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**LDK 7500 + LDK5490**

**Viper**

**Digital Cinematographic Camera**

**Technical Manual**

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## About This Manual

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### Service policy

The LDK 7500 + LDK 5490 is a sophisticated camera containing state-of-the-art electronic components which are designed to provide long-life operation without the need for maintenance. With this in mind, the service policy of Thomson Broadcast Solutions endeavours to ensure that help will be quickly on hand in the unlikely event of anything going wrong. The guiding principles of the Thomson Broadcast Solutions first line maintenance philosophy are speed and cost effectiveness. First line maintenance is dedicated to keeping your camera operational, despite a fault, by module replacement and the replacement of minor mechanical parts by the user.

### Purpose of this manual

The provision of correct information is the first step in ensuring the operational integrity of the camera. Information on the operation of the camera is to be found in the Operators's Manual.

This technical manual is an integral part of the service policy. It ensures that you will be able to install and set-up your camera to meet the requirements of your environment. This information on the installation of the camera is contained in Section 2 of the manual. The remaining sections of the manual provide first line service information so that suitably qualified service personnel can detect and repair faults, normally by module replacement.

Because of the complexity of some of the components, second line service can only be carried out at the specially equipped service centres and information concerning second line maintenance is not supplied in this manual.

### Intended audience

The manual is intended as a guide to those with a working knowledge of camera systems and installation techniques. The first line detection and repair of faults requires a general knowledge of test and measurement techniques.

### Structure of this manual

The manual is divided into five different sections:

#### Section 1: Safety Instructions

Outlines the safety precautions that must be taken when using the camera.

#### Section 2: Installation.

Gives instructions on the integration of the camera into the operating environment and the customization of certain hardware functions

#### Section 3: Replacements.

Gives information on the replacement of components at first line level.

#### Section 4: Adjustments.

Contains the adjustment procedures to be followed to obtain the best performance.

#### Section 5: Exploded Views

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### Identification and Status

To indicate the status of a drawing, a box with the numbers 0 to 9 is shown in the bottom-right of the drawing. The number that is crossed-out is the status number of the drawing. For example, in the illustration below, the status is 1.

0	<del>1</del>	2	3	4
5	6	7	8	9

A sticker is used on the units themselves to identify them and to indicate their status. For example, in the illustration below, the top line is the 12-digit number that identifies the unit type.

3922	406	88991
00121107	00	01

The first four digits of the number on the second line represent a date code (year, week); the next four digits represent the serial number for that week.

The number in the grey area indicates the status of the unit. The last two digits represent the number that will be given to the next status. However, if these two digits are contained in a box, then this is the current status. For example, in the illustration above, the current status of the unit is 01.

Line 1	→	3922 407 00000
Line 2	→	123456AA0101
Line 3	→	VR/0123456789

### Line 1

This is the code number of the printed circuit board assembly (PCB).

### Line 2

This is the serial number of the PCB. The first 6 digits and the 2 letters are for internal use. The last four digits represent the date of the manufacturing: wwyy.

Example:

123456AA1402 means the PCB is manufactured in week 14 of the year 2002.

### Line 3

This is the status of the PCB.

The digit after the first slash is the status. If there is no number before the slash, it means that the status is less than 10, a 1 before the slash means the status is between 10 and 19, a 2 before the slash means between 20 and 29 etc.

Example:

VR4567891012 means status 4

VR3/78901234 means status 37.

Example of LDK number:

LDK 4501/01 means 8926 **450 10101**

LDK 4500/00 means 8926 **450 00001**

Numbers of printed circuit board assembly

- 3922 406 xxxxx or 3922 407 xxxxx

Number (screened in PCB layout) of printed circuit board assembly: 3922 411xxxxx (not a spare part).



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# Section 1

## Safety Instructions

*This section outlines the precautions that must be taken into account when using the adapter.*

### Contents

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Safety Summary .....	1-2	Cautions and Warnings .....	1-2
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This information is intended as a guide for trained and qualified personnel who are aware of the dangers involved in handling potentially hazardous electrical/electronic equipment. It is not intended to contain a complete list of all safety precautions which should be observed by personnel in using this or other electronic equipment.

The installation, maintenance and service of this equipment involves risks both to personnel and equipment and must be performed only by qualified personnel exercising due care.

Personnel engaged in the installation, operation, maintenance or servicing of this equipment are urged to become familiar with First Aid theory and practices.

During installation and operation of this equipment, local building safety and fire protection standards must be observed.

Before connecting the equipment to the power supply of the installation, the proper functioning of the protective earth lead of the installation needs to be verified.

Whenever it is likely that safe operation is impaired, the apparatus must be made inoperative and secured against any unintended operation. The appropriate servicing authority must then be informed. For example, safety is likely to be impaired if the apparatus fails to perform the intended function or shows visible damage.

This product has been designed and tested according to EN60065.

When performing service, be sure to read and comply with the warning and caution notices appearing in the manuals. Warnings indicate danger that requires correct procedures or practices to prevent death or injury to personnel. Cautions indicate procedures or practices that should be followed to prevent damage or destruction to equipment or property.

### WARNING

THE CURRENT AND VOLTAGES PRESENT IN THIS EQUIPMENT ARE DANGEROUS. ALL PERSONNEL MUST AT ALL TIMES FOLLOW THE SAFETY REGULATIONS.

ALWAYS DISCONNECT POWER BEFORE REMOVING COVERS OR PANELS.

ALWAYS DISCHARGE HIGH VOLTAGE POINTS BEFORE SERVICING.

NEVER MAKE INTERNAL ADJUSTMENTS, PERFORM MAINTENANCE OR SERVICE WHEN ALONE OR WHEN FATIGUED.

IN CASE OF AN EMERGENCY ENSURE THAT THE POWER IS DISCONNECTED.

ANY INTERRUPTION OF THE PROTECTION CONDUCTOR INSIDE OR OUTSIDE THE APPARATUS, OR DISCONNECTION OF THE PROTECTIVE EARTH TERMINAL, IS LIKELY TO MAKE THE APPARATUS DANGEROUS. INTENTIONAL INTERRUPTION IS PROHIBITED.

USE ONLY FUSES OF THE TYPE AND RATING SPECIFIED.





### CAUTION

To prevent risk of overheating, ventilate the product correctly.


Connect the product only to a power source with the specified voltage rating.

Do not allow system ground currents to exceed 1.5A in the outer shield of the triax cable or 0.2A in other cable shields.

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Symbol	Colour	Explanation
	Red	High voltage terminal at which a voltage, with respect to an other terminal, exists or may be adjusted to 1000V or more.
	Yellow/Black	Live part.
	Yellow/Black	This marking indicates that the operator must refer to an explanation in the Instruction Manual, or that a specific component must be replaced by the component specified in the documentation for safety reasons.
	White/Black	Protective earth (ground) terminal.

### Cathode ray tubes

Components marked  on the circuit diagram are critical for safety and include those specified to comply with X-ray emission standards for units using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

When servicing units that use cathode ray tubes (CRTs), the cathode ray tubes themselves, the high voltage circuits and related circuits are specifically chosen so that they comply with recognized codes pertaining to X-ray emission.

Consequently, when servicing, replace the cathode ray tubes and other parts with specified parts only. Do not attempt to modify these circuits as any unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

Handle the cathode ray tube only when wearing shatterproof goggles and after discharging the high voltage completely.



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## Section 2

### Installation

*This section provides information which is relevant when the camera is to be used for the first time. Packing and unpacking instructions together with information on the integration of the camera into your studio system are provided. The procedures for the customization of certain hardware functions and connector information is also provided.*

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Inspect the shipping container for evidence of damage immediately after receipt. If the shipping container or cushioning material is damaged, it should be kept until the contents of the shipment have been checked for completeness and the units have been checked mechanically and electrically.

The shipping container should be placed upright and opened from the top. Remove the cushioning material and lift out the contents.

The contents of the shipment should be checked against the packing list. If the contents are incomplete, if there is mechanical damage or defect, or if the units do not perform correctly when unpacked, notify your Thomson Multimedia Broadcast Solutions sales or service centre within eight days. If the shipping container shows signs of damage or stress, notify the carrier as well.

If a unit is being returned to Thomson Multimedia Broadcast Solutions for servicing, try to use the containers and materials of the original packaging. Attach a tag indicating the type of service required, return address, model number, full serial number and the return number which will be supplied by your Thomson Multimedia Broadcast Solutions service centre.

If the original packing can no longer be used, the following general instructions should be used for repacking with commercially available materials:

- a. Wrap unit in heavy paper or plastic.
- b. Use strong shipping container.
- c. Use a layer of shock-absorbing material around all sides of the unit to provide firm cushioning and prevent movement inside container.
- d. Seal shipping container securely.
- e. Mark shipping container FRAGILE to ensure careful handling.

The camera head is delivered in a ready-to-use state, however, there are occasions when it might be necessary to re-adjust some functions after, for example, fitting a new lens.

A large number of functions can be set-up using the control facilities of the menu system. In addition to this software set-up there are some functions which can be selected or adjusted internally in the camera.

Refer to the next chapters for instructions.

### Lens matching

When a camera is supplied with a lens it is not necessary to perform any of the following adjustments as the lens is already matched to the camera. However, if you wish to change to a different type of lens or the lens is not supplied with your camera, back focus, white shading and auto iris adjustment procedures may have to be performed.

- Colour balance.  
If required, perform the gain adjustment of the preprocessor board and/or white shading adjustment procedures, described in section 4.
- Auto Iris Adjustment  
If a different lens either works too slow or overshoots too much with the auto iris control, adjust the potentiometer on the lens to obtain acceptable operation. Refer to the lens documentation.
- Back Focus Adjustment  
To adjust the back focus of the lens refer to the documentation of the lens.

## Attaching an Adapter

The adapter can be used with various HD camera heads. To attach the adapter to the camera proceed as follow the steps in the order given:

### Caution

Do not connect this HD adapter to an SD camera head - connectors and guide pins are not compatible.

### Caution

Be extremely careful. Do not allow the guide pins to damage the pins of the connector.

### Caution

Tightening the screws in the wrong order could result in mechanical damage to the camera.

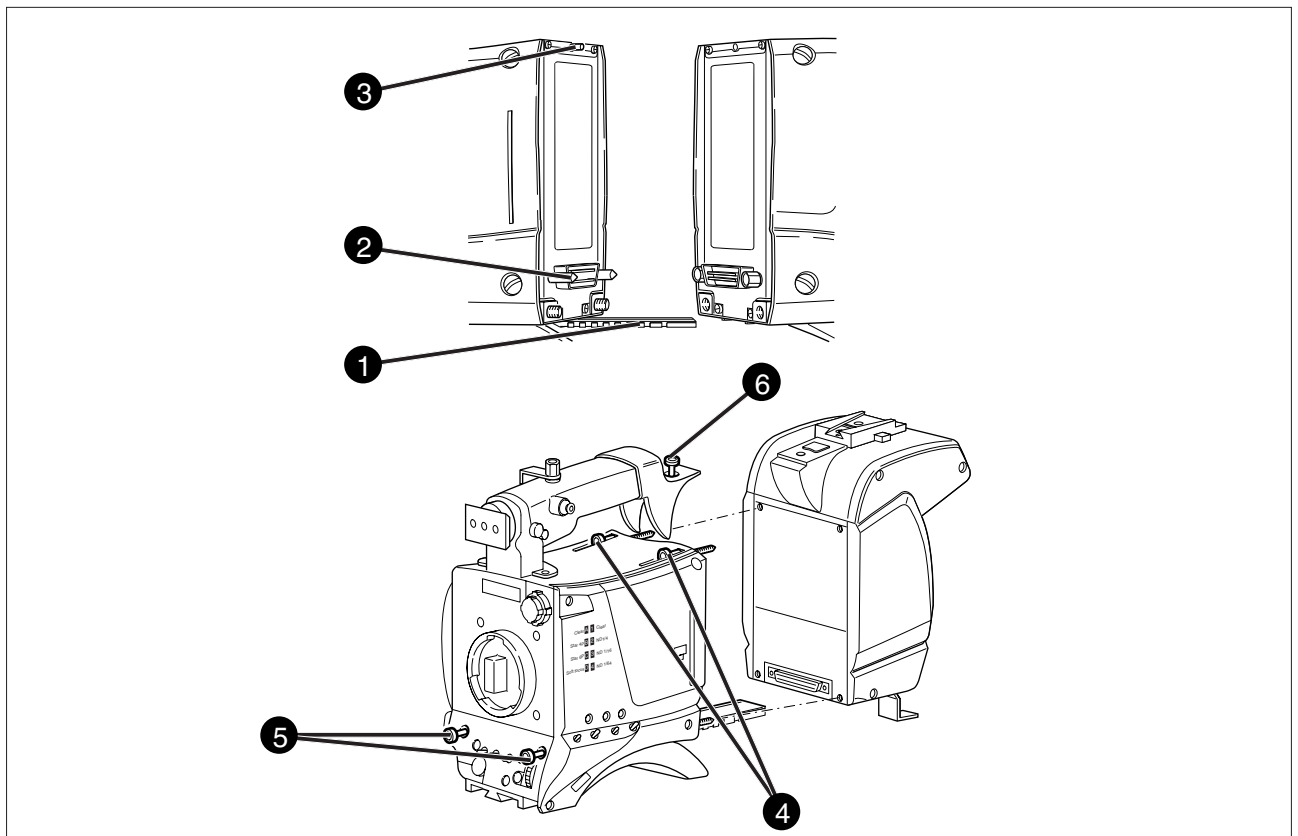
- a. Using the rail **(1)** on the bottom of the camera head as a guide, fit the guide pins **(2)** on either side of the connector and the guide pin **(3)** at the top rear of the camera head into the corresponding slots of the adapter.
- b. First, tighten the two horizontal screws **(4)** on the top of camera.
- c. Next, tighten the two horizontal screws **(5)** at the front of the camera.
- d. Lastly, tighten the vertical screw **(6)** in the handle of the camera.

## Detaching an Adapter

To detach the adapter from the camera head follow the steps for attaching it in the reverse order.

### Caution

Loosening the screws in the wrong order could result in mechanical damage to the camera.



# Connectors

## Viewfinder connector

1. -80V (not used)
2. n.c.
3. GND
4. INTN-D
5. vf ext video (not used)
6. n.c.
7. vf video ret
8. SDA-D
9. SCL-D
10. vf ext video ret (not used)
11. GND
12. vf video
13. Pb vf ret
14. Pr vf ret
15. GND
16. +batt
17. +batt
18. Pb vf
19. Pr vf
20. shield

**Hirose 20-pole female; panel view**

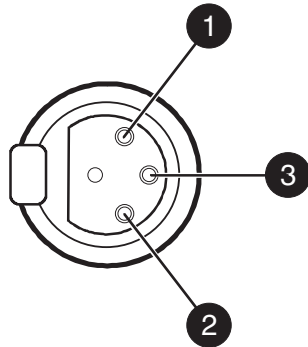
Cable 20-pin male connector:  
Part number 5322 320 12159

## RS232 connector

1. SPARE
2. RS-RXD
3. RS-TXD
4. RS-DTR
5. RS-DGND
6. RS-DSR
7. RS-RTS
8. RS-CTS
9. +12V

**D-conn 9-pin male; panel view**

### Audio microphone connector

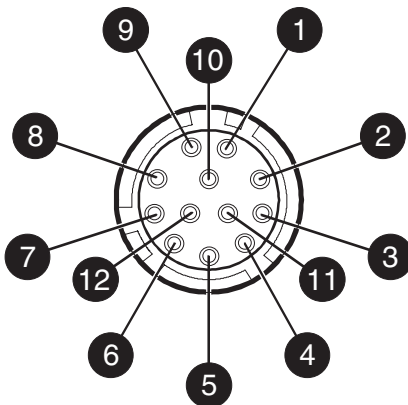


XLR 3-pole female

1. Audio Screen
2. Audio In
3. Audio Return

Microphone impedance >200 ohm  
Sensitivity controlled via camera menu: -64 dBu to -22 dBu.  
Signal at pin 2 of audio input is in phase with signal at pin 2  
of audio output on Breakout box.

### Lens connector



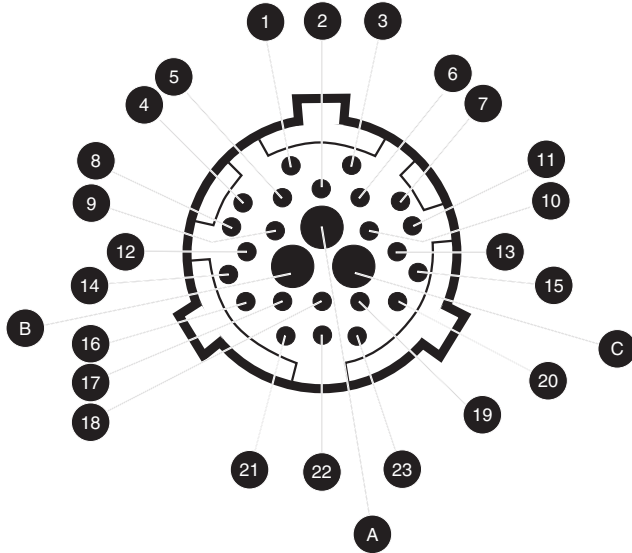
Hirose 12-pole female; panel view

Cable 12-pin male connector:  
Part number 5322 265 41208

1. Ext. Video On/Off
2. VTR Trigger Switch
3. -batt
4. Momentary Iris
5. IrisControl
6. + batt
7. Iris Follow
8. Lens Servo
9. Range Extender
10. Zoom Follow
11. Focus follow\*
12. Spare

\* not standard on lens

## Multicore connector



**23+3-pin male; panel view**  
Panel connector part number 3922 040 03231

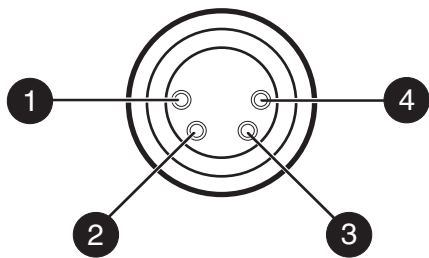
- 1 Audio X
- 2 Audio Shield
- 3 Audio Y
- 4 Tally in (active >3V; imped. 10KOhm)
- 5 -Batt
- 6 +Batt
- 7 Record out (stop < 0.2V; start >4.5V; imped. 1KOhm)
- 8 -Batt sense
- 9 -Batt
- 10 +Batt
- 11 +Batt sense
- 12 -Batt
- 13 +Batt
- 14 TXD
- 15 RXD
- 16 TXD ret
- 17 Playback in
- 18 CVBS
- 19 Gen Lock in (HD tri-level sync. 0.6Vpp, 75 Ohm)
- 20 RXD ret
- 21 Playback ret
- 22 CVBS ret
- 23 Gen Lock in ret
- A Dual Link A (see table)
- B HD SDI (see table)
- C Dual Link B (see table)

## Viper signal output

BNC connectors	Multicore pins	Processing modes			
		FilmStream	HD Stream	R, G, B	Y, Cr, Cb
HDSDI-A	A	Dual link 4:2:2*	HDSDI 4:2:2*	Dual link 4:2:2	HDSDI 4:2:2
Viewing	B	HDSDI 4:2:2**	HDSDI 4:2:2**	HDSDI 4:2:2	HDSDI 4:2:2
HDSDI-B	C	Dual link 0:2:2*	HDSDI 4:2:2*	Dual link 0:2:2	HDSDI 4:2:2

\* no video processing  
\*\* monitoring quality only

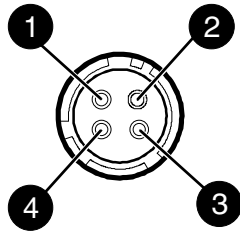
## Power input connector



**XLR4-pin male; panel view**

- 1. - Batt
- 2. - Batt sense
- 3. + Batt sense
- 4. + Batt (+10.5V.....+17V)

## Power output connector

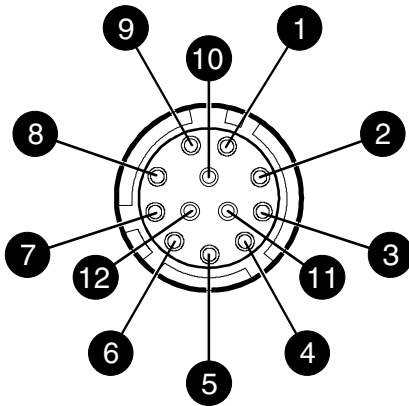


1. Gnd
2. On air (TTL level; H= on air)
3. Housing
4. + Batt (max. 2A)

Hirose 4-pole female; panel view

Cable 4-pin male connector:  
Obtainable from Hirose part number HR10A-7P-4P

## LCP connector



1. -
2. RS-232 RXD
3. RS-232 TXD
4. -
5. ground
6. -
7. -
8. -
9. +Batt
10. -
11. -
12. Housing

Hirose 12-pin male; panel view

## Cables and breakout box (options)

### Cables

To connect the multicore connector of the camera to the breakout box the following cables are optionally available:

HD Cable Assy 10m Full Function	LDK8175/01
HD Cable Assy 40m Full Function	LDK8175/04
HD Cable Assy 10m Standard	LDK8175/11
HD Cable Assy 40m Standard	LDK8175/14

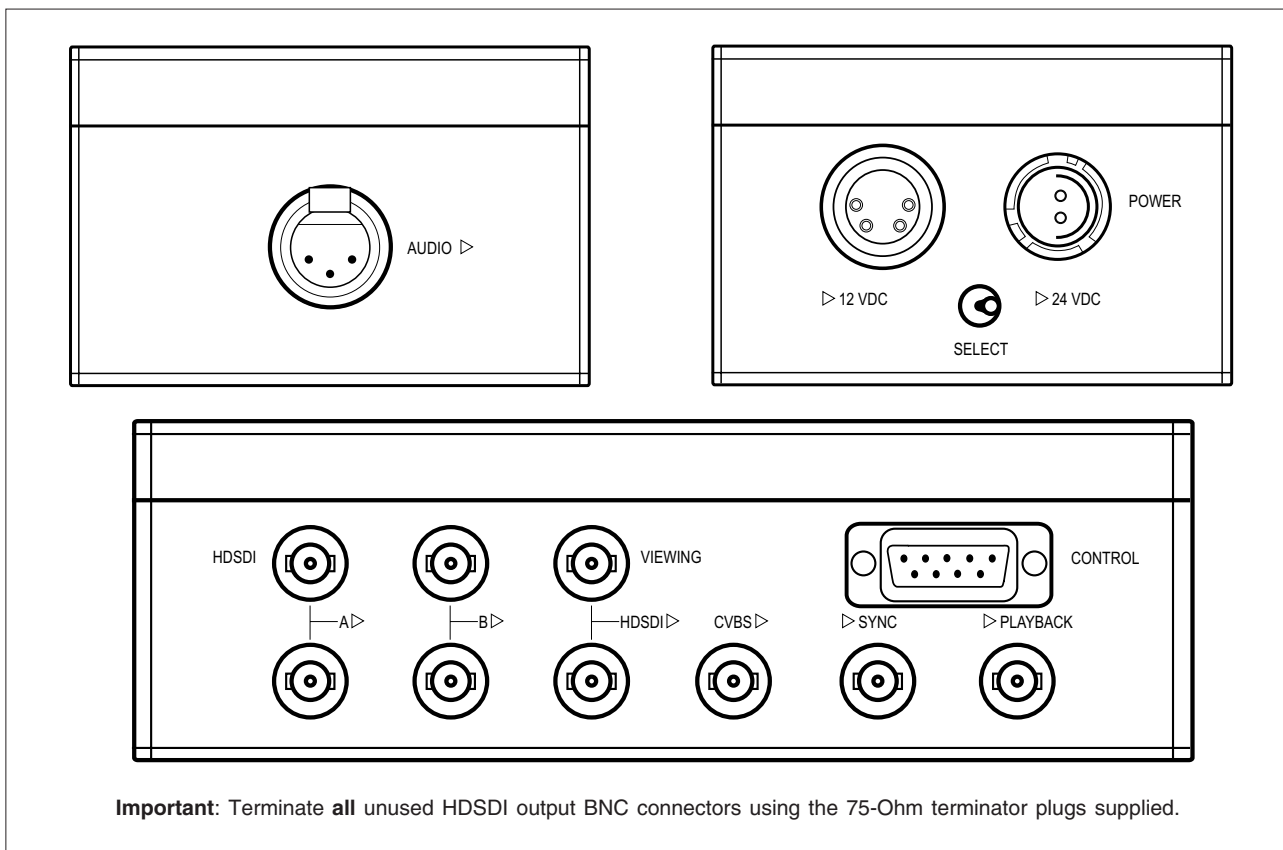
In the standard cables the following pins are not connected: 1, 2, 3, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 and B (see multicore connector pinning).

### Breakout box option (LDK 8275)

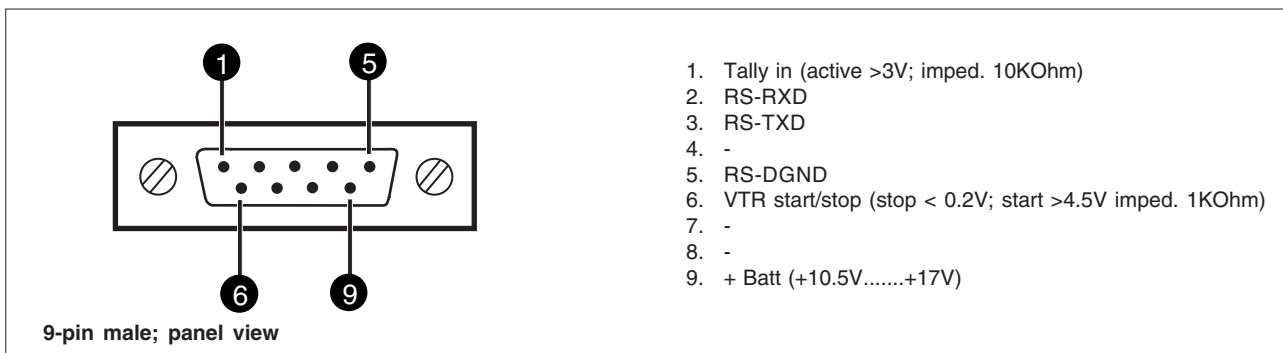
The breakout box has the following connectors:

- Multicore in
- HDSDI A out (2x BNC) \*
- HDSDI B out (2x BNC) \*
- Viewing HDSDI out (2x BNC) \*
- CVBS out
- Sync. in
- Playback in
- Control
- Power in 12 Vdc
- Power in 24 Vdc
- Audio out

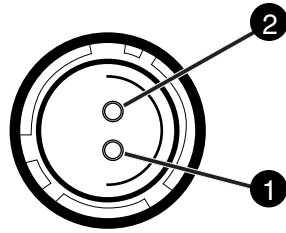
\* terminate (75 Ohm) if not used



### Control connector



### Power input connector 24 Vdc



Fischer 2-pin male; panel view

Cable 2-pin female connector:  
Fischer part number WS105Z087/7.2

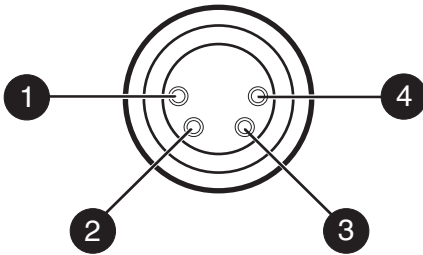
1. - Batt
2. + Batt (+17V.....+30V)

Use the SELECT switch to choose this input.

**Note**

If the DC output connector of the camera is drawing 18W or more and a 50m cable or longer is used, then the power supplied to this socket will not be sufficient to operate the system. Power the camera locally to use cables lengths greater than 50m.

### Power input connector 12 Vdc



XLR 4-pin male; panel view

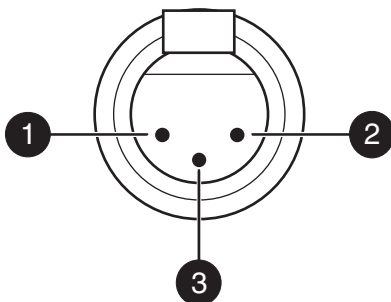
1. - Batt
2. - Batt sense
3. + Batt sense
4. + Batt (+10.5V.....+17V)

Use the SELECT switch to choose this input.

**Note**

If the DC output connector of the camera is drawing 18W or more and a 40m cable or longer is used, then the power supplied to this socket will not be sufficient to operate the system. Power the camera locally to use cables lengths greater than 40m.

### Audio connector



XLR 3-pin male; panel view

1. Shield
2. Audio in
3. Audio return

Signal at pin 2 of audio output is in phase with signal at pin 2 of audio input on camera.

Sensitivity controlled in camera: -64 dBu to -22 dBu.

# Specifications

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## General data

Power requirements:	12 Vdc nominal (11.5 to 17 Vdc)
Power consumption:	44 W approx. (incl. 2-inch VF and FilmStream adapter)
Operating temperatures:	-20°C to +40°C (-4°F to +113°F)
Storage temperatures:	-20°C to +60°C (-4°F to +140°F)
Weight:	4.3 kg (9.7 lbs) approx. (incl. 2-inch VF and FilmStream adapter)
Dimensions:	197 x 117 x 349 mm (H x W x L)
Viewfinder CRT:	2" monochrome
2" Viewfinder resolution:	>600 TV lines (centre)
Output Modes:	FilmStream mode (RGB 10-bit log) HDStream (YUV 10-bit log) RGB (4:4:4) YUV (4:2:2)

Sensitivity:	2000 lux (186 ft cd) at F9.0 (typical, 1080p24 video mode). Effective ASA320 in FilmStream mode
Gain:	<b>FilmStream mode</b> (viewing channel only): -6, 0, +6, +12 dB -3dB to +12dB in 3dB steps (user definable presets in video modes)
S/N ratio:	54 dB in Y (typical, in video modes)
Modulation depth:	40% at 27 MHz
Exposure control:	Down to 1/1000 sec.
Variable shutter:	approx. 50 to 310 degrees

## Connectors

Front microphone input:	1x XLR-3 female, balanced, +48V
Viewfinder:	20-pin connector
Lens out:	12-pin connector

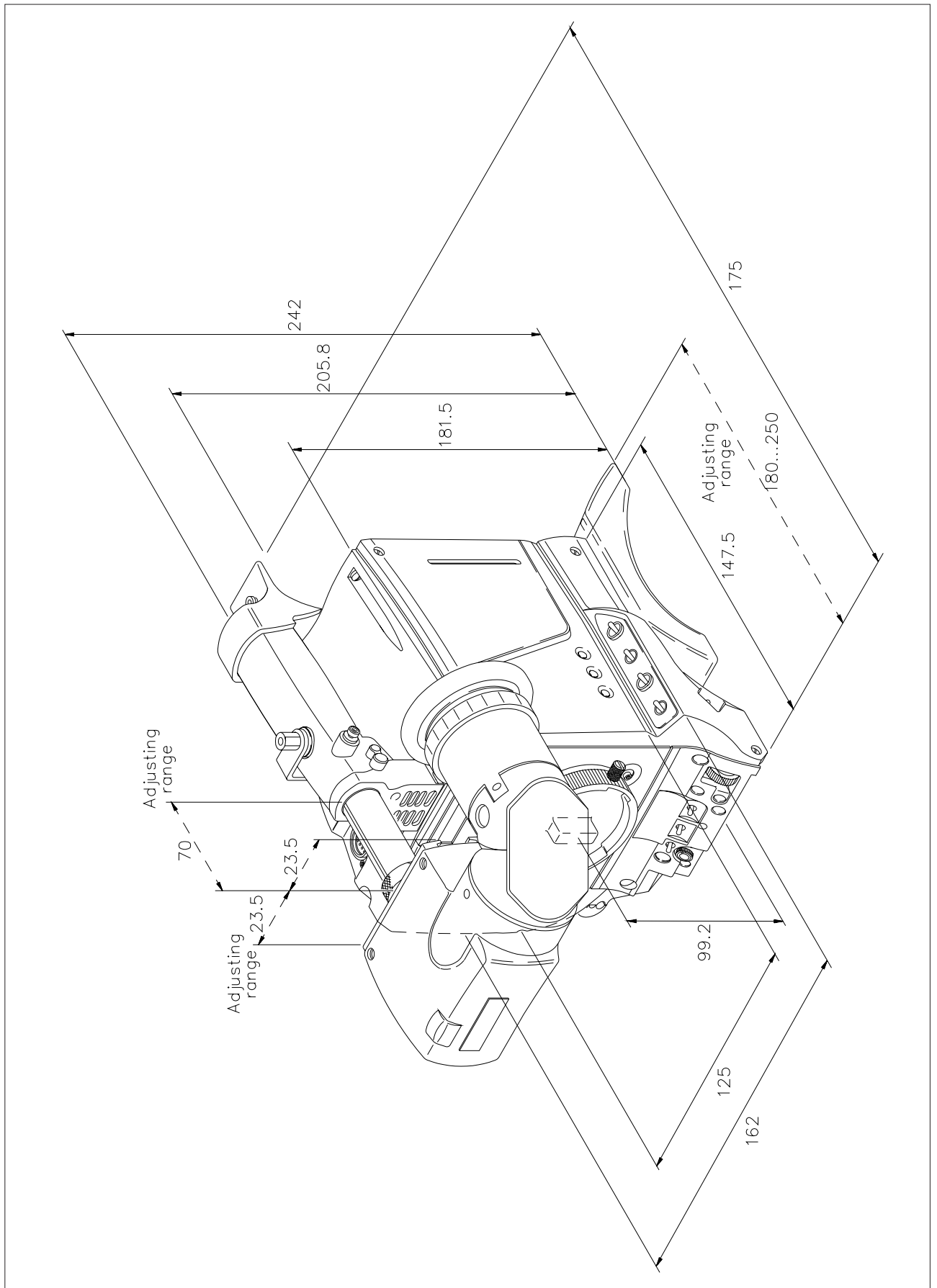
## Camera Head

Pick-up device:	3x2/3" HD-DPM <sup>TM</sup> CCDs
Picture elements:	9.2 million pixels 1920 (H) x 4320 (V) effective
Aspect Ratio:	16:9 (1.77:1) in 1080 or 720 lines or 2.37:1 in 1080p mode
Frame rates:	- 1080p: 23.98, 24, 25, 29.97 fps (segmented frame output) - 1080p: 23.98 fps with 3:2 pull-down to give 1080i59.94 - 1080i: 50, 59.94 Hz -720p: 23.98, 25, 29.97 fps with 2:2/3:2 frame repeat to give 50, 59.94 Hz -720p: 50, 59.94 Hz
Smear:	No vertical smear
Optical system:	F1.4 prism system
Optical filters:	1st Wheel Clear, 2-stop, 4-stop, 6-stop ND 2nd Wheel Clear, 4-point star, 6-point star, soft-focus
Electronic colour filters:	<b>RGB, YCrCb modes:</b> 3200K, 4700K, 5600K, 7200K, Auto white. <b>HDStream mode:</b> 3200K, 5600K, Thru (no correction). <b>FilmStream mode</b> (viewing channel only): 3200K, 4700K, 5600K, 7200K, Thru
Digital quantization:	12-bit A-to-D
Digital signal processing:	> 22 bits (not active in FilmStream mode)

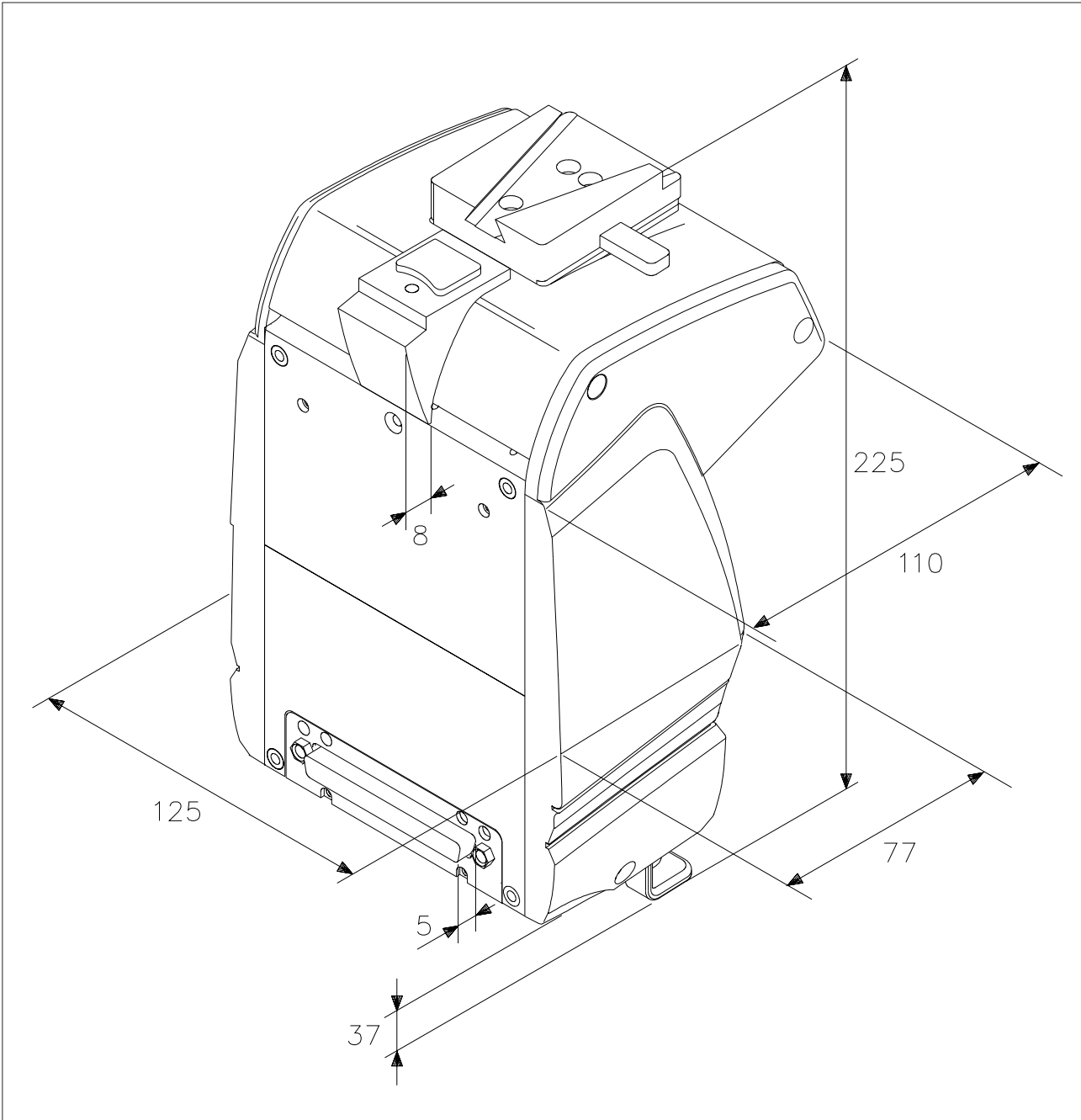
## LDK 5490 FilmStream adapter

Dual link HD SDI out:	BNC 2x, SMPTE 372M, 0.8 Vpp; 75 Ohm; 1.5 Gb/s (FilmStream or full resolution RGB 10-bits)
HD SDI out:	BNC 1x, SMPTE 292M, 0.8 Vpp; 75 Ohm; 1.5 Gb/s (viewing output in FilmStream and HDStream modes)
CVBS out:	BNC 1x, 1.0 Vpp; 75 Ohm, standard definition - viewing quality.
Viewfinder out:	BNC 1x, Y-signal of viewfinder or external video, 1 Vpp; 75 Ohm
DC In:	XLR-4, 12 Volts dc
DC Out:	4-pole Fischer, 12 Volts, 1.5A, (unregulated)
LCP:	12-pole Hirose, LCP-100 local control panel
Multicore:	23+3 pole, record start, return video (SD) in, genlock in, DC in, camera control, tally, CVBS out, audio out, HD SDI out, Dual link HD SDI out

## Camera head dimensions



## Adapter dimensions



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## Section 3

# Replacements

*This section gives information on the procedures to follow when replacing printed circuit boards and mechanical components at first line level.*

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The instructions given in this section are restricted to those modules which can be replaced at the first line service level. These modules include:

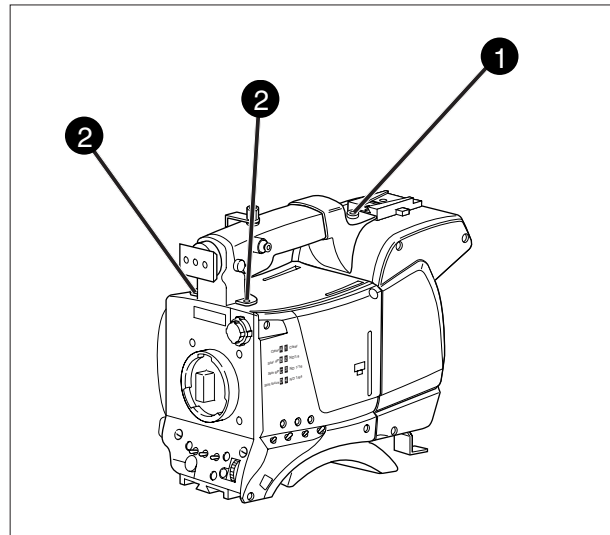
- The handgrip
- The printed circuit boards
- The front unit

After a printed circuit board has been replaced it is sometimes necessary to carry out adjustments to match the new boards to your camera and so maintain the performance levels. The relevant adjustment procedures are given in Section 4.

The procedures for removing the modules should be followed in reverse order when remounting the units.

To remove the handgrip proceed as follows:

- a. Remove the viewfinder from its support bracket on the handgrip.
- b. Loosen the screw ① securing the handgrip to the top of the adapter.
- c. Loosen the two socket head screws ② securing the handgrip to the front of the camera.

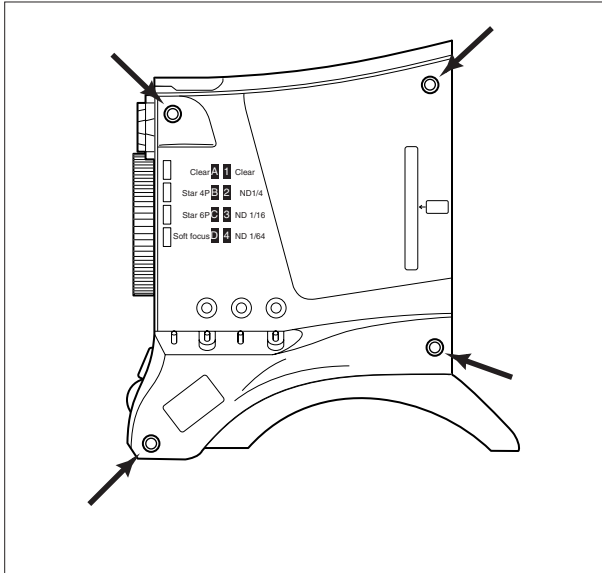


## Printed circuit boards

### Gaining access to camera head boards

To access the printed circuit boards remove the left side cover of the camera head as follows:

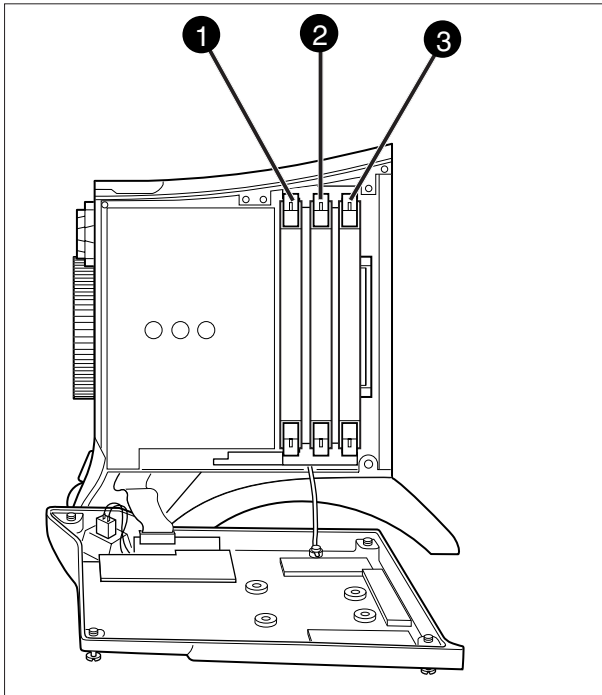
- Unscrew the four screws on the left side panel.
- Swing down the cover.



### Location of boards

The boards in the camera head are numbered as follows:

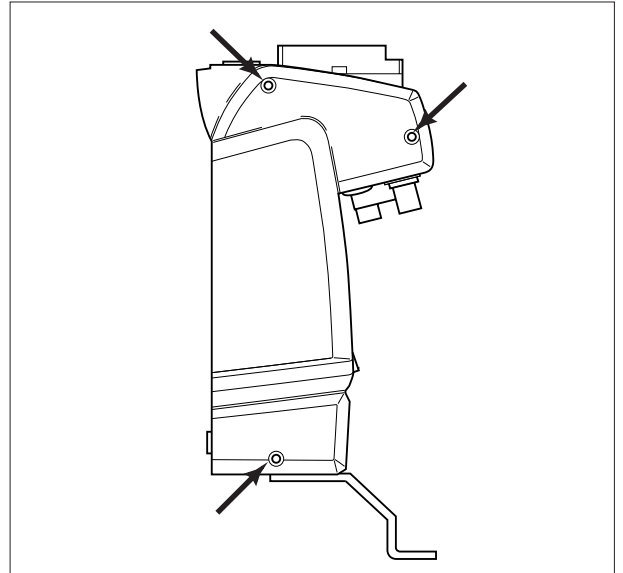
- Sync monitoring board
- Data board
- Front driver board



### Gaining access to adapter boards

To access the printed circuit boards remove the left side cover of the adapter as follows:

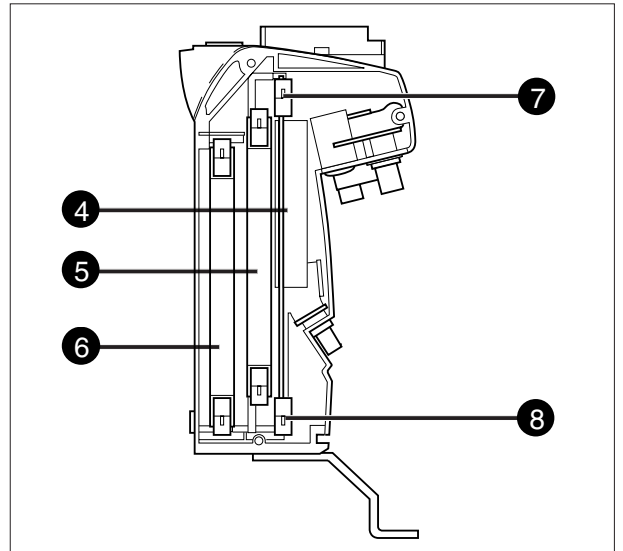
- Unscrew the three screws on the left side panel.
- Remove the cover.



### Location of adapter boards

The boards in the adapter are numbered as follows:

- Powerboard
- HDSOI output board
- Miscellaneous HDSOI board



### Removing a board

To remove a printed circuit board proceed as follows:

- Pull up the top print ejector 7 and pull down the bottom print ejector 8 to release the printed circuit board from its connector.
- Pull horizontally on these ejectors to slide the board clear of the camera.

## Front unit

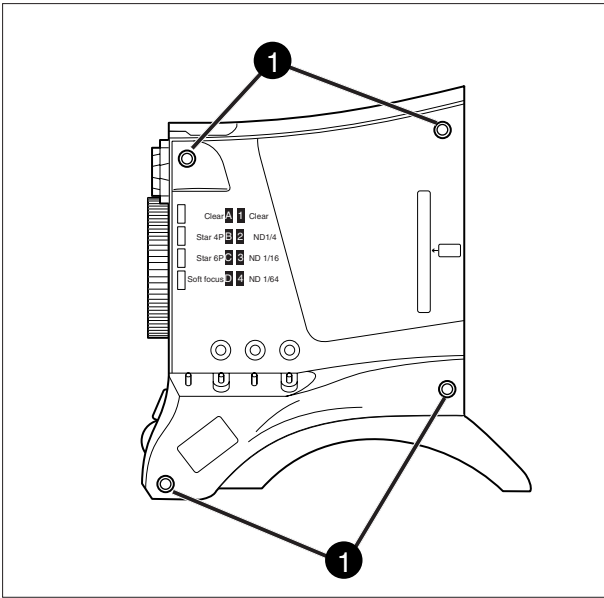
To remove the front unit the following steps have to be carried out:

- Loosen the two top screws
- Open the camera left side cover
- Open the camera right side cover
- Remove DVP board
- Remove the front unit

### Opening the left side cover

To open the left side cover proceed as follow:

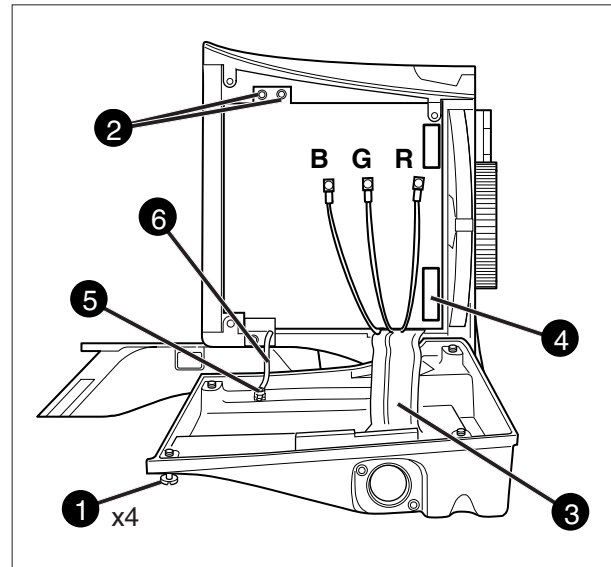
- a. Loosen the four screws ❶ at the front of the camera.
- b. Swing down the cover



### Opening the right side cover

To remove the right front cover proceed as follows:

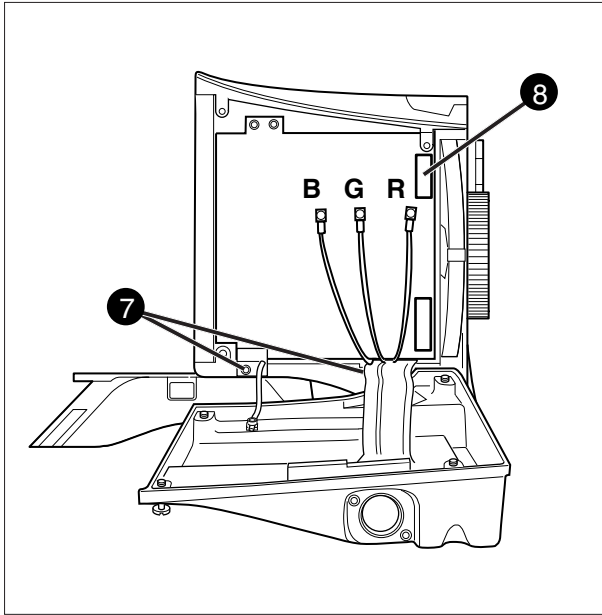
- a. Unscrew the four retaining screws ❶ and swing the right front cover down.
- b. Disconnect the B, R and G coax cables from the DVP board using the correct tool (part no. 5322 395 10802)
- c. Unscrew the two top retaining screws ❷ of the DVP board and swing the board downwards.
- d. Reach in behind the board and disconnect the flat cable from the connector at the bottom of the board.
- e. Disconnect the flat cable ❸ that comes from the cover, from the motherboard connector ❹.
- f. Loosen the screw ❺ and remove the retaining tie ❻ that restrains the cover.
- g. Remove the cover.



### Removing the DVP board

To remove the DVP board proceed as follows:

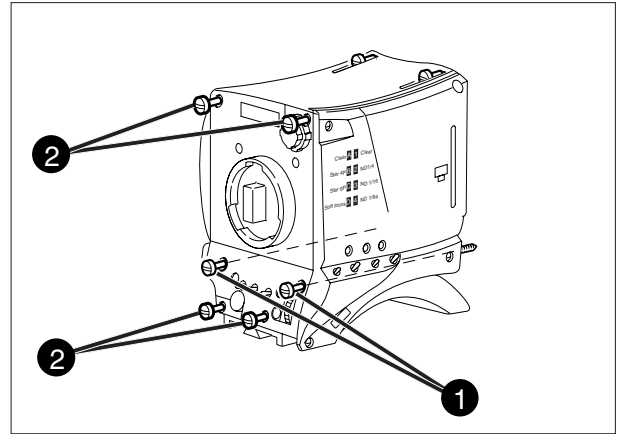
- h. Unscrew the two bottom retaining screws **7** of the DVP board from the plastic clips and remove the board.
- i. Unscrew and disconnect the connector **8** from the Front.



### Removing the front unit

To remove the front unit proceed as follows:

- a. To ease the removal of the front unit remove the adapter screws **1** completely.
- b. Unscrew the four retaining screws **2** of the front unit.
- c. Move the front unit slightly upwards and forward and disconnect the flat cable that comes from the front from the connector on the connector board of the camera.
- d. Remove the front unit.





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## Section 4

### Adjustments

*This section contains the adjustment procedures to be followed to obtain the best performance from the camera. These procedures need only be used if, following a module replacement, the camera does not perform according to specifications.*

### Contents

---

Introduction .....	4-2	3200K Adjustment .....	4-4
Test Equipment .....	4-3	Sawtooth Calibration .....	4-4
Set-up Instructions .....	4-3	Flare Adjustment .....	4-5
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## Introduction

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This camera is factory tested and adjusted for operational use. Under normal circumstances, the internal automatic calibration procedures do not need to be started and the internal potentiometers do not need to be adjusted.

There are two situations that might require some realignment of the camera:

- a. When a lens is fitted.
- b. When a printed circuit board has been replaced.

When a lens is fitted the following alignment procedures should be carried out in the order given:

1. Run the internal 3200K calibration procedure.
2. Adjust the white shading via the menu system.
3. Adjust the flare.
4. Adjust the back focus (see lens manual for this adjustment).

If a printed circuit board is replaced, refer to table 4-1 to see which adjustments must be carried out to realign the camera. For a particular board, carry out the procedures in the order given.

If it is discovered that the camera is misaligned, the following procedures are given as a guide for competent service personnel, who have a thorough knowledge of the camera and have the use of calibrated equipment, to realign the camera.

If no improvement can be achieved or an adjustment is out of range, please contact your local supplier or the nearest Thomson Multimedia Broadcast Solutions Service Centre.

The camera head adjustment procedures are designed as separate units. Within a numbered procedure do not change the position of switches or jumpers unless instructed to do so in the procedure.

Table 4-1 Adjustment procedures on board replacement

<b>Printed Circuit Board</b>	<b>Adjustment Procedure</b>
Digital video board	<ol style="list-style-type: none"> <li>1. Video ADC automatic calibration (internal)</li> <li>2. Sawtooth calibration (internal)</li> </ol>
Pre-processor board	<ol style="list-style-type: none"> <li>1. Pre-processor calibration (internal)</li> </ol>
Lens plate assemble	<ol style="list-style-type: none"> <li>1. 3200K adjustment</li> <li>2. White shading adjustment</li> <li>3. Flare adjustment</li> </ol>
Data Board	<ol style="list-style-type: none"> <li>1. Software download</li> </ol>
Sync. / monitoring board	<ol style="list-style-type: none"> <li>1. Video monitoring adjustment</li> </ol>

The following is a list of equipment required to carry out the adjustment procedure:

- Set of board extenders LDK 5820/01
- Oscilloscope (with cursor measurement)
- Spotlight 3200K
- Focus test chart
- Black hole test chart
- White PortaPattern test chart
- White 3200K test chart
- Waveform monitor

Before carrying out any adjustments the following steps are recommended:

- Attach an adapter to the camera.
- Install the camera on a tripod.
- Attach the lens and the necessary cables.
- Allow the camera to warm-up.

**CAUTION:**

Do not attempt to improve camera performance by adjusting individual potentiometers, jumpers or switches as this may lead to complete misalignment of the camera.

**CAUTION:**

Do not realign individual potentiometers, jumpers or switches not mentioned in this chapter or earlier in this manual. These adjustment points are for factory use only.

**CAUTION:**

Switch off the power supply to the camera before removing or replacing printed circuit boards.

## **Video ADC Automatic Calibration**

---

The following is an automatic internal calibration procedure to adjust the analogue-digital convertors.  
(There are not pre-conditions for this calibration.)

- a. In the menu system select the Service menu.
- b. Select Calibrations.
- c. Select Video ADC and run the procedure.

## **Sawtooth Calibration**

---

The following is an automatic internal calibration procedure to adjust the internal gain of the DVP board.  
(There are not pre-conditions for this calibration.)

- a. In the menu system select the Service menu.
- b. Select Calibrations.
- c. Select Sawtooth and run the procedure.

## **Pre-processor Calibration**

---

The following is an automatic internal calibration procedure to adjust the analogue-digital convertors.  
(There are not pre-conditions for this calibration.)

- a. In the menu system select the Service menu.
- b. Select Calibrations.
- c. Select PreProc and run the procedure.

## **3200K Adjustment**

---

The following is an automatic internal calibration procedure to set the 3200K colour temperature.

- a. Recall the standard factory file.
- b. Shoot the white test chart illuminated with a 3200k spotlight (nominal video).
- c. In the menu system select the Service menu.
- d. Select Calibrations.
- e. Select 3200K and run the procedure.

## **Flare Adjustment**

---

The following is an adjustment procedure to correct the flare introduced by the lens.

- a. Recall the standard factory file.
- b. Close the lens and set the black level to approximately 10mV.
- c. With the menu system select the green signal.
- d. Shoot the black hole test chart (100% video).
- e. In the menu system select the Video menu.
- f. Select Flare.
- g. View the waveform monitor and adjust the green flare so that there is no difference in the black level.
- h. Repeat this adjustment for blue and red.

## **Software Download**

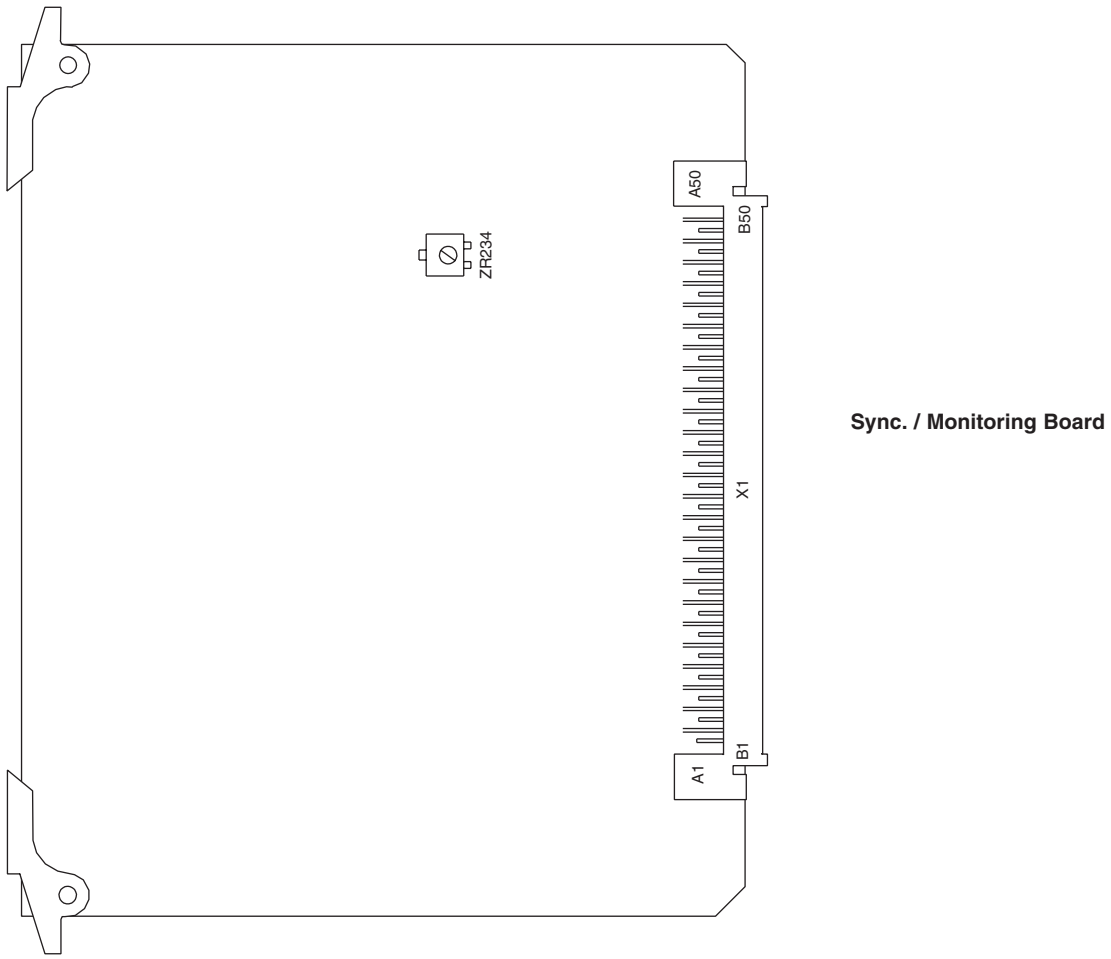
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The following procedure should be carried out to update the software.

- a. Connect the PC to the RS232 connector of the camera.
- b. Follow the instruction on the PC to download the software.

## Video Monitoring Adjustment

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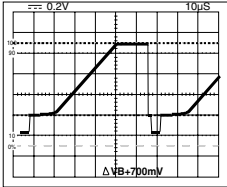
## Video Monitoring Adjustment

### Set-up

1. Switch off power. Place sync. monitoring board on service extender. Switch on power.
2. Switch on colour bar.

### Viewfinder output level

3. Connect oscilloscope to X1-B45.
4. Adjust the potentiometer on the sync. monitoring board to obtain the correct output amplitude VF output signal.

Measure at:	Adjust with:	Required result:	Correct:
X1-B45	ZR234	700mV	

5. Switch off power. Return sync. monitoring board to its position in the camera.



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## Section 5

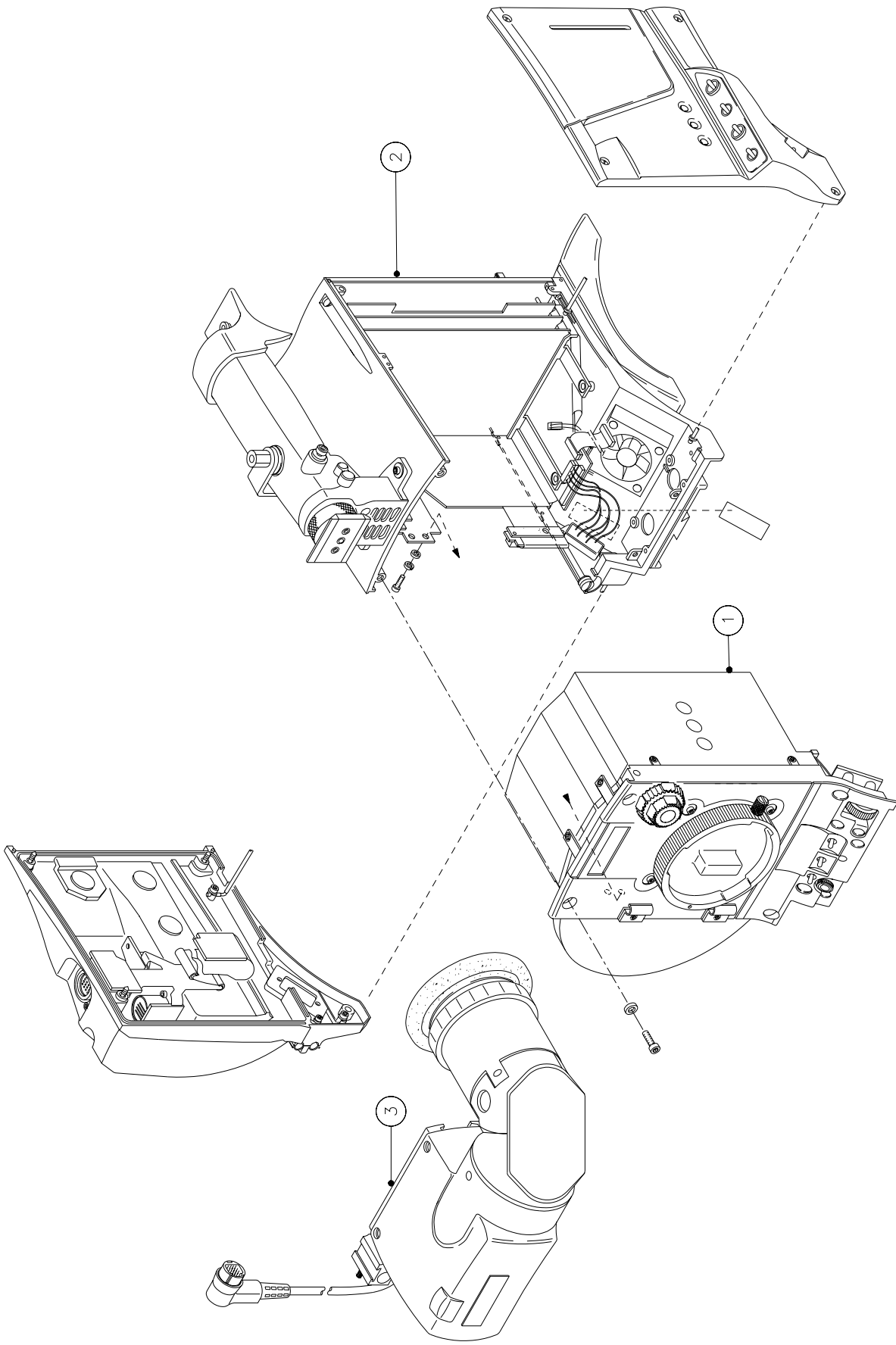
### Exploded Views

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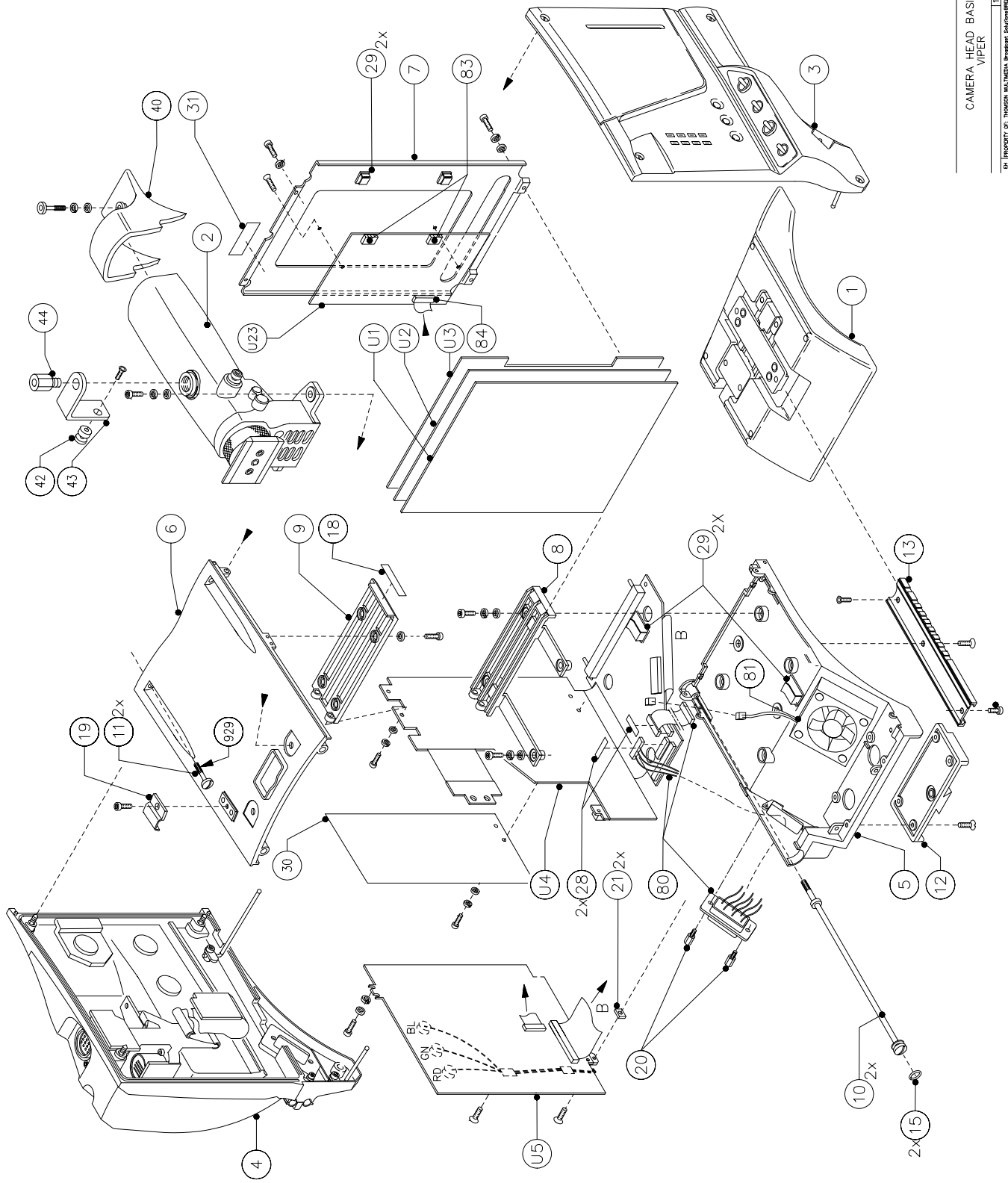
#### Contents

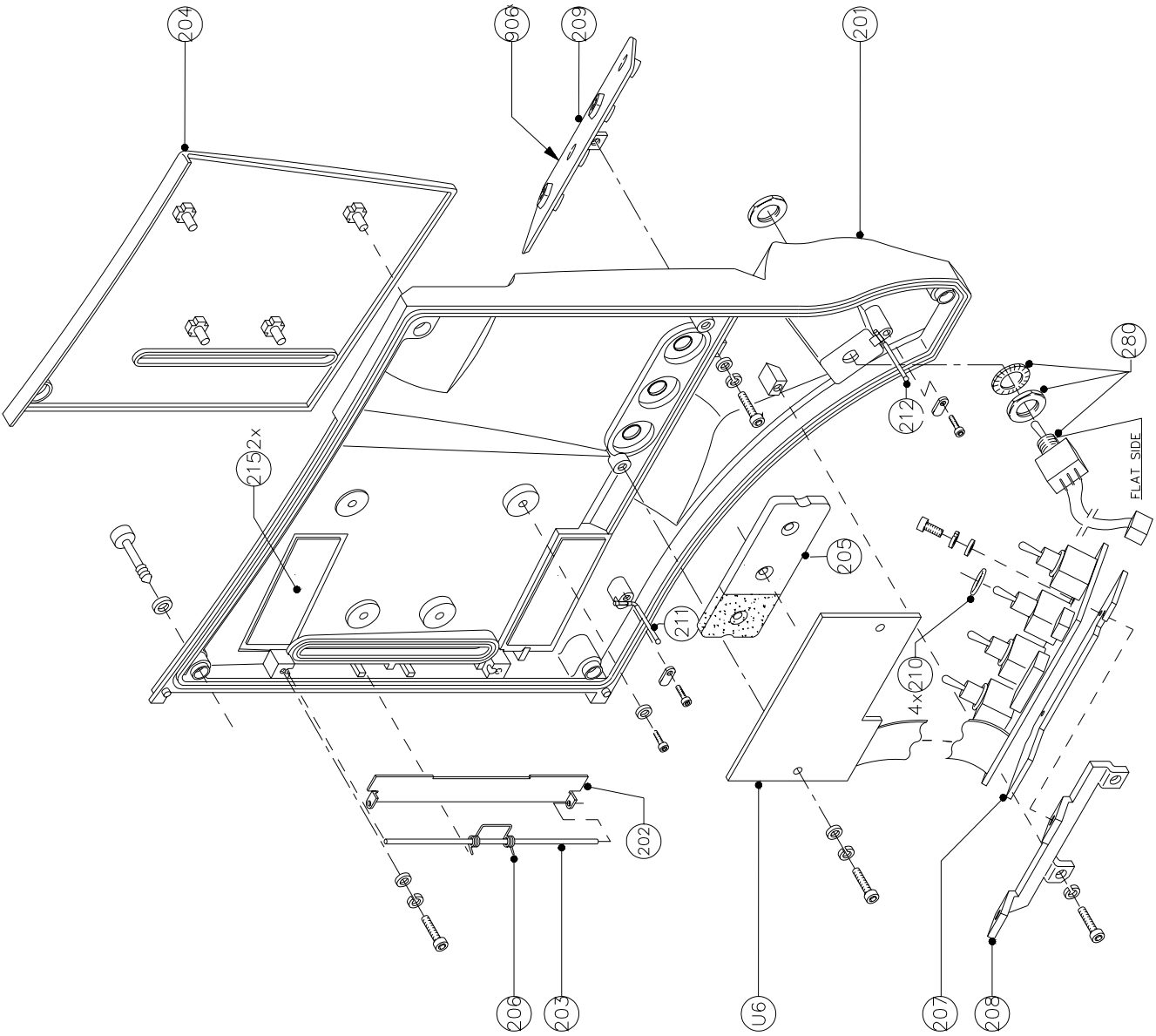
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HD Camera head .....	5-2	Right cover assembly .....	5-5
Camera head basic .....	5-3	Shoulder pad assembly .....	5-6
Left cover assembly .....	5-4	Handgrip assembly .....	5-7

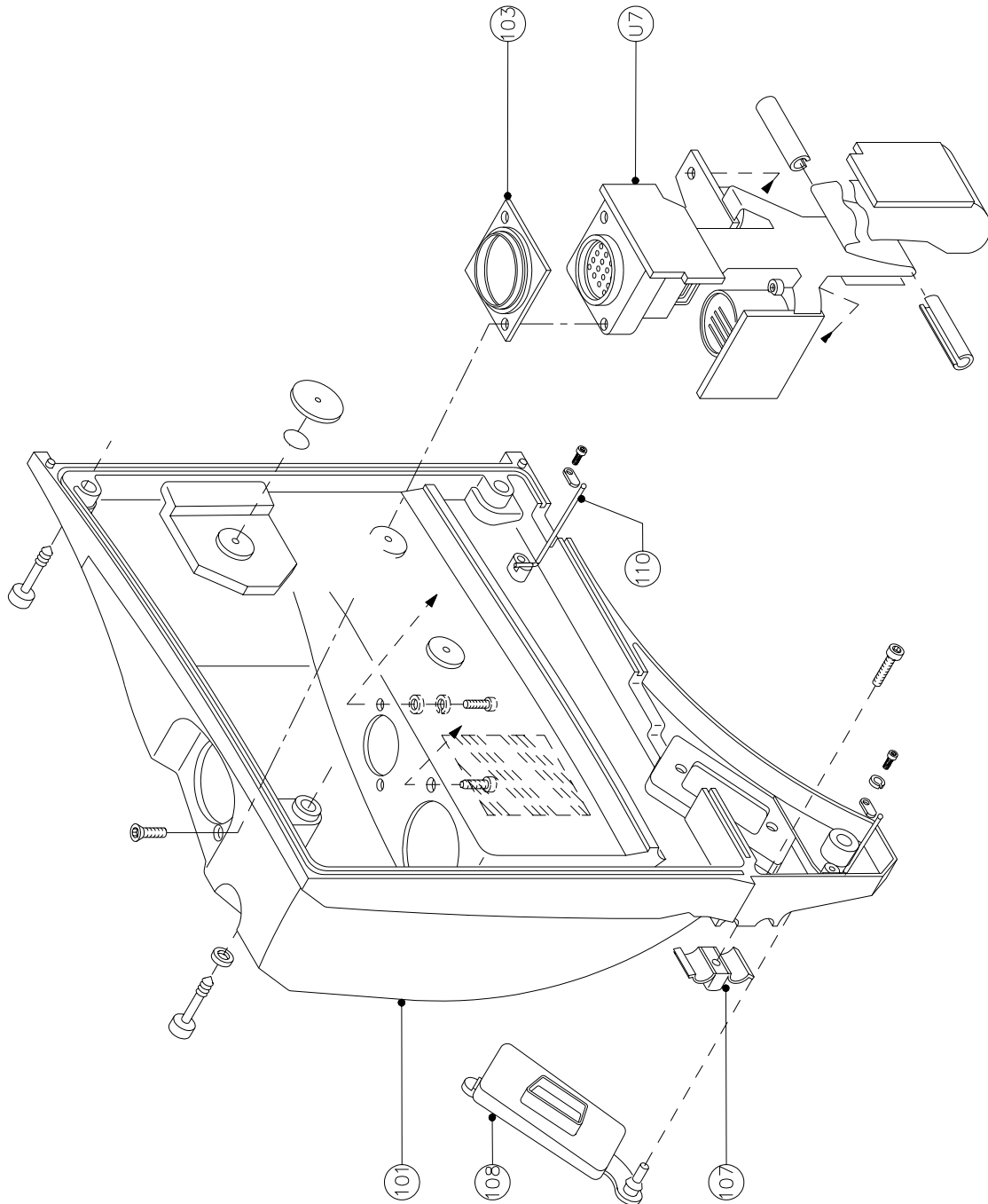


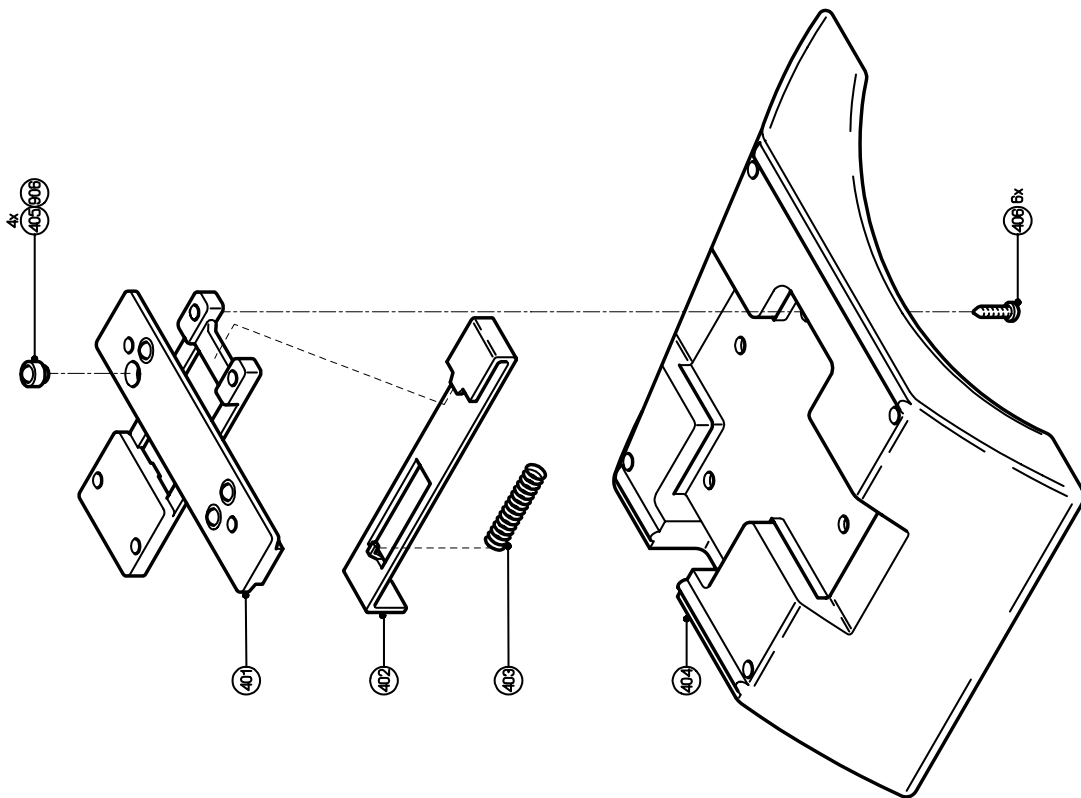
VIPER FILMSTREAM CAMERA	8926 750 09901
LDK 7500	
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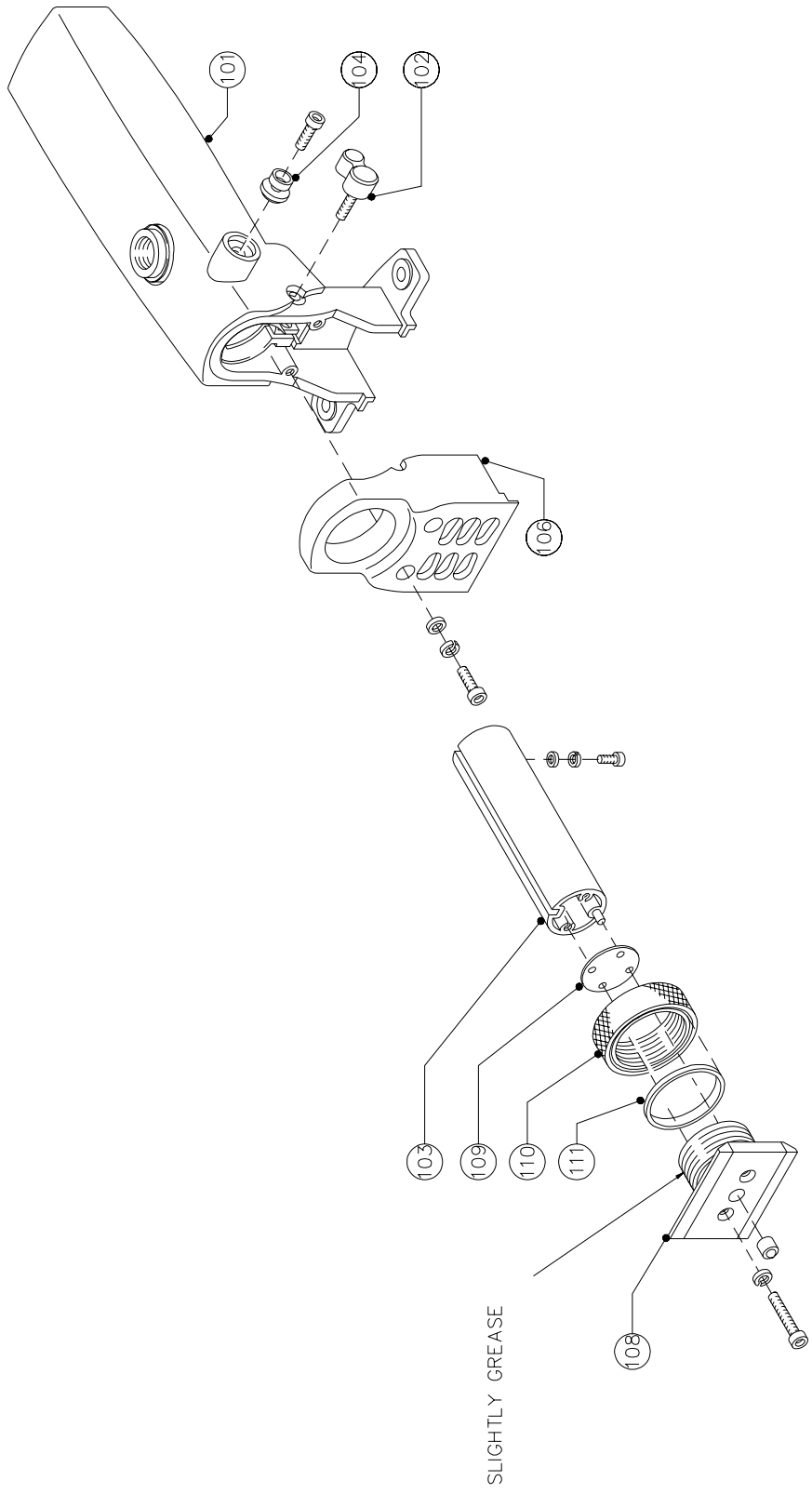


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