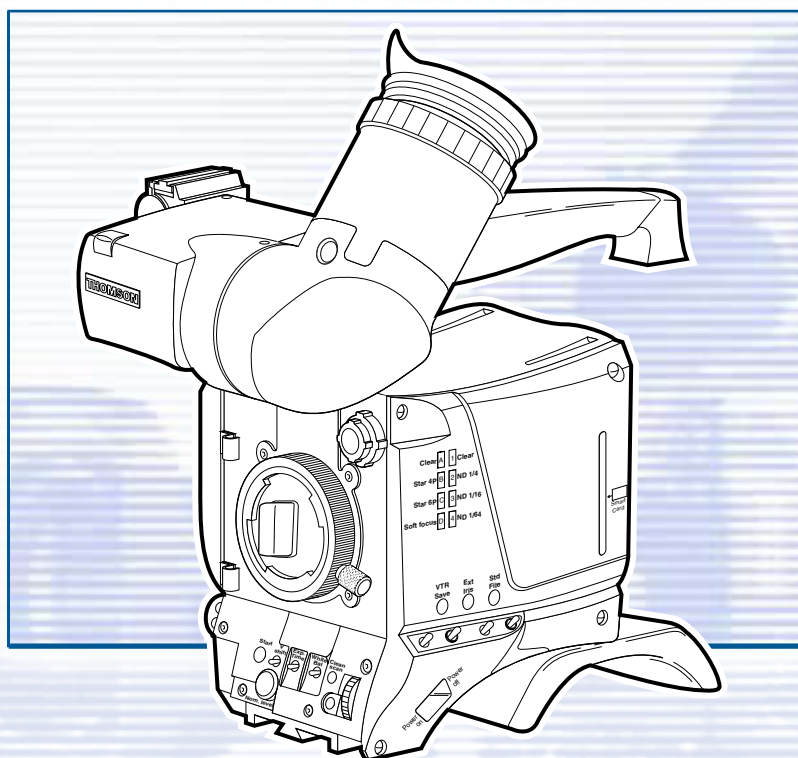


# LDK 200

Multi-role Digital Camera Head



# Technical Manual

3922 496 47951 St.03

## Declaration of Conformity

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We, Thomson Broadcast Solutions Nederland B.V., Kapittelweg 10, 4827 HG Breda, The Netherlands declare under our sole responsibility that this product is in compliance with the following standards:

- EN60065 : Safety
- EN55103-1 : EMC (Emission)
- EN55103-2 : EMC (Immunity)

following the provisions of:

- a. the Safety Directives 73/23/EEC and 93/68/EEC
- b. the EMC Directives 89/336/EEC and 93/68/EEC

## FCC Class A Statement

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This product generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause interference to radio communications.

It has been tested and found to comply with the limits for a class A computing device pursuant to Subpart J of part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Operation of this product in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

## Copyright

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# LDK 200 Camera Head

## Technical Manual

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## About This Manual

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### Service policy

The LDK200 is a sophisticated camera head 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 Multimedia 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 Multimedia 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 1 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 four 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: Diagnostics.

Contains diagnostic messages and block diagrams.

#### Section 6: Wiring & Block Diagrams

#### Section 7: Mechanical Exploded Views

#### Section 8: Parts Lists

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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 <span style="border: 1px solid black; padding: 2px;">00</span> <span style="border: 1px solid black; padding: 2px;">01</span>

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	392240700000
Line 2	123456AA0101
Line 3	VR/0123456789

### Line 1

This is the code number of the printed circuit board assy. (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 assy

- 3922 406 xxxxx or 3922 407 xxxxx

Number (screened in PCB layout) of printed circuit board assy: 3922 411xxxxx. (not a sparepart)



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# Section 1

## Safety Instructions

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

---

### Contents

Safety Summary .....	1-2	Earthing .....	1-3
Cautions and Warnings .....	1-2		

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.

FOR SAFETY REASONS THE CPU MUST BE MOUNTED IN A 19-inch RACK WHICH HAS SAFETY COVERS ACCORDING TO IEC65.

WHEN TWO CPUs ARE MOUNTED ABOVE EACH OTHER THE MINIMUM DISTANCE BETWEEN THEM MUST BE 50MM OR THE RACK MUST BE FORCE-AIR COOLED.

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.

Only connect a Triax cable from the LDK 6 camera family to an LDK 6 CPU. Never connect it to any other base station.

Never connect the Triax cable from a camera to a CPU of a different family; never connect the LDK family to the TTV family.

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.

It is strictly prohibited to short circuit the inner and outer shields of a triax cable used to connect a camera to a base station.



# Earthing

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

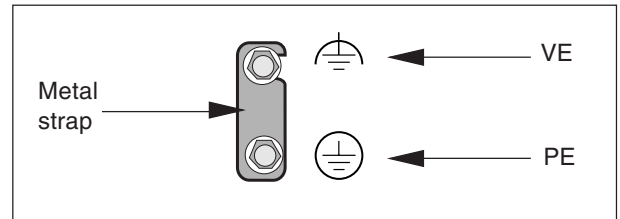
Components marked on the circuit diagram are critical for safety and include those specified to comply with X-ray emission standards for units using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

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.

The rear of a CPU has two separate screw terminals for protective earth (PE) and video earth (VE).



These are normally connected by a metal strap. The protective earth terminal is internally connected to the protective earth conductor of the power cable. If required, the central earth connection wire of the studio can be connected to terminal PE.

In normal circumstances the connection between the protective earth and the video earth should not be broken.

The metal strap may be removed only if the studio (or OB van) is equipped with separate protective and video earth systems. Under these circumstances the video earth terminal must be connected to the central functional earth potential (video earth) of the studio. This earth potential should have functional protective and noiseless earth (FPE) qualities as stated in the VDE regulation 0800/part2. A low impedance interconnection of both earth conductors must be provided at the central studio earthing point.

## WARNING

THE UNIT MUST ALWAYS BE CONNECTED TO PROTECTIVE EARTH.

## Mains Lead Wiring for UK Users

The wires in the mains lead are coloured in accordance with the following code:

GREEN AND YELLOW	-	EARTH
BLUE	-	NEUTRAL
BROWN	-	LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

- The wire coloured GREEN AND YELLOW must be connected to the terminal on the plug marked with the letter E or by the safety earth symbol or coloured GREEN or GREEN AND YELLOW.
- The wire coloured BROWN must be connected to the terminal marked with the letter L or coloured RED.
- The wire coloured BLUE must be connected to the terminal marked with the letter N or coloured BLACK.

Ensure that your equipment is connected correctly - if you are in any doubt consult a qualified electrician.



---

## 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.*

#### Contents

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Attaching an Adapter .....	2-3	Connectors and Cables .....	2-5
Detaching an Adapter .....	2-3	Specifications LDK 200 .....	2-8
Hardware Customization .....	2-4	Dimensions .....	2-9

## Packing/Unpacking

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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.

## Attaching an Adapter

The LDK200 Camera head is a multi-role camera head that can be used with various adapters. To attach an adapter to the camera proceed as follow:

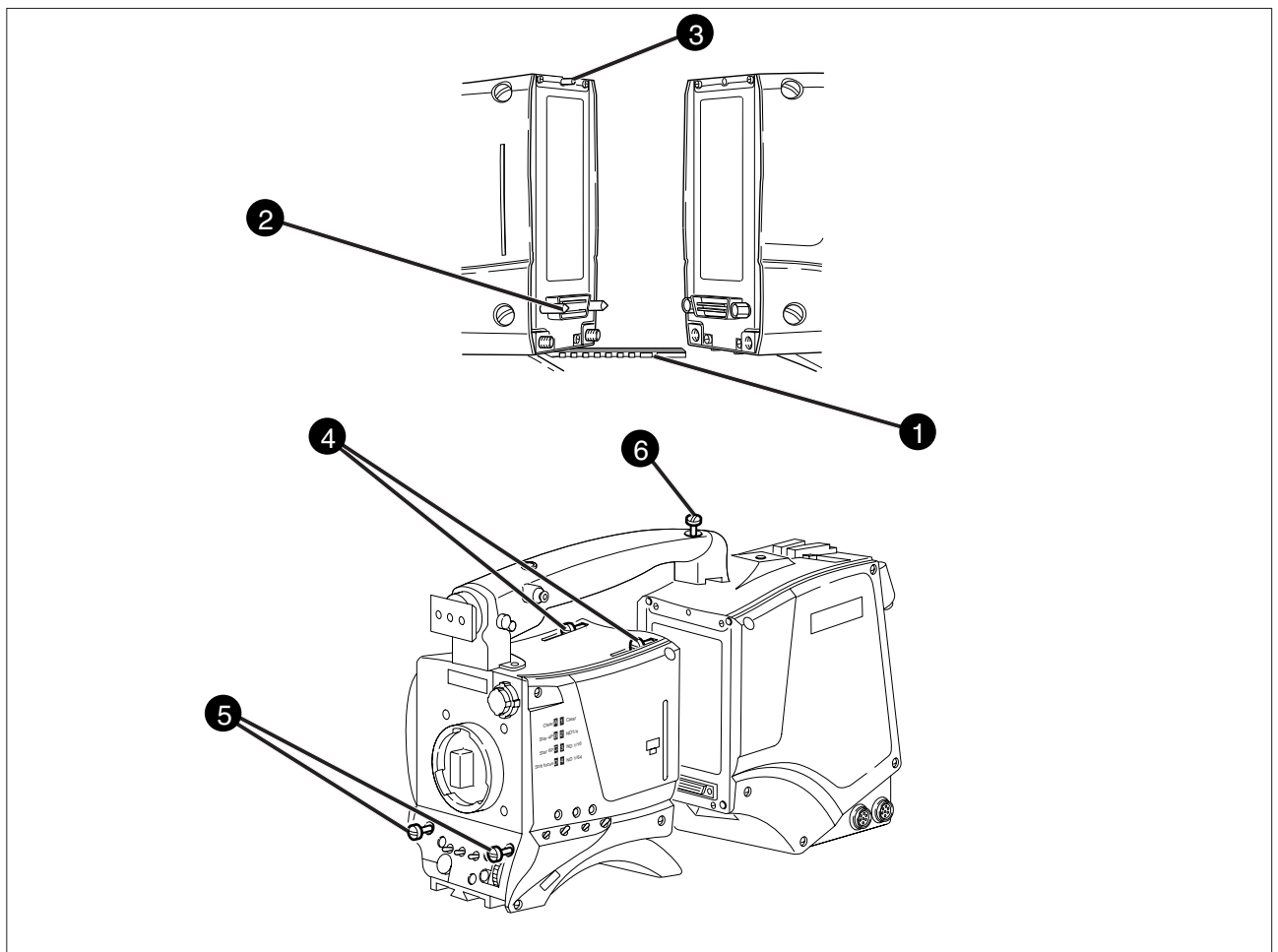
### Caution

Be extremely careful with the connectors between the camera head and the adapter. Do not allow the guide pins to damage the pins of the connector.

### Caution

Follow these steps in the order given. 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 an 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.

### Note

The procedure is given for the Triax adapter LDK 5430. Follow the same procedure for the other adapters.

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.

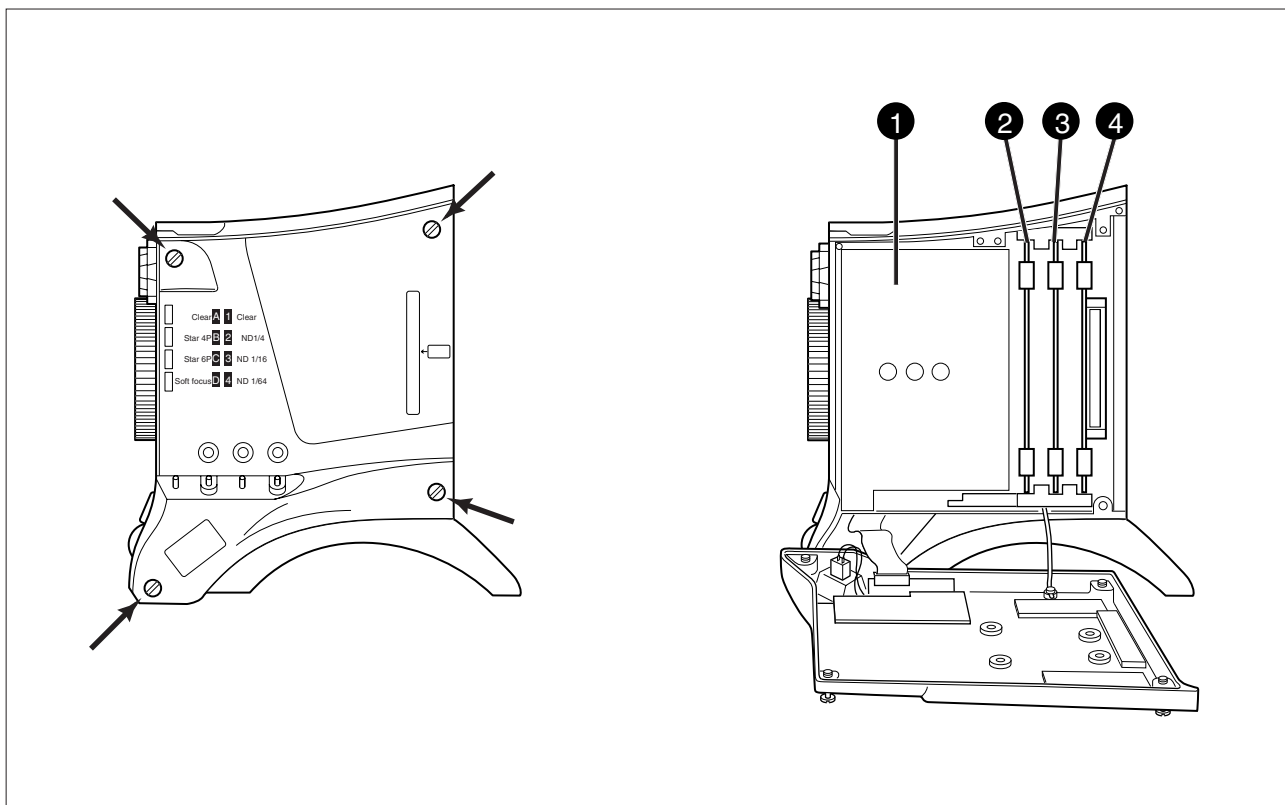
**Location of boards**

Unscrew the four screws on the left side panel and swing down the cover.

- Front module ①
- Sync monitoring board ②
- Data board ③
- Front driver board ④

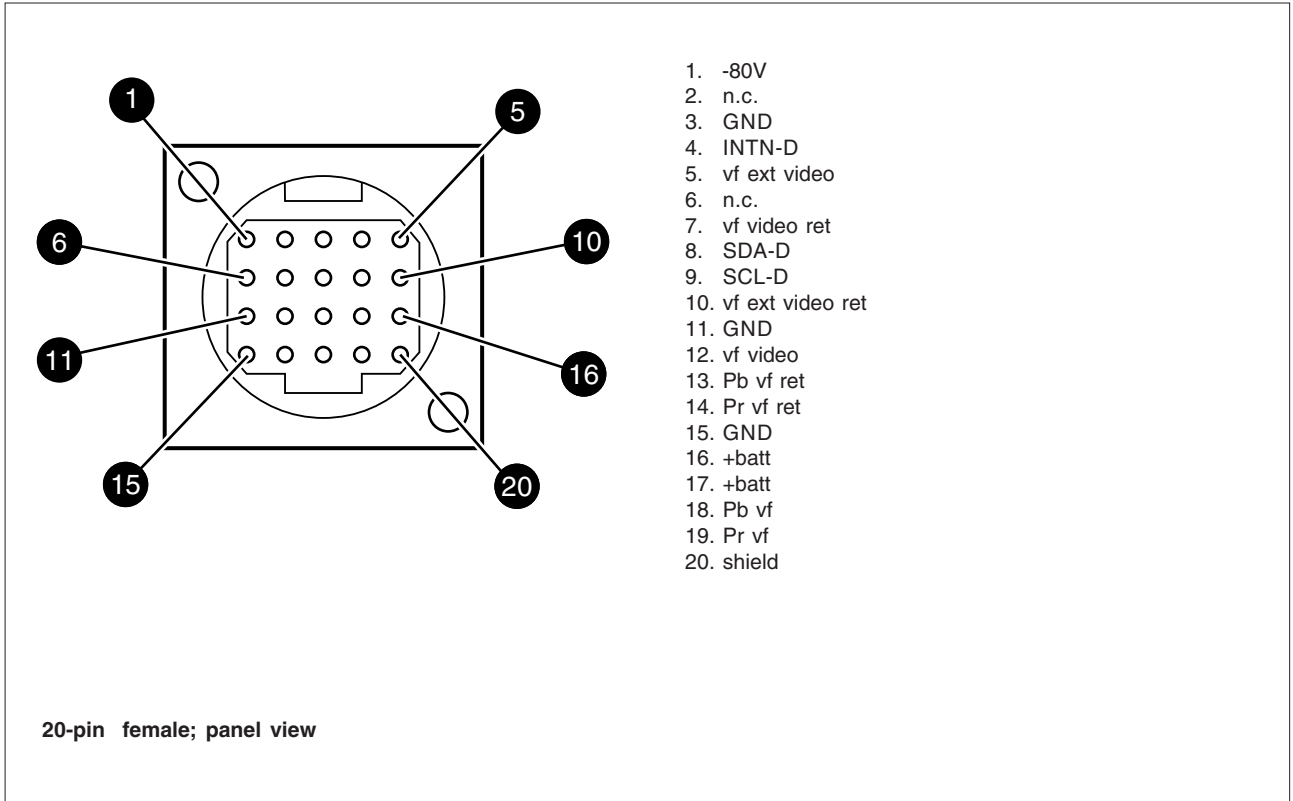
When a camera is supplied with a lens it is not necessary to perform any of the following adjustments as the lens is already matched to the camera. However, if you wish to change to a different type of lens or the lens is not supplied with your camera, back focus, white shading and auto iris adjustment 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 3.
- 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.

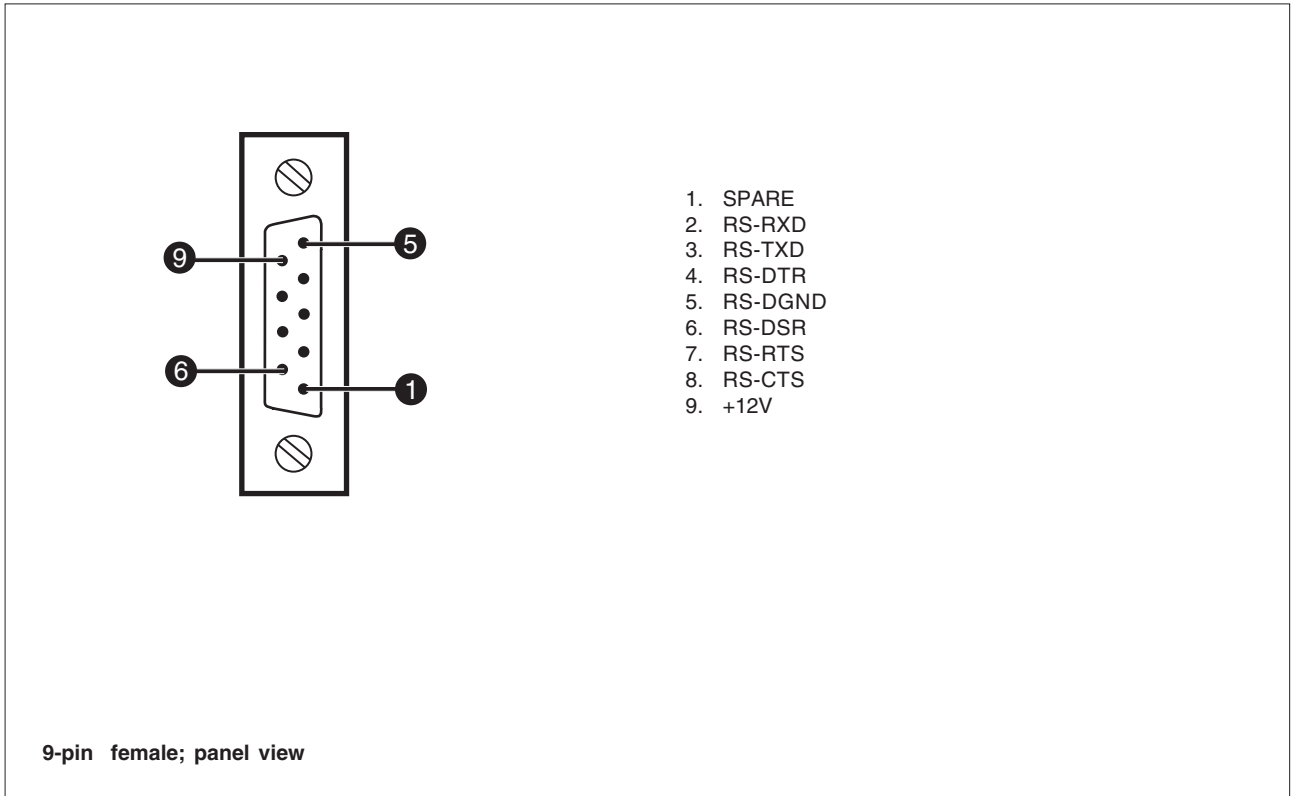


## Connectors and Cables

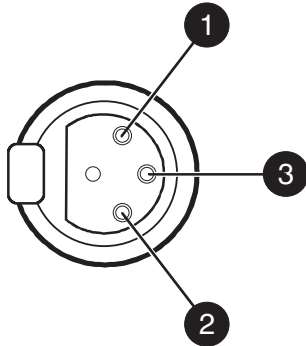
### Viewfinder connector



### RS232 connector



## Audio microphone connector

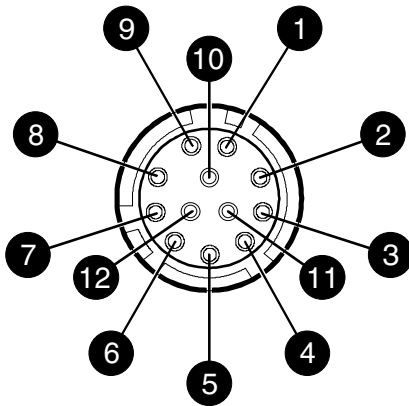


1. Audio Screen
2. Audio In
3. Audio Return

Microphone impedance >200 ohm  
 Sensitivity remote controlled via base station:  
 range: -70 to -28 dBm  
 Signal at pin 2 of audio input is in phase with signal at pin 2 of audio output on Base station

**XLR 3-pin female**

## Lens connector



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

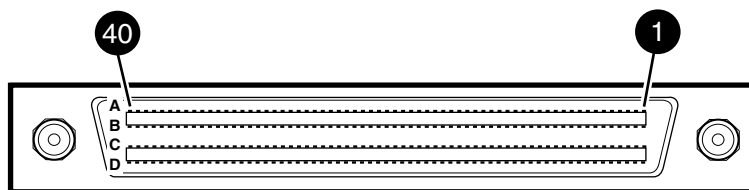
**Hirose 12-pin female; panel view**

Panel Connector	Type	Part number	Cable part number
Viewfinder	20-pin Hirose female	5322 214 12544	5322 320 12159 male
Lens	12-pin Hirose female	5322 265 10389	5322 265 41208 male
Audio Mic	3-pin XLR female	5322 267 40523	—
Rs 232	9-pin male	—	—



## Docking connector camera (X10)

A row	name	B row	name	C row	name	D row	name
1	lon data	1	lon data N	1	GND	1	+ batt
2	C-SDA	2	C-SCL	2	GND	2	+ batt
3	INTN_C	3	audio indication	3	GND	3	+ batt
4	AB batt sense	4	batt sense	4	GND	4	+ batt
5	adpt id 0	5	adpt id 1	5	GND	5	+ batt
6	adpt id 2	6	adpt id 3	6	GND	6	+ batt
7	cam id 0	7	cam id 1	7	GND	7	+ batt
8	spare	8	PIP	8	GND	8	+ batt
9	sync	9	blanking	9	GND	9	
10	white pulse 1	10	white pulse 2	10	GND	10	
11	colour framing	11	frame reset	11	GND	11	
12	BS_TDA	12	H lock	12	GND	12	
13	PIP video	13	PIP video ret	13	GND	13	
14	BS_TDV	14	BS_TMS	14	GND	14	
15	adapter vf video	15	adapter vf video ret	15	GND	15	
16	BS_TCK	16	BS_TRSTN	16	GND	16	GND
17	ext video	17	ext video ret	17	GND	17	GND
18	-5V	18	-5V	18	-5V	18	-5V
19	+5V	19	+5V	19	+5V	19	+5V
20	+3.3V	20	+3.3V	20	+3.3V	20	+3.3V
21	+5VD	21	+5VD	21	+5VD	21	+5VD
22	shield	22	shield s	22	GND	22	GND
23	mic X	23	mic Xs	23	GND	23	GND
24	mic Y	24	mic Ys	24	GND	24	
25	audio level	25	audio level ref	25	GND	25	
26	power switch	26	n.c	26	GND	26	
27	R	27	R ret	27	GND	27	
28	YC clock	28	YC clock ret	28	GND	28	
29	G	29	G ret	29	GND	29	
30	YC9	30	YC9 ret	30	GND	30	
31	B	31	B ret	31	GND	31	
32	YC8	32	YC8 ret	32	GND	32	
33	YC7	33	YC7 ret	33	GND	33	
34	YC6	34	YC6 ret	34	GND	34	housing
35	YC5	35	YC5 ret	35	GND	35	housing
36	YC4	36	YC4 ret	36	GND	36	housing
37	YC3	37	YC3 ret	37	n.c	37	
38	YC2	38	YC2 ret	38	n.c	38	
39	YC1	39	YC1 ret	39	-80V	39	
40	YC0	40	YC0 ret	40	-80V	40	



160-pin male; panel view

# Specifications LDK 200

## Camera Head

### General data

Power requirements triax powered or 12V dc  
Power consumption 23 W (Head + VF)

Operating temperatures  
-20 to +45°C (-4 to +113°F)

Storage temperatures  
-20 to +60°C (-4 to +140°F)

Weight (approx.)  
2.1 kg (2.2 lbs) incl. 1.5-inch VF

Triax cable length  
2.400m (7,875 ft) max. with 16mm (0.63") cable  
3000m with RGB long triax modification (optional)  
Pick-up device  
3 x 2/3-inch DPM Frame Transfer CCD's  
aspect ratio switchable 4:3 and 16:9

Picture elements  
NTSC: 1000(h) x 498(v)  
PAL: 1000(h) x 594(v)

Digital quantization  
12 bits A to D

Digital signal processing  
18 MHz and 36 MHz, 24 bits accuracy

Sensitivity  
2000 lux (186 ft cd) at F8.0 reflectance 89.9%

Minimum illumination  
Approx. 2 lux at F 1.4 and +30 dB gain

Exposure control  
Down to 1/1000

Clean scanning  
NTSC: between 61.1 and 151.0 Hz  
PAL: between 51.0 and 103.0 Hz

### Optical system

F1.4 with quartz filter

### Optical filters

Clear, 1/4 ND, 1/16 ND, 1/64 ND  
Clear, 4-point star, 6-point star, soft focus

### Modulation depth

70% at 5Mhz  
65% at 5Mhz with HiRes Digital Noise Slicer

### S/N ratio

Typical: 61 dB PAL, 67 dB with HiRes Digital NoiseSlicer  
Typical: 63 dB NTSC, 69 dB with HiRes Digital NoiseSlicer

### Registration

<25 ns (0.05%) in all zones, without lens

### Dynamic range

>600%

### Gain

-6dB to +30dB in 3dB steps (user defined presets)

### Viewfinder

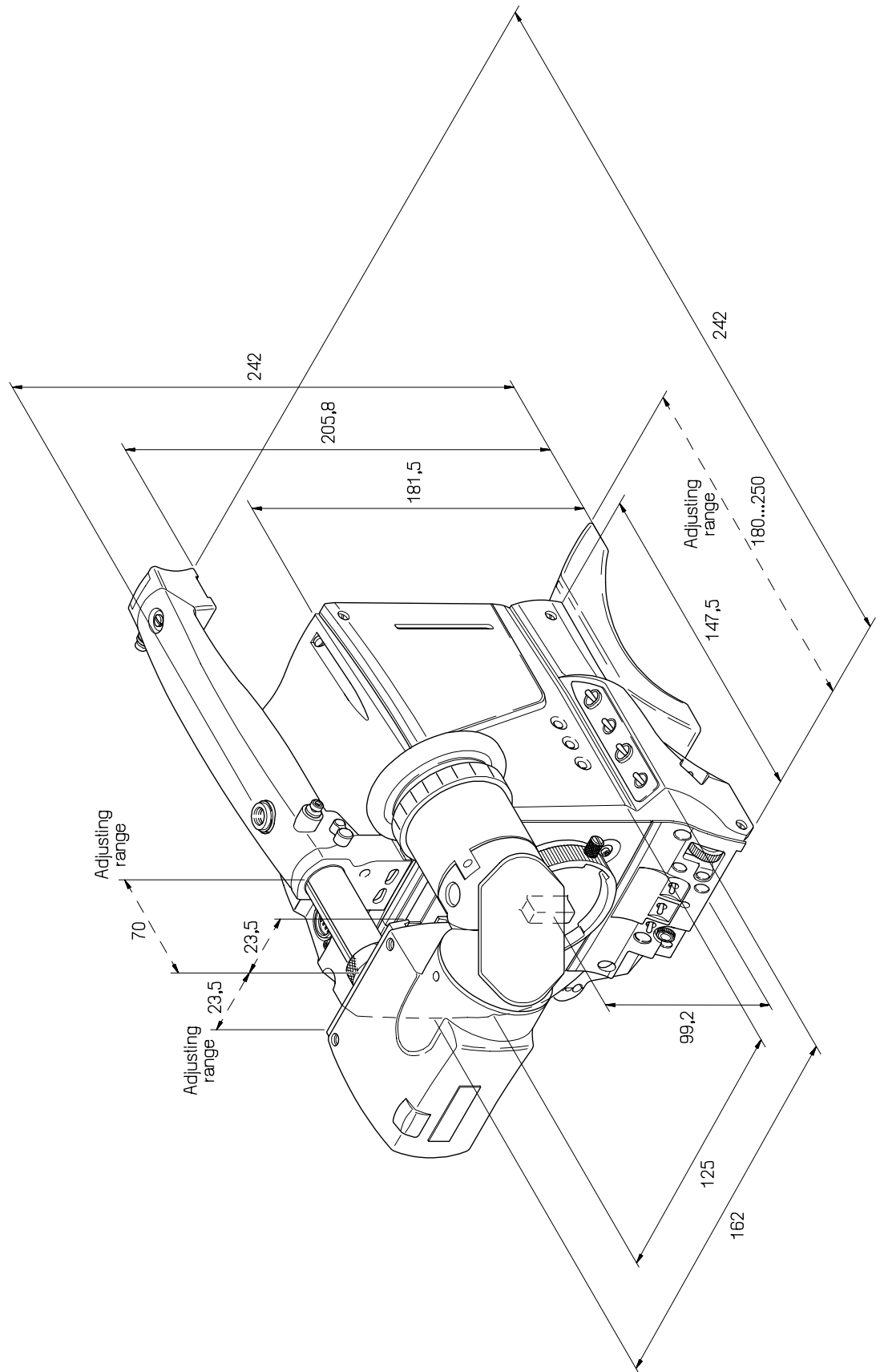
Type 1.5-inch B/W  
Resolution > 600 TV lines

### Connectors

Front mic in. XLR 3, balanced, +48V  
(CH1 on Base Station)  
Control bus 9-pin, RS232 compatible  
Viewfinder out 20-pin  
Lens out 12-pin  
Docking connector 160-pin

These typical specifications are valid for PAL and NTSC systems and are subject to change without notice

# 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.*

### Contents

---

Introduction .....	3-2	Handgrip .....	3-3
Printed circuit boards .....	3-2	Front unit .....	3-4

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 printed circuit boards
- The handgrip
- 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 3.

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

### Gaining access to the 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

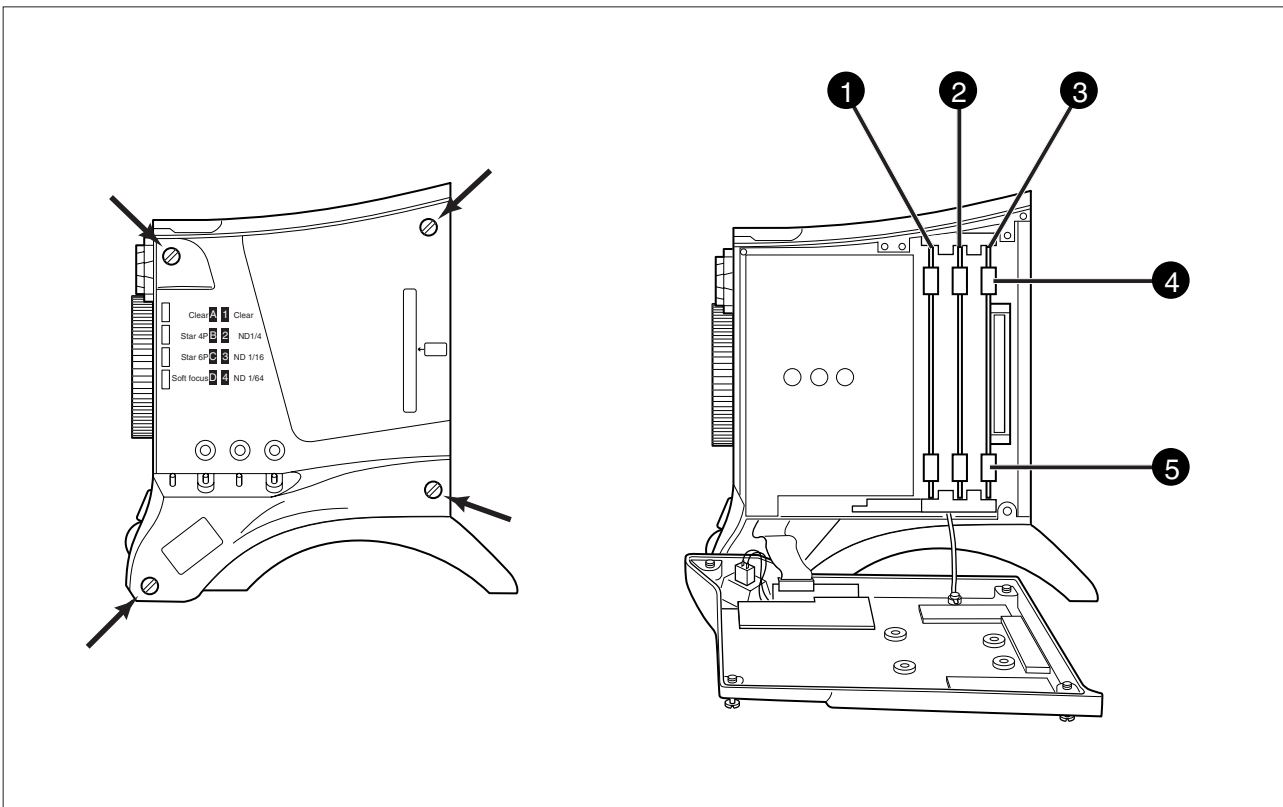
The boards in the camera head are numbered as follows:

- 1 Sync monitoring board
- 2 Data board
- 3 Front driver board

### Removing a board

To remove a printed circuit board proceed as follows:

- Pull up the top print ejector ④ and pull down the bottom print ejector ⑤ to release the printed circuit board from its connector.
- Pull horizontally on these ejectors to slide the board clear of the camera.

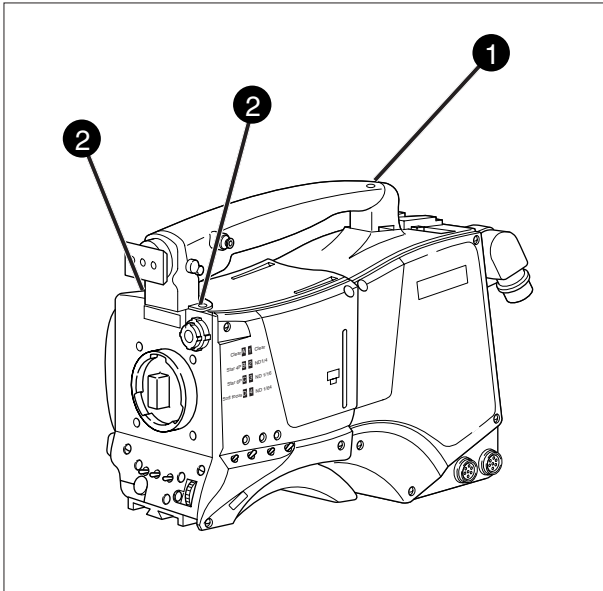


## Handgrip

---

To remove the handgrip proceed as follows:

- a. Remove the 1.5 inch viewfinder from its support bracket on the handgrip.
- b. Loosen the screw ❶ securing the handgrip to the top of the adapter.
- c. Loosen the two socket head screws ❷ securing the handgrip to the front of the camera.



## Front unit

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

- Remove the handgrip
- Detach the adapter
- Remove the camera left side cover
- Remove the camera right side cover
- Remove DVP board
- Remove the front unit

### Removing the handgrip

To detach the handgrip follow the instructions given on the previous page.

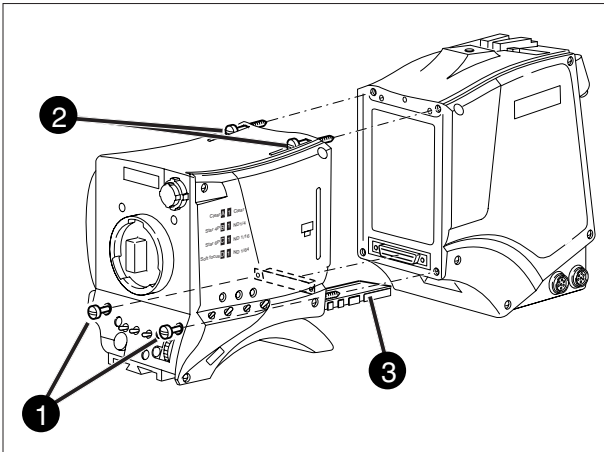
### Detaching the adapter

To detach the adapter from the camera proceed as follows:

#### Caution

Follow these steps in the order given. Loosening the screws in the wrong order could result in mechanical damage to the camera.

- a. Loosen the two horizontal screws ❶ at the front of the camera.
- b. Loosen the two horizontal screws ❷ on the top of camera.
- c. Slide the adapter away from the camera along the rail ❸ at the bottom of the camera.



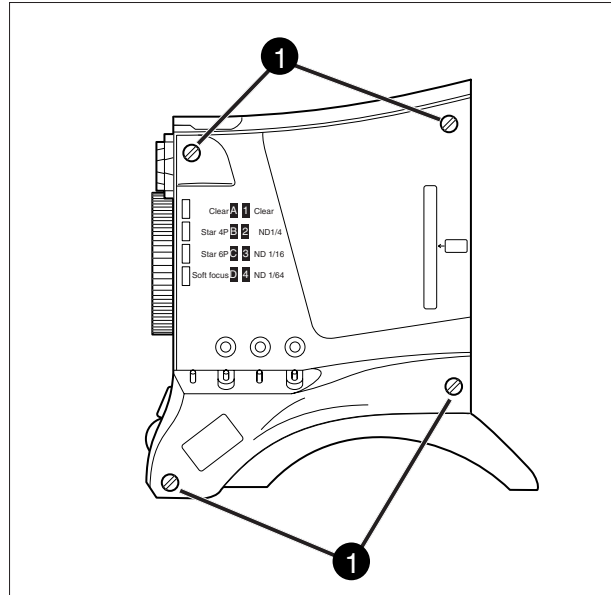
#### Caution

When reattaching the adapter be extremely careful with the connectors between the camera head and the adapter. Do not allow the guide pins to damage the pins of the connector.

### 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

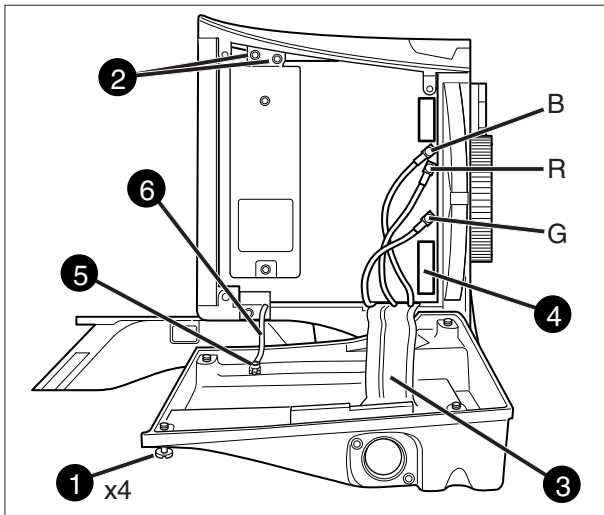




### Opening the right side cover

To remove the right front cover proceed as follows:

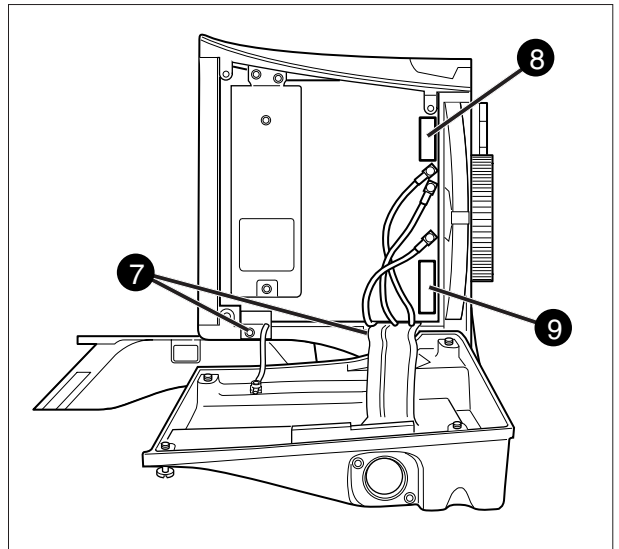
- a. Unscrew the four retaining screws ❶ and swing the right front cover down.
- b. Disconnect the B, R and G coax cables from the DVP board using the correct tool (part no. 5322 395 10802)
- c. Unscrew the two top retaining screws ❷ of the DVP board and swing the board downwards.
- d. Reach in behind 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:

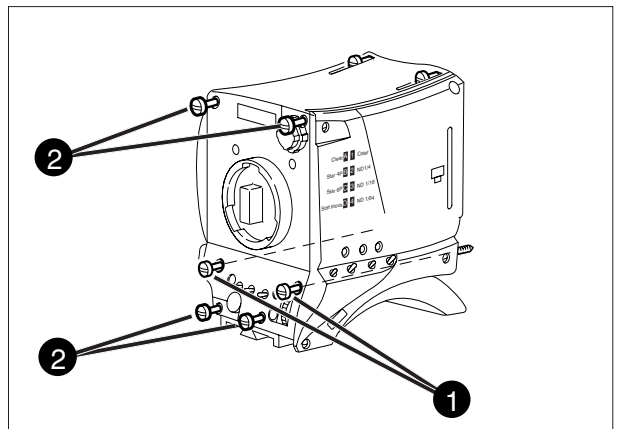
- h. Unscrew the two bottom retaining screws ❷ of the DVP board from the plastic clips and remove the board.
- i. Unscrew and disconnect the top connector ❸ from the DVP board.
- j. Unscrew the bottom connector ❹.



### 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 ❶ completely.
- b. Unscrew the four retaining screws ❷ 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.





---

## 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	Sawtooth Calibration .....	4-4
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Set-up Instructions .....	4-3	Software Download .....	4-5
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## Introduction

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 3-1 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.

These adjustment procedures are for the Camera Head. However, for practical purposes the Triax Adapter is used together with the camera head to facilitate some measurements. Other adapters can be used for these measurements.

Table 3-1 Adjustment procedures on board replacement

Printed Circuit Board	Adjustment Procedure
Digital video board	<ol style="list-style-type: none"> <li>1. Video ADC automatic calibration (internal)</li> <li>2. Sawtooth calibration (internal)</li> <li>3. Video gain adjustment</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.

---

## White Shading Adjustment

---

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

- a. Recall the standard factory file.
- b. Shoot the white PortaPattern test chart illuminated with a 3200k spotlight (80% video).
- c. Set gain to 0 dB, gamma to linear and run the auto white balance process.
- d. Defocus.
- e. In the menu system select the Video menu.
- f. Select Shading.
- g. View the waveform monitor and adjust the level, parabolic, and sawtooth adjustments for each colour in turn.

---

## 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 Install menu.
- d. Select Aspect Ratio
- e. Select 4:3 aspect ratio.
- c. In the menu system select the Service menu.
- d. Select Calibrations.
- e. Select 3200K and run the procedure.
- f. In the menu system select the Install menu.
- g. Select Aspect Ratio
- h. Select 16:9 aspect ratio.
- i. In the menu system select the Service menu.
- j. Select Calibrations.
- k. 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.

---

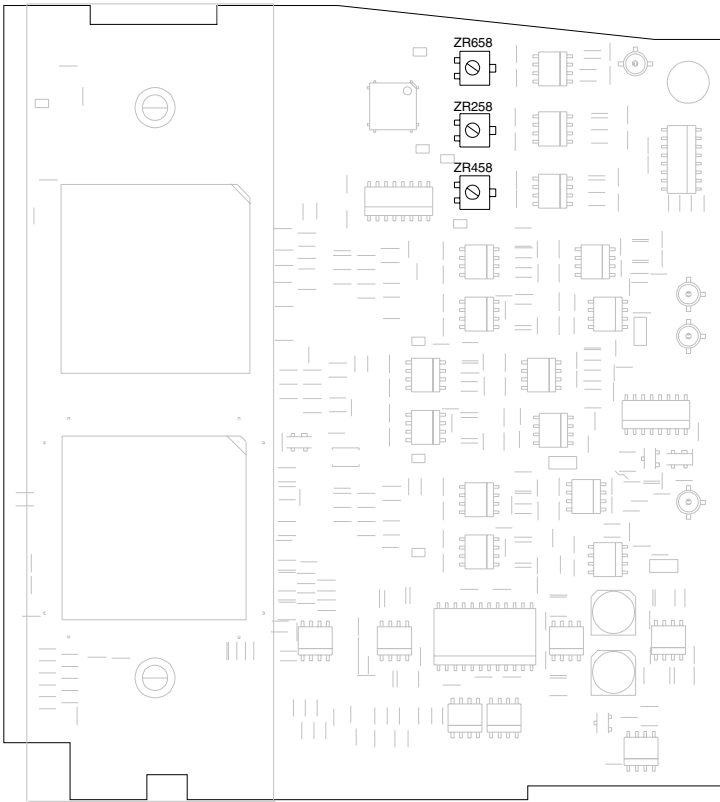
## Software Download

---

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

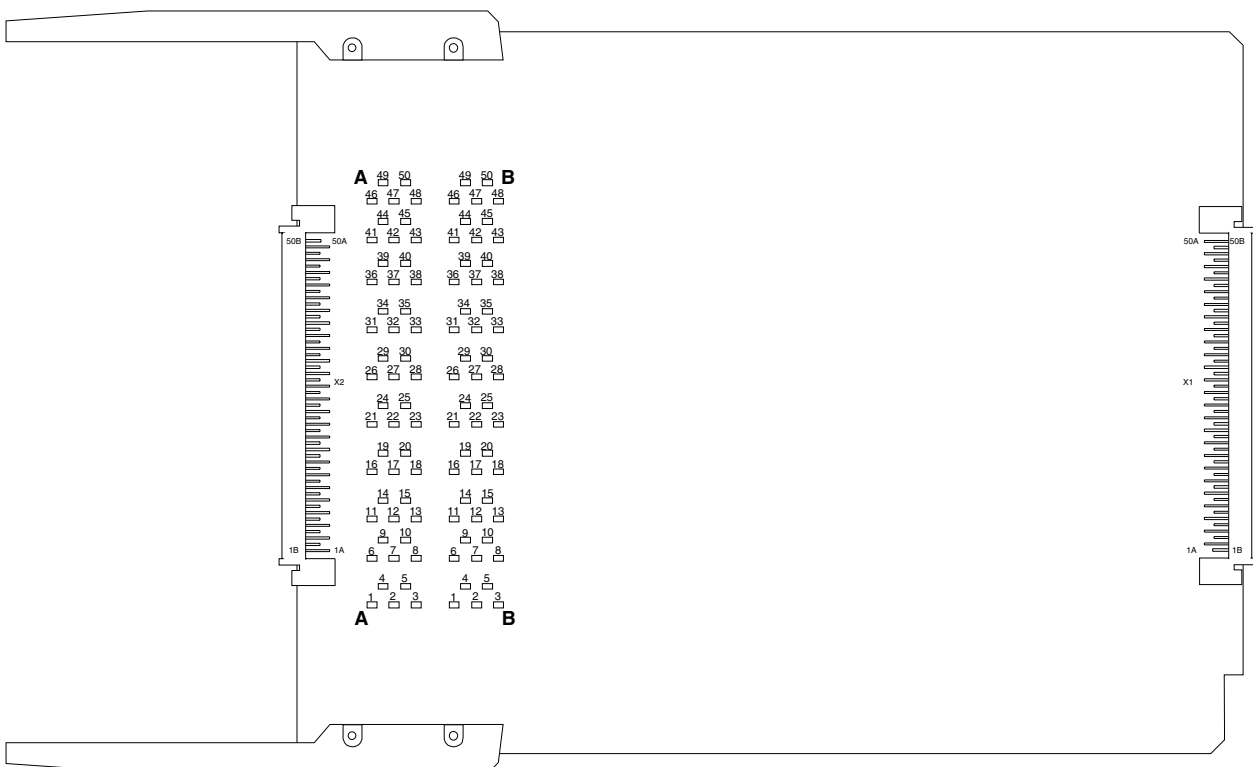
- a. Connect the PC to the RS232 connector of the camera.
- b. Follow the instruction on the PC to download the software.

## Video Gain Adjustment



Digital Video Processor Board  
layer bottom

## Extender Board





## —Video Gain Adjustment—

---

### Set-up

1. Switch off power. Place digital video board and video mux. board (Triax adapter) on service extenders. Switch on power.
2. Switch on colour bar.

### Video output level

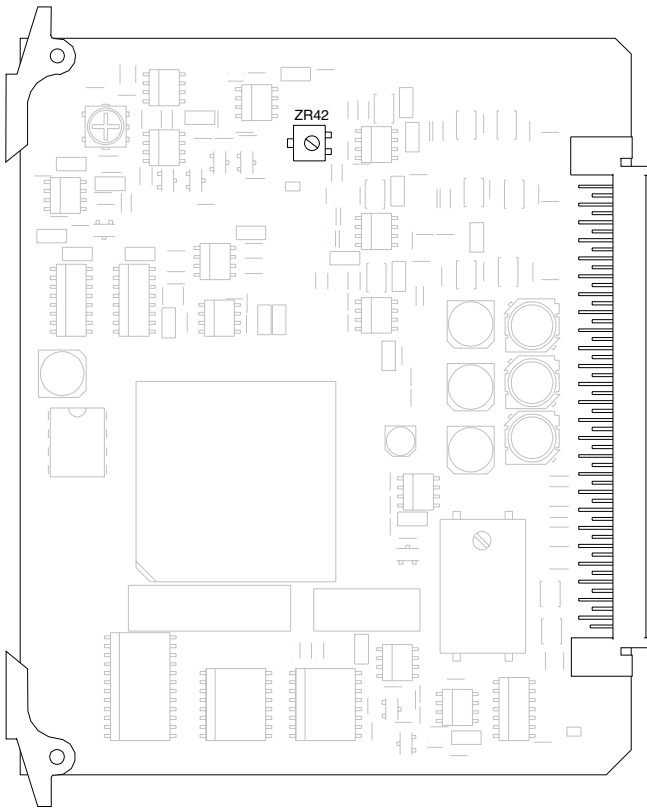
3. Adjust the R, G and B potentiometers on the digital video board to obtain the correct output amplitudes.

Measure at:	Adjust with:	Required result:	
Extender X22 (Video mux.)			
MP B50	ZR258 (R)	1400mV	
MP B42	ZR458 (G)	1400mV	
MP B46	ZR658 (B)	1400mV	

6. Switch off power. Return digital video board and video mux. board (Triax adapter) to their positions in the camera and adapter.

## Video Monitoring Adjustment

---



**Sync. / Monitoring Board**

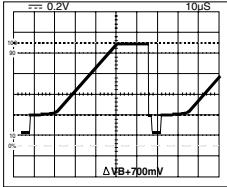
## —Video Monitoring Adjustment—

### 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 terminated with 75 Ohm to the VF output on the back panel.
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:
VF output	ZR42	PAL 700mV NTSC 714mV (100IRE)	

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



---

## Section 5

### Diagnostics

*This section contains an explanation of the internal diagnostic system of the camera. The diagnostic messages and the block diagrams are a useful help when fault finding.*

#### **Contents**

---

Diagnostic Messages .....	5-2
---------------------------	-----

## Diagnostic Messages

The internal system of the camera can carry out a diagnostic test. When the test is started via the menu system, the status of the various units is displayed in the diagnostic menu.

If a test fails then a message is displayed to indicate the module that has not passed the test. At the service level, additional information is given to indicate which particular test has failed.

The table below lists the tests in the order in which they are performed. It indicates the action that is taken if the test fails and it lists the messages that are displayed. An indication of the degree of certainty for each test is also given.

Test Id	Test Fails	Message, User0-3	Message, Service1-2	%
1. ViPr - SPI	Continue	Video Proc Fails	SPI Error	90
2. ViPr - IIC	Continue	Video Proc Fails	IIC Error	90
3. ICB - IIC	Continue	InterCon.B Fails	IIC Error	90
4. PPG - IIC	Continue	Pulse Generator Fails	IIC Error	90
5. PPG - SPI	Continue	Pulse Generator Fails	SPI Error	90
6. PrPr - IIC	Continue	PreProcessor Fails	IIC Error	90
7. FrDr - IICjudge all iic/spi tests	ContinueStop	FrontDriver FailsDataboard Fails	IIC ErrorIIC/SPI Error	90
8. FrDr - Sensor_Supply	Stop	Front Driver Fails	Sensor Supply	
9. FrDr - Shutter	Stop	Front Driver Fails	Shutter not running	
10. ViPr - ASIC_AB	Stop	Video Proc Fails	BST ASIC A->B	90
11. ViPr - FreqLock	Stop	Video Proc Fails	FreqLock	70
12. ViPr - ASIC_B_Adapter	Stop	Video Proc Fails	BST ASIC->buffer	70
13. ViPr - RGB_Out	Stop	Video Proc Fails	I/O Error	80
14. ViPr - Sawtooth	Stop	Video Proc Fails	Sawtooth Fails	80
15. ViPr - VF_Y	Stop	Video Proc Fails	VF signal Fails	80
16. SyMo - VF video	Stop	Sync Monit. Fails	VF signal Fails	80
17. PrPr - Clamp	Stop	PreProcessor Fails	Clamp/WhPulse	
18. PrPr - Gain0	Stop	PreProcessor Fails	Output	
19. PrPr - Gain1	Stop	PreProcessor Fails	AGC Fails	
20. PrPr - Gain2	Stop	PreProcessor Fails	AGC Fails	
21. PrPr - VSawtooth	Stop	PreProcessor Fails	V-Sawtooth Fails	
22. Sensor_Video	Stop	PPG/Front Fails	No Video	
23. FSP - IIC	Warning	Front Switch Fails	IIC Error	90
24. LSP - IIC	Warning	Left Switch Fails	IIC Error	90
25. CBRC - IIC	Warning	Right Cover Fails	IIC Error	90
26. SeDa - Calibrations	Warning	xx Calibrations	xx not performed	

---

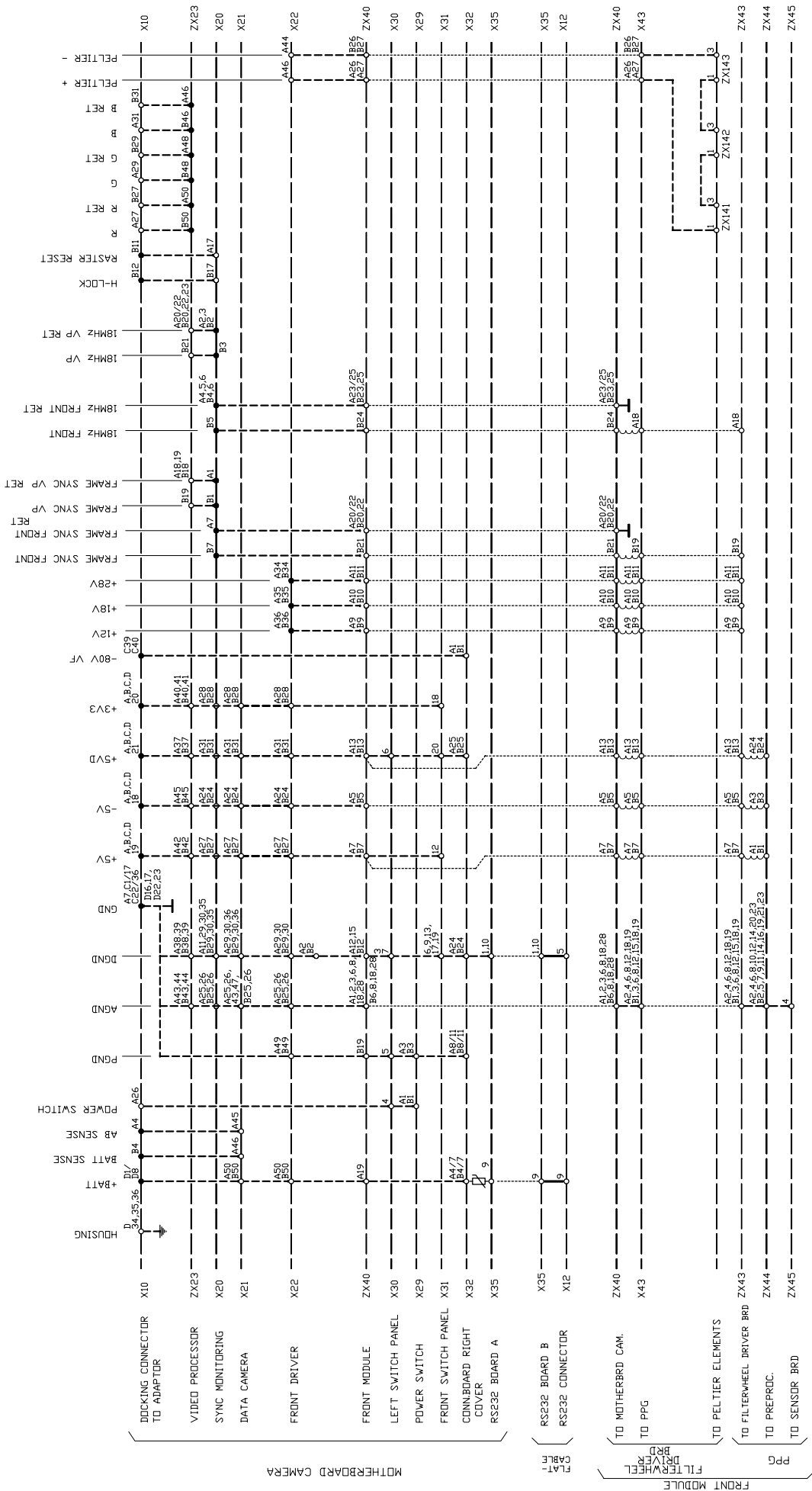
## Section 6

### Wiring & Block Diagrams

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Wiring Diagram Dockable Camera Head .....	6-2	Block Diagram Dockable Camera Head .....	6-6
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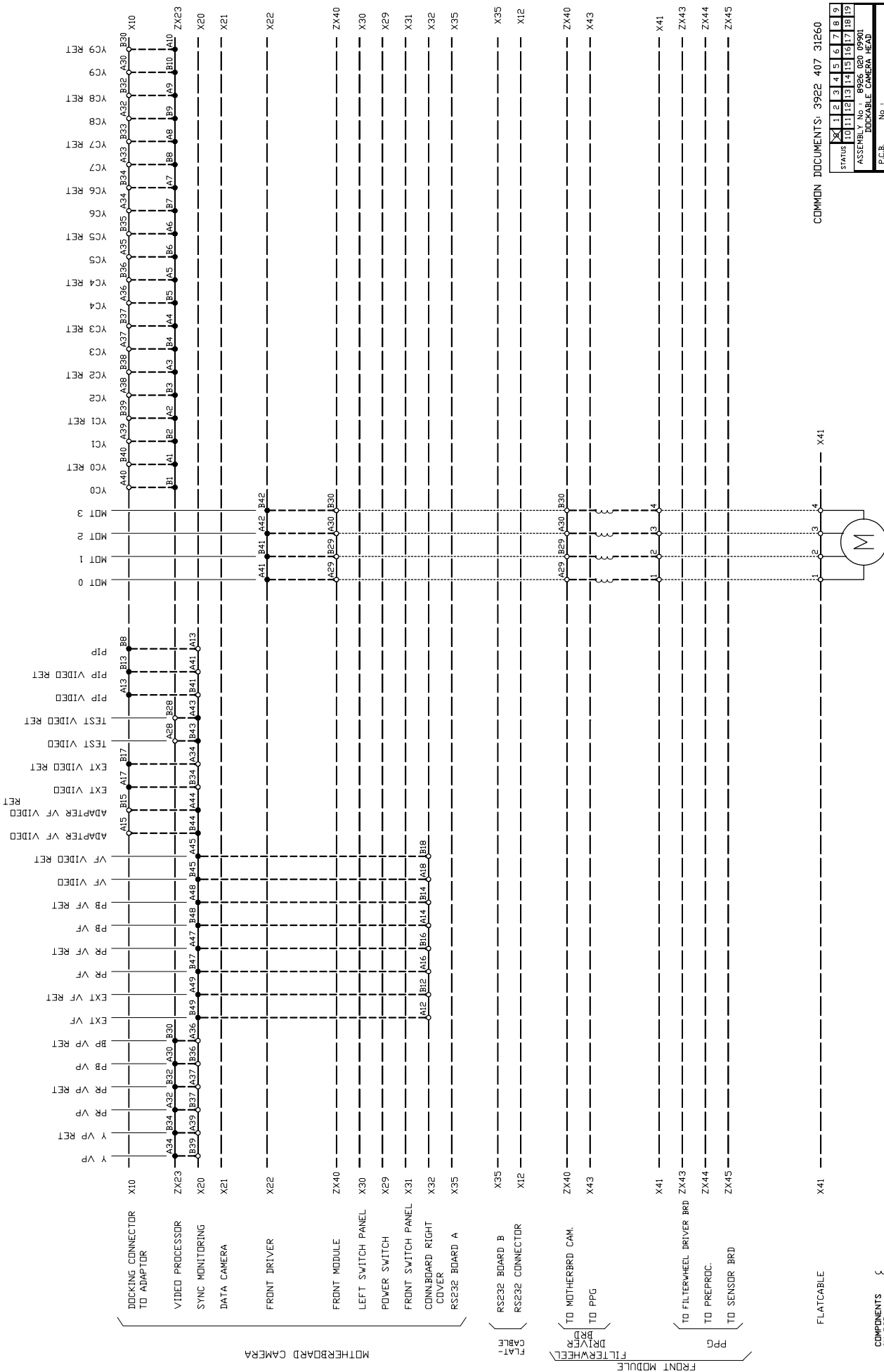


COMMON DOCUMENTS: 3922 407 31260

STATUS	1	2	3	4	5	6	7	8	9	
ASSEMBLY No. 1	10	11	12	13	14	15	16	17	18	19
ASSEMBLY No. 1 89266 020 09900										
BLOCKABLE CAMERA HEAD										
P.C.B. No. 1										
WIRING DIAGRAM										
NAME P. VISSERS										
PROJ. DATE: 00-01-03										
PROJ. DATE: 00-01-03										
PROJ. SHEET 131 - 1										
PROPERTY OF: PHILIPS BROADCAST TELEVISION SYSTEMS BV										
BREDA, THE NETHERLANDS										

COMPONENTS ON PCB: {  
 TRACK: - - - - -  
 WIRE: ————  
 CONNECTOR: ·······

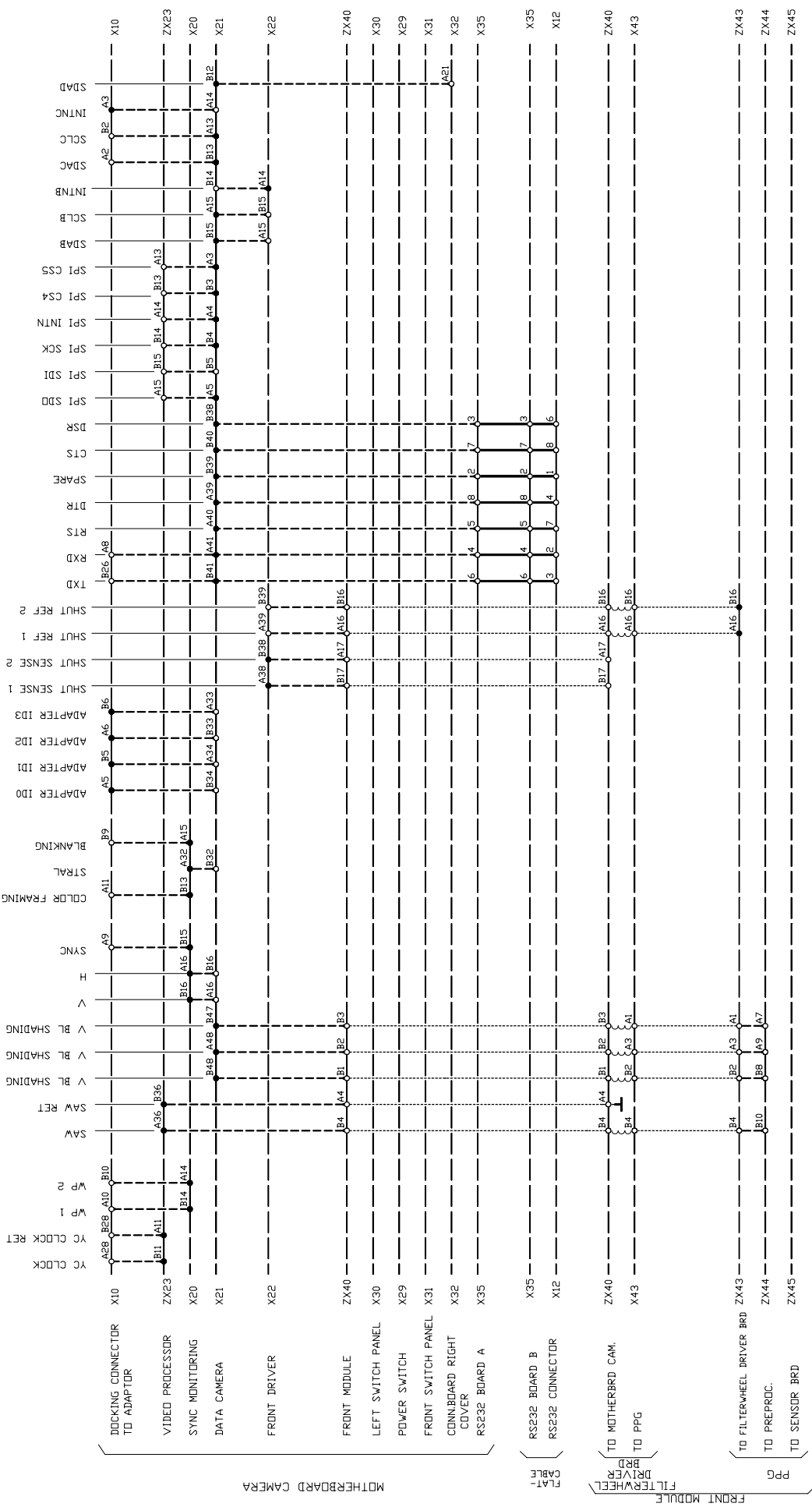




COMMON DOCUMENTS: 3922 407 31260

STATUS	1	2	3	4	5	6	7	8	9	
ASSEMBLY No. 1	10	11	12	13	14	15	16	17	18	19
DOKKABLE CAMERA HEAD										
P.C.B. No. 1										
VIRING DIAGRAM										
NAME P. VISSERS										
PROPERTY OF: 4 SHI SHEET 131 - 2										
B.T.S. BROADCAST TELEVISION SYSTEMS BV										
BREDA, THE NETHERLANDS										

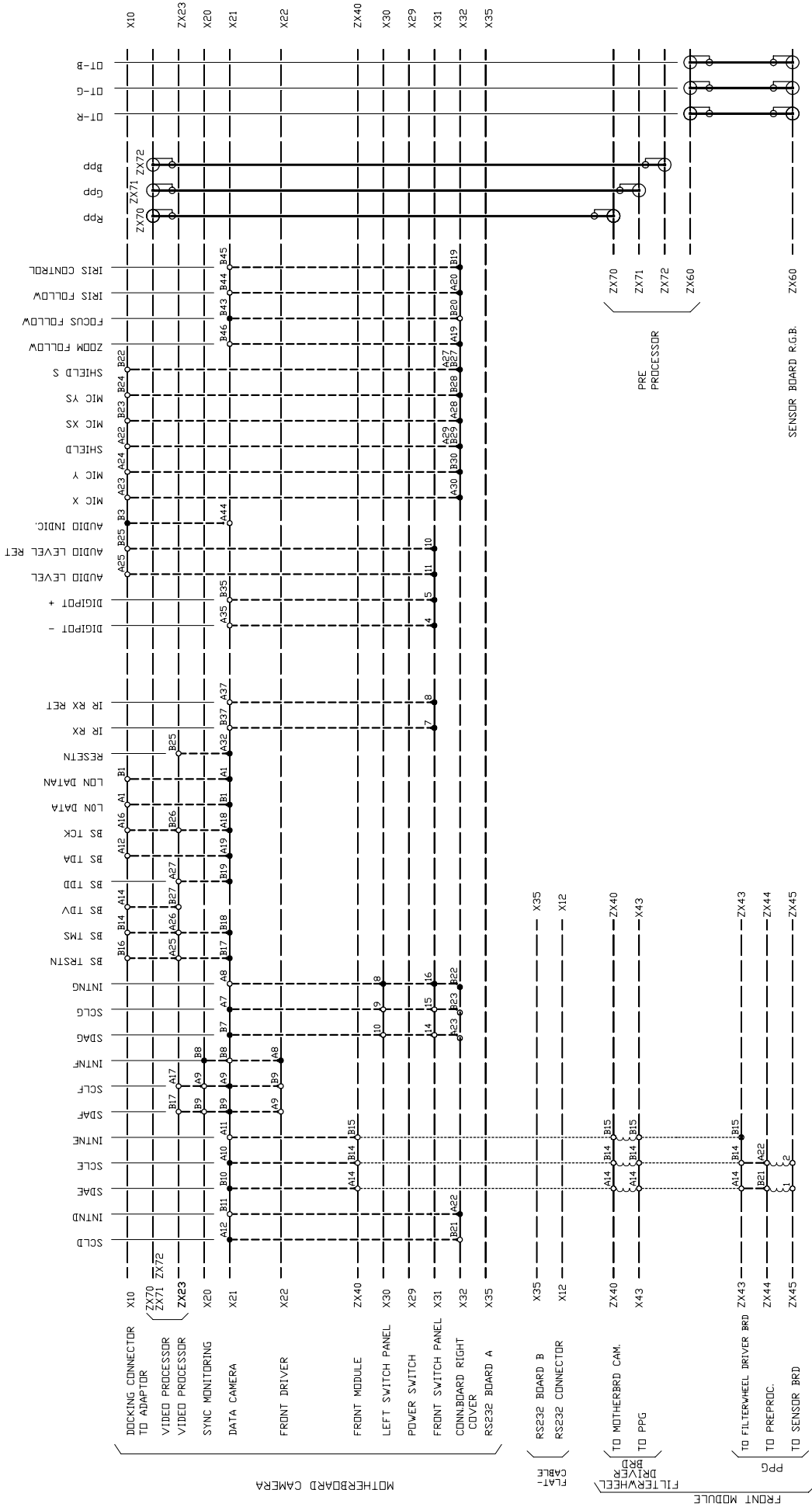
CURR. DATE: 00-01-03									
PREV. DATE: 00-01-03									
NAME P. VISSERS									
PROPERTY OF: 4 SHI SHEET 131 - 2									
B.T.S. BROADCAST TELEVISION SYSTEMS BV									
BREDA, THE NETHERLANDS									



COMPONENTS ON PCB. {  
 TRACK : - - - - -  
 WIRE : \_\_\_\_\_  
 CONNECTOR : .....  
 .....

COMMON DOCUMENTS: 3922 407 31260

STATUS	X	1	2	3	4	5	6	7	8	9
	10	11	12	13	14	15	16	17	18	19
ASSEMBLY No.	B926 020 09900									
DECKABLE CAMERA HEAD										
P.C.B. No.	No 1									
DATE	00-01-03									
WIRING DIAGRAM	PREV. DATE: 00-01-03									
NAME P. VISSERS	DWS. DATE: 00-01-03									
PROPERTY OF	4 SH SHEET 131 - 3									
BTS BROADCAST TELEVISION SYSTEMS BY	BREDA, THE NETHERLANDS									

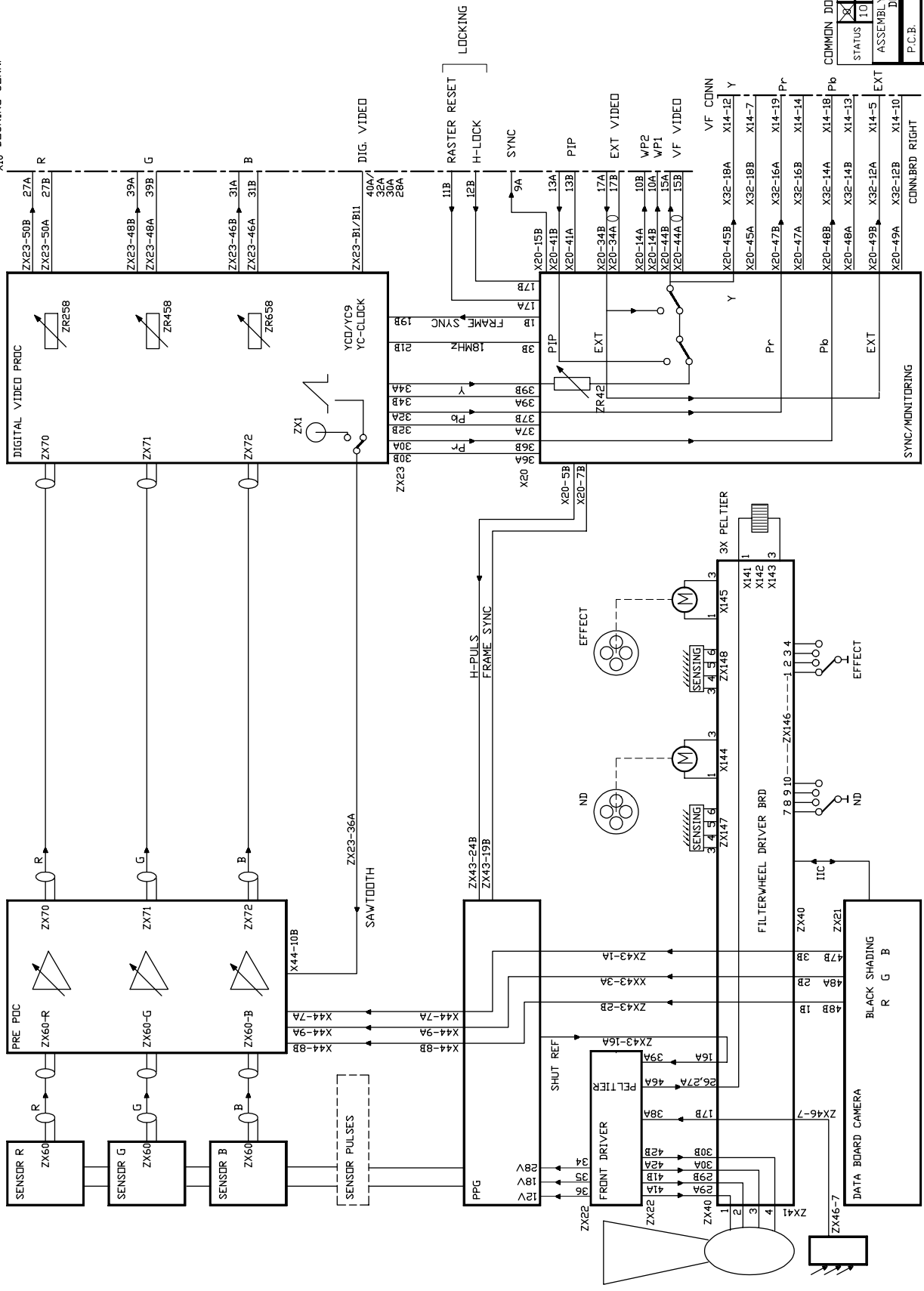


COMMON DOCUMENTS: 3922 407 31260

STATUS	X	1	2	3	4	5	6	7	8	9
ASSEMBLY No.	10	11	12	13	14	15	16	17	18	19
DESIGN No.	B956 020 0990									
DATE	00-01-03									
PROJECT	BROADCAST TELEVISION SYSTEMS BV									
ADDRESS	BREDA, THE NETHERLANDS									

COMPONENTS ON PCB: {  
 TRACK: - - - - -  
 WIRE: ————  
 CONNECTOR: .....

X10 DOCKING CONN.



COMMON DOCUMENTS: 3922 407 31260									
STATUS	1	2	3	4	5	6	7	8	9
	10	11	12	13	14	15	16	17	18
ASSEMBLY No. : 8926 020 09901									
DOCKABLE CAMERA HEAD									
P.C.B. No. :									
BLOCK DIAGRAM									
CURR. DATE : 00-10-05									
PREV. DATE : 00-10-05									
NAME P. VISSERS									
DRG. DATE : 00-10-05									
PROPERTY OF: PHILIPS DIGITAL VIDEO SYSTEMS BV									
BREDA, THE NETHERLANDS									

VIDEO PROCESSING LDK200

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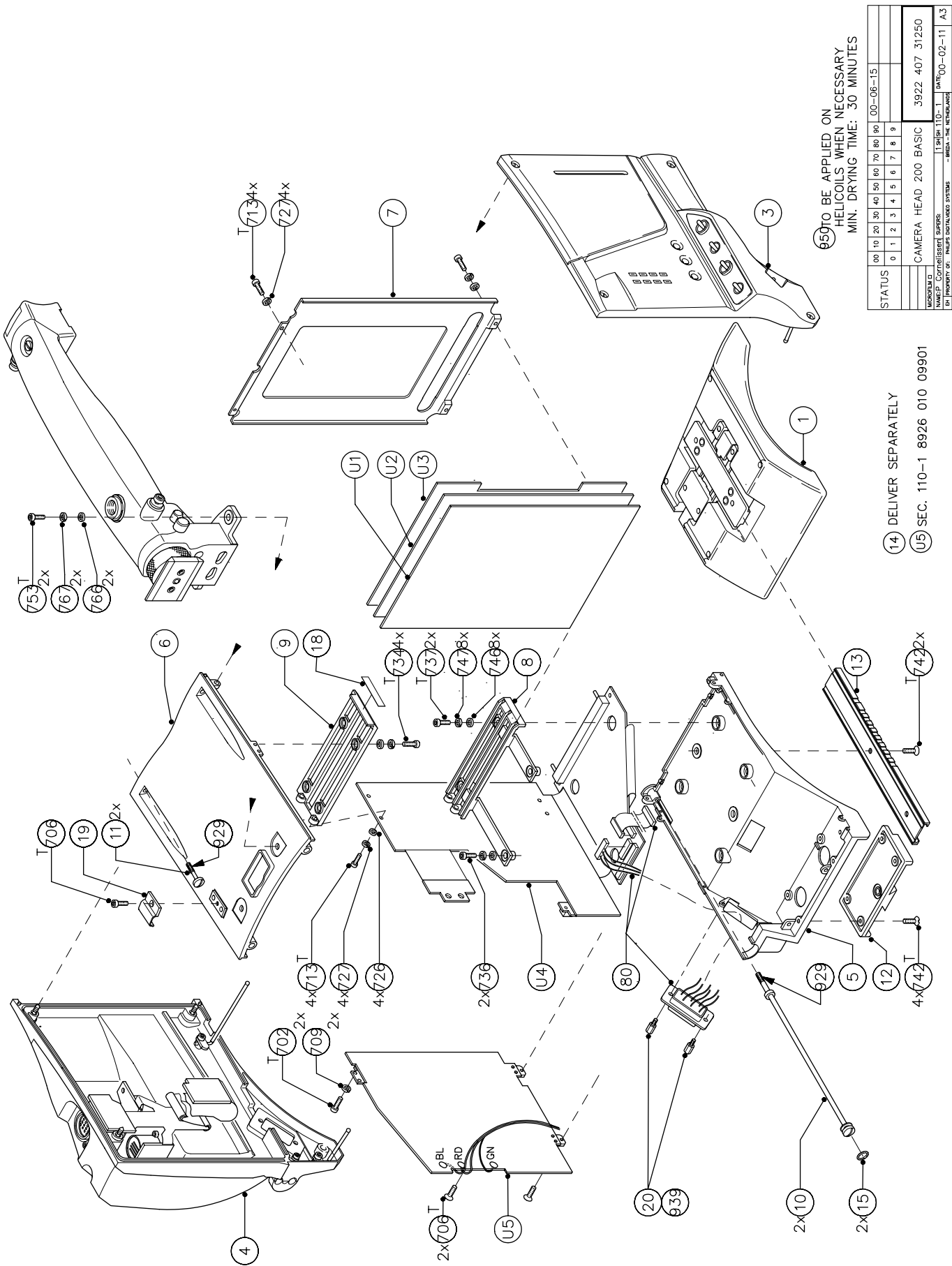
## Section 7

### Mechanical Exploded Views

#### **Contents**

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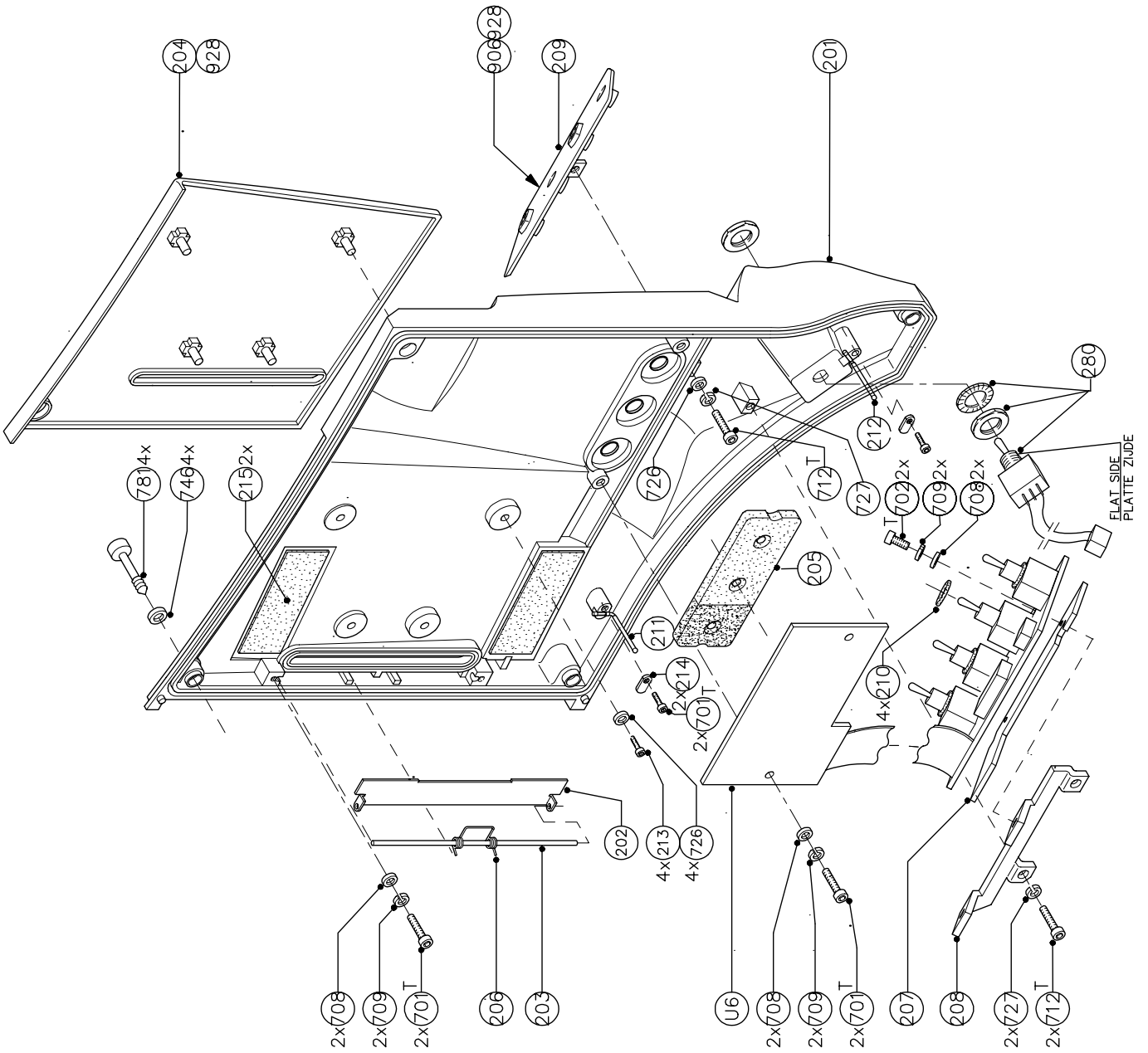
Camera head 200 Basic .....	7-2	Shoulder pad assy .....	7-7
Cover left assy .....	7-3	Front module 200 PAL .....	7-8
Cover right assy .....	7-4	Optical module 200 PAL switchable .....	7-9
Hand grip assy .....	7-5	Dockable camera head LDK 200 .....	7-10
Hand grip rubber assy .....	7-6		



650 TO BE APPLIED ON  
HELICOILS WHEN NECESSARY  
MIN. DRYING TIME: 30 MINUTES

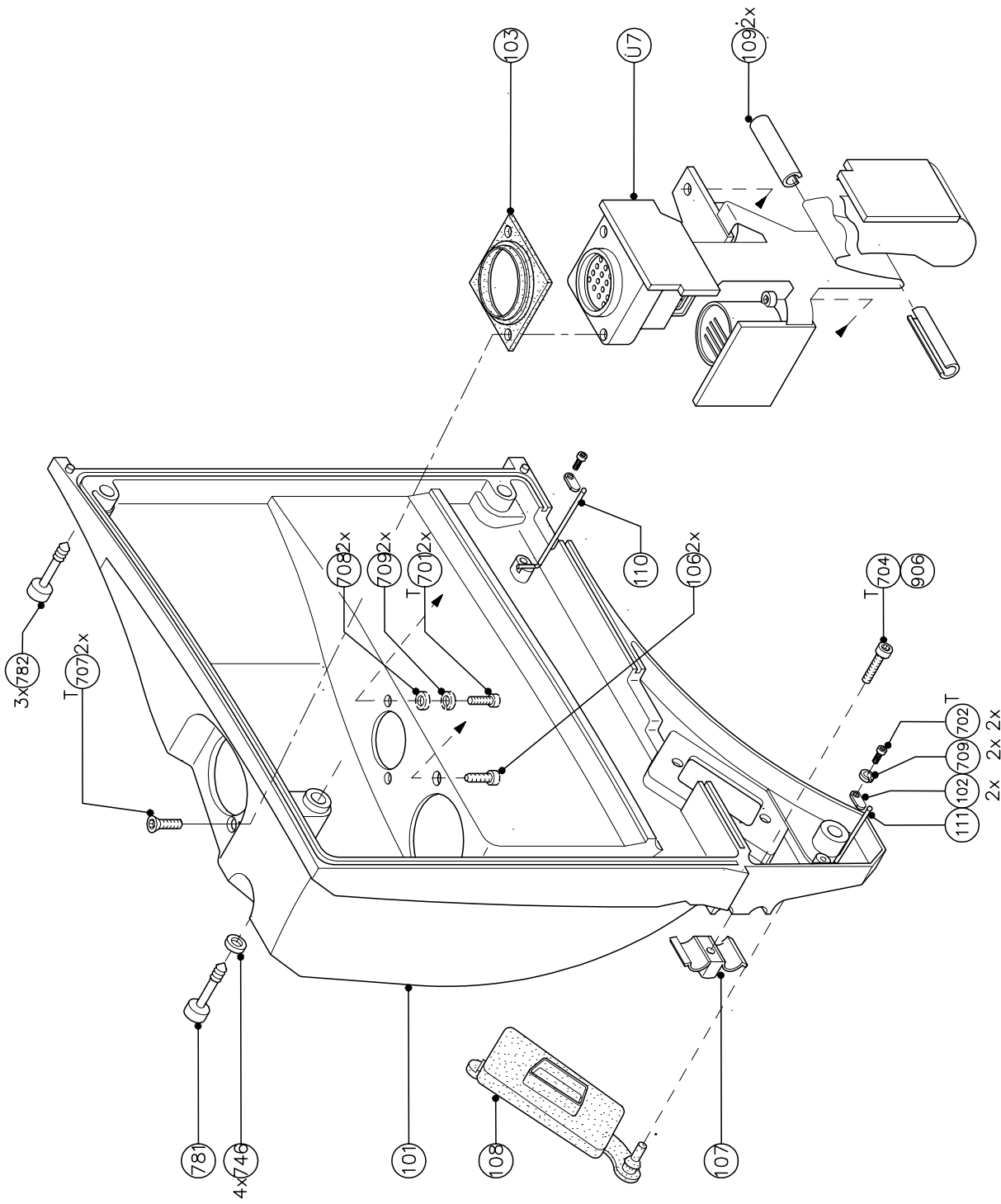
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	0	1	2	3	4	5	6	7	8	9		
MICROFILM ID	CAMERA HEAD 200 BASIC											
NAME/F. CORRECTION SUPER	3922 407 31250											
BY / PROPERTY OF	T 31250 T10-1 - MB - IN. INDICATED											
	DATE 00-02-11 A3											

- (14) DELIVER SEPARATELY
- (15) SEC. 110-1 8926 010 09901



ALSO VALID FOR: 3922 407 31350

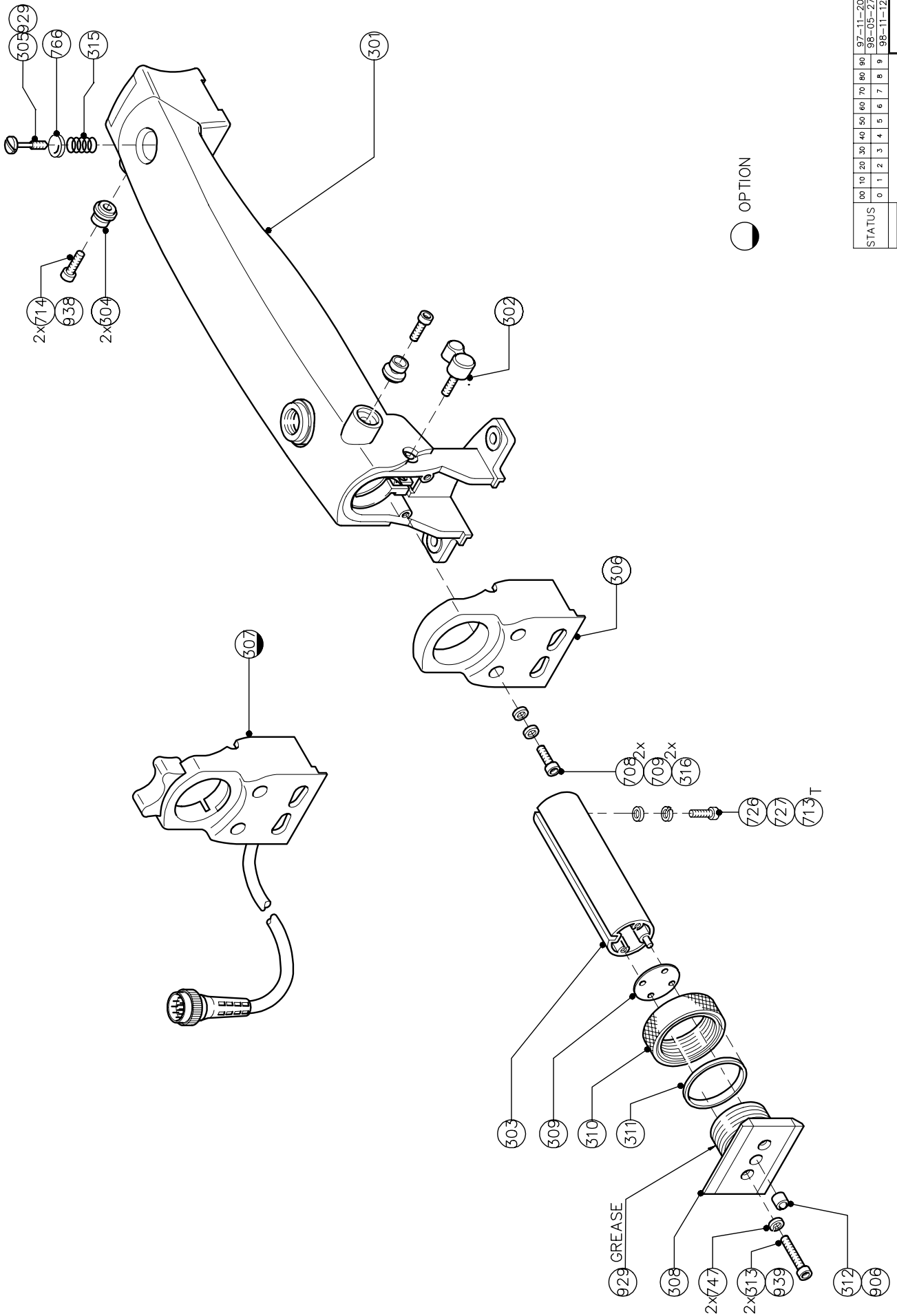
00	10	20	30	40	50	60	70	80	90	97-08-20	98-07-20				
STATUS	1	0	1	2	3	4	5	6	7	8	9	97-11-20	00-01-11	97-11-25	00-04-26
MICROFILM D.	COVER LEFT ASSY														
MODEL V. VITEL	3922 407 24320														
DTI PROJEKT GRUPOUZE	BROJEREN: 110-1														
	DANSK: 110-1														
	TILBUD: 7-05-16														
	A3														



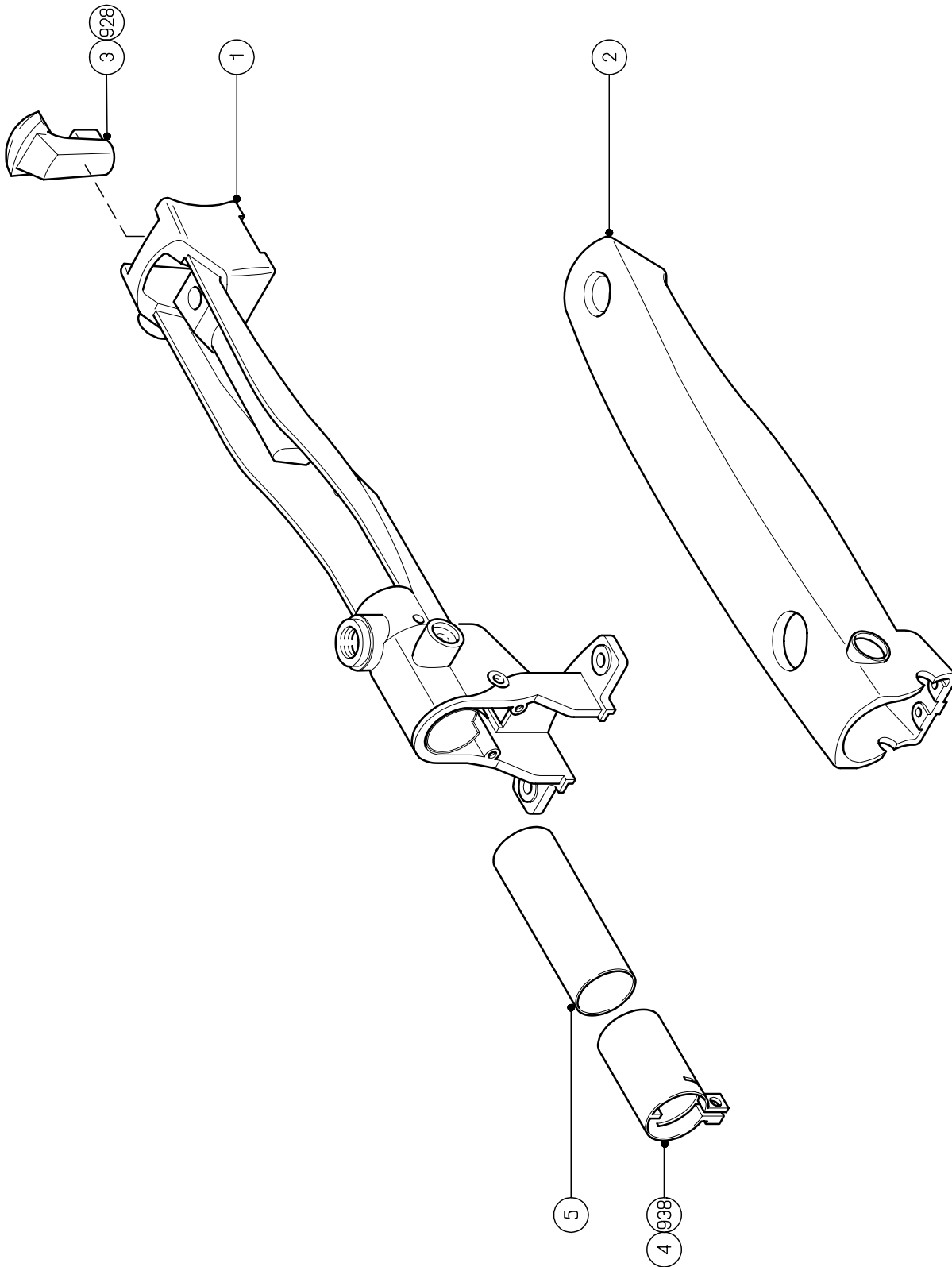
ALSO VALID FOR : 3922 407 31360

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STATUS											
0	1	2	3	4	5	6	7	8	9	98-07-20	00-12-13
98-09-02											
D1-12-03											
COVER RIGHT ASSY											
3922 407 24310											
MICROFILM D											
NAME: U. V. VIEB											
SUPPERS: 11/19/11/110-1											
DATE: 07-05-13											
BY: (Personnel) CP: (Personnel) M: (Personnel) B: (Personnel) E: (Personnel) A: (Personnel)											

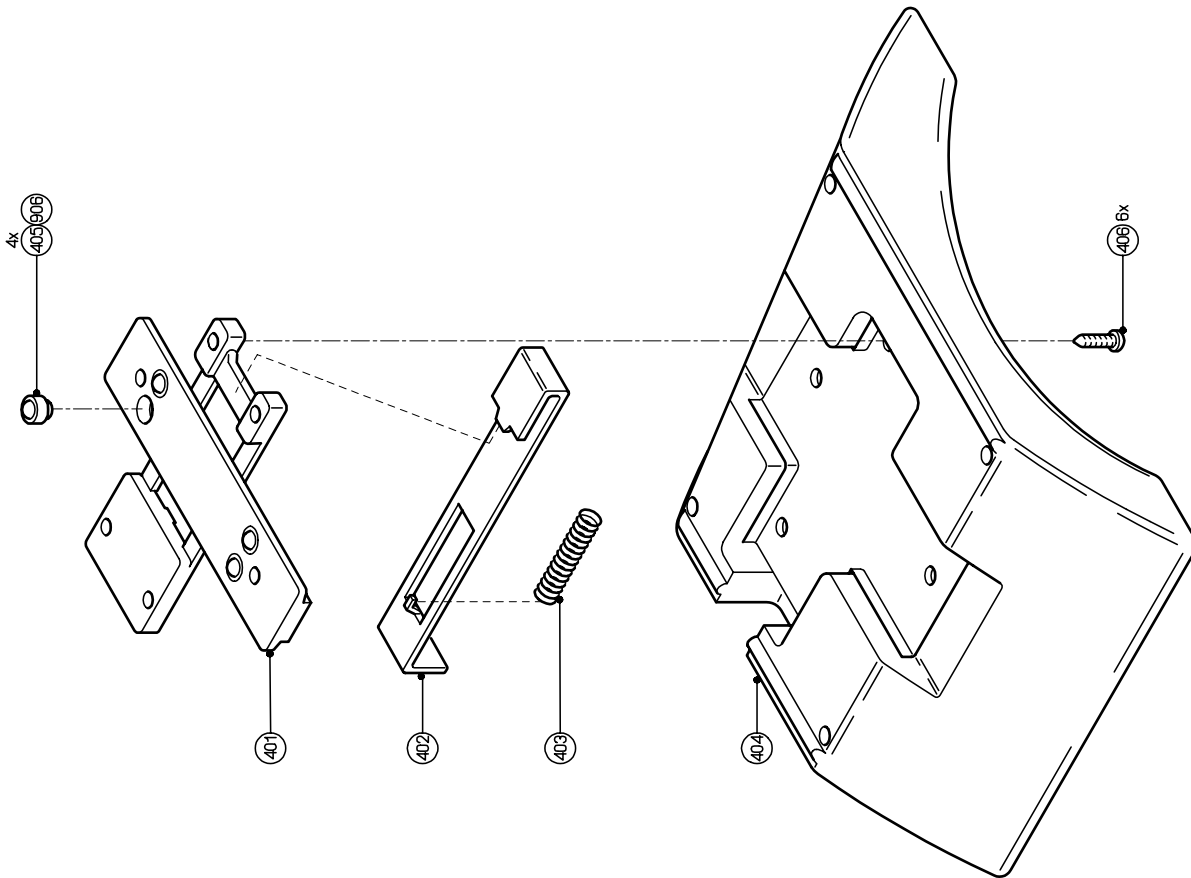




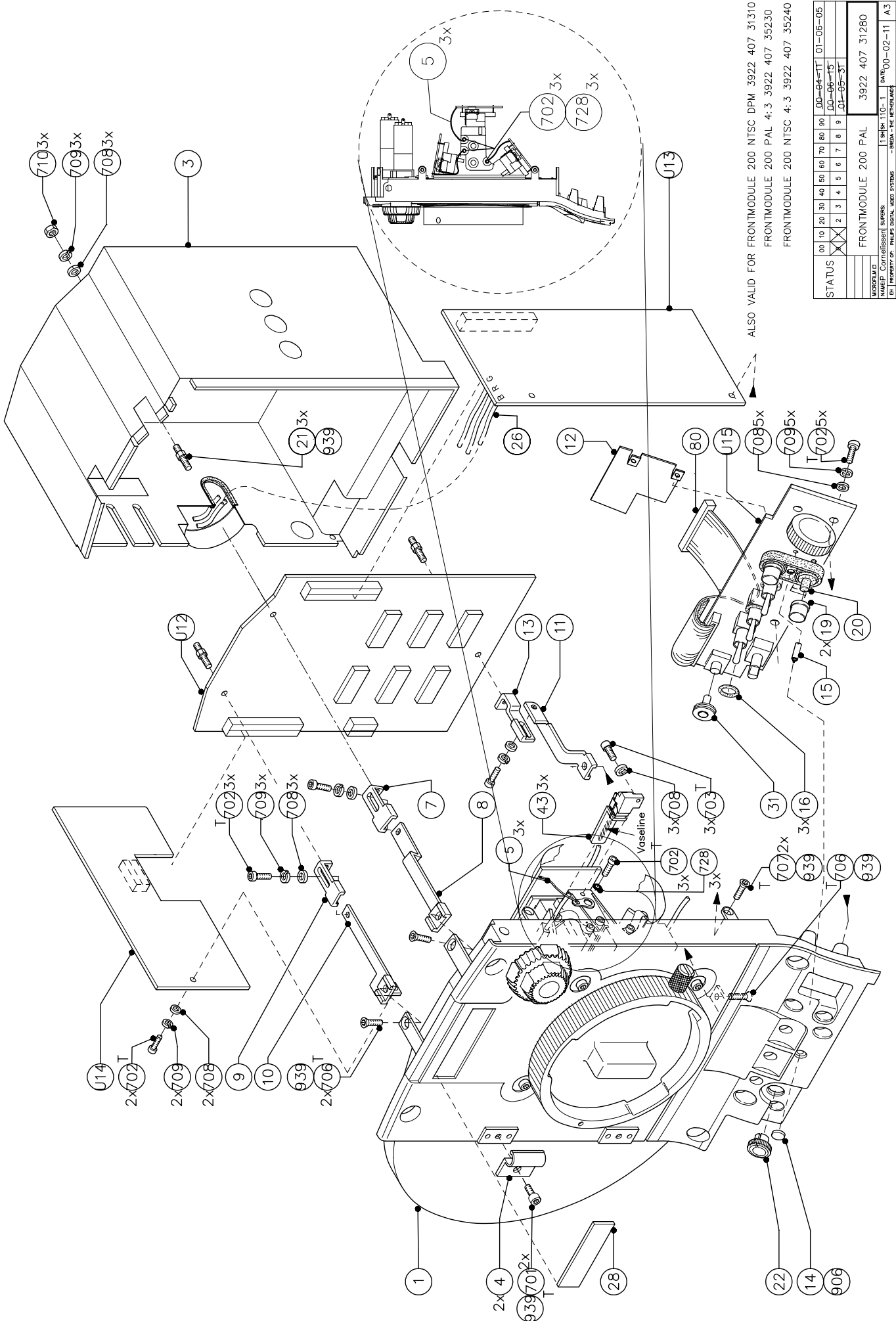
00	10	20	30	40	50	60	70	80	90	97-11-20	00-10-11
0	1	2	3	4	5	6	7	8	9	98-05-27	
										98-11-12	
MODEL D: _____ NAME: DOTTI _____ DATE: _____ PROJECT: OPTIMUS BRACKET TELECOM SYSTEMS BRACKET TELECOM											
HAND GRIP ASSY										3922 407 25350	A3



STATUS	00	10	20	30	40	50	60	70	80	90	97-10-22
	0	1	2	3	4	5	6	7	8	9	
HAND GRIP RUBBER ASSY											
WORKFIELD											97-10-22
DATE											97-03-17
BY: [REDACTED] AREA: TELEVISIONS SYSTEMS DIV. AREA: TELEVISIONS											

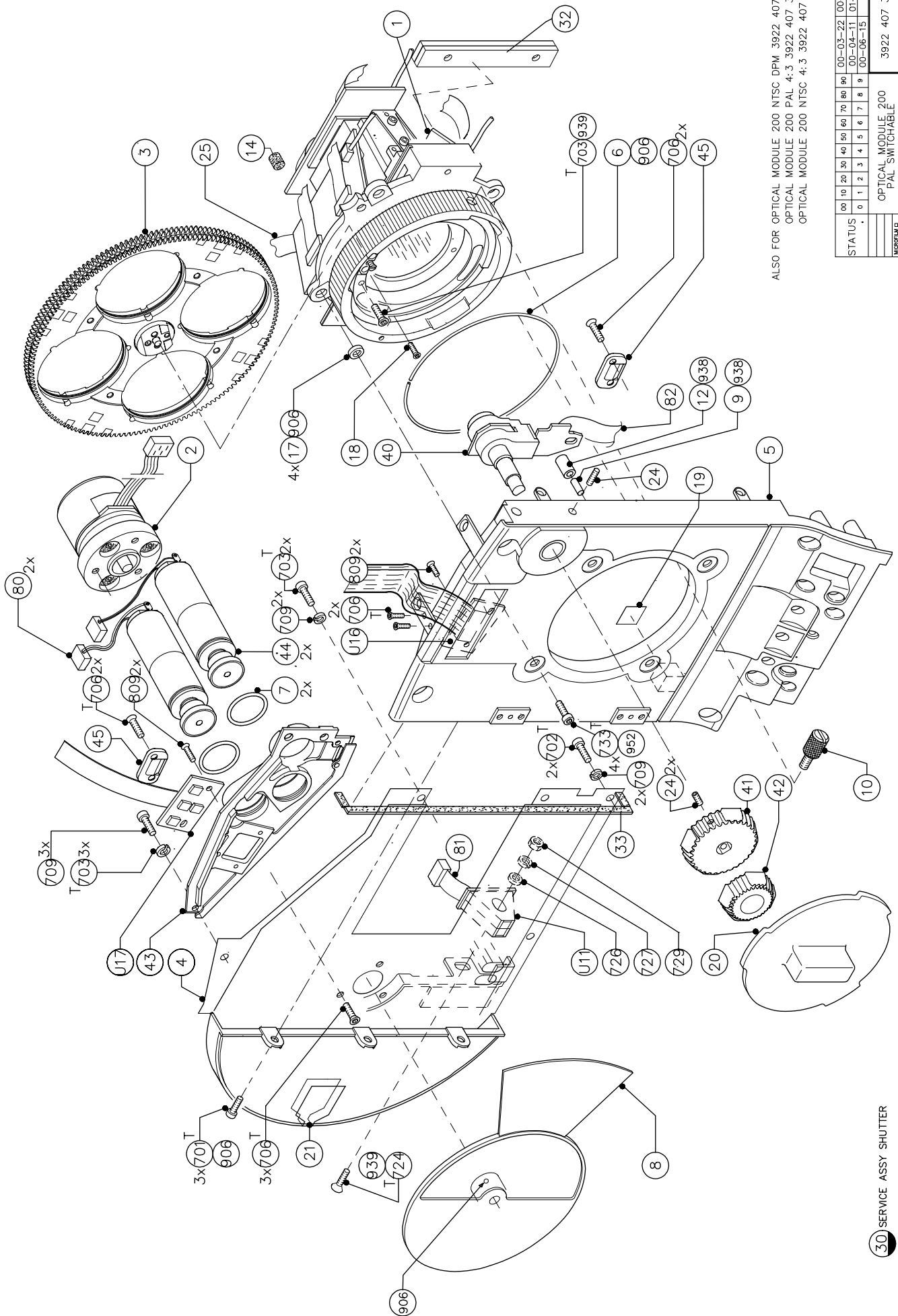


00	10	20	30	40	50	60	70	80	90	98-01-21
STATUS	0	1	2	3	4	5	6	7	8	9
SHOULDERPAD ASSY										
3922 407 22220										
MAKE: P. 08 CHREWIJ, S. PERS. 1 SHJST-110-1 DATE: 98-11-13 PROPERTY OF: PHILIPSCONST TELEVISION SYSTEMS BV - BREDA - THE NETHERLANDS										



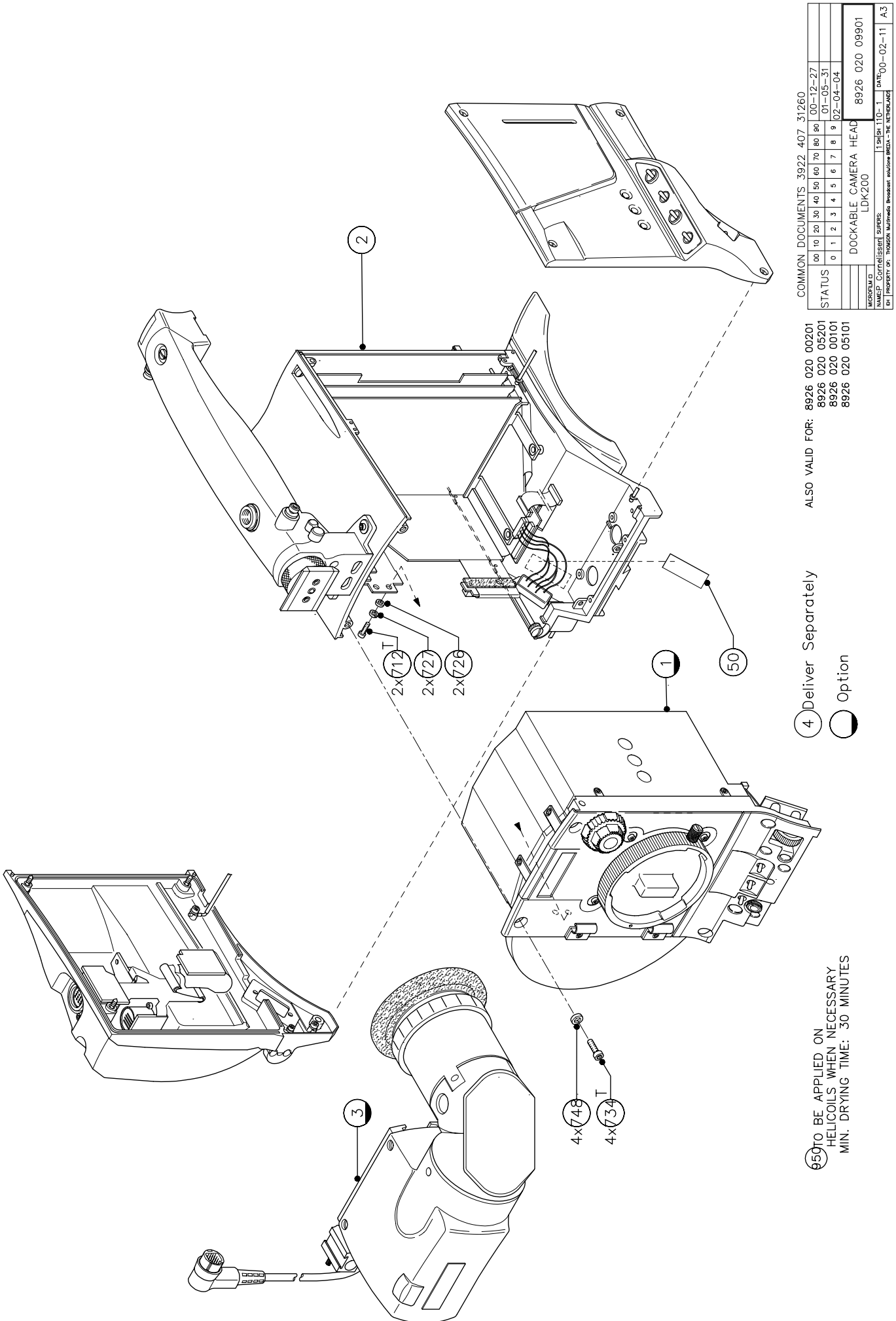
ALSO VALID FOR FRONTMODULE 200 NTSC DPM 3922 407 31310  
 FRONTMODULE 200 PAL 4:3 3922 407 35230  
 FRONTMODULE 200 NTSC 4:3 3922 407 35240

STATUS	00	10	20	30	40	50	60	70	80	90	00-04-11	01-06-05
	X	X	3	4	5	6	7	8	9		00-06-15	
											01-09-31	
FRONTMODULE												
NAMEP: Cornélissen Supers												
ON PROPERTY OF: Philips Video Systems												
	- BETA - THE REMOVED											
	113181 110-1											
	3922 407 31280											
	00-02-11 A3											



ALSO FOR OPTICAL MODULE 200 NTSC DPM 3922 407 31320  
 OPTICAL MODULE 200 PAL 4:3 3922 407 35250  
 OPTICAL MODULE 200 NTSC 4:3 3922 407 35260

STATUS	00	10	20	30	40	50	60	70	80	90	00-03-22	00-08-11
	0	1	2	3	4	5	6	7	8	9	00-04-11	01-05-31
											00-06-15	
MICROLOG												
NAME/P. CONTROLLEERT SUPPL.	OPTICAL MODULE 200 PAL SWITCHABLE											
DATE	3922 407 31290											
FILE	LDKSHR110-1 DATE: 90-02-15 A.3											



ALSO VALID FOR: 8926 020 00201  
 8926 020 05201  
 8926 020 00101  
 8926 020 05101

4 Deliver Separately  
 Option

50 TO BE APPLIED ON  
 HELICOILS WHEN NECESSARY  
 MIN. DRYING TIME: 30 MINUTES

COMMON DOCUMENTS 3922 407 31260

00	10	20	30	40	50	60	70	80	90
STATUS									
0	1	2	3	4	5	6	7	8	9
DOCKABLE CAMERA HEAD									
LDK200									
8926 020 09901									

MICROFILM D: \_\_\_\_\_  
 NAME/P: Corneillesen SUPERS: \_\_\_\_\_  
 DATE: 00-02-11  
 PROPERTY OF: THALES Nederland B.V.

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## **Section 8**

### **Parts Lists**

SERVICE PARTS LIST		
Item	Description	Code Number
1	FRONT MODULE PAL 200 DPM	s 3922 407 31281
2	CAMERAHEAD BASIC	3922 407 31251
50	TYPEPLATE THOMSON CE	
702T	PAN SCR STL ST M2X6	s 5322 502 14494
706T	CSK SCR STL ST M2X4	s 5322 502 14493
709	SPR WASH STL ST 2,1X4.4	s 5322 530 84092
712T	PAN SCR STL ST M2,5X5	s 5322 502 21206
726	WASH STL ST 2,7X6,5	s 5322 532 12128
727	SPR WASH STL ST 2,6X5,1	s 5322 530 80656
734T	PAN SCR STL ST M3X8	s 5322 502 14405
748	EARTH WASH STL ST A4 3,2X6	s 5322 532 12257
950	LOCKTITE 480	
DIAGRBL	OVERALL BLOCK DIAGRAMS LDK200	3922 496 49471
DIAGRWR	WIRING DIAGRAMS LDK200	3922 496 49181

products marked with "s" are available as spare part,  
other parts are printed for information only.

<b>DIG.CAM HEAD, 50HZ, DPM</b>	ORDERING CODE: <b>8926 020 00201</b>	STATUS:
	REF NR: <b>8926 020 00201</b>	DATE: <b>2001-12-05</b>
		SHEET: <b>1</b> OF <b>1</b>

alt. code: LDK200/02



<b>SERVICE PARTS LIST</b>		
<i>Item</i>	<i>Description</i>	<i>Code Number</i>
1	FRONT MODULE NTSC 200 DPM	s 3922 407 31311
2	CAMERAHEAD BASIC	3922 407 31251
50	TYPEPLATE THOMSON CE	
702T	PAN SCR STL ST M2X6	s 5322 502 14494
706T	CSK SCR STL ST M2X4	s 5322 502 14493
709	SPR WASH STL ST 2,1X4.4	s 5322 530 84092
712T	PAN SCR STL ST M2,5X5	s 5322 502 21206
726	WASH STL ST 2,7X6,5	s 5322 532 12128
727	SPR WASH STL ST 2,6X5,1	s 5322 530 80656
734T	PAN SCR STL ST M3X8	s 5322 502 14405
748	EARTH WASH STL ST A4 3,2X6	s 5322 532 12257
950	LOCKTITE 480	
DIAGRBL	OVERALL BLOCK DIAGRAMS LDK200	3922 496 49471
DIAGRWR	WIRING DIAGRAMS LDK200	3922 496 49181

products marked with "s" are available as spare part,  
other parts are printed for information only.

<b>DIG.CAM HEAD, 60HZ, DPM</b>	ORDERING CODE: <b>8926 020 05201</b>	STATUS:
	REF NR: <b>8926 020 05201</b>	DATE: <b>2001-12-05</b>
		SHEET: <b>1</b> OF <b>1</b>

alt. code: LDK200/52

<b>SERVICE PARTS LIST</b>		
<i>Item</i>	<i>Description</i>	<i>Code Number</i>
1	SMART CARD/LDK100	
2	OWNER SETUP/PINCODE CARD	
3	OPERATOR'S MANUAL LDK200	s 3922 496 47941
4	TECHNICAL MANUAL LDK200	s 3922 496 47951
5	RAIN / OFF USE COVER	s 3922 401 49581
6	BAG PE 250X410X0,03	s 5322 600 10768
7	USER'S GUIDE LDK5021	s 3922 496 47341
8	SERVICE MANUAL LDK200	s 3922 496 47961
9	OPERATOR'S MANUAL LDK5430 GER	s 3922 496 48861
4D1	OPERATOR'S MANUAL LDK200 TRIAX	s 3922 496 47971
4D2	OPERATOR'S MANUAL LDK5430 GER	s 3922 496 48861

products marked with "s" are available as spare part,  
other parts are printed for information only.

<b>SET OF ADDITIONAL SUPPL.LDK200</b>	ORDERING CODE: <b>not a spare part</b>	STATUS:
	REF NR: <b>3922 407 31271</b>	DATE: <b>2001-01-16</b>
		SHEET: <b>1 OF 1</b>

SERVICE PARTS LIST		
Item	Description	Code Number
1	SHOULDERPAD ASSY	s 5322 256 10408
2	HANDGRIP ASSY	s 5322 498 10681
3	COVER LEFT ASSY 200 SERIES	s 3922 407 31351
4	COVER RIGHT ASSY 200 SERIES	s 3922 407 31361
5	BOTTOM	s 5322 442 01127
6	TOP	s 5322 442 01128
7	DOCKPLATE	s 5322 426 10542
8	PRINTRAIL BOTTOM	s 5322 463 11157
9	PRINTRAIL TOP	s 5322 463 11158
10	DOCKSCREW BOTTOM	s 5322 502 14501
11	DOCKSCREW TOP	s 5322 502 14502
12	V-BLOCK	s 5322 466 11711
13	SUPPORT GUIDE	s 5322 463 11159
14	SET OF ADDITIONAL SUPPL.LDK200	3922 407 31271
15	O-RING 4.1X1.6	s 5322 530 51271
18	LABEL PRINTRAIL	
19	CABLECLAMP	s 5322 401 11721
20	HEXAGON LOCK SCREW	s 5322 502 14503
80	WIRE ASSY CAMERA HEAD	s 5322 320 12164
90	SET OF SOFTWARE LDK100 FOR V1.4	s 3922 407 27931
709	SPR WASH STL ST 2,1X4.4	s 5322 530 84092
713T	PAN SCR STL ST M2,5X6	s 5322 502 21207
726	WASH STL ST 2,7X6,5	s 5322 532 12128
727	SPR WASH STL ST 2,6X5,1	s 5322 530 80656
734T	PAN SCR STL ST M3X8	s 5322 502 14405
736T	PAN SCR STL ST M3X12	s 5322 502 21213
737T	PAN SCR STL ST M3X16	s 5322 502 14155
742T	CSK SCR STL ST M3X6	s 5322 502 14498
746	WASH STL ST 3,2X7	s 5322 532 12126
747	SPR WASH STL ST 3,1X5,7	s 4822 530 80188
753T	PAN SCR STL ST M4X10	s 5322 502 14499
766	WASH STL ST 4,3X9	s 5322 532 11595
767	SPR WASH STL ST 4,1X7,1	s 5322 530 80658
929	GREASE FS 1292	
939	SCREW LOCK 222	
950	LOCKTITE 480	
U1	SYNC MONITORING	s 3922 406 89241
U2	DATA BOARD	s 5322 214 12534
U3	FRONT DRIVER	s 3922 406 87851
U4	MOTHERBOARD CAM	s 5322 214 12536
U5	VIDEOPROCESSING	s 5322 214 12517

products marked with "s" are available as spare part,  
other parts are printed for information only.

<b>CAMERAHEAD BASIC</b>	ORDERING CODE: <b>not a spare part</b>	STATUS:
	REF NR: <b>3922 407 31251</b>	DATE: <b>2002-04-18</b>
		SHEET: <b>1 OF 1</b>

SERVICE PARTS LIST		
Item	Description	Code Number
201	COVER LEFT	s 3922 407 31382
202	COVER SMART CARD	s 5322 442 01131
203	HINGE	s 5322 417 11362
204	PADDING	s 5322 466 11704
205	SWITCH PAD	s 5322 410 11449
206	TORSION SPRING	s 5322 492 11503
207	INSULATION FOIL	s 5322 466 11855
208	BRACKET SWITCH PANEL	s 5322 402 10873
209	COVER SWITCH PANEL	s 5322 442 01132
210	O-RING 4.47X1.78	s 5322 530 10463
211	COVER HINGE LONG	s 5322 417 11364
212	COVER HINGE SHORT	s 5322 417 11365
213	PAN TAP SCR F ST T8 2,9X6,5	s 5322 502 14037
214	PLATE	s 5322 466 11856
215	CR STRIP 10X2MM SELFADH	
280	POWER SWITCH ASSY	s 3922 407 26062
701T	PAN SCR STL ST M2X4	s 5322 502 14492
702T	PAN SCR STL ST M2X6	s 5322 502 14494
708	WASH STL ST 2,2X5	s 5322 532 12139
709	SPR WASH STL ST 2,1X4.4	s 5322 530 84092
712T	PAN SCR STL ST M2,5X5	s 5322 502 21206
726	WASH STL ST 2,7X6,5	s 5322 532 12128
727	SPR WASH STL ST 2,6X5,1	s 5322 530 80656
746	WASH STL ST 3,2X7	s 5322 532 12126
781	RSD CH NK SCR STL ST M3X10 RVS	s 5322 502 13956
906	RUBBER GLUE SYNTHETIC NBR 042	
928	LOCTITE 403 CYANO ACR GLUE 045	
U6	LEFT SWITCH PANEL	s 5322 214 12545

products marked with "s" are available as spare part,  
other parts are printed for information only.

<b>COVER LEFT ASSY 200 SERIES</b>	ORDERING CODE: <b>3922 407 31351</b>	STATUS:
	REF NR: <b>3922 407 31351</b>	DATE: <b>2001-02-13</b>
		SHEET: <b>1 OF 1</b>

SERVICE PARTS LIST		
Item	Description	Code Number
101	COVER RIGHT	s 3922 407 31392
102	PLATE	s 5322 466 11856
103	SEALING VF CONNECTOR	s 5322 532 12903
106	PAN TAP SCR F ST T8 2,9X8	s 5322 502 14044
107	CABLECLAMP	s 5322 463 11156
108	RAINCOVER RS232	s 5322 442 01134
109	QUENCHER FOR FLEX CABLE	s 5322 401 11719
110	COVER HINGE LONG	s 5322 417 11364
111	COVER HINGE SHORT	s 5322 417 11365
701T	PAN SCR STL ST M2X4	s 5322 502 14492
702T	PAN SCR STL ST M2X6	s 5322 502 14494
704T	PAN SCR STL ST M2X10	s 5322 502 14454
707T	CSK SCR STL ST M2X6	s 5322 502 14495
708B	WASH STL ST 2,2X5	s 5322 532 12139
709	SPR WASH STL ST 2,1X4.4	s 5322 530 84092
746	WASH STL ST 3,2X7	s 5322 532 12126
781	RSD CH NK SCR STL ST M3X10 RVS	s 5322 502 13956
782	RSD CH NK SCR STL ST M3X12	s 5322 502 13913
906	RUBBER GLUE SYNTHETIC NBR 042	
U7	CONN BRD RIGHT COVER	s 5322 214 12544

products market with "s" are available as spare part,  
other parts are printed for information only.

<b>COVER RIGHT ASSY 200 SERIES</b>	ORDERING CODE: <b>3922 407 31361</b>	STATUS:
	REF NR: <b>3922 407 31361</b>	DATE: <b>2002-01-09</b>
		SHEET: <b>1</b> OF <b>1</b>

SERVICE PARTS LIST		
Item	Description	Code Number
301	HANDGRIP RUBBER ASSY	s 5322 498 10705
302	CLAMPBOLT	s 5322 500 10543
303	VF PIPE LDK100	s 5322 530 10461
304	BUSH	s 5322 532 12887
305	CAPTIVE SCREW M4X30	s 5322 502 14489
306	ZOOMCOVER STANDARD ASSY	s 5322 442 01297
307A	ZOOM KNOB ASSY FOR CANON LENS	s 8926 611 32601
307B	ZOOM KNOB ASSY FOR FUJINON	s 8926 611 33601
307C	ZOOM KNOB ASSY FOR ANGINIEUX	s 8926 611 31601
308	VF SCREW LONG ASSY	s 5322 532 12888
309	DISC	s 5322 466 11701
310	VF NUT LONG	s 5322 505 11251
311	VF RING	s 5322 532 12889
312	SPRING LOADED BALL BUSH	s 5322 520 40301
313	TORX SCREW M3X25	s 5322 502 14642
315	COMPRESSION SPRING	s 5322 492 11502
316	TORX SCREW M2X16	s 5322 502 14643
708	WASH STL ST 2,2X5	s 5322 532 12139
709	SPR WASH STL ST 2,1X4.4	s 5322 530 84092
713T	PAN SCR STL ST M2,5X6	s 5322 502 21207
714	CH SCR STL ST M2,5X8	s 5322 502 13892
726	WASH STL ST 2,7X6,5	s 5322 532 12128
727	SPR WASH STL ST 2,6X5,1	s 5322 530 80656
747	SPR WASH STL ST 3,1X5,7	s 4822 530 80188
766	WASH STL ST 4,3X9	s 5322 532 11595
906	RUBBER GLUE SYNTHETIC NBR 042	
929	GREASE FS 1292	
938	HEAT RESITANT RETAINER 648	
939	SCREW LOCK 222	

products marked with "s" are available as spare part,  
other parts are printed for information only.

<b>HANDGRIP ASSY</b>	ORDERING CODE: <b>5322 498 10681</b>	STATUS: <b>00</b>
	REF NR: <b>3922 407 25351</b>	DATE: <b>2000-11-21</b>
		SHEET: <b>1</b> OF <b>1</b>

<b>SERVICE PARTS LIST</b>		
<i>Item</i>	<i>Description</i>	<i>Code Number</i>
1	HANDGRIP	
2	HANDGRIP RUBBER	
3	TALLY LIGHT GUIDE	s 3922 400 08641
4	CLAMP	3922 404 23292
5	EXTRUSION BUSH	
928	LOCTITE 403 CYANO ACR GLUE 045	
938	HEAT RESITANT RETAINER 648	

products market with "s" are available as spare part,  
other parts are printed for information only.

<b>HANDGRIP RUBBER ASSY</b>	ORDERING CODE: <b>5322 498 10705</b>	STATUS:
	REF NR: <b>3922 407 25344</b>	DATE: <b>1999-11-25</b>
		SHEET: <b>1</b> OF <b>1</b>

<b>SERVICE PARTS LIST</b>		
<i>Item</i>	<i>Description</i>	<i>Code Number</i>
1	OPTICAL MODULE PAL 200 DPM	3922 407 31291
3	EMC BOX ASSY	s 5322 441 12073
4	CABLECLAMP	s 5322 401 11721
5	WIRE ASSY	s 3922 407 33931
7	SLIDE BRACKET PPG 200 SERIE	s 3922 404 27851
8	BRACKET PPG	s 3922 404 27841
9	SLIDE BRACKET PPG TOP	s 5322 402 10875
10	BRACKET PPG TOP RIGHT	s 5322 402 10876
11	PPG BOTTOM BRACKET	s 5322 402 10877
12	INSULATING FOIL	s 5322 466 11857
13	PPG BRACKET HINGE	s 5322 402 10878
14	IR-FILTER	s 5322 381 11925
15	SPACER	s 3922 404 27412
16	O-RING 4.47X1.78	s 5322 530 10463
19	PUSH KNOB	s 5322 410 11457
20	SWITCH PAD FRONT	s 5322 410 11456
21	DISTANCE PIECE	s 5322 535 10514
22	AUDIO LEVEL KNOB	s 5322 410 11458
26	COAX CABLE SET LONG	s 5322 322 10133
28	BATCH DPM WIDE	s 3922 404 27141
31	SWITCHRUBBER	s 3922 400 09931
43	PELTIER ASSY	s 3922 407 31551
80	FLATCABLE FRONT	s 5322 320 12163
701T	PAN SCR STL ST M2X4	s 5322 502 14492
702T	PAN SCR STL ST M2X6	s 5322 502 14494
703T	PAN SCR STL ST M2X8	s 5322 502 21322
706T	CSK SCR STL ST M2X4	s 5322 502 14493
707T	CSK SCR STL ST M2X6	s 5322 502 14495
708	WASH STL ST 2,2X5	s 5322 532 12139
709	SPR WASH STL ST 2,1X4.4	s 5322 530 84092
710	HEX NUT STL ST M2	s 4822 505 10323
728	LOCK WASH STL ST A4 2,7X5,5	s 5322 530 80666
906	RUBBER GLUE SYNTHETIC NBR 042	
939	SCREW LOCK 222	
U12	PULSE PATTERN GEN FT	s 3922 406 88421
U13	PREPROCESSING FT	s 5322 214 12538
U14	FILTERWHEEL DRIVER	s 3922 406 87461
U15	FRONT SWITCH PANEL	s 3922 406 89251

products marked with "s" are available as spare part,  
other parts are printed for information only.

<b>FRONT MODULE PAL 200 DPM</b>	ORDERING CODE: <b>3922 407 31281</b>	STATUS: <b>01</b>
	REF NR: <b>3922 407 31281</b>	DATE: <b>2001-12-13</b>
		SHEET: <b>1 OF 1</b>



SERVICE PARTS LIST		
Item	Description	Code Number
1	OPTICAL MODULE NTSC 200 DPM	3922 407 31321
3	EMC BOX ASSY	s 5322 441 12073
4	CABLECLAMP	s 5322 401 11721
5	WIRE ASSY	s 3922 407 33931
7	SLIDE BRACKET PPG 200 SERIE	s 3922 404 27851
8	BRACKET PPG	s 3922 404 27841
9	SLIDE BRACKET PPG TOP	s 5322 402 10875
10	BRACKET PPG TOP RIGHT	s 5322 402 10876
11	PPG BOTTOM BRACKET	s 5322 402 10877
12	INSULATING FOIL	s 5322 466 11857
13	PPG BRACKET HINGE	s 5322 402 10878
14	IR-FILTER	s 5322 381 11925
15	SPACER	s 3922 404 27412
16	O-RING 4.47X1.78	s 5322 530 10463
19	PUSH KNOB	s 5322 410 11457
20	SWITCH PAD FRONT	s 5322 410 11456
21	DISTANCE PIECE	s 5322 535 10514
22	AUDIO LEVEL KNOB	s 5322 410 11458
26	COAX CABLE SET LONG	s 5322 322 10133
28	BATCH DPM WIDE	s 3922 404 27141
31	SWITCHRUBBER	s 3922 400 09931
43	PELTIER ASSY	s 3922 407 31551
80	FLATCABLE FRONT	s 5322 320 12163
701T	PAN SCR STL ST M2X4	s 5322 502 14492
702T	PAN SCR STL ST M2X6	s 5322 502 14494
703T	PAN SCR STL ST M2X8	s 5322 502 21322
706T	CSK SCR STL ST M2X4	s 5322 502 14493
707T	CSK SCR STL ST M2X4	s 5322 502 14493
708	WASH STL ST 2,2X5	s 5322 532 12139
709	SPR WASH STL ST 2,1X4.4	s 5322 530 84092
710	HEX NUT STL ST M2	s 4822 505 10323
728	LOCK WASH STL ST A4 2,7X5,5	s 5322 530 80666
906	RUBBER GLUE SYNTHETIC NBR 042	
939	SCREW LOCK 222	
U12	PULSE PATTERN GEN FT	s 3922 406 88421
U13	PREPROCESSING FT	s 5322 214 12538
U14	FILTERWHEEL DRIVER	s 3922 406 87461
U15	FRONT SWITCH PANEL	s 3922 406 89251

products market with "s" are available as spare part,  
other parts are printed for information only.

<b>FRONT MODULE NTSC 200 DPM</b>	ORDERING CODE: <b>3922 407 31311</b>	STATUS: <b>01</b>
	REF NR: <b>3922 407 31311</b>	DATE: <b>2001-12-13</b>
		SHEET: <b>1 OF 1</b>

SERVICE PARTS LIST		
Item	Description	Code Number
1	LENSPLATE ASSY 200 PAL DPM	
2	SPINDLE MOTOR	s 5322 361 11038
3	FILTERWHEEL ASSEMBLY LDK200	
4	DUST COVER ASSY	
5	FRONT	s 5322 459 04781
6	HOLLOW SEALINGSTRIP 1.35-0,4	s 5322 530 10464
7	O-RING 10X1.3 COMPOUND VITON	
8	SHUTTER	s 5322 466 11708
9	DOWEL ST A2 246X12	
10	BAJONETRING HANDLE	s 5322 410 10276
12	DISTANCE BUSH AL 2.7X4X6	
14	COMPRESSION RUBBER	s 5322 466 11709
17	PLAIN WASH.PA6.6 3.2X7X0.5	s 5322 532 12899
18	CSK SCR STL ST M1,6X3	s 2522 187 21003
19	MIRROR	s 5322 380 10217
20	DUSTCAP	s 5322 466 30413
21	WARNING LABEL	
24	SET SCR STL ST A4-70 M2.5X5	
25	FLEX 10P L=82MM	s 5322 321 11365
30	SHUTTER SERV.KIT LDK100/120	s 5322 310 11228
32	SEALING STRIP	
33	SEALING STRIP	s 3922 405 00161
40	FILTERWHEEL SELECT SWITCH	
41	FILTER SELECT KNOB LARGE	s 3922 400 09761
42	FILTER SELECT KNOB SMALL	s 3922 400 09771
43	MOTORHOLDER	
44	FILTERWHEEL DRIVING UNIT	
45	FLEX COVER	s 3922 400 09821
80	FILTERWHEEL MOTORWIRE	s 3922 407 32361
81	SHUTTER SENSOR WIRED	
82	FLEX 10P L=130MM	
701T	PAN SCR STL ST M2X4	s 5322 502 14492
702T	PAN SCR STL ST M2X6	s 5322 502 14494
703T	PAN SCR STL ST M2X8	s 5322 502 21322
706T	CSK SCR STL ST M2X4	s 5322 502 14493
709	SPR WASH STL ST 2,1X4.4	s 5322 530 84092
724T	CSK SCR STL ST M2,5X10	s 2522 203 04015
726	WASH STL ST 2,7X6,5	s 5322 532 12128
727	SPR WASH STL ST 2,6X5,1	s 5322 530 80656
729	HEX NUT STL ST M2,5	s 5322 505 11129
733T	PAN SCR STL ST M3X6	s 5322 502 14403
809	CH SCR STL ST A4 M1,6X4	s 2522 001 17764
906	RUBBER GLUE SYNTHETIC NBR 042	
938	HEAT RESITANT RETAINER 648	
939	SCREW LOCK 222	
952	LOCTITE 2701	
U16	FILTERWHEEL SENSING BOARD	s 3922 406 87451
U17	FILTERWHEEL SENSING BOARD	s 3922 406 87451

products market with "s" are available as spare part,  
other parts are printed for information only.

<b>OPTICAL MODULE PAL 200 DPM</b>	ORDERING CODE: <b>not a spare part</b>	STATUS:
	REF NR: <b>3922 407 31291</b>	DATE: <b>2001-09-05</b>
		SHEET: <b>1 OF 1</b>

SERVICE PARTS LIST		
Item	Description	Code Number
1	LENSPLATE ASSY 200 NTSC DPM	
2	SPINDLE MOTOR	s 5322 361 11038
3	FILTERWHEEL ASSEMBLY LDK200	
4	DUST COVER ASSY	
5	FRONT	s 5322 459 04781
6	HOLLOW SEALINGSTRIP 1.35-0,4	s 5322 530 10464
7	O-RING 10X1.3 COMPOUND VITON	
8	SHUTTER	s 5322 466 11708
9	DOWEL ST A2 246X12	
10	BAJONETRING HANDLE	s 5322 410 10276
12	DISTANCE BUSH AL 2.7X4X6	
14	COMPRESSION RUBBER	s 5322 466 11709
17	PLAIN WASH.PA6.6 3.2X7X0.5	s 5322 532 12899
18	CSK SCR STL ST M1,6X3	s 2522 187 21003
19	MIRROR	s 5322 380 10217
20	DUSTCAP	s 5322 466 30413
21	WARNING LABEL	
24	SET SCR STL ST A4-70 M2.5X5	
25	FLEX 10P L=82MM	s 5322 321 11365
30	SHUTTER SERV.KIT LDK100/120	s 5322 310 11228
32	SEALING STRIP	
33	SEALING STRIP	s 3922 405 00161
40	FILTERWHEEL SELECT SWITCH	
41	FILTER SELECT KNOB LARGE	s 3922 400 09761
42	FILTER SELECT KNOB SMALL	s 3922 400 09771
43	MOTORHOLDER	
44	FILTERWHEEL DRIVING UNIT	
45	FLEX COVER	s 3922 400 09821
80	FILTERWHEEL MOTORWIRE	s 3922 407 32361
81	SHUTTER SENSOR WIRED	
82	FLEX 10P L=130MM	
701T	PAN SCR STL ST M2X4	s 5322 502 14492
702T	PAN SCR STL ST M2X6	s 5322 502 14494
703T	PAN SCR STL ST M2X8	s 5322 502 21322
706T	CSK SCR STL ST M2X4	s 5322 502 14493
709	SPR WASH STL ST 2,1X4.4	s 5322 530 84092
724T	CSK SCR STL ST M2,5X10	s 2522 203 04015
726	WASH STL ST 2,7X6,5	s 5322 532 12128
727	SPR WASH STL ST 2,6X5,1	s 5322 530 80656
729	HEX NUT STL ST M2,5	s 5322 505 11129
733T	PAN SCR STL ST M3X6	s 5322 502 14403
809	CH SCR STL ST A4 M1,6X4	s 2522 001 17764
906	RUBBER GLUE SYNTHETIC NBR 042	
938	HEAT RESITANT RETAINER 648	
939	SCREW LOCK 222	
952	LOCTITE 2701	
U16	FILTERWHEEL SENSING BOARD	s 3922 406 87451
U17	FILTERWHEEL SENSING BOARD	s 3922 406 87451

products market with "s" are available as spare part,  
other parts are printed for information only.

<b>OPTICAL MODULE NTSC 200 DPM</b>	ORDERING CODE: <b>not a spare part</b>	STATUS:
	REF NR: <b>3922 407 31321</b>	DATE: <b>2001-09-05</b>
		SHEET: <b>1 OF 1</b>

