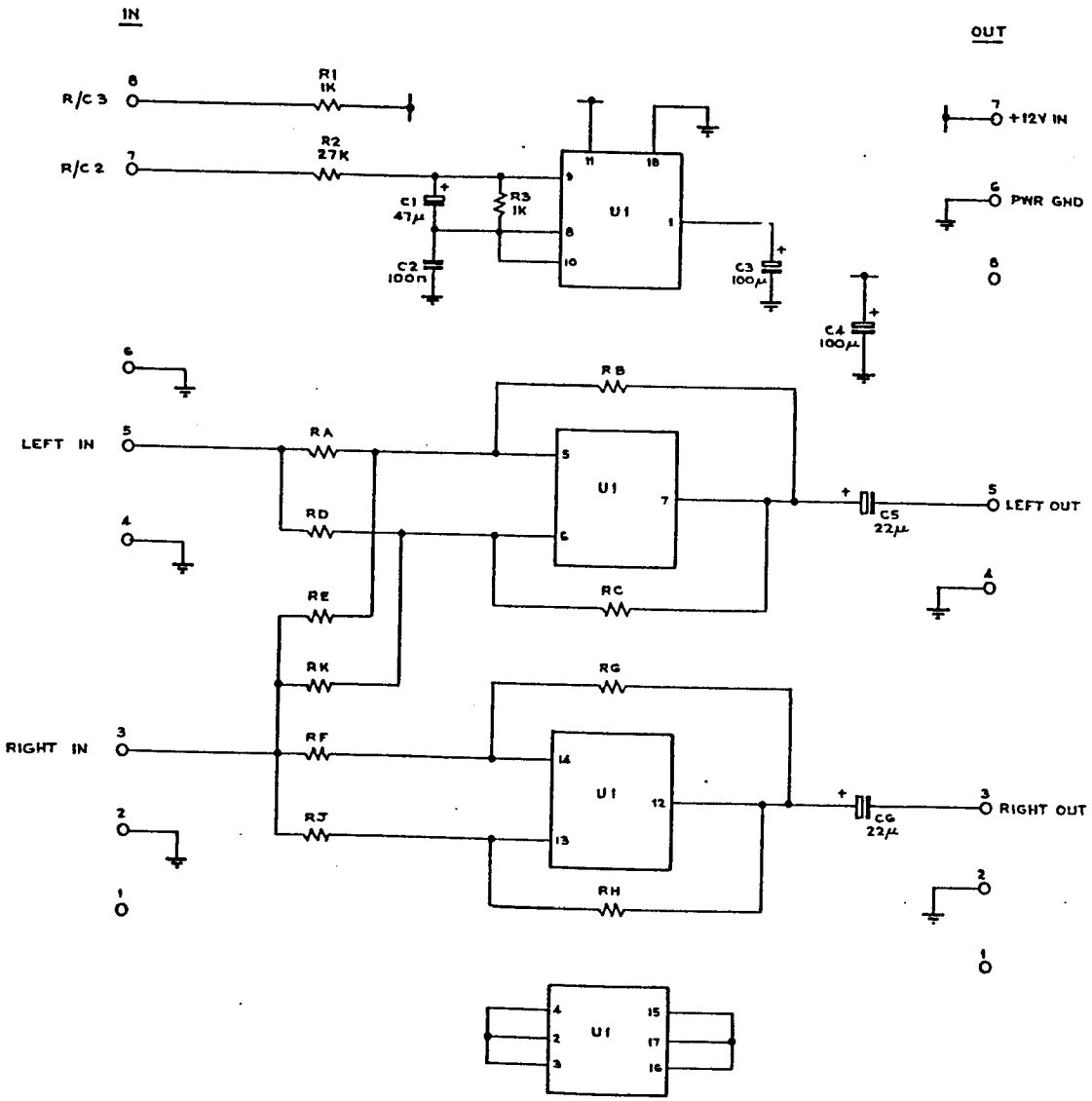
7/1/1993	DRAWN K.N.	SIZE	TITLE RB-704 REAR ASSEMBLY
	CHECKED	SCALE	DRAWING No. 803540 SHEET 1 OF 1
	ENG. APP.		
	CONTRACT No.	IRT Electronics Pty. Ltd. ARTARMON NSW AUSTRALIA 2064	



	RA	RC	RD	RE	RF	RH	RJ	RK
STEREO FADE	10K	S/C	O/C	O/C	10K	S/C	O/C	O/C
CROSS FADE	10K	10K	O/C	O/C	10K	10K	10K	10K
AUDIO OVER	10K	10K	33K	O/C	10K	10K	10K	10K
MIX L+R + FADE	6K8	S/C	O/C	6K8	10K	10K	10K	O/C
TRIM	10K	10K	22K	O/C	10K	10K	22K	O/C
BALANCE	10K	10K	22K	O/C	22K	10K	10K	O/C

NOTE : RB & RG are always 10K.

PCB 802738

IRT

DRAWN RAS DATE
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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM
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ORIGINAL ISSUE DATE 10.6.86

TITLE
S.D.A
REMOTE CONTROL
AR-604

SIZE SCALE :

CONTRACT NO

DRAWING NO 802739

SHEET OF

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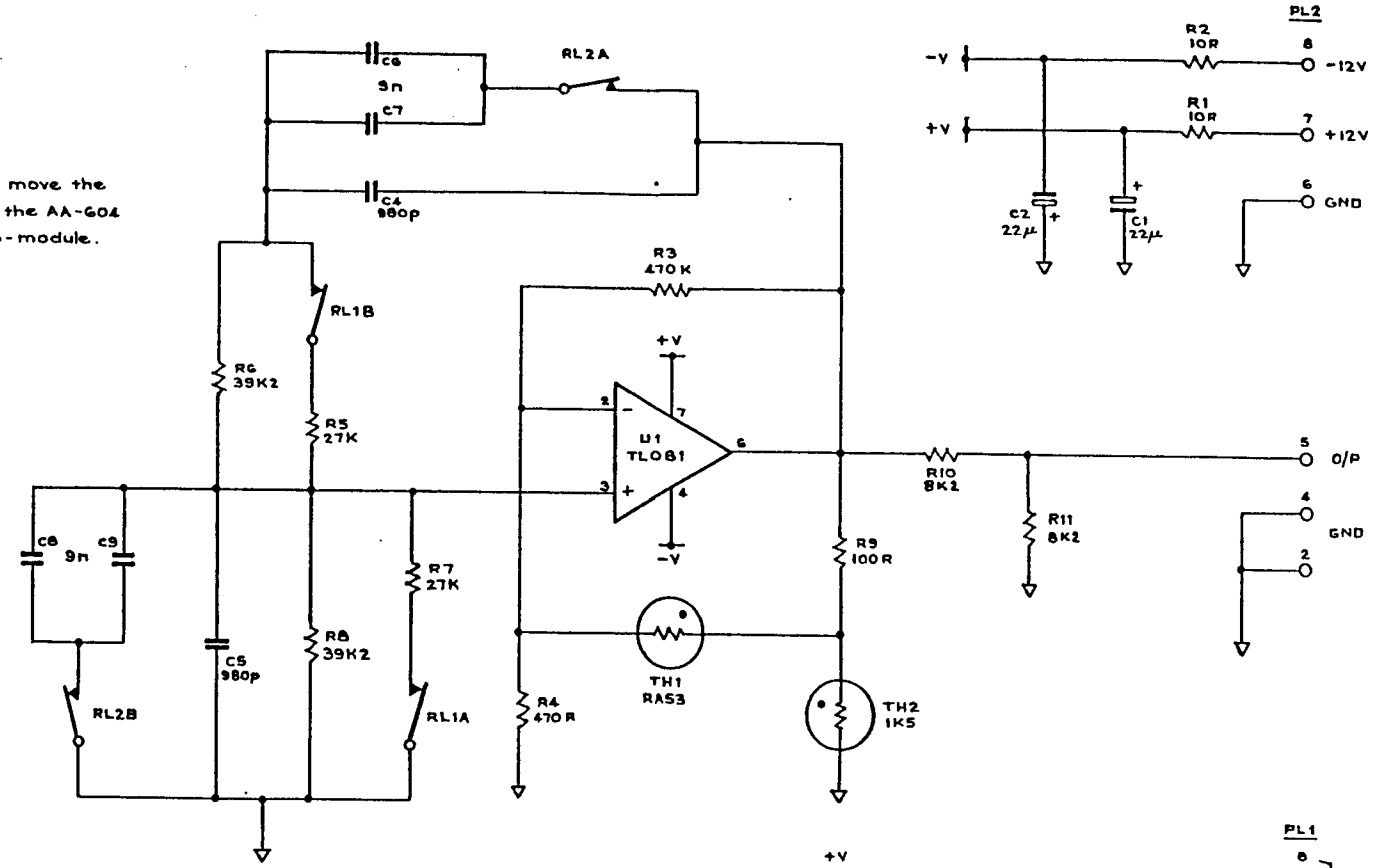
NOTE : Remove Links 1 & 2 , and move the Mode Link to STEREO in the AA-604 before installing the sub-module.



CONTROL	FREQ.
STATIC	1KHz
RL1 ON	400Hz
RL2 ON	10KHz
RL1 & 2 ON	4KHz

PCB 803007

IRT

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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM FRACTIONS DECIMALS ANGLES

ORIGINAL ISSUE - 6 6 - DATE

TITLE AG-604 SW SWITCHED OSCILLATOR SUB MODULE

SIZE | SCALE

CONTRACT NO -

DRAWING NO. 803006

SHEET OF

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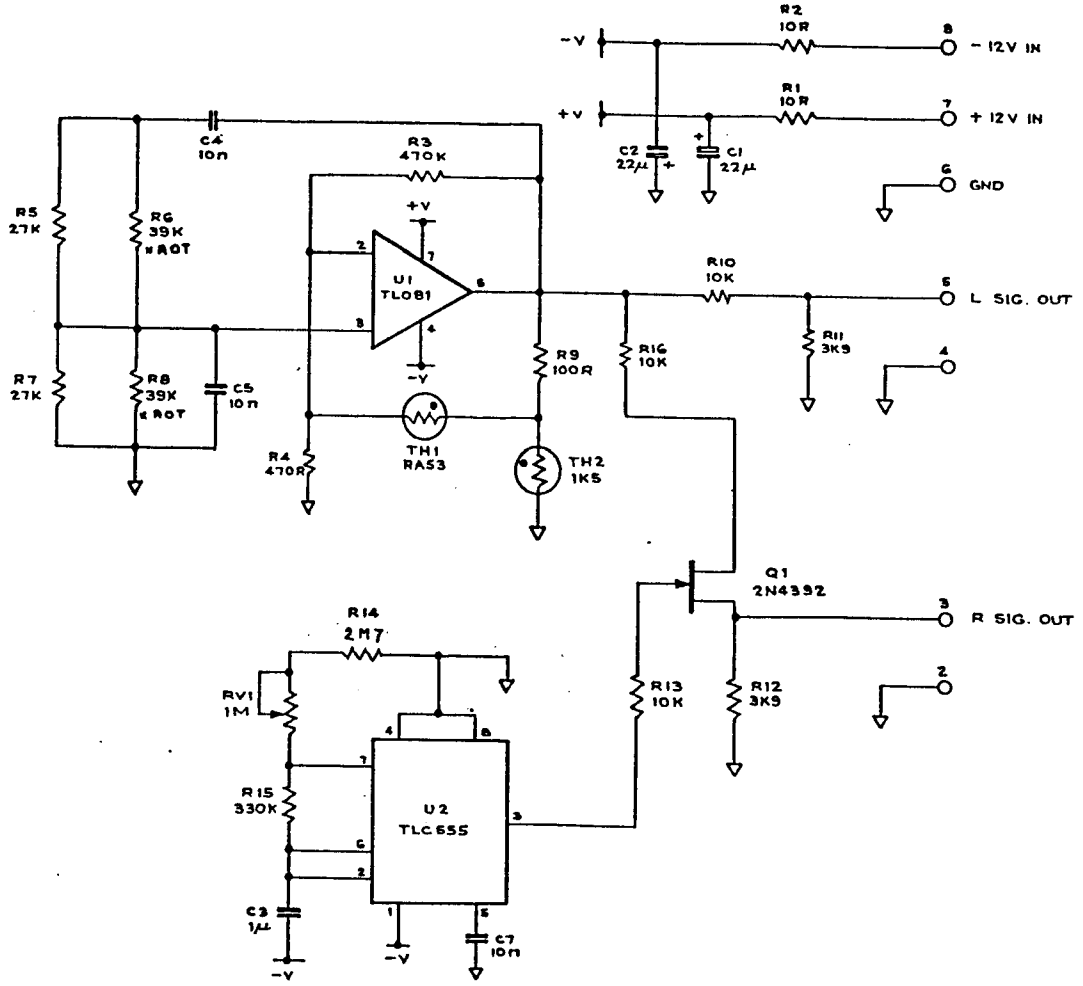
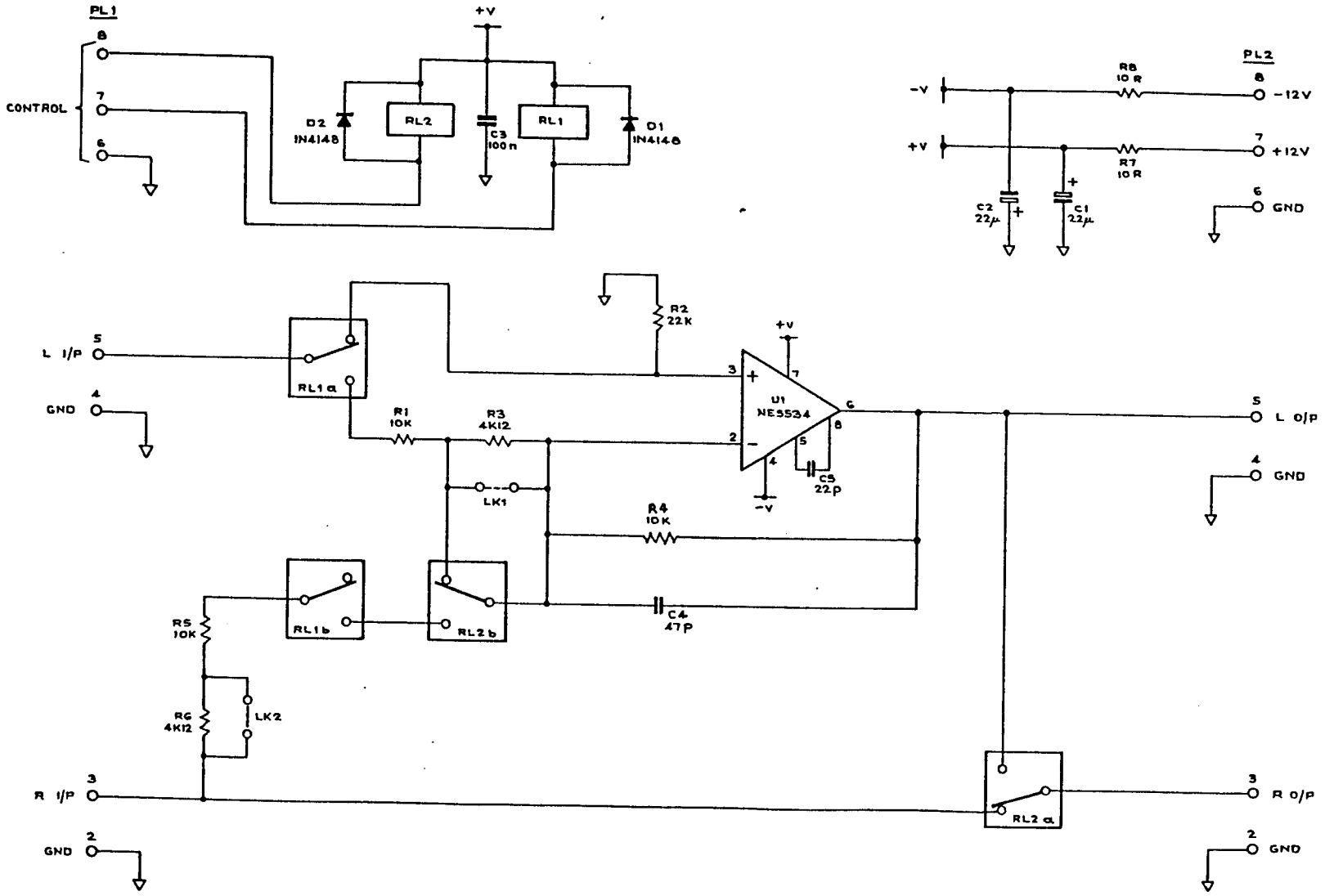


NOTE : Remove Links 1 & 2, and move the Mode Link to STEREO in the AA-604 before installing the sub-module.

PCB 803005

ORIGINAL ISSUE 1 DATE 28-6-89	© COPYRIGHT DO NOT COPY NOR DISCLOSE TO ANY THIRD PARTY WITHOUT WRITTEN CONSENT	IRT	
	DRAWN BAS DATE	TITLE	AG-604ST STEREO OSCILLATOR SUB MODULE
	TAPED	SIZE	SCALE
	CHECKED		
	ENG APP.		
	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MM FRACTIONS DECIMALS ANGLES	CONTRACT NO	DRAWING NO 803004 SHEET OF
		IRT	IRT Electronics Pty Ltd 56 Hotham Pde, Artarmon, Australia 2064



STATIC	STEREO
RL1 ON	CHANGE 'L' PHASE
RL2 ON	MONO O/P
RL1 + RL2 ON	MIX OF STEREO TO MONO

NOTE : Remove Links 1 & 2, and move the Mode Link to STEREO in the AA-604 before installing the sub-module.

PCB 803014

ORIGINAL ISSUE DATE 1-9-89

DRAWN BAS DATE

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TITLE AS-604 STEREO CONTROL SUB MODULE

SIZE SCALE :

CONTRACT NO

DRAWING NO 803013

SHEET 6P

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