



AVC 2D

AUTOMATIC VOLUME CONTROL

USERS MANUAL

GENERAL DETAIL

The AVC 2D controls the sound level of a system to a set maximum, if the incoming signal is below the set threshold the AVC 2D has no effect. If the average programme level exceeds the set threshold the AVC 2D will reduce its gain to hold the output level at the set maximum. The gain is reduced slowly so as not to affect the dynamics of the music and is almost undetectable in use.

Once the set threshold is reached any increases the input level (volume) is offset by reducing the gain, so that the system will barely change in perceived level. A 2 X 20 segment multi-function liquid crystal display (LCD) shows the mode in use and the attenuation level in both channels, there is also a clip indicator LED. There is provision to connect remote warning and clip LED indicators.

The AVC 2D is installed in the signal chain before the amplifiers, in modes 1 and 2 the amplifiers must either be locked away or set to maximum gain (so the amplifiers cannot be turned up after the maximum level is set). In mode 3 a microphone is used to monitor the actual sound level so turning up amplifiers will not increase the sound level.

Utilising digital control circuits and a very pure analogue signal chain the audio quality of the sound system is maintained while achieving the required degree of sound level control.

With 3 operating modes currently featured, it is envisaged that upgrades will be available that will allow the AVC 2D to fulfil further functions. e.g. The ability to intelligently adjust the level of a sound system (paging etc.) depending on the surrounding ambient noise level.

Operating Modes

Mode 1

The AVC 2D operates as a single stereo channel.

Mode 2

The AVC 2D operates as a 2 channel mono unit, each channel may be set to a different level allowing two separate mono zones to be controlled.

Mode 3

The AVC 2D operates as a stereo unit that controls volume level based on the microphone input. The microphone (not included) measures actual sound pressure level in the venue. The advantages of using a microphone are that absorption of sound in a venue that is full of people is automatically catered for and the amplifiers do not need to be locked away or set at maximum gain. The disadvantage is that audience sound is also picked up.

Controls

The AVC 2D has no external controls - just a display and indicator LED's to inform the operator of the status of the unit. The clip indicator LED shows if the input to the AVC 2D is being overloaded, and there is provision to connect a remote clip indicator LED. An external remote warning indicator may be connected to warn that the operating level is within 3dB of the threshold at which the AVC 2D will start to control the level.

Mute and dim functions are fitted which can be operated by an external switch to improve system security or act as a fire alarm connection in case of fire. Mute reduces the output level by 90dB and dim reduces the output level by 20dB. When released the action is to fade back to the normal level. The AVC 2D also has provision to connect an external switch, to switch between two operating levels (stereo mode 1 only).

Settings are made by a recessed button and recessed pots through the back panel.

Installation

The unit should be installed in the signal chain either between the mixer or pre amp and the amplifiers, or in larger systems the mixer/ preamp and the electronic crossover. It is not essential for the unit to be visible to the performer as a remote indicator can be installed (see auxiliary connections section) or the mixer can be marked with maximum and clip levels.

As supplied the unit will be set to Mode 1 detecting the incoming signal to control the output level.

Connections are via XLR connectors for the audio and 3 X 4 way connectors for auxiliary connections. **A tamper proof cover is supplied which can be sealed. This cover prevents the connectors from being disconnected and is often a requirement when the unit is installed as a noise controlling device specified in a licensing application .**

The unit features balanced inputs and outputs which are self compensating. (NB. For unbalanced operation the negative output should be tied to the screen and not left single ended. An unbalanced connection between positive and screen with no connection to negative will result in a loss of signal level). When wiring to balanced circuits for stereo operation both left and right channels should be identical to maintain phase.

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 and this must always be connected to MAINS EARTH.

AUXILIARY CONNECTIONS. 3 x 4 way connectors are provided for the auxiliary connections. The connectors are labelled 1,2,3,4 for the first connector, 5,6,7,8 for the second connector and 9,10,11,12 for the third connector. The mating halves for these connectors are supplied with each unit.

Connector 1 (pins 1,2,3,4.)

The unit is supplied with a link which is fitted between pins 1 and 2. This is the security link and these two terminals need to be joined for the unit to operate. Removing the link will mute the unit. Pins 3 and 4 labelled COMS are for future use and can be disregarded, do not connect anything to pins 3 and 4.

Connector 2 (pins 5,6,7,8.)

Pins 5 and 6 allow a warning indicator to be connected to the system. An LED indicator may be connected directly to pins 5 and 6 observing polarity to avoid damaging the LED. The warning LED will indicate 3dB before the unit starts to control volume levels. Pins 7 and 8 allow a remote clip indicator to be connected to the system. An LED indicator may be connected directly to pins 7 and 8 observing polarity to avoid damaging the LED.

If larger mains voltage indicator lamps are required, solid state relays may be connected that are compatible with 5V DC. Input. The output provides a current limited 5V D.C. Voltage.

"Do not attempt mains voltage wiring unless you are qualified to do so"

Connector 3 (pins 9,10,11,12.)

Pins 9 and 10 when joined allow the unit to be dimmed by 20dB. When the connection is removed the unit will fade back to the previous level. Pins 11 and 12 are provided for switching between two output levels (Stereo mode 1 operation only). This function may be controlled by a time switch or key switch as required. (Switches are not supplied).

All the auxiliary connections are low voltage low current connections, When connected to external switches fire alarms etc. they must be totally isolated and fully floating from any other electrical circuit.

Operation Modes and Set Up

All adjustments are made through holes on the rear of the unit to prevent accidental changes. The security cover supplied should be fitted after set up to prevent tampering.

Mode selection is by push button labelled MODE. Pressing the button cycles through Mode's 1, 2, & 3, holding the button down while in the various modes selects the set up display for each mode. Hold the button down until the display clears then release. Pressing the button again changes back to the normal operation display.

In mode 1 set TH1 to maximum and play music louder than required maximum, adjust TH1 to bring music down to required maximum. Turn amplifiers to full (unless they are to be locked away) and the level is now set. If level 2 is required switch to level 2 (short pins 11 & 12 on back connector) and adjust TH2 for required music level.

Mode 1

Mode 1 display
Normal operation

MODE 1				A	0 dB
STEREO	INPUT	B			0 dB

THRES 1	+	4 dB	ATK 5
THRES 2	-	2 dB	DCY 5

Setup display

The attenuation level is shown on the right of the display, once the set threshold is exceeded the reduction in gain in dB will be shown. (Mode 1 is a stereo mode so both channels will be the same.)

Setup display. The threshold for level 1 and 2 is shown, these are set by the TH1 and TH2 presets. (Connecting aux pins 11 & 12 together selects level 2. The control chain attack and decay settings are also shown factory settings are 5 for each setting. The adjustment presets for this are internal (see later section).

Mode 2 allows the unit to be used to control 2 independent mono systems in this mode switching to a second level is not possible (shorting pins 11 & 12 will have no effect).

In mode 2 set TH1 to maximum and play music for this channel louder than required maximum, adjust TH1 to bring music down to required maximum. Turn amplifiers to full (unless they are to be locked away) and the level is now set. Repeat for the second channel and set TH2.

Mode 2 (2 x mono) display
Normal operation

MODE 2				A	0 dB
MONO	INPUT	B			0 dB

THRES A	+	4 dB	ATK 5
THRES B	-	2 dB	DCY 5

Setup display

Mode 2

The attenuation level for each channel is shown on the right of the display, once the set thresholds are exceeded the reduction in gain in dB will be shown.

Setup display. The threshold level for each channel is shown, these are set by the TH1 and TH2 presets. The control chain attack and decay settings are also shown, factory settings are 5 for each setting. Both channels will have the same setting.

Mode 3 - Microphone Sensing operation

When mode 3 is selected the AVC 2D control chain is operated by a signal derived from a measuring microphone. The advantages of this are that the amount of absorption which takes place when a venue is full of people is automatically catered for and the amplifiers do not need to be set to full gain or locked away.

A good quality low impedance, omni directional balanced microphone with a reasonably flat response, should be used. Phantom power (internally selectable) at 15V is available for an electret or capacitor microphone. The microphone should be mounted reasonably central it should not be mounted too close to any loudspeaker. Formula Sound can supply a suitable microphone if required, contact our sales office.

Mode 3 display Normal operation

MODE 3										A		0 dB
STEREO MIC										B		0 dB

THRES												ATK 5
LEVEL												DCY 5

Setup display

Setting up

In mode 3 the threshold is displayed in the top half of the LCD display and the signal from the microphone is displayed in the bottom half of the display. Between "THRES" and "ATK" (also "LEVEL" and "DCY" there are 10 LCD segments and one will be lit as a black square.

In the display shown above "THRES" has a black square in segment 9 and "LEVEL" has a black square in segment 2 indicating threshold setting is 9 and mic level is reading 2.

Adjust TH1 so "THRES" is set to 8 (black square in segment 8).

With the system playing at the desired maximum level adjust the mic gain trimmer (through the back panel) so that the "LEVEL" is also set to 8 (black square in segment 8).

If the mic gain will not reach the "THRES" setting then providing the mic "LEVEL" is at least 5 the "THRES" setting can be reduced to match the mic "LEVEL" at maximum gain.

If the mic "LEVEL" is below 5 then the microphone is not sensitive enough and a more sensitive (electret) microphone will probably solve the problem.

Basic operation

As supplied the unit will be adjusted to operate at an average programme line level of 0Vu (+4dBu) and in most cases no adjustment of output level will be necessary.

This is the level that a standard Vu meter will read before going into the red (end section), therefore the operator can use the readings on the Vu meters fitted to the mixer to be an indication of maximum permitted volume level.

If a different output level is required then adjust the output pot accessible through a small hole on the rear panel located between the input and output connectors and labelled OP.

In mode 2 the output of the second channel is similarly adjustable through a second (unmarked) small hole between the output connectors on the rear panel.

Check the level by driving the system until the LCD displays starts to show some attenuation and readjust the output as necessary.

The AVC 2D is slow acting to differentiate between dynamic peaks of music and an increase in average level. Bear this in mind when making adjustments.

INTERNAL ADJUSTMENTS

Do not attempt to make any internal adjustments unless you are qualified to do so. Refer to Drg 1013 (later page)

ALWAYS DISCONNECT POWER BEFORE REMOVING COVERS.

Access is gained by removing the top cover.
Remove 3 screws from either side of the case.
Remove 2 screws from the top and lift top cover off.
When the adjustments are completed refit the case top.

**ALL OTHER PRESETS ARE FOR ALIGNMENT AND TEST PURPOSES AND ARE
FACTORY SET. AND SEALED DO NOT - REPEAT - DO NOT TOUCH!**

INCORRECT SETTING OF ANY SEALED ADJUSTMENT WILL INVALIDATE THE WARRANTY.

AVC2-D SPECIFICATIONS

Frequency response	20Hz - 20kHz	+/- 0.5dB
Distortion (THD and noise) freq 1kHz	O/P@ any level 0 to +22dBu	Attenuation @ any level 0 to -90dB < 0.01% (typically 0.005%)
Noise measured 20Hz-20kHz	Equiv. input noise	< -90dBu

INPUTS Electronically balanced, connect pins 1 & 3 to screen pin 2 hot for unbalanced use

XLR Connectors	Pin 1 screen Pin 3 -Ve Non Phase Pin 2 +Ve Phase
Input impedance	Balanced 20K ohms Unbalanced 10K ohms
Maximum input level	+22dBu
Clip indicator	Indicates @ +20dBu

OUTPUTS Electronically balanced, connect pins 1 & 3 to screen pin 2 hot for unbalanced use

XLR Connectors	Pin 1 screen Pin 3 -Ve Non Phase Pin 2 +Ve Phase
Source impedance	100 ohms
Minimum load impedance	600 ohms

Operating Threshold Range	Average level +10 dBu -20dBu
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Operating Modes 3

Mode 1	Stereo operation. (A & B channels are controlled together)
Mode 2	2 x Mono operation. (A & B Channels are controlled independently)
Mode 3	Stereo operation with control taken from an optional microphone which will measure & control actual sound pressure level (SPL) in the venue.

AUX CONNECTIONS	1 & 2 Open to Mute	3 & 4 Coms (future development)
	5 & 6 Warning LED	7 & 8 Clip LED
	9 & 10 close to DIM - 20dB	11 & 12 Close to select level 2

MICROPHONE CONTROL INPUT	XLR Connector Lo Z Balanced input (15V Phantom internal selection)
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DISPLAY	2 X 20 Segment Liquid Crystal Display (LCD) Backlight & Contrast are internally adjustable 1 Green LED Power indicator 1 Red LED Input Clip indicator
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POWER

220-240 V AC 110 -120V AC Operation Internal selection I.E.C. Mains connector

Mains Fuse 220V operation 250mA slow blow. 110V operation 500mA slow blow

FINISH

Front and Rear panels - Black anodised aluminium with silver notation
Case black plastic-coated steel.

DIMENSIONS

19" Rack mounting 1RU
Width 482mm (19") Depth 200mm (7.9") Height 44mm (1.75")

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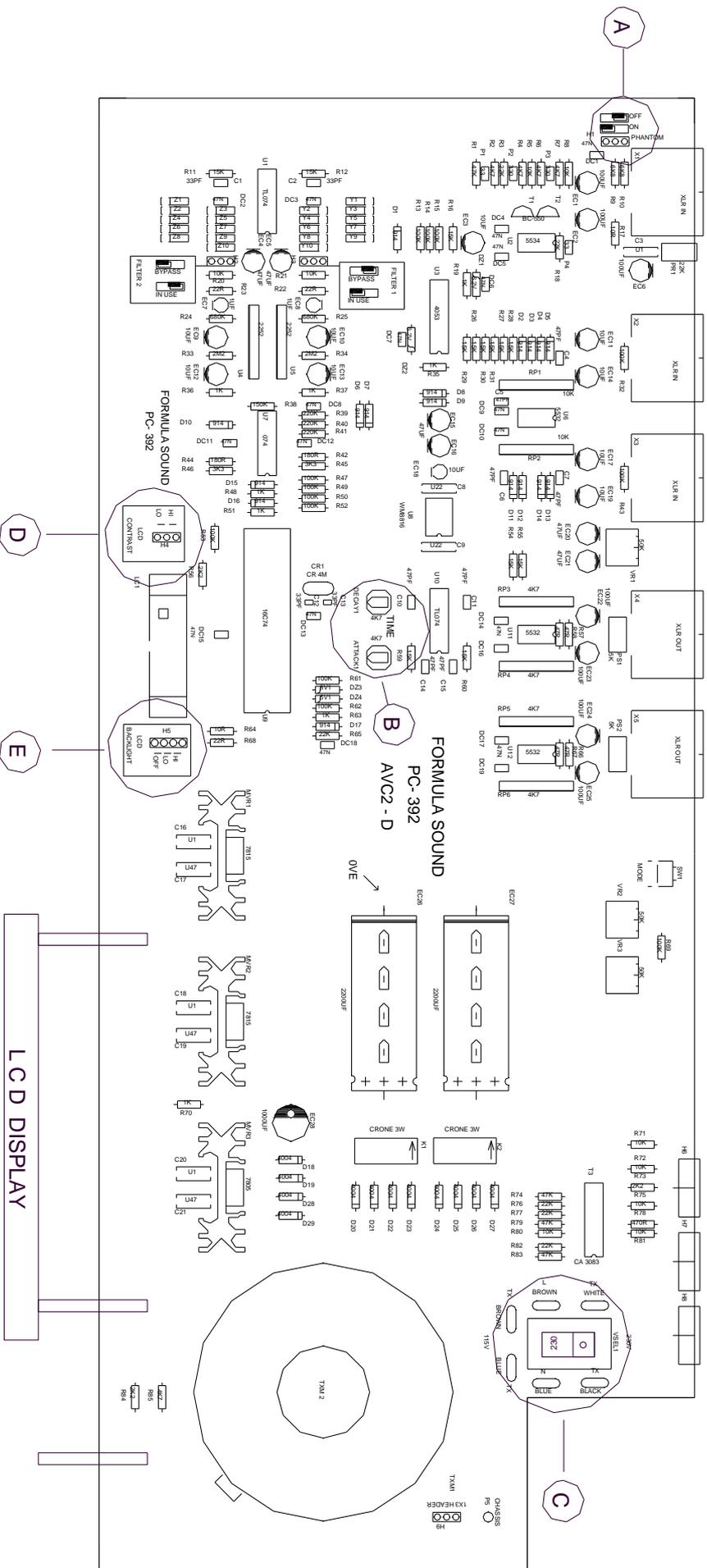
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Formula Sound reserve the right to alter specifications at any time without notice



- A. Phantom power selector for control microphone
- B. Attack and Decay control presets (normal position is center)
- C. Mains Voltage selector switch (slide switch)

- D. LCD Display contrast selector
- E. LCD Display backlight selector



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TITLE		AVC2 - D INTERNAL ADJUSTMENTS	
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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 2D

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