

MREGA III



HEAD MANUAL

SECTIONS

- Standards
- Building the head.
- Controller and software.
- Connections and cables.
- Camera functions.
- Balancing.
- Problems and service

1. STANDARDS:

CABLES:

White tied cables: 20m length

Blue tied cables: 30m length

POWER SUPPLY: 24-30V DC @ 31.25A (XLR Pin 1 +V)

DC POWER CABLE		
3 XLR	Wire number:	2 Pin KPT (Head Power)
1 (+24-30V)	1	A
2 (0V)	2	B

UMBILICAL			
6-KPT (Console)	Colour / Pair No:	Function:	19-KPT (Head)
A	ORANGE / 1	+24-30V DC	A
B	WHITE / 1	0V	B
C	WHITE / 2	DATA – L	N
D	BLU / 2	DATA – H	P

BASEPLATE:

4 Pin Lemo	Camera Power (24-30V)
Pins 1 & 2	+24-30V
Pins 3 & 4	0V

6 Pin Lemo	Accessories Power
Pin 1	+12V (SUPPLY A)
Pin 2	0V (SUPPLY A)
Pin 3	+12V (SUPPLY B)
Pin 4	0V SUPPLY B)
Pin 5	+24-30V (HEAD POWER)
Pin 6	0V (HEAD POWER)

7 Pin Lemo	LCS / Accessories	10 Pin KPT
Pin 1	Data 1	Pin A
Pin 2	Data 2	Pin B
Pin 3	Data 3	Pin C
Pin 4	Data 4	Pin D
Pin 5	Data 5	Pin E
Pin 6	Data 6	Pin F
Pin 7	Data 7	Pin G
	Not used	Pin H
	+24-30VDC	Pin J
	0V	Pin K

Connector Schedules:

Controller:

6w KPT (CONTROL)		10w KPT (ACCS)		3-XLR (AUX POWER)	
A	+V FROM HEAD	A	PAN JOYSTICK (0-5V)	1	POWER
B	0V FROM HEAD	B	TILT JOYSTICK (0-5V)	2	POWER
C	CAN-L (DATA)	C	ROLL JOYSTICK	3	-
D	CAN-H (DATA)	D	JOYSTICK REF		
E	-	E	-		
F	-	F	-		
		G	IN / OUT 1		
		H	IN / OUT 2		
		J	+V*		
		K	0V		

NOTE:

Both the 6w KPT and the 3-XLR are either polarity input for power.

*For the Accs 10w KPT, the power available at pin J will be $V_{in} - 1V$ (approx)

HEAD:

19W KPT (CONTROL)		10W KPT (ACCS)		2-KPT (POWER IN)	
A	+V TO CONTROLLER**	A	CAMERA DATA 1	A	+24-30VDC
B	0V TO CONTROLLER	B	CAMERA DATA 2	B	0V
C	-	C	CAMERA DATA 3		
D	-	D	CAMERA DATA 4		
E	PAN ENCODER A	E	CAMERA DATA 5		
F	PAN ENCODER B	F	CAMERA DATA 6		
G	TILT ENCODER A	G	CAMERA DATA 7		
H	TILT ENCODER B	H	-		
J	ROLL ENCODER A	J	+24-30VDC**		
K	ROLL ENCODER B	K	0V		
L	ENCODER 0V (REF)				
M	- (DO NOT CONNECT)				
N	CAN-L (HEAD DATA)				
P	CAN-H (HEAD DATA)				
R	-				
S	-				
T	-				
U	-				
V	-				

NOTE: 19-KPT PIN A & 10-KPT PIN J WILL BE APPROX. 0.5V BELOW VOLTAGE APPLIED TO 2-KPT PIN A (DUE TO DIODE DROP)

BASEPLATE:

LEMO-7		LEMO-6		LEMO-4	
1	CAMERA DATA 1	1	+12VDC (A)	1	+24-28VDC
2	CAMERA DATA 2	2	0V (A)	2	+24-28VDC
3	CAMERA DATA 3	3	+12VDC (B)	3	0V (SYSTEM)
4	CAMERA DATA 4	4	0V (B)	4	0V (SYSTEM)
5	CAMERA DATA 5	5	+24-28VDC		
6	CAMERA DATA 6	6	0V (SYSTEM)		
7	CAMERA DATA 7				

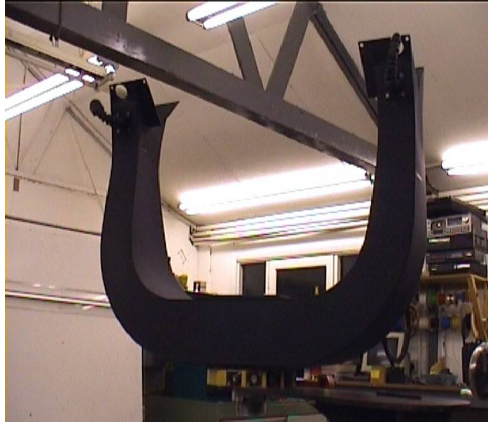
NOTE:

CAMERA DATA IS DIRECT FROM 10W KPT (ACCS) FROM HEAD MOUNTING PLATE (VIA PAN PCB RESETTABLE FUSES)

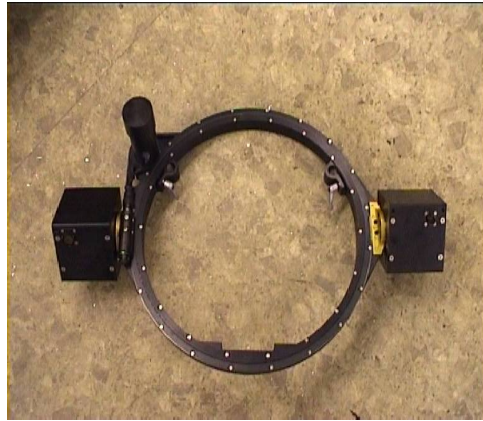
12VDC OUTPUTS FROM BASEPLATE ARE A CONSTANT 13.2VDC (IRRESPECTIVE OF INPUT VOLTAGE) AND ARE **ISOLATED** FROM SYSTEM POWER, AND EACH OTHER.

MEGA MAINTENANCE MANUAL.

Building the Head.



The claw

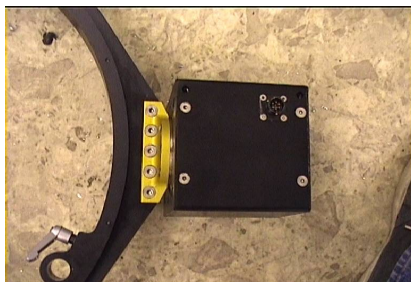
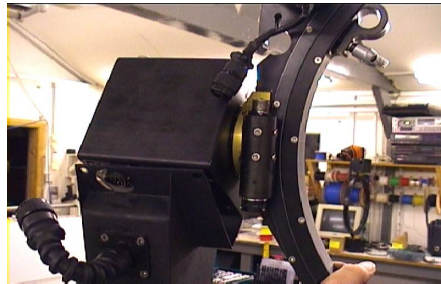


The Roll Ring

When building the head from the cases the mount is split into two sections - the claw, and the roll ring.

Mount the claw upright (as in claw photo) and the diamond shaped boxes of the roll ring drop easily into the diamond shaped ends of the claw.

Note that on the boxes of the roll ring are connectors which locate through the holes in the ends of the claw and that one is much larger than the other and so fits the end with the larger hole.

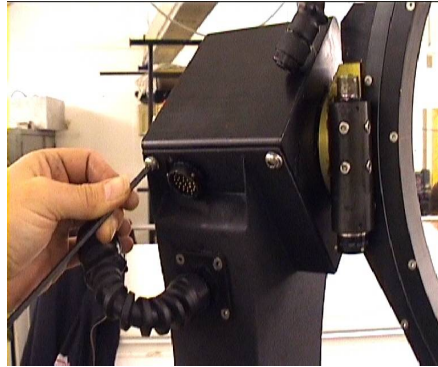


Tilt motor – small connector



Tilt slipring – large connector

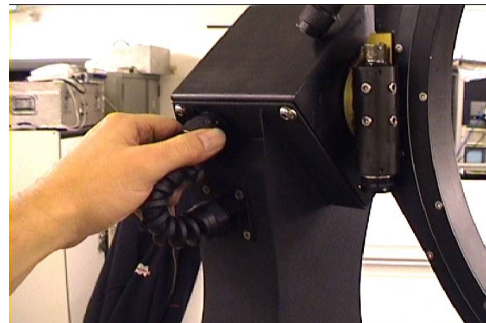
Once in place, insert 8 off M6x16 bolts (+ washers), to lock the two sections together (but do not tighten any until all are in place).



Once securely bolted in place, connect each connector (one on each side of the claw) with the cable from the claw.

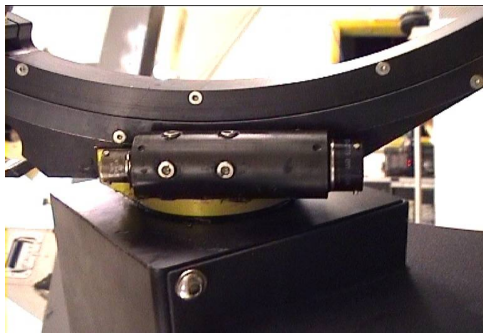


Tilt motor connection.



Tilt slipring connection.

Check that the Roll motor is connected to the barrel shaped connector block on the roll ring.



Roll ring barrel connector

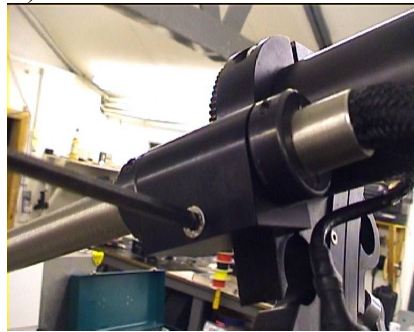
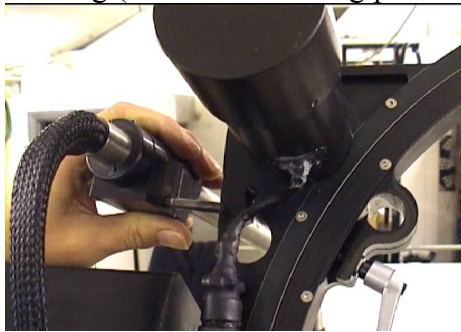


Roll motor connection.

Into the other connector on this barrel goes the roll slipping cable.



The roll slipping cable runs through the curved bar which attaches to the roll ring with a single bolt next to the roll motor (if it has come from the box, you may need to attach the cable guide). The curved section of the bar goes toward the gear side of the roll ring (roll motor housing points forward).



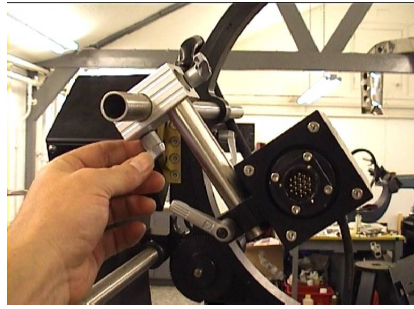
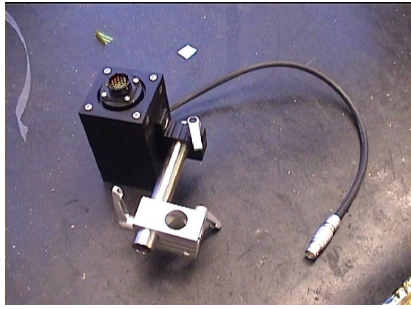
Connect the large connector on the motor side to the barrel shaped connector.



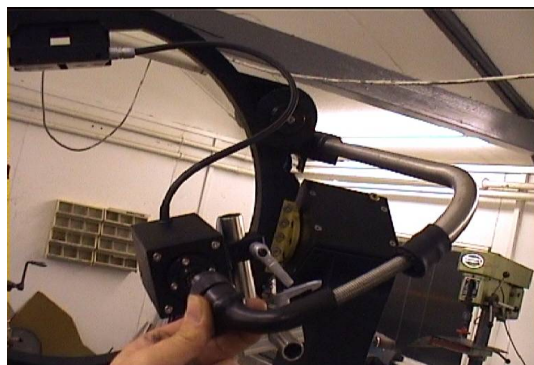
To enable you to mount the roll slip ring, fit two long bars into the roll ring clamps, and fit a short bar into the roll slipping clamp.



The roll slipping mounts to the long bar using the clamp and short bar as shown. Move the roll ring such that the roll motor, and the flat for attaching the baseplate are at the bottom. Attach the roll slipping to the long bar on the same side as the curved bar, and swing it on the clamp until it is fairly central within the roll axis.



The roll slipping cable can now be connected to the roll slipping. The connector pulls out on its spring and by holding the 90 degree sleeve on the rear of the connector the join can easily be made. **NOTE:** As you pull on the spring loaded cable the black webbing on the opposite end of the curved tube retracts. **Make sure you do not over pull this cable and that it is not twisted. The spring MUST be 90 degrees to the bars.**

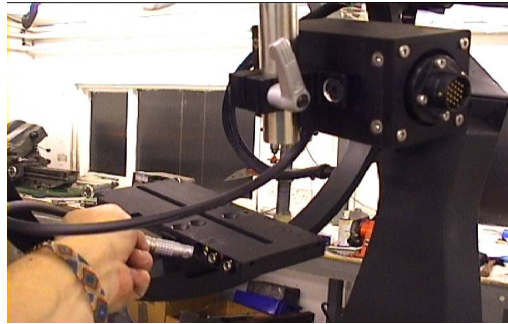


Within the roll ring interior is the mounting holes for the baseplate riser. Each riser is labelled as to the camera it is used for. There is one for Arri 35mm & 19mm bars, one for Arri 16mm & 19mm bars, & one for Panaflex/Moviecam. The riser is to lift the baseplate such that the camera lens is central within the roll ring (NODAL). If when shooting it is better to have the camera as low to the ground as possible then the riser can be removed. However this has an effect on the roll (rotation) of the image such that it does not revolve around the centre of the lens. If this is agreed by the cameraman – no problem but rebalancing in the roll axis is necessary.

Mount the baseplate riser (if used). The head's baseplate then bolts to this riser (or straight onto the roll ring, if no riser is required).



The roll slipping can now be connected to the baseplate. Be aware of this connection as it can feel as though it is connected when it is not. The shell of the connector must 'click' to be fully engaged and will cause you problems if it is not truly in.



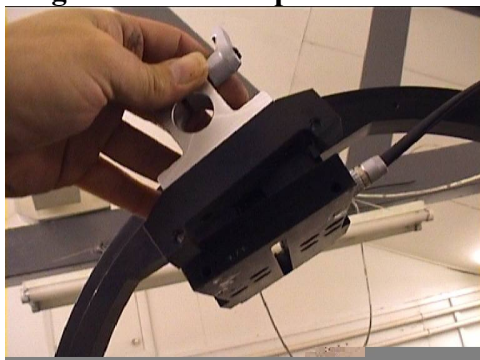
The camera baseplate can now be mounted onto the mount baseplate using at least two standard 3/8 BSW camera bolts. The long slot in the baseplate enables you to slide the camera baseplate into whatever position you require, but generally if you line-up the front of the camera baseplate to the front of the mount baseplate you should have enough adjustment to balance the camera for primes and zooms. Bear in mind that the camera must clear the claw to look down. If the camera package is out of balance, you must add weights to the bars (or not have full look-down). See section on balancing.

The MEGA III requires every camera to be top supported. Many cameras have a camera bolt point somewhere in the top of them. A Panaflex has one in the top of the Camera bar support bracket where the main handle has been removed for back loading the magazine, a 435/535 has one in the handle. Some cameras have brackets which are found in the mount boxes: Moviecam compact has an M5 threaded hole to mount the 20mm bar (with M5 stud) into. Arri III has a small square bar which slides into the handle of the camera.

Moviecam SL and Panaflex lightweight do not have brackets and so should be fitted with the steadicam top plates which have bolt holes in them.

The Mega III top attach bracket is then bolted to this bracket on the camera. A 90 degree offset clamp is also in the box. If you have difficulty reaching the bolt hole on the camera with the bracket, there is a selection of bars and clamps in the box which can be used to pretty much get you anywhere you need to, in a “Meccano” fasion.

To enable you to balance the mount when a top heavy load is in the rig, a clamp can be bolted onto the back of the mount baseplate – **but do not mount more than 2 weights to this clamp.**



With the camera in place and locked with the top attach the build is complete.

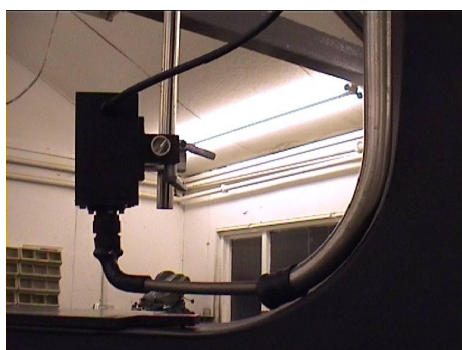
BEWARE OF :

The roll slipping and its cable if not set correctly can cause problems when rotating the camera.

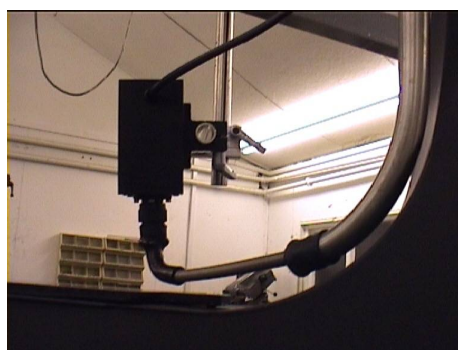
SETTING THE ROLL SLIPRING AND CABLE.

Start by setting the roll slipping cable – the curved bar.

This should be set so that the bar just clears the claw when looking down and rotating the camera. If at any point it hits the claw it needs adjusting.



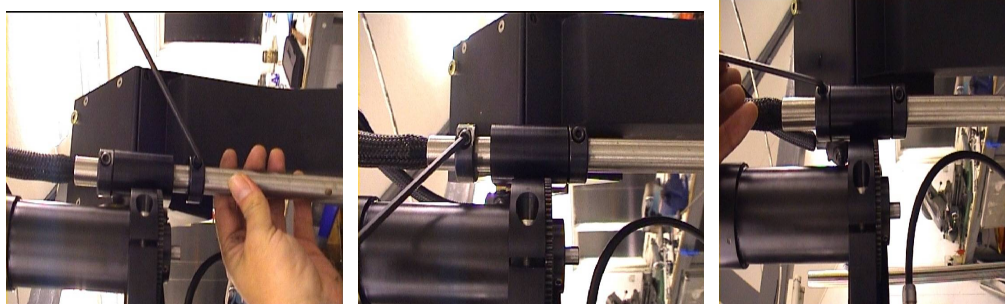
Bar fouls on the claw



Bar clears the claw

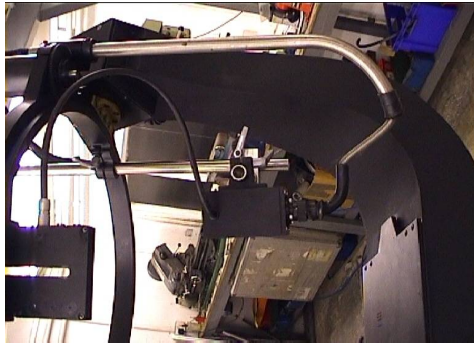
The adjustment can be made very quickly.

The bar is held in place by two locks around its mounting point. Loosen the outer lock with a 4mm allen key and slide into the position where the bar now clears the claw. Lock back into place against the attaching mount, loosen the other lock and slide up to the mount so that the bar is trapped in place by the two locks. Note: Don't slide the bar back further than this position as it is necessary for the spring to travel across the face of the claw and around the back of the magazine when the camera is rotated.

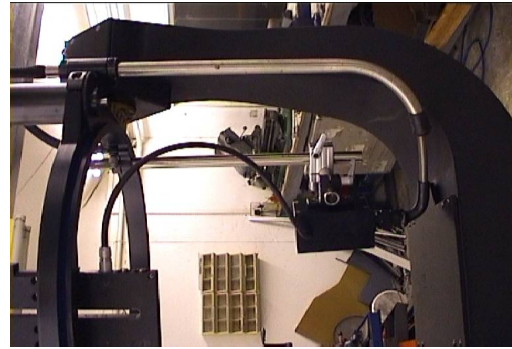


Loosen first lock and adjust, tighten in place, loosen 2nd lock, adjust and tighten.

With this in place you must now check the roll slipping is in the correct position. The spring should run straight, from the bar to the slipping. If it does not, adjust the slipping into the correct position by sliding the clamps on the long mount bars.



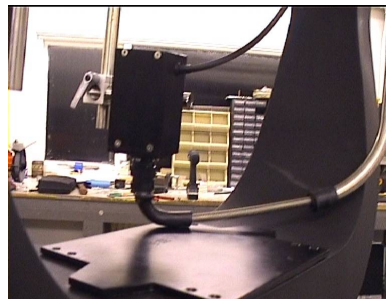
WRONG



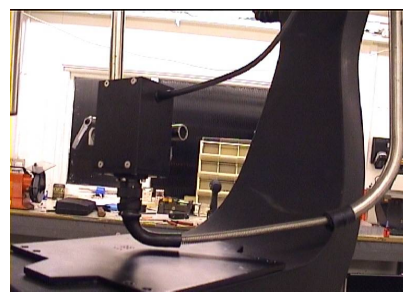
Correct

BEWARE: the 90 degree connector on the roll slipping cable does not hit the claw as you tilt and rotate.

WRONG



CORRECT



MEGA MAINTENANCE MANUAL.

CONNECTIONS AND CABLES.

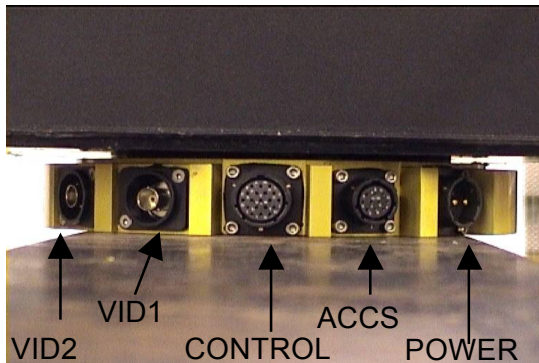
The Mega III has two basic cables, power and control.

The power is a normal 3 pin 24V connection to either a mains supply or batteries, which goes to a big 2 pin KPT connector on the head by the Moy fitting.

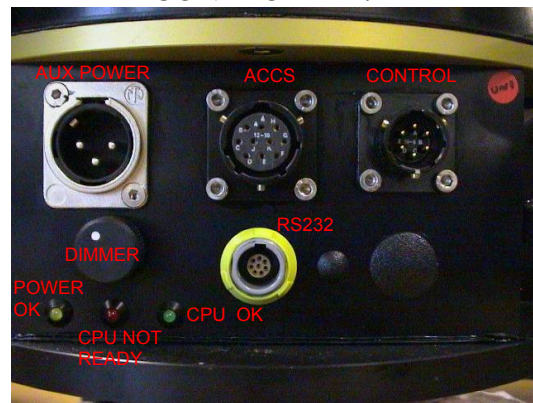
The control cable (the umbilical) is a 19way KPT – 6way KPT which goes between the head and the controller respectively.

With these two connected the mount will operate.

HEAD:

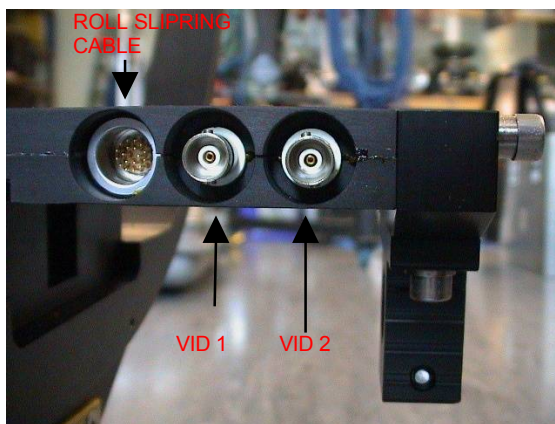


CONTROLLER:



Other connections on the head of the mount are 2 video BNCs and a camera function KPT connector. These are discussed in the camera functions section. Other connections on the controller see controller section.

BASEPLATE:



MEGA MAINTENANCE MANUAL.

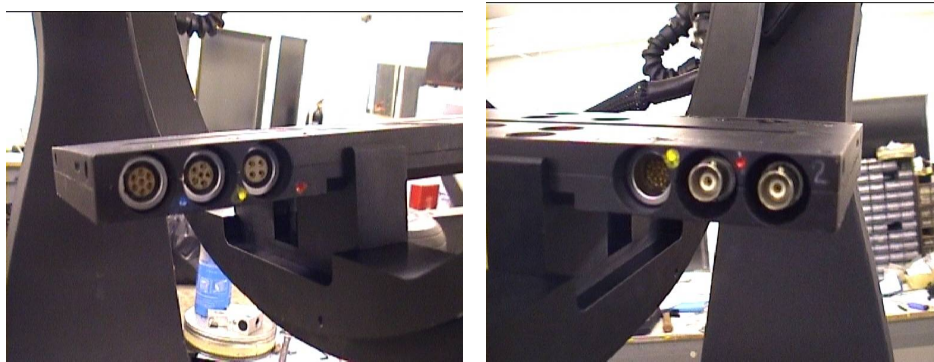
CAMERA FUNCTIONS.

Between the head baseplate and the moy head connections run the various camera functions.

Next to where the roll slipping cable plugs into the baseplate are two video BNC connectors. One for camera video and one for lens scale camera.

On the opposite side of the baseplate are three Lemo connectors. The 4 pin is 24V camera power; the 6 pin is accessories power (12v and 24V), and 7 pin is lens control / Arri RCU.

At the head of the mount the LCS/ RCU connections come out on the camera function connector.



MEGA MAINTENANCE MANUAL.

BALANCING.

The mount when completely built with the camera and accessories must be balanced. There are no rules set in stone to do this but here is a guide.

Slide the camera to balance front to back remembering that it should clear the claw. If it is as far back as is allowed by this and not balanced you must add weights to the bars. The further back the weight on the bar the more effect it has. Don't put all the weights on one side or only on the top as it will be either top or side heavy.

When balanced front to back, Tilt the camera 45 degrees down and see where it falls. If it drops further forward it is probably top heavy so either move top weights to the bottom or add weights to the bottom. Remember that it is balanced front to back so if you add more weight to the bottom put it close up to the roll ring as it will not effect the front/back balance.

If the camera falls back reverse the procedure.

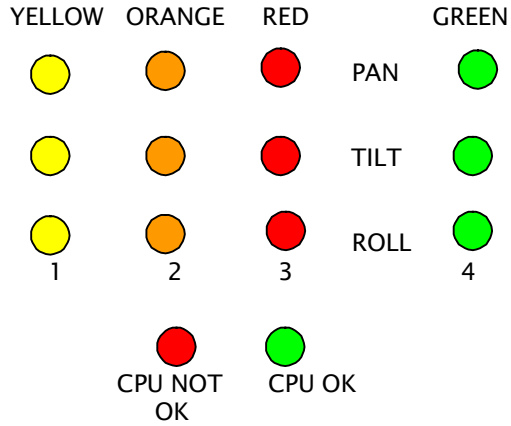
Now balanced front/back, top/bottom balance side to side.

With the camera horizontal, rotate 45 degrees one way and see if it falls further the same way. If it does not move, move another 45 degrees and check again. If no movement still carry on rotating round until it is level again. If it did not fall at any point it is balanced. If at one point it does fall it is side heavy. If it falls back the way you moved it, it is probably heavy on the side which is on higher and vice versa.

Once you have finished balancing check all weights are tight, and 'R' clips in place.

MEGA MAINTENANCE MANUAL.

AMPLIFIERS - All the amplifiers in the system are identical. When an amplifier is plugged into its respective connector, the current limits for that axis are set up automatically. The only function of the amplifiers is to drive the motors – there are no power supplies driving anything else in the system. The are indicator lights on the pan lid to indicate the amplifier status on each axis. These are as follows:



<i>STATUS</i>	<i>YELLOW</i>	<i>ORANGE</i>	<i>RED</i>	<i>GREEN</i>
AMPLIFIER OK	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
DISABLED	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
CURRENT LIMIT	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
SHORT	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
OVER TEMPERATURE	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
PROTECTION	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
UNDER VOLTAGE	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
OVER VOLTAGE	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
SHUNT	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

PROBLEMS AND SERVICE.

The Mega III is modular and each section can be replaced individually.

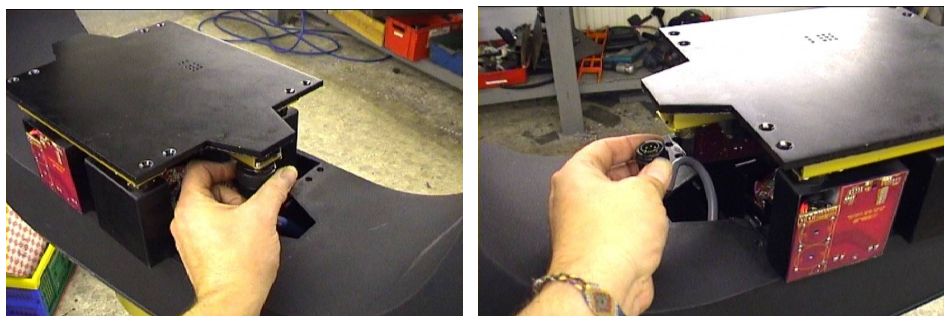
PAN HOUSING.

In the centre of the claw (when top mounted is easiest) the amplifiers, fuses and control PCB boards can be accessed.

Removal of this section is by the 8 off M6x20 CSK screws on the top. Once removed pry open the top with your finger and lift the section as shown.



As you lift it out disconnect the two cables which run from this unit through to the tilt motor / tilt slipping.

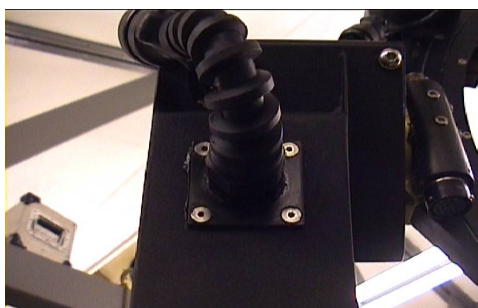


These two cables can be replaced if suspected to be faulty.

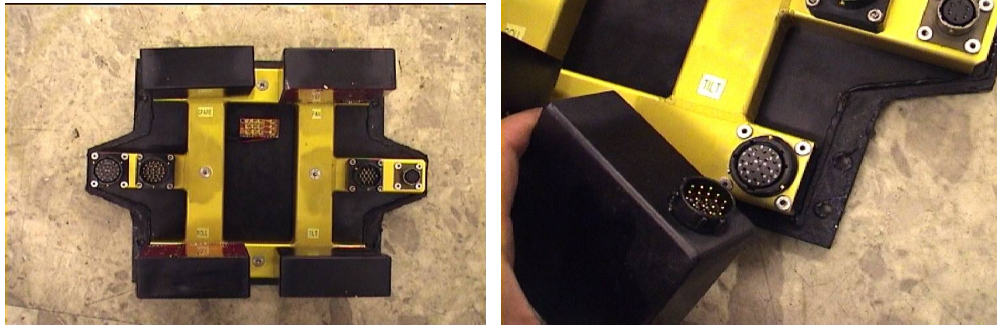
The smaller cable carries the tilt motor drive & encoder signals.

The larger cable carries all the lens control lines, video, camera/baseplate power and the roll motor information.

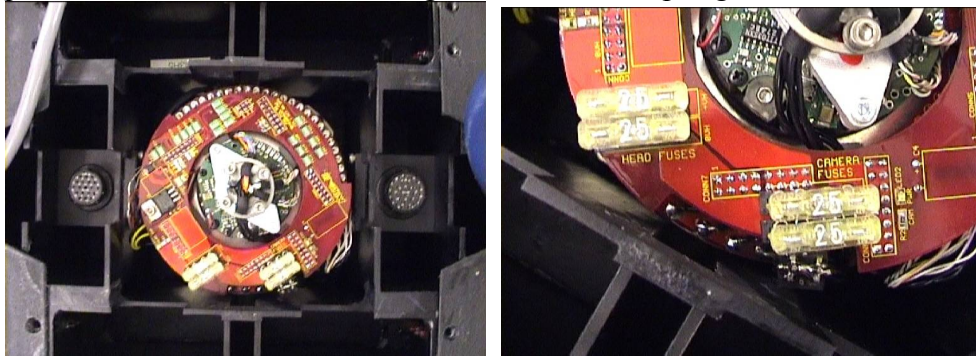
To replace them undo the four small bolts at the plates which hold the cable to the claw. Pull out the cable and replace.



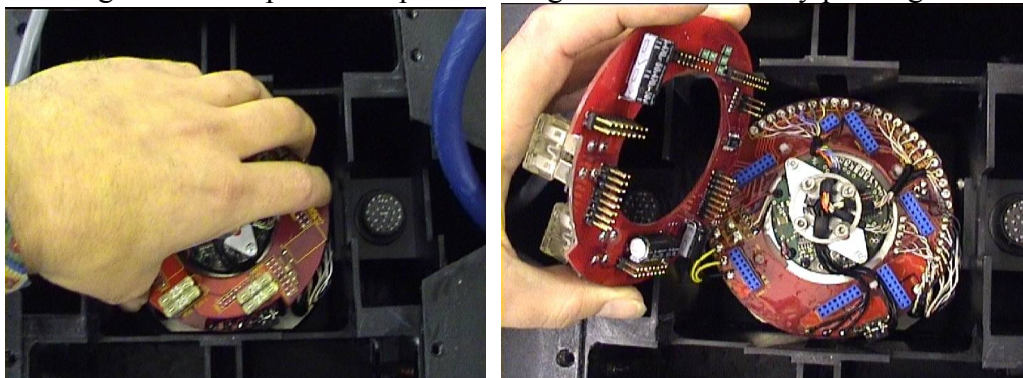
The amplifiers are removed as one section, there are four modules – 3 amplifiers, and a control module (all are marked). Simply pull out and replace. All the amplifiers are identical.



Within the mount is the only other active component, the pan board. This has the camera & head fuses on the board. These are standard car fuses at 25A and simply pull out. Also, it has self-resetting fuses for each slipping line.



If you experience electronic problems with the mount itself the main control board can be replaced. Note the position of the board and whilst holding down the board below, carefully separate the top board by easing it out. Once out, replace with the new one ensuring that all the pins line up and none get bent when firmly pushing home.

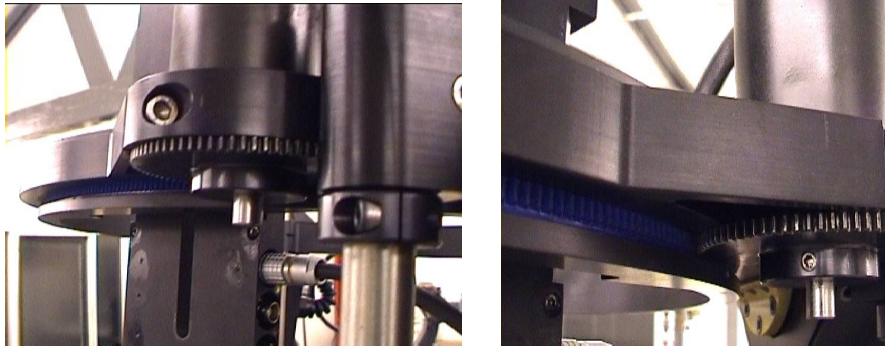


To replace the pan section reverse the procedure described. The lid will self-align, but remember to connect the two cables, and push firmly home before screwing back up. Also, as each screw is tightened, it will loosen the one next to it slightly. Make sure ALL are snug.

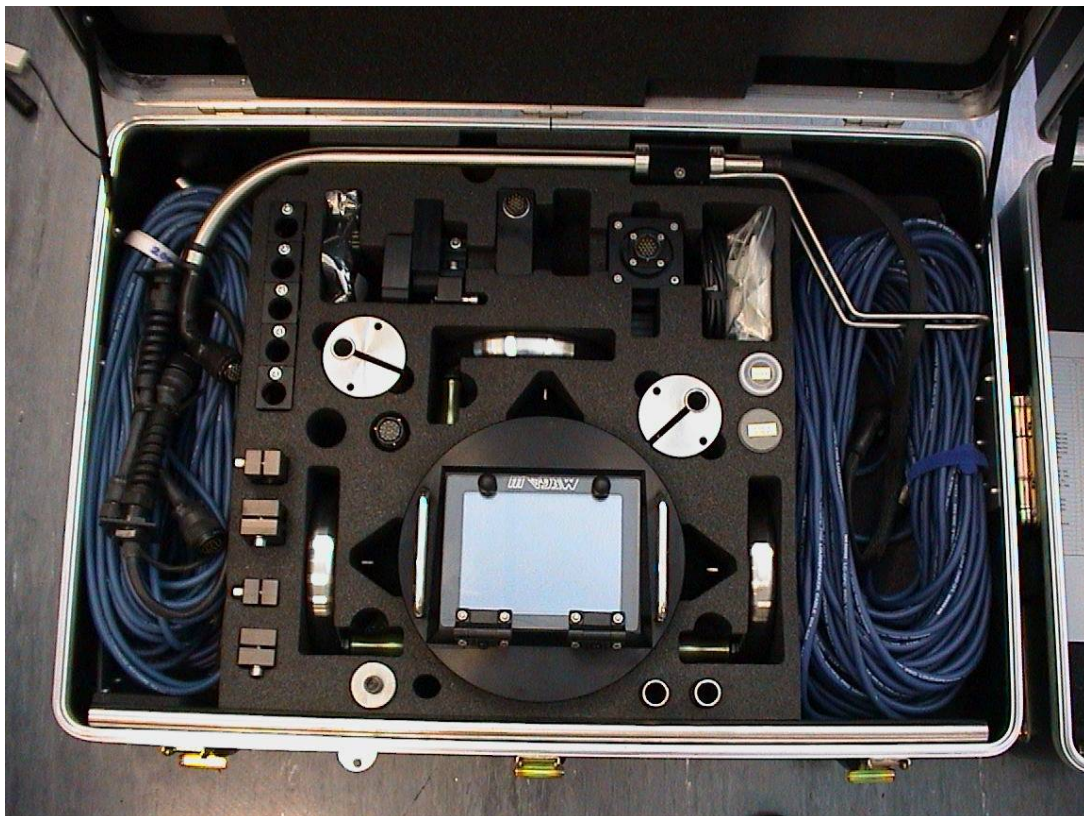
ROLL MOTOR ADJUSTMENT.

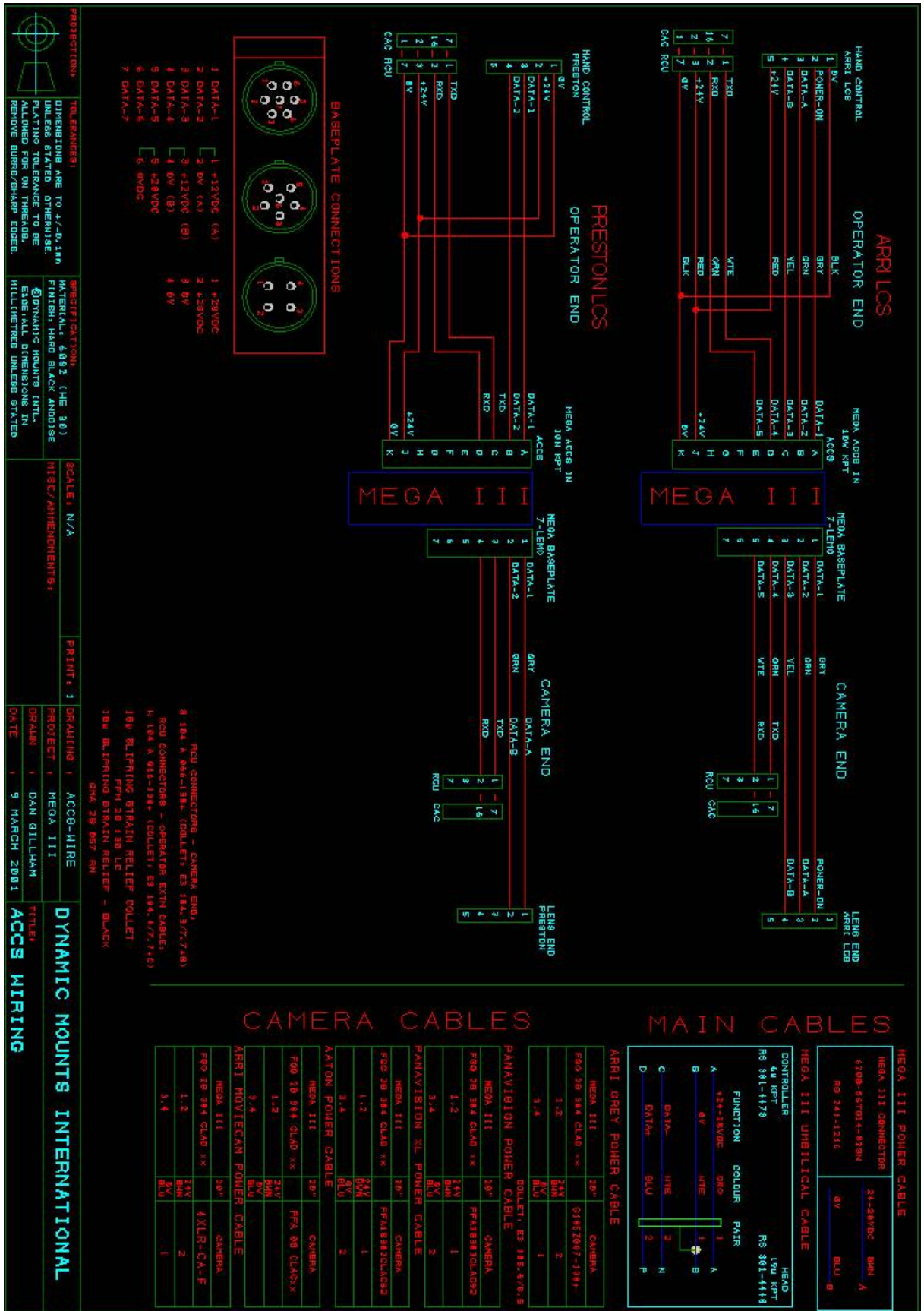
If you experience play in the roll axis between the gear and the blue gear on the ring the roll motor needs adjusting.

Loosen the bolt which holds the roll motor in place – just enough to twist the roll motor. The roll motor gear is on an eccentric, such that as you twist it, the gear moves in or out from the blue gear. Move it in until there is no play between the two at any point around the roll ring, and re-tighten the holding bolt.



CONTROLLER CASE PACKED:





Please note that due to constant striving for improvement, some things may appear slightly different from what is contained in this manual. E&OE.