



AMIS250 Series Service Manual

**Product Description
Set-Up/Test Procedures
Component Lists
Full Schematics
PCB Overlays**

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AMIS250

Circuit Description

The AMIS250 mixer amplifier is designed for commercial installations. It operates on [230/240 VAC, 50Hz] (240V version)/[115VAC, 60Hz] (115V version) and may be desk or rack mounted (rack mount kit supplied). The AMIS250 delivers 250 watts into a load of 4 ohms, [70 or 100 volt line] (240V version)/ [25 or 70 volt line] (115V version). As standard, the AMIS250 is supplied self standing with rubber feet. It features 6 microphone/line input channels as well as a host of unique features including multiple levels of muting and 24 VDC make the AMIS250 a very flexible amplifier. [The 115V version also has a transformer balanced, 600 ohm telephone input] (115V version).

Power Switch

This switch controls the switching of AC power to the amplifier. A blue 'On' LED will indicate whether the amplifier is switched on or off. This switch will not switch DC power on or off in DC operation. In DC operation mode, the amplifier is always on and the blue power LED will always be illuminated.

Protect LED

A feature of the AMIS250 is high temperature protection. In most applications, the internal cooling fan will most probably never switch on. When used with demanding speaker loads or in difficult operating environments, the fan may regularly switch on to cool the amp down and then switch off again. This switching on and switching off is quite normal. The "Protect" function is there to protect the amplifier from high temperature problems which would only occur if the fan stopped working or became clogged up. In this very rare occurrence, the amplifier will shut down and the protect LED will illuminate. The amplifier will automatically restart once it's internal temperature has fallen below the fan switch on temperature.

The fan switch on temp is preset at 60degC by the trimmer on the power amp board R58 (10k) and the NTC R25 (10k@25degC).

The high temperature trip point is set at the factory by trimmer R58. Turning the trim pot clockwise will cause the amplifier to trip and mute at a lower temperature.

AC Power Inlet

The operating voltage is [230/240 VAC @ 50 Hz] (240V version)/[115 VAC @ 60Hz] (115V version). 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 inlet is equipped with an in-built AC fuse holder fitted with a [6.3 amp] (240V version)/[8 amp] (115V version) fuse plus a spare within the holder. Power consumption is 550 VA.

24 Volt DC Power Inlet

The AMIS250 features 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'.

[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 right of the AC inlet. 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 & V6 (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 (BAV21/3k3) & 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 ohms)
4	Positive “+” for 4 ohm speaker loads (use with common)
COM	Common or “-” for 70v or 100v speaker loads (maximum load of 40 ohms at 100v)
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 40 Ohms.

(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 ohms).
4	Positive “+” for 4 ohm speaker loads (use with common)
COM	Common or “-” for 25v or 70v speaker loads (maximum load of 20 ohms at 70v)
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 20.

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
[600 Ohm Telephone Input] (115V version)

Phantom Power

This button enables or disables the 15 volts DC phantom power to all microphone inputs XLR's. Do not plug an unbalanced microphone in 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 four 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 6,5,4, 3, 2, & 1.

Line Inputs

Line inputs 1, 2, 3, 4, & 5 have an input sensitivity of 150mV @ 100K ohms. Input 6 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 connections are for inputs 6, 5, 4, 3, 2, & 1 respectively.

[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)

Insert Point

The Insert Point is located electronically after the master volume pot and before the balancing circuit for the power amp and line output.

The Insert Point is a 3 conductor (Tip, Ring, Sleeve) phone socket which accepts a standard stereo 6.35mm (1/4") jack. The connections are:

Tip	Amplifier in.
Ring	Mix Output.
Sleeve	Ground

The switched contacts are used to break the signal internally.

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.

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 labeled R6 (located behind the Bass adjustment pot). This pot adjusts the level for all 4 tones.

Tones available on the AMIS250 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 IC7 (PIC16C55A) on pin 6 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 C40 with the sink and sourcing of current on the microcontroller outputs pins 8, 9 & 17.

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 (labeled JP2, located just to the left and behind the level pot for channel 1) to the middle and rear pins. (Factory setting is with VOX enabled with the jumper on the middle and front pins).

Channels 3, 4, 5 & 6 are summed through IC1A (LM1458 or equivalent) to the VCA IC4 (M5222P) which does the muting. The VCA is held on (i.e. no attenuation) by R22 (10k) pulled to the reference voltage and the reverse biasing of diode D2 (BAV21 or equivalent) by R20 and R21. This is to eliminate any attenuation by the op amp IC1B (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 IC1B. This op amp runs at very high gain to activate on even very small signal. The jumper JP2 shorts out the feedback resistor thus removing the sensitivity. The attack of the muting circuit is controlled by the charging of C13 (47uF) through R20 (100k) and the release by the discharge of C13 through R16 (2k2). 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 M5222P pin out

- 1 – Output1
- 2 – Input1
- 3 – Reference voltage ($\frac{1}{2}$ Vcc)
- 4 – Gnd
- 5 – Control
- 6 – Input2
- 7 – Output2

Note: The M5222P is a current in, current out device. Voltage conversion is done through resistors. The maximum input current is 50uA rms. Current gain is 0.5.

Fuse Sizes

(240V version)

Mains: 230 VAC 6.3 Amperes Slow Blow

DC: 10 Amperes Slow Blow

(115V version)

Mains: 230 VAC 8 Amperes Slow Blow

DC: 10 Amperes Slow Blow

TEST PROCEDURE MODEL - AMIS 250 (US)

1. Perform physical inspection (Visual Inspection stage).

1.1 Check:

- All screws for tightness (esp. bridge rectifier and transistor bolts),
- Earth connection for good contact (XLR GND to AC earth),
- All wiring points for good contacts (soldering and crimping)

PRETESTING

PRE TESTING SETUP REQUIREMENT

- a. Oscilloscope.
- b. Variac
- c. Multimeter.
- d. Load [4Ω]
- e. Signal generator

2. Set up amplifier for test :

2.1 Check :

- AC fuses (8A), 20mm
- DC fuses (10A), 20mm
-

2.2 Connect amplifier to :

- Variac (0 VAC),
- Signal generator (mic1, no signal),
- Resistive load (4Ω on 4Ω terminal).
- Connect 24V DC supply externally for the relay on amplifier PCB. (Optional test for 24V DC operation)

2.3 Reset controls :

- Volume controls to minimum,
- Bass/treble control to center,
- R33 & R34 (Bias adjust pots) Amplifier PCB fully anticlockwise.

3 Power up :

- 3.1 Turn on the power switch and adjust the variac voltage to 115VAC . Watch current meter for excess current draw. Current should not exceed 0.5A.
- 3.2 Check DC power supply at the fuses, the measurement should be approximately. 40V ($\pm 1.5V$)
- 3.3 Check DC voltage on the mixer board, the measurement should be approximately. 15V ($\pm 0.5V$).
- 3.4 Check 1/2 VCC on mixer board, the measurement should be 8VDC (± 0.5).
- 3.5 Measure the DC voltages on the IC's of the mixer & input PCB's, Pin 8, 15V ($\pm 5\%$), Pin 4 0V ($\pm 100mV$),
Pin 1, 8V ($\pm 5\%$) but on power it should be P8 18V ($\pm 5\%$) other remain same.
- 3.6 Put a multimeter across R47, the meter should read 0.3 mV ($\pm 5\%$). Slowly adjust the preset R 33 so that you measure 2.5mVin addition to the base reading
- 3.7 Repeat 3.7 for R55 adjusting preset R34.

4 AC Check:

- 4.1 Set signal generator to 1mV. Turn up Mic1 volume control to full. Watch for irregularities in the output waveform.
- 4.2 Set output voltage to 35V using the master volume control. Check voltages across the Emitter resistors (on the output power devices)
- 4.3 Voltage should be between 150mV – 200mV. Min. and Max. values should be between 33% of the average value (i.e. min/max = 0.5mV).
- 4.4 Turn the master up to full. Check sensitivity of the microphone inputs. – MIC 1mV ($\pm$ 1mV) 32V in a 4 Ω load.
- 4.5 Check the output level of the amplifier using each of the input channels.
- 4.6 Measure 25V line 70V LINE.
- 4.7 Check tape outputs (L and R) 300mV ($\pm$ 50mV) (Measure on RCA socket).
- 4.8 Check line outputs. Approx. (2.0V $\pm$ 25mV).

5. Function Checks :

- 5.1 check the position of header links.
 - a. Vox muting enabled.
 - b. VCA Con. Disabled.
- 5.2 Keep signal in CH1 insert 'INSERT-PLUG' having external signal of different frequency the out put should cut off and switch over to applied insert signal, check signal on inset plugs ring terminal with respective ground should be 300mV. Remove insert plug .
- 5.3 Check Phantom Switch for on/off operation. Measure Phantom voltage on an XLR inputs (the measurement should be 14.5VDC) (Reset the phantom switch)
- 5.4 Switch off the set connect battery (24V) check for rated out put power (out put signal will clip up to 2% on battery power)

FINAL TESTING

Requirements for final testing

- a. Load 40 Ω .
- b. Multimeter
- c. Oscilloscope
- d. Microphone
- e. Variac

6 Check sensitivity of all channels.

- 6.2 Mic input (CH1-CH4) = 1mV out put =70V ($\pm$ 5V)
- 6.3 AUX input (CH1-CH5) = 150mV out put =70V ($\pm$ 5V)
- 6.4 AUX input (CH6) = 150mV out put = 32.5V ($\pm$ 1.5V)
- 6.5 Check the Power bandwidth of CH 1 MIC input. – (68Hz $\pm$ 5Hz – 15KHz $\pm$ 2KHz).
- 6.6 Check Bass control @ 100HZ = $\pm$ 10dB (TOL. $\pm$ 1dB), MID Control $\pm$ 10dB (TOL. $\pm$ 1dB) and treble @ 10kHz = $\pm$ 10dB (TOL. $\pm$ 1dB)
- 6.7 Check that input signal and output signal are in same phase by comparing CH 1 AUX Input and all other Outputs (25V, 70v, 4 Ω , 8 Ω)

7 Priority check

- 7.2 Plug microphone into input 1 and oscillator to input 3. Check for muting of channel 3.
 - 7.3 Plug microphone into input 2. Check for muting of channel 3.
 - 7.4 Check 'Mute Disable' function. Insert Disable / Enable link (Factory set – ENABLE).
- 8 Check 4 tone switched inputs. Set output level of tones to approx. 14Vrms ($\pm 2V$) using Evac tone. Make sure channel 3 – 6 mutes with any of the tone's.
- 9 Check telephone input sensitivity for CH2
Tel input = 180 mV output = 70V ($\pm 5V$).
- 10 Increase the signal such that you get 76V & you can see the overload protection coming on with a kink visible on the sine wave if it is there then reduce the voltage to 35V out and then short output. Release the shorting and check for the return of output waveform
- 11 Remove input signal and check for Hum & Noise (<20mVrms).
- 12 Reset volumes to minimum.

THERMAL CHECK

- 13 Connect load to the amplifier apply signal such that you get 42V at output. Set for thermal shut off at 110°C ($\pm 5^\circ\text{C}$)

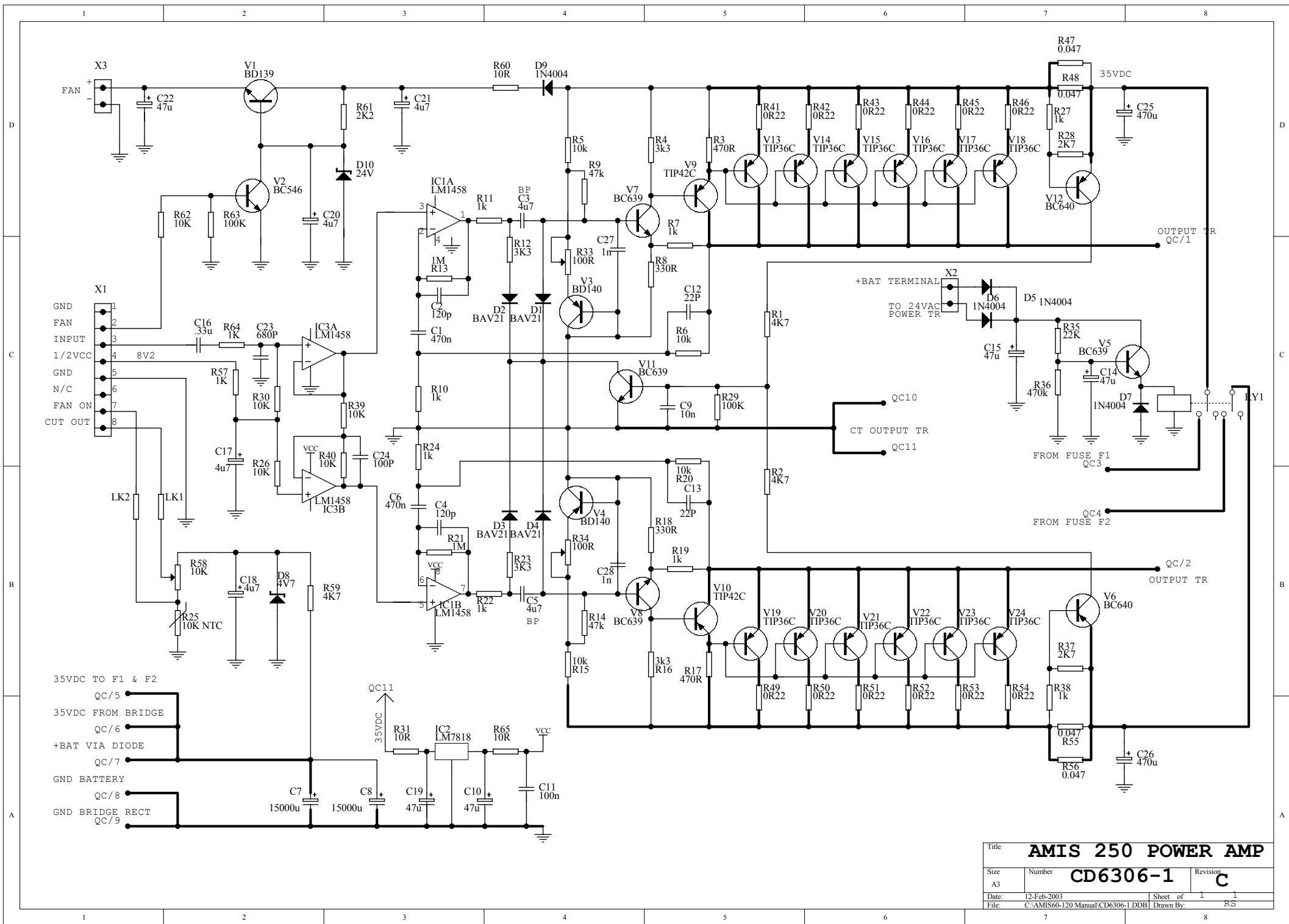
LISTENING TEST

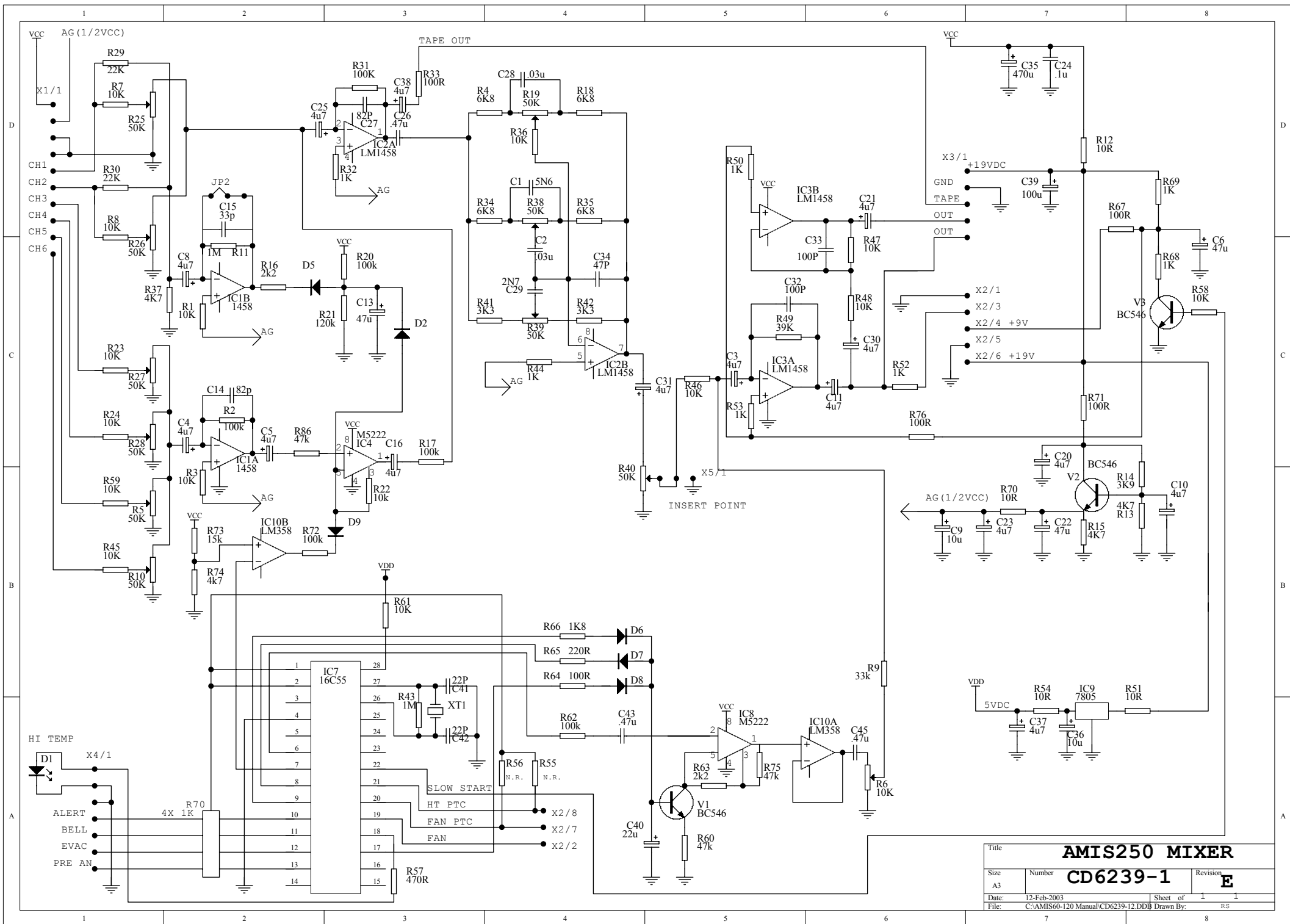
Requirements for Listening Test Setup :

- a. CD Player
- b. Speaker
- c. Microphone

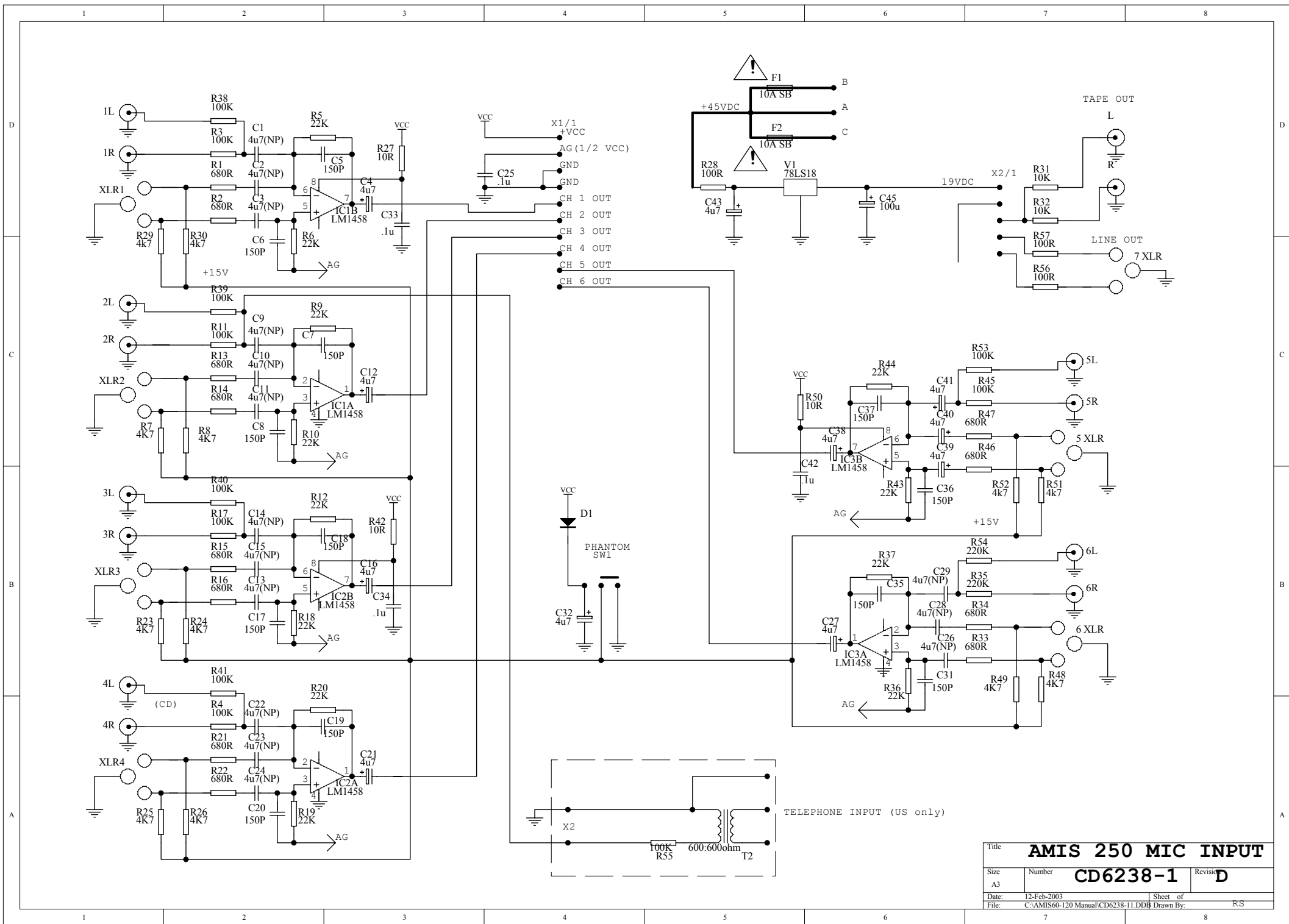
14 Connect amplifier to the program source and speaker

- 14.2 Set all input pots at minimum and all tone pots to the centre (12 o'clock) position and check for turn on thump
- 14.3 Check CD Player (AUX) inputs each channel and tone controls for each channel
- 14.4 Check Priority functions: CH 1 over CH 3 – CH 6, CH 2 over CH 3 – CH 6.
- 14.5 Check that all generated (alert, evacuation) tones function

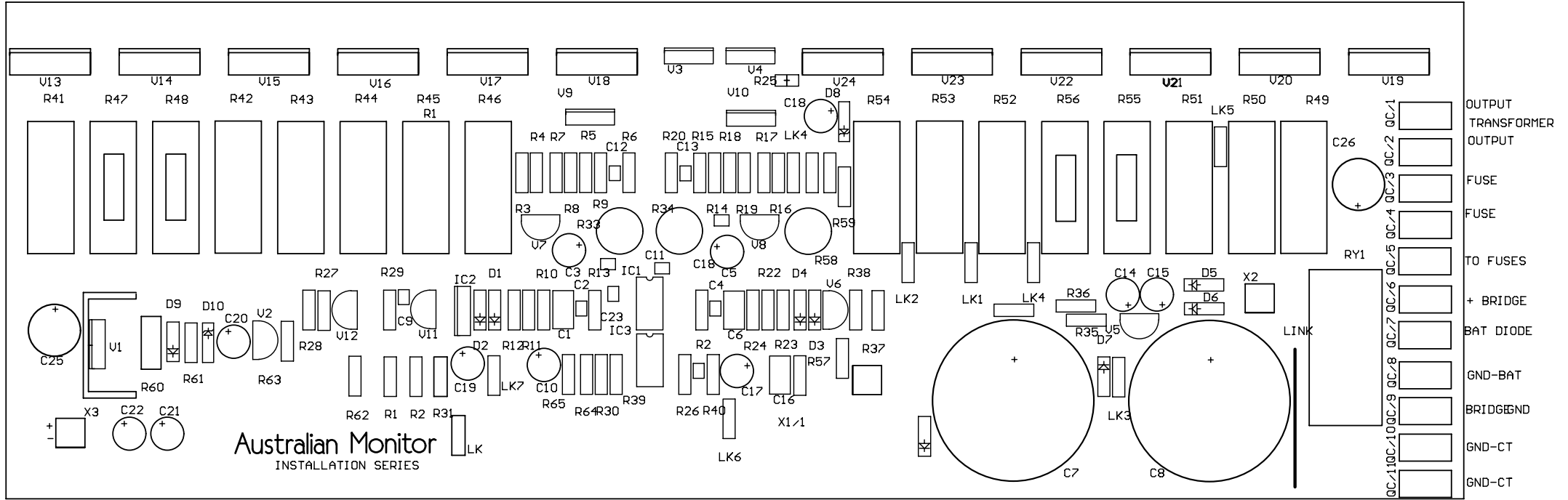


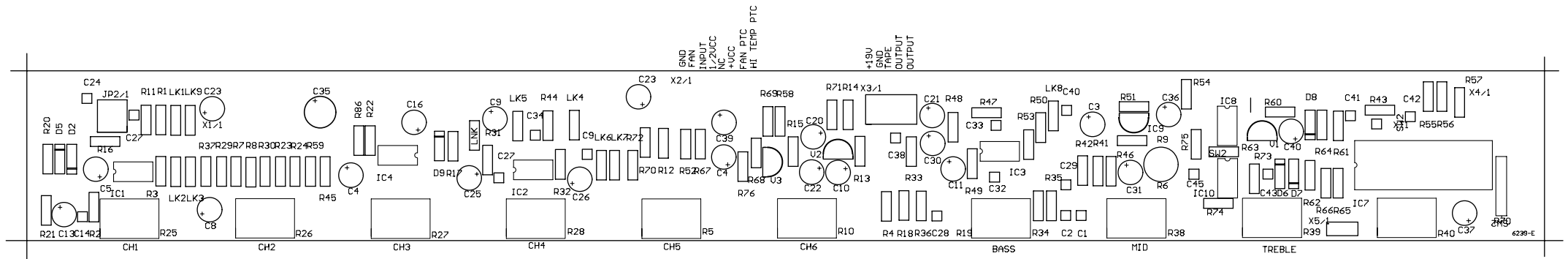


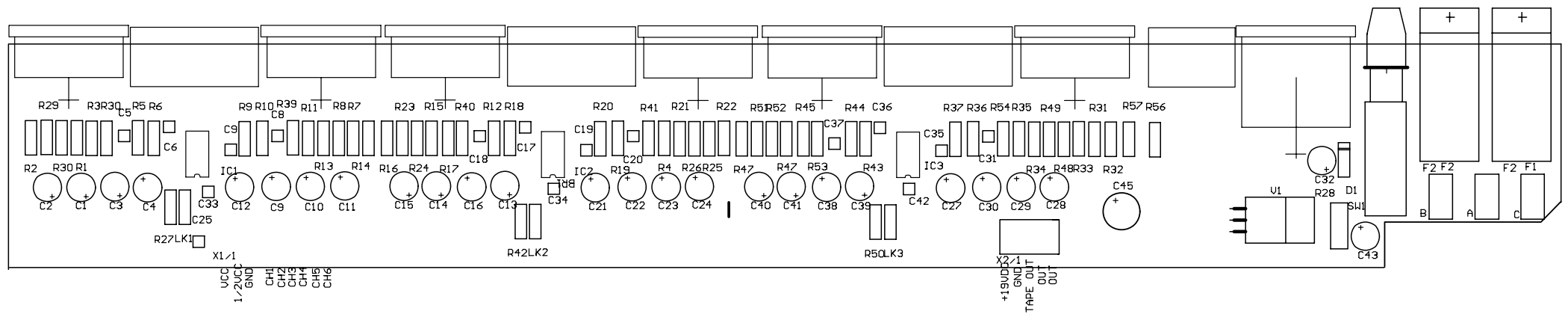
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Title AMIS 250 MIC INPUT		
Size A3	Number CD6238-1	Revision D
Date: 12-Feb-2003	Sheet of C:\AMIS60-120 Manual\CD6238-11.DDD	
File:	Drawn By: R.S.	







AMIS250 Power amp Component List			
Designator	Part Type	Description	Manufacturer's Code
C1	470n	Metalised Poly 100V	2124262472
C10	47u	Electrolytic 35V	2121250470
C11	100n	Metalised Poly 100V	2124282101
C12	22P	Multi Layer Ceramic 100V	2127181220
C13	22P	Multi Layer Ceramic 100V	2127181220
C14	47u	Electrolytic 35V	2121250470
C15	47u	Electrolytic 35V	2121250470
C16	.33u	Metalised Poly 100V	2124282331
C17	4u7	Electrolytic 35V	2121230479
C18	4u7	Electrolytic 35V	2121230479
C19	47u	Electrolytic 35V	2121250470
C2	120p	Multi Layer Ceramic 100V	2127180121
C20	4u7	Electrolytic 35V	2121230479
C21	4u7	Electrolytic 35V	2121230479
C22	47u	Electrolytic 35V	2121250470
C23	680P	Multi Layer Ceramic 100V	2127181681
C24	100P	Multi Layer Ceramic 100V	2127181101
C25	470u	Electrolytic 50V	2121250470
C26	470u	Electrolytic 50V	2121250470
C27	1n	Multi Layer Ceramic 100V	2122250017
C28	1n	Multi Layer Ceramic 100V	2122250017
C3	4u7	Electrolytic 35V	2121230479
C4	120p	Multi Layer Ceramic 100V	2127180121
C5	4u7	Electrolytic 35V	2121230479
C6	470n	Metalised Poly 100V	2124262472
C7	15000u	Electrolytic 50V	2121250153
C8	15000u	Electrolytic 50V	2121250153
C9	10n	Metalised Poly 100V	2124182100
D1	BAV21	Small Signal Diode	2133400201
D10	24V	Zener Diode 1Watt	2136010240
D2	BAV21	Small Signal Diode	2133400201
D3	BAV21	Small Signal Diode	2133400201
D4	BAV21	Small Signal Diode	2133400201
D5	1N4004	Rectifier Diode	2133440004
D6	1N4004	Rectifier Diode	2133440004
D7	1N4004	Rectifier Diode	2133440004
D8	4V7	Zener Diode 1Watt	2136010479
D9	1N4004	Rectifier Diode	2133440004
IC1A	LM1458	Dual op-amp DIP 8 Pin	2152810458
IC1B	LM1458	Dual op-amp DIP 8 Pin	2152810458
IC2	LM7818	Regulator T0220	2151370815
IC3A	LM1458	Dual op-amp DIP 8 Pin	2152810458
IC3B	LM1458	Dual op-amp DIP 8 Pin	2152810458
LK1		Link	
LK2		Link	
R1	4K7	Resistor, metal film 1/2 watt	9111590472
R10	1k	Resistor, metal film 1/2 watt	9111590102
R11	1k	Resistor, metal film 1/2 watt	9111590102
R12	3K3	Resistor, metal film 1/2 watt	9111590332
R13	1M	Resistor, metal film 1/2 watt	9111590105
R14	47k	Resistor, metal film 1/2 watt	9111590473
R15	10k	Resistor, metal film 1/2 watt	9111590103
R16	3k3	Resistor, metal film 1/2 watt	9111590332

R17	470R	Resistor, metal film 1/2 watt	9111590471
R18	330R	Resistor, metal film 1/2 watt	9111590331
R19	1k	Resistor, metal film 1/2 watt	9111590102
R2	4K7	Resistor, metal film 1/2 watt	9111590472
R20	10k	Resistor, metal film 1/2 watt	9111590103
R21	1M	Resistor, metal film 1/2 watt	9111590105
R22	1k	Resistor, metal film 1/2 watt	9111590102
R23	3K3	Resistor, metal film 1/2 watt	9111590332
R24	1k	Resistor, metal film 1/2 watt	9111590102
R25	10K NTC	Thermistor	2111911103
R26	10K	Resistor, metal film 1/2 watt	9111590103
R27	1k	Resistor, metal film 1/2 watt	9111590102
R28	2K7	Resistor, metal film 1/2 watt	9111590272
R29	100K	Resistor, metal film 1/2 watt	9111590104
R3	470R	Resistor, metal film 1/2 watt	9111590471
R30	10K	Resistor, metal film 1/2 watt	9111590103
R31	10R	Metal oxide resistor 2W	2111221100
R33	100R	Resistor, metal film 1/2 watt	9111590101
R34	100R	Resistor, metal film 1/2 watt	9111590101
R35	22K	Resistor, metal film 1/2 watt	9111590223
R36	470k	Resistor, metal film 1/2 watt	9111590474
R37	2K7	Resistor, metal film 1/2 watt	9111590272
R38	1k	Resistor, metal film 1/2 watt	9111590102
R39	10K	Resistor, metal film 1/2 watt	9111590103
R4	3k3	Resistor, metal film 1/2 watt	9111590332
R40	10K	Resistor, metal film 1/2 watt	9111590103
R41	0R22	Wire wound 5 watt resistor	2111450228
R42	0R22	Wire wound 5 watt resistor	2111450228
R43	0R22	Wire wound 5 watt resistor	2111450228
R44	0R22	Wire wound 5 watt resistor	2111450228
R45	0R22	Wire wound 5 watt resistor	2111450228
R46	0R22	Wire wound 5 watt resistor	2111450228
R47	0.047	Wire wound 5 watt resistor	2111450177
R48	0.047	Wire wound 5 watt resistor	2111450177
R49	0R22	Wire wound 5 watt resistor	2111450228
R5	10k	Resistor, metal film 1/2 watt	9111590103
R50	0R22	Wire wound 5 watt resistor	2111450228
R51	0R22	Wire wound 5 watt resistor	2111450228
R52	0R22	Wire wound 5 watt resistor	2111450228
R53	0R22	Wire wound 5 watt resistor	2111450228
R54	0R22	Wire wound 5 watt resistor	2111450228
R55	0.047	Wire wound 5 watt resistor	2111450177
R56	0.047	Wire wound 5 watt resistor	2111450177
R57	1K	Resistor, metal film 1/2 watt	9111590102
R58	10K	Resistor, metal film 1/2 watt	9111590103
R59	4K7	Resistor, metal film 1/2 watt	9111590472
R6	10k	Resistor, metal film 1/2 watt	9111590103
R60	10R	Metal oxide resistor 2W	2111221100
R61	2K2	Resistor, metal film 1/2 watt	9111590222
R62	10K	Resistor, metal film 1/2 watt	9111590103
R63	100K	Resistor, metal film 1/2 watt	9111590104
R64	1K	Resistor, metal film 1/2 watt	9111590102
R65	10R	Resistor, metal film 1/2 watt	9111590100
R7	1k	Resistor, metal film 1/2 watt	9111590102
R8	330R	Resistor, metal film 1/2 watt	9111590331

R9	47k	Resistor, metal film 1/2 watt	9111590473
RY1		2P2T Relay	2523120001
V1	BD139	Transistor	2141400139
V10	TIP42C	Transistor	2141300042
V11	BC639	Transistor	2144200639
V12	BC640	Transistor	2144200640
V13	TIP36C	Transistor TOP-3	2141600036
V14	TIP36C	Transistor TOP-3	2141600036
V15	TIP36C	Transistor TOP-3	2141600036
V16	TIP36C	Transistor TOP-3	2141600036
V17	TIP36C	Transistor TOP-3	2141600036
V18	TIP36C	Transistor TOP-3	2141600036
V19	TIP36C	Transistor TOP-3	2141600036
V2	BC546	Transistor	2144200546
V20	TIP36C	Transistor TOP-3	2141600036
V21	TIP36C	Transistor TOP-3	2141600036
V22	TIP36C	Transistor TOP-3	2141600036
V23	TIP36C	Transistor TOP-3	2141600036
V24	TIP36C	Transistor TOP-3	2141600036
V3	BD140	Transistor	2141400140
V4	BD140	Transistor	2141400140
V5	BC639	Transistor	2144200639
V6	BC640	Transistor	2144200640
V7	BC639	Transistor	2144200639
V8	BC639	Transistor	2144200639
V9	TIP42C	Transistor	2141300042
X1	SIL8		
X2	SIL2		
X3	SIL2		

AMIS250 Mixer Component list			
Designator	Part Type	Description	Manufacturer's Code
C1	5N6	Metalised Poly 100V	2124180562
C10	4u7	Electrolytic 35V	2121230479
C11	4u7	Electrolytic 35V	2121230479
C13	47u	Electrolytic 35V	2121250470
C14	82p	Multi Layer Ceramic 100V	2127181820
C15	33p	Multi Layer Ceramic 100V	2127280336
C16	4u7	Electrolytic 35V	2121230479
C2	.03u	Multi Layer Ceramic 100V	2127280336
C20	4u7	Electrolytic 35V	2121230479
C21	4u7	Electrolytic 35V	2121230479
C22	47u	Electrolytic 35V	2121230479
C23	4u7	Electrolytic 35V	2121230479
C24	.1u	Metalised Poly 100V	2128280019
C25	4u7	Electrolytic 35V	2121230479
C26	.47u	Metalised Poly 100V	2124262472
C27	82P	Multi Layer Ceramic 63V	2127181820
C28	.03u	Multi Layer Ceramic 100V	2127280336
C29	2N7	Multi Layer Ceramic 100V	2127181279
C3	4u7	Electrolytic 35V	2121230479
C30	4u7	Electrolytic 35V	2121230479
C31	4u7	Electrolytic 35V	2121230479
C32	100P	Multi Layer Ceramic 100V	2127180155
C33	100P	Multi Layer Ceramic 100V	2127180155
C34	47P	Multi Layer Ceramic 100V	2127181470
C35	470u	Electrolytic 35V	2121230471
C36	10u	Electrolytic 35V	2121220100
C37	4u7	Electrolytic 35V	2121230479
C38	4u7	Electrolytic 35V	2121230479
C39	100u	Electrolytic 35V	2121220101
C4	4u7	Electrolytic 35V	2121230479
C40	22u	electrolytic 35V	2121250220
C41	22P	Multi Layer Ceramic 100V	2127181220
C42	22P	Multi Layer Ceramic 100V	2127181220
C43	.47u	Metalised Poly 63V	2124262472
C45	.47u	Metalised Poly 63V	2124262472
C5	4u7	Electrolytic 35V	2121230479
C6	47u	Electrolytic 35V	2121250470
C8	4u7	Electrolytic 35V	2121230479
C9	10u	Electrolytic 35V	2121220100
D1	LED	3.0mm Red Led	2137200003
D2	BAV21	Small Signal Diode	2133400201
D5	BAV21	Small Signal Diode	2133400201
D6	BAV21	Small Signal Diode	2133400201
D7	BAV21	Small Signal Diode	2133400201
D8	BAV21	Small Signal Diode	2133400201
D9	BAV21	Small Signal Diode	2133400201
IC10A	LM358	Dual op-amp DIP 8 Pin	2152800358
IC10B	LM358	Dual op-amp DIP 8 Pin	2152800358
IC1A	LM1458	Dual op-amp DIP 8 Pin	2152810458
IC1B	LM1458	Dual op-amp DIP 8 Pin	2152810458
IC2A	LM1458	Dual op-amp DIP 8 Pin	2152810458
IC2B	LM1458	Dual op-amp DIP 8 Pin	2152810458
IC3A	LM1458	Dual op-amp DIP 8 Pin	2152810458

IC3B	LM1458	Dual op-amp DIP 8 Pin	2152810458
IC4	M5222	VCA DIP 8 Pin	2153850222
IC7	16C55	PIC-16C55X1,TP,28PIN	2159601655
IC8	M5222	VCA DIP 8 Pin	2153850222
IC9	7805	Regulator, T092	2151270805
R1	10K	Resistor, metal film 1/2 watt	9111590103
R10	50K	Potentiometer Linear	2021000503
R11	1M	Resistor, metal film 1/2 watt	9111590105
R12	10R	Resistor, metal film 1/2 watt	9111590100
R13	4K7	Resistor, metal film 1/2 watt	9111590472
R14	3K9	Resistor, metal film 1/2 watt	9111590392
R15	4K7	Resistor, metal film 1/2 watt	9111590472
R16	2k2	Resistor, metal film 1/2 watt	9111590222
R17	100k	Resistor, metal film 1/2 watt	9111590104
R18	6K8	Resistor, metal film 1/2 watt	9111590682
R19	50K	Potentiometer Linear	2021000503
R2	100k	Resistor, metal film 1/2 watt	9111590104
R20	100k	Resistor, metal film 1/2 watt	9111590104
R21	120k	Resistor, metal film 1/2 watt	9111590124
R22	10k	Resistor, metal film 1/2 watt	9111590103
R23	10K	Resistor, metal film 1/2 watt	9111590103
R24	10K	Resistor, metal film 1/2 watt	9111590103
R25	50K	Potentiometer Linear	2021000503
R26	50K	Potentiometer Linear	2021000503
R27	50K	Potentiometer Linear	2021000503
R28	50K	Potentiometer Linear	2021000503
R29	22K	Resistor, metal film 1/2 watt	9111590223
R3	10K	Resistor, metal film 1/2 watt	9111590103
R30	22K	Resistor, metal film 1/2 watt	9111590223
R31	100K	Resistor, metal film 1/2 watt	9111590104
R32	1K	Resistor, metal film 1/2 watt	9111590102
R33	100R	Resistor, metal film 1/2 watt	9111590101
R34	6K8	Resistor, metal film 1/2 watt	9111590682
R35	6K8	Resistor, metal film 1/2 watt	9111590682
R36	10K	Resistor, metal film 1/2 watt	9111590103
R37	4K7	Resistor, metal film 1/2 watt	9111590473
R38	50K	Potentiometer Linear	2021000503
R39	50K	Potentiometer Linear	2021000503
R4	6K8	Resistor, metal film 1/2 watt	9111590682
R40	50K	Potentiometer Linear	2021000503
R41	3K3	Resistor, metal film 1/2 watt	9111590332
R42	3K3	Resistor, metal film 1/2 watt	9111590332
R43	1M	Resistor, metal film 1/2 watt	9111590105
R44	1K	Resistor, metal film 1/2 watt	9111590102
R45	10K	Resistor, metal film 1/2 watt	9111590103
R46	10K	Resistor, metal film 1/2 watt	9111590103
R47	10K	Resistor, metal film 1/2 watt	9111590103
R48	10K	Resistor, metal film 1/2 watt	9111590103
R49	39K	Resistor, metal film 1/2 watt	9111590393
R5	50K	Potentiometer Linear	2021000503
R50	1K	Resistor, metal film 1/2 watt	9111590102
R51	10R	Resistor, metal film 1/2 watt	9111590100
R52	1K	Resistor, metal film 1/2 watt	9111590102
R53	1K	Resistor, metal film 1/2 watt	9111590102
R54	10R	Resistor, metal film 1/2 watt	9111590100

R55		Not Required	
R56		Not Required	
R57	470R	Resistor, metal film 1/2 watt	9111590470
R58	10K	Resistor, metal film 1/2 watt	9111590103
R59	10K	Resistor, metal film 1/2 watt	9111590103
R6	10K	Cermet Horizontal	2002211103
R60	47k	Resistor, metal film 1/2 watt	9111590473
R61	10K	Resistor, metal film 1/2 watt	9111590103
R62	100k	Resistor, metal film 1/2 watt	9111590104
R63	2k2	Resistor, metal film 1/2 watt	9111590222
R64	100R	Resistor, metal film 1/2 watt	9111590101
R65	220R	Resistor, metal film 1/2 watt	9111590221
R66	1K8	Resistor, metal film 1/2 watt	9111590182
R67	100R	Resistor, metal film 1/2 watt	9111590101
R68	1K	Resistor, metal film 1/2 watt	9111590102
R69	1K	Resistor, metal film 1/2 watt	9111590102
R7	10K	Resistor, metal film 1/2 watt	9111590103
R70	1k RN	Resistor network	9111590100
R71	100R	Resistor, metal film 1/2 watt	9111590101
R72	100k	Resistor, metal film 1/2 watt	9111590104
R73	15k	Resistor, metal film 1/2 watt	9111590153
R74	4k7	Resistor, metal film 1/2 watt	9111590473
R75	47k	Resistor, metal film 1/2 watt	9111590473
R76	100R	Resistor, metal film 1/2 watt	9111590101
R8	10K	Resistor, metal film 1/2 watt	9111590103
R86	47k	Resistor, metal film 1/2 watt	9111590473
R9	33k	Resistor, metal film 1/2 watt	9111590333
V1	BC546	Transistor	2144200546
V2	BC546	Transistor	2144200546
V3	BC546	Transistor	2144200546
XT1		Resonator 4.00 MZ	2171400000

AMIS250 Input PCB component list			
Designator	Part Type	Description	Manufacture's Code
1	XLR	XLR Connector female	2587210266
2	XLR	XLR Connector female	2587210266
3	XLR	XLR Connector female	2587210266
4	XLR	XLR Connector female	2587210266
5	XLR	XLR Connector female	2587210266
6	XLR	XLR Connector female	2587210266
7	XLR	XLR Connector male	2587110227
1L	RCA	RCA Connector Female	2581420102
1R	RCA	RCA Connector Female	2581420102
2L	RCA	RCA Connector Female	2581420102
2R	RCA	RCA Connector Female	2581420102
3L	RCA	RCA Connector Female	2581420102
3R	RCA	RCA Connector Female	2581420102
4L	RCA	RCA Connector Female	2581420102
4R	RCA	RCA Connector Female	2581420102
5L	RCA	RCA Connector Female	2581420102
5R	RCA	RCA Connector Female	2581420102
6L	RCA	RCA Connector Female	2581420102
6R	RCA	RCA Connector Female	2581420102
C1	4u7(NP)	Non Polar Electrolytic 50V	2120250479
C10	4u7(NP)	Non Polar Electrolytic 50V	2120250479
C11	4u7(NP)	Non Polar Electrolytic 50V	2120250479
C12	4u7	Electrolytic 35V	2121230479
C13	4u7(NP)	Non Polar Electrolytic 50V	2120250479
C14	4u7(NP)	Non Polar Electrolytic 50V	2120250479
C15	4u7(NP)	Non Polar Electrolytic 50V	2120250479
C16	4u7	Electrolytic 35V	2121230479
C17	150P	Multi Layer Ceramic 100v	2127180155
C18	150P	Multi Layer Ceramic 100v	2127180155
C19	150P	Multi Layer Ceramic 100v	2127180155
C2	4u7(NP)	Non Polar Electrolytic 50V	2120250479
C20	150P	Multi Layer Ceramic 100v	2127180155
C21	4u7	Electrolytic 35V	2121230479
C22	4u7(NP)	Non Polar Electrolytic 50V	2120250479
C23	4u7(NP)	Non Polar Electrolytic 50V	2120250479
C24	4u7(NP)	Non Polar Electrolytic 50V	2120250479
C25	.1u	Metalised Poly 100V	2124182100
C26	4u7(NP)	Non Polar Electrolytic 50V	2120250479
C27	4u7	Electrolytic 35V	2121230479
C28	4u7(NP)	Non Polar Electrolytic 50V	2120250479
C29	4u7(NP)	Non Polar Electrolytic 50V	2120250479
C3	4u7(NP)	Non Polar Electrolytic 50V	2120250479
C31	150P	Multi Layer Ceramic 100v	2127180155
C32	4u7	Electrolytic 35V	2121230479
C33	.1u	Metalised Poly 100V	2124182100
C34	.1u	Metalised Poly 100V	2124182100
C35	150P	Multi Layer Ceramic 100v	2127180155
C36	150P	Multi Layer Ceramic 100v	2127180155
C37	150P	Multi Layer Ceramic 100v	2127180155
C38	4u7	Electrolytic 35V	2121230479
C39	4u7	Electrolytic 35V	2121230479
C4	4u7	Electrolytic 35V	2121230479
C40	4u7	Electrolytic 35V	2121230479

C41	4u7	Electrolytic 35V	2121230479
C42	.1u	Metalised Poly 100V	2124182100
C43	4u7	Electrolytic 35V	2121230479
C45	100u	Electrolytic 25V	2121220101
C5	150P	Multi Layer Ceramic 100v	2127180155
C6	150P	Multi Layer Ceramic 100v	2127180155
C7	150P	Multi Layer Ceramic 100v	2127180155
C8	150P	Multi Layer Ceramic 100v	2127180155
C9	4u7(NP)	Non Polar Electrolytic 50V	2120250479
D1			
F1	10A SB		
F2	10A SB		
IC1A	LM1458	Dual op-amp DIP 8 Pin	2152810458
IC1B	LM1458	Dual op-amp DIP 8 Pin	2152810458
IC2A	LM1458	Dual op-amp DIP 8 Pin	2152810458
IC2B	LM1458	Dual op-amp DIP 8 Pin	2152810458
IC3A	LM1458	Dual op-amp DIP 8 Pin	2152810458
IC3B	LM1458	Dual op-amp DIP 8 Pin	2152810458
L	RCA	RCA Connector Female	2581420102
R	RCA	RCA Connector Female	2581420102
R1	680R	Resistor, metal film 1/2 watt	9111590681
R10	22K	Resistor, metal film 1/2 watt	9111590223
R11	100K	Resistor, metal film 1/2 watt	9111590104
R12	22K	Resistor, metal film 1/2 watt	9111590223
R13	680R	Resistor, metal film 1/2 watt	9111590681
R14	680R	Resistor, metal film 1/2 watt	9111590681
R15	680R	Resistor, metal film 1/2 watt	9111590681
R16	680R	Resistor, metal film 1/2 watt	9111590681
R17	100K	Resistor, metal film 1/2 watt	9111590104
R18	22K	Resistor, metal film 1/2 watt	9111590223
R19	22K	Resistor, metal film 1/2 watt	9111590223
R2	680R	Resistor, metal film 1/2 watt	9111590681
R20	22K	Resistor, metal film 1/2 watt	9111590223
R21	680R	Resistor, metal film 1/2 watt	9111590681
R22	680R	Resistor, metal film 1/2 watt	9111590681
R23	4K7	Resistor, metal film 1/2 watt	9111590472
R24	4K7	Resistor, metal film 1/2 watt	9111590472
R25	4K7	Resistor, metal film 1/2 watt	9111590472
R26	4K7	Resistor, metal film 1/2 watt	9111590472
R27	10R	Resistor, metal film 1/2 watt	9111590100
R28	100R	Resistor, metal film 1/2 watt	9111590101
R29	4k7	Resistor, metal film 1/2 watt	9111590472
R3	100K	Resistor, metal film 1/2 watt	9111590474
R30	4k7	Resistor, metal film 1/2 watt	9111590472
R31	10K	Resistor, metal film 1/2 watt	9111590103
R32	10K	Resistor, metal film 1/2 watt	9111590103
R33	680R	Resistor, metal film 1/2 watt	9111590681
R34	680R	Resistor, metal film 1/2 watt	9111590681
R35	220K	Resistor, metal film 1/2 watt	9111590224
R36	22K	Resistor, metal film 1/2 watt	9111590223
R37	22K	Resistor, metal film 1/2 watt	9111590223
R38	100K	Resistor, metal film 1/2 watt	9111590104
R39	100K	Resistor, metal film 1/2 watt	9111590104
R4	100K	Resistor, metal film 1/2 watt	9111590104
R40	100K	Resistor, metal film 1/2 watt	9111590104
R41	100K	Resistor, metal film 1/2 watt	9111590104

R42	10R	Resistor, metal film 1/2 watt	9111590100
R43	22K	Resistor, metal film 1/2 watt	9111590223
R44	22K	Resistor, metal film 1/2 watt	9111590223
R45	100K	Resistor, metal film 1/2 watt	9111590104
R46	680R	Resistor, metal film 1/2 watt	9111590681
R47	680R	Resistor, metal film 1/2 watt	9111590681
R48	4K7	Resistor, metal film 1/2 watt	9111590472
R49	4K7	Resistor, metal film 1/2 watt	9111590472
R5	22K	Resistor, metal film 1/2 watt	9111590223
R50	10R	Resistor, metal film 1/2 watt	9111590100
R51	4k7	Resistor, metal film 1/2 watt	9111590472
R52	4k7	Resistor, metal film 1/2 watt	9111590472
R53	100K	Resistor, metal film 1/2 watt	9111590104
R54	220K	Resistor, metal film 1/2 watt	9111590224
R55	100K	Resistor, metal film 1/2 watt	9111590104
R56	100R	Resistor, metal film 1/2 watt	9111590101
R57	100R	Resistor, metal film 1/2 watt	9111590101
R6	22K	Resistor, metal film 1/2 watt	9111590223
R7	4K7	Resistor, metal film 1/2 watt	9111590472
R8	4K7	Resistor, metal film 1/2 watt	9111590472
R9	22K	Resistor, metal film 1/2 watt	9111590223
T2	600:600Ω	Isolation Transformer US only	2651280253
V1	78LS18	Regulator 18V	2151370818

AMIS 250 Major Components price list				
Part	Description	Manufacturer code	in house	AUD\$
PCB's				
Mixer	Mixer PCB	S5728MAMIS250S16		\$75.54
Input	Input PCB assy	S5728MAMIS250S17		\$26.26
Output	Output PCB assy	S5728MAMIS250S18		\$114.43
LED	Display PCB	S5728MAMIS250S21		\$5.13
Transformers				
230/240VAC	Mains 230/240V	2651983262		\$56.76
120VAC	Mains 120V			
Output	Output	2651983264		\$42.66
FUSE 12 Amp	DC rail fuse	2541201125		\$0.33
Semiconductors				
TIP36C	PNP TO3P transistor	2141600036	TIP36C	\$3.59
TIP42C	PNP TO220 transistor	2141300042	TIP42C	\$2.00
BC639	NPN TO92	2144200639	S7007	\$0.16
BC640	PNP TO92	2144200640	S7008	\$0.16
BD140	PNP TO92	2141400140		\$0.22
BD139	NPN TO92	2141400139	S7009	\$0.22
LM1458	IC Dual Op amp	2152801048	LM1458	\$0.26
LM833N	IC Dual Op amp	2157800833	LM833	\$1.05
LM358	IC Dual Op amp	2152800358	LM358	\$1.05
LM78L05	IC Regulator	2151270805	LM7805	\$0.17
LM7815	IC Regulator	2151370815	LM7815	\$0.52
LM7818	IC Regulator	2151370818	LM7818	\$0.52
PIC16C54-XTP	Program IC	2159601654	120PIC	\$4.17
LM5222	IC VCA	2153850222		\$0.57
10k Thermistor		2111911103		\$0.29
Switches & Pots				
Volume Pot	channel & master	2021000503		\$0.56
Power switch	Round rocker switch	2511213112		\$1.39
Hardware				
Front Panel		S600000151		\$3.61
Lid		S600000149		\$14.45
Rack ears		S600000137		\$4.35
Chassis		S600000152		\$16.15

Barrier Strip 6	6 way barrier connector	2583528306		\$2.51
Phono connector	1/4" socket	2582110645		\$0.86
XLRF		2587210266		\$1.34
XLMR		2587110227		\$1.08
Screw + washer	Black screw w/star	2316420308		\$0.04
Screw	Black screw wo/star	2316421306		\$0.04
Knob	volume & master	9346110015		\$0.12
Acrylic cover for		9347560006		\$0.31
6 way terminal				