

# Arcam DV135 DVD player

English



**ARCAM**

# Safety guidelines



## CAUTION

RISK OF ELECTRIC SHOCK DO NOT OPEN

## ATTENTION

RISQUE DE CHOC ELECTRIQUE NE PAS OUVRIR



**CAUTION:** To reduce the risk of electric shock, do not remove cover (or back). No user serviceable parts inside. Refer servicing to qualified service personnel.

**WARNING:** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

The lightning flash with an arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated 'dangerous voltage' within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

**CAUTION:** In Canada and the USA, to prevent electric shock, match the wide blade of the plug to the wide slot in the socket and insert the plug fully into the socket.

## Important safety instructions

This product is designed and manufactured to meet strict quality and safety standards. However, you should be aware of the following installation and operation precautions:

### 1. Take heed of warnings and instructions

You should read all the safety and operating instructions before operating this appliance. Retain this handbook for future reference and adhere to all warnings in the handbook or on the appliance.

### 2. Water and moisture

The presence of electricity near water can be dangerous. Do not use the appliance near water – for example next to a bathtub, washbowl, kitchen sink, in a wet basement or near a swimming pool, etc.

### 3. Object or liquid entry

Take care that objects do not fall and liquids are not spilled into the enclosure through any openings. Liquid filled objects such as vases should not be placed on the equipment.

### 4. Ventilation

Do not place the equipment on a bed, sofa, rug or similar soft surface, or in an enclosed bookcase or cabinet, since ventilation may be impeded. The unit should be installed in a well-ventilated area.

### 5. Heat

Locate the appliance away from naked flames or heat producing equipment such as radiators, stoves or other appliances (including amplifiers) that produce heat.

### 6. Climate

The appliance has been designed for use in moderate climates.

### 7. Racks and stands

Only use a rack or stand that is recommended for use with audio equipment. If the equipment is on a portable rack it should be moved with great care, to avoid overturning the combination.

### 8. Cleaning

Unplug the unit from the mains supply before cleaning.

The case should normally only require a wipe with a soft, damp, lint-free cloth. Do not use paint thinners or other chemical solvents for cleaning.

We do not advise the use of furniture cleaning sprays or polishes as they can cause indelible white marks if the unit is subsequently wiped with a damp cloth.

### 9. Power sources

Only connect the appliance to a power supply of the type described in the operating instructions or as marked on the appliance.

**Warning:** This is a Class I device and **must** be earthed.

**Warning:** The mains plug is used as the disconnect device from the mains supply and shall remain readily operable.

### 10. Power-cord protection

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, and the point where they exit from the appliance.

### 11. Grounding

Ensure that the grounding means of the appliance is not defeated.

### 12. Power lines

Locate any outdoor antenna/aerial away from power lines.

### 13. Non-use periods

If the unit has a stand-by function, a small amount of current will continue to flow into the equipment in this mode. Unplug the power cord of the appliance from the outlet if left unused for a long period of time.

### 14. Abnormal smell

If an abnormal smell or smoke is detected from the appliance, turn the power off immediately and unplug the unit from the wall outlet. Contact your dealer immediately.

### 15. Servicing

You should not attempt to service the appliance beyond that described in this handbook. All other servicing should be referred to qualified service personnel.

### 16. Damage requiring service

The appliance should be serviced by qualified service personnel when:

- the power-supply cord or the plug has been damaged, or
- objects have fallen, or liquid has spilled into the appliance, or
- the appliance has been exposed to rain, or
- the appliance does not appear to operate normally or exhibits a marked change in performance, or
- the appliance has been dropped or the enclosure damaged.

## Safety compliance

This product has been designed to meet the IEC 60065 international electrical safety standard.

# Contents

<b>Safety guidelines</b> .....	<b>E-2</b>
Important safety instructions .....	E-2
Safety compliance .....	E-2
<b>Installation</b> .....	<b>E-4</b>
Positioning the unit .....	E-4
Making video connections .....	E-4
Making audio connections .....	E-5
The remote-control and trigger inputs .....	E-6
Inserting the batteries into the remote control.....	E-6
Connecting to a power supply .....	E-6
<b>Basic use of your DVD player</b> .....	<b>E-7</b>
Introduction.....	E-7
Front-panel controls.....	E-7
Basic operation.....	E-7
<b>CR-515 remote control</b> .....	<b>E-8</b>
<b>Advanced controls (CR-515)</b> .....	<b>E-9</b>
<b>Configuring your DVD player</b> .....	<b>E-10</b>
Introduction.....	E-10
Obtaining a picture .....	E-10
Using the Set-up menus .....	E-10
Operational set-up .....	E-11
Video set-up .....	E-12
Audio set-up .....	E-14
Completing the set-up.....	E-15
<b>DVD/VCD special playback modes</b> .....	<b>E-16</b>
Jumping to a particular point.....	E-16
Special playback modes.....	E-16
<b>Disc navigator screen</b> .....	<b>E-17</b>
<b>The HDMI interface</b> .....	<b>E-18</b>
About HDMI .....	E-18
Connecting using HDMI .....	E-18
Troubleshooting.....	E-18
<b>Remote-control codes</b> .....	<b>E-19</b>
<b>Technical specifications</b> .....	<b>E-20</b>
Disc types supported.....	E-20
<b>Guarantee</b> .....	<b>E-22</b>
On line registration .....	E-22

*Please note that for purposes of improvement, specifications and design are subject to change without notice.*

Thank you for purchasing the Arcam DV135 DVD player.

Designed to reproduce the highest quality two-channel digital sound and vision. With true 10-bit vertical and horizontal scaling, full picture quality controls and output rates to 1080i, the picture output from the DV135 is sure to impress.

## Environmental matters:

This handbook is printed in the U.K. on recycled paper, and is itself fully recyclable and biodegradable.

The paper used is from the 'Revive' range of papers, manufactured in the U.K. by Robert Horne. In Revive, 75% of the paper is de-inked post-consumer waste, with the remaining 25% being mill broke and virgin fibre. The recycled pulps used in the production of this paper are a combination of Totally Chlorine Free (TCF) giving zero AOX and Elemental Chlorine Free (ECF) giving a resultant AOX level of less than 0.5kg per 1000kg of pulp.

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Consumers should note that not all high definition television sets are fully compatible with this product and may cause artifacts to be displayed in the picture. In case of 525/625 progressive scan picture problems, it is recommended that the user switch the connection to the 'Standard Definition' output. If there are questions regarding TV set compatibility with this model 525/625p DVD player, please contact your dealer or the Arcam Customer Support Department.

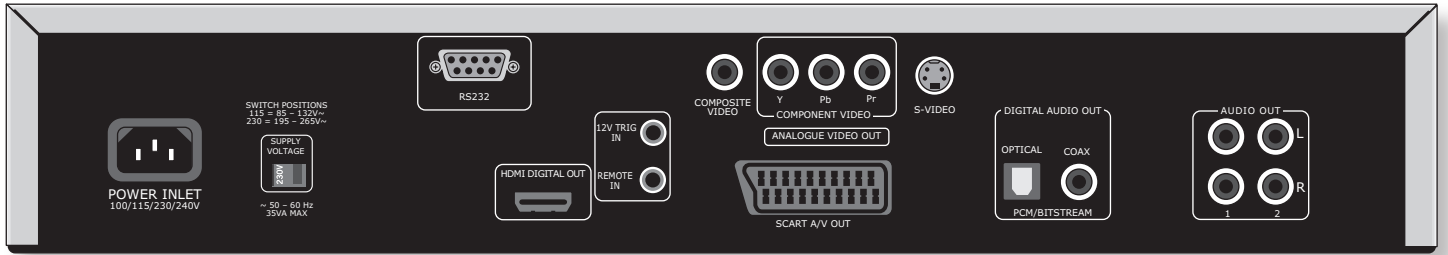
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# Installation



## Positioning the unit

Place the DV135 on a level, firm surface and ensure that there is adequate ventilation for the unit. Arcam recommend a minimum of 10cm (4") free space above the unit.

## Making video connections

To view the pictures from the DVD player you need to connect one of its video outputs to your display device (TV, monitor, projector, etc.).

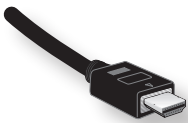
The DV135 has five video output options, described below. You need only use one type of video from the list; choose a type that your display device supports. If your display device does not support any of the above connection types then you will be unable to use it with the DV135; in this case, please contact your dealer for further assistance.

Note that you may connect equipment such as AV receivers in the signal path between the DVD player and the display device, so long that the connected equipment also supports the type of video signal you intend to use. For instructions on how to connect AV equipment, consult the manual for that equipment.

### Using two video connections simultaneously

In some circumstances, it is possible to use two video connections simultaneously (routing one connection to a second room or display, for example). If you wish to do this, please read these notes:

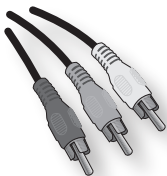
- The Composite video and SCART outputs are only active if HDMI is not connected (or if 'HDMI Resolution' is set to 'SD Progressive' – see page 12). These two output types carry interlaced output at all times.
- The Component video output is only active if HDMI is not connected (or if 'HDMI Resolution' is set to 'SD Progressive' – see page 12). It can be set to carry either interlaced or progressive-scan output.
- The HDMI output is active only if a compatible display is detected by the DV135. It can be set to carry either interlaced, progressive-scan or high-definition output.
- The S-video output is active only when the Component and HDMI outputs are carrying interlaced video.



### HDMI digital video

The HDMI connector offers uncompressed digital video and audio transmission between the DV135 and the display device, and provides the highest quality output. Generally, it is also the easiest connection type to configure.

To use this video connection, you will require a HDMI or HDMI/DVI cable between the DV135 and your display device or receiver. **The DV135 supports HDMI version 1.0.**



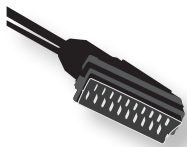
### Component video

Use three 75Ω phono cables to connect the Component Y, Pb, Pr outputs of the DVD player to the Y, Pb, Pr inputs of the display device. Ensure that the cables are suitable for video use and that they are approximately the same length.

If your television is capable of accepting a progressively scanned (de-interlaced) video signal, you may wish to use the progressive video output from the DV135. If you are unsure whether your display device can accept progressive video, please refer to its instruction manual or consult your dealer.

Some component video interfaces are labelled differently to the DV135; see the table if the component inputs of your display device are not labelled 'Y, Pb, Pr'.

DV135	alternative	alternative	alternative
<b>Y</b>	Y	Y	Y
<b>Pb</b>	Cb	(B-Y)	U
<b>Pr</b>	Cr	(R-Y)	V



### SCART output

The SCART connector is common on European A/V equipment and provides a convenient connection method between your DVD player and display device, carrying both video and stereo audio.

If you are using a SCART connection and you do not wish to listen to the audio through your TV, then it is best to mute your TV's speakers; muting the TV will prevent this audio being heard.

Note that the SCART output has a control signal that switches your TV to its SCART input when the DV135 is turned on. It will also signal to wide-screen TVs the correct aspect ratio (16:9 or 4:3), provided this feature is supported by the TV.



### S-Video

The S-Video output (also known as S-VHS or Y/C) is commonly supported by display devices worldwide. Connect the **S-VIDEO** output of the DVD player to the S-Video input of the display device using an appropriate cable.



### Composite video

If your display device offers only a composite input (sometimes labelled CVBS or just 'video'), connect this to the **COMPOSITE** video output of the DVD player using a 75Ω phono cable suitable for video use. Note that a composite video connection gives the lowest-quality output; if your display device supports other video connection types, we advise that those are used instead.

## Making audio connections

The DV135 offers a number of alternatives for connecting audio. The connection type to use depends on the rest of your system; choose the type most appropriate to your amplifier.

*If you want to listen to audio through... we recommend the following:*

#### ■ Your television

How you listen to audio through your TV depends on the inputs it has and your video connection:

- SCART: If you are using a SCART connection, this will carry stereo audio. No further connection is required.
- HDMI: If you are using an HDMI connection (not DVI), this will carry audio. No further connection is required.
- Stereo phono: (For use with a connection type other than SCART or HDMI.) If your TV has stereo phono inputs, follow the instructions below for a stereo amplifier.

#### ■ Your stereo amplifier

If you wish to listen to audio from your player through a stereo amplifier, then use the stereo analogue outputs (marked **AUDIO OUT L** and **R**). These outputs provide a stereo down-mix of the source material. The two pairs of outputs (marked **1** and **2**) are connected internally, so you can connect either pair.

Using a pair of high quality phono cables, connect the **L** (left) and **R** (right) outputs to the CD input of your receiver.

#### ■ Your surround-sound receiver

Connect either the HDMI or one of the digital audio outputs (optical or coax) to the DVD input of your receiver.

Some high quality receivers (such as those by Arcam) switch HDMI video, but do not decode audio from HDMI. If this is the case, you'll need to connect both **HDMI DIGITAL OUT** (for video), and optical or coax cables from the **DIGITAL AUDIO OUT** connectors (for audio), into your surround-sound receiver.

### Listening to DVD-audio or SACD discs

The high quality of DVD-audio and SACD discs can be realised only by using analogue outputs. Using a conventional digital connection between your DVD player and surround-sound receiver will not allow you to hear these discs at their best, since the audio carried across the digital link when these discs are played is compromised (i.e. limited to a sample rate of 48K). This is true for all DVD players and is not a limitation of your DV135.

Connect the stereo analogue outputs to the CD input of your stereo amplifier or surround-sound receiver.

Note that SACD audio is not available as an output on the **DIGITAL AUDIO OUT** (optical or coax) connectors or the **HDMI DIGITAL OUT** interface.

## The remote-control and trigger inputs

The **REMOTE IN** input can be used to pass RC5 codes to the DV135 if it is installed in a position (or system) where infrared cannot be used. If this is required, please contact your dealer for further information.

The **TRIGGER IN** input can be used to switch the DV135 in and out of stand-by. Connecting the trigger output of your Arcam amplifier (or other compatible device), will cause the DV135 to come out of stand-by automatically when the amplifier is switched on, returning to stand-by when the amplifier is switched off. Please see your amplifier handbook for further information.

In normal use there is no need to make any connections to these inputs.

**1** The remote control input requires a mono 3.5mm jack, with the tip active and the sleeve grounded.

The remote control signals must be in modulated RC5 format (at 36kHz), with a voltage level of between 5V and 12V.

## Inserting the batteries into the remote control

The remote control requires two 'AAA' batteries to operate. To insert the batteries into the remote control, please follow the instructions in the side panel diagram:

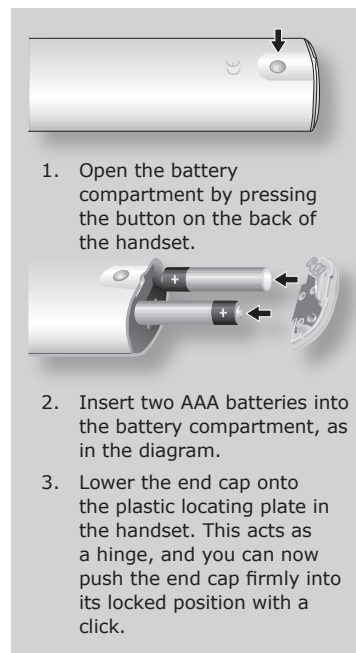
### Notes on inserting the remote control batteries

- Incorrect use of batteries can result in hazards such as leakage and bursting.
- Do not mix old and new batteries together.
- Do not use different kinds of battery together—although they may look similar, different batteries may have different voltages.
- Ensure that the plus (+) and minus (−) ends of each battery match the directions in the diagram on the right.
- Remove batteries from equipment that is not going to be used for a month or more.
- When disposing of used batteries, please comply with government (or other) regulations that apply in your country or area.

### Using the remote control

Please keep in mind the following when using the remote control:

- Ensure that there are no obstacles between the remote control and the remote sensor on the DV135. The remote has a range of about 7 metres. (If the remote sensor is obscured, the remote control input jack on the rear panel is available. Please contact your dealer for further information.)
- Remote operation may become unreliable if strong sunlight or fluorescent light is shining on the remote sensor of the DV135.
- Replace the batteries when you notice a reduction in the operating range of the remote control.



## Connecting to a power supply

### Mains lead

The appliance is normally supplied with a moulded mains plug already fitted to the lead. Check that the plug supplied with the unit fits your supply and that your mains supply voltage agrees with the voltage setting (**115V** or **230V**) indicated on the rear panel of the unit. If for any reason the plug needs to be removed, it must be disposed of immediately and securely, as it is a potential shock hazard when inserted into the mains socket.

If your mains supply voltage or mains plug is different, or you require a new lead, please consult your Arcam dealer.

### Plugging in

Push the plug (IEC line socket) of the power cable supplied with the unit into the socket (**POWER INLET**) in the back of the unit. Make sure it is pushed in firmly.

Put the plug on the other end of the cable into your power supply socket and switch the socket on.

# Basic use of your DVD player



## Introduction

'Basic use' explains how to play a DVD, CD or other type of disc. Note that it may be necessary to configure your player correctly for your system before optimum – or any – playback can be achieved. Player configuration is described beginning on page 12.

More sophisticated features – such as special playback modes and programming jumps and playback sequences – are described in the 'Advanced features' section, later in this handbook.

## Front-panel controls

### Switching on

Switch the unit on by pressing the **POWER** button. The status LED glows green when the unit is powered up and red when in stand-by mode (stand-by is operated from the remote control).

Note that the remote control sensor is located on the right-hand side of the display window. Do not obstruct this or the remote control will not work.

## Basic operation

### Loading a disc

Press **LOAD** on the front panel (or **OPEN** on the handset) and place the disc on the tray, with the playback side facing down (some discs are double sided, in which case the side labelled 'side A' should face up to play side A).

Press **LOAD** on the front panel to close the tray. The disc loads after a pause of a few seconds.

### Playing a disc

Many DVDs begin playing automatically, but some titles begin by displaying a menu. Select the menu item 'Play movie' (or similar) using the cursor pad, then press **OK** to start playback.

For discs that do not play automatically (including CDs and VCDs), press **PLAY**.

### Fast play

Press **▶▶** or **◀◀** on the front-panel or remote control to play fast forwards or backwards. The following speeds for fast playback are available: x2, x4, x8, x16, x50 and x100 (depending on disc type). Press the button repeatedly to cycle through the different speeds. To resume normal playback speed, press **PLAY**.

Fast playback is not available for MP3/WMA discs.

### Skipping chapters/tracks

To skip chapters (or tracks on a CD), press **▶** or **◀**.

When skipping back, the first button press takes you to the beginning of the current chapter. Pressing the button again takes you to the start of the previous chapter.

### Pausing playback

Press **PAUSE** on the front panel or **||** on the remote control to pause playback. To resume playback, press **PLAY** on the front panel or **▶** on the handset.

### Stopping playback

Press the **STOP** button on the front panel or **■** on the remote control to stop playback.

When playing a DVD, pressing **STOP** once performs a 'resume stop'. If you now press **PLAY**, playback resumes from the point it was stopped.

If you press **STOP** twice, this is a 'complete stop', and playback resumes from the beginning of the disc.

### Front panel menu navigation

If desired, it is possible to navigate disc and player menus using the front panel buttons; to this end, the **NAV** button is provided.

Pressing the **NAV** button causes the player to enter 'navigator' mode, indicated by 'NAV' being shown on the front panel display. In this mode, the front panel buttons take on the functions illustrated above each button, for example the **STOP** and **PAUSE** buttons become **▼** and **▲**.

To exit navigator mode, press the **NAV** button for a second time.

# CR-515 remote control

The CR-515 is a remote control designed for use with Arcam DVD players. Some owners may wish to use a dedicated remote in preference to a Universal remote control.

## DISP (display)

Press to cycle through the front panel display's brightness options (dim to bright, off).

**\***  
This button is not currently used.

## Numeric keys

Gives direct access to individual tracks on audio CDs. For tracks greater than 9, enter the digits in sequence. For example, to play track 15, press **1**, then **5**, then **OK**.

## SRCH (search)

Displays Search menu with Time, Title and Track options.

## OPEN

Opens and closes the disc tray

## Fast play and Skip chapter/tracks

Play fast (◀▶) and Skip (◀▶) chapters/tracks in both directions.

## SETUP

Ensure no disc is playing and press **SETUP** to access the 'Setup' menu.  
Press **SETUP** a second time to exit the setup menu.

## Playback control

Pause (⏸), Play (▶) and Stop (■).

## Advanced controls

These buttons are described on the next page.

## On/Standby

This allows the DV135 to be put into and taken out of stand-by remotely.

## HDMI

Selects the picture resolution for HDMI output.

## CLEAR

Use **CLEAR** to clear a numeric field.

## Page Up/Down (DVD-audio)/ Slow play (other discs)

**DVD-audio:** Some DVD-audio discs allow the user to browse through images (photographs of the artist, lyrics, etc.) while music is being played. Use the ◀ or ▶ buttons to change to the previous/next page. Note that this is not available on all DVD-audio discs.

**Other discs:** Press ◀ or ▶ on the remote control to play slow forward or backwards. Press the button repeatedly to cycle through the different speeds. To resume normal playback speed, press **PLAY**.

Note that slow-play does not apply to audio CDs or DVD-audio discs.

## STATUS

Press **STATUS** to give play status information about the current disc. Press **STATUS** again to close the status display.

The status information displayed varies depending on the type of disc – DVD, CD or VCD.

## Navigation buttons

Arrow buttons allow navigation around the Basic and Advanced Set-up menus on the DV135. Confirm a selection by pressing **OK**.

## MENU

Activates the DVD menu if available. Adds/Clears tracks to programme (not SACD).

## MUTE

Press once to mute an Arcam amplifier. Press again (or use +/- volume) to un-mute.

## Volume +/-

Adjusts the volume on Arcam remote-controllable amplifiers.

Note that the volume (+/-) controls and **MUTE** button have no effect on the audio output level of the DVD players.



Remember to install the **two** AAA batteries supplied before trying to use your remote control.



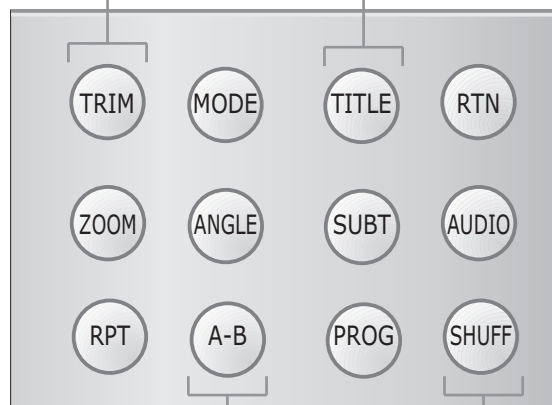
If the infrared receiver (located on the right of the front-panel window) is not 'visible' to the remote control hand-set, then the remote control will not work! Either locate the unit differently, or take advantage of the remote control input on the rear of the player (consult your dealer for further information on this option).



# Advanced controls (CR-515)

<b>TRIM</b>	This button has no function on the DV135
<b>ZOOM</b>	Press <b>ZOOM</b> to enlarge a particular area of the picture. Each press of the <b>ZOOM</b> button increases the zoom. Pressing <b>ZOOM</b> when the maximum enlargement has been reached returns the image to normal size.
<b>RPT</b>	Press <b>RPT</b> to cycle through the repeat play options

<b>TITLE</b>	Press <b>TITLE</b> to access the DVD's 'Title' menu (a feature that only applies to multi-title discs).
<b>SUBT</b>	Cycles through the available subtitle languages, including 'Off'. Some discs force subtitles on, overriding any set up preferences.
<b>PROG</b>	Changes between 'Programmed track view' and 'All tracks' in the Disc Navigator menu.



<b>MODE</b>	This button has no function on the DV135
<b>ANGLE</b>	Some DVDs offer the facility to select different camera angles. If this feature is available a 'camera' symbol shows in the display. Press <b>ANGLE</b> to cycle through the available angles.
<b>A-B</b>	This button enables you to repeat a selected section from the disc.

<b>RTN</b>	Press <b>RTN</b> to move back through the DVD 'Disc' and 'Title' menus. Note that this feature is only of use with discs using multi-level menus.
<b>AUDIO</b>	Some DVDs offer the facility to select different audio tracks. Press <b>AUDIO</b> to cycle through the available tracks. The on-screen display shows the number, language and type of audio track, e.g. '1 Eng D 6CH'.
<b>SHUFF</b>	Toggles random ('shuffle') play of chapters/tracks on and off.

# Configuring your DVD player

## Introduction

This section of the document describes the use of the 'Set-up' menu, which is used to configure your player for your system and your personal preferences.

## Obtaining a picture

To view the Set-up menu for the initial configuration, we recommend the use of the composite video output to connect to your display device. This is because the high quality video output has several display modes and may be incompatible with your display device in its default configuration.

Ensure that your display device is switched on and that you have selected the correct video input. You should see the image shown on the right. This is the image that the DVD player gives whenever there is no disc playing.

**NOTE:** To protect your screen from damage caused by persistent static images, a 'screen saver' facility activates after a few minutes of inactivity. When this occurs, a small ARCAM logo moves around the screen. To reset the image, press the **STOP** button on the front panel of the player or **OK** on the remote control.



## Using the Set-up menus

Your DV135 has two different set-up menus:

- The Set-up menu allows configuration of all aspects of your DVD player. Configurable items and their potential values are described on the following pages.
- The Display set-up menu is a series of video test patterns with instructions that will allow you to configure your display optimally for your DVD player.
- To enter the Set-up menus, press the **SETUP** button on the remote control. Press **SETUP** a second time to close the menu.

### The Set-up menu

The Set-up menu comprises **three** pages of options. The tabs on the left side of the screen show the pages available, indicating the nature of the items on each page. To change between pages, move the menu highlight to the appropriate tab and press **▶**.

To change an item first use the **UP/DOWN** controls to highlight the item, then press **OK** to open the list of options for the menu item. The current option for the menu item is indicated. The **UP/DOWN** controls can be used then to select the new option and pressing **OK** confirms the new selection and closes the option list. (If the item to be changed is controlled by a slider, press **OK** to activate the slider and **OK** again when the desired value has been selected.)

Note that items that are not applicable currently (for example, 'HDMI Resolution' when Main Video Output is set to 'Analogue') are shown 'greyed out', and cannot be highlighted or changed.

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### The Display set-up menu

For optimum video performance it is necessary to configure your display for the video source – your DVD player, in this case. A series of test patterns generated by your DVD player will allow you to optimise colour balance, contrast, brightness and to centre your picture. Full instructions for each test pattern are displayed on the screen before the test pattern is shown.

To enter the **Display set-up menu**, move the menu highlight to the 'Display' button, then press **OK**. Press **SETUP** for a second time when you have finished.

## Operational set-up

### Preferred language

This settings allows you to specify your preferred language. The default language is English, but three other languages (French, German and Dutch) are supported.

### Status messages

This setting controls the 'pop up' messages that appear on screen.

<b>On</b>	Pop-up messages are enabled.
<b>Off</b>	No pop-up messages, only menus when required.

Certain messages, such as 'No Disc' are always shown regardless of how this is set.

### Subtitle display

This setting controls which subtitles displayed on your TV (although note that some discs may force the subtitles to be displayed regardless of how this item is set).

<b>Off</b>	No Subtitles.
<b>On</b>	Subtitles are displayed in the 'preferred language'.
<b>Closed Caption</b>	Closed-caption information from the disc (where available) is sent to your TV.

The default setting for Subtitle is 'Off'.

Note that not all discs will have your preferred language available as a subtitle. Some discs will require you to choose your preferred subtitle language from the disc menu and some discs may force the subtitles to be displayed regardless of how this item is set. Closed-caption information is available only on discs produced for the US and Canadian markets and will be displayed only by TVs that support NTSC-format signals.

### Auto power off

This setting can be used to put your player into stand-by mode automatically if the player is left unused.

<b>Off</b>	The player will not enter stand-by mode automatically.
<b>30 minutes</b>	The player will enter stand-by mode automatically after 30 minutes disuse.

### DVD Audio priority

Many DVD-Audio discs are actually dual DVD-Audio/DVD-Video discs. To decide which part is selected for playing, you can set the priority with this control.

<b>DVD-Audio</b>	The DVD-Audio part is played
<b>DVD-Video</b>	The DVD-Video part is played

### SACD priority

Many SACD discs are actually hybrid SACD/CDs. To decide which layer is selected for playing, you can set the priority with this control.

<b>SACD</b>	The SACD layer is played
<b>CD</b>	The CD layer is played

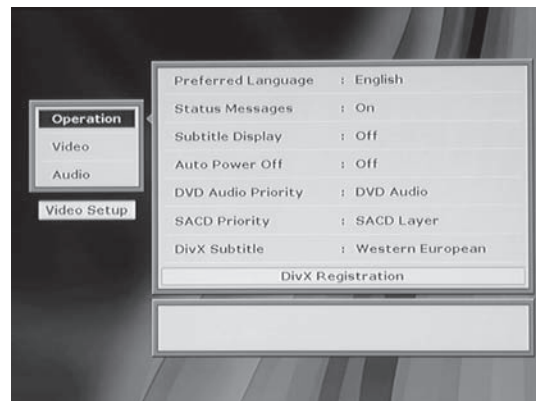
### DivX subtitles

If you use DivX subtitles, choose the appropriate language group from the list. The factory setting is 'Western European'.

### DivX registration

DivX Video-On-Demand (VOD) is a digital video delivery service that lets you copy video content from your computer to a CD or DVD for playback on your DV135. To register for this service, a player-generated registration code is required. This code can be seen by selecting the 'DivX registration' button.

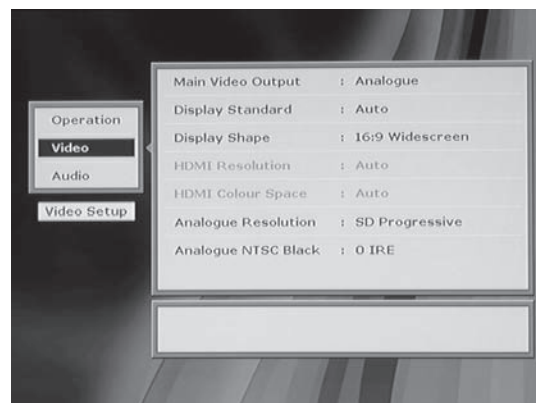
For more information on this service, please visit [www.divx.com/vod](http://www.divx.com/vod).



## Video set-up

If your display device is HDMI-compliant, the DV135 can read the capabilities of the display device directly; the information allows the DV135 to configure its output automatically and optimally for the attached device.

See page 18 for more information about connecting to HDMI devices.



### Main video output

This setting is to tell the DV135 which of the available video outputs is the 'main' output, i.e., in the event of a conflict between video outputs, which output has priority.

<b>HDMI</b>	Select this item if you are connecting the DV135 to an HDMI-compliant device, and you are happy for the DV135 to configure itself automatically for the device it is attached to. <b>This is the recommended setting if you are connecting the DV135 to an HDMI-compliant device.</b>
<b>HDMI as DVI</b>	Select this item if you are connecting the DV135 to a DVI-compliant device, and you are happy for the DV135 to configure itself automatically for the device it is attached to.
<b>Analogue</b>	Select this setting if you are not connecting the DV135 to a HDMI-compliant device.



#### HDMI as DVI

*Even though your display device may be fully HDMI compliant, it is possible that in-line receivers or repeaters may work only in DVI mode. In this case, it is useful to disable HDMI, forcing DVI output instead.*

*Selecting 'HDMI as DVI' will force the DV135 into DVI mode even when an HDMI device is detected.*

### Display standard

This is set at the factory to be appropriate for the type of display device used in your country. Should you need to change this setting, the options are as follows.

<b>Auto</b>	The video output is taken from that recorded on the disc. When no disc is playing, the logo screen is displayed using the standard of the last disc played.
<b>NTSC</b>	NTSC is always used as the video standard. Note that PAL discs are converted to NTSC, but this causes some reduction in the quality of the video output (and may cause the video to become 'jerky'). This is the best setting to use if your display device can accept only NTSC video (this is generally the case in North America); better results are obtained by using 'Auto', but your display device must be able to support PAL.
<b>PAL</b>	PAL is always used as the video standard. Note that NTSC discs are converted to PAL, but this causes some reduction in the quality of the video output (and may cause the video to become 'jerky'). Better results will be obtained by using 'Auto', but your display device must be able to support NTSC.

### Display shape

This needs to be set correctly for the type of display device you have and the type of display you prefer.

<b>4:3 Letterbox</b>	Use this setting if you have a conventional 4:3 display device, and you prefer to view wide screen movies in letterbox format (with black bars at the top and bottom).
<b>4:3 Panscan</b>	Use this setting if you have a conventional 4:3 display device, and you prefer to view wide screen movies in Pan & Scan format (cropping the sides of the image).
<b>16:9</b>	Use this setting if you have a wide screen (16:9) display device. Material in 16:9 format is displayed so as to fill the screen.

If you have a 4:3 display device and you have set a preference for **PANSCAN**, it does not mean you will always see movies in this format, since Panscan display must be supported by the disc being played.

### HDMI resolution

Normally the video resolution of the HDMI output is set to the native format of the connected display device. If you wish to specify the output format, however, use this setting.

<b>Auto</b>	The output resolution will be set appropriately for the connected display. <b>This is the recommended setting if you are connecting the DV135 to an HDMI- or DVI-compliant device.</b>
<b>SD-progressive</b>	The HDMI output will be restricted to progressive resolutions with no scaling (i.e., NTSC 480p or PAL 576p).
<b>(Other resolutions)</b>	Resolutions of 720p and 1080i are also available.

This setting can be changed only if 'Main video output' is set to 'HDMI' or 'HDMI as DVI'.

## HDMI colour space

This setting controls the type of video (the colour space) given out over the HDMI connection.

<b>Auto</b>	The colour space will be set appropriately for the connected display. <b>This is the recommended setting if you are connecting the DV135 to an HDMI- or DVI-compliant device.</b>
<b>YUV</b>	The HDMI connection carries Y, Pb, Pr (YUV) component video.
<b>RGB</b>	The HDMI connection carries RGB video with standard video levels.

This setting can be changed only if 'Main video output' is set to 'HDMI'. This setting has no effect on the analogue video outputs.

## Analogue resolution

Allows selection of interlaced or de-interlaced (progressive scan) output from the component video connection.

<b>SD-interlaced</b>	The video output will always be interlaced (standard definition video). Use this setting if your display device does not support progressive scan.
<b>SD Progressive</b>	The component- and HDMI-video outputs will put progressive scan video out for both PAL and NTSC discs. Use this setting only if your display device supports progressive scan in both PAL and NTSC formats.

This setting can be changed only if 'Main video output' is set to 'Analogue'.

Note that the video on the component video connections always matches that on the HDMI link, so changing this value when in 'Analogue' mode will change the HDMI output too.

The S-video output will be muted when progressive scan is active.

## Analogue NTSC black (Pedestal)

This setting controls the 'pedestal' signal or black level when the NTSC video standard is used.

<b>0 IRE</b>	This removes the pedestal from NTSC video. This setting should be used in Japan, and also if you are using RGB video, whatever the country.
<b>7.5 IRE</b>	This is the standard pedestal level that should be used in all countries that use NTSC video, with the exception of Japan.

This setting can be changed, but it only has an effect with NTSC output standards.



*Not all displays support progressive scan. If you enable progressive scan accidentally and your display does not support it, you may be unable to view the picture from the DVD player, including the on-screen display required to change the video settings back. If this happens, use a composite or SCART video connection (which always carry interlaced video) between the DV135 and your display device in order to be able to see the set-up menu and correct the mistake.*

## Audio set-up

This section allows you to configure the analogue, digital and HDMI audio outputs. In particular, the digital output type needs to be set correctly if you are using an external audio decoder, receiver or D-A converter.

### Digital audio output

This setting configures the digital audio output – coaxial, optical and HDMI.



<b>S/PDIF stereo PCM</b>	When the 'Stereo PCM' digital output is selected, all audio material played is down-mixed to stereo and output as stereo PCM. Use this setting if you have an external D-A converter that supports only 2-channel PCM.
<b>S/PDIF bitstream</b>	The Bitstream setting supports the following audio standards: <ul style="list-style-type: none"> <li><input type="checkbox"/> 2 channel PCM (on CDs or DVDs)</li> <li><input type="checkbox"/> Dolby Digital</li> <li><input type="checkbox"/> MPEG multi channel</li> <li><input type="checkbox"/> DTS multi channel</li> </ul> Use this setting if you have a receiver/decoder that supports Dolby Digital.
<b>HDMI (Auto)</b>	Select this item if you are using an HDMI connection between your DV135 and your receiver or display device. <p style="color: red; margin-top: 5px;">The audio type will be changed automatically to work with the device attached to your player.</p> <p style="color: red; margin-top: 5px;"><b>Do not select this item if your HDMI display device or surround-sound receiver cannot decode audio over HDMI, or if you are connecting to a DVI device (since a DVI link cannot carry audio) – choose one of the other settings instead.</b></p>

### DVD sample rate

This needs to be set correctly if you are using an external audio decoder, receiver or D-A converter connected to the S/PDIF digital audio output.

<b>Max 96KHz</b>	Choose this option if your external audio decoder is able to process digital audio with a sample rate of up to 96kHz, or if you are not using the digital audio outputs. This is the maximum sample rate present on DVD-video discs.
<b>Max 48KHz</b>	Choose this option if your external audio decoder is unable to process digital audio with a sample rate of up to 96kHz. <b>This is the normal setting for this menu item.</b>

Note that this setting is relevant only to the output from DVD-video discs.

### Audio compression

This option allows compression of the audio stream to be turned on or off, where 'On' is intended for 'late night' listening when large volume changes are not desirable.

Turning compression on decreases the volume of the louder passages, i.e., the total dynamic range of the audio is reduced. Normally, however, this item is set to 'Off', to disable compression.

This menu option affects both the analogue and the HDMI outputs (although note that the HDMI output is affected only when multi-channel uncompressed audio is requested by the receiver, not otherwise). The co-axial and optical digital audio outputs are never affected by this menu setting.

Compression is available only on Dolby Digital recordings.

### VCD mode

Some VCD discs are produced with a dual-mono soundtrack. This means that the left audio channel carries one language, the right another. In this case it can be useful to listen to just one of the channels.

Stereo	The default setting. Choose this option to play the VCD with both channels audible.
Left channel only	Choose this option to play the VCD with only the left channel audible. The audio from the left channel will be routed to both the left and right speakers.
Right channel only	Choose this option to play the VCD with only the right channel audible. The audio from the right channel will be routed to both the left and right speakers.

This setting applies only to VCD discs.

### Video post-processing (lip-sync.)

#### Delay for NTSC (ms)/Delay for PAL (ms)

Modern displays and video scalers often employ digital video processing that can introduce a significant video delay. The 'Delay' menu items allow correction of this effect by delaying the audio soundtrack up to 150 milliseconds. The amount of correction required in a given system is best determined by experimentation.

- If the interlaced video outputs of the DV135 are in use and the display is converting the signal to progressive scan then we recommend a delay of 50–80ms, depending upon the display.
- If the progressive video output of the DV135 is in use, the player corrects automatically for its own processing delays and it is unlikely that additional delay will be necessary. Therefore, start

by setting these items to 0ms (no delay).

# DVD/VCD special playback modes

This section explains the special playback modes for DVDs and VCDs. The operations described here are not exactly the same for DVDs and VCDs, but very similar.

Note that many VCDs have a single track, so some operations involving tracks will not be relevant.

## Jumping to a particular point

Press the **SRCH** button on the remote control to open the 'Search' menu:

If the disc is playing, then the elapsed and total times on the disc are shown. With a DVD, Title, Chapter and Time are displayed; with a CD, Track, Time and Disc Time are displayed.

A jump can be performed using different specifiers: jump to a particular time or to a specified chapter/track on the disc.

### Time

Highlight the 'Time' field and enter the time in hours, minutes and seconds, then press **OK**. The Search menu is removed from the screen and playback starts from the time specified. Invalid time entries are ignored.

### Title/Chapter

(Applies to DVDs only) To jump to a title or chapter, highlight the title/chapter position and enter the number of the title/chapter to jump to, before pressing **OK**. It is possible to jump to a chapter within a different title to the current one by entering a value into both fields. Note that specifying a title without a chapter will jump to the first chapter in the title.

### Group/Track

(Applicable to DVD-audio discs only.) To jump to a group or track, highlight the group/track position and enter the number of the group/track to jump to, before pressing **OK**. It is possible to jump to a track within a different group to the current one by entering a value into both fields. Note that specifying a group without a track will jump to the first track in the group.

### Track

(Applies to VCDs only) To jump to a specified track on a VCD, enter the track number in the 'Track' field, then press **OK**. Note that many VCDs have only one track.



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## Closing the Search menu

When displayed, this menu screen can be closed again by pressing the **SRCH** button (which also has the effect of cancelling the search).

## Special playback modes

Repeat, shuffle or looped (A-B repeat) playback modes are available.

### Repeat

Press the **RPT** button on the remote control to cycle through the repeat options. For DVDs, a chapter or title repeat may be selected (i.e., play continuously the current chapter or the current title). For VCDs, a track or disc repeat is available.

When a chapter/track repeat is selected, the loop symbol on the front panel display is illuminated and the current chapter/track is repeated. If a title/disc repeat is selected, the loop symbol and 'ALL' are illuminated and the current title/disc is repeated.

To cancel repeat, press the **RPT** button until 'Repeat: Off' is displayed.

### Shuffle

Press the or **SHUFF** button on the remote control to switch shuffle play on. This causes the chapters/tracks to be played in random order.

To cancel random play, press **SHUFF** button for a second time.

### A-B repeat

The DV135 can repeat a specific section of a DVD or VCD; this is called an A-B repeat.

To perform an A-B repeat, wait until the disc is at the point where you want the repeat to start, then press **SHIFT + RPT**. The OSD shows a repeat symbol, followed by 'A-', and the front panel shows 'A-'.

Press **SHIFT + RPT** again at the point you want the repeat to end. The repeat symbol, followed by 'A-B' is shown on the display device, and the front panel shows 'A-B'. The selected section is repeated in a loop.

To cancel the A-B repeat, press **SHIFT + RPT** again. An 'Off' message is displayed on the OSD.



# Disc navigator screen

When a disc containing audio/video/image files is detected by the DVD player, the disc navigator screen is displayed. In the example, a CD-R containing MP3 files is shown.

The following areas can be identified:

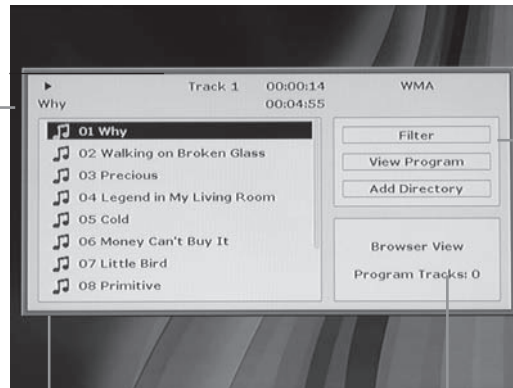
## File/Folder

The name of the file or folder that is currently selected.

## Folder/track list area

The names of folders, files and tracks are displayed here. **Select an item and press OK or PLAY to play a file, display a photo, or open a folder, as appropriate.**

Pressing **MENU** adds the currently selected file to the programme list.



## Browser area

Shows the number of tracks currently programmed in the sequence

## Control window

The following advanced functions can be accessed from here:

**Filter:** You can use this to allow only certain types of file to be displayed (audio, photo and video)

**View Program:** Select 'View Program'. The track list now shows only those items in the programmed sequence. To play a programmed sequence, press **PLAY**.

Return to 'Browser view' to view all the available tracks.

**Add Directory:** Adds all the files in the current directory to the programme sequence.

**Clear program:** When no disc is playing, this clears the programme sequence.

# The HDMI interface

If you have a HDMI- or DVI-equipped monitor or display, you can connect it to the DV135 using a HDMI cable. The HDMI connector carries uncompressed digital video, as well as digital audio.

## About HDMI

HDMI (High Definition Multimedia Interface) supports both video and audio on a single digital connection for use with DVD players, digital TV, set-top boxes, and other AV devices. HDMI was developed to combine the technologies of High-bandwidth Digital Content Protection (HDCP) and the Digital Visual Interface (DVI) in one specification, with the addition of transmission of digital audio information; HDCP is used to protect digital content transmitted to DVI-compliant displays.

HDMI has the capability to support standard or high-definition video, together with stereo or multi-channel surround-sound audio. HDMI features include uncompressed digital video, one connector (instead of several cables and connectors), and communication between the AV source and AV devices.



## Connecting using HDMI

If the HDMI connector is to be used, we recommend first setting the 'Main video output' item on the video menu page to 'HDMI'. This will give full 'plug and play' functionality. See page 14 for details on how to do this.

Use a HDMI cable to connect the **HDMI** socket on this player to a HDMI socket on a compatible display device or receiver. The arrow on the cable connector body should be face up for correct alignment with the connector on the DV135. If the DV135 has been configured to 'HDMI', then the DV135 will configure its video output automatically to match the capabilities of the attached HDMI device.

**NOTE:** A HDMI connection can be made only with HDMI or DVI-equipped components compatible with both DVI and HDCP. Note that if you choose to connect to a DVI device, you will need an adaptor (HDMI to DVI) to do so; a DVI/HDCP connection, however, does not support audio signals.

If you require further information on the possibilities for connecting your DV135 to your DVI/HDMI equipped display device, please contact your Arcam dealer.

## Troubleshooting

### Problems with video

#### NO VIDEO (BLANK SCREEN)

- Check that the HDMI cable is connected correctly at both ends. If an HDMI-equipped A/V receiver is in use, try connecting the DV135 directly to the display device, in order to isolate where the fault may lie.
- Check that the display device is set to display the HDMI input (i.e., has not been set to some other video input, instead).
- Check that the HDMI input of the receiver and/or display device is enabled. See the user handbook of the connected device for details on doing this.
- Using an alternative video display device (e.g., connected via the composite video out), check that the 'Main Video Output' item on the Video page of the Set-up menu is set to 'HDMI'. See page 14 for details on how to do this.
- Consult the user handbook of the display device to ensure that it can handle at least one of the following output formats provided by the DV135:

720 x 576p	1280 x 720p	1366 x 768p
720 x 480p	1920 x 1080i	

#### NO VIDEO (RANDOM NOISE)

Random noise will be displayed if the content-protection algorithm fails to authenticate the attached device. This will occur, for example, if a DVI device that does not support HDCP (such as a computer monitor) is connected to the DV135.

To attempt to isolate this problem, remove all discs from the DV135, then power-off both the DV135 and the connected display device. Switch the display device on, then the DV135 – at this point, the idle logo of the DV135 should be shown on the display device. If this is not the case, please check the items listed above for a blank screen.

If the noise appears when a copy-protected disc (DVD) is played, then it is the authentication that is failing. Please contact your dealer for further information.

### Problems with audio

The type of audio provided by the HDMI connector depends on the configuration of the DV135 (see 'Audio Set-up' on page 14). Note that pure DVI devices (connections requiring a HDMI to DVI convertor cable) do not support audio via this connection.

Note that for audio to be transmitted over HDMI, 'Digital Audio Output' must be set to 'HDMI (Auto)' – see page 14.

The DV135 supports HDMI version 1.0: this means that it does not support discrete multi-channel audio over HDMI. Dolby Digital multichannel audio and two-channel stereo is supported.

# Remote-control codes

The following table gives the IR-commands accepted by the DV135. The system code for the DV135 is 25 (in common with other Arcam DVD players).

## Power commands

Command	Decimal Code
Power toggle	25-12
Power-on	25-123
Power-off	25-124

## Playback control commands

Command	Decimal Code
Track number 'n', (e.g., 1)	25-n (e.g., 25-1)
Track forward	25-32
Track back	25-33
Fast forward	25-52
Fast rewind	25-50
Slow forward	25-30
Slow rewind	25-31
Open	25-45
Pause	25-48
Stop	25-54
Play	25-53

## Display control commands

Command	Decimal Code
Display	25-18

## Advanced control commands

Command	Decimal Code
Repeat toggle	25-29
Repeat A-B	25-59
Clear	25-58
Up	25-86
Down	25-85
Left	25-81
Right	25-80
OK	25-87
Shuff / Rand	25-64
Subtitle	25-65
Title	25-66
Menu	25-67
Zoom	25-68
Audio	25-69
Return	25-72
Angle	25-73
Setup	25-74
Status	25-75
Search	25-76
Mode	25-77
Trim	25-37
HDMI	25-88

# Technical specifications

General	
Power Requirements	100/115V or 230V AC, set by voltage selector switch on rear panel
Power consumption	< 35 VA
Dimensions (W x D x H)	435mm x 355mm x 87mm inc. feet
Weight	net: 5.1kg; packed: 8.0kg
Video outputs	
Composite video	1 x gold plated phono. 1V pk-pk in 75Ω
S-Video	1 x 4-pin mini-DIN. Y 1V pk-pk in 75Ω, C 0.3V pk-pk in 75Ω
Component video	Interlaced or Progressive 3 gold plated phono sockets. Y 1V pk-pk in 75Ω, Pb 0.7V pk-pk in 75Ω, Pr 0.7V pk-pk in 75Ω
SCART socket with RGB video	All 0.7V in 75Ω, composite video 1V in 75Ω, and stereo audio Auto switching of TV with aspect ratio control
HDMI	19-pin HDMI connector Supported video formats are: 720 x 576p; 720 x 480p; 1280 x 720p; 1920 x 1080i; 1366 x 768p Audio to 2-channel/96kHz (24-bit).
Audio outputs	
Analogue audio outputs	Stereo output on gold-plated phono sockets
Output level	2.2V rms at 0dB signal, 4V rms with HDCD discs (left and right channels only)
Frequency response	20Hz to 20kHz (+0.1dB, -0.5dB)
THD+N	<0.005% for 1kHz 0dB signal, measured 22Hz-22kHz, unweighted
Signal-to-noise ratio	105dB, measured 20Hz-20kHz, unweighted
Digital audio output (IEC958)	PCM/Dolby Digital/DTS on gold plated phono (coax) and TOSLINK (optical)
Accessories supplied	
	CR-515 remote control
	2 x AAA batteries
	Mains lead, Handbook
E&EO	

**NOTE:** All specification values are typical unless otherwise stated.

## Continual improvement policy

Arcam has a policy of continual improvement for its products. This means that designs and specifications are subject to change without notice.

## Disc types supported

The ARCAM DV135 DVD-player plays a range of disc types. These disc types include:

- DVD-Video (single region, set at factory)
- DVD-Audio
- DVD-R, DVD-RW, DVD+R, DVD+RW
- SACD version 1.3
- MPEG2-encoded video files
- MPEG4-encoded (DivX) video files (in AVI, MP4, and MP4-Nero formatting)
- CD-Audio (including CD-R and CD-RW) with PCM, HDCD, WMA, MP2, MP3 or OGG encoding
- JPEG image files on CD (Picture CDs) and DVD.

Other disc formats may not play correctly in this player.

DVD-R/RW and CD-R/RW discs (Audio CDs and Video CD/Super VCDs) recorded using a DVD recorder, CD recorder or personal computer cannot be guaranteed to play in the DV135. Incompatibility may be due to a number of possibilities, including the type of disc used and the recording method.

## CD-R/RW and DVD-R/RW compatibility

- This unit will play CD-R and CD-RW discs recorded in CD Audio or Video CD/Super VCD format, or as a CD-ROM containing the audio and video file types listed above. Other content may cause the disc not to play, or to create noise/distortion in the output.
- This unit will play DVD-R/RW discs that are recorded using the DVD Video format, or as a DVD-ROM containing the audio and video file types listed above.
- This unit cannot be used for recording discs.
- This player is compatible with multi-session discs, but plays only sessions that are closed. Unfinalised discs cannot be played.
- File names must not contain blank spaces or special characters (.+/=).
- A CD-ROM used to compile your files must be ISO 9660 Level 1 or Level 2 compliant. CD physical format: Mode1, Mode2 XA Form 1, or Mode2 Form 2. File names up to 15 characters are supported.
- A DVD-ROM used to compile your files must be ISO 9660 Level 1 or Level 2 compliant.
- Each disc (CD or DVD) may contain up to 1500 directories. Each directory may contain up to 680 files.

## Compressed audio compatibility

The DV135 will play CD- or DVD-ROM discs containing files saved in the MPEG1 Audio Layer 2 (MP2), MPEG1 Audio Layer 3 (MP3), Windows Media file (WMA) and OGG formats, with sampling rates of 44.1 or 48kHz. Incompatible files will not play correctly, potentially causing noise or distortion on the audio outputs.

- Fixed bitrate files are recommended. Variable bitrate (VBR) files are playable, but the playing time may not be shown correctly.
- This player recognises only tracks that are named with the file extensions '.mp3', '.wma', '.mp2' and '.ogg' (upper-case equivalents may also be used).
- There are many different recording bit-rates available to encode your audio files. Those supported by this player are:

For MP2, MP3 and OGG playback	The following constant bit rates are supported: 32, 64, 80, 96, 112, 128, 160, 192, 256 and 320 kilobits per second. Variable bit rate (VBR) between 96kb/s and 320kb/s is also supported.
For WMA playback	The following constant bit rates are supported: 48, 64, 80, 96, 128, 160 and 192kb/s.

Note that MP3 audio encoded at 128 kbps or higher should sound close to regular CD Audio quality. This player will play lower bitrate MP3 or WMA tracks, but be aware that the sound quality becomes noticeably worse at lower bitrates.

## Picture disc compatibility

This DVD player will play CDs or DVDs containing JPEG images.

- Only files with the .jpg or .jpeg extension will be recognised (upper-case equivalents may also be used).
- Kodak picture discs are supported (only the files in the JPEG directory will be shown on the screen).
- Fuji picture discs are supported (select the JPEG files in the clips menu).
- Konica and QSS picture discs are **not** supported.

## PC created disc compatibility

- If you record a disc using a personal computer, even if it is recorded in a 'compatible format' as listed above, there will be cases in which the disc may not be playable in this machine due to the setting of the application software used to create the disc. In these particular instances, check with the software publisher for more detailed information.
- Check the DVD-R/RW or CD-R/RW software disc boxes for additional compatibility information.

# Guarantee

## **Worldwide Guarantee**

This entitles you to have the unit repaired free of charge, during the first two years after purchase, at any authorised Arcam distributor provided that it was originally purchased from an authorised Arcam dealer or distributor. The manufacturer can take no responsibility for defects arising from accident, misuse, abuse, wear and tear, neglect or through unauthorised adjustment and/or repair, neither can they accept responsibility for damage or loss occurring during transit to or from the person claiming under the guarantee.

## **The warranty covers:**

Parts and labour costs for two years from the purchase date. After two years you must pay for both parts and labour costs. **The warranty does not cover transportation costs at any time.**

## **Claims under guarantee**

This equipment should be packed in the original packing and returned to the dealer from whom it was purchased, or failing this, directly to the Arcam distributor in the country of residence.

It should be sent carriage prepaid by a reputable carrier – **not** by post. No responsibility can be accepted for the unit whilst in transit to the dealer or distributor and customers are therefore advised to insure the unit against loss or damage whilst in transit.

## **For further details contact Arcam at:**

Arcam Customer Support Department,  
Pembroke Avenue, Waterbeach, CAMBRIDGE, CB25 9QR, England.

## **Problems?**

If your Arcam dealer is unable to answer any query regarding this or any other Arcam product please contact Arcam Customer Support at the above address and we will do our best to help you.

## **On line registration**

You can register your Arcam product on line at: [www.arcam.co.uk](http://www.arcam.co.uk)



# ARCAM

Pembroke Avenue, Waterbeach, CAMBRIDGE CB25 9QR, England