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Section 1 - Introduction

1.1 - What is the ACM-5SA?

The ACM-5SA plug-in for Windows or Linux PCs and compatible audio workstation applications comprises a vintage mid-range EQ emulation based on the vintage Pultec MEQ-5 units. It models the passive filter circuitry found in such devices, and in addition, the transformer-coupled valve amplifier used to make up the gain after the filters.

1.2 - Main Features

- VST, VST3 and CLAP plug-in for 64Bit Linux PCs and compatible host applications.
- 'Passive' filters model the behaviour of a vintage Pultec MEQ-5 style mid-range EQ.
- Low frequency peak / boost filter.
- Mid range dip / cut filter.
- High frequency peak / boost filter.
- Transformer-coupled valve amplifier emulation.
- Physical Control Weighting replicates the feel of high quality rotary controls.

1.3 System Requirements



Windows:

A PC running 64Bit Windows 7 or newer and a VST, VST3 or CLAP compatible host application.



Linux:

An X11 compatible Linux distribution and a Linux VST, VST3 or CLAP compatible host application.

1.4 - About the Manual

This manual covers the installation and use of the ACM-5SA equalizer. Features and operation may vary depending upon your operating system configuration and host application. Where appropriate, examples are also illustrated with screenshots of the features being discussed.

1.5 - Conventions Used

Access to menu items are shown as follows:

Menu -> Item -> Item

A Mono-spaced font is used to illustrate commands as they are typed on the command line.

Section 2 - Installation

2.1 Download Contents

Within the folder that contained this manual you will find Windows and Linux folders containing the plug-in built for **64Bit Windows or Linux systems**. Please refer to section 1.3 for system requirements.

2.2a Installing the Plug-In for Windows

Installing the Plug-In for Windows:

Within the Windows folder you will find installers for the VST, VST3 and CLAP plug-ins. The installers will guide you through the steps required to install the plug-ins.

NOTE: VST3 and CLAP define specific locations for compatible plug-ins. For Windows this is normally:

Program Files\Common Files\VST3\[CompanyName]

and

Program Files\Common Files\CLAP\[CompanyName]

The installer will permit other locations however you should use only the installer recommended location for the VST3 or CLAP plug-ins. unless you are confident of a specific reason for selecting an alternative.

The installer will only install the files necessary for the plug-in to function. It will not install anything else on your computer.

Uninstalling the plug-in:

To uninstall the plug-in It is recommended to use

Control Panel -> Add or Remove Programs

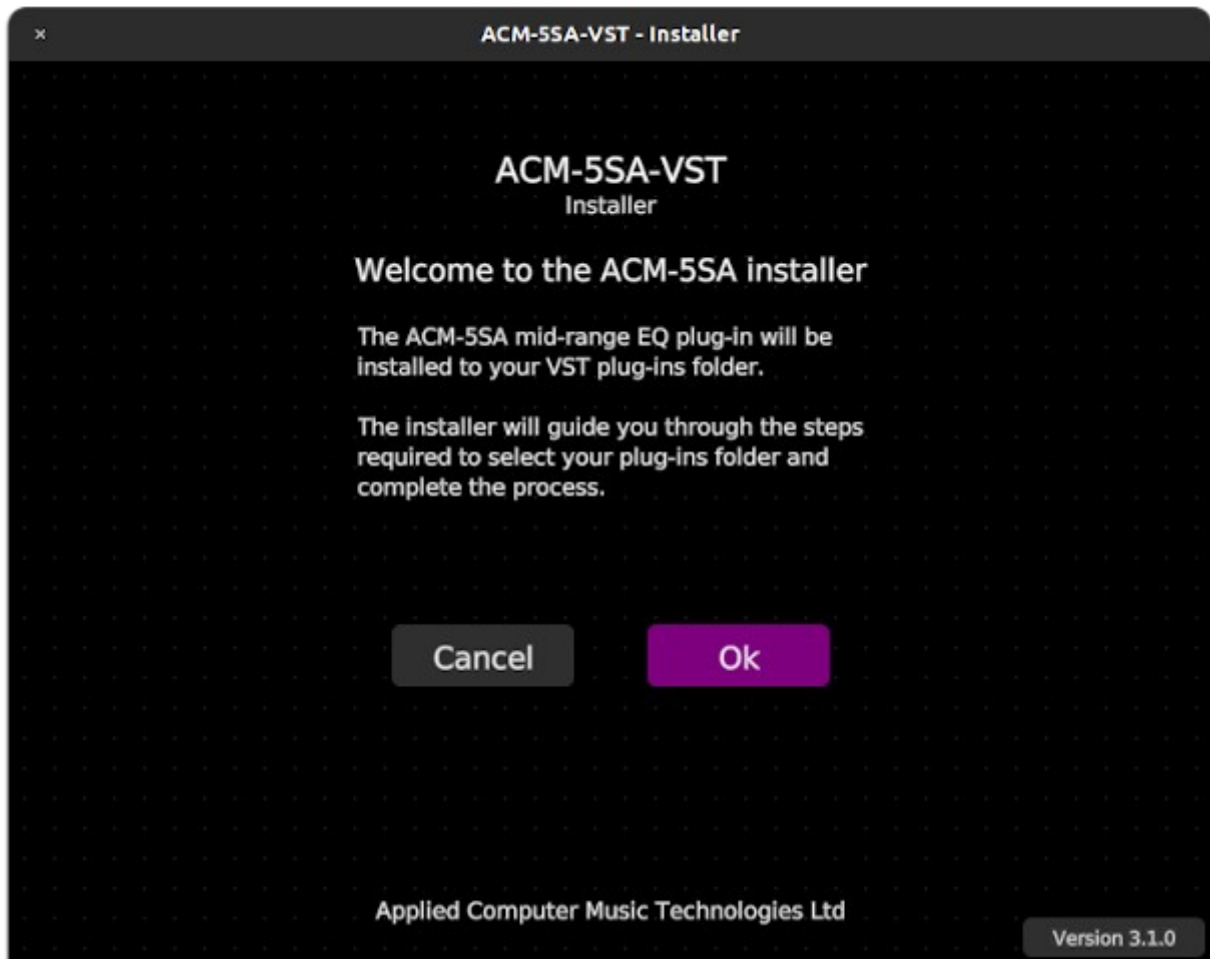
and select **Remove** for the ACM-5SA.

2.2b Installing the Plug-In for Linux

Installing the Plug-In for Linux:

Within the Linux folder, you will find the x86-64 folder containing the installer executable.

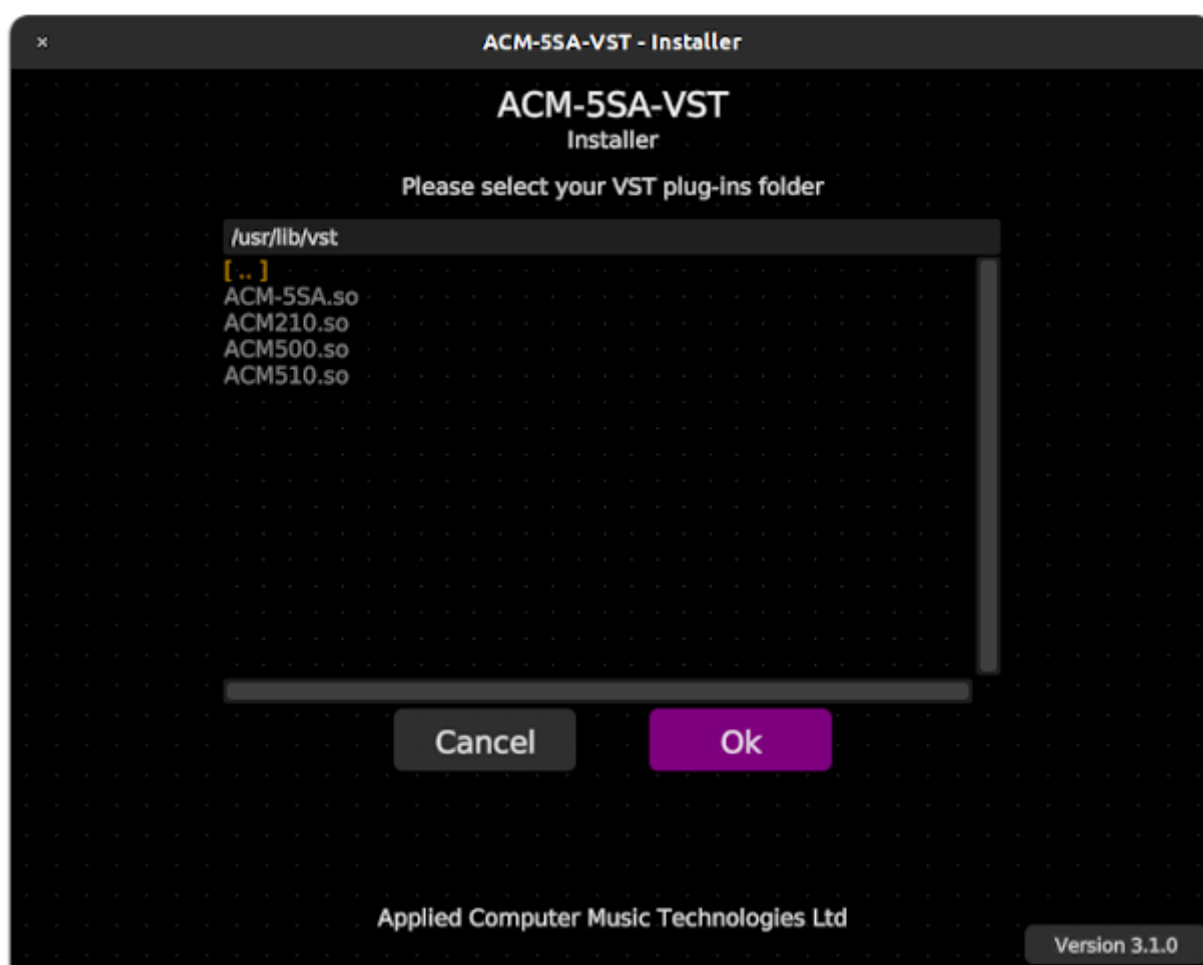
Run the installer executable by (double) clicking it in a file browser, or launching it from the command line. The installer will guide you through the installation process.



Selecting the Install Location:

The installer will prompt for your plug-ins folder location. Normally this will be `/home/your-user-name/.vst` or `.vst3`. It is recommended to have a single VST or VST3 plug-ins folder, but you can install the plug-in to as many different locations as you require (just run the installer again and select a new location).

Depending upon system configuration, you may also be prompted for your user or root password if you attempt to install to a system folder, or one to which you do not have write permissions. The installer uses a standard system authentication process (`pkexec`) and does not directly gain elevated permissions.



Troubleshooting:

The installer is designed to be self-contained and compatible with most Linux distributions, if you need to backup the installer, the single executable file should be all you need. However, due to the varied and customizable nature of Linux distributions, it is possible that the installer may not be compatible with your system configuration. If this happens, follow these steps to isolate the problem or to install the plug-ins manually.

1. Do not try to run the installer as the root / admin user. If you do, there will be a warning message on the console and the installer will exit. The installer is designed to be run as a normal user and will prompt for a password if required.
2. The installer uses the `pkexec` authentication method if attempting to install to a system folder, or one to which the current user does not have write access. (the installer itself never gains root or elevated permissions on your system). If this is not a standard component of your Linux distribution, you will need to correctly install and configure it for your system, or select a different install location with appropriate user access permissions.
3. In some circumstances you may need to mark the installer as 'executable' in order for it to be launched. You can normally do this by right-clicking the installer and selecting:

Properties -> Permissions -> Allow executing file as program

Manually Installing the Plug-In:

If your system configuration is not compatible with the installer, you can install the plug-in manually by copying the required files onto your system. You will need to be familiar with command line operations in order to do this.

The plug-in binary files are contained in the `plug-in_binaries.tar.gz` file within the x86 or x86-64 folders. Extract the archive, and you will find it contains VST and VST3 folders.

The VST and VST3 folders contain the plug-in in Linux VST and VST3 format.

There is also a README file which details how to copy the required files onto your system.

2.3 Product Support

If you are unsure how to install the plug-in, or encounter problems during the installation, please contact:

support@acmt.co.uk

Section 3 - Operation

3.1 - The Graphical User Interface



This is the ACM-5SA front panel. You can control it by clicking and dragging on the knobs or switches. Some controls may have indents – these manifest themselves as areas in the control rotation where the reluctance to move is increased such that you have to drag a bit 'harder'. They are intended to behave like real controls which may have a 'click stop' at 0dB for example.

You can also move the controls by placing the mouse pointer over them and using the scroll wheel. In this case the centre indent has no effect. The way in which the rotary controls respond to mouse movement may also be affected by host application configuration, as described in the next section.

3.2 Control Modes

The control mode determines the way in which the rotary controls respond to mouse movement. This can normally be configured via the host application preferences. Please refer to your host application documentation for details.

1. Circular

This is the default mode unless changed by host application settings. Clicking on a control will move it immediately to the mouse pointer's angular position. To adjust the control, drag the mouse pointer in a circle or arc.

2. Relative Circular (Default)

Similar to circular mode, however moving the mouse will adjust the control relative to its current setting.

3. Linear

The control responds to vertical movement. Drag up to increase the value, turning the control clockwise, or down to decrease the value, turning the control anticlockwise.

In all modes, double clicking in the centre of a control will return it to its default position.

3.3 - Physically Weighted Controls

To improve the feel of the controls, and make them behave more as hardware equivalents do, the control knobs have been given a small amount of physical 'inertia'. This weighting does not affect the 'law' of the control, only the way it responds to mouse movement. When you begin to drag on a control, or change direction, its 'gearing' will be at a higher resolution (which also helps to locate more precise settings). As you continue to drag the control, it will become more closely geared to the mouse movement, meaning that you can still make significant control changes without large and awkward movements of the mouse.

As the controls are operated their value will be displayed in the status bar above the front panel. If at any time you need to know a control's setting, just click on its centre and the value will appear in the status bar.

3.4 – Control Functions

Similar to some of some original vintage hardware EQs, the ACM-5SA has a slightly unusual control layout. The EQ consists of three separate sections, a low frequency peak boost, a mid dip (or cut) and a high frequency peak boost. The control functions are described in detail as follows:



1. EQ In

This is the EQ bypass switch. With the switch on, the filters will be in the signal path and affecting the output. With the switch off, the filters will be out of the signal path.

Note that vintage hardware EQs such as Pultec units often had passive filters, followed by a transformer-coupled valve amplifier stage to make up for the signal loss in the filter. Even with the switch off, the valve amplifier stage remained in circuit. While this does not affect the signal level, it does mean that there is still a bit of extra valve 'warmth' even with the EQ switched out.

2. Low Frequency - CPS

The low frequency switch selects the centre frequency at which the low peak filter operates. The switch has five positions and in keeping with similar vintage hardware, the control settings are indicated in cycles per second (CPS) - equivalent to Hz.

3. Low Frequency - Peak

Next to the low frequency selector switch is the low frequency boost control. This determines the amount by which the low peak filter boosts the selected frequency. The scale does not indicate dBs directly, though at some points it may align with the equivalent dB boost. The low frequency peak filter is a constant Q circuit, meaning that the Q / bandwidth remains constant as the boost is adjusted, however the Q may vary with different frequency settings.

4. Mid Frequency - KCS

The mid frequency switch selects the centre frequency at which the mid-range dip filter operates. The switch has eleven positions, and in keeping with similar vintage hardware, the control settings are indicated in KCS [kilocycles per second] or kHz.

5. Mid Frequency Dip

The mid-range filter provides a cut or dip in the response at the selected frequency. It is not possible to boost the mid range with this EQ. Instead, the amount by which the selected frequency is reduced is determined by the dip control.

6. High Frequency - KCS

Similar to the low frequency section the high peak filter consists of a frequency selector and a boost control. The selector switch has five positions marked in KCS [kilocycles per second] or kHz.

7. High Frequency - Peak

The amount of boost applied at the selected frequency is determined by this control. Similar to the low peak filter, the high peak filter is a constant Q design, ensuring that the filter Q stays constant for different boost settings, however the Q may vary with different frequency settings.

8. Power Switch

This is the EQ power switch. With the switch off, the EQ **and** the tube amplifier stage will be completely out of circuit and signals will pass through unaffected. With the switch on, the EQ will operate normally. In this mode, the tube amplifier remains in the signal path even when the EQ filters are bypassed ('EQ In' switch off).

NOTE: When applying large amounts of boost to the signal, be careful not to damage amplifiers, speakers (or ears) this is not a 'fault' with the equalizer, it is just something you can do if you turn things up too loud. Any equalizer – digital or analogue - has the potential to cause low or high frequency transients that are far in excess of the nominal average level of the signal. As with all signal processors, its best to start with small amounts of boost or cut and add more gradually.

Section 4 – System Toolbars

4.1 - Preset Selectors



In addition to the preset selector options provided by the host application, the plug-in has a pair of preset selector buttons to the right of the status display. Pressing the right or left arrows will step up or down through the factory presets and the four user preset memories.

4.2 - Info Button



Clicking on the Info button will open a pop-up showing the current version, together with a product ID code if the plug-in has been activated with a valid key.

4.3 – Demo Indicator



The red lock icon indicates the plug-in has not been activated with a valid key. To unlock the plug-in and remove the demo limitations, click the button to open the demo / activation key pop-up and enter your key (see section 4.2). Once the key is accepted, the lock will change to an open symbol. **You will need to restart the host application to complete the activation process.**

4.4 – Phase / Polarity



The phase / polarity switch causes the signal at the output to be inverted. When switching between inverted and normal settings, or when bypassing the plug-in with the phase invert enabled, there may be a slight interruption to the audio.

4.5 – Output Trim



The level trim adjusts the output by up to +/- 6dB. Click on the control and drag upwards to increase the level or down to decrease. The mouse scroll-wheel can also be used to adjust the level in +/- 3dB steps. Double clicking on the control will return it to its default 0.0dB setting.

Section 5 - Presets

5.1 - Preset Configurations

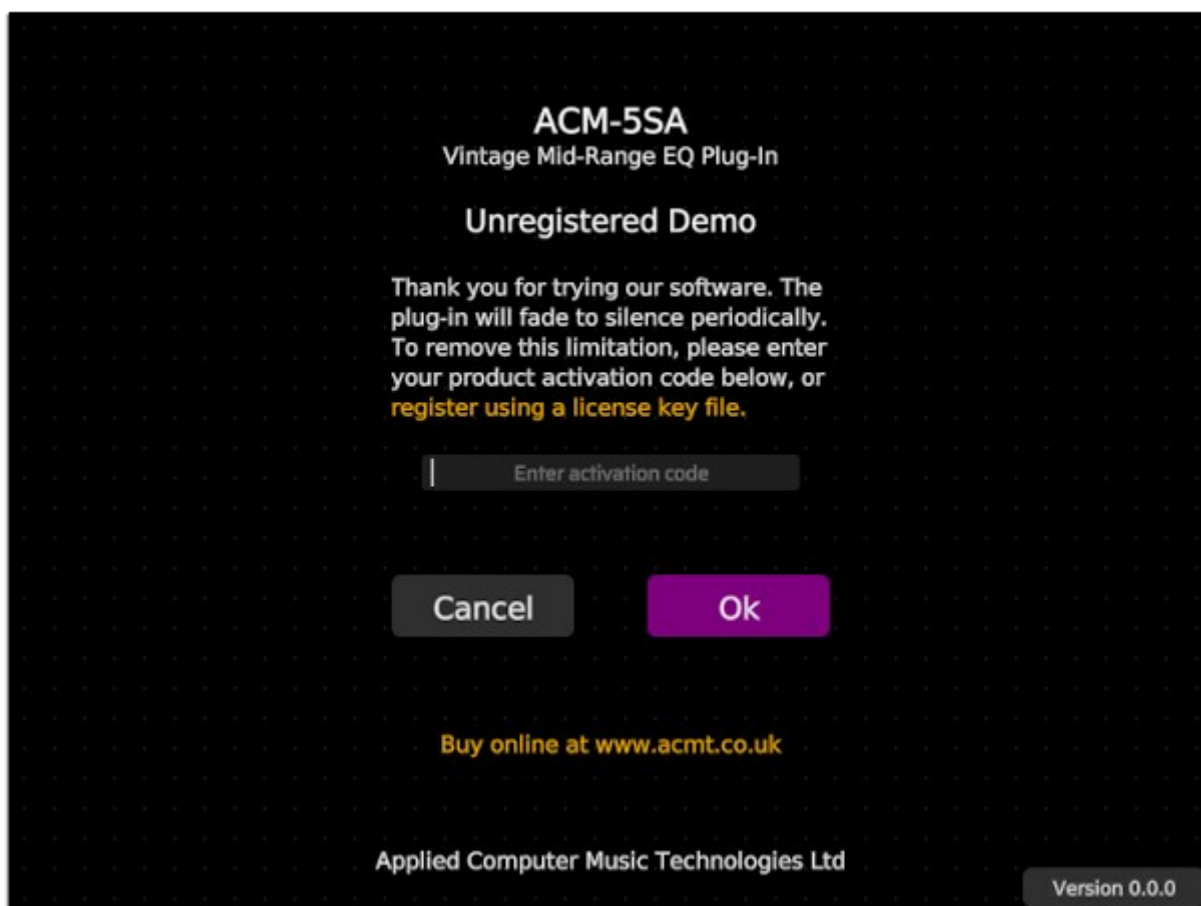
The ACM-5SA has four factory presets, designed to provide a guide to some of the more common combinations of control settings.

Factory Preset 1 - Warm Acoustic	Using the LF Peak to add some 'warmth' at 300Hz, while the HF Peak adds some presence / air, together with a slight dip in the low-mid to remove any harsh resonances.
Factory Preset 2 - Warm Vox	Vocal EQ preset, using the mid filter to dip the mid-range while the HF Peak compensates with some presence / air.
Factory Preset 3 - Vox Air	Vocal EQ setting, using the HF Peak filter to add some 'air' in the high frequency range.
Factory Preset 4 - Bass Direct	Using the LF Peak to provide a mid-bass boost for direct recording of bass instruments.

Section 6 – Demo Limitations

6.1 - Demo Screen

When the plug-in is first added to a channel / buss, the following screen will appear if it has not been activated by a valid key. This indicates the plug-in is in demo mode and will run with some limitations. To remove these limitations you will need to obtain a valid activation key from the Applied Computer Music Technologies website at: <https://www.acmt.co.uk>



To activate the plug-in, enter your activation code into the text box (you can also paste it from the clipboard by right-clicking and selecting the 'Paste' context pop-up). You will need to restart your host application to complete the process. If you do not have a valid key, you can cancel the pop-up and activate it at another time by clicking the lock button in the plug-in's graphical user-interface.

Section 7 – About The Processing

7.1 ACM-5SA Functional Blocks

1. Passive Filters

Audio entering the ACM-5SA passes through a passive filter emulation, which provides the low frequency peak, mid-range dip and the high frequency peak, adjusted via the front panel controls.

2. Transformer-Coupled Valve / Tube Amplifier Stage

After the filters, a transformer-coupled valve amplifier emulation provides a small amount of transformer saturation at high signal levels, and a slight modification of the frequency response - as would happen in equivalent analogue hardware.

3. Bypass Switching

Just as in original Pultec style EQs, the 'EQ In' (bypass) switch affects only the passive filters which means the amplifier stage is always in circuit. This does not affect the output level, as the unit is designed to be zero loss, but it does confer the 'valve sound' on the audio even with the effect switched out.

In this emulation, the 'power' switch is used to activate a clean bypass, completely removing the plug-in from the signal path.

Section 8 - Using the ACM-5SA

The ACM-5SA emulates a Pultec MEQ-5 style vintage mid-range EQ. Historically this has often been something of a forgotten unit compared to the more familiar EQP-1A. The mid-range EQ provides three filter sections, a low frequency peak (boost), mid-range dip (cut) and a high frequency peak (boost).

8.1 Low Frequency Peak

The low frequency peak filter provides up to 10dB of boost at one of five selectable centre frequencies. The filter is designed to be constant Q, that is the Q, or sharpness of the filter will remain constant over a wide range of boost settings. Note however that the filter sharpness will vary significantly as the centre *frequency* is adjusted. The filter peak becomes narrower as the frequency is increased. The continuously variable boost control determines the amount by which the selected frequency is increased. The control law is approximately that of a logarithmic potentiometer however the scale markings are not intended to directly represent the equivalent boost in dB.

8.2 Mid Dip

The mid-range filter provides up to 10dB of cut (dip) at the selected frequency. The filter has eleven selectable centre frequencies, using a similar circuit to the low and high frequency peak filters. Note however that the dip / cut control law is slightly different, becoming less sensitive at higher settings.

8.3 High Frequency Peak

Similar to the low frequency peak filter, the HF peak provides up to 8dB of boost at one of five selectable centre frequencies. The filter is designed to be constant Q, that is the Q or sharpness of the filter will remain constant over a wide range of boost settings. Note however that like the low frequency peak, the filter sharpness will vary significantly as the centre *frequency* is adjusted.

The filter peak becomes narrower as the frequency is increased. The continuously variable boost control determines the amount by which the selected frequency is increased. The control law is approximately that of a logarithmic potentiometer, however the scale markings are not intended to directly represent the equivalent boost in dB.

Appendix

Appendix A - Technical Data

1. Technical Specifications

Frequency Response:	20Hz to $F_s/2$ (bypassed) - where F_s is the sample rate.
Internal Processing:	32bit floating point, 64Bit DSP coefficients and storage.
Reference Level:	0dBu = -18dBFS.
Dynamic Range:	Limited only by internal processing resolution (32bit floating point) and progressive limiting after -8dBFS (10dBu) due to transformer saturation emulation.
LF Peak Max Boost:	11.5dB dependent on control interaction.
LF Peak Frequency:	200Hz, 300Hz, 500Hz, 700Hz, 1000Hz - Switch selectable.
Mid-Range Dip. Max Cut:	-10dB dependent on control interaction.
Mid-Range Dip Frequency:	0.2kHz, 0.3kHz, 0.5kHz, 0.7kHz, 1kHz, 1.5kHz, 2kHz, 3kHz, 4kHz, 5kHz, 7kHz - Switch selectable.
HF Peak Max Boost	9dB dependent on control interaction.
HF Peak Frequency:	1.5kHz, 2kHz, 3kHz, 4kHz, 5kHz.
Filter Types:	Low frequency peak (boost). Mid-range dip (cut). High frequency peak (boost).

NOTE: VST is a trademark of Steinberg Media Technologies GmbH

Appendix B - Spare Parts and Service

With regular care and maintenance your new ACM-5SA equalizer plug-in is designed to give long and reliable service. Spare parts and service updates can be downloaded from:

`https://www.acmt.co.uk`

Always ensure it has adequate ventilation and is kept free from dust. **Always use genuine replacement parts.** For service and support information contact:

`support@acmt.co.uk`

Appendix C – Disclaimer

Disclaimer

All trademarks are the property of their respective owners and are used for information purposes only. References to other companies or their products or representation of those products does not imply any official endorsement of the software by those companies or any affiliation to those companies unless expressly stated otherwise.

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