



AVC 4

AUTOMATIC VOLUME CONTROL

USERS MANUAL

General Information

Increasingly it is a condition of licensing that sound levels in a venue are controlled to a specified maximum level, the AVC 4 will perform this task.

The AVC 4 will control the level of 2 stereo channels to a maximum set level (each stereo channel is set independently, and may have different levels). Essentially it is a dual version of the AVC 2.

The equipment is installed in the signal chain after the Mixer (or Zoner) and before the Amplifiers, providing the amplifier volume control is either not accessible or set to maximum the sound level from the system will be no more than the maximum set on the AVC 4.

It is essential that the volume control on the amplifiers is either inaccessible or set to maximum, it is preferable to have the amplifiers in a locked cabinet (so a visiting performer cannot adjust) with the volume control set to an appropriate level. However if this is not possible the amplifier should be set to maximum.

Setting the maximum level on the AVC 4 is done by the adjustment of a single pot through the rear panel for each stereo channel (a security cover then prevents unauthorised access).

Once the maximum threshold is set, if the average input audio level exceeds the threshold for that channel of the AVC 4 the output level will be maintained close to the set maximum.

Once the input signal is above the set maximum threshold the AVC 4 will attenuate the signal in discrete steps as indicated by the display on the front panel, the AVC 4 will fade between these steps so the action of controlling the level is not noticed.

Performers should be advised to operate either below the threshold or with no more than the first two LED's on the front panel display lit, the reason for this is that at higher levels of attenuation the AVC 4 will reduce the level by slightly more than the increase in input level. Maximum sound level is where the AVC 4 starts to operate and when it is driven harder the level will be reduced to slightly below maximum.

The AVC 4 has no external controls, once set it will sit there and control the signals to the maximums set and provide an indication of status on the front panel.

A 25 way connector on the rear panel provides a number of features and functions which give the ability to tailor the installation to different requirements.

Each stereo channel can have two output levels set which may be useful if different sound levels are required (weekdays and weekends or day and night perhaps). Switching between the two set levels is via connection to pins on a 25 way connector on the rear panel and may be done in a number of ways from a simple switch to a keyswitch or even a time switch.

There is also a mute facility, this can be used to interface with a fire alarm for example.

A dim facility is available which will dim the signal by 20dB.

Other features include drive for a remote display and the ability to supply power (+/- 18V at 50mA MAX). For full details see the section on Auxiliary connections.

Installation

The unit is 1RU high and is suitable for installation into a 19" rack.

The unit should normally be installed in the signal chain either between the mixer/pre-amp/zoner and the amplifiers, if the amplifiers have electronic crossovers before them then the AVC4 will be installed before the electronic crossovers.

The unit will control two independent stereo signals to separate maximum levels, generally this means controlling two different zones (this may be different rooms or different floors of a building).

Usually it is preferable for the display to be visible to the performer in the primary area but remote displays may be added if required (performers will often benefit from being able to see the display, however in a restaurant with background music for example the display would only be referred to during set up and would not need to be visible).

Connections on the rear are via XLR connectors for the audio and a 25 way D connector for auxiliary connections. A tamperproof cover is included and must be removed first.

The units has balanced inputs and outputs which are self compensating, for unbalanced operation the negative connection may be disconnected and connected to the screen.

To avoid ground loop problems, the audio common (cable screens) in this equipment is not connected to mains earth within the unit. The mains lead earth connection is only connected to the case of the unit and this always must be connected to mains earth.

The output of the mixer/pre-amp/zoner will be connected to the XLR's marked input on the AVC4, the corresponding AVC4 output will then be connected to the amplifier (or crossover if present) input.

Auxiliary Connections

A 25 way D connector on the rear of the unit provides additional features for each of the two stereo channels, the mating connector is supplied with the unit.

Pin 1 Channel 1 Mute	Pin 8 Channel 2 Mute
Pin 2 Channel 1 Clip	Pin 9 Channel 2 Clip
Pin 3 Channel 1 Warning LED	Pin 10 Channel 2 Warning LED
Pin 4 Channel 1 Dim	Pin 11 Channel 2 Dim
Pin 5 Channel 1 Dim	Pin 12 Channel 2 Dim
Pin 6 Channel 1 Remote display	Pin 13 Channel 2 Level 2
Pin 7 Channel 1 Level 2	Pin 14 Channel 2 Remote display
Pin 15 Channel 1 -VE	Pin 25 Channel 2 +VE
Pins 16 – 24 are all 0V (not mains earth)	

Pins 1 and 8 provide the mute facility for channels 1 and 2, these each have a link to 0V which when broken will cause that channel to mute. To interface with a fire alarm the link would be replaced by relay contacts which open when the fire alarm operates.

Pins 2 and 9 provides a clip indicator for channels 1 and 2, the pins will each drive a standard LED, the other end of which should be connected to the +VE pin 25. Alternatively this drive may be used as a trigger for a larger device.

Pins 3 and 10 provides a warning indicator for channels 1 and 2, the pins will each drive a standard LED, the other end of which should be connected to a 0V pin. Alternatively this drive may be used as a trigger for a larger device.

Pins 4 & 5 and 11 & 12 provides a dim facility for channels 1 and 2, connecting pin 4 to pin 5 will dim channel 1 by 20dB and connecting pin 11 to pin 12 will dim channel 2 by 20dB.

Pins 6 and 14 will drive a remote display for channels 1 and 2, the remote display is an additional option available from Formula Sound and comes with instructions for connection.

Pins 7 and 13 provides level 2 facility for channels 1 and 2, connecting pin 7 to a 0V pin will put channel 1 on its level 2 output setting and connecting pin 13 to a 0V pin will put channel 2 on its level 2 output setting. A switch, relay or relay on a timer may make the connection.

Power is available from pins 15 (-VE) and 25 (+VE) with 16 – 24 as 0V. Ensure no more than 50mA is drawn from each, and no electrical connection to any other system. This should only be used for Formula Sound peripherals such as remote display.

Auxiliary connections for Mute, level 2 and Dim must be totally isolated and fully floating from any other electrical circuit. A fire alarm for example will drive a relay, the contacts of which will be isolated from the fire alarm and only connected to the mute pins.

Indicator LED's or their drives should not be tied electrically to any other system.

Operation and set-up

As supplied the unit is set to operate at an average programme line level of 0Vu (+4dBu) and in many cases will not need any adjustment. This is the level that a standard VU meter will read before going into the red therefore the operator can use the readings on the VU meter fitted to their mixer to be an indication of maximum permitted volume level.

To achieve the required system volume level, adjust the output level of the AVC 4 by using the output pots on the rear panel. The two output pots for each channel are marked L1 and L2, corresponding to level 1 and level 2 (level 2 is switched by shorting pin 7 to 0V for channel 1 and pin 13 to 0V for channel 2).

For channel 1 and channel 2 in turn, adjust L1 and L2 to full down and play music through the system with the mixer/pre-amp/zoner set to full volume. Turn music/incoming signal up until first LED is lit, adjust L1 to give the required maximum sound level. Maximum sound level is now at a sensible point on the mixer/pre-amp/zoner volume control.

Switch to L2 and repeat for L2 if required.

Internal Adjustments

Do not attempt to make any internal adjustments unless you are an experienced audio installer and know what you are doing.

Always disconnect the power before removing covers.

Access is gained by removing the top cover, remove 3 screws from either side of the case and 2 screws from the top cover and lift the cover off. Put the cover and the screws to one side.

Fig 1A Shows the position of the range setting jump plugs (H1 & H2). One for each stereo channel, these set high and low operating ranges for the unit.

Fig 1B Shows the position of the sensitivity adjustment preset (PR7 & PR8). This is a multi-turn preset and changes the operating threshold of the unit. Use in conjunction with the range setting jump plug.

Fig 1C Shows the position of 2 jump plugs (H3/H4 & H7/H8) that select the weighting of the control chain. The AVC 4 uses two control chains in parallel, one flat (LIN) and one "A" weighted, the higher output controls the unit.

The legend on the PCB shows the setting for BOTH (1 Linear and 1 A weighted), LIN (both control chains linear) and A WTG (both control chains A weighted).

Fig 1D There is an Earth lift jumper (H11), it should not be removed unless you are a qualified electrician and know the implications of this.

Fig 1E H5/H6 and H9/H10 are for factory calibration and must not be moved.

AVC 4 Specification

Formula Sound reserve the right to vary or alter the specification without notice.

Frequency Response	20 Hz – 20 KHz	+/- 0/5dB	
Distortion 1KHz (THD and noise)	O/P level 0dBu 0dBu	Attenuation 0dB 30dB	<0.01% <0.05%
Noise (20 Hz – 20 KHz)	EIN	<-90dBu	
Inputs XLR connector Input impedance	Electronically balanced, connect pins 1 & 3 for unbalanced use Pin 1 Screen, Pin 3 –VE Non phase, Pin 2 +VE phase Balanced >20 KOhms Unbalanced >10 KOhms		
Maximum input level	+22dBu		
Clip indicator	Indicates	+20dBu	
Outputs XLR connector	Electronically balanced, connect pins 1 & 3 for unbalanced use Pin 1 Screen, Pin 3 –VE Non phase, Pin 2 +VE phase		
Source impedance	<100 Ohms		
Minimum load impedance	600 Ohms		
Operating threshold range			
High range	Average level adjustable	+5dBu to –2dBu	
Low range	Average level adjustable	-8dBu to –14dBu	
Attenuator range	-3dB, –6dB, -9dB, -12dB, -15dB, -18dB, -24dB, -30dB		
Control chain	Standard is combined Linear and A weighting but may be set to either Linear or A weighting.		
Auxiliary connections 25 way D connector	Each stereo channel has Mute, Dim, Level 2 selection and also clip, warning and remote display drives. Power at +/- 18V is also available limited to 50mA max. See auxiliary connections section.		
Power IEC mains connector	240V Mains fuse 250mA anti-surge. 110V Mains fuse 500mA anti-surge - Internal selection switch.		
Finish	Front and Rear panels are black anodised aluminium with silver legend and enclosed by black plastic coated steel case.		
Dimensions	Width 19" Depth 8" Height 1.75" (482 x 200 x 44.5mm) Weight 4 Kg (Out of shipping carton).		

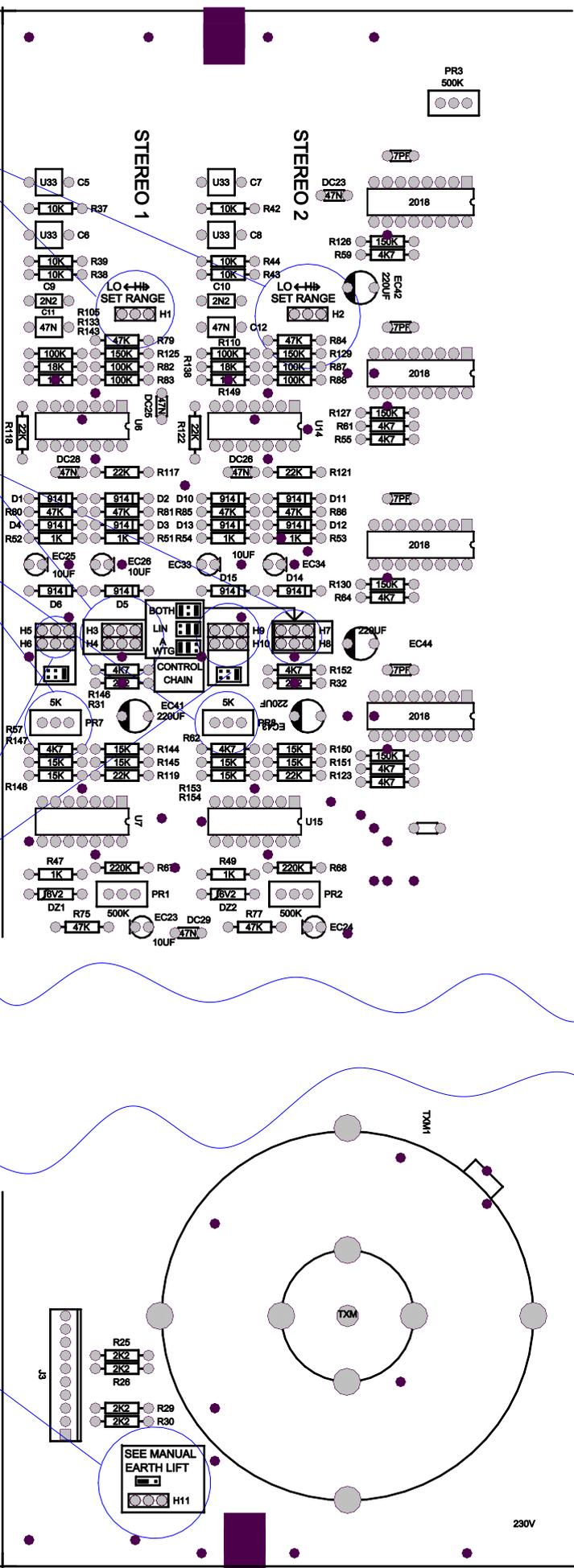
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- A. High and low operating range, headers H1 and H2.
- B. Operating threshold, PR7 and PR8.
- C. Control chain weighting, headers H3/H4 and H7/H8.
- D. Earth lift, header H11. Do not remove unless qualified to do so.
- E. Factory calibration only, do not change headers H5/H6 and H9/H10.



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TITLE AVC 4 INTERNAL ADJUSTMENTS

DRG No. Fig 1

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E.U. CERTIFICATE OF CONFORMITY

We declare that the products listed conform to the following directives and standards

89/336/EEC amended by 92/31/EEC and 93/68/EEC

BS EN 50082-1 BS EN 50081-1

PRODUCT TYPE

AVC 4

The CE mark was first applied in 1995

Signed

B. J. Penaligon General Manager

Attention

The attention of the specifier, purchaser, installer, or user is drawn to the fact that good wiring practice must be observed when connecting the above equipment. Good quality connectors and screened cables must be used for all audio connections. Twin screened cables should be used for all balanced lines.

**THIS EQUIPMENT MUST BE EARTHED
CONSULT THE USERS MANUAL FOR TECHNICAL DETAILS**