

SERVICE INFORMATION

AMIS120 MIXER AMPLIFIER (6ch version)

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OPERATION MANUAL

PRODUCT DESCRIPTION

SCHEMATIC DIAGRAMS

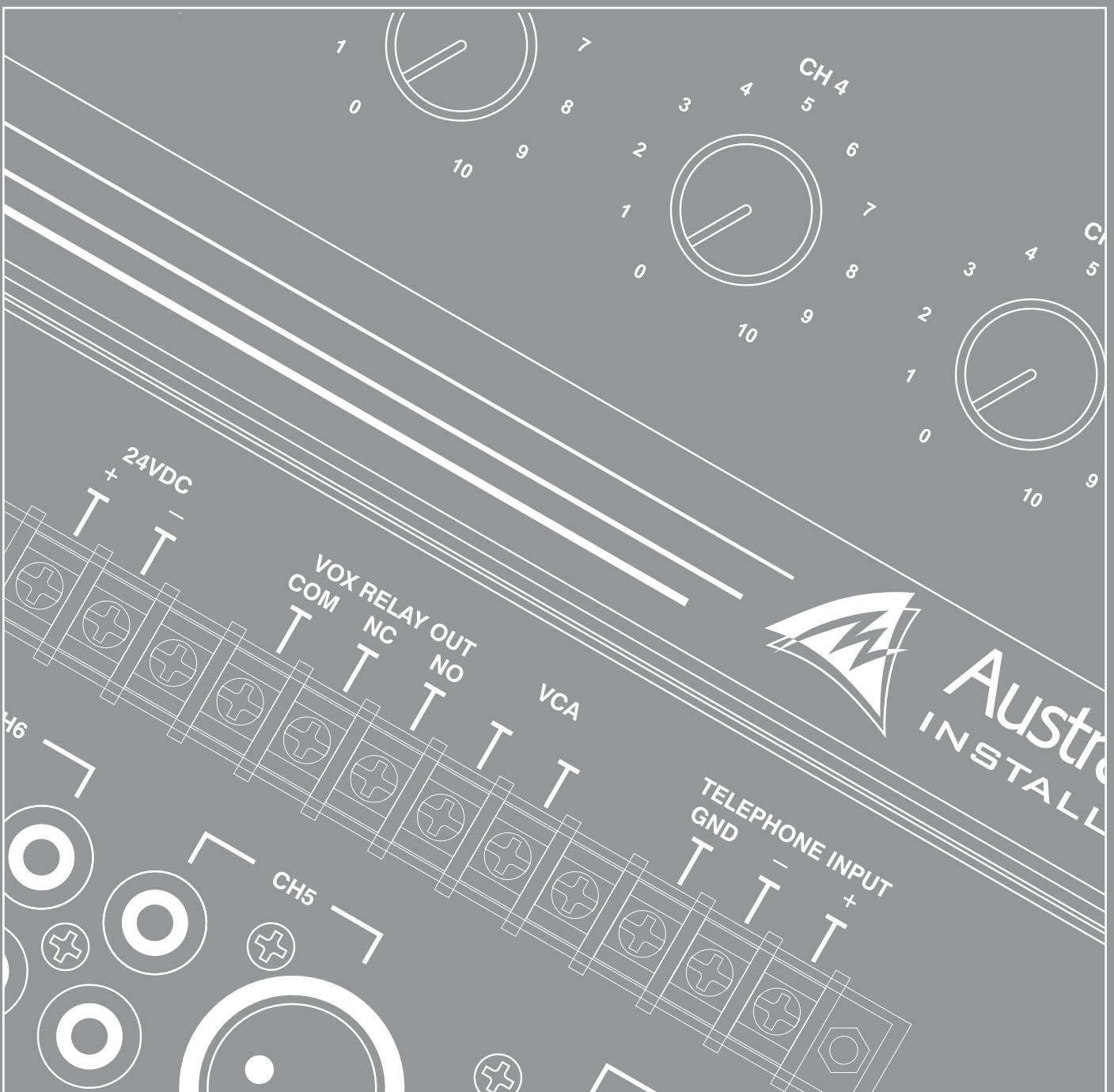
BOARD LAYOUTS

SERVICE BULLETINS

* Over the years there have been a number of revisions to this model

AMIS SERIES

60W / 120W MIXER AMPLIFIER
INSTALLATION AND OPERATION MANUAL





IMPORTANT SAFETY INFORMATION



1. Save the carton and packing material even if the equipment has arrived in good condition. Should you ever need to ship the unit, use only the original factory packing.
2. Read all documentation before operating your equipment. Retain all documentation for future reference.
3. Follow all instructions printed on unit chassis for proper operation.
4. Do not spill water or other liquids into or on the unit, or operate the unit while standing in liquid.
5. Make sure power outlets conform to the power requirements listed on the back of the unit.
6. Do not use the unit if the electrical power cord is frayed or broken. The power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs, convenience receptacles, and the point where they exit from the appliance.
7. Always operate the unit with the AC ground wire connected to the electrical system ground. Precautions should be taken so that the means of grounding of a piece of equipment is not defeated.
8. Mains voltage must be correct and the same as that printed on the rear of the unit. Damage caused by connection to improper AC voltage is not covered by any warranty.
9. Have gain controls on amplifiers turned down during power-up to prevent speaker damage if there are high signal levels at the inputs.
10. Power down & disconnect units from mains voltage before making connections.
11. Never hold a power switch in the "ON" position if it won't stay there itself!
12. Do not use the unit near stoves, heat registers, radiators, or other heat producing devices.
13. Do not block fan intake or exhaust ports. Do not operate equipment on a surface or in an environment which may impede the normal flow of air around the unit, such as a bed, rug, weathersheet, carpet, or completely enclosed rack. If the unit is used in an extremely dusty or smoky environment, the unit should be periodically "blown free" of foreign matter.
14. Do not remove the cover. Removing the cover will expose you to potentially dangerous voltages. There are no user serviceable parts inside.
15. Do not drive the inputs with a signal level greater than that required to drive equipment to full output.
16. Do not connect the inputs / outputs of amplifiers or consoles to any other voltage source, such as a battery, mains source, or power supply, regardless of whether the amplifier or console is turned on or off.
17. Do not run the output of any amplifier channel back into another channel's input. Do not parallel- or series-connect an amplifier output with any other amplifier output. Australian Monitor Inc is not responsible for damage to loudspeakers for any reason.
18. Do not ground any red ("hot") terminal. Never connect a "hot" (red) output to ground or to another "hot" (red) output!
19. Non-use periods. The power cord of equipment should be unplugged from the outlet when left unused for a long period of time.
20. Service Information Equipment should be serviced by qualified service personnel when:
 - A. The power supply cord or the plug has been damaged.
 - B. Objects have fallen, or liquid has been spilled into the equipment
 - C. The equipment has been exposed to rain
 - D. The equipment does not appear to operate normally, or exhibits a marked change in performance
 - E. The equipment has been dropped, or the enclosure damaged.

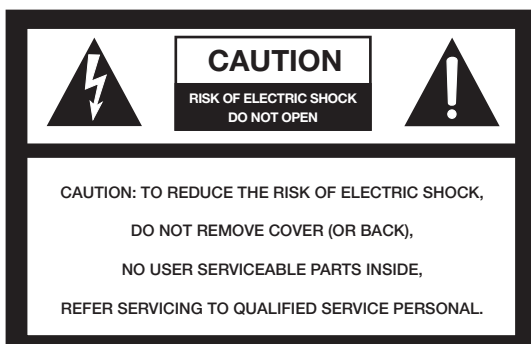
THIS SAFETY INFORMATION IS OF A GENERAL NATURE AND MAY BE SUPERSEDED BY INSTRUCTIONS CONTAINED WITHIN THIS MANUAL

INTRODUCTION AND CONTENTS

The AMIS60 and AMIS120 mixer amplifiers are designed for commercial installations. Both models operate on 230/240 VAC, 50Hz (115VAC, 60Hz) or 24 VDC, and may be desk or rack mounted (rack mount kit supplied fitted). The AMIS60 will deliver 60 watts into a load of 8 ohms, 70 volt or 100 volt line. The AMIS120 will deliver 120 watts into a load of 4 or 8 ohms, 70 volt or 100 volt line. Both Models feature 6 universal mic/line inputs. The AMIS60/120 also feature a dual RCA record output while a balanced XLR output is also provided to feed external booster power amplifiers. Other standard features include on-board bell, pre-announce, alert & evac tones, remote master VCA control & priority muting. As standard, both models are self standing and come with rubber feet.

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WARNING!

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK
DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the products enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

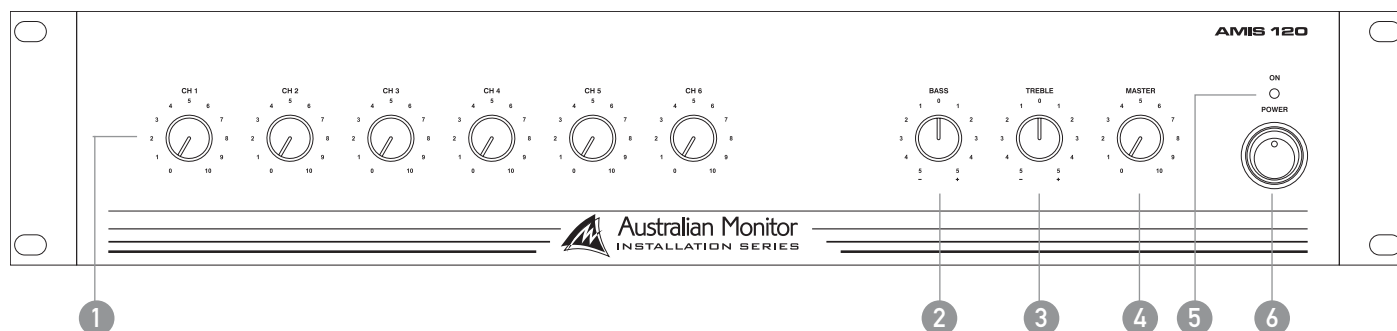


This symbol is intended to alert the user to the presence of important operational and maintenance (servicing) instructions in the literature accompanying the appliance.

Caution:

To prevent electric shock do not use this (polarised) plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure. To prevent electric shock, match wide blade of plug to wide slot, fully insert.

FRONT PANEL



1 CH 1-6

These control the individual level for each channel input.

2 BASS

There is 12dB of cut and boost at 100Hz. This EQ is the shelving type.

3 TREBLE

There is 9dB of cut and boost at 10kHz. This EQ is the shelving type.

4 MASTER

This controls the overall output level.

5 ON

This LED indicates the unit is powered "on".



NOTE: When using the "24VDC" in terminals, the amplifier is 'on' and the power LED will always be on regardless of the position of the power switch.

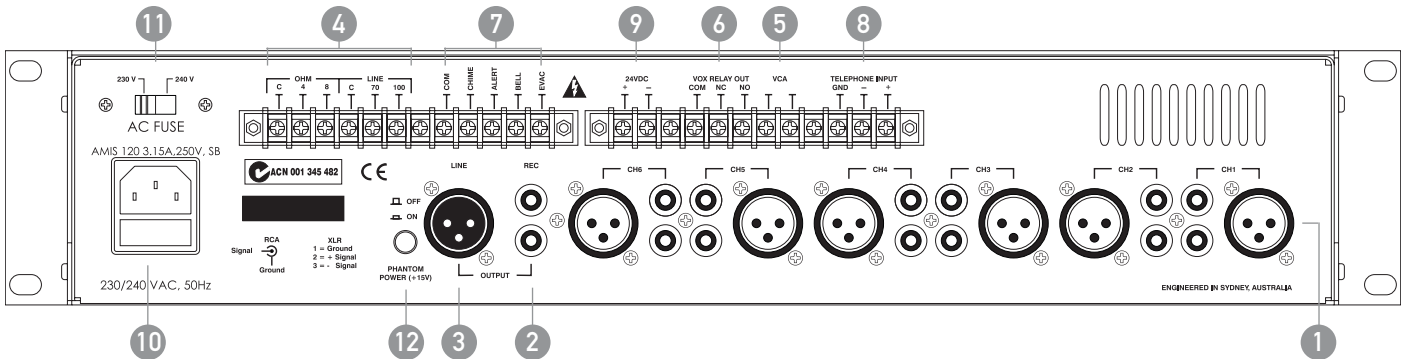
6 POWER

This switch switches power on or off from the mains. The up position is on.



NOTE: When using the "24VDC" in terminals, the amplifier is 'on' regardless of the switch position.

REAR PANEL



1 CH 1-6

Each channel input section has two inputs:

XLR input – This is a balanced microphone input. It has an input sensitivity of 1mV.

RCA input – This is an unbalanced line level input. It has an input sensitivity of 150mV. The two RCA sockets are summed to mono internally.

2 REC OUTPUT

The REC output is on unbalanced RCA connectors. The output level is 300mV into 10kohm at rated output. The output is dual mono.

The REC output is not affected by the MASTER volume control or the BASS and TREBLE controls. The REC output does not receive the tone signal.

3 LINE OUTPUT

The LINE output is on a balanced XLR connector. The output level is 2V into 1k at rated output.

NOTE: When wiring the LINE output as unbalanced, Pin2 should be wired as hot and Pin1 should be wired as ground/shield. Do not wire Pin3.

4 AMP OUT

The speaker connections are on the 12 pole terminal strip. There is a low impedance output (OHM) and a distributed line voltage output (LINE).

25V/70V out is available on 115V models.

70V/100V out is available on 230V/240V models.

8ohm out is available on the AMIS60 and AMIS120.

4ohm out is available on the AMIS120.

MINIMUM IMPEDANCE

	AMIS60	AMIS120
Distributed Line Output		
25V (115V version)	10.4ohm	5.2ohm
100V (230/240V version)	333ohm	166ohm
70V (230/240 & 115V versions)	166ohm	83ohm

Low Impedance Output

4 ohm (230/240 & 115V versions)	N/A	4ohm
8 ohm (230/240 & 115V versions)	8ohm	8ohm

NOTE: Only connect one output - either Distributed Line or Low Impedance per channel. Do not connect the 8ohm, 4ohm and 100V at the same time.

The output strip comes fitted with a touch-proof cover held in place by two M3 machine screws with flat and spring washers.

5 VCA CONTROL

These two terminals provide connection for an external potentiometer (500k log) which is available mounted on a wall panel from Australian Monitor (RC1). When the potentiometer is connected it allows for remote control of the master level. The external pot is governed by the master level of the amplifier allowing the installer to set the volume and then lock the amplifier in a rack, leaving the user with just a master volume control that cannot go beyond the level set on the front panel master control. The terminals can also be used as a system mute by shorting the two contacts together (by a relay or switch for example).

6 VOX RELAY

These terminals provide connection for the priority relay output. The relay outputs are C (Common), NO (Normally Open) and NC (Normally Closed). These are the states of the relay when the amplifier is off (mains or dc). When the unit is switched on the relay activates. The relay deactivates when signal is present at any of the priority inputs regardless of the front panel channel volumes. This would normally be inputs 1 and 2 however these channels can be removed from the priority bus via internal links (see "Functional Notes"). The unit is shipped from the factory with inputs 1 and 2 having priority so assuming that this has not been changed, signal at any of these inputs will deactivate the VOX relay circuit. The relay also deactivates when a tone sound is triggered

The NO or NC selection provides the installer with the option of the relay either opening or closing a contact. This feature is normally used in conjunction with relay override attenuators (volume controls). In this application, the relay output could trigger an accessory power supply which in turn bypasses the remote attenuators. The result is that priority inputs or alarm tones will always be heard irrespective of the attenuator setting. The relay contacts are rated at 3 amps at 125VAC/30VDC. The relay can be disabled via an internal link (see "Internal Settings").

7 TONES MODULE

These terminals provide connection for triggering the in built tone module. The four tones can be activated individually by shorting the named terminal to COM. When any tone is activated, all inputs (except for inputs 1 and 2) will automatically mute. The level of the tones can be adjusted internally (see "Internal Adjustments"). The pot adjusts the level for all 4 tones.

Tones available on the AMIS60 and AMIS120 are:

- Evacuation Tone
- Alert Tone
- Bell Tone
- Pre-Announce Chime

8 TELEPHONE INPUT (only on 115V models)

The 600 ohm transformer balanced Telephone Input is paralleled with input 2. If telephone paging is required, the XLR & dual RCA inputs should not be used as these inputs will be summed with the Telephone Input into channel 2. The front panel level control will set the gain for the Telephone Input.

The Telephone input is shipped with a jumper lead connected to the input terminals; this must be discarded if the telephone input is to be used.

9 24VDC POWER IN

These terminals provide connection for an external 24V emergency power system and are not switched by the front panel power switch. The 24VDC does NOT provide any trickle charge facility. The binding posts can accommodate wire of up to 1.5mm in diameter. The maximum current draw at 24VDC is 9A.

10 IEC MAINS INPUT SOCKET

This is a standard IEC 3 pin socket. It accepts a standard IEC mains cable, provided. The fuse draw contains the mains fuse and a spare.

	AMIS60	AMIS120
230V/240V model	2A	3.15A
115V model	3.15A	4A

IMPORTANT: Always replace the fuse with one of the same value and type.

NOTE: Always disconnect power to the amplifier before replacing fuses.

11 VOLTAGE SELECT SWITCH (only on 230V/240V models)

This switch is used to select the mains voltage for your region.

IMPORTANT: Disconnect power to the amplifier before operating this switch.

12 PHANTOM POWER

This switch enables +15V phantom power across all XLR input connectors.

INSTALLATION

MOUNTING

When rack mounting, it is advisable to allow 1 rack space above and below the amplifier. When multiple amplifiers are mounted in a rack, exhaust fans should be used on the rack. Airflow for cooling the amplifier is by convection from bottom to top and by fan left to right.

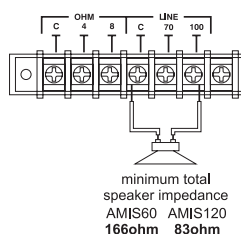
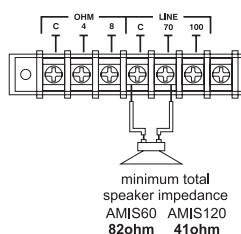
OUTPUT CONNECTIONS

The output terminal strip accepts wire sizes from 16-22AWG (1.5mm² - 0.35mm²).

The following table should be used as a guideline for cable sizes. Regulations in your area may require different gauged wire and should be checked before using.

OUTPUT	DISTANCE	WIRE SIZE AMC60	AMC120
100V	Up to 50m	AWG26(0.12mm ²)	AWG24(0.2mm ²)
	50m–200m	AWG20(0.5mm ²)	AWG18(0.75mm ²)
	Over 200m	AWG18(0.75mm ²)	AWG16(1.5mm ²)
70V	Up to 50m	AWG24(0.2mm ²)	AWG22(0.35mm ²)
	50m–200m	AWG18(0.75mm ²)	AWG16(1.5mm ²)
	Over 200m	AWG16(1.5mm ²)	AWG13(2.5mm ²)
4 ohm	Up to 10m	AWG20(0.5mm ²)	AWG20(0.5mm ²)
	10m–30m	AWG16(1.5mm ²)	AWG16(1.5mm ²)
	Over 30m	Not Recommended	Not Recommended
8 ohm	Up to 10m	AWG24(0.2mm ²)	AWG24(0.2mm ²)
	10m–30m	AWG18(0.75mm ²)	AWG18(0.75mm ²)
	Over 30m	Not Recommended	Not Recommended

230/240V version

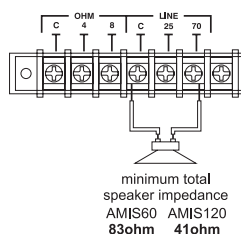
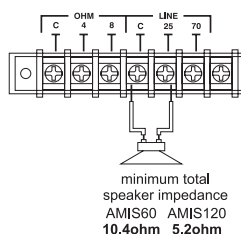


NOTE: Only connect one output - either Distributed Line or Low Impedance.

The LINE output XLR can be used to connect up to 6 booster amplifiers. Balanced input wiring (shielded pair cable) is recommended.

NOTE: When wiring the LINE output as unbalanced, Pin2 should be wired as hot and Pin1 should be wired as ground/shield. Do not wire Pin3.

115V version

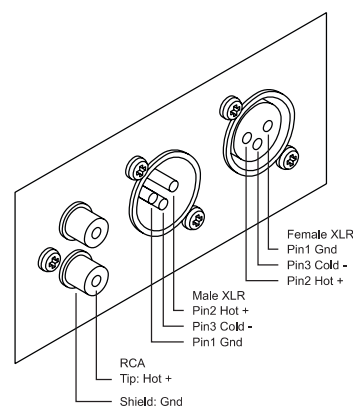


The REC output wiring should be kept as short as possible.

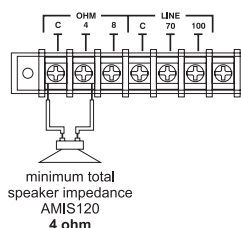
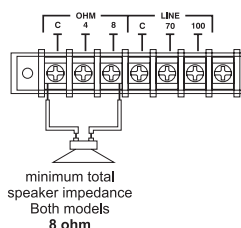
INPUT CONNECTIONS

For wiring balanced in, pin 2 is hot. Unbalanced wiring on the microphone inputs is not recommended. Balanced input wiring (shielded pair cable) is recommended.

Unbalanced RCA wiring should be kept as short as possible.



Both versions



SETUP & TROUBLESHOOTING

Levels

Volume controls should aimed to be set at nominal, which is at the half or 12o'clock position. Any unused channels should be set to minimum.

When establishing a mix, remember: Less is more.

TROUBLESHOOTING GUIDE

TROUBLE	LIKELY CAUSE	REMEDY
Power LED not on	Power not reaching amplifier	Check mains connection Check mains fuse Check power switch is on
Distorted sound	Output is short circuit	Check speaker loads for shorts
	Input is overloaded	Reduce input level at source
	Output is being over driven	Reduce volume levels on front panel
	Bass control is turned up	Reduce Bass control level
No sound but amp is on	DC fuse(s) blown	Refer product to local Australian Monitor dealer
	Volume controls down	Check volume controls
	Amplifier has overheated	Make sure the amplifier is well ventilated.
No sound from channels 3-6	Priority function is being used	Remove signal (disconnect input) from channel 1 OR Disable priority function (see Internal Adjustments)
Condenser microphone does not work	Phantom power not switched on	Turn on phantom power switch on back panel.

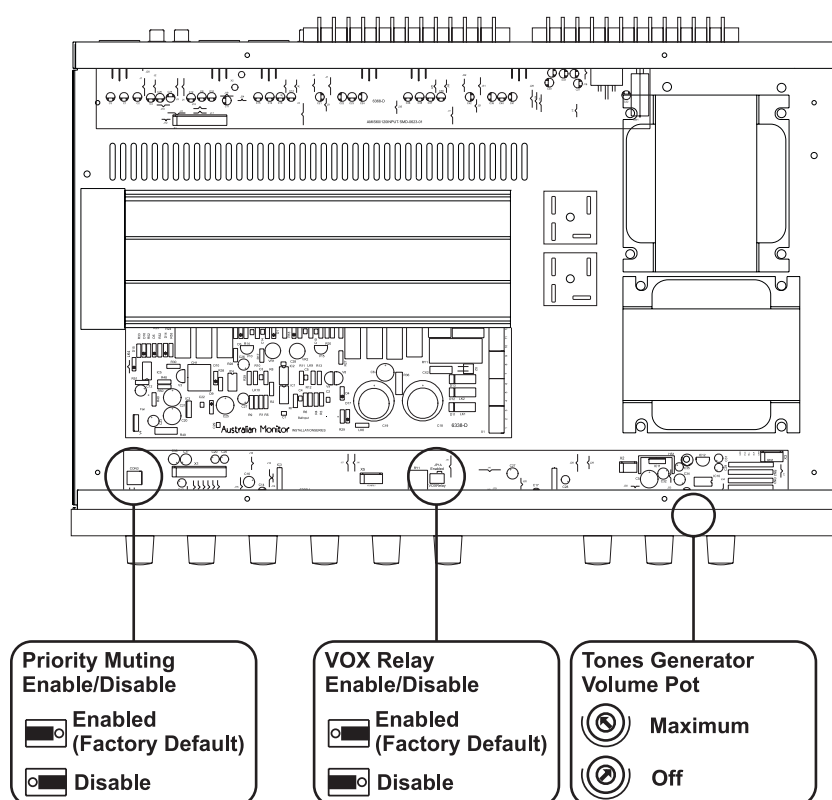
PRIORITY

Channel 1 and 2 are set up to mute channels 3 to 6. This will only occur when signal appears on channel 1 or 2 irrespective of the channel volume control.

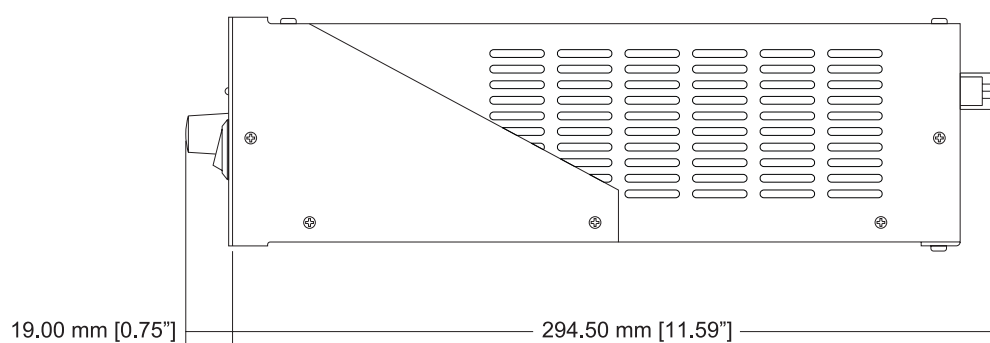
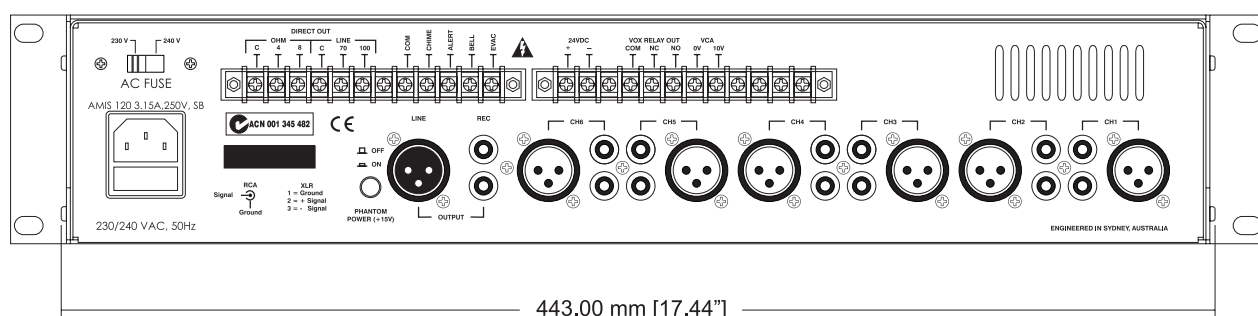
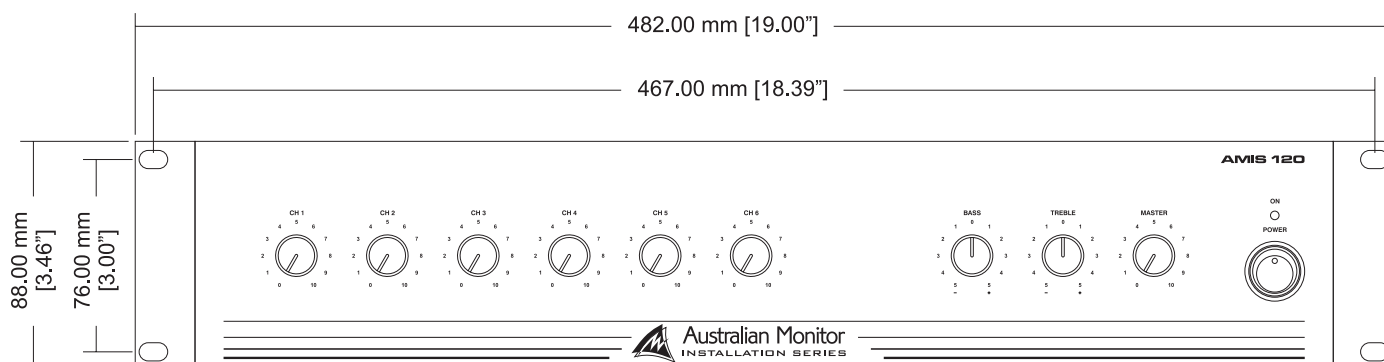
Priority can be disabled. (See below).

The release time is approx. 1 sec and is NOT adjustable.

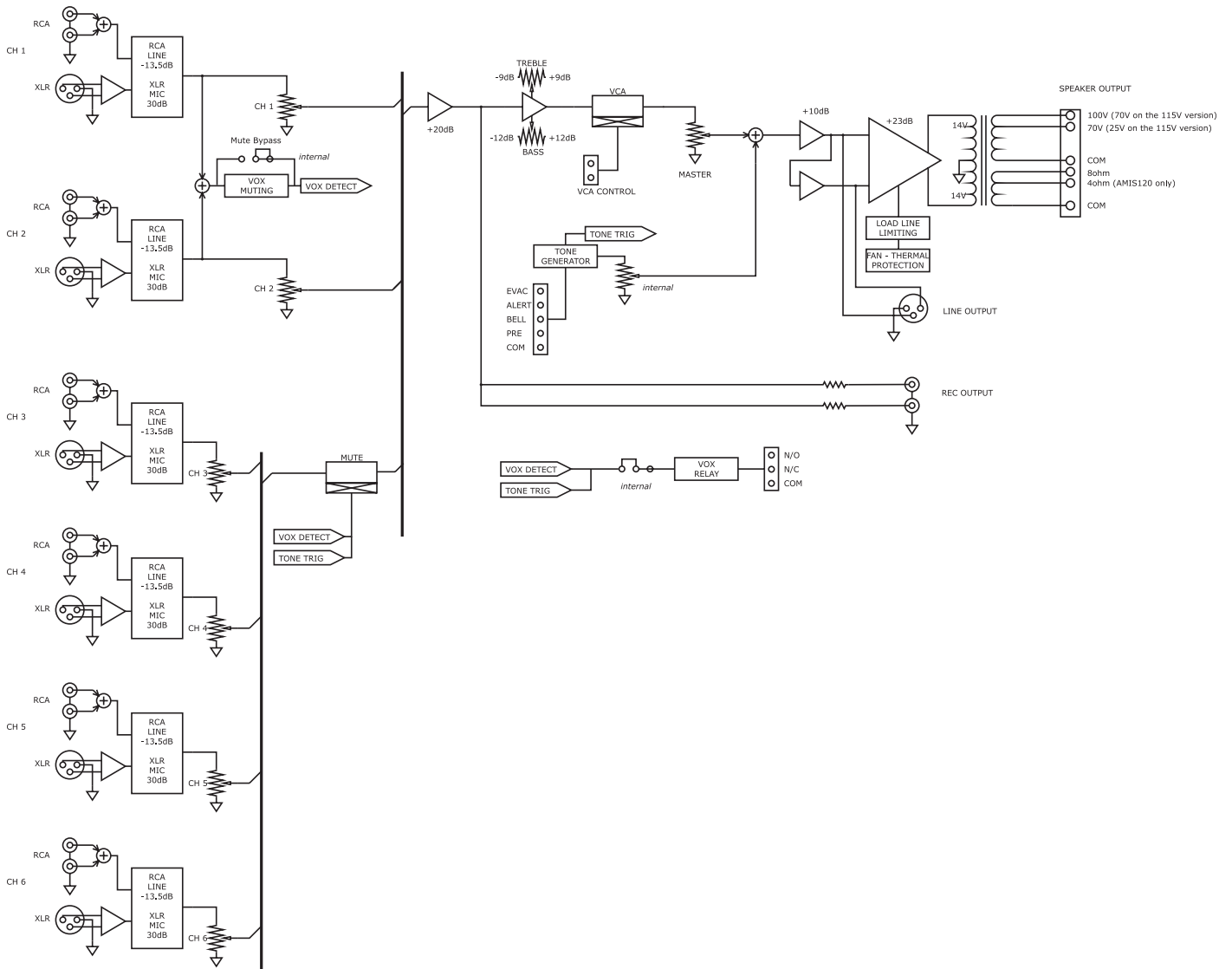
The mute depth is greater than 60dB and is not adjustable.



DIMENSIONS



BLOCK DIAGRAM



SPECIFICATIONS

	AMIS 60	AMIS 120
POWER OUTPUT (0.5%THD, 1KHZ)	60W	120W
S/N RATIO	> 76dB	> 76dB
POWER BANDWIDTH (-3DB +1DB)	60Hz-15kHz	60Hz-15kHz
OUTPUT REGULATION	90%	90%
SIZE (WXHxD)	482x88x313.5mm 19"x3.5"x12.3"	482x88x313.5mm 19"x3.5"x12.3"
NET WEIGHT	8.5kg 18.7lb	11.0kg 24.2lb
SHIPPING DIMENSIONS (WXHxD)	525x175x385mm 20.7"x6.9"x15.2"	525x175x385mm 20.7"x6.9"x15.2"
SHIPPING WEIGHT	10.5kg 23.1lb	13.0kg 28.6lb

COMMON TO ALL MODELS

THD (1KHZ, -1DB)		< 0.5%
MIC INPUT	SENSITIVITY IMPEDANCE HEADROOM	1mV 1k3 ohm 136mV (42dB)
AUX INPUT	SENSITIVITY IMPEDANCE HEADROOM	50mV >200kohm > 15V (>40dB)
TONE CONTROL	BASS @ 100HZ TREBLE @ 10KHZ	+/- 12 dB +/- 9 dB
LINE OUT	SENSITIVITY OUTPUT IMPEDANCE	2V @ 1kohm 100ohm
TAPE	SENSITIVITY OUTPUT IMPEDANCE	300mV @ 10kohm 100ohm

SPECIFICATIONS

	AMIS 60	AMIS 120
MAINS CURRENT DRAW (240V)		
FULL POWER	0.75A	1.5A
1/3 POWER	0.50A	0.95A
1/8 POWER	0.40A	0.65A
IDLE	0.25A	0.15A
MAINS CURRENT DRAW (115V)		
FULL POWER	1.6A	3.1A
1/3 POWER	1.0A	2.0A
1/8 POWER	0.80A	1.4A
IDLE	0.50A	0.30A
THERMAL OUTPUT (W)		
FULL POWER	80W	170W
1/3 POWER	70W	140W
1/8 POWER	55W	110W
IDLE	15W	20W
THERMAL OUTPUT (BTU/HR)		
FULL POWER	273	580
1/3 POWER	239	478
1/8 POWER	188	375
IDLE	51	68

**1/3 and 1/8 power levels relate to voltage changes, not load changes.*

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AMIS60/120

Product Description

The AMIS60 and AMIS120 mixer amplifiers are designed for commercial installations. Both models operate on [230/240 VAC, 50Hz] (240V version)/[115VAC, 60Hz] (115V version) or 24 VDC, and may be desk or rack mounted (rack mount kit supplied fitted). Both amplifiers incorporate a 6 zone 100 volt line speaker zone selector with "All Call". The AMIS60 will deliver 60 watts into a load of 8 ohms, 70 volt or 100 volt line. The AMIS120 will deliver 120 watts into a load of 4 or 8 ohms, [70 volt or 100 volt line] (240V version)/[70 volt or 25 volt line] (115V version). Both Models feature 4 universal mic/line inputs, and an insert point for additional EQ or feedback exterminator if required. The AMIS60/120 also feature a dual RCA tape output while a balanced, 700mV XLR output is also provided to feed up to six power amplifiers. Other standard features include on-board Bell, Pre Announce, Alert & Evac tones, Remote Master VCA Control & dual stage priority muting. As standard, both models are self standing and come with rubber feet. They may be stacked to a maximum of four units high. [The 115V version also has a transformer balanced, 600 ohm telephone input] (115V version).

AC Power Inlet

The 3 pin IEC power inlet is located on the bottom left of the rear panel and accepts a standard mains power lead fitted with an IEC connector. Before plugging in a power lead, please check the rear panel of the amplifier to ensure that the voltage switch is set correctly for your part of the world.

The operating voltage is [230/240 VAC @ 50 Hz] (240V version)/[115 VAC @ 60 Hz] (115V version). (240V version) [The inlet is equipped with an inbuilt AC fuse holder fitted with a 4 amp fuse (ACM120) or a 2 amp fuse (ACM60) plus a spare within the holder].

(115V version) [The inlet is equipped with an inbuilt AC fuse holder fitted with an 8 amp fuse (AMIS120) or a 4 amp fuse (AMIS60) plus a spare within the holder].

Power consumption is approximately 125 VA for the AMIS60 and 250VA for the AMIS120.

24 Volt DC Power Inlet

The AMIS60 & AMIS120 feature optional 24VDC power to run off a battery supply if required. This is connected via the rear terminal strip. The front panel Power Switch will not switch DC power 'on' or 'off' in DC operation. In this mode the amplifier is always 'on'.

There is no trickle charge resistor across the diode (one diode of a bridge rectifier).

[230V/240V Slide Switch] (240V version)

The operating voltage of the amplifier is user selectable between 230V and 240V via a slide switch located on the top left side of the rear panel. This switch should be set to match the AC voltage of your country. The mains transformer is wound with a 230V winding plus a 10V winding internally connected.

Power Amp

The power amp is a push pull single supply amplifier driving a centre tapped transformer. The amplifier has an overall gain of approximately x10 and the transformer has a turns ratio of approximately [x7] (240V version)/[x5] (115V version). The sensitivity of the amp is approximately 2.7V.

A particularly good aspect of this amplifier is the current limiting circuit. The sensing circuit is a standard rail load line limiting circuit but it is the drive circuit that is important. As transistors V12 & V14 (BC640) turn on transistor V11 (BC639), it pulls bias current away from the amp through diodes D1 & D4 (BAV21) and pulls drive away from the op amp IC1 (LM1458) through the diode/resistor pair D2/R12 (BAV21/2k2) & D3/R23. Individually each topology acts to limit the current in the amp but it is the combination of the two and the fine tuning of there interaction that produces the characteristic soft limiting without the harsh crossover distortion. It is not until the amp is in hard clip does the amp produce the high freq crossover

distortion. This makes for nice sounding current limit that allows for soft distorted peaks to get through but limits continuous excessive current while maintaining thermal stability.

Speaker Output Terminal Strip

(240V version)

The screw terminals on the left hand side of the strip allow access to the direct speaker outputs of the amplifier. Reading from left to right the terminals are:

COM	Common or “-” for low impedance speaker loads (4 or 8 ohms).
4	Positive “+” for 4 ohm speaker loads (use with common) (AMIS120 only)
8	Positive “+” for 8 ohm speaker loads (use with common)
COM	Common or “-” for 70v or 100v speaker loads (maximum load of 80 ohms at 100v AMIS120 & 160 Ohms at 100v AMIS60)
70	Positive “+” for 70v line speaker loads (use with common)
100	Positive “+” for 100v line speaker loads (use with common)

Please ensure that the correct “Common” is used. Low impedance and 70/100v loads can be used simultaneously but please pay careful attention to the overall speaker load.

Note: The minimum impedance (or maximum load) at 100 volt line should be no less than 80 Ohms for the ACM120 and no less than 160 Ohms for the AMIS60.

(115V version)

The screw terminals on the left hand side of the strip allow access to the direct speaker outputs of the amplifier. Reading from left to right the terminals are:

COM	Common or “-” for low impedance speaker loads (4 or 8 ohms).
4	Positive “+” for 4 ohm speaker loads (use with common) (AMIS120 only)
8	Positive “+” for 8 ohm speaker loads (use with common)
COM	Common or “-” for 25v or 70v speaker loads (maximum load of 40 ohms at 70v AMIS120 & 80 Ohms at 70v AMIS60)
25	Positive “+” for 25v line speaker loads (use with common)
70	Positive “+” for 70v line speaker loads (use with common)

Please ensure that the correct “Common” is used. Low impedance and 25/70v loads can be used simultaneously but please pay careful attention to the overall speaker load.

Note: The minimum impedance (or maximum load) at 70 volt line should be no less than 40 Ohms for the ACM120 and no less than 80 Ohms for the AMIS60.

Terminal Strip

The remaining terminals read as:

Spare
Tone Generator Common (use with one of the 4 tones listed below)
Pre-Announce Chime
Alert Tone
Bell Chime
Evacuation Tone
24 volt DC
Vox Relay Out
VCA

[600 Ohm Telephone Input] (115V version)

Phantom Power Button

This button enables or disables the 15 volts DC phantom power to all microphone XLRs. Do not plug an unbalanced microphone in to any amplifier or mixer when phantom power is switched 'on'.

The phantom voltage is connected through 4k7 1/4W resistors. The maximum current draw available per microphone is approximately 3mA.

Line Output

The balanced XLR line level output provides a maximum of 700mV to allow for the connection of up to 6 power amplifiers. Pin connections are: pin 1-earth; pin 2-signal (hot +); pin 3-signal (cold -).

The output is electronically balanced with an inverting op-amp and buffered with voltage follower op amps. Neither hot nor cold output should be grounded when connecting as unbalanced.

Tape Output

Dual RCA output connectors provide a line level output with a maximum of 350mV into 10k Ohms. This output is sourced before the master gain control so the tape output level is not influenced by the operation of the master gain control.

Microphone Inputs

All six inputs are dual mic/line with microphone inputs being via a 3 pin XLR connector per channel. The mic input sensitivity is 1mV @ 200 ohms. Pin connections are: pin 1-earth; pin 2-signal (hot +); pin 3-signal (cold -). Phantom power of +15 volts is available on all microphone inputs. Reading from left to right across the rear panel, the inputs are 4, 3, 2, & 1.

Line Inputs

All four inputs are dual mic/line with line/auxiliary inputs being via dual RCA connectors per channel. Line inputs 1, 2 & 3 have an input sensitivity of 150mV @ 100K ohms. Input 4 has an input sensitivity of 300mV @ 220K ohms making it suitable for high level inputs such as a CD player. Reading from left to right across the rear panel, the inputs are 4, 3, 2, & 1.

[600 Ohm Telephone Input] (115V version)

The 600 ohm transformer balanced Telephone Input is summed with input 2 through 100k ohms.

The input sensitivity is 150mV (driving the amp to full power)

When an external processor is used via the insert point, it only affects the power amplifier section and line output of the AMIS60 & AMIS120. The tape output remains unprocessed.

VOX Relay Output

The terminal strip to the immediate right of the AC inlet features a relay output. This relay is deactivated when signal becomes present at any of the priority inputs. This would normally be inputs 1 and 2; however these channels can be removed from the priority bus via internal links. The unit is shipped from the factory with inputs 1 and 2 having priority. The emergency tones also deactivate the relay. The relay can also be removed from the priority bus allowing muting to occur without operation of the relay.

The relay outputs are C (Common), NO (Normally Open) and NC (Normally Closed). The NO or NC selection provides the installer with the option of the relay either opening or closing a contact. This feature is normally used in conjunction with relay override attenuators (volume controls). In this application, the relay output could trigger an accessory power supply which in turn bypasses the remote attenuators. The result is that priority inputs will always be heard irrespective of the attenuator setting. The relay contacts are 3 amps at 125VAC/30VDC.

The relay outputs are marked in the fail safe position, i.e. power off. When power is applied and no signal is present the relay energizes through transistor V3 (BC546). This transistor is turned on by IC5B (LM358 or equivalent). This output is normally high. Switch on and switch off times are controlled by the time constants of the RC network of C21 and R77. The switch off time is determined by the current sinking capabilities of the LM358 through diode D4 (BAV21 or equivalent). This time can be considered instant. The on time is determined by the charge time of C21 (22uF) through R77 (22k). This is approximately 2 seconds. It must be remembered that the relay circuit is designed to be fail safe so that when power is on the relay is on and therefore the relay must turn off quickly (when priority is on) and on slowly (when priority is off). This is to avoid chatter of the relay.

VCA Control

An external pot (500K) can be connected to the AMIS60/120 for remote control of the master level. The external pot is governed by the master level of the amplifier allowing the installer to set the volume, then lock the amplifier in a rack, leaving the user with just a master volume control that cannot go beyond the level set on the master (front panel) control. Connection is via a 2 wire terminal strip on the rear panel of the amplifier. Shorting this input will mute the amp.

The VCA IC has a Voltage/Gain ratio of approximately -3mV/dB. That is a voltage difference of approximately 300mV below the reference voltage (pin3, ~7.5V) will provide full mute (-80dB). The need to have the remote pot on two wire connection means that there is a small amount of attenuation (approx 1dB) when the pot is connected. For the best audio control a log pot should be used. The control circuitry is a DC attenuator and an inverter. When a pot is connected, the current through R64 (10k) and the pot resistance generated from the 1/2Vcc bias voltage flows through R76 (330R). This generates a voltage increase on the output of op amp IC7B (LM1458 or equivalent) above the reference voltage (1/2Vcc). The second op amp IC7A (LM1458 or equivalent) inverts this voltage to a voltage difference below the reference voltage. Thus if the pot is turned to S/C the voltage difference below the reference voltage is:

$$7.5(\text{V}) / 10(\text{kohm}) * 330(\text{ohm}) = 248(\text{mV}) = 248(\text{mV}) / -3(\text{mV/dB}) = -82(\text{dB})$$

From this you can see that when a 500k pot is attached the initial attenuation is:

$$7.5(\text{V}) / 510(\text{kohm}) * 330(\text{ohm}) = 4.85(\text{mV}) = 4.85(\text{mV}) / -3(\text{mV/dB}) = -1.62(\text{dB})$$

These calculations are only approximate and are used to show operation of the circuit.

Tone Generators

Four separate tones are available from the in-built tone generator board. All four tones can be activated individually via a contact closure connected to the screw terminals on the rear of the amplifier. When any tone is activated, all inputs (except for inputs 1 and 2) will automatically mute. The level of the tone generator is controlled by the pot labelled R6 (located behind the Bass adjustment pot). This pot adjusts the level for all 4 tones.

Tones available on the AMIS60 and AMIS120 include:

- Evacuation Tone
- Alert Tone
- Bell Tone
- Pre-Announce Chime

These inputs are pulled up to 5VDC internally through 1k resistors.

The tones are generated through a combination of digital frequency modulation and analogue amplitude modulation. The output of the microcontroller IC13 (PIC16C54A) on pin 17 is a 0-5V square wave of varying frequency (depending on the tone selected). This signal is amplitude modulated using a VCA IC8 (M5222P). The envelope is controlled by the charging and discharging of the electrolytic capacitor C47 with the sink and sourcing of current on the microcontroller outputs pins 1, 2 & 13.

Page Chime Enable Button

This allows the user to disable or enable the Pre-Announce Chime. This switch does not activate the chime. Activation is accomplished via the rear panel barrier strip (normally wired to a paging microphone). If the pre-announce chime is connected to a paging microphone (meaning that it would be activated by the switch on the microphone), the Page Chime Enable switch on the front panel of the amplifier allows the user to disable the chime function on those occasions when it is not required.

VOX Muting

This feature provides automatic muting channels 3 & 4 when signal is applied to either channels 1 or 2. It is normally used so that a paging microphone can have priority (by muting) over background music. The muted channels will automatically ramp back up to normal volume when the signal on channels 1 and/or 2 is no longer active. The amplifier ships with the VOX muting function enabled. To disable the VOX muting move the jumper (labelled JP2, located just to the left and behind the level pot for channel 1) to the middle and left pins. (Factory setting is with VOX enabled with the jumper on the middle and right pins).

Channels 3 & 4 are summed through IC1B (LM1458 or equivalent) to the VCA IC4 (THAT2180C) which does the muting. The VCA is held on (i.e. no attenuation) by R55 (10k) pulled to the reference voltage and the reverse biasing of diode D3 (BAV21 or equivalent) by R22 and R21. This is to eliminate any attenuation by the op amp IC1A (LM1458 or equivalent) and its $\frac{1}{2}$ supply which may be different to the internal reference voltage of the VCA.

The control pin of the VCA is pulled down by op amp IC1A. This op amp runs at very high gain to activate on even very small signal. The jumper JP3 shorts out the feedback resistor thus removing the sensitivity. The attack of the muting circuit is controlled by the charging of C16 (100uF) through R16 (100k) and the release by the discharge of C16 through D1. Note that VCA will mute at 250mV (-80dB) below the reference voltage so the muting will occur only over the range of approximately (depends on VCA production batch) 7.2V to 7.5V. The charging of the capacitor occurs from approximately 1V to 8.1V.

VCA THAT2180C pin out

- 1 – Input
- 2 – Ec+
- 3 – Ec-
- 4 – Gnd
- 5 – V-
- 6 – Ground
- 7 – V+
- 8 – Output

Fuse Sizes

(240V version)

Mains AMIS60, 230 VAC: 2 Amperes Slow Blow

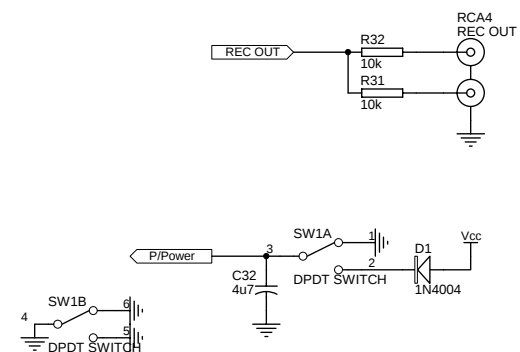
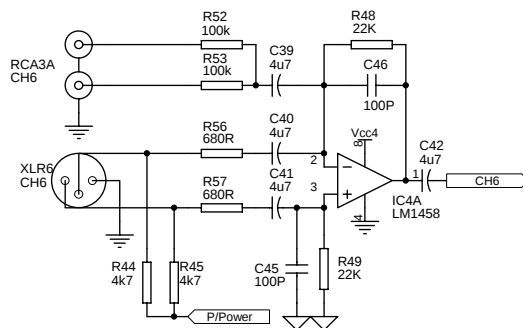
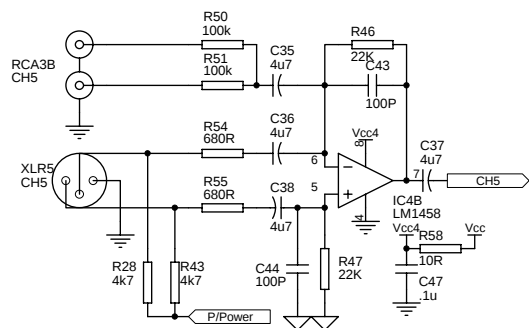
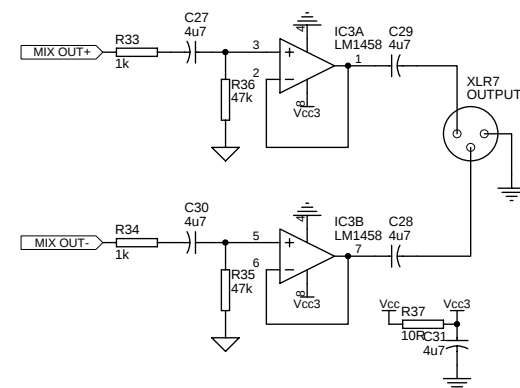
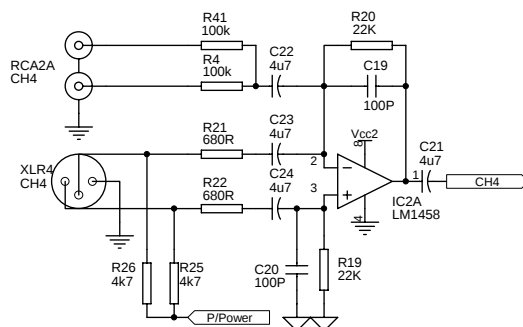
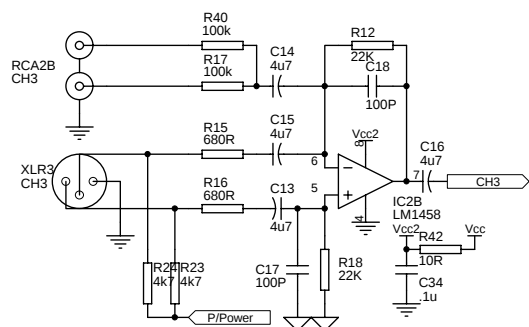
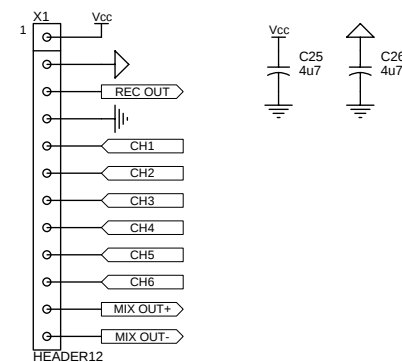
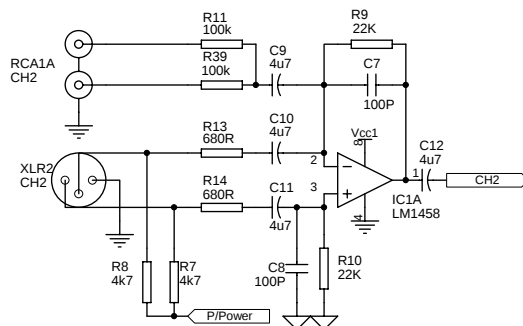
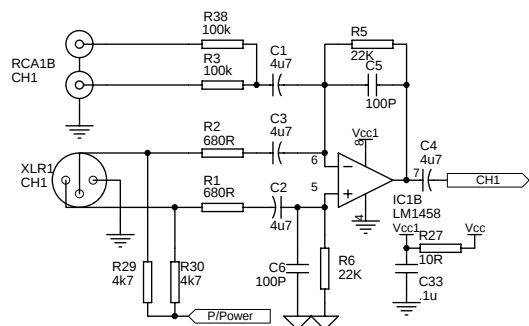
Mains AMIS120, 230 VAC: 3.15 Amperes Slow Blow

(115V version)

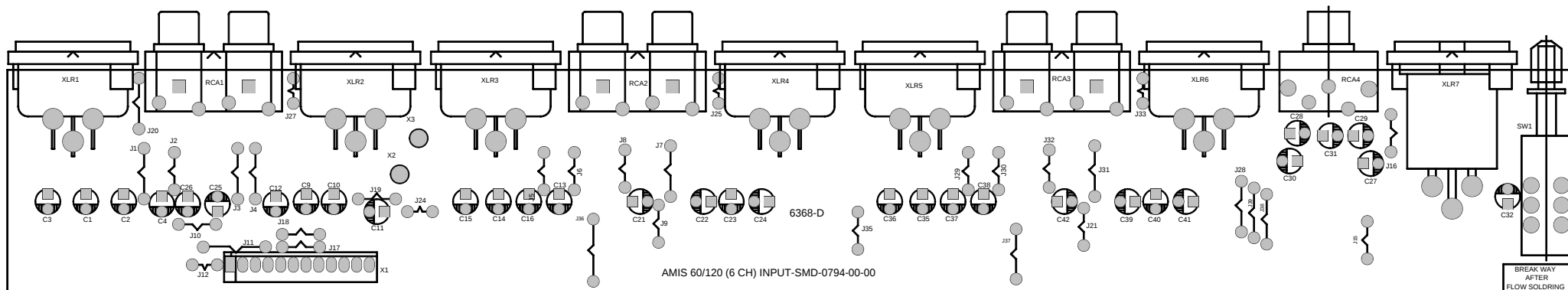
Mains AMIS60, 115 VAC: 3.15 Amperes Slow Blow

Mains AMIS120, 115 VAC: 4 Amperes Slow Blow

The DC fuse is located on the circuit board. This is a feature of the AMIS series amplifiers, which are equipped with a current limiting circuit preventing excessive DC currents, thus eliminating the risk of blowing high tension fuses. In the unlikely event that the DC fuse actuates, the output transistors should be checked, as it is probable that the amplifier has been subjected to very extreme conditions. The DC fuses are 10A time lag fuses.

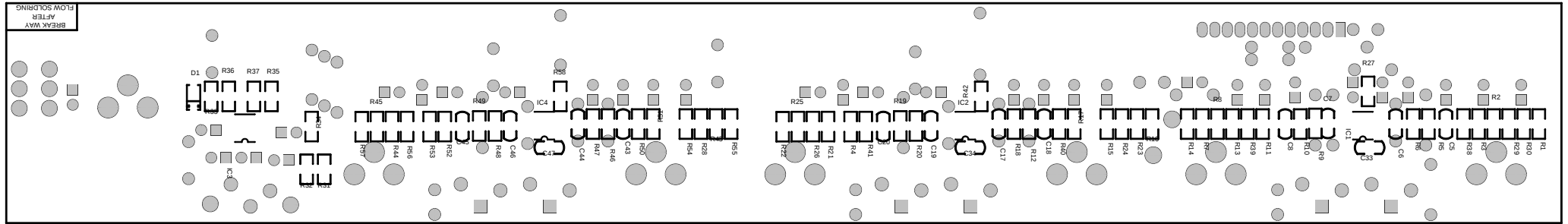


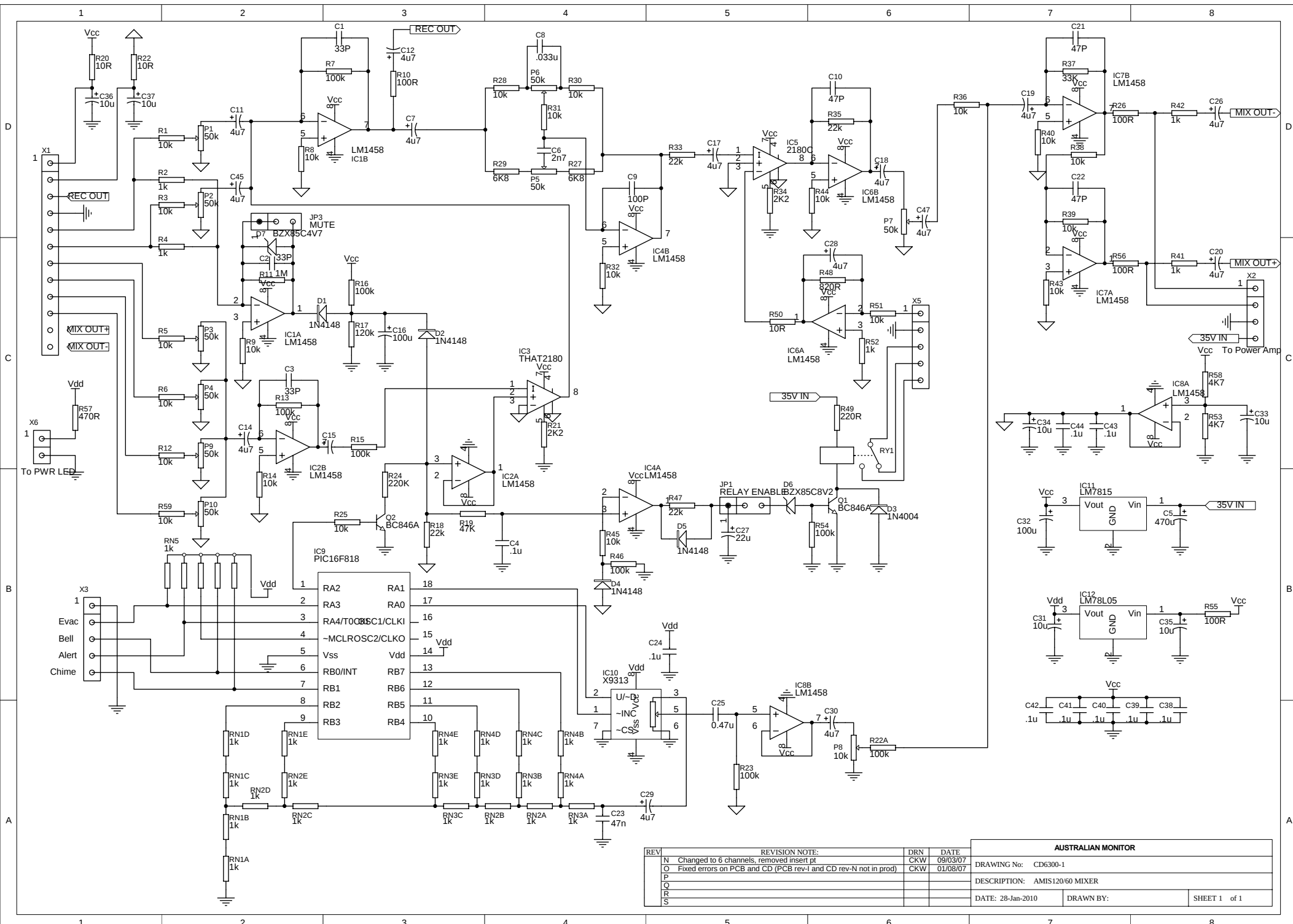
REV	REVISION NOTE:	DRN	DATE	AUSTRALIAN MONITOR		
A				DRAWING No: CD6235-1		
B				DESCRIPTION: AMIS120/60 INPUT		
C				DATE: 10-Feb-2010		
D	Changed to 6 channels	CKW	09/03/07	DRAWN BY:		
E				SHEET 1 of 1		
F						

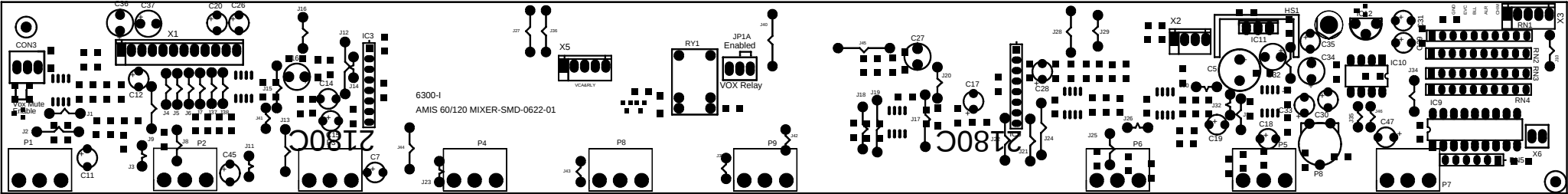


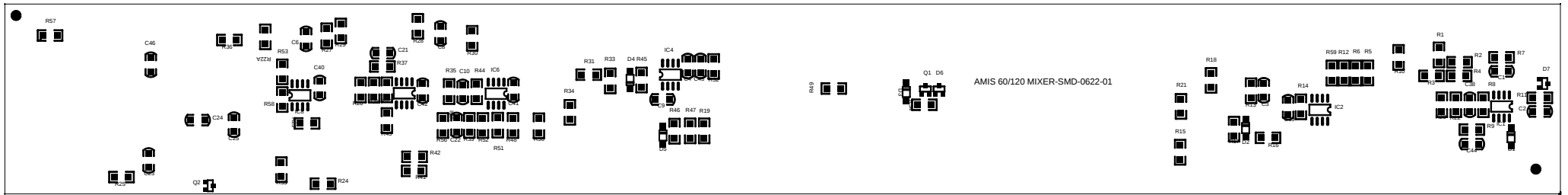
LEGEND LAYER

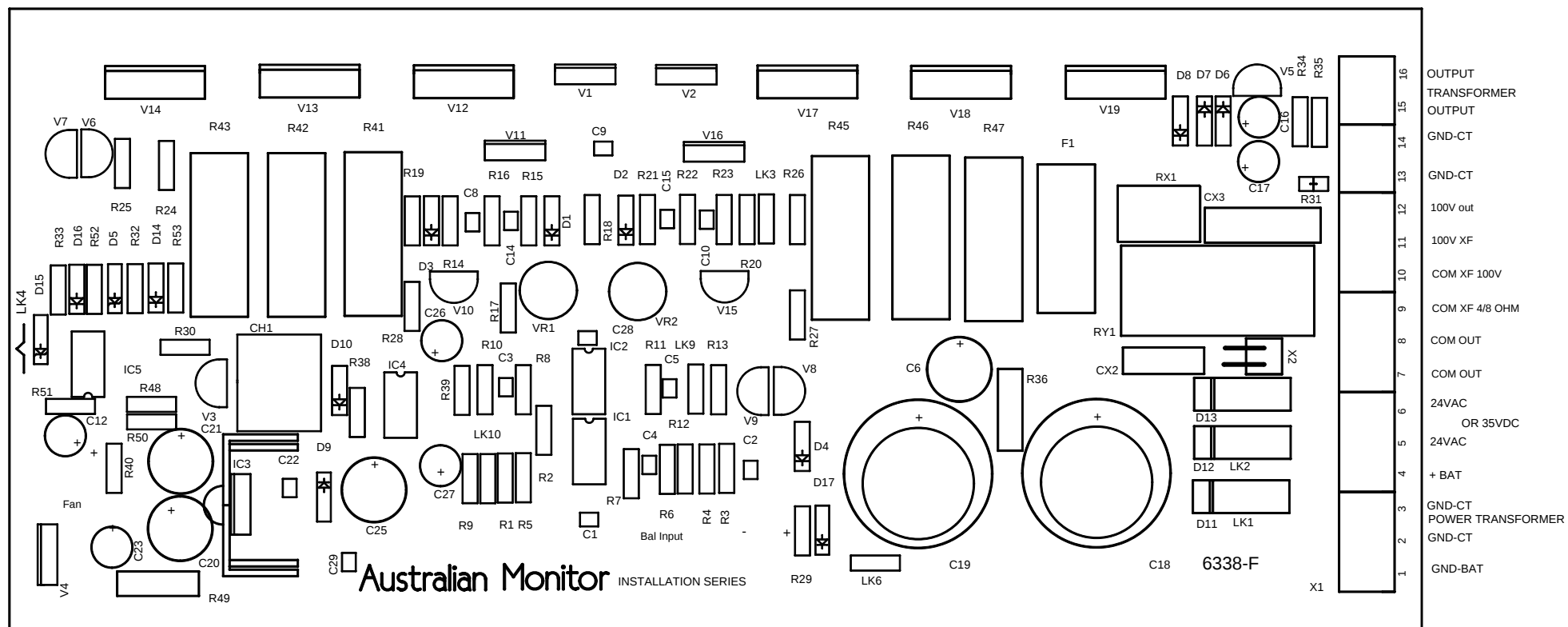
BOTTOM OVERLAY











AMIS120 Zener diode problem

18 August 2009

We have encountered a higher than acceptable failure rate of zener diode circuit reference D15 in AMIS120 amplifiers.

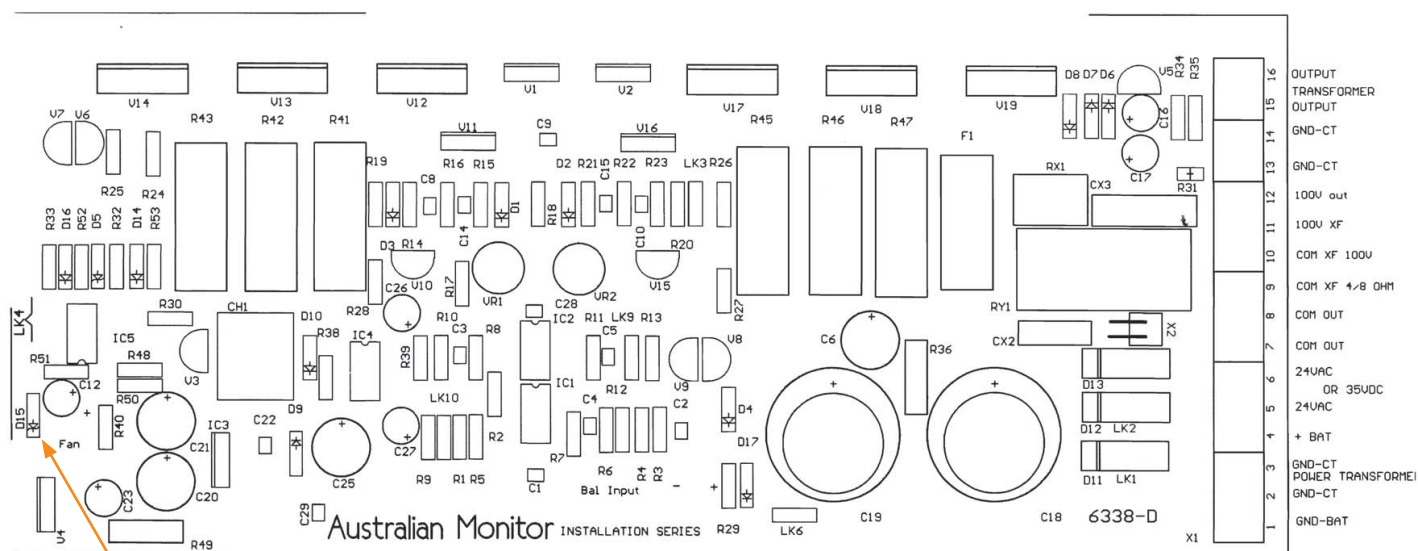
The Zener diode is part of the thermal protection circuit in the amplifier and in time may go short circuit and cause the amplifier to mute all audio.

The problem occurs after the amplifier has been in use for many months and appears to be caused by excessive current dissipation in the diode caused by higher than expected low fan speed running current draw.

Airway obstruction, dust build up on the rotor blades or in the bearings may cause the fan to run below speed and draw enough current to cause thermal degradation to the diode over time.

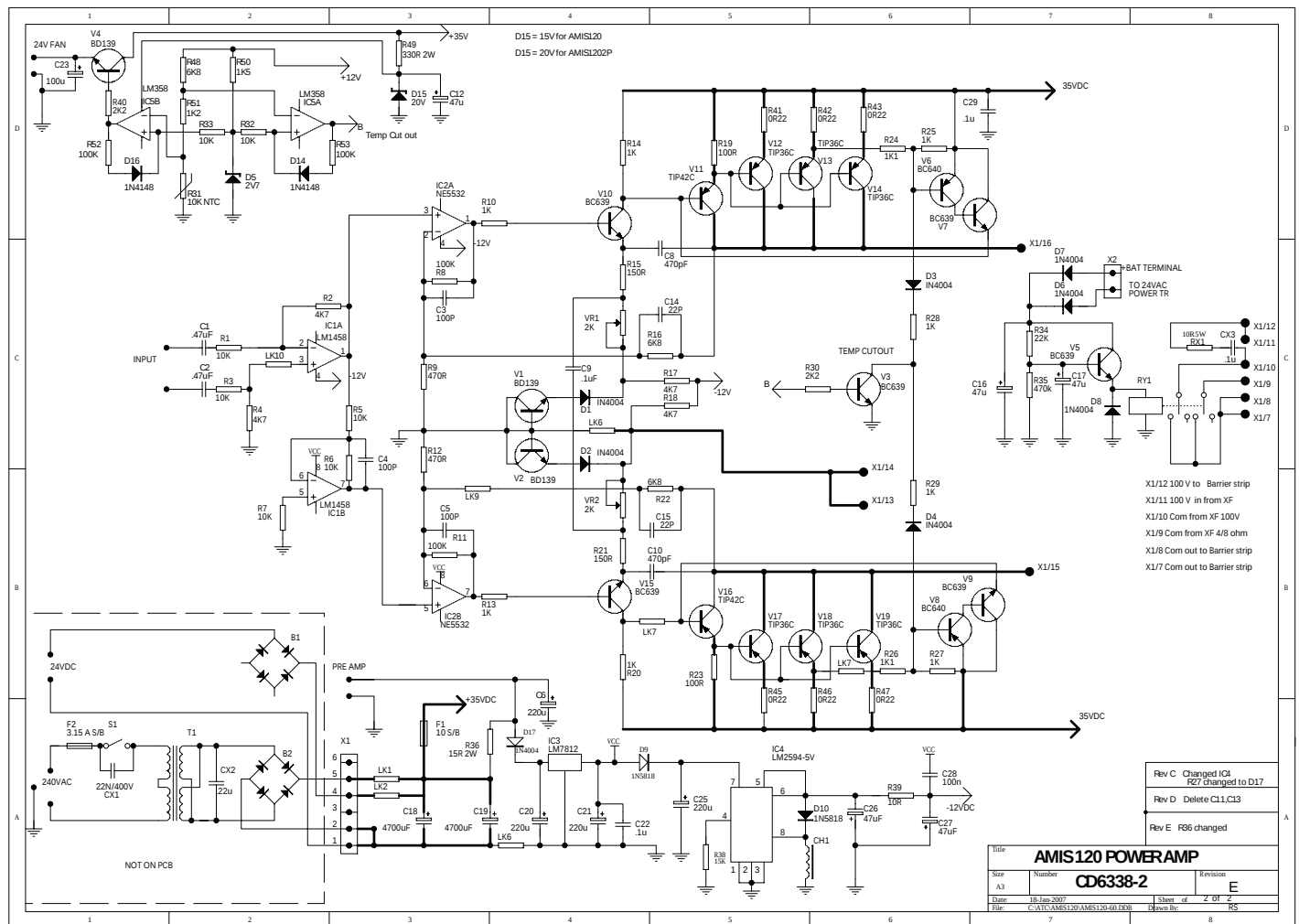
This problem is limited to AMIS120 amplifiers manufactured between April 2008 to July 2009.

The solution is to replace the 15 volt 1 watt zener diode with a 20 volt 1.3 watt or higher (two 1.0 watt or similar) zener diodes. The diode should also be raised 5.0mm above the board for improved heat dissipation



Original diode 15V 1W zener.
Replace with 20V 1.3W or 2 of 1W.

AMIS120 Zener diode problem



Australian Monitor Service Bulletin



AMIS Mixer Amplifiers

AMIS Booster Amplifier

Start-Up Issues in Extreme Cold Conditions

12 March 2012

Applicable Models

This bulletin applies to the AMIS250 and AMIS250P models, and older versions of the AMIS60, AMIS120, AMIS120P, AMIS120XL, AMIS1202P and AMIS480P models.

For Information Only

This bulletin is intended for service technicians only and is to be applied when presented with models exhibiting the issue identified below.

Known Issue

In extreme cold conditions the models listed may not operate when turned on. A small number of reported instances have been recorded in regions of extreme cold, typically when the unit temperature is less than 10°C.

In some instances, the failure to start can lead to failure of the main bridge rectifier also.

This issue is limited to AMIS products using the Maxim MAX765CPA inverter IC.

The range of AMIS60 and AMIS120 models stopped using this part several years ago so this issue is limited to the older models.

Identification

If you have one of the models listed above that has presented with the described issue then inspect the part fitted (IC4) on the main amplifier board. If this part is a MAX765CPA then the cold start issue may be resolved by replacing this part with a MAX765EPA part.

Later models are fitted with an LM2594 part that does not exhibit cold start issues.

Solution

An alternate part is available with wider operating temperature specifications.

The alternate part MAX765EPA is fully compatible with the original part MAX765CPA and may be exchanged if required.

Replacement Wide Temperature Range Component				
Temp. Range	Package	Maxim Part	Mouser	Digikey
-40° to +85 ° C	DIP8	MAX765EPA	700-MAX765EPA	MAX765EPA+-ND

Notes

The MAX765 and LM2594 parts are not directly interchangeable.

Australian Monitor Service Bulletin



AMIS120 Mixer Amplifier
AMIS120XL Mixer Amplifier
AMIS120P Booster Amplifier
AMIS1202P Booster Amplifier
12V Regulator Capacitors

13 March 2012

Applicable Models

This bulletin applies to AMIS120, AMIS120P, AMIS120XL and AMIS1202P models manufactured prior to March 2012.

For Information Only

This bulletin is intended for service technicians only and is to be applied when repairing failed amplifiers. This bulletin does not apply to functional units.

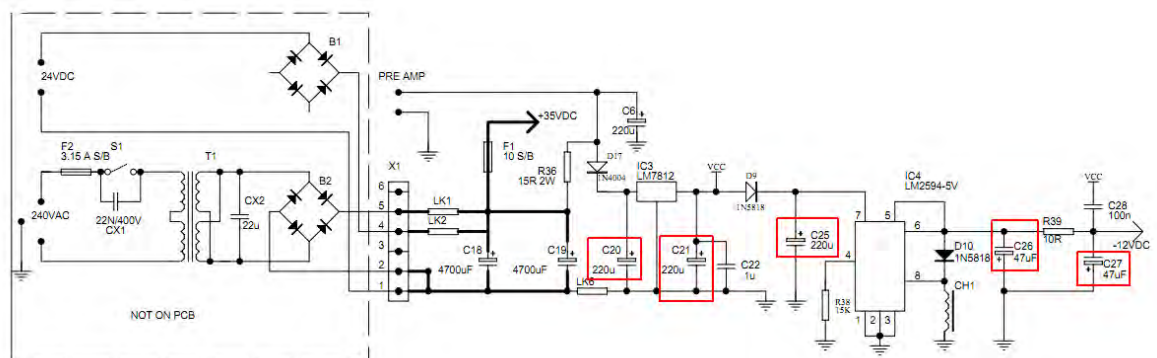
Known Issue

A larger than expected number of failures have been observed once these models have been in service for a number of years, due to the failure of a number of electrolytic capacitors in the negative 12V power supply inverter.

When the negative inverter circuit falls out of specification the amplifier may exhibit a large DC offsets at turn on, resulting in failure of the main AC bridge rectifier.

Solution

Replacement of the electrolytic capacitors in the negative 12V inverter section with higher operating temperature low impedance parts is recommended in the interest of longevity and reliable operation. Replace the critical components as per the table below.



Designators	Value	Voltage	Temperature Rating	Special Attributes	Recommended Part	
					Panasonic	Element14
C20, C21, C25	220uF	35V	105°C	Low ESR	EEUFC1V221	9692282
C26, C27	47uF	35V	105°C	Low ESR	EEUFC1V470	1848447

Notes

- All models manufactured March 2012 or later are fitted with higher specification parts and should therefore provide improved longevity and reliability.
- The Panasonic parts recommended may be substituted with other brand components of similar specification.

Australian Monitor Service Bulletin



AMIS120 Mixer Amplifier

AMIS120XL Mixer Amplifier

AMIS120P Booster Amplifier

AMIS1202P Booster Amplifier

Bridge Rectifier Upgrade

13 March 2012

Applicable Models

This bulletin applies to AMIS120, AMIS120P, AMIS120XL and AMIS1202P models manufactured prior to March 2012.

For Information Only

This bulletin is intended for service technicians only and is to be applied when replacing failed bridge rectifiers.

This bulletin does not apply to functional units.

Known Issue

A small number of bridge rectifier failures at power on have been observed.

Details

- i. Failure of the electrolytic capacitors in the positive and negative 12V regulators result in a large DC offsets at turn on, resulting in failure of the main AC bridge rectifier.
- ii. It is believed that RoHS compliant 35A bridge rectifiers are not as reliable as the earlier non-RoHS equivalents. We have therefore decided to increase the rating from 35A to 50A to provide additional headroom under turn on conditions.

Solution

- i. Replace the electrolytic capacitors in the 12V regulator section as per service bulletin AM-SB-120313.
- ii. When replacing a failed AC bridge rectifier, substitute the original 35A bridge with a 50A model as indicated in the table below.

		Model	VRRM	I(AV)	Terminals
✗	Original Part	KBPC3504	400V	35A	0.25" FASTON terminals
✓	Replacement Part	KBPC5004	400V	50A	0.25" FASTON terminals

Notes

- All models manufactured March 2012 or later are fitted with the 50A replacement part.
- Part number KBPC5006 may also be fitted (50A 600V).