LDK 6000

Native Multi-format HDTV Camera Head

Technical Manual

3922 496 48781 St.01

PHILIPS

Declaration of Conformity

We, Broadcast Television Systems Camera's 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

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

LDK 6000
Camera Head

Technical Manual

Contents

About This Manual

Service policy
The LDK 6000 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 Philips Digital Video Systems endeavours to ensure that help will be quickly on hand in the unlikely event of anything going wrong. The guiding principles of the Philips Digital Video Systems 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 seven 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.

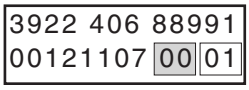
Section 5: Wiring Diagrams

Section 6: Exploded Views

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.

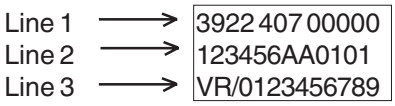
0	1	2	3	4
5	6	7	8	9

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.



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
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 reperesent 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)

Section 1

Safety Instructions

This section outlines the precautions that must be taken into account when using the LDK 200 camera head.

Contents

Safety Summary

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

Before connecting the equipment to the mains of the building installation, the proper functioning of the protective earth lead of the building 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.

Symbol 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.

Cautions and Warnings

When performing service, be sure to read and comply with the warning and caution notices appearing in the manual. 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.

Components marked ⚠ on the circuit diagram are critical for safety. They must only be replaced with specified part numbers.
Parts in this category also 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. Under no circumstances 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.

Mains Lead Wiring

- important 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.

First Aid

Personnel engaged in the installation, operation, maintenance or servicing of this equipment are urged to become familiar with First-Aid theory and practises. The following information is not intended to be complete First-Aid procedures, it is brief and is only to be used as a reference. It is the duty of all personnel using the equipment to be prepared to give adequate Emergency First-Aid and thereby prevent avoidable loss of life.

Treatment of electrical shock

DO NOT TOUCH THE VICTIM WITH YOUR BARE HANDS until the circuit is broken.

SWITCH OFF. If this is not possible, PROTECT YOURSELF with some dry insulating material and pull the victim clear of the conductor.

Treatment of electrical burns

Extensive burned and broken skin:

a. Cover area with clean sheet or cloth. (Cleanest available cloth article).
b. Do not break blisters, remove tissue, remove adhered particles of clothing, or apply any salve or ointment.
c. Treat victim for shock as required.
d. Arrange transportation to a hospital as quickly as possible.
e. If arms or legs are affected keep them elevated.

If it is anticipated that qualified medical help will not be available for at least an hour and the victim is conscious and not vomiting, give him a weak solution of salt and soda: 1 level teaspoonful of salt and 1/2 level teaspoonful of baking soda to each quart of luke warm water. Allow victim to sip slowly about 4 ounces (half glass) over a period of 15 minutes. Discontinue fluid if vomiting occurs. Do not give alcohol.

Less severe burns (1st and 2nd degree):

a. Apply cool (not ice cold) compresses using the cleanest available cloth article.
b. Do not break blisters, remove tissue, remove adhered particles of clothing, or apply salve or ointment.
c. Apply clean dry dressing if necessary.
d. Treat victim for shock as required.
e. Arrange transportation to a hospital as quickly as possible.
f. If arms or legs are affected keep them elevated.

Artificial Respiration

The expired air method

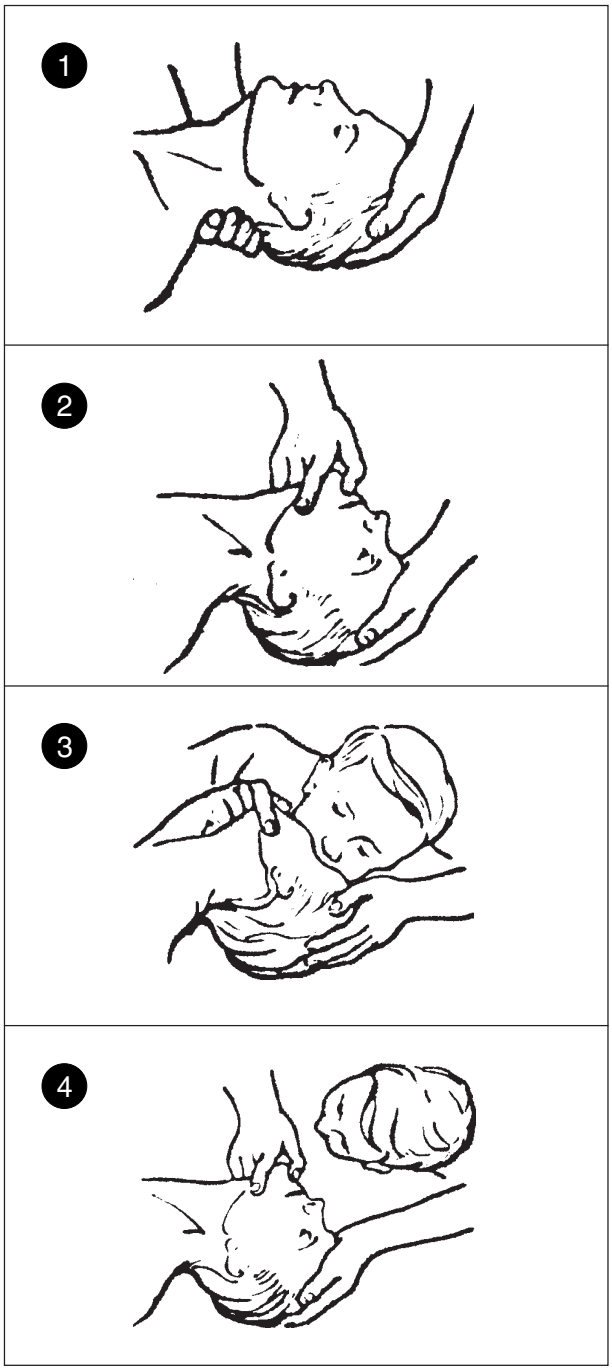
1. It is essential to commence artificial respiration without delay. Send for medical assistance as soon as possible.
   Lay the patient on his back with his arms to his sides. If on a slope have the stomach slightly lower than the chest. Make a brief inspection of the mouth and throat to ensure that they are clear of obvious obstruction.
   Kneel on one side of the patient level with his head, place one hand under his neck and the other hand on top of his head.

2. Lift the neck and tilt the head back as far as possible. Move the hand from under the neck and place it on the chin of the patient, the thumb between the chin and mouth, the index finger along the line of the jaw, the remaining fingers curled. Whilst positioning the patient, open your mouth and take deep breaths.

3. Using the thumb of the hand on the chin to keep the lips sealed, open your mouth wide and make a seal round the patients nose and blow into it.

4. After blowing, turn your head to observe the rise of the chest.

Start with ten quick deep breaths and then continue at the rate of twelve to fifteen breaths per minute. This should be continued until the patient revives or a doctor certifies death.



Notes

If no air enters the patients lungs, the nose may be blocked and the mouth should be opened using the hand on the chin; open your mouth wide and making a seal round his mouth blow into his mouth. Turn the head to observe the chest rise. This may be used as an alternative to blowing into the nose even when the nose is not blocked, but in this case the nose must be sealed either with the cheek or by moving the hand from the top of the head and pinching the nostrils. The head must be kept at full backwards tilt.

In case of facial injuries it may be necessary to do a manual method of artificial respiration (Holger Nielsen).

If victim is responsive:

a. Keep him warm
b. Keep him as quiet as possible
c. Loosen his clothing

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

Packing/Unpacking

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 Philips Digital Video Systems 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 Philips Digital Video Systems 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 Philips Digital Video Systems 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 LDK 6000 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

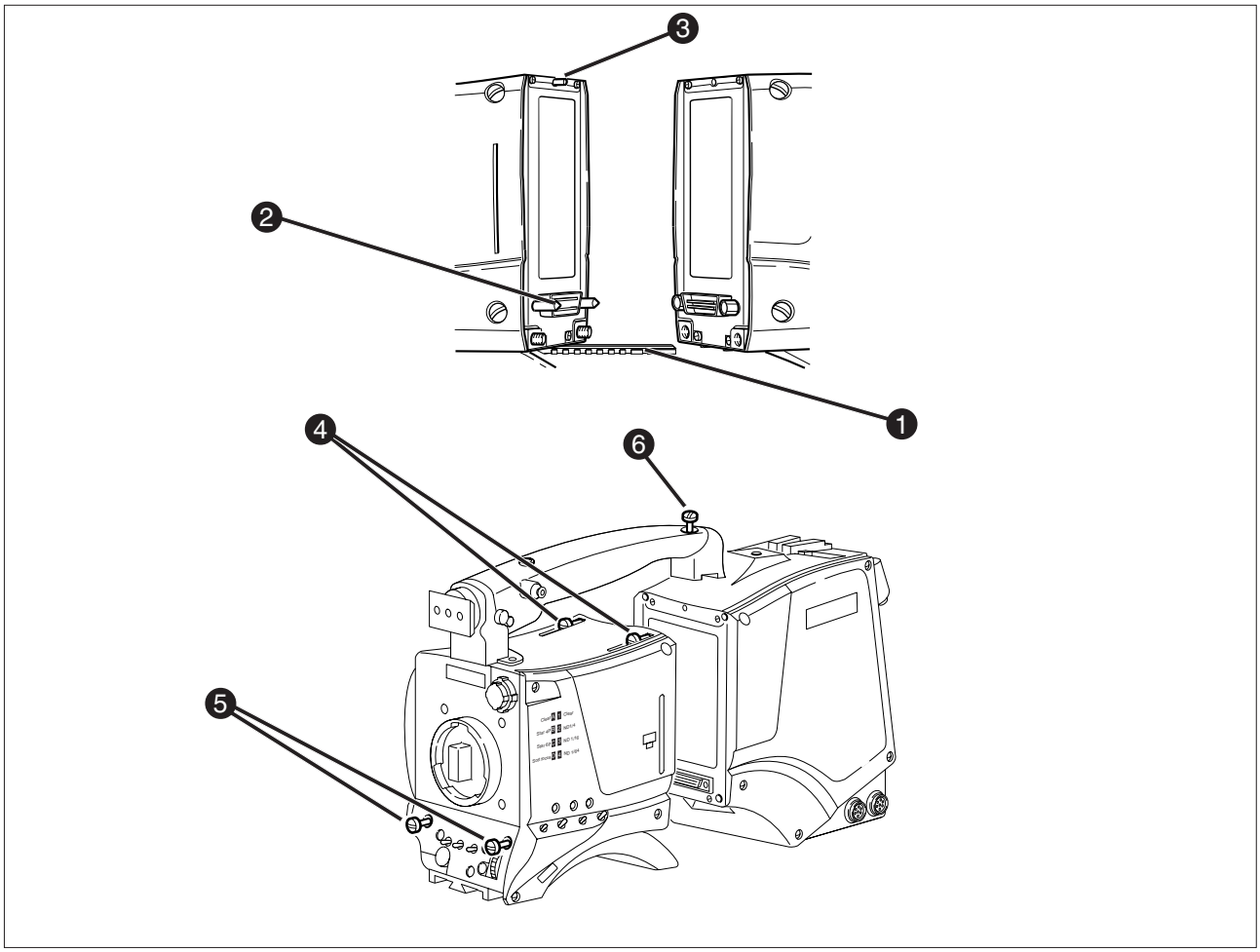
To detach an adapter from the camera head follow the steps for attaching it in the reverse order.

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 5460. Follow the same procedure for the other adapters.



Hardware Customization

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.

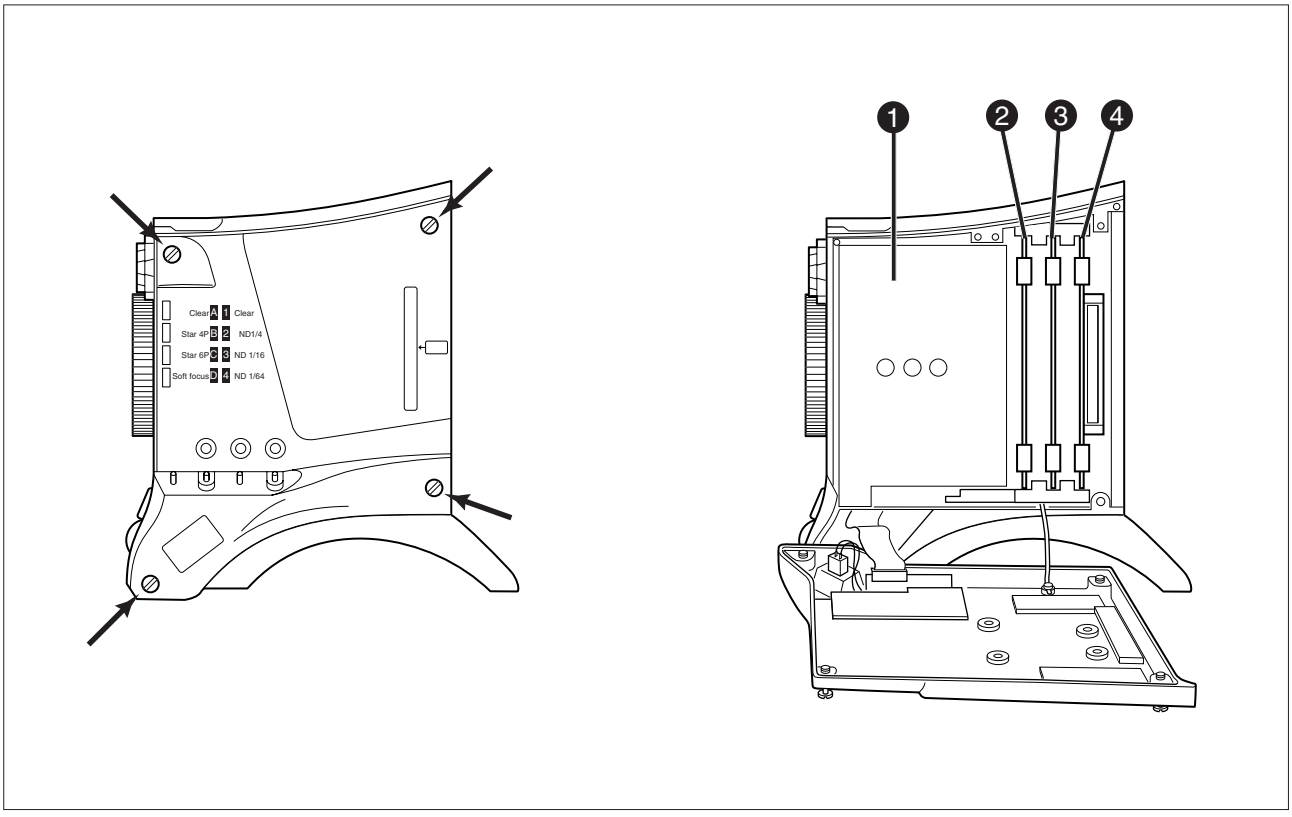
Location of boards
Unscrew the four screws on the left side panel and swing down the cover.

Front module **(1)**
Sync monitoring board **(2)**
Data board **(3)**
Front driver board **(4)**

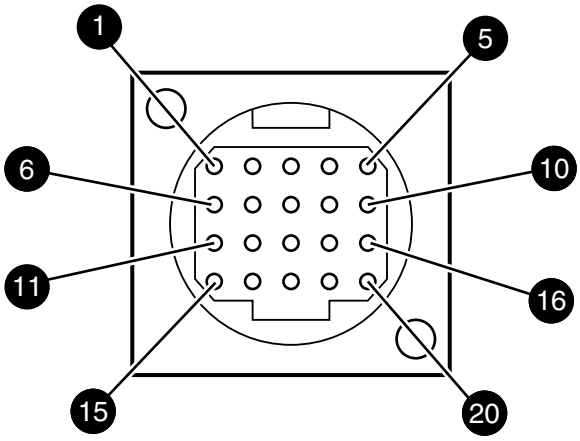
Lens matching

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.



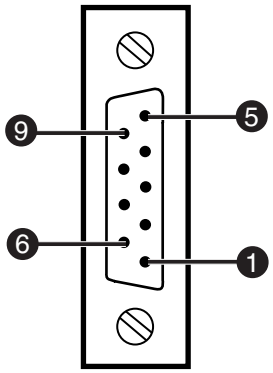
Viewfinder connector



1. -80V
2. n.c.
3. GND
4. INTN-D
5. vf ext video
6. n.c.
7. vf video ret
8. SDA-D
9. SCL-D
10. vf ext video ret
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

20-pin female; panel view

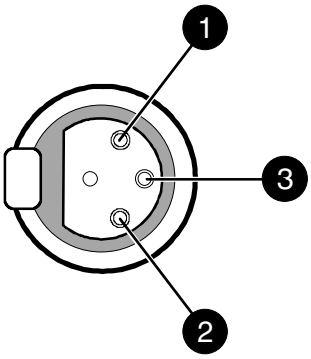
RS232 connector



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

9-pin female; panel view

Audio microphone connector

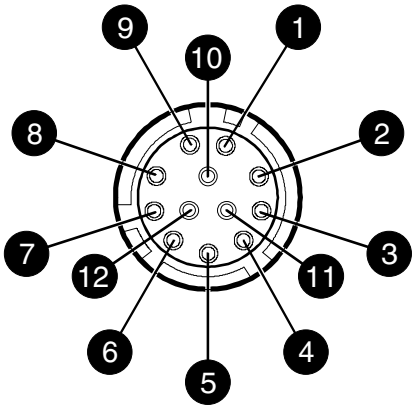


XLR 3-pin female

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

Lens connector



Hirose 12-pin female; panel view

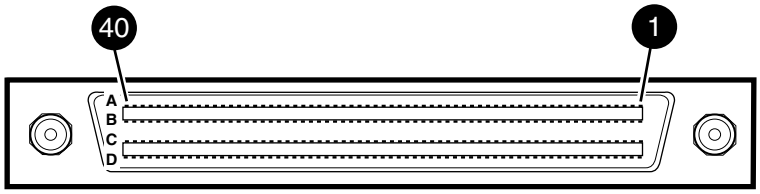
1. Ext. Video On/Off
2. VTR Trigger Switch
3. -batt
4. Momentary Iris
5. IrisControl
6. + batt
7. Iris Follow
8. Lens Servo
9. Range Extender
10. Zoom Follow
11. Focus follow*
12. Spare

* not standard on lens

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	Ion data	1	Ion data N	1	GND	1	+ batt
2	SDA_C	2	SCL_C	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	YB9_RET	7	YB8
8	RXD	8	PIP	8	YB9	8	YB8_RET
9	sync	9	blanking	9	YB7_RET	9	YB6
10	white pulse 1	10	white pulse 2	10	YB7	10	YB6_RET
11	colour framing	11	frame reset	11	YB5_RET	11	YB4
12	BS_TDA	12	H lock	12	YB5	12	YB4_RET
13	PIP video	13	PIP video ret	13	YB3_RET	13	YB2
14	BS_TDV	14	BS_TMS	14	YB3	14	YB2_RET
15	adapter vf video	15	adapter vf video ret	15	YB1_RET	15	YB0
16	BS_TCK	16	BS_TRSTN	16	YB1	16	YB0_RET
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	mic Y	22	mic Ys	22	+12VFC	22	+12VFC
23	mic X	23	mic Xs	23	GND	23	GND
24	SHIELD	24	SHIELD_S	24	CR9_RET	24	CR8
25	audio level	25	audio level RET	25	CR9	25	CR8_RET
26	power switch	26	TXD	26	CR7_RET	26	CR6
27	+5VS	27	-5VS	27	CR7	27	CR6_RET
28	Fsync_out	28	Fsync_out ret	28	CR5_RET	28	CR4
29	spare 1	29	spare 2	29	CR5	29	CR4_RET
30	Clock_scaler	30	Clock_scaler_N	30	CR3_RET	30	CR2
31	G9	31	G9 ret	31	CR3	31	CR2_RET
32	G8	32	G8 ret	32	CR1_RET	32	CR0
33	G7	33	G7 ret	33	CR1	33	CR0_RET
34	G6	34	G6 ret	34	GND	34	housing
35	G5	35	G5 ret	35	GND	35	housing
36	G4	36	G4 ret	36	GND	36	housing
37	G3	37	G3 ret	37	n.c	37	
38	G2	38	G2 ret	38	n.c	38	
39	G1	39	G1 ret	39	-80V	39	
40	G0	40	G0 ret	40	-80V	40	



160-pin male; panel view

Specifications LDK 6000

General data

Power requirements
triax powered or 12V dc
Power consumption
34 W (Head + Triax Adaptor + VF)
Operating temperatures
-20 to +40°C (-4 to +113°F)
Storage temperatures
-20 to +60°C (-4 to +140°F)
Weight (approx.)
4.4 kg (9.7 lbs) incl. 2-inch VF and Multi-Purpose adapter
Dimensions
197 x 117 x 349 (H x W x L in mm.)
Triax*HD* cable length
Y/C transmission over 1,000 m. (3,300 ft.) with 14 mm. cable
Viewfinder CRT
2" or 7" monochrome
2" Viewfinder resolution
>600 TV lines (centre)
7" Viewfinder resolution
>800 TV lines (centre)

Camera Head

Pick-up device
3x2/3" Philips HD-DPM+™ CCD's,
1080i/720p switchable
3x2/3" Philips HD-FT CCD's,
1080i or 720p
Picture elements
9.2 million pixels 1920 (H) x 4320 (V) effective

HDTV Aspect Ratio
16:9
Temporal frequency
59.94 or 50Hz.
Smear
No vertical smear
Optical system
F1.4 prism system
Optical filters
1st Wheel Clear, 1/4 ND, 1/16 ND. 1/64 ND
2nd Wheel Clear, 4-point star, 6-point star, soft-focus
Electronic filters
3200K, 4700K, 5600K, 7200K, FL,
2AWB presets, Continues Auto White, Colour Filter
Digital quantization
12 bits A to D
Digital signal processing
>22-bits
Sensitivity
2000 lux (186 ft cd) at F7.0 (typical, 1080i mode)
Gain
-6dB to +12dB in 3dB steps (user definable presets)
S/N ratio
52 dB in Y (typical)
Modulation depth
40% at 27 MHz
Exposure control
Down to 1/500 sec.
Clean scanning
50.6 to 125 Hz (at 50 Hz temp. freq.)
61 to 150 Hz (at 59.94 Hz temp. freq.)

Connectors

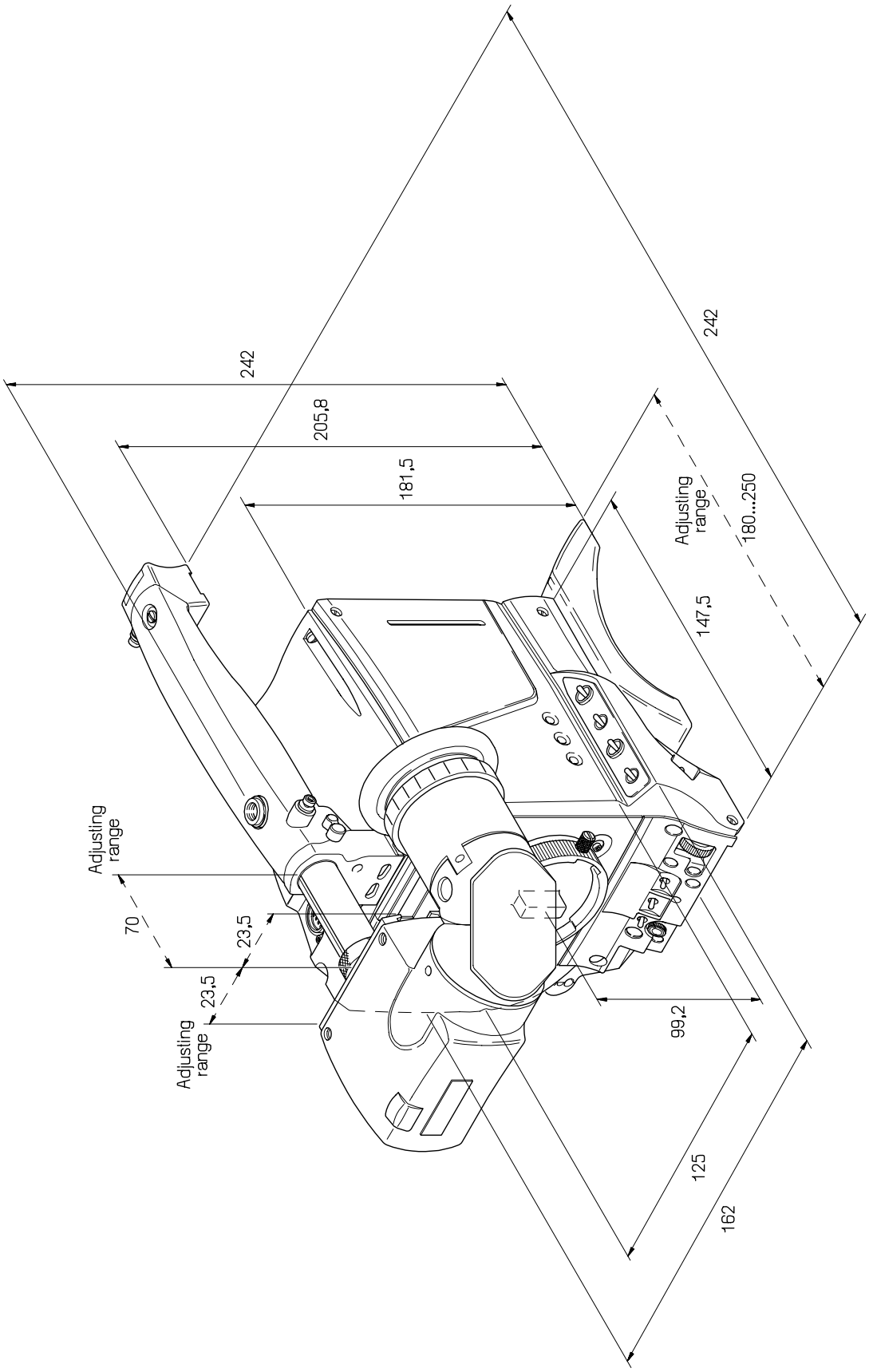
Front microphone In.
1x XLR 3, balanced, +48V, CH1 on HD Base Station
Viewfinder out
20-pin
Lens out
12-pin
Control bus
9-pin, RS232 compatible
Docking connector
160-pin

Supplied Accessories

1x Operator's Manual
1x Technical Manual
1x Owner card
2x User card
1x Rain cover
1x Shoulder strap
1x IR Remote control

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

Dimensions


242
242
205,8
181,5
Adjusting range
180...250
147,5
Adjusting range
70
23,5
23,5
Adjusting range
99,2
125
162

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

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 4.

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

Printed circuit boards

Gaining access to the boards

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

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

Location of boards

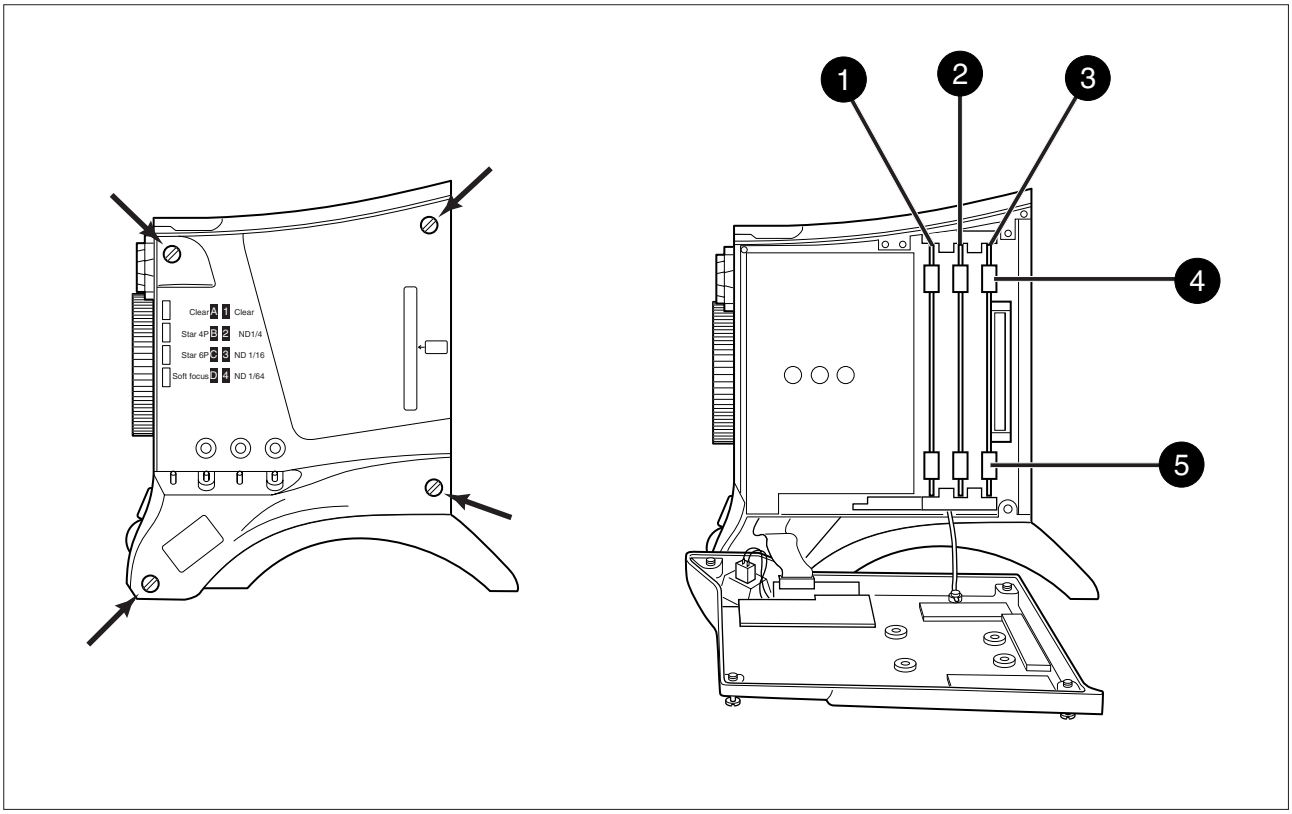
The boards in the camera head are numbered as follows:

❶ Sync monitoring board
❷ Data board
❸ Front driver board

Removing a board

To remove a printed circuit board proceed as follows:

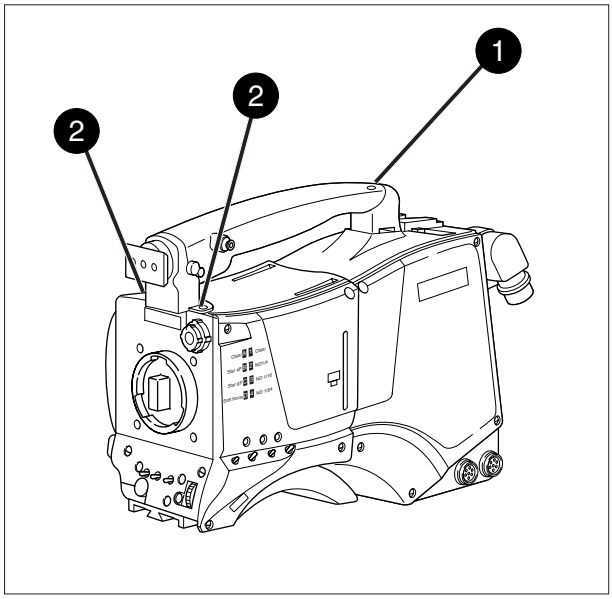
a. Pull up the top print ejector ❹ and pull down the bottom print ejector ❺ to release the printed circuit board from its connector.
b. Pull horizontally on these ejectors to slide the board clear of the camera.



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.

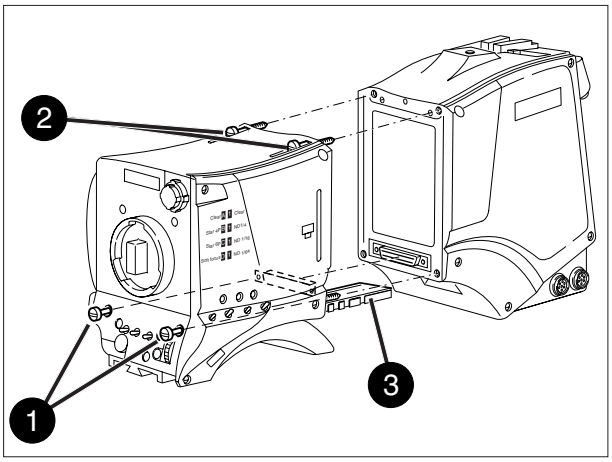
Detaching the adapter

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.



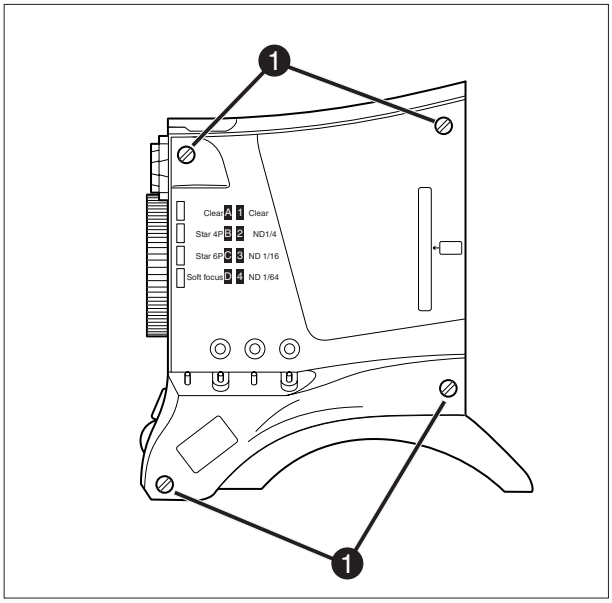
Caution

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:

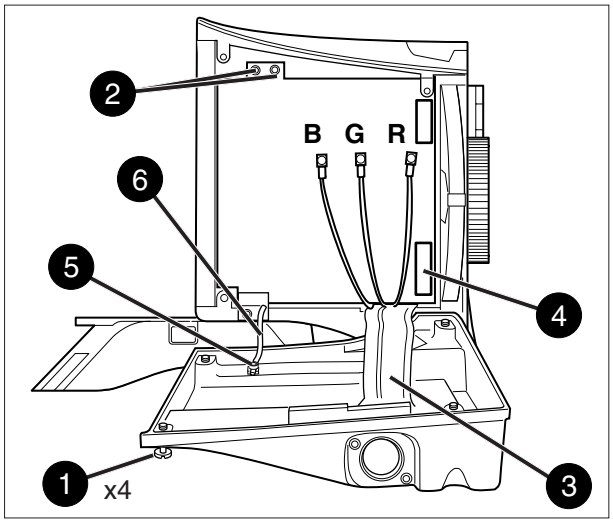
a. Loosen the four screws ❶ at the front of the camera.
b. Swing down the cover



Opening the right side cover

To remove the right front cover proceed as follows:

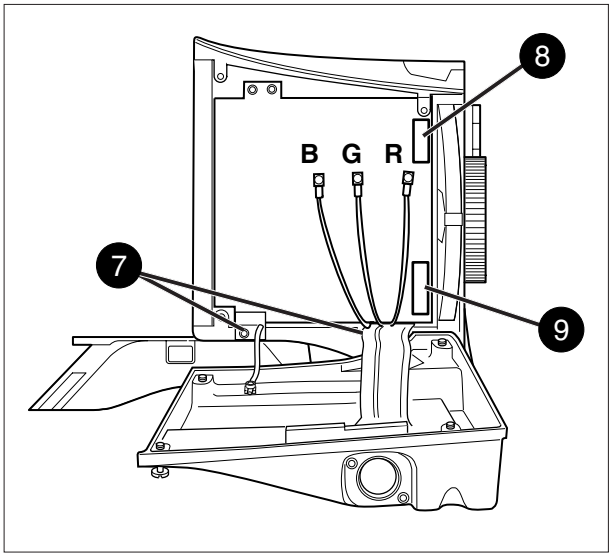
a. Unscrew the four retaining screws ❶ and swing the right front cover down.
b. Disconnect the B, R and G coax cables from the DVP board using the correct tool (part no. 5322 395 10802)
c. Unscrew the two top retaining screws ❷ of the DVP board and swing the board downwards.
d. Reach in behind the board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

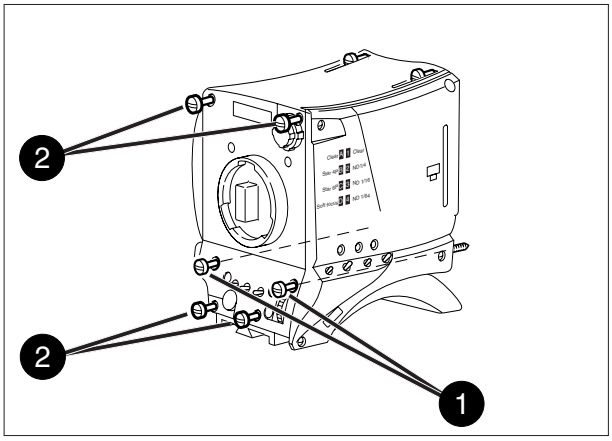
h. Unscrew the two bottom retaining screws ❼ of the DVP board from the plastic clips and remove the board.
i. Unscrew and disconnect the top connector ❽ from the DVP board.
j. Unscrew the bottom connector ❾.



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

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 Philips 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 4-1 Adjustment procedures on board replacement

Printed Circuit Board	Adjustment Procedure
Digital video board	1. Video ADC automatic calibration (internal) 2. Sawtooth calibration (internal)
Pre-processor board	1. Pre-processor calibration (internal)
Lens plate assemble	1. 3200K adjustment 2. White shading adjustment 3. Flare adjustment
Data Board	1. Software download
Sync. / monitoring board	1. Video monitoring adjustment

Test Equipment

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

Set-up Instructions

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.

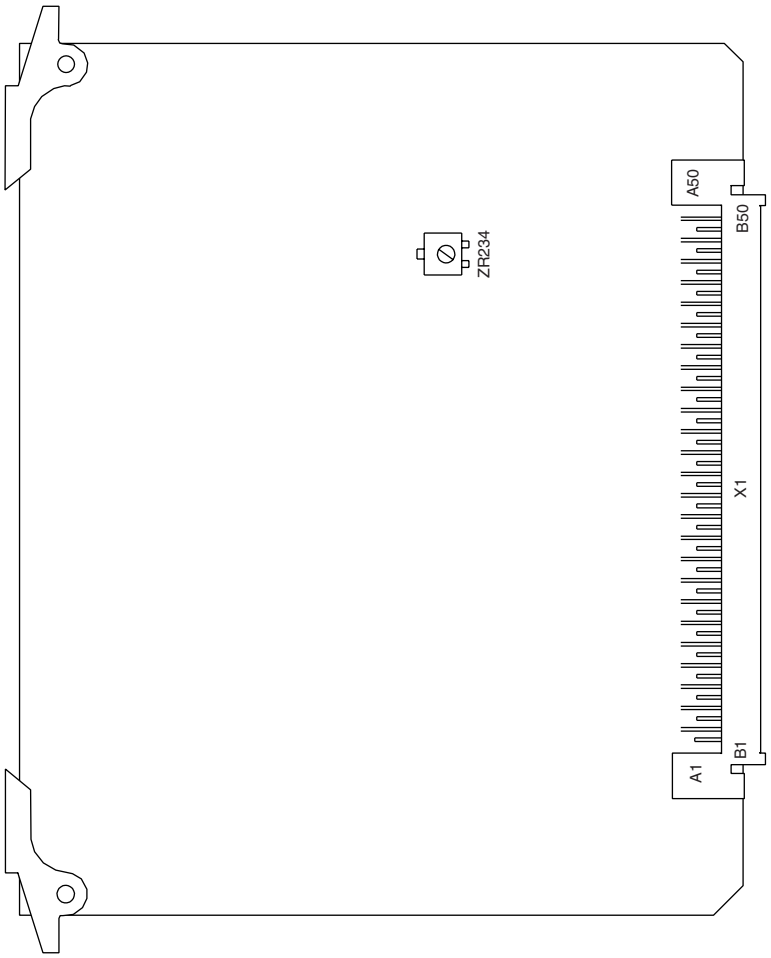
Flare Adjustment

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

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



Sync. / Monitoring Board

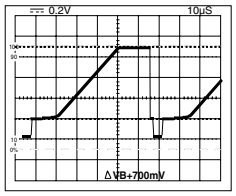
Video Monitoring Adjustment

Set-up

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

Viewfinder output level

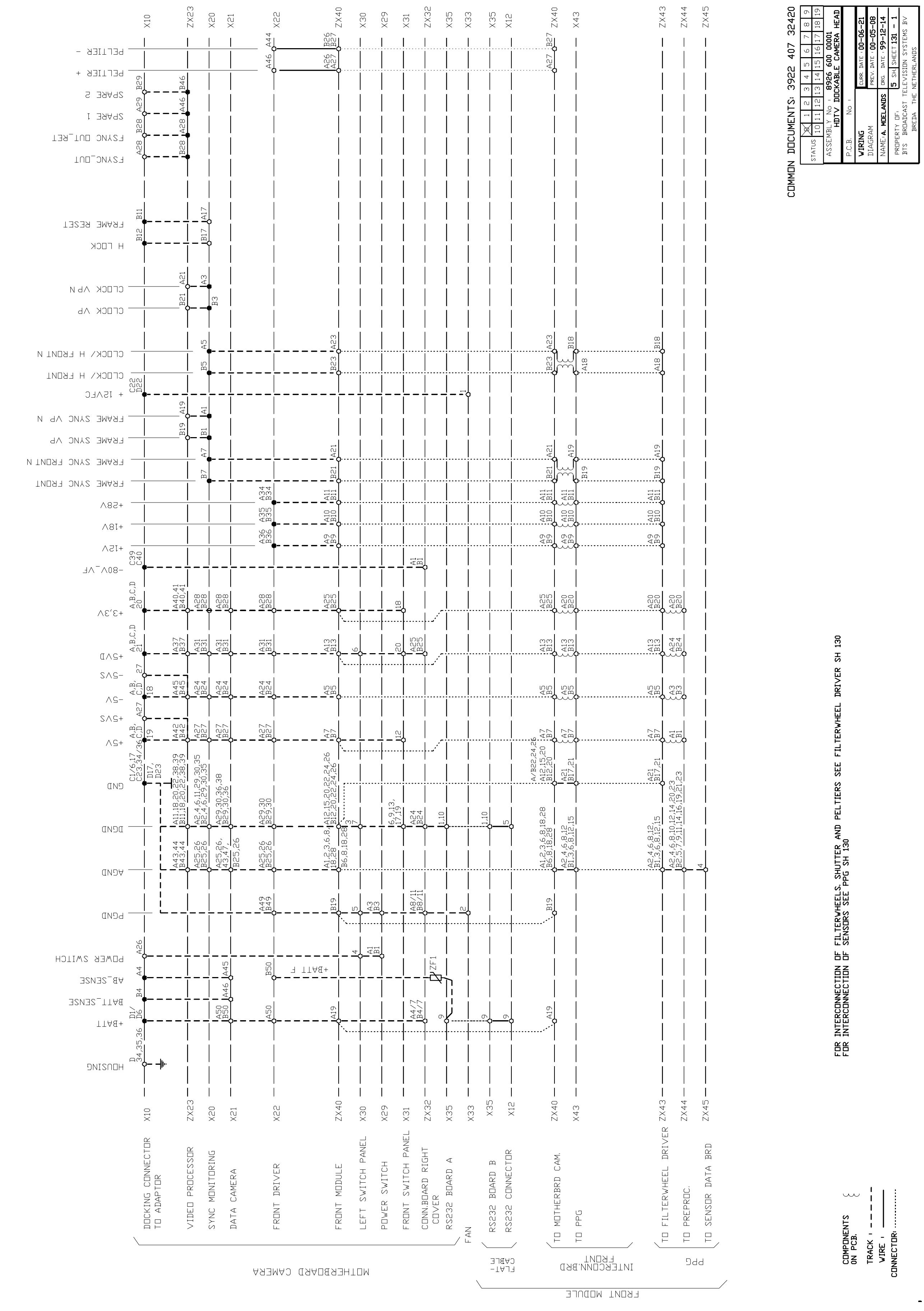
3. Connect oscilloscope to X1-B45.
4. Adjust the potentiometer on the sync. monitoring board to obtain the correct output amplitude VF output signal.

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.

Section 5

Wiring Diagrams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FOR INTERCONNECTION OF SENSORS SEE PPG SH 130
ASSEMBLY No.: 8926 600 00001
HDTV DOCKABLE CAMERA HEAD
WIRING DIAGRAM
NAME: A. MOELANDS
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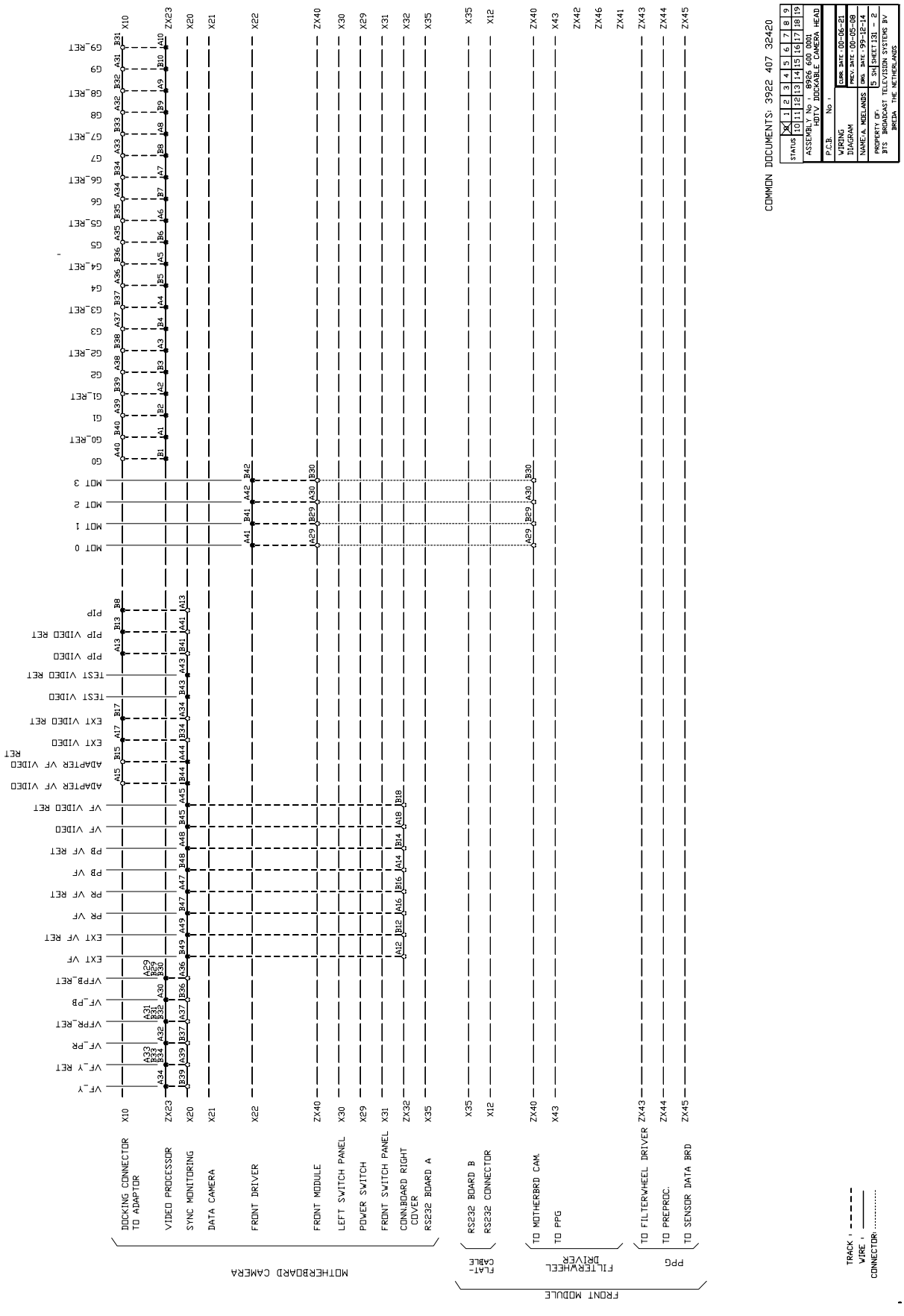
MOTHERBOARD CAMERA
FRONT MODULE
COMPONENTS ON PCB.
TRACK
WIRE
CONNECTOR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PREV. DATE 00-05-08
NAME/A. MIDLANDS
DRG. DATE 99-12-14
SHEET 131 - 2
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WIRE :
CONNECTOR :
MOTHERBOARD CAMERA
FRONT MODULE
DOCKING CONNECTOR TO ADAPTOR
VIDEO PROCESSOR
SYNC MONITORING
DATA CAMERA
FRONT DRIVER
FRONT MODULE
LEFT SWITCH PANEL
POWER SWITCH
FRONT SWITCH PANEL
CONN.BOARD RIGHT COVER
RS232 BOARD A
RS232 BOARD B
RS232 CONNECTOR
TO MOTHERBRD CAM.
TO PPG
TO FILTERWHEEL DRIVER
TO PREPROC.
TO SENSOR DATA BRD
FLAT-CABLE
FILTERWHEEL DRIVER
PPG
X10
ZX23
X20
X21
X22
ZX40
X30
X29
X31
ZX32
X35
X12
ZX43
ZX44
ZX45
ZX42
ZX46
X41
X43
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VF_Y RET
VF_PR
VFPR_RET
VF_PB
VFPB_RET
EXT VF
EXT VF RET
PR VF
PR VF RET
PB VF
PB VF RET
VF VIDEO
VF VIDEO RET
ADAPTER VF VIDEO
ADAPTER VF VIDEO RET
EXT VIDEO
EXT VIDEO RET
TEST VIDEO
TEST VIDEO RET
PIP VIDEO
PIP VIDEO RET
PIP
MOT 0
MOT 1
MOT 2
MOT 3
G0
G0_RET
G1
G1_RET
G2
G2_RET
G3
G3_RET
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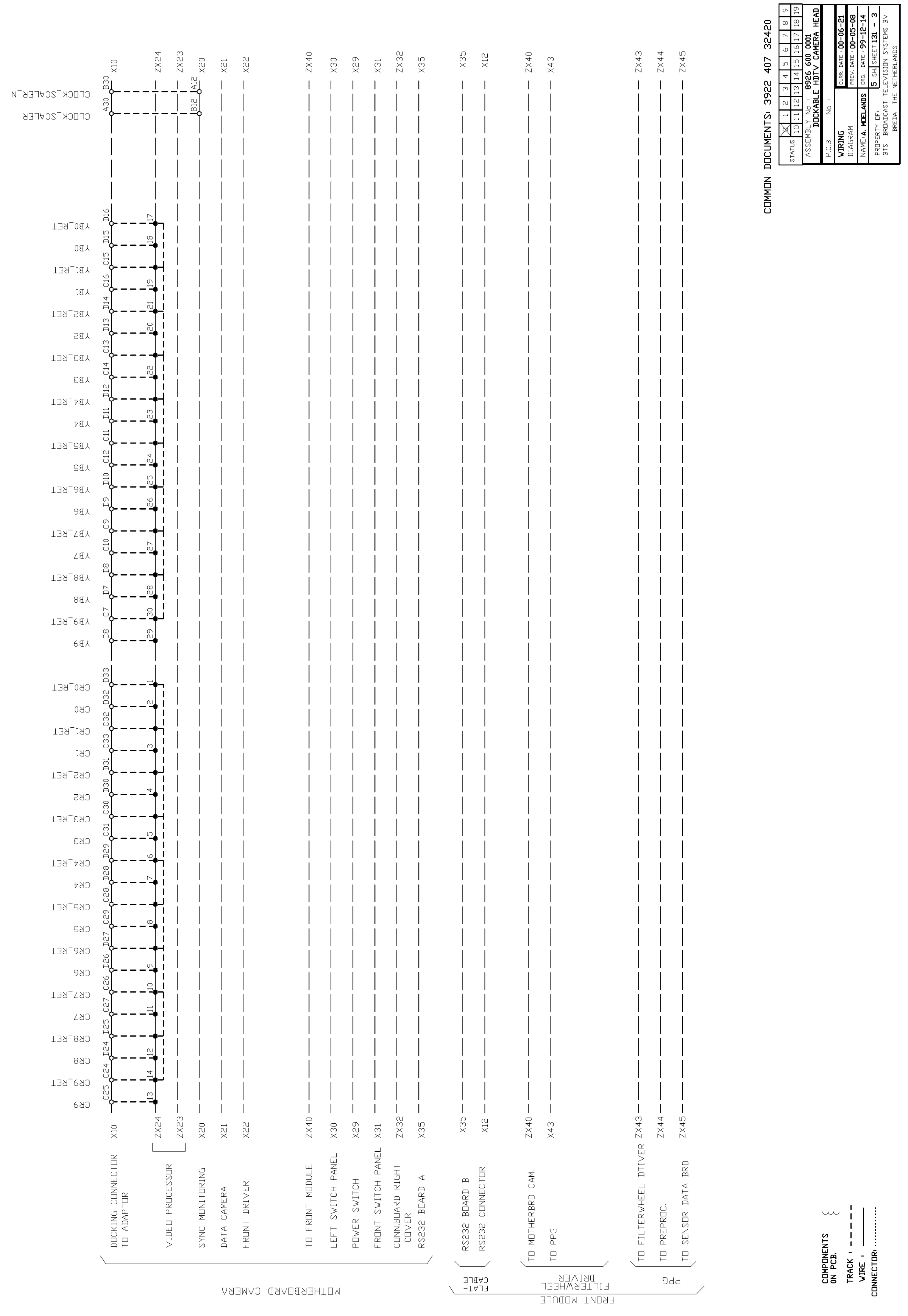
G9_RET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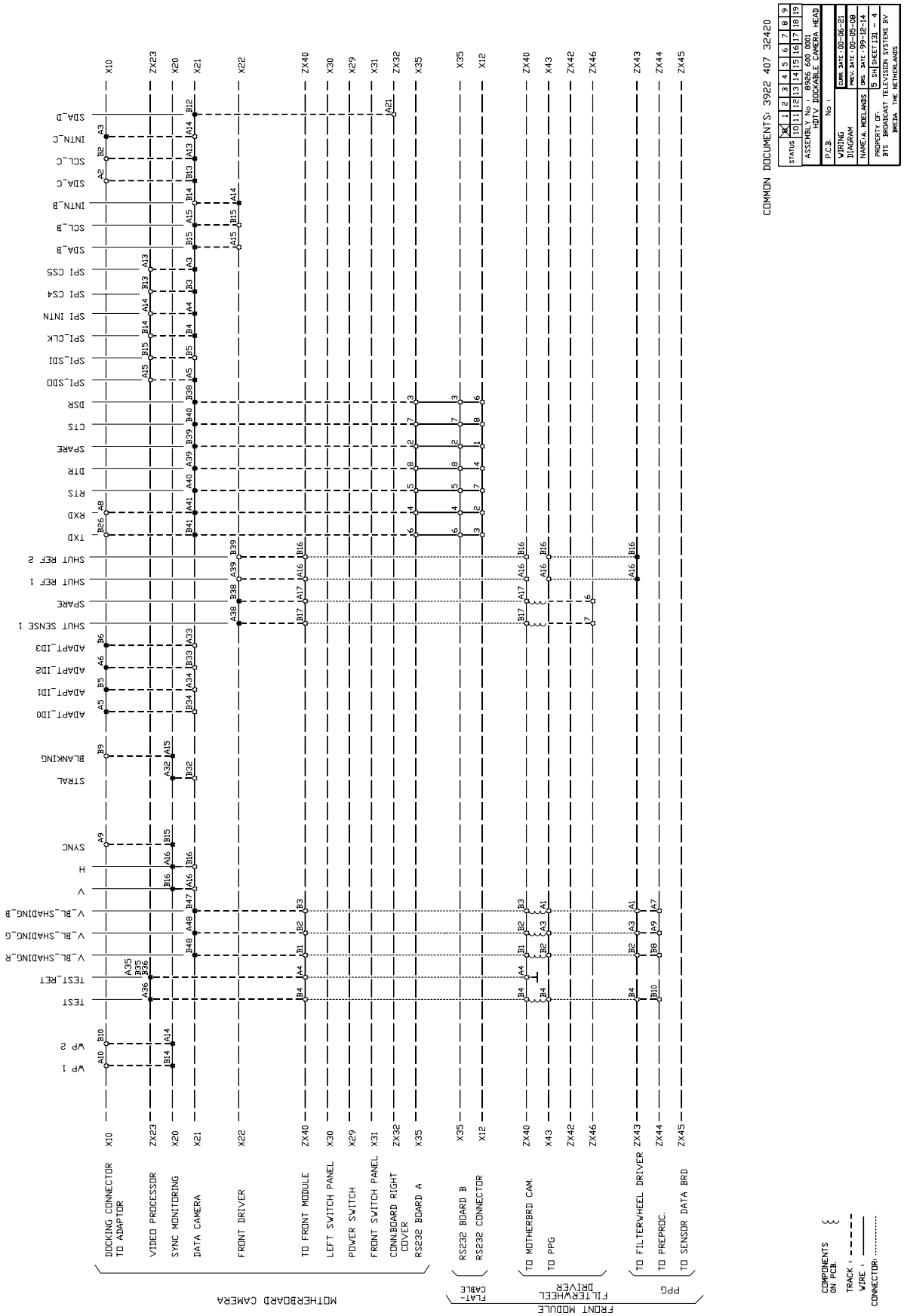
VIDEO PROCESSOR
SYNC MONITORING
DATA CAMERA
FRONT DRIVER
TO FRONT MODULE
LEFT SWITCH PANEL
POWER SWITCH
FRONT SWITCH PANEL
CONN.BOARD RIGHT COVER
RS232 BOARD A
RS232 BOARD B
RS232 CONNECTOR
TO MOTHERBRD CAM.
TO PPG
TO FILTERWHEEL DTIVER
TO PREPROC.
TO SENSOR DATA BRD
MOTHERBOARD CAMERA
FLAT-CABLE
FILTERWHEEL DRIVER
PPG
FRONT MODULE
CLOCK_SCALER_N
CLOCK_SCALER
COMPONENTS ON PCB.
TRACK :
WIRE :
CONNECTOR: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WIRE :
CONNECTOR:
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FRONT MODULE
FLAT-CABLE
FILTERWHEEL DRIVER
PPG
DOCKING CONNECTOR TO ADAPTOR
VIDEO PROCESSOR
SYNC MONITORING
DATA CAMERA
FRONT DRIVER
TO FRONT MODULE
LEFT SWITCH PANEL
POWER SWITCH
FRONT SWITCH PANEL
CONN.BOARD RIGHT COVER
RS232 BOARD A
RS232 BOARD B
RS232 CONNECTOR
TO MOTHERBRD CAM.
TO PPG
TO FILTERWHEEL DRIVER
TO PREPROC.
TO SENSOR DATA BRD
WP 1
WP 2
TEST
TEST_RET
V_BL_SHADING_R
V_BL_SHADING_G
V_BL_SHADING_B
V
H
SYNC
STRAL
BLANKING
ADAPT_ID0
ADAPT_ID1
ADAPT_ID2
ADAPT_ID3
SHUT SENSE 1
SPARE
SHUT REF 1
SHUT REF 2
TXD
RXD
RTS
DTR
SPARE
CTS
DSR
SPI_SDD
SPI_SDI
SPI_CLK
SPI INTN
SPI CS4
SPI CS5
SDA_B
SCL_B
INTN_B
SDA_C
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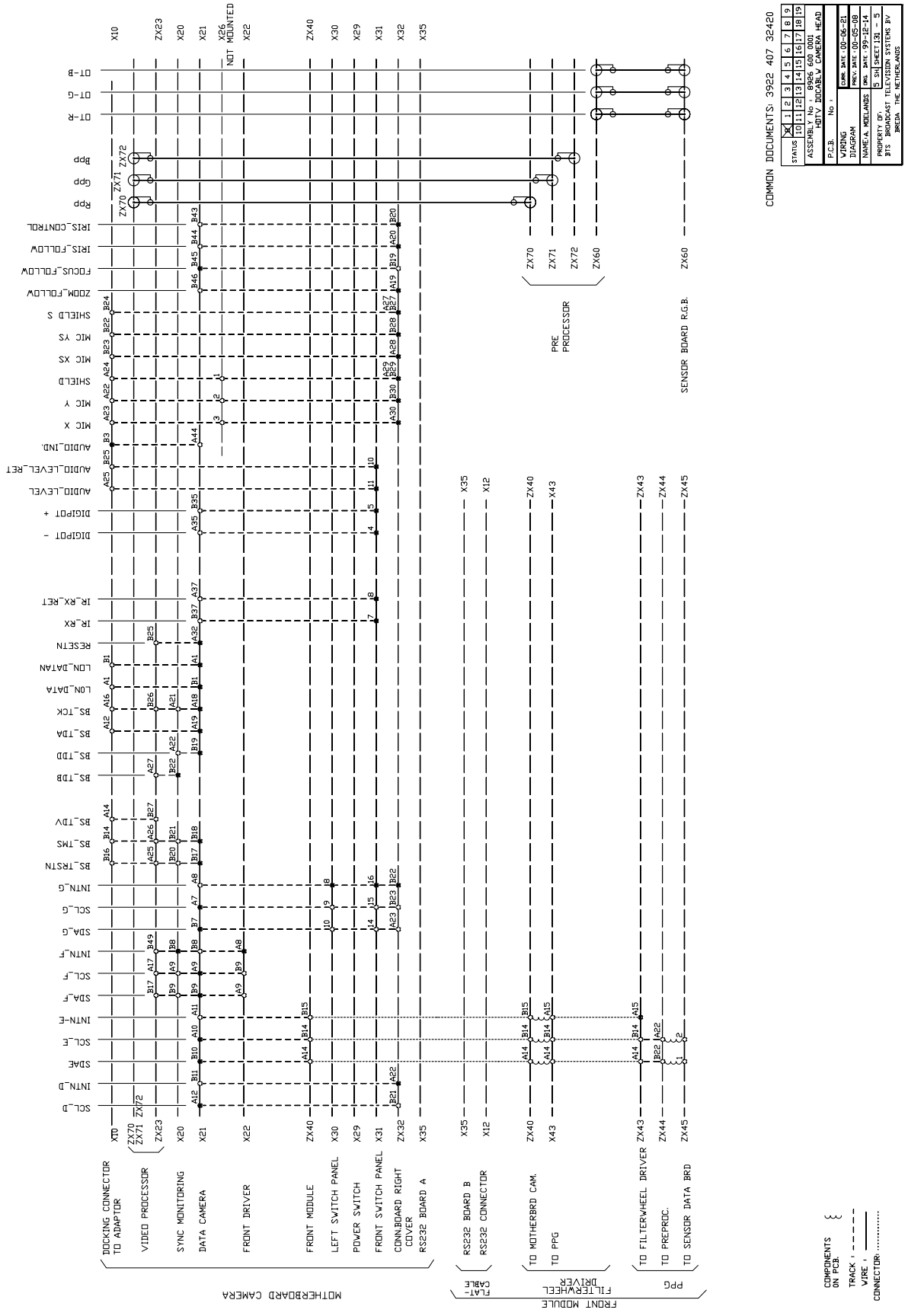
INTN_C
SDA_D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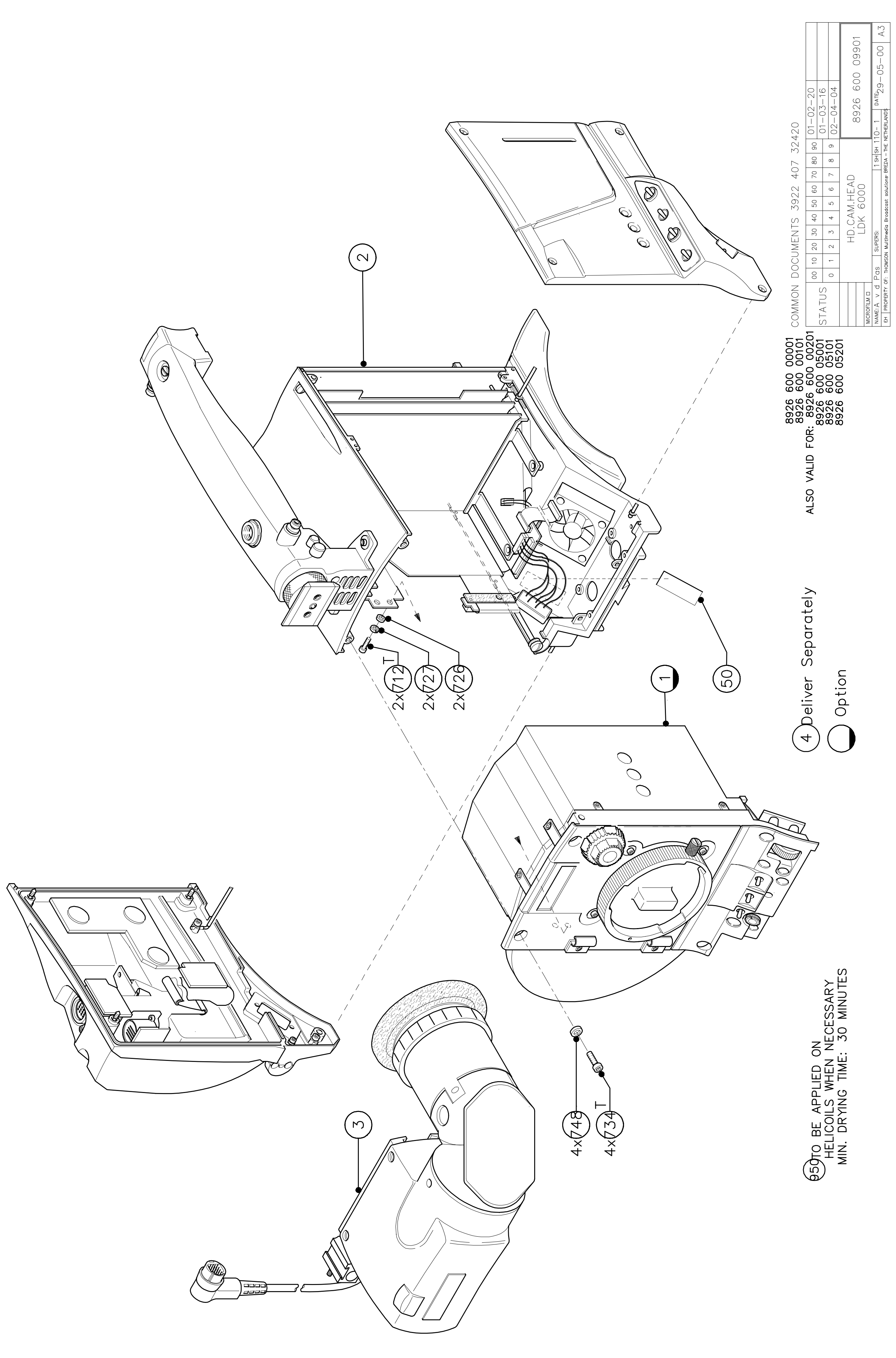
VIDEO PROCESSOR
SYNC MONITORING
DATA CAMERA
FRONT DRIVER
FRONT MODULE
LEFT SWITCH PANEL
POWER SWITCH
FRONT SWITCH PANEL
CONN.BOARD RIGHT COVER
RS232 BOARD A
RS232 BOARD B
RS232 CONNECTOR
TO MOTHERBRD CAM.
TO PPG
TO FILTERWHEEL DRIVER
TO PREPROC.
TO SENSOR DATA BRD
SENSOR BOARD R.G.B.
PRE PROCESSOR
MOTHERBOARD CAMERA
FLAT-CABLE
FILTERWHEEL DRIVER
FRONT MODULE
PPG
COMPONENTS ON PCB.
TRACK
WIRE
CONNECTOR

Section 6

Mechanical Exploded Views

Contents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01-03-16
02-04-04
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29-05-00
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8926 600 00101
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8926 600 05001
8926 600 05101
8926 600 05201
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1
3
50
2x712
2x727
2x726
4x748
4x734
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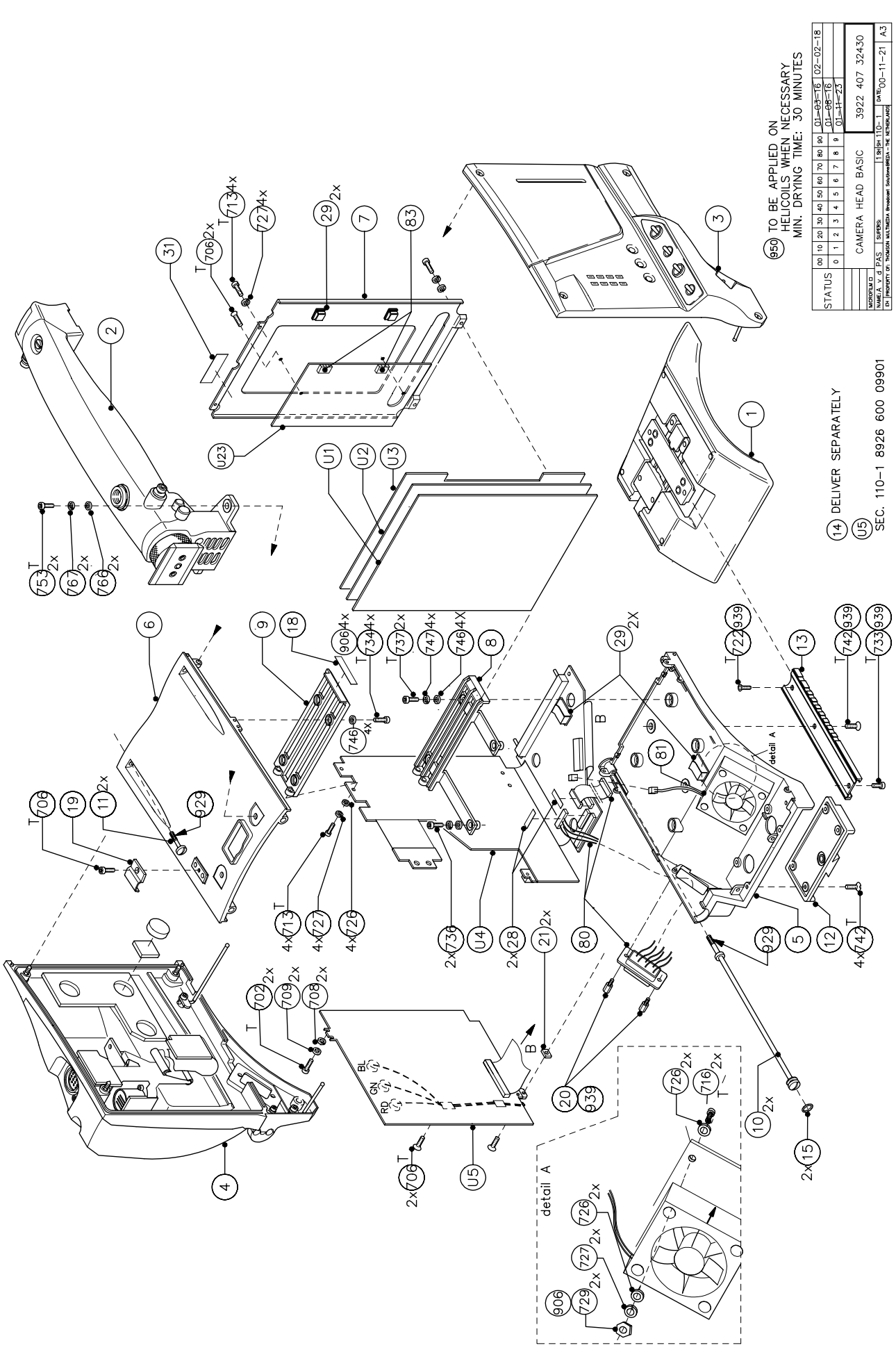
Option
950 TO BE APPLIED ON
HELICOILS WHEN NECESSARY
MIN. DRYING TIME: 30 MINUTES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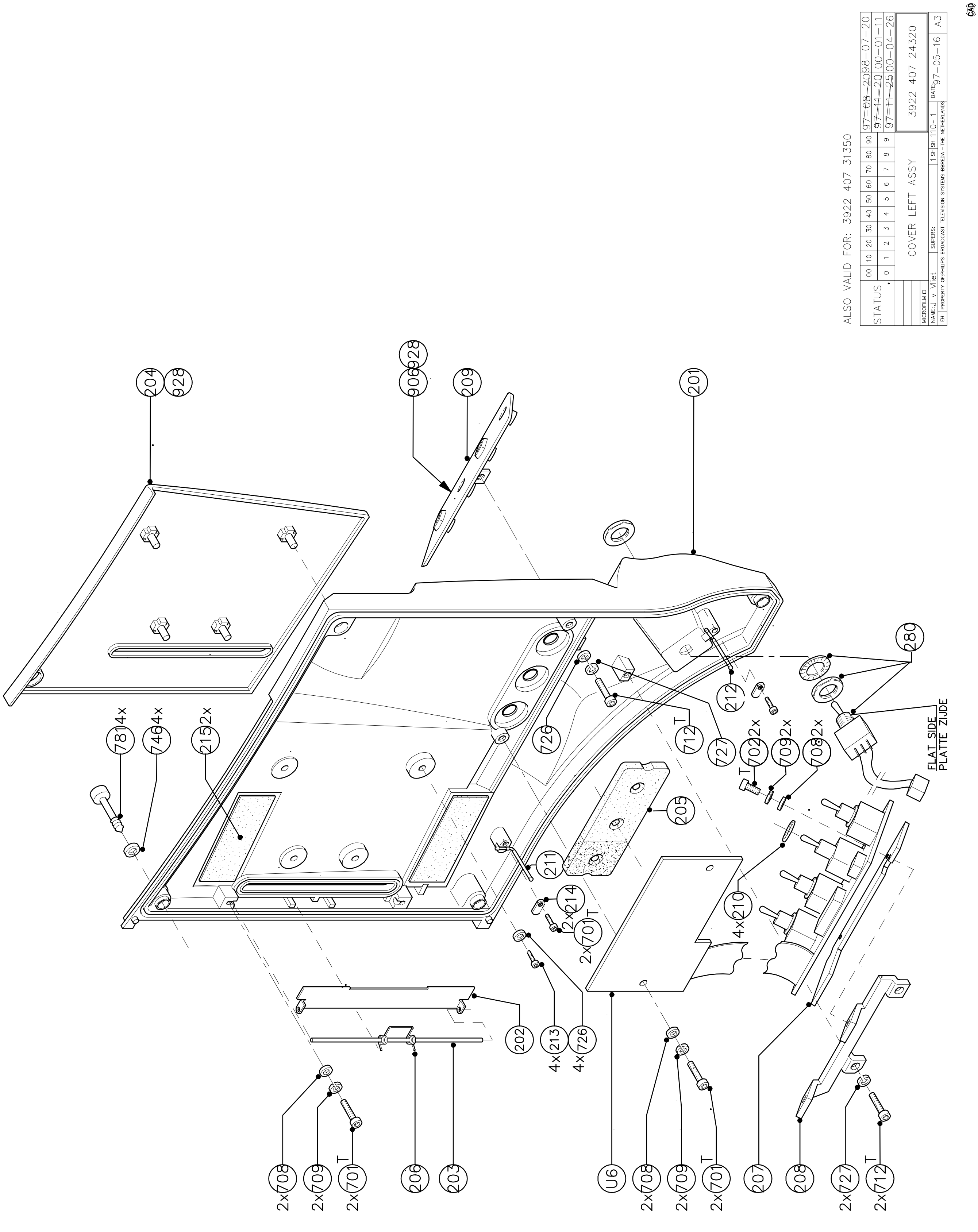
detail B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MICROFILM
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PLATTE ZIJDE
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204
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4x 746
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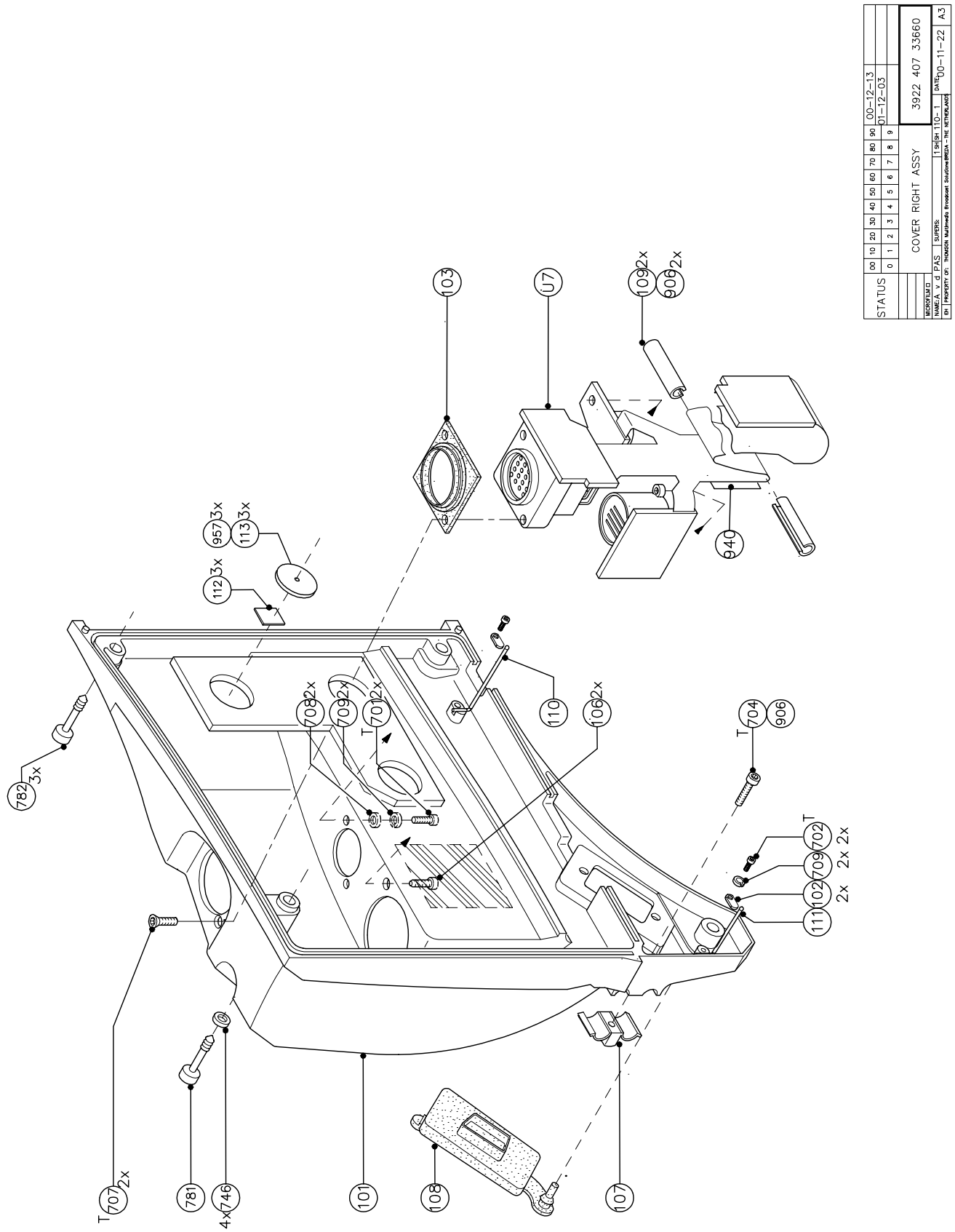
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DATE 00-11-22
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103
U7
109 2x
906 2x
940
957 3x
113 3x
112 3x
782 3x
708 2x
709 2x
T 702 2x
110
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906
T 702
709
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2x 2x
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T 707 2x
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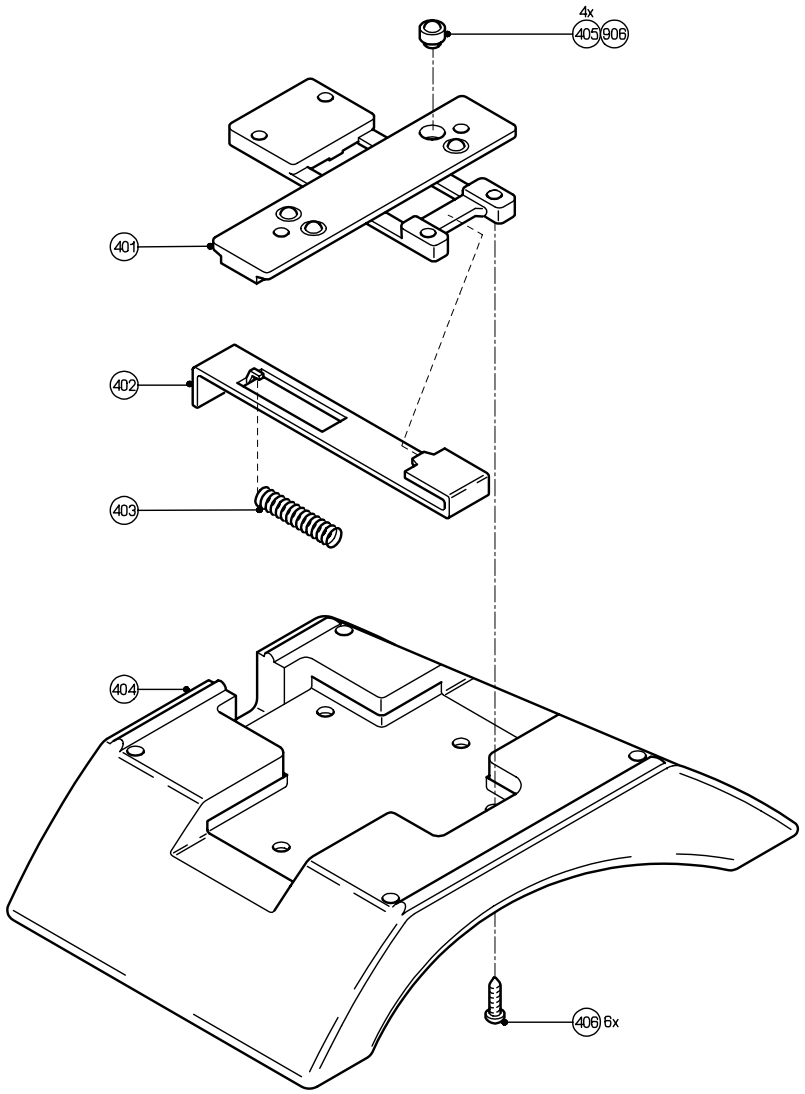

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MICROFILM ☐											
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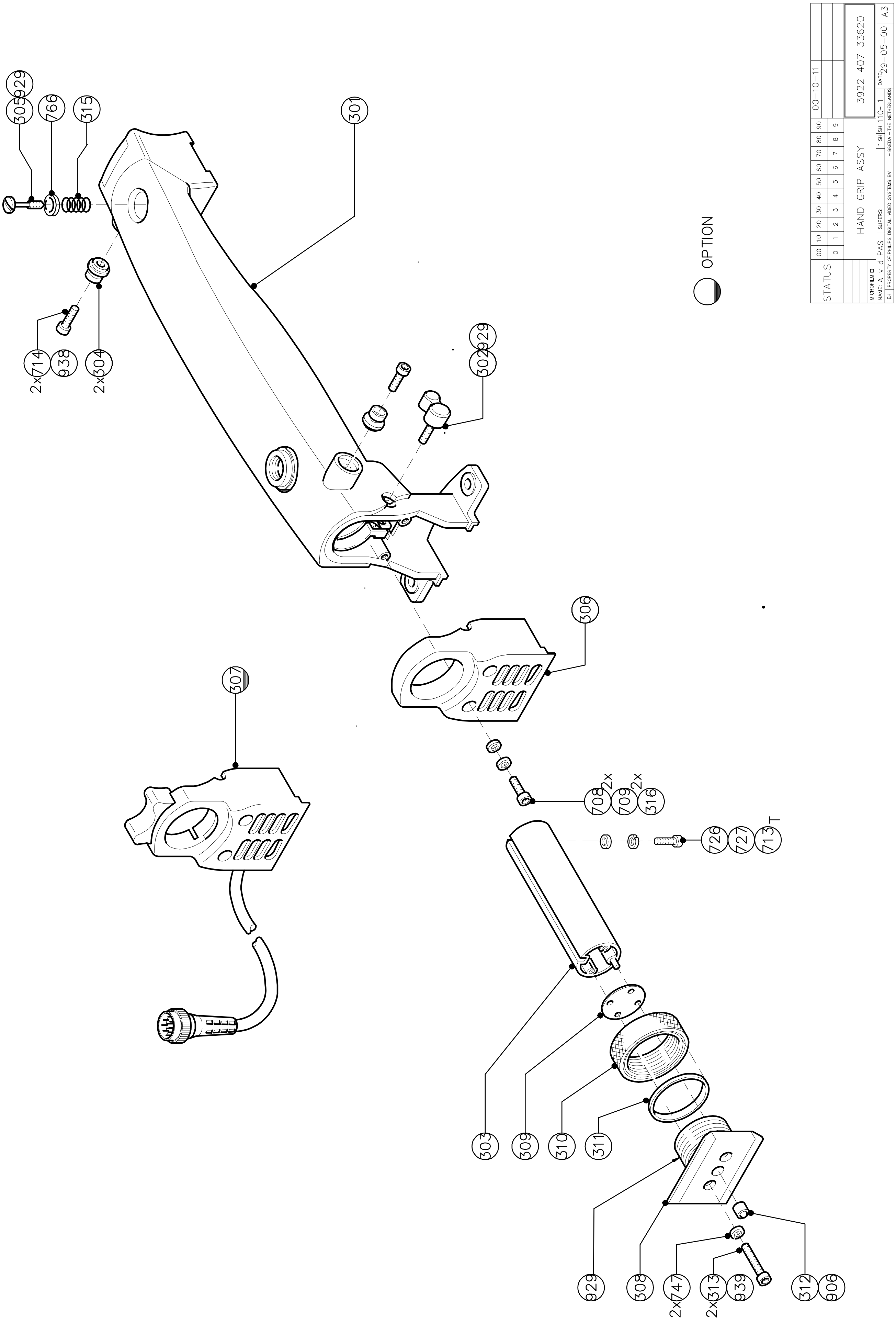
CAD



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SH 110-1
DATE 29-05-00
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- BREDA - THE NETHERLANDS
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301
2x714
938
2x304
302
929
306
307
708
709
316
2x
2x
726
727
713
T
303
309
310
311
929
308
2x747
2x313
939
312
906