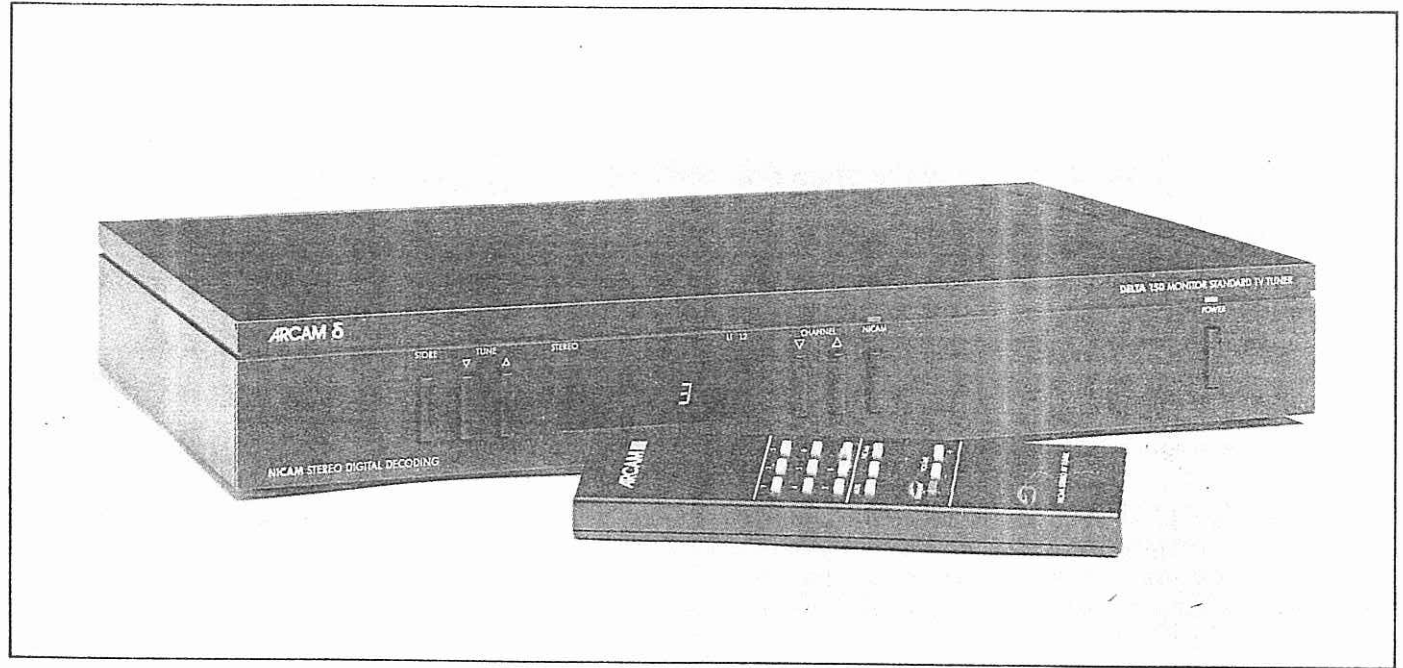


Audiophile products
from A&R Cambridge

ARCAM



Delta 150 NICAM stereo TV tuner handbook

Addendum

The following points were omitted from the Delta 150 handbook:

The "MUTE" function on the CR50 remote control handset will only work when the "VARIABLE AUDIO OUTPUT" is connected.

When switching the Delta 150 on from the "STANDBY" mode, the last selected channel number will appear on the front panel display.

If the Delta 150 is switched on with the power switch on the front panel, it will default to channel 1.

When the Delta 150 is connected to your hi fi VCR using a SCART (or separate audio/video leads), it will be necessary to switch the VCR to the "AUX" mode in order to record stereo transmissions. Please refer to the VCR's handbook.

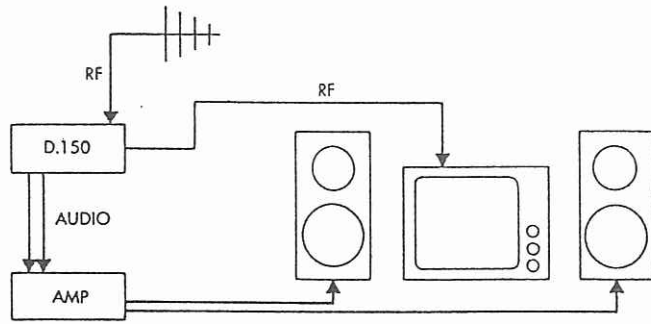


Figure 1. Simple configuration using the Delta 150's remodulated output

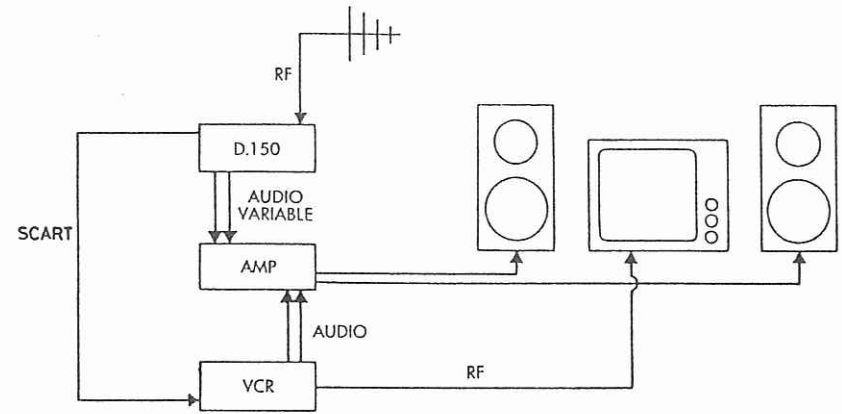


Figure 2. Simple configuration connecting your TV and VCR to the Delta 150.

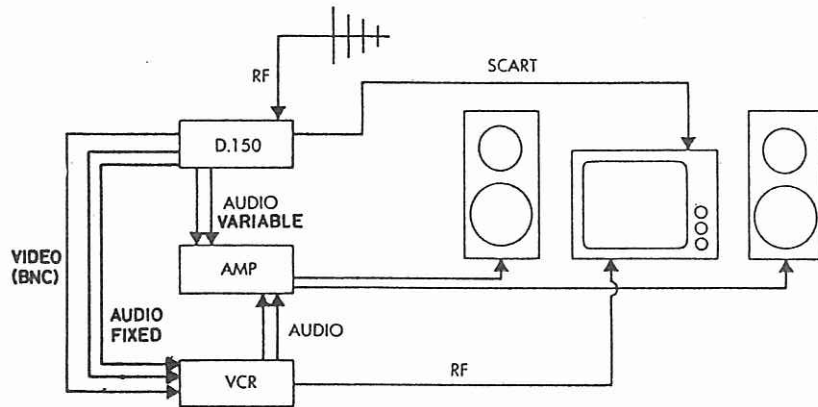


Figure 3. Configuration making use of TV set fitted with a SCART socket.

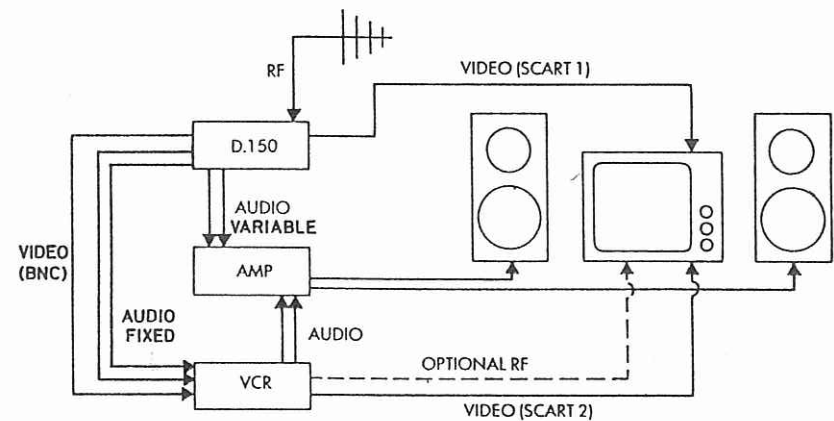


Figure 4. Configuration making use of TV set fitted with two SCART sockets.

Erratum

Please refer to these diagrams when installing your Delta 150, NOT the diagrams on page 11.

These have been incorrectly labelled. Please accept our apologies for any inconvenience this may have caused.

Introduction

The Arcam Delta 150 is a NICAM (Near Instantaneously Companded Audio Multiplex) stereo TV tuner which offers the enthusiast near compact disc quality stereo sound from terrestrial TV broadcasts in the UK.

The Delta 150 is a stand alone unit built to the highest standards. It is designed to be used in conjunction with a television or video system, and complements the existing range of Arcam Delta hi fi separates.

Although there are many 'stereo' TV sets currently available, the quality of the TV's own speakers will not realise the full potential of the Delta 150.

Best results will be achieved when the Delta 150 is connected to an amplifier and a pair of good quality hi fi loudspeakers. We recommend positioning your television set midway between your speakers, and turning down the volume on the TV set. If your room layout does not permit this, and your amplifier is capable of driving two or more pairs of speakers, you might choose simply to place a second pair of speakers either side of the TV and use these when watching the television. Your main pair of speakers can then be left in their existing location and used exclusively for the hi fi system.

The Delta 150 is also equipped with a high quality composite video output. This can be used to enhance picture quality, provided your TV has a suitable composite video input (usually found on a SCART or Peritel A/V socket).

Because of its design, the Delta 150's 8 presets can be tuned and operated in much the same way as a conventional TV set, either from the unit itself, or via the supplied CR50 remote control handset. This also provides remote control operation of the volume, mute, and standby functions.

Please study this handbook carefully to ensure that you get the best possible results from your Delta 150 NICAM tuner. It will probably be necessary to refer to the handbooks of your video cassette recorder (VCR) and TV in order to find the configuration that suits you best.

If in doubt, consult your dealer. He is there to help!

Installing and using your Delta 150 NICAM tuner

Mains Supply

The Arcam Delta 150 is supplied to work on 220V/240V AC mains. A detachable mains lead is supplied with the Delta 150. The cores of this lead are coloured in accordance with the following code:

Green and yellow – Earth
Blue – Neutral
Brown – Live

If the colours in the mains lead do not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured green and yellow must be connected to the terminal on the plug which is marked by the letter E, or to the safety earth symbol, or to the terminal coloured green and yellow. The wire which is coloured blue must be connected to the terminal which is marked by the letter N, or coloured black or blue. The wire which is coloured brown must be connected to the terminal which is marked by the letter L, or coloured red or brown.

Fuses

If the mains plug is fused, fit a 3 amp fuse.

The AC supply inlet to the Delta 150 uses a standard IEC chassis mounting plug.

The IEC line socket on your mains lead and the IEC plug on the Delta 150 are a tight fit; before first using the Delta 150 it is therefore important to ensure that the socket is firmly pushed home into the chassis plug.

Under no circumstances should the Delta 150 top cover be removed unless the supply is first disconnected at the wall socket.

Notice

1. Please retain the carton and all packaging materials provided with this equipment so that it may be repacked correctly if it ever becomes necessary to transport the unit, or to return it for service.

2. If servicing is required, then the equipment should be properly packed and returned to the dealer from whom it was purchased. It is essential to include a covering letter giving your name and address, and a brief but thorough description of the fault.

Positioning the Delta 150

In general we believe you will find the Delta 150 to be most useful if it is placed alongside your hi fi equipment rather than your television. The various audio cables required can then be kept short, to ensure the highest sound quality. If you own a hi fi video cassette recorder, there is also a strong case for moving this closer to your hi fi system. The VCR's audio record and replay functions are then more easily integrated with the Delta 150 and the rest of your sound system. Connected to your FM radio tuner, most hi fi VCRs can be used to record long duration radio programmes if you wish.

Please observe the following precautions when siting the Delta 150:

Do not place the Delta 150 close to a source of heat (e.g. direct sunlight, a radiator or a powerful amplifier.)

Ensure that air can circulate freely around the unit.

Do not place the Delta 150 directly underneath (or on top of) a turntable, cassette deck or VCR. The mains transformer of the Delta 150 may, in some circumstances, induce a level of background hum into the sensitive circuits of these units.

Do not expose the Delta 150 to rain or moisture.

Connections and warming up

There are several points that should be noted before using your Delta 150.

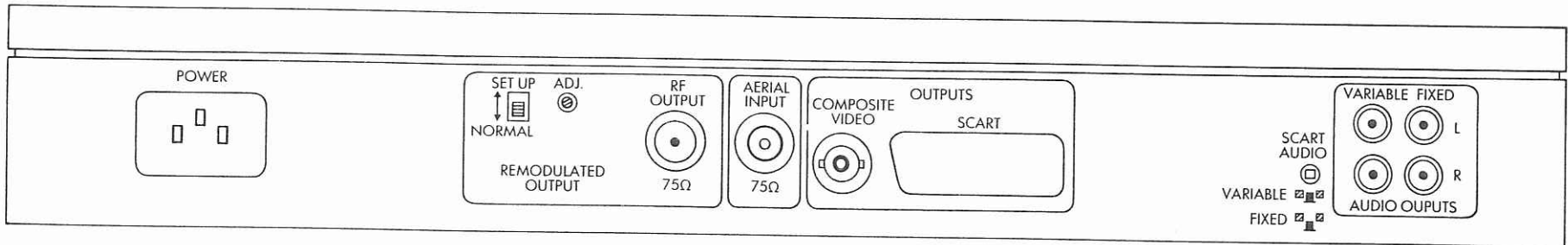
In particular, it is advisable to switch off your system before connecting it up to the Delta 150. This will avoid possible damage to your loudspeakers. At the very least, ensure that the volume control on your amplifier is turned down, or an unused input is selected.

Although the Delta 150 will receive broadcasts within seconds of switching on, in common with other audiophile products its internal circuits take some time to fully stabilise. We have found that the very best sound quality may not be obtained until the unit has had some time, maybe an hour or two, to warm up.

Note

When the Delta 150 is switched to standby mode, these critical circuits remain energised. The optimum audio performance may then be obtained as soon as the unit is switched on again.

Rear panel connections



The Arcam Delta 150 NICAM stereo TV tuner is equipped with numerous inputs and outputs to ensure compatibility with other audio and video equipment. It has also been designed so that it can be used in many different configurations. Please refer to the diagrams on page 11.

The rear panel connections are as follows:

Audio outputs

Two pairs of audio outputs, one fixed and one variable, are provided via RCA phono connectors. These sockets are marked 'L' for the left channel and 'R' for the right channel, with the left channel sockets nearer the top of the cabinet. Your connecting leads will be marked either 'L' or 'R', or will have a red plug for the right channel, and a black or white plug for the left channel.

The audio output should be connected to your amplifier's A/V or AUX inputs, or to the audio input of your hi fi VCR using the supplied phono lead.

The very best sound quality will be obtained by using the fixed outputs. However, by using the variable output, you can take advantage of the remote volume facility on your handset. If you are connecting the Delta 150 directly into your VCR, we recommend the use

of the direct output, in order to avoid inadvertently adjusting the volume level when recording a programme.

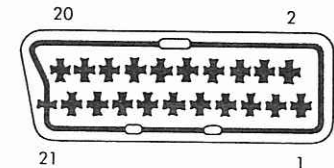
Both pairs of audio outputs may be used simultaneously if required.

SCART socket

This is a 21 pin socket, also known as a CENELEC, Peritel or Euro connector. It contains both audio and composite video (CVBS) outputs, and a logic voltage (CVBS status) which is either 0V (Delta 150 off or in 'standby' mode) or 12V (Delta 150 on). This can be used to control the TV/AV switching function on certain models of TVs.

The output pins are connected as follows:

- Pin 1 – Audio out, right.
- Pin 3 – Audio out, left.
- Pin 4 – Audio ground.
- Pin 8 – Status CVBS.
- Pin 17 – Video ground.
- Pin 19 – CVBS out.
- Pin 21 – Shielding.



If you have a VCR, TV or A/V amplifier which is fitted with a SCART socket, you can connect it to the Delta 150 using the appropriate SCART lead.

With a suitable hybrid lead, the outputs from the Delta 150's SCART socket may also be fed directly to the appropriate BNC or phono sockets of a VCR, TV or A/V amplifier.

The Delta 150's remote volume facility may be assigned to the SCART audio outputs by adjusting the small blue SCART audio switch, located immediately to the left of the main audio output sockets. For fixed outputs, use the tip of a ball point pen or pencil to push the switch in; for variable outputs push the switch again so that it springs back flush with rear panel.

Composite Video Output

The CVBS output is also available on a BNC socket as well as the SCART socket described above. The two outputs may be used together if required, for example to feed the composite video inputs of both a VCR and a TV/monitor at the same time. Good quality 75 ohm co-axial cable, or a specialist video cable, must be used for this purpose. Note that teletext information is preserved on this output, but not sound. In general the CVBS outputs will provide better video quality than that obtained by using the remodulated RF output (see below).

Aerial input

This utilises a UK standard 75 ohm co-axial socket. Your existing TV aerial lead, which is presently connected to your TV set or VCR, should be connected to this input.

As with any audio or video system, the best results will only be obtained with a good quality outdoor aerial, correctly oriented towards the appropriate transmitter(s). To avoid unnecessary degradation of the signal the aerial downlead must be UHF co-axial cable of the very highest quality (such as low loss type RG59). We also recommend against the use of aerial preamplifiers or distribution amplifiers whenever possible, as these can often introduce more problems, such as noise and cross-modulation distortion, than they solve. Your local dealer or aerial contractor should be able to provide suitable advice on all of these topics.

RF (aerial) output

The Delta 150 is equipped with a male co-axial RF output socket similar to those used in VCRs. This performs two functions.

Firstly it provides a 'clean feed' of all the UHF TV channels picked up by the aerial to other equipment further down the chain. Therefore if the RF output is connected to the aerial inputs of your TV or VCR, these units can be operated normally, independent of what the Delta 150 is being used for. A suitable lead is provided with the Delta 150 for this purpose.

Secondly, the socket is connected internally to a remodulator unit. This re-broadcasts, on or around channel 36, whichever TV station is selected on the Delta 150 (n.b. The remodulated output includes the video signal, with teletext and FM mono sound, but not NICAM sound).

If you tune your TV to the remodulated output channel, then the Delta 150 can be used for normal selection of up to 8 channels of sound and vision, either directly or via its CR50 remote control handset.

Note

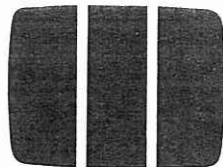
The RF output does not work if the Delta 150 is turned fully off. If it is left in the 'standby' mode, then the 'clean feed' circuit will be operative. The remodulated output only functions when the Delta 150 is switched fully on.

Set up switch

The set up/normal switch works in the same way as on a VCR, and is used to provide a test signal which helps tune in your TV or VCR to the remodulated output of the Delta 150.

When the Delta 150 is installed, switch the power on and select the 'set up' position on this switch.

Select an unused channel on the TV (eg channel 5), and adjust the TV tuning until the test signal appears on the screen – two white vertical bars on a black background. The television should be tuned in to give the best picture, i.e. good definition on the edges of the white bars, and uniform brightness in the centre of the bars.



Test signal

Now select the 'normal' position on the set up switch, and tune the Delta 150, as described on page 8.

ADJ

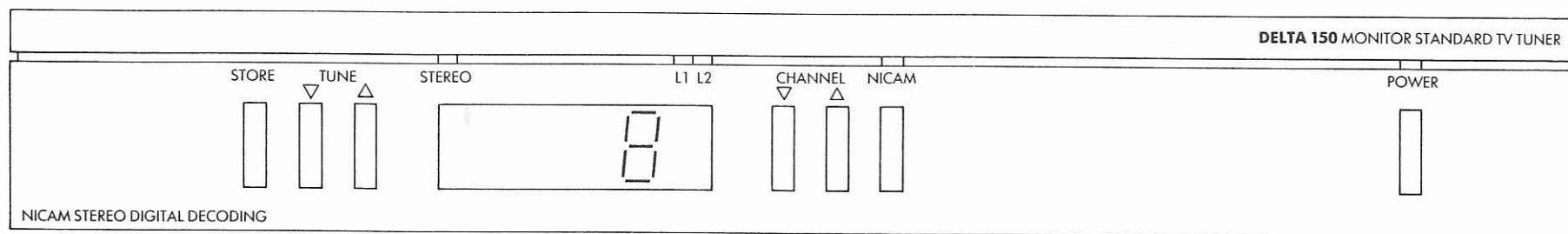
If the test signal cannot be obtained properly when tuning your TV into the remodulated output of the Delta 150, then it may be necessary to adjust this screw. This will alter the channel (i.e. frequency) on which the test signal is transmitted. Insert a small screwdriver through the hole in the back panel and carefully make small adjustments (about $\frac{1}{20}$ of a turn at a time) until a clear picture is received. The range of adjustment is from channels 30 to 39.

It will probably be necessary to make this adjustment if you use a satellite receiver as well as a VCR in conjunction with the Delta 150. In fact, it is possible that some re-adjustment of the channels allocated to all these remodulated outputs may be necessary. This is to ensure that they do not interfere with each other or compromise the reception of any TV transmissions broadcast within the range of channels 30 to 39.

Power socket

Plug the supplied mains lead into the power socket, making sure it is pushed firmly home.

Front panel functions



Store and Tune buttons (up & down)

These controls are not for everyday use. They are needed to tune the Delta 150 to the required TV channels in your area. By pressing down one of the 'tune' buttons all the available TV channels from 21 to 69 are scanned in a period of approximately one minute, after which the cycle repeats itself.

Most people will wish to assign BBC1 to preset 1 on the Delta 150, BBC2 to preset 2, ITV to preset 3 and so on. To do this speedily when first setting up the Delta 150 proceed as follows:

Use the set up procedure described on page 7 to tune your TV into the remodulated output of the Delta 150. Then use the TV normally to check the programme content of a desired station (e.g. Channel 4). Now use the Delta 150's channel buttons or remote control to select preset number 4, shown by the display on the front panel. Switch the TV back to channel 5 (displaying the Delta 150's remodulated output), and hold down one of the tune buttons on the Delta 150 until the same programme appears on the TV screen. When the picture is tuned in as clearly as possible, press the 'store' button on the Delta 150. Preset number 4 on the Delta 150 is now assigned to your local Channel 4 transmitter.

Repeat the procedure for as many other channels as you wish, up to 8.

Please note that the Delta 150 employs a powerful Automatic Frequency Control (AFC). This circuitry is used to compensate for minor tuning drift with time and temperature. The AFC function is defeated during tuning and remains defeated for approximately 1 second after a channel has been tuned.

The effects of this are noticeable as the Delta 150 will 'pull in' a slightly mistuned programme back into the optimum position.

This means that it is possible to obtain a good picture on a programme that is badly tuned in. When tuning the programme in, care should be taken to ensure that the initial effects of the AFC are minimised: this is done by tuning the programme in and waiting for about 1 second for the AFC function to be enabled. If the picture does not change when the AFC is enabled, then the programme will be close to its optimum tuning point.

To achieve precise tuning you may find it helpful to use two fingers to 'rock' between the tune up and down buttons. If this is done quickly then the AFC remains disabled, making it easy to see when optimum tuning (i.e. the best picture) has been achieved.

Stereo LED

This LED (light emitting diode) will glow green when the stereo flag is switched on at the transmitter. You may find that the stereo LED will be illuminated even when a mono broadcast is transmitted. This is not indicative of a fault, merely of the practice of the broadcasting station.

L1, L2 Dual language mode LEDs.

The L1 LED will glow green when a dual language programme is transmitted. English is always transmitted as the main language (L1), and the second language is transmitted as L2.

The English language will be received automatically – there is no need to select it. However, if you wish to receive the second language, simply press the NICAM button once and the second language will be received instead.

The L2 LED will now glow green.

Pressing the NICAM button a second time will return the programme to L1. When a dual language programme is transmitted, the stereo LED is not illuminated.

Note

When a dual language programme is transmitted, both languages are in mono – although the chosen language will automatically be heard through both loudspeakers of your TV or hi fi system.

It is not possible to receive English on the left channel and the second language on the right channel simultaneously.

Channel buttons

These two buttons select any of the 8 preset channels by pressing the up button to change sequentially from channels 1 to 8, and the down button to change sequentially from channels 8 to 1.

NICAM button and LED

The NICAM LED uses a 'traffic light' sequence to indicate the status of the sound track of the programme being transmitted.

If the LED glows red, only a mono FM programme is being transmitted. This is automatically routed equally to both the left and right audio outputs.

If the LED glows amber, a NICAM encoded programme is being transmitted, but the tuner is switched to mono FM reception. Press the NICAM button once and the LED will now glow green, to indicate that the NICAM version of the transmission is being routed to the audio outputs.

Press the NICAM button again to revert to the mono FM mode.

Only if the LED glows green, are you receiving and listening to a NICAM broadcast.

Tuning tip

When tuning in the channels of your Delta 150, please observe the status of the NICAM LED.

If it glows amber, press the NICAM button before pressing the store button, so that the NICAM LED now glows green.

This will ensure that every time this channel is selected, it will be automatically received in NICAM (when transmitted).

Similarly, if a programme, which was originally available only in mono FM (red LED), is now available in NICAM, you may find that every time this programme is selected, the NICAM LED glows amber. If this is the case, simply press the NICAM button, so that the LED now glows green, and then press the store button.

Power switch

This switches the unit on and off. The LED above the switch will glow green when the unit is on.

Remote control handset

The Delta 150 is supplied with the CR50 remote control handset. It is powered by 4 x manganese alkaline AAA cells (supplied), which are inserted in the base of the handset. To access the battery compartment, slide the whole bottom panel forwards approximately 5cm (2 inches).

Take care to insert the batteries the right way round. We recommend that the batteries are removed from the handset if the unit is not to be used for some time.

Remote functions

The CR50 allows remote operation of the volume, mute, standby, audio mode (NICAM or FM) and channel change functions.

Pressing the volume + button increases the volume.

Pressing the volume – button reduces the volume.

The system takes about 10 seconds to go from minimum to maximum volume or vice versa. When the Delta 150 is first turned on, the volume level is automatically set for a quiet listening level, i.e. about 30 dB below the maximum output.

Pressing the mute button mutes the audio output fully. Pressing the mute button a second time restores the output. This is particularly useful for answering the phone, or when the door bell rings.

Pressing the NICAM button selects the audio mode, either FM or NICAM. Pressing the NICAM button when a dual language programme is transmitted selects either L1 or L2.

Pressing one of the 8 channel preset buttons selects the desired channel directly.

Pressing the standby button puts the Delta 150 into the 'standby' mode. The audio, video and remodulated RF output signals are muted and all LEDs are extinguished except the power LED. Pressing the standby button again restores all functions to their pre-standby status.

The CR50 handset has a range of about 5 metres, and should always be pointed towards the centre of the unit. Take care not to obstruct the remote receiver (located next to the channel number LED), or the tuner will not receive the handset's commands.

When using the handset, hold each button down for about 1 second. Do not attempt to press more than one button at a time.

Note

1. If the remote control becomes lost or accidentally disabled, it is possible to remove the Delta 150 from its 'standby' or mute modes by briefly switching the unit off and on again with the mains power switch.

2. The two unmarked buttons on the CR50 have no function.

Connecting cables

When dealing with high quality hi fi components, such as those with the resolving power of the Delta 150, the question of connecting cables becomes of paramount importance. We strongly recommend that only first class interconnect cables are used, such as those from the AudioQuest range. Detailed information on the AudioQuest range of video and audio interconnect cables can be obtained from your dealer, or the factory.

As a rule of thumb, you might consider budgeting to spend between 5% and 20% of the cost of your system on cable. Surprising though it may seem, this can be one of the most effective upgrades you can carry out.

We suggest that you discuss the matter of video and audio interconnect cables (and loudspeaker cables) with your dealer.

Typical A/V system connections incorporating the Delta 150

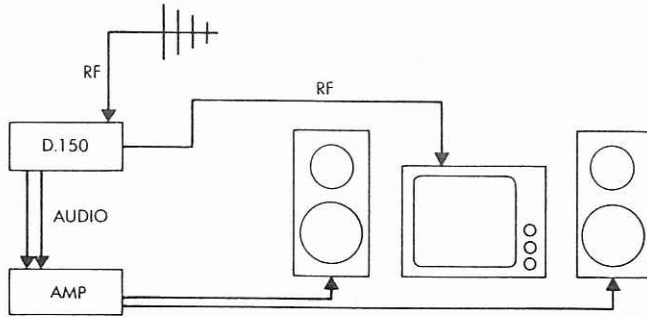


Figure 1. Simple configuration using the Delta 150's remodulated output

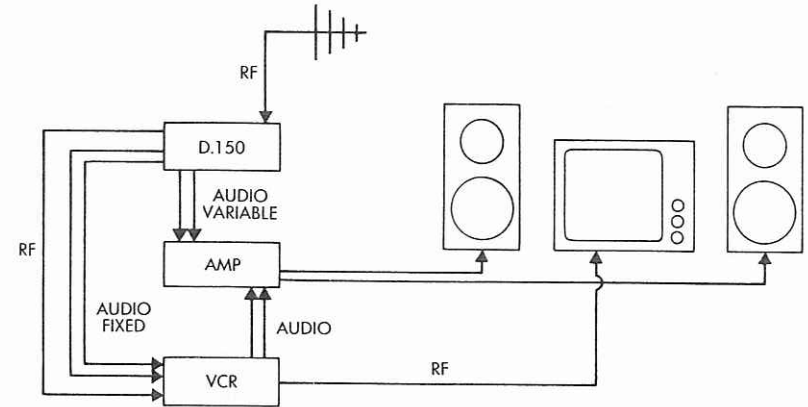


Figure 2. Simple configuration connecting your TV and VCR to the Delta 150, using remodulated outputs.

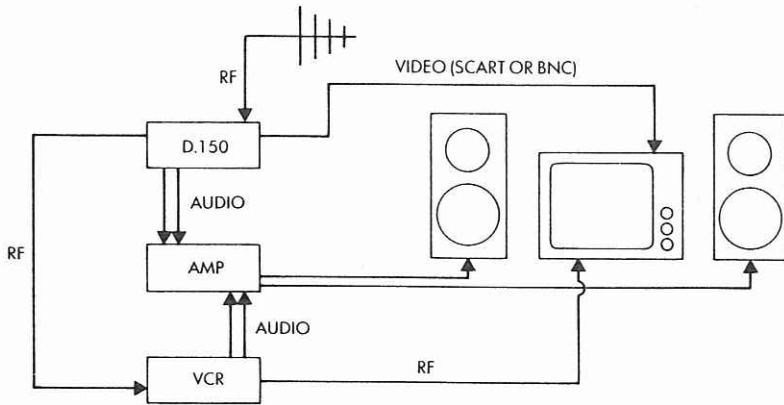


Figure 3. Configuration making use of TV set fitted with a SCART socket.

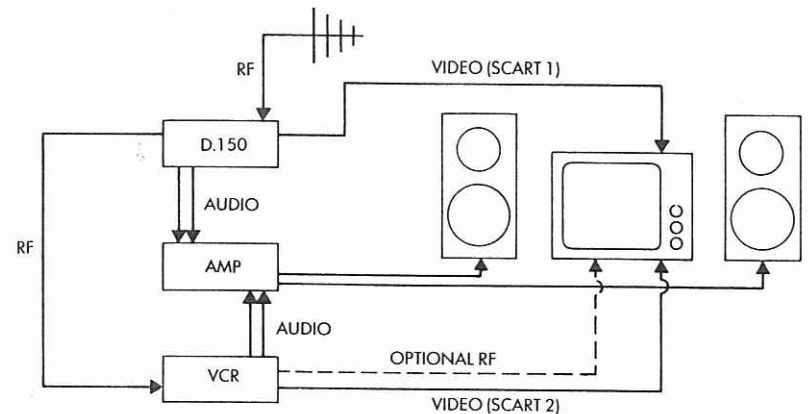


Figure 4. Configuration making use of TV set fitted with two SCART sockets.

Faults and their likely causes

No picture or sound. Check that:

1. the unit(s) are turned on and plugged into working mains outlets.
2. the Delta 150 is not in the 'standby' mode (all lights off except the green power LED). If so, press the standby button on the remote control, or briefly switch the unit off and on again with the power switch on the right side of the front panel.
3. your Delta 150 and/or TV has stored the TV station correctly.
4. the chosen TV station is broadcasting at the time.

Picture OK, but no sound. Check that:

1. the Delta 150 is not in the mute mode. If so, press the mute button on the remote control, or briefly switch the unit on and off again with the mains power switch.
2. the variable audio output of the Delta 150, if in use, is turned up (use the remote control).
3. the amplifier is switched on, set to the correct input and that the volume is turned up.
4. the audio leads between the Delta 150 and your amplifier are properly connected.
5. the loudspeakers are connected correctly.

Sound from one channel only. Check that:

1. the balance control on the amplifier is positioned centrally.
2. the audio leads are fitted correctly, and the wiring is not faulty. Check by interchanging left and right leads.
3. both loudspeakers are connected correctly to the amplifier's output terminals.

Sound OK, but no picture. Check that:

1. your TV set is selecting the correct channel.
2. if using SCART – SCART lead (Eurocable), the external input has been selected on the TV/VCR.
3. the video cables to the TV are plugged in and connected correctly.

Sound OK, but poor picture. Check that:

1. all the aerial (RF) plugs are pushed home firmly in their sockets and are correctly fitted to their co-axial cables. If the outer braiding (earth) of the cable is allowed to come into contact with the central core of the cable, or the centre pin of the plug, this will result in a very poor picture.
2. mutual interference is not being caused between TV stations broadcasting between channels 30-40 and the remodulated outputs from the Delta 150, VCR or a satellite receiver. Careful retuning of some or all of the remodulators fitted to these devices may be necessary to effect a cure.
3. patterning of an otherwise clear picture may be caused by (2) above or by cross modulation distortion in the tuner head of your Delta 150, VCR or TV. This is due to excessive signal levels and may usually be controlled with simple in-line co-axial attenuators fitted in the aerial leads between the units.
4. persistent hues near the corners of your TV picture may be caused by your hi fi speakers being too close to the TV screen. The speakers' powerful magnets affect the colour purity of the TV tube. Move the speakers further away and turn the TV on and off again in order to activate its degaussing circuits until the problem is solved.

Picture OK, but interference (crackling) on NICAM sound

The NICAM digital signal is very robust and can normally be received cleanly, even with a weak signal which gives an unacceptably noisy picture.

However, the NICAM signal is susceptible to adjacent channel interference. This is a particular problem when trying to pick up a distant NICAM TV transmission in the presence of a strong local transmitter which uses similar channel numbers. The problem manifests itself as a severe crackling on the NICAM sound channels. FM sound is unaffected, and in severe cases the Delta 150 will switch back automatically from NICAM to FM sound as the NICAM signal degrades.

There is no cure for this except to null out the interfering signals. Careful re-orientation of your aerial may help as may a more directional aerial array. If in doubt consult your local aerial contractor.

Further information on the availability of NICAM broadcasts may be obtained from:

Independent Broadcasting Authority
Engineering Information
Crawley Court
Winchester
Hants
SO21 2QA

Telephone 0962 822444

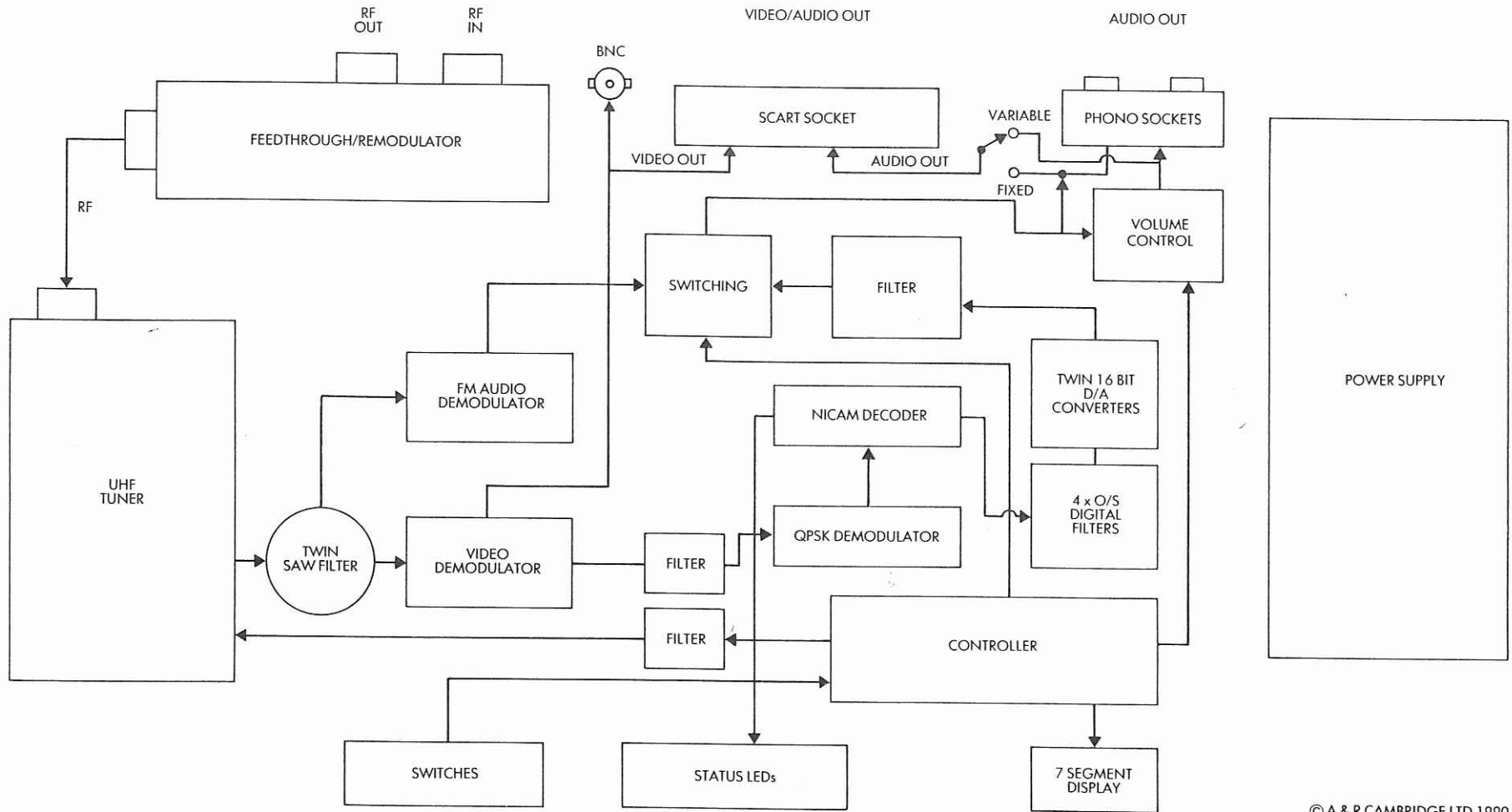
(see also ORACLE, p 697)

and

British Broadcasting Corporation
Engineering Information Department
Broadcasting House
London
W1A 1AA

Telephone 071 580 4468 Extension 5040

Arcam Delta 150 NICAM Decoder



Technical specifications

Suitable for CCIR TV system I (UK)

RF input

Frequency range 471.25 – 855.25 MHz (Channels E21 – E69)

Impedance 75 Ohms

Input signal for onset of video noise 50dBuV

NICAM drop-out point 28dBuV

Maximum input signal 75dBuV

Locked picture and sound 20dBuV

RF system characteristics

AFC hold in +/- 1.25 MHz

AFC pull in +/- 1.25 MHz

UHF modulator/booster

Boost gain 0 dB +/- 3 dB

Carrier frequency 543.25 – 615.25 MHz (E30 – E39)

Carrier level 73dBuV +/- 3dB

Test signal 2 vertical bars, line sync. only

IF section

Employs dual surface wave filter

Vision frequency 39.5 MHz

FM sound frequency 33.5 MHz

Video section both SCART and BNC outputs

Output level 1V peak to peak into 75 Ohms

Output impedance 75 Ohms

Audio section

Minimum load 5kOhms

Nominal output level 500mV

FM mono audio

Frequency response 40 Hz – 12 kHz +/- 2dB

Signal to noise ratio 70dB CCIR

De-emphasis 50uS

NICAM audio

Frequency response 30Hz – 14kHz +/- 1dB

THD, NICAM 0dB reference 0.02%

Signal to noise ratio 83 dB CCIR

De-emphasis CCIR J17

Channel balance +/- 1dB

Dimensions

Width 430mm

Height 64mm

Depth 265mm (excluding rear panel connections)

Weight

Net 3.1 kg

Packed 4.5 kg

Guarantee for UK sales

This equipment has been fully tested and a full record of these tests made before despatch from the factory. Both the workmanship and the performance of this equipment are (except as set out below) guaranteed against defects for a period of two years from the date of purchase, provided that it was originally purchased from an authorised UK dealer under a consumer sale agreement. (The words 'consumer sale' shall be construed in accordance with Section 15 of the Supply Of Goods (Implied Terms) Act 1973.)

The manufacturers can accept 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 this guarantee.

This guarantee covers both labour and parts, and is transferable to subsequent purchasers, but the liability of the manufacturers is limited to the cost of repair or replacement of the defective parts (at the discretion of the manufacturers) and under no circumstances extends to consequential loss or damage.

Claims under this guarantee

This equipment should be packed in the original packing and returned to the dealer from whom it was purchased or, failing this, to any other authorised Arcam dealer. If it is not possible to return the equipment by hand, then it should be sent carriage prepaid by a reputable carrier.

If the original packing is not available, replacement packing can be purchased from the manufacturers. The equipment should not be sent by post.

DO NOT CONSIGN THE EQUIPMENT TO ARCAM UNLESS YOU HAVE BEEN SPECIFICALLY REQUESTED TO DO SO BY THE MANUFACTURER'S TECHNICAL SALES OR SERVICE DEPARTMENTS. DO NOT UNDER ANY CIRCUMSTANCES ATTEMPT TO DISASSEMBLE THE EQUIPMENT BEFORE DESPATCH.

If you have any difficulty complying with these requirements, please contact the manufacturers at the following address:

ARCAM (A & R Cambridge Limited)
Pembroke Avenue,
Denny Industrial Centre,
Waterbeach,
Cambridge, CB5 9PB, England.

Telephone (0223) 861550 and (0223) 440964
Fax (0223) 863384

In either case you should state clearly your name and address, the date and place of purchase together with a brief description of the fault. In the event of equipment being returned which, after having been tested, is found to comply with the published specification, the manufacturers reserve the right to charge a reasonable fee for testing the equipment, and for the return carriage.

Enquiries

The manufacturers are happy to answer any queries you may have regarding the use of this equipment on the condition that this enquiry is by letter and a stamped addressed envelope is provided. You should state clearly the serial number of the unit, the dealer from whom it was purchased, and the date of purchase.

THIS GUARANTEE IN NO WAY VARIES OR REMOVES A PURCHASER'S STATUTORY RIGHTS.

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