

FELSTON



DD740

FOUR INPUT DIGITAL AUDIO DELAY

Owner's Manual

IMPORTANT INFORMATION

PLEASE READ THIS BEFORE OPERATING THE UNIT

1. To ensure the best performance, read this manual carefully. Keep it in a safe place for future reference.
2. Install this unit in a well-ventilated, cool, dry, clean place. There should be a space of at least 4" (10cm) above, behind and to the sides of the unit. Lack of ventilation can cause the unit to malfunction.
3. Do not expose the unit to sudden temperature changes from cold to hot. Do not locate the unit in an environment with high humidity (e.g. a room with a humidifier), as this can cause condensation inside the unit which may cause an electrical shock, fire, damage to the unit and/or personal injury.
4. Do not plug this unit into a wall socket until all the connections are completed.
5. When disconnecting the power adaptor from the wall socket, hold the plug-in adaptor. Do not pull on the power lead.
6. Do not use force on any of the buttons or the cables attached to the unit.
7. Do not clean this unit with chemical solvents, as this can damage the unit's finish. Use only a clean, dry cloth.
8. Only use the power adaptor supplied with this unit. Using another power supply is dangerous and may cause fire and/or damage to the unit, and/or personal injury. The manufacturer of the unit will not be held responsible for any damage or injury caused in this way.
9. Only use in a wall socket providing the AC voltage specified on the power adaptor. Using an AC voltage outside the specified range is dangerous and may cause fire and/or damage to the unit, and/or personal injury. The manufacturer of the unit will not be held responsible for any damage or injury caused in this way.
10. To prevent damage by lightning, disconnect the power adaptor from the wall socket during an electrical storm.
11. Take care not to drop any liquid or foreign objects into the unit.
12. Do not open the unit, the power adaptor, or try to modify them in any way. There are no user-serviceable parts inside the unit or power supply. Opening the unit or power supply, or carrying out any modifications will invalidate your warranty, as well as being potentially dangerous. Always contact your supplier or the manufacturer for service requirements.
13. When you are not using the unit for a long period of time, disconnect the power adaptor from the wall socket.
14. Should a problem occur, please read the *Troubleshooting* section covering common operating errors before deciding the unit is faulty.



This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by removing and reapplying power to the equipment, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and AV receiver
- Connect the equipment to an outlet on a circuit different from that to which the AV receiver is connected
- Consult the dealer or an experienced radio/TV technician for help



This unit is in conformity with the EMC directive and low-voltage directive.



Disposal of Waste Electrical & Electronic Equipment (WEEE). This symbol on the product or on its packaging indicates that this product shall not be treated as household waste. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this product, please contact your local city office, your household waste disposal service or the dealer from whom you purchased the product. Visit www.felston.com/weee.



This product is compliant with the European Union Restriction of Hazardous Substances (RoHS) directive 2002/95/EC, which became effective July 2006.

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Introduction

Digital image processing within broadcasts and modern displays (Plasma, LCD, etc.) causes video delay which lets audio arrive a fraction of a second too soon. This creates the annoying timing difference we see in lip motion and sound called *lip-sync error*.

However, research at Stanford University¹ in the US statistically confirmed that presentations with this unnatural phenomenon - *audio leading video* - caused viewers to perceive the material more negatively - even viewers who did not consciously notice the lip-sync error.

So lip-sync error is not just a minor distraction but it is the most noticeable symptom of the larger problem - *sound before its cause* - which fundamentally undermines the home cinema experience by contradicting reality.

With the DD740 you have total control over audio/video synchronization and by delaying audio to match the video delay you not only correct lip-sync but you *restore reality!*

We would like to thank our DD340 and DD540 customers for sharing their lip-sync correction experiences. Their invaluable input has given your third generation DD740 many features no AV receiver or other audio delay offers.

Some of these new features (numeric delay entry, 36 presets, etc.) will benefit all users, while others (1/3 ms Fine Mode) will appeal only to those most sensitive to lip-sync error. Our goal was to incorporate each feature without burdening those who do not use it, making the DD740 the most functional and easiest to use lip-sync correction solution available.

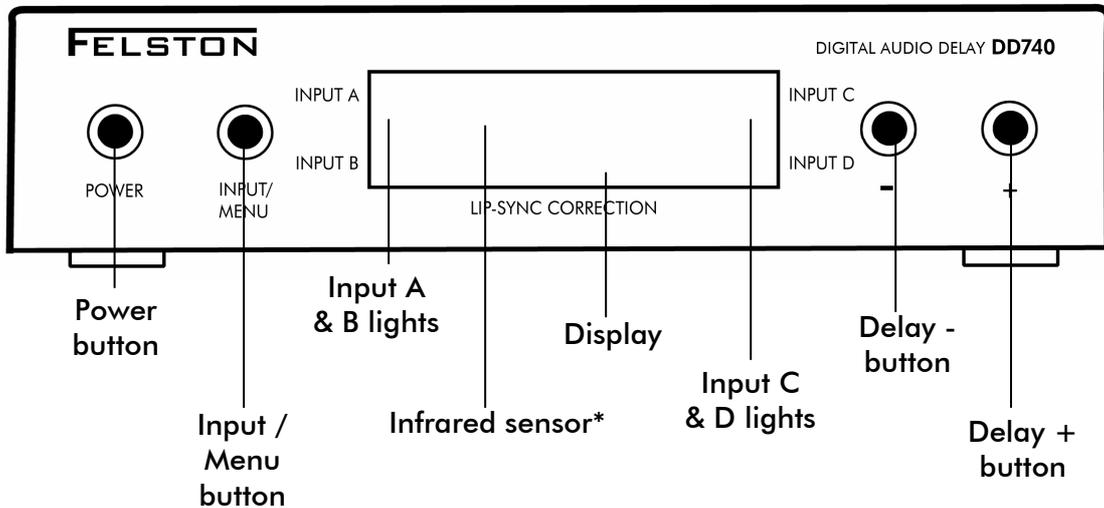
We appreciate your choosing the Felston DD740 to *restore reality* to your home cinema and look forward to hearing from you:

FelstonListens@Felston.com

¹B. Reeves, D.Voelker: "Effects of Audio-Video Asynchrony on Viewer's Memory, Evaluation of Content, and Detection Ability", Research Paper Prepared for Pixel Instruments at Stanford University

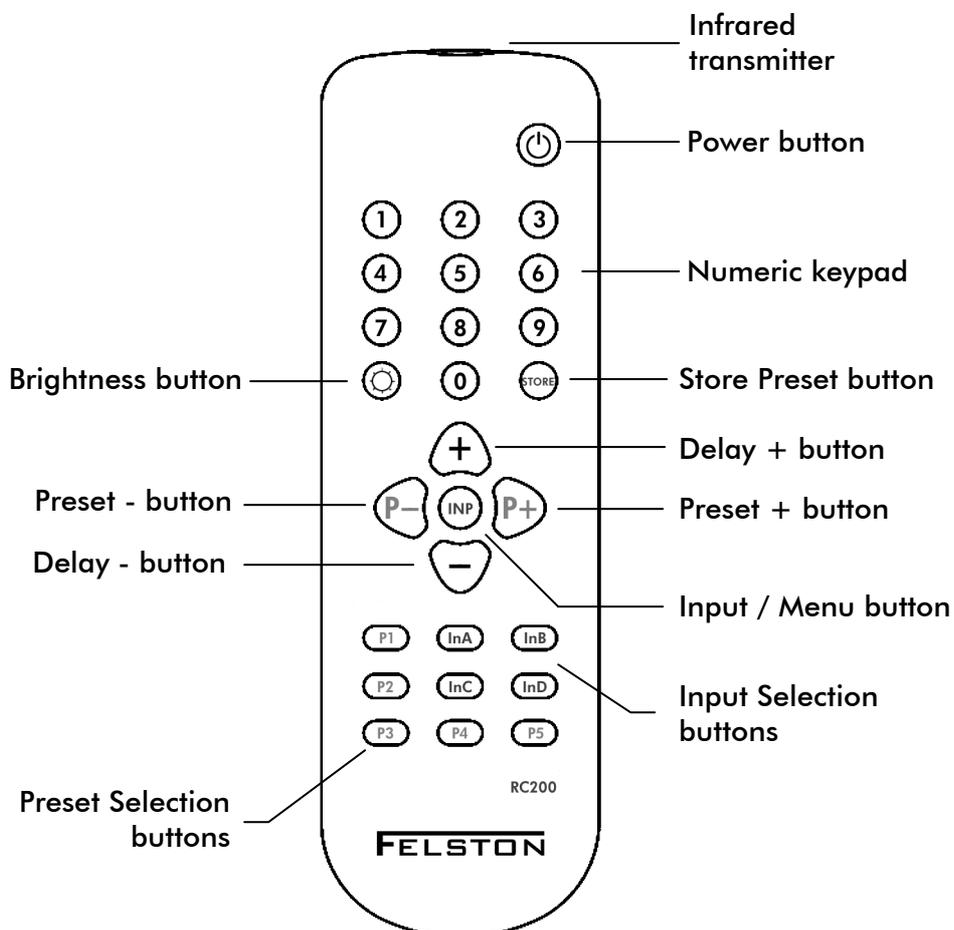
Controls

Front Panel



*For optional IR repeater attachment the sensor is located 60 mm from the left side of the enclosure and 15 mm down from its top behind the acrylic window.

Remote Control



Getting Started

Check Package Contents

- DD740 digital audio delay
- Power adaptor
- Remote control
- 2 x AAA batteries
- Owner's manual – this document
- Warranty card

PLEASE KEEP ALL THE ORIGINAL PACKAGING!

If the unit requires repair it should be returned in its original packaging to ensure protection.

Install Batteries in Remote Control

Install two AAA (UM-4/MN2400/LR03) alkaline 1.5V batteries making sure their + and - terminals are as pictured on the diagrams embossed within the battery compartment. Do not use rechargeable batteries with lower voltage.

Use with Programmable Learning Remotes

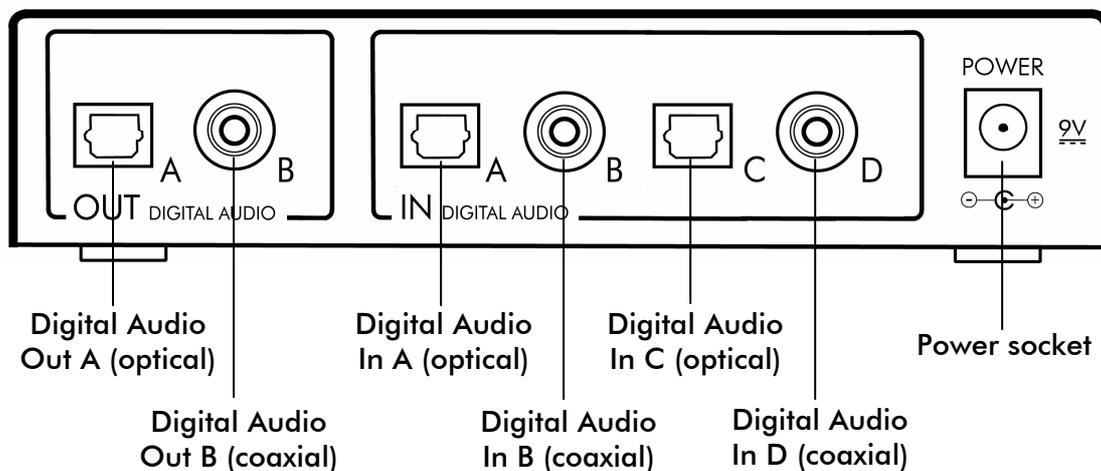
Download the DD740's full discrete IR code support for use with most programmable learning remotes from:

<http://www.felston.com/DD740/remotes>

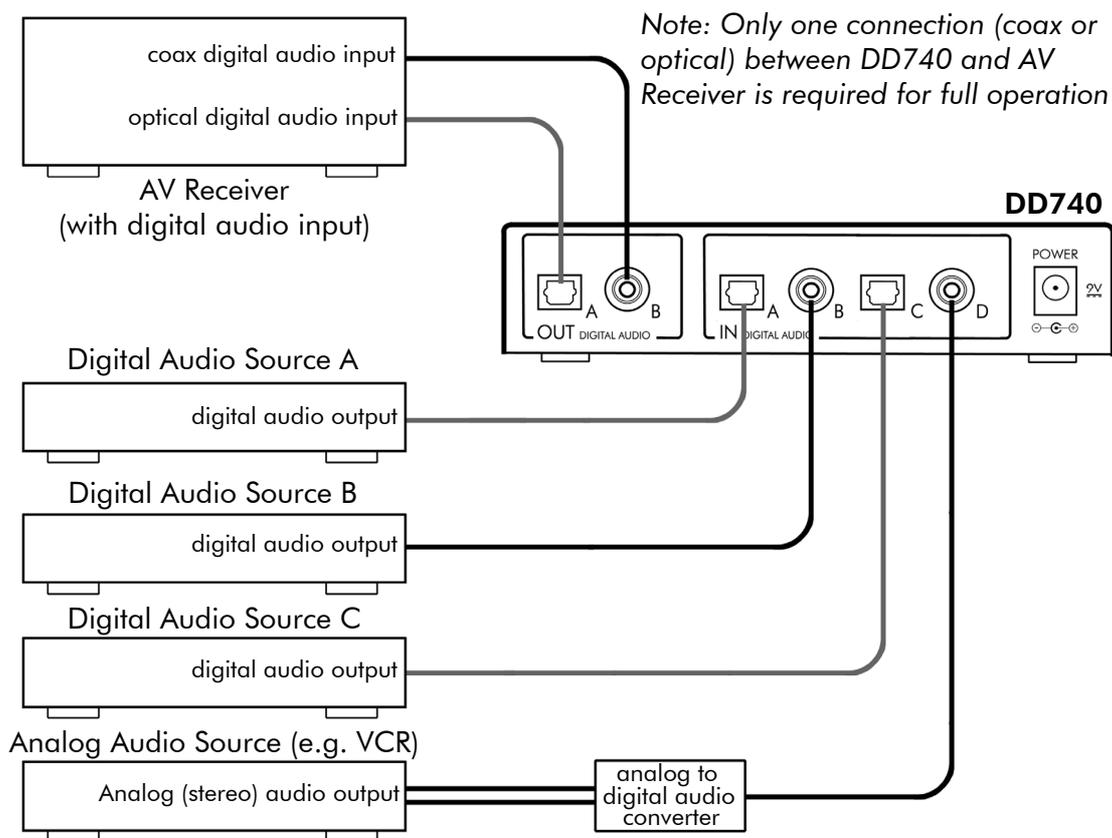
Full discrete IR code support coupled with the DD740's numeric delay entry gives automation systems total control over lip-sync delay with no dependence upon presets, toggles, etc.

Connecting the DD740

Rear Panel



Typical Connections



Note: None of the equipment or cables shown attached to the DD740 is included

Audio Connections

Connect the digital audio output from each of your sources to the DD740's digital audio inputs (A, B, C, D). Use optical or coaxial cables as required making sure any optical fiber cables are not bent in a tight radius causing them to fracture and be irreparably damaged.

If you are using coaxial cable, take extra care to connect to the *digital audio output* of the source – which may be labeled “digital audio”, “S/PDIF”, “coax audio” or similar, and should have either an orange- or black-colored insert in its socket.

Do NOT connect the DD740 to *analog stereo connectors* which otherwise look the same but should appear in pairs and have *red* (for right channel) and *white* (for left channel) colored inserts.

If you have an analog (stereo) audio source, e.g. a VCR, you can use a third-party accessory, called an analog-to-digital audio converter, to convert its signal into digital audio, suitable for connection to the DD740.

Connect one of the DD740's outputs - either optical (A) or coax (B) - to one of your AV receiver's digital audio inputs. This single connection is sufficient because the DD740 serves as a four input switcher and outputs the selected input (A, B, C, or D) simultaneously on both its optical and coax outputs. However, if you wish, you can connect both DD740 outputs to your receiver.

AV Receiver Source Selection

Make sure the AV receiver's source selection is set to its input connected to the DD740. To listen to any source connected to the DD740, you do not need to change source selection on your AV receiver. Instead select the new source using the DD740's input selection. See *Selecting the Input Source* on page 10 for more details.

Power

When the digital audio input and output connections are complete, plug the power adaptor's connector into the power socket on the rear of the DD740. Finally plug the power adaptor into a wall socket.

When power is connected, the DD740 will enter standby mode.

Operation

Standby Mode

Standby mode is indicated by a single light – Input A, B, C or D – being lit while the rest of the display remains blank. In standby mode, the digital audio signal on the selected input passes through the DD740 without any delay being applied. Coax/optical and optical/coax input/output conversion remains active during standby.

Switching the DD740 to Active Mode

From standby mode, press the **POWER** button (on the front panel or remote control). The DD740 will switch to active mode and the delay displayed will be applied to the selected input signal before it appears on the DD740's outputs. To return to standby mode press **POWER** again.

Selecting the Input Source

The DD740's input can be selected in either active or standby mode by two methods:

Method 1 (remote control only):

Press either **InA**, **InB**, **InC**, or **InD**. The selected input will appear briefly on the display and the input indicator light (A,B,C, or D) behind the acrylic window will illuminate and remain lit as long as that input remains selected.

InA

Note: In active mode a *flashing* input indicator light means there is no digital audio signal on the selected input.

Method 2 (remote control or front panel buttons):

Press and release **INPUT/MENU**.

The current input selection will appear on the display. *In A*

To change the input, press and release **INPUT/MENU** until the required setting is reached.

The input setting will remain selected until it is next changed, even if power is lost to the DD740.

Remember that you do not need to change the source selection of your AV receiver when you change the input selection on the DD740.

Setting the Delay

The delay applied is shown on the display in milliseconds (ms). 1 ms = 1/1000 second. *120*

The delay can be set to any time between 0 and 680 ms for 48 KHz audio and 0 and 340 ms for 96 KHz audio. To increase the delay, press **DELAY +**. By holding down this button, the delay will increase quickly until you release it.

To decrease the delay, use **DELAY -**.

Release the buttons and the new delay will be set.

The delay is set independently for each input. If the input changes the delay will revert to the setting that was last used for the new input.

Numeric Delay Entry

The numeric keypad can be used to set the delay directly. Simply enter the desired delay by pressing the number buttons in sequence. The delay will be set after a brief pause following the last digit entered.

Fine Mode Delay Adjustment

To enter fine adjustment mode, press **DELAY +** then **DELAY -** in quick succession.

Following this unlikely key sequence, any adjustments made using **DELAY +** and **DELAY -** will change the delay by 1/3 millisecond with each press. The display continues to show the delay in whole milliseconds (ms) so in this mode it will increment after three 1/3 ms steps have been entered. Note, after 5 seconds of no buttons being pressed, the DD740 returns to normal mode where delays are made in 1 millisecond steps.

Presets

The DD740 allows storage of up to 36 delay settings for easy recall, 9 for each input. Each of these delays is held in a preset – PA1 to PA9 (for Input A), PB1 to PB9 (for Input B), PC1 to PC9 (for Input C), and PD1 to PD9 (for Input D).

Presets are stored and recalled using buttons on the remote control. Presets are retained even if power to the DD740 is lost.

Storing a Delay in a Preset

1. Set the delay that you wish to store for the selected input
2. Press **STORE** on the remote control
3. The most recent preset used with the selected input will appear and start flashing
4. Select the preset to hold the delay by using **PRESET +** and **PRESET -** on the remote control
5. Press **STORE** once more

120

PA2

PA3

The preset will stop flashing, indicating that the delay is stored in the preset.

PA3

After a couple of seconds, the delay will reappear on the display.

120

Recalling a Delay from a Preset

Method 1 (remote control only):

Presets 1 to 5 for each input can be recalled with a single button press on the remote control. Simply press the required Preset Selection button (**P1** to **P5**). The preset selected will be displayed.

P65

Use presets 1 to 5 for the most common delay settings.

Method 2 (remote control or front panel buttons):

1. Press **PRESET +** or **PRESET -** on the remote control. The most recent preset number for the selected input will appear.
2. Use **PRESET +** and **PRESET -** to select the preset you require.
3. Release the buttons. After a couple of seconds, the delay stored in the preset will be displayed.

P64

P65

60

Any time the delay setting is changed the delay memory must be filled with sound to create the new delay, so a slight gap in sound is normal.

Changing Display Brightness

Method 1 (remote only):

Press and release the **Brightness** button until you achieve the brightness required.

br5

The new brightness setting will be displayed briefly. Five levels are available between **br1** (dimmiest) and **br5** (brightest).

Method 2 (remote control or front panel buttons):

Enter the display brightness menu: *press and hold* **INPUT/MENU** for approximately 5 seconds.

The display will show the current brightness setting.

br5

With the brightness level displayed, change brightness using the **DELAY +** and **DELAY -** buttons to change brightness.

br3

When the required brightness level is selected, release the buttons for approximately 5 seconds to exit the menu. Alternatively, press and release **INPUT/MENU** to exit immediately.

Returns and Repairs

If, after checking the *Troubleshooting* section on page 15, you believe there is a fault with the unit contact your dealer. If a return is required, be sure to include the unit along with all requested accessories and warranty documentation (if applicable), preferably in its original packaging to ensure safe transit.

Troubleshooting

No Input lights are lit and the display is blank.

Check the power lead is securely plugged into the back of the DD740. Check the power adaptor is plugged into a working, powered wall socket.

The DD740 is on. It responds to the buttons on its front panel, but there is no response from the remote control.

Ensure you are pointing the remote control's infrared transmitter squarely at the front of the DD740. Check there is nothing obscuring the display of the DD740. Check the batteries in the remote control are installed correctly; replace them with new ones if required.

The DD740 is on but there is no sound heard from the AV receiver.

Check the digital audio source is operating.

Check the correct input is selected on the DD740. Check the correct input is selected on the AV receiver.

Check that the cable connections between the source and the DD740, and between the DD740 and the AV receiver, are secure. Try alternative cables that are known to be working.

If there is still no sound heard after following the above procedures, try this test: Disconnect the source from the DD740. Disconnect the AV receiver from the DD740. Connect the source to the AV receiver directly using the same sockets that were used with the DD740. If there is no sound, the issue is with the source or AV receiver. Refer to their owner manuals for more information.

For any other problems with the DD740 perform a reset to factory settings before contacting your dealer:

1. Remove power from the DD740 and count to 20.
2. Hold down **DELAY –** and **DELAY +** buttons and keep them depressed while reapplying power.
3. After 5 seconds, the letters "rst" (reset) will appear on the display. Release the buttons.

Retest the DD740 to see if the reset resolved the problem.

Specifications

Audio Delay Capabilities

- 0 – 680ms in 1ms or 0.33ms steps (32–48kHz sample rate)
- 0 – 340ms in 1ms or 0.33ms steps (96kHz sample rate)
- 36 user-programmable presets (9 per input)

Digital Audio Signal Compatibility

S/PDIF Digital Audio both coax and optical.

The DD740 preserves digital audio integrity *bit-for-bit* insuring compatibility with all present and future S/PDIF surround sound formats at both 48 KHz and 96 KHz sample rates.

Connections

- 2 x Digital Audio In RCA phono socket (75Ω, 0.5Vpk-pk)
- 2 x Digital Audio In optical socket
- Digital Audio Out RCA phono socket (75Ω, 0.5Vpk-pk)
- Digital Audio Out optical socket
- DC power supply socket

Power Requirements

9V DC (+ve center), <200mA from power adaptor supplied

Refer to the specifications printed on the power adaptor supplied with DD740 for AC power requirements.

Power Consumption

Less than 2 Watts for the DD740 from 9VDC.

AC power consumption will depend upon the country specific power adaptor supplied with the unit but will not exceed 5 watts in any case.

Dimensions of Main Unit (WxDxH)

Size: 5.7" (145mm) x 4.1" (105mm) x 1.4" (35mm)

Weight: 9.9oz (280g) approx.