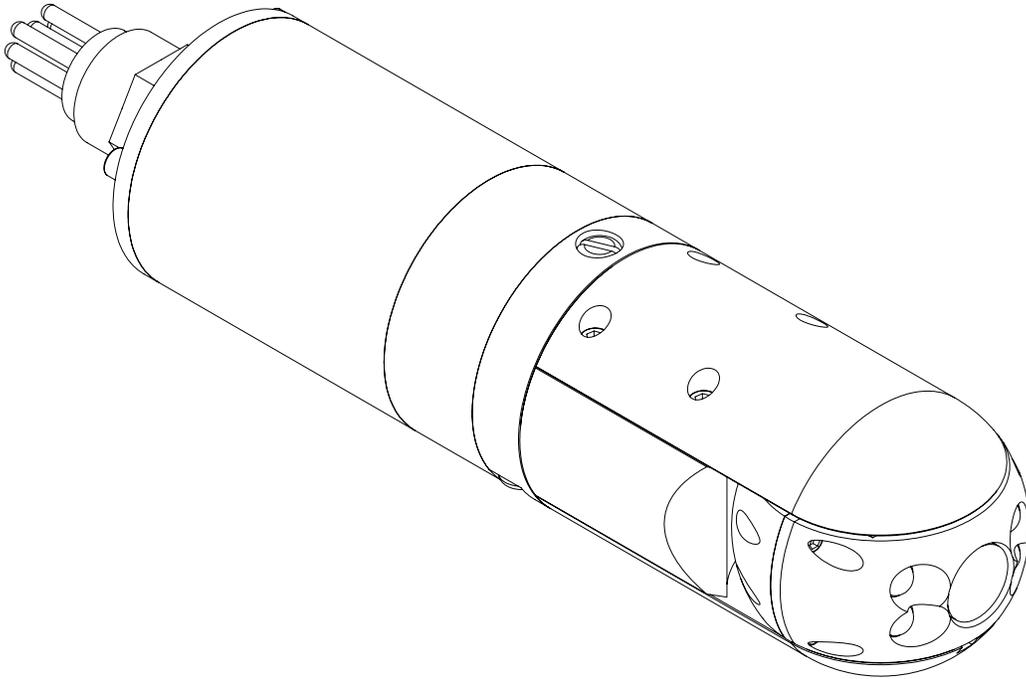


# SPECTRUM 45<sup>TM</sup> CAMERA MICRO-ALUMINUM



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**SOC#**

Spectrum 45<sup>TM</sup> Aluminum Camera  
Spectrum Controller  
Tether Cable

Ser# \_\_\_\_\_  
Ser# \_\_\_\_\_  
Ser# \_\_\_\_\_

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**1. ABOUT THIS MANUAL**

The purpose of this manual is to provide information only. It is subject to change without notice and does not represent a commitment on the part of Inuktun, or its agents.

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**2. SPECIFICATIONS**

**Spectrum 45™ Micro PT Specifications**

Pwr Cord: North Am <input type="checkbox"/>	Aluminium <input type="checkbox"/>	Clear Anodised <input type="checkbox"/>	NTSC <input type="checkbox"/>
Other _____ <input type="checkbox"/>	Stainless <input type="checkbox"/>	Other Colour _____ <input type="checkbox"/>	PAL <input type="checkbox"/>

- Depth Rating: 100 Feet. Salt or Fresh Water
- Camera: Pick-up Element: 1/4" CMOS (NTSC or PAL)  
 Lens: 3.6mm  
 Resolution: 420 TV Lines (Horizontal)  
 Illumination: 0.2 lux  
 Focus 1/2" to ∞
- Lights: 4X 1/2 Watt LED. Variable Intensity
- Pan Range: 360 ° Continuous
- Tilt Range: 280 ° Mechanical Stops
- Control System: Spectrum Camera Control System.
- Power Supply: Universal Switcher: 110-220 VAC, 50-60 Hz.
- Weight in Air: 450g / 1.0 lbs
- Operating Temp 32 ~ 122°F / 0 ~ 50°C
- Storage Temp -4 ~ 140°F / -20 ~ 60°C

### 3. SETUP & OPERATION

#### 3.1 Unpacking Components

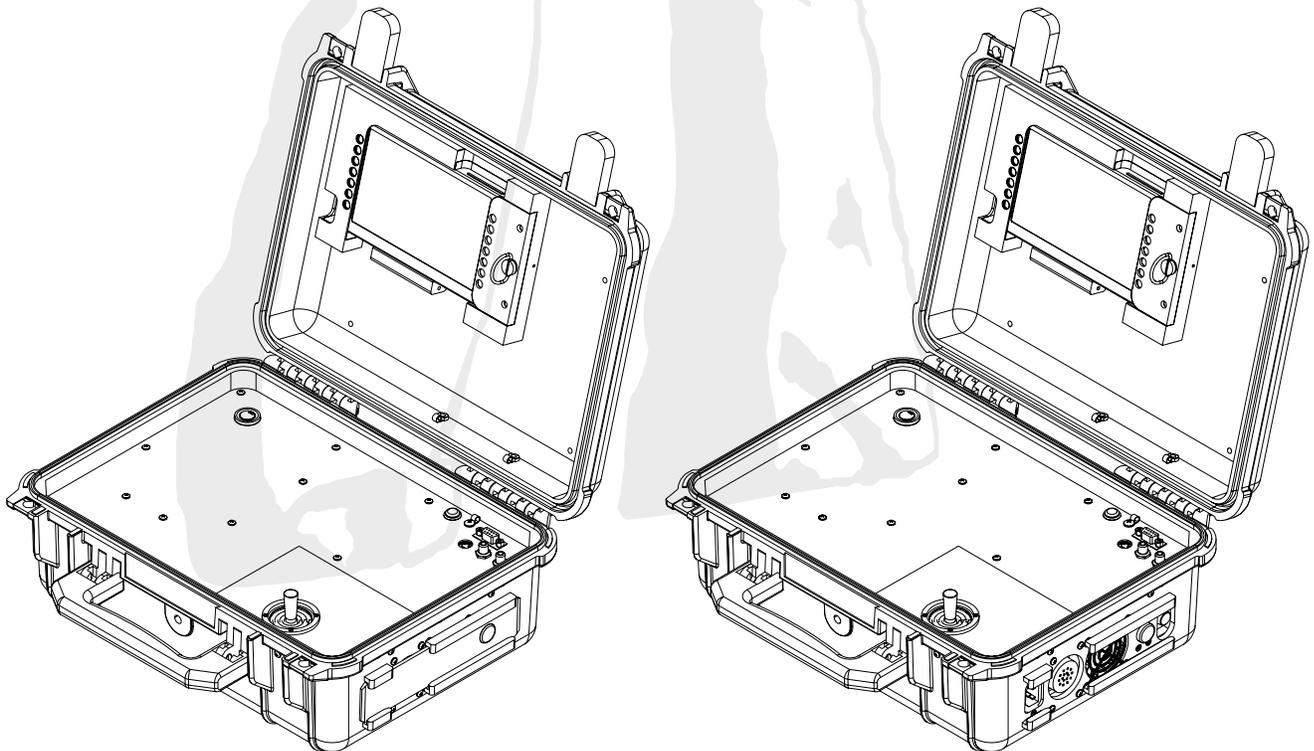
The Spectrum 45™ Micro PT camera is shipped in a rugged Pelican case. The case is selected to protect the camera from damage during shipping or storage. Upon receiving your system, check the case and contents for any damage that may have occurred during transport. Should any of these components be missing or damaged, please notify the selling agency. We suggest that if the system is to be re-shipped or stored for any length of time, it should be repacked in its original case.

It is strongly advised that the pelican case be placed in a **cardboard box** again for shipping purposes. This measure greatly reduces rough handling and subsequent shipping damage.

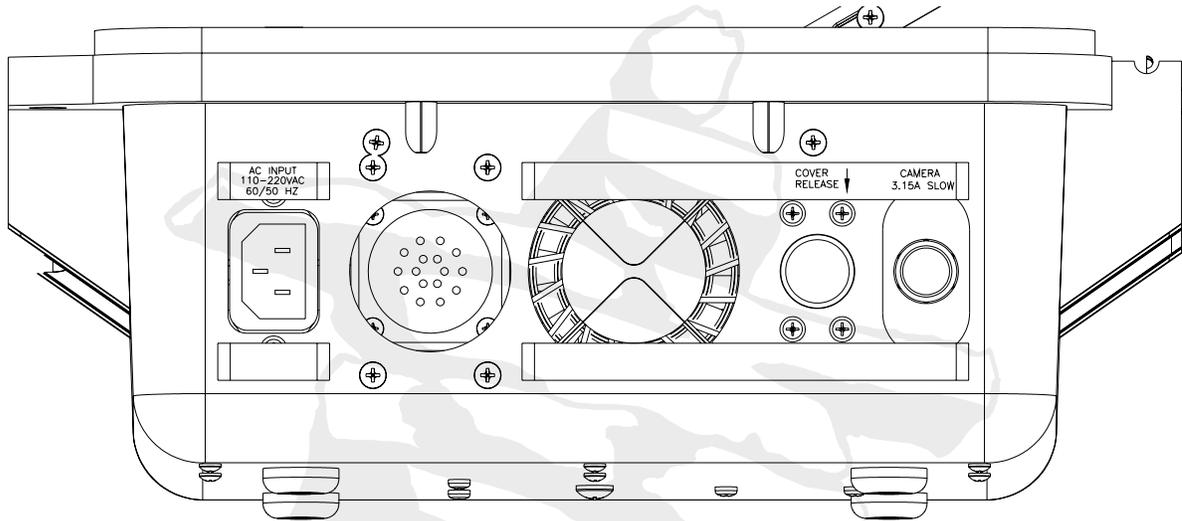
#### 3.2 Pelican-Case Controller Set-Up

##### Panel Access

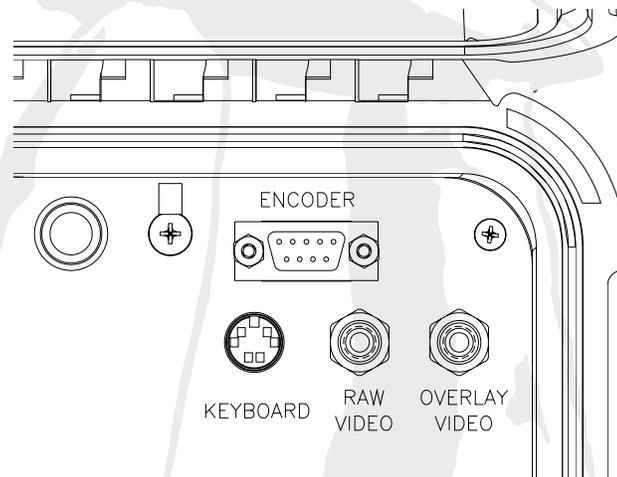
Power, video and tether connections are located underneath a protective sliding panel. To access, push in the latch button and slide out the panel. If your controller is equipped with an LCD monitor, store the panel above the monitor. A piece of foam will hold it in place. This will remind you to replace the panel when closing the lid, and act as a small sun shade for the monitor.



**Figure 3-1: Connector Access Panel**



**Figure 3-2: Side Connector Panel**

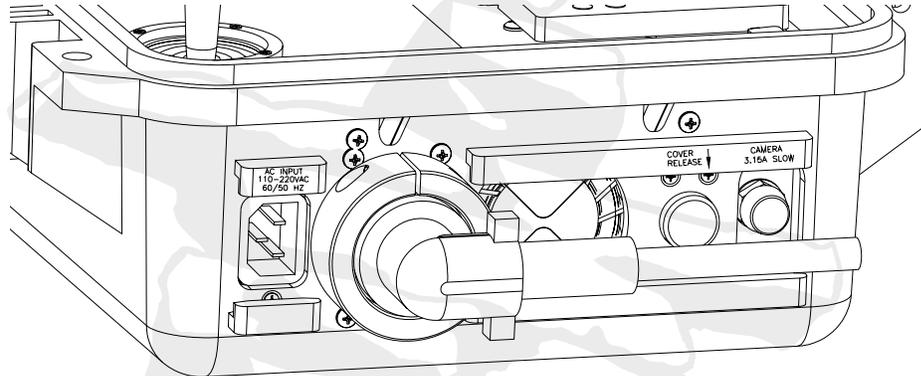


**Figure 3-3: Top Panel Connectors**

#### Side Connector Panel Layout

- Cover Release – Firmly press in the catch button with your thumb to slide out the protective side panel.
- AC Power – Universal Power Input 110-220 VAC, 50/60 Hz.
- Fuse – Camera 3.15A slow blow fuse. This protects the 72V DC power in the tether.
- Main Connector – Tether connection to the Spectrum 90 camera. This connector is also compatible with the VT100/150 systems – if a VT100/150 vehicle is plugged in this controller will run the camera.
- Encoder – Connection for a digital tether distance counter. Distances will appear on the video overlay.
- Keyboard – PS-2 style keyboard connection for video overlay and overlay messages.
- RAW Video – Video straight from the camera with no overlay.
- Overlay Video – Video signal with overlay added.

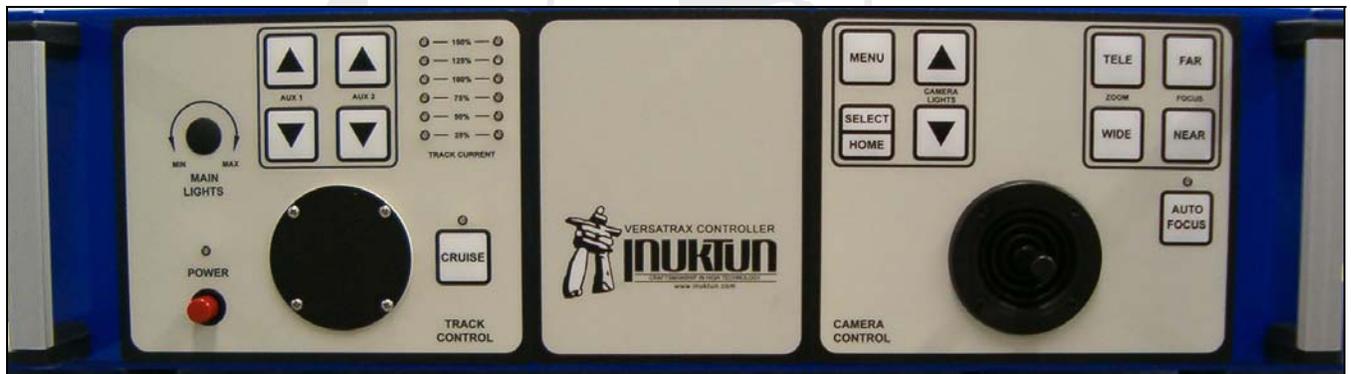
**Connecting The Tether**



**Figure 3-4: Tether Connection**

The tether is fitted with a large collar over the connection for easy connection and removal. Note that the 90° elbow on the connector will always be keyed to point to the back of the controller.

**3.3 Rack-Mount Controller Set-Up**



**Figure 3-5: Rack Mount Controller**

**General Setup**

Set-up and cable plug-ins for the 19" rack mount controller are the same as for the pelican-case controller described above. Note that the rack mount controller will come with a track control panel with some features blanked out. This enables the Spectrum 90 controller to be fully upgradeable to a Versatrax 150 controller.

**Voltage Input Switch**

There is a voltage input select switch at the back of the 19" rack mount controller. This switch is only used if your Spectrum 90/150 rack mount controller is upgraded to a VT150 controller. The auto-ranging power supplies in the Spectrum 90 controller will automatically adapt to the power voltage and frequency.



**Figure 3-6: Voltage Selection – There But NOT USED!**

#### **Other Switch / Connectors**

Additional connectors are found at the back of the rack-mount controller; some unused.

##### **Additional Connectors:**

Desktop Controller – connection point for an optional desktop control console.

Winch encoder – connection point for a digital distance encoder.

##### **Unused:**

Aux Video

Factory Test

Line Voltage Select (all power supplies in the Spectrum controller configuration are auto-ranging.)

### **3.4 A Note About Video Hook-Up**

Your Spectrum 45™ Micro PT camera system comes equipped with a video cable and an adapter. The VIDEO OUT jack on the control box and the video cable use BNC style connectors, common for industrial quality monitors and video systems. However, a regular commercial television monitor will likely use a RCA style jack. For this purpose a BNC to RCA adapter is included with the system.

There are several ways a video signal can be input to a television, monitor or VCR. These are:

- a) On a carrier frequency with many channels, such as from an aerial or cable company. This input will look like a screw jack and will be labelled VHF / UHF. **Do not hook the Spectrum 45™ Micro PT Camera to this input.**

Sometimes this will be the only input to a Television. In this case the video must first be run through a VCR or RF Modulator. **Refer to your VCR owner's manual to determine correct cable hookup.** If you are not using a VCR, an RF Modulator may be obtained from Radio Shack or other electronics store.



## Spectrum 45™ Micro PT

## 3.0 – SETUP & OPERATION

- b) The second input method is a base-band video signal with no carrier frequency. This is the video format output by the Spectrum 45™ Micro PT Camera. The TV or VCR input will typically be an RCA style jack labelled **VIDEO (IN)**.

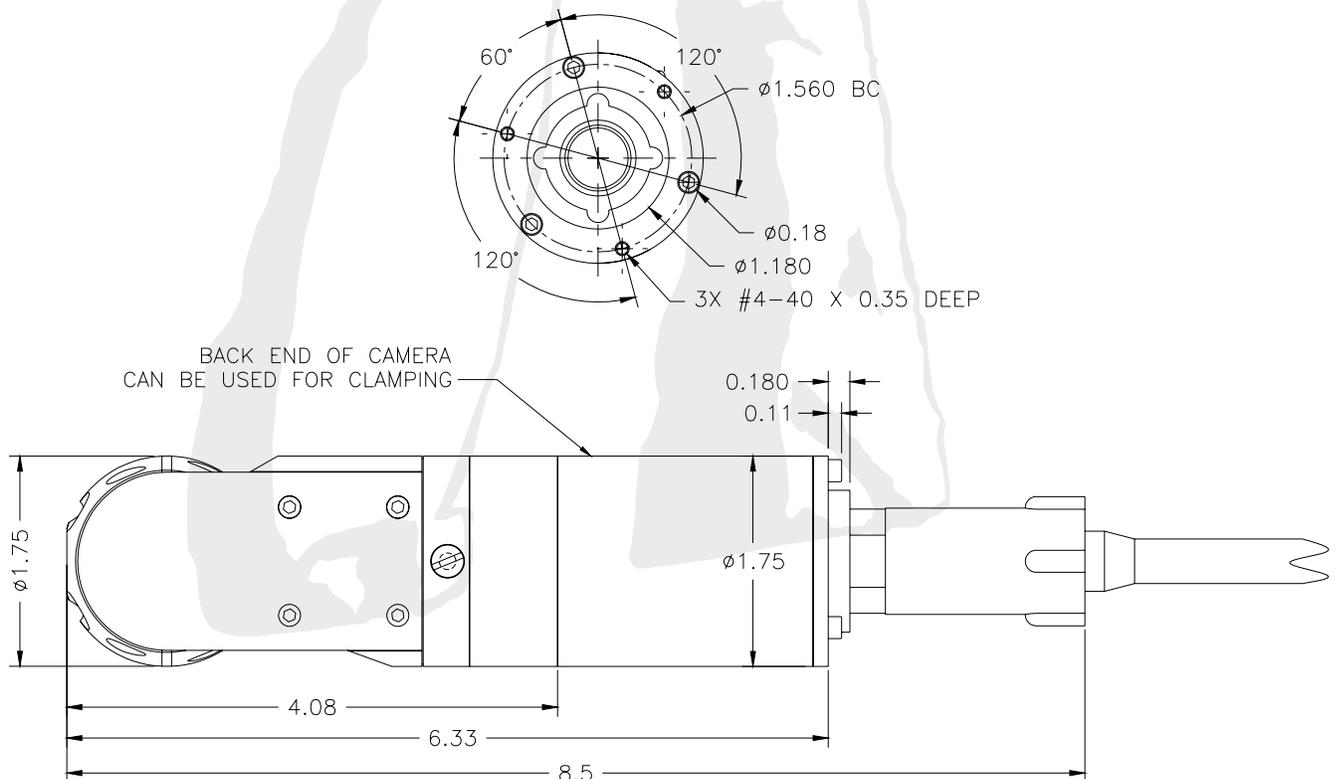
### Use the VIDEO input

Often the **VIDEO** jack will be found together with some audio jacks at the back of the TV or VCR. Alternatively, it may be located at the front in a compartment with a flip-down lid. Sometimes there will be more than one video input. **Refer to your Television or VCR owners manual to switch to the appropriate video input.**

### 3.5 Mounting The Camera

The Spectrum 45™ Micro PT camera can be mounted by a clamp around the stationary portion of the barrel. Use smooth or soft clamps. Avoid concentrated pressure points as these may dent the body. Remember to leave  $\varnothing 1"$  clearance for the connector. The camera may be mounted in any orientation.

**Caution: Never force the Pan or Tilt mechanisms to move by hand.**



**Spectrum 45™ Micro PT Camera Mounting Dimensions**



### 3.6 Caring For Connectors

With regard to system reliability, connectors come next after the tether in terms of importance. Though not quite as expensive to replace as a whole tether or wiring harness, a damaged connector can still represent significant cost in downtime and re-termination which could easily have been prevented. “A good tether is no tether if you can’t plug it in.” To this end, ISL recommends the following steps to help prevent damage to connectors.

Care must be taken not to damage the camera connector by forcing it together wrong. Observe the pattern of the pins, note that there is a ‘flat’ spot at the top of the pattern. (No pin at the very top center of the connector). Align and push the connector of the whip FULLY into its mate.

**Please, also pay attention to the following points:**

1. When plugging in any connector:
  - a. Inspect for dirt in both sides of the connectors.
  - b. Inspect for bent, burnt, corroded etc. pins.
  - c. Periodically apply some silicone grease to the connector pins and into the holes of the female bulkhead connector as well..
  - d. Secure the connector by screwing the locking collar onto the bulk head connector body until finger tight.
2. These are wet-pluggable connector halves. Connectors can be damp when being plugging in. Ensure, however, that the connectors are free of contaminants etc.
3. Even though the male connector has a certain degree of flexibility, avoid situations where strong sideways loads are applied to the connector.
4. Do not drive over a connector. Ever. It will crush and be broken.
5. Do not walk on a connector or tether. This fosters the wrong attitude toward tether and connector care.
6. When disconnecting a connector, it is best to clean it off dirt first with water so that dirt does not get inside.
7. If water is discovered inside the tether connector (power supply end), clean it and check the contact surfaces of the pins. Ensure that the connector is dry inside. A blow dryer may be used to achieve this. In addition, make sure the connector is not damaged and will properly screw onto the power supply.

### 3.7 Pre-Ops Inspection

**Warning** Always turn the system off before unplugging the camera. Plugging in or unplugging the camera while the system is on can cause camera damage.

A Pre-Ops check should to be carried out prior to every camera mission.

- 1) Visually inspect the camera to ensure that there is nothing jamming the movement.
- 2) Check the camera cable for cuts, tears, etc.
- 3) Check that the camera connector is fully engaged and that the locking collar is finger tight..



## Spectrum 45™ Micro PT

## 3.0 – SETUP & OPERATION

- 4) Ensure that all other cables are properly connected, including the monitor.
- 5) Clean the camera port. (window)
- 6) Power up and test all camera functions. This would include: Adjustability of the lights and FULL Pan & Tilt movements.
- 7) Verify the functionality of your monitor and video recording equipment. At this time, verify the functionality of the video overlay, feed back of camera movements, zoom and manual focus settings.

### 3.8 Post-Ops Inspection

**Warning:** Always turn the system off before connecting or disconnecting the camera. Doing so while the system is on can cause camera damage.

A Post-Ops inspection should be carried out after every camera mission.

- 1) The system should be visually inspected for mechanical damage.
- 2) If the system has been used in salt water, thoroughly rinse the camera and pole with fresh water right away. Accelerated corrosion will result if the camera is not rinsed properly. Pay close attention to rinsing and cleaning the spaces between moving parts.

**Warning:** Use regular water line pressure to rinse. **DO NOT**, under any circumstances, use a pressure washer. This will cause water damage since high pressure water can push past the seals.

- 3) Clean off the camera and remove objects or debris from between its moving parts.
- 4) Visually check through the camera port to ensure that no water has entered the pressure housing.
- 5) Inspect the camera cable for cuts, nicks or kinks. Store the camera in its Pelican case with the connector sufficiently protected.

### 3.9 Operating the Spectrum 45™ Micro PT Camera

**Note:** Only turn the power supply on when ALL components are connected.

Standard controls for the Spectrum 45™ PT camera are as follows:

**Power** – On / Off. Turns on the power to the camera and built-in lights.

**Joystick** – Gives the operator variable speed control of the camera's pan and tilt functions. The Tilt mechanism will hit mechanical stops at either end of the tilt motion. A slip clutch will prevent motor damage if the motor continues to be driven past the limits. Stop when the camera motion comes to the end of its travel – avoid running on the clutch. The Pan mechanism is **continuous** and therefore has no mechanical stops. The motion, however, is also clutch protected in the event that the motion is hindered for any reason.

**Joystick Trim Adjustments** – Pan & Tilt speeds can be trimmed in the software Menu using the video overlay.



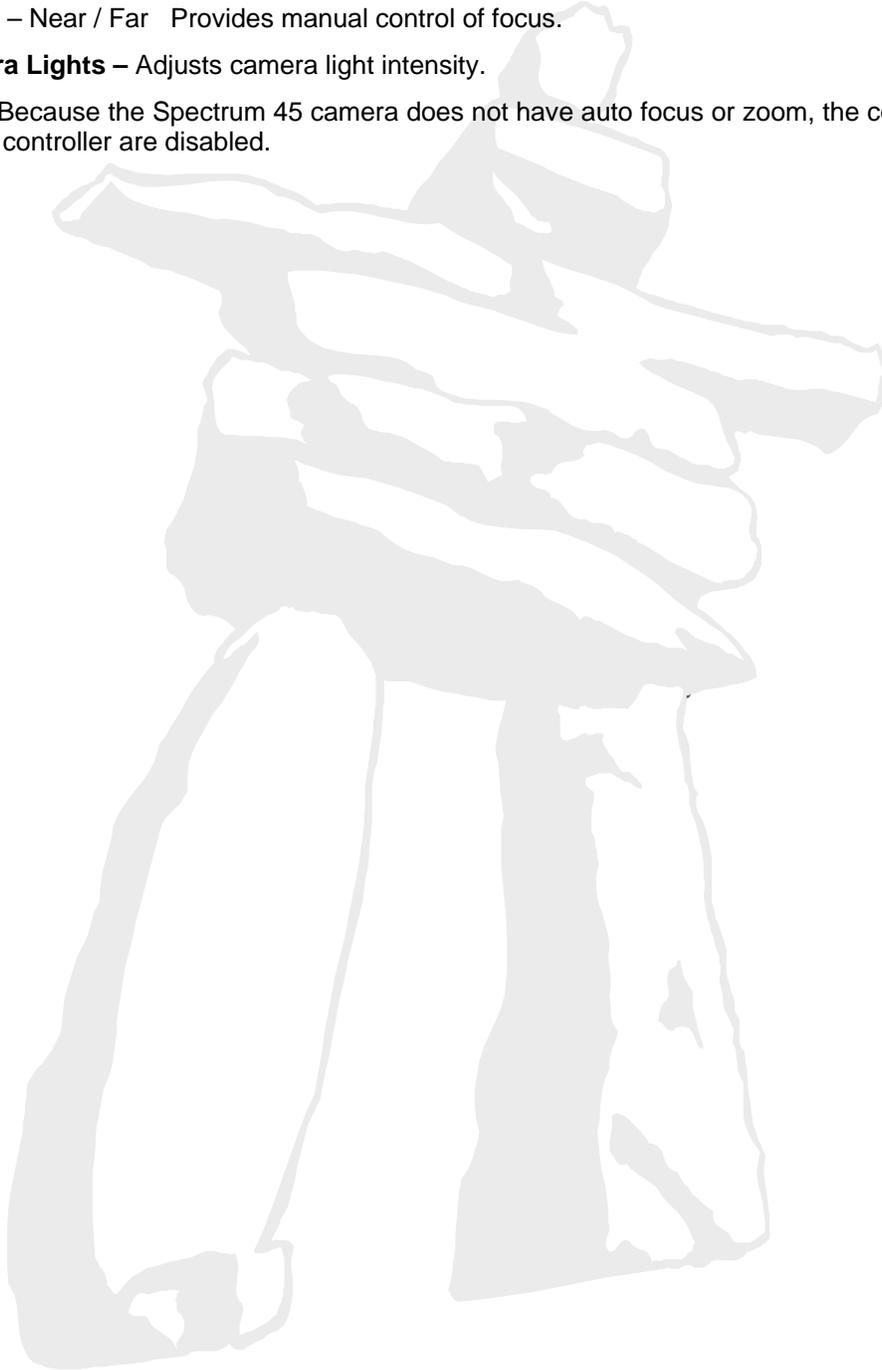
## Spectrum 45™ Micro PT

## 3.0 – SETUP & OPERATION

**Focus** – Near / Far Provides manual control of focus.

**Camera Lights** – Adjusts camera light intensity.

**Note:** Because the Spectrum 45 camera does not have auto focus or zoom, the corresponding switches on the controller are disabled.

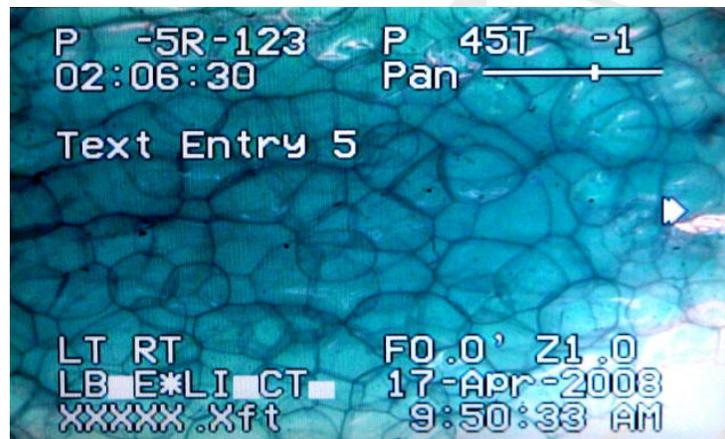


## 4. Video Overlay

### 4.1 On Screen Display (Video Overlay)

The Spectrum controller is capable of displaying system and camera information overlaid with the video feed. This information can be turned on and off through the Displayed Information menu.

The below screen illustrates how this information will be displayed.



**Figure 4-1: Typical Video Overlay**

#### Top Left Corner

- **Pitch & Roll** – \*Not used with SP45. Turn visibility of this item off.
- **Elapsed Time** – Displays the elapsed time counter. (Hot-key “I”)

#### Top Right Corner

- **Pan & Tilt Numeric Data** – \*Not used with SP45. Turn visibility of this item off.
- **Pan Indicator** – \*Not used with SP45. Turn visibility of this item off.

#### Right Side

- **Tilt Indicator** – \*Not used with SP45. Turn visibility of this item off.

#### Bottom Left Corner

- **Track Current Monitors** – \*Not used with SP45. Turn visibility of this item off.
- **Lights Mode [LX]** – \*Not used with SP45. Turn visibility of this item off.
- **Exposure [E]** – \*Not used with SP45. Turn visibility of this item off.
- **Lights Current Monitor [LI]** – \*Not used with SP45. Turn visibility of this item off.
- **Camera Temperature** – \*Not used with SP45. Turn visibility of this item off.
- **Distance** – Tether payout distance. (Hot-key “D”)

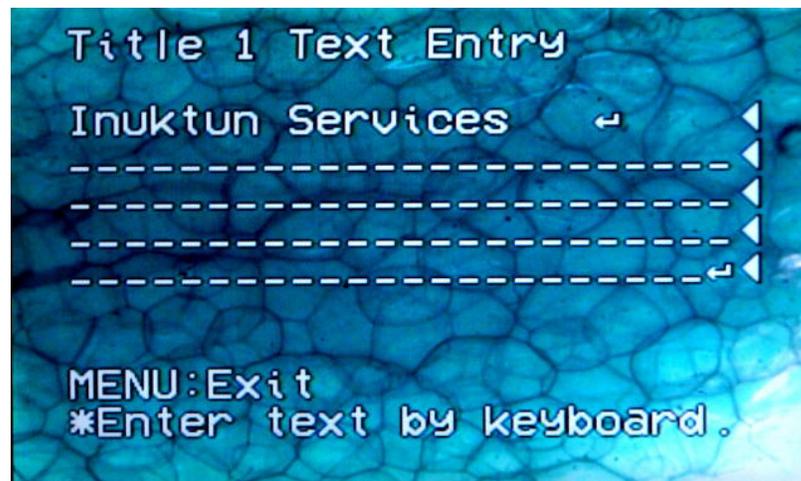
### Bottom Right Corner

- **Camera Status** – \*Not used with SP45. Turn visibility of this item off.
- **Date/Time** – The current date and time. This selection can be toggled between short date format (dd/mm/yy hh:ss) or long date format (example 01-Jan-2006 11:38:24 AM). (Hot-key “T”)

### Center Screen

- **Title Text** – Title and operator comments. (Hot-keys “F1”, “F2”, “F3”, “F4”, and “F5”)

### 4.2 Title Text Entry



**Figure 4-2: Overlay Title Text Entry Screen**

The Spectrum text overlay system allows up to five video overlay title screens to be stored in memory. These screens may be changed at any time or pre-typed and called up on demand. This can be useful for adding comments or site data to an inspection recording.

Each screen can be up to five lines long with 25 characters per line.

A keyboard is required to edit text but once stored in memory the title screens can be called up through the Displayed Information screen in the main menu.

To **display** or hide any of the five title screens press keyboard keys F1 though F5.

To **edit** a comment press Shift + F1, Shift + F2, etc, depending on which of the five screens you want to edit.

F1	Show / hide title screen 1
F2	Show / hide title screen 2
F3	Show / hide title screen 3
F4	Show / hide title screen 4
F5	Show / hide title screen 5

Shift + F1	Edit title screen 1
Shift + F2	Edit title screen 2
Shift + F3	Edit title screen 3
Shift + F4	Edit title screen 4
Shift + F5	Edit title screen 5

### Cursor Control Keys:

← – Move cursor left.

→ – Move cursor right.

↑ – Move cursor up.

↓ – Move cursor down.

**Tab** – Move the cursor and insert space.

**Home** – Move the cursor to the beginning of the line.

**End** – Move cursor to the end of the line.

**Page up** – Move the cursor to the first line.

**Page down** – Move the cursor to the last line.

**Enter** – Moves cursor to the beginning of the next line.

**Delete** – Deletes the character to the right.

**Backspace** – Deletes the character to the left.

**Insert** – Toggles between insert or overwrite text. Flashing characters will be overwritten.

**Num lock** – Enables numeric keypad.

### 4.3 Menu System

The following sections describe the on-screen menu system for c options and settings.

#### 4.3.1 Menu Navigation



The on-screen menu system is navigated using the group of four buttons to the upper left of the camera control joystick. Many items in the menu can also be accessed and / or activated using keyboard hot-keys. General navigation using the panel buttons is as follows:

- The system is organized as a main menu with sub-menus.
- Enter the main menu pressing the MENU button.
- Pressing the MENU button while inside a menu will back you out one level. In this way the menu system can be exited by pressing the MENU button several times, depending on the depth of your current level.
- Move the cursor down the list of items using the arrow keys.
- Select or toggle items using the SELECT key.
- You can jump to different parts of the menu by pressing the corresponding keyboard hot-key. Hot-keys are tabulated in section 4.3.8. When in the menu system press the “Alt” key to highlight available hot keys for that menu.
- Back out of menu sub-directories and from the menu system itself by again pressing the MENU button. Alternatively press “M” on the keyboard to exit all menus.

### 4.3.2 Main Menu

Enter the main menu by pressing the MENU key once or by pressing “M” on the keyboard.

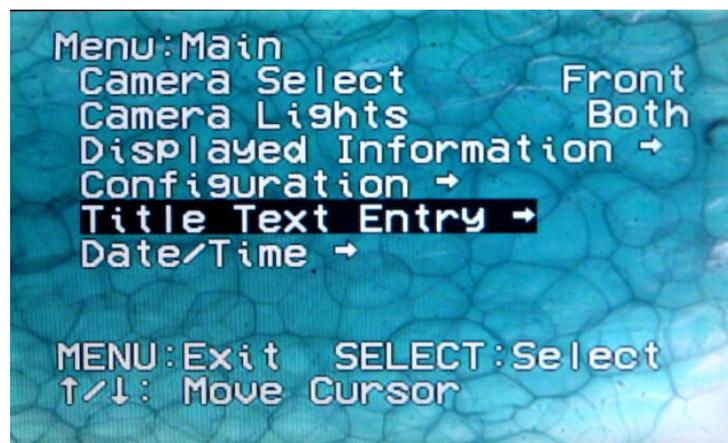


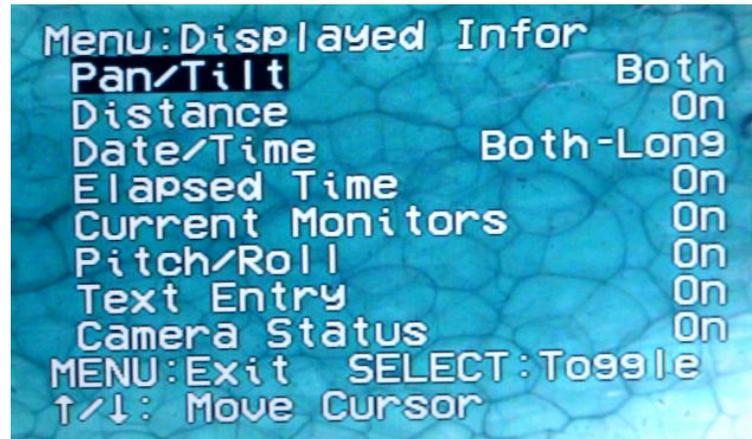
Figure 4-3: Main Configuration Menu

Notes:

- **Camera Select** – (Not used – SP45)
- **Camera Lights** – (Not used – SP45)
- **Displayed Information** – Video overlay visibility sub-menu.
- **Configuration** – (Not used – SP45)
- **Text Entry** – Title Screen sub-menu.
- **Date / Time** – Date/time settings sub-menu. (Hot-key “Ctrl + T”)

**4.3.3 Displayed Information Menu**

This menu allows you to choose what to display on the video overlay. All of the visible options are toggled by pressing the SELECT button.



**Figure 4-4: Displayed Information Menu**

- **Pan/Tilt Indicator** – (Not Used – SP45) Set to OFF.
- **Distance** – (On, Off) Displays the tether payout distance. (Hot-key “D”)
- **Date/Time** – Display current date and time – hot-key “T”. (12hr / 24hr / Long-Date / Short-Date / Both-Long / Both-short / OFF) The short date format is <dd/mm/yy>.
- **Elapsed Time** – (On, Off) Displays the elapsed time counter. (Hot-key “I”)
- **Current Monitors** – – (Not Used – SP45) Set to OFF.
- **Pitch / Roll** – – (Not Used – SP45) Set to OFF.
- **Text Entry** – (On, Off) Displays last title screen. (Hot-key “X”)
- **Camera Status** – – (Not Used – SP45) Set to OFF.

### 4.3.4 Configuration Menu

This menu contains operational settings and configuration sub-menus.

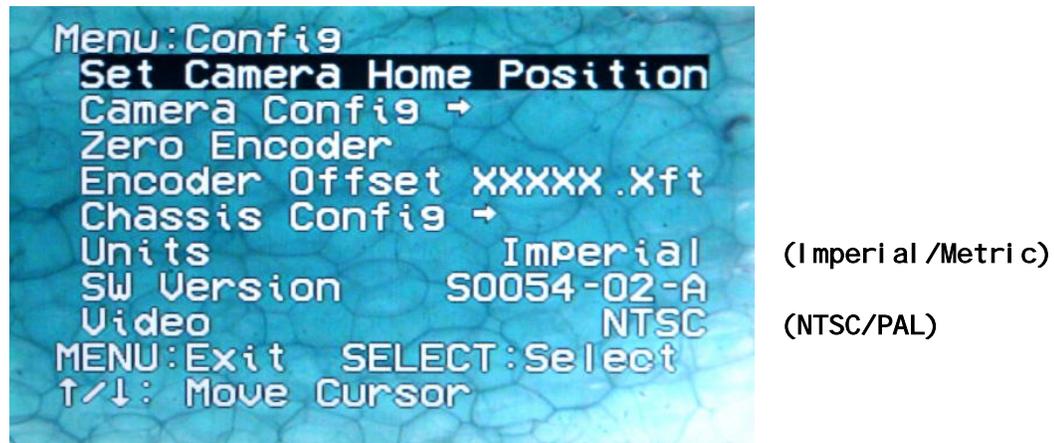


Figure 4-5: Configuration Menu Screen

- **Set Camera Home Position** – (Not used with SP45)
- **Camera Config** – Camera configuration menu.
- **Zero Encoder** – Zeros the tether distance encoder. (Hot-key sequence: M, O, Z)
- **Encoder Offset** – The operator can start the tether distance count at any value using the Encoder Offset function. Set by using the SELECT button to advance through the number fields. The arrow keys will increment and decrement the fields. The value is stored once the last digit has been selected.
- **Chassis Config** – (Not used with SP45)
- **Units** – Toggle between Metric and US Standard units.
- **Software Version** – The software version and video output is informative only.
- **Video** – The video format is informative only



#### 4.3.6 Date/Time



**Figure 4-7: Date / Time Set Screen**

- **Set Date** – The date can be set by using SELECT button to advance through the fields. The arrow keys will increment and decrement the fields. The value is saved when the last field is entered.
- **Set Time** – Set using the same method as the date.
- **Zero Elapsed Time** – Zeros the elapsed time counter.

#### 4.3.7 Calibration Menu



**Warning!**

This menu allows the operator to change system settings which could cause malfunction or erratic behavior. For this reason access is gained only through special key strokes noted below.

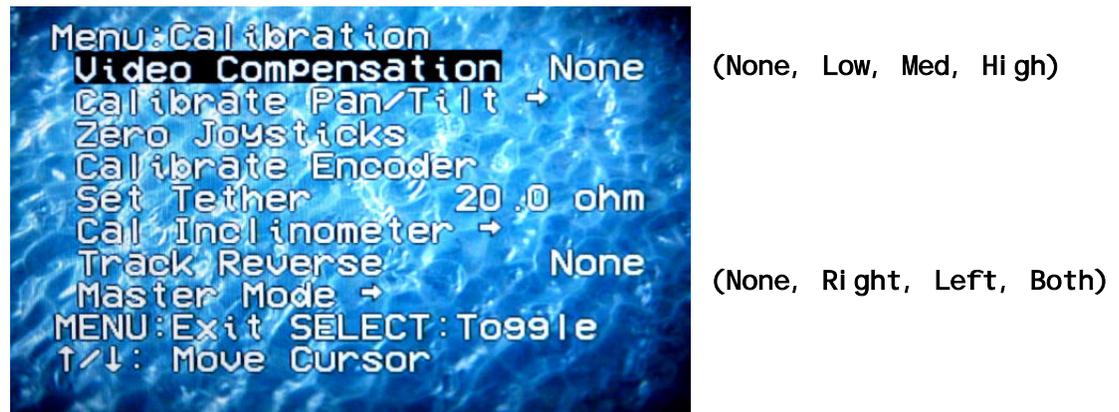


Figure 0-1: Calibration Menu Screen

**NOTE:** The calibration menu can only be entered either by pressing CTRL+ALT+C on the keyboard or pressing MENU+SELECT+UP+DOWN simultaneously on the front panel. It cannot be found through the main menu.

- **Video Compensation** – Video compensation corrects for video signal loss over the tether. If the compensation is set too low you may have a blurry picture or washed-out color. If set too high the picture may appear jumbled and may flicker.
- **Calibrate Pan/Tilt** – (not used for Spectrum 45)
- **Zero Joystick** – When a system is first powered up or a new pendant is installed, the joystick must be zeroed. To accomplish this, release all joysticks to zero themselves and press the SELECT button.
- **Calibrate Encoder** – Enters the tether distance calibration routine. Instructions shown at the bottom of the screen will assist the operator through the sequence of events.
  - When “Calibrate Encoder” is selected the calibration routine enters its first step. A number is displayed on the right showing the number of encoder counts. This is the raw data from the encoder.
  - The operator is asked to pull out a known length of tether. This can be any known length but somewhere between 10 and 30 feet is recommended.
  - Enter in the length of the tether you just pulled through. Make sure that the units are set to match your measurement. The numeric value is entered by using the SELECT button to advance through the digits. The arrow keys will increment and decrement the digits. The value is saved after pressing SELECT when the last digit is filled in. When using a keyboard you may simply type the number using the top number row (not the number pad). If the currently set units do not match your measurement press “U” to switch.
- **Cal Inclinator** – (not used for Spectrum 45)
- **Track Reverse** – (not used for Spectrum 45)
- **Master Mode** – (not used for Spectrum 45)



**4.3.8 Keyboard Shortcuts**

The following hot keys are used with the Spectrum camera controller:

<b>Key</b>	<b>Function</b>
<b>Overlay Display</b>	
D	Toggle the display mode of the distance encoder
P	*(Not used – SP45) Toggle the pan/tilt display mode
R	*(Not used – SP45) Toggle the pitch/roll display mode
S	*(Not used – SP45) Toggle the camera status display mode
T	Toggle the date/time display mode
U	Toggle the display units mode (metric/imperial)
X	Toggle the text entry display mode
<b>Timer Control</b>	
I	Toggle elapsed timer display.
Ctrl + I	Zero elapsed timer.
<b>Camera Control</b>	
A	*(Not used – SP45) Toggle the Auto Focus mode
F	Focus the camera near
Shift + F	Focus the camera far
Z	*(Not used – SP45) Zoom the camera in
Shift + Z	*(Not used – SP45) Zoom the camera out
H, Home	*(Not used – SP45) Send the camera to the Home position
Ctrl + H, Ctrl + Home	*(Not used – SP45) Store the camera Home position
<b>Camera Video / Light / Control Settings</b>	
Shift + B	Decrease the camera light set point
B	Increase the camera light set point
E	*(Not used – SP45) Increase the camera exposure level
Shift + E	*(Not used – SP45) Decrease the camera exposure level
Ctrl + E	*(Not used – SP45) Toggle the camera exposure mode between automatic and manual
L	*(Not used – SP45) Toggle the camera light mode between spot/flood/both



<b>Menu Shortcuts</b>	
Ctrl + T	Display the date/time menu
Ctrl + Alt + C	Display the Calibration menu
M	Display the main menu
Alt	Display the main menu (also displays short cut keys for the menu while the Alt key is held down)
<b>Title Screen &amp; Comments Shortcuts</b>	
X	Show / hide the last title screen.
F1 Key	Select Title Screen 1
F2 Key	Select Title Screen 2
F3 Key	Select Title Screen 3
F4 Key	Select Title Screen 4
F5 Key	Select Title Screen 5
Shift + F1 Key	Edit Title Screen 1
Shift + F2 Key	Edit Title Screen 2
Shift + F3 Key	Edit Title Screen 3
Shift + F4 Key	Edit Title Screen 4
Shift + F5 Key	Edit Title Screen 5

## 5. Digital Video Recorder (Archos 7)



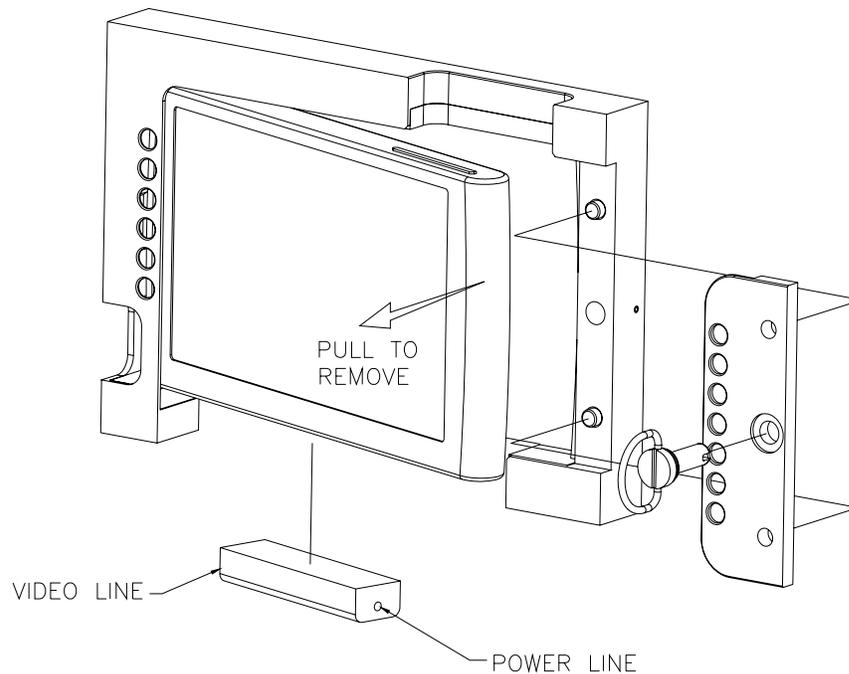
**Figure 5-1: Archos 7**

The Archos 7 Media tablet is optionally integrated into the Spectrum 90 controller to record and playback video inspection files. The Media Tablet offers the following features:

- Touch Screen Control.
- Wireless network connection to upload inspection video.
- Large internal hard drive for ample video storage.
- MPEG 4 AVI recording with VGA 640X480 resolution at 30 fps.
- On-Line instruction manual for the Archos 7 accessible through the touch screen.
- On-Line Spectrum 90 manual (this manual) accessible through the touch screen.
- Quick-release mounting system for easy removal of the Archos 7 Media Tablet.
- A microphone is also available as an option for voice commented inspection.

### 5.1 Mounting the Archos 7

The Archos monitor/recorder is mounted in the lid using a quick-release mounting bezel. It can be removed after an inspection and taken to the office for wireless download of the day's inspection footage.



**Archos 7 Quick Release**

### 5.2 To display and record video:

1. Turn on the system.
2. Press the “DVR-SnapON” button at the lower left of the screen.
3. Press the “Video Recorder” button.  
Video is now displayed from the camera with overlay.
4. To display the Archos menu overlay, tap once anywhere in the screen, to make it disappear, tap again.
5. Press the “REC” button at the lower left of the screen to start recording. If the “REC” button is not visible, tap the screen and the Archos menu items will appear.
6. To stop recording touch the stop button on the lower left of the screen. Again, first tap the screen if the Archos menu items are not visible.
7. The back icon  (upper right hand corner of the screen) will take you back one level in the interface. The Home icon  (upper left hand corner of the screen) will return you to the Home screen.

**5.3 To view recorded video:**

1. From the home screen, tap on the “Play” button. A new set of menus will appear to the right.
2. Tap on the “Video” button. A list of videos files and folders will appear.
3. Tap on the “Record” folder. Tapping it once will select the folder. Tapping it again will open the folder. When the folder is opened it will display a list of the videos that have been recorded on the system
4. Tap on the video that you want to view. It will start to play.
5. When the video has finished playing, the system will return to the list of recorder videos. If you wish to stop the video while it is playing, tap the screen and then tap the back icon .

**5.4 General use of the Archos 7:**

1. To turn on/off the Archos, press the power button  located on the very top of the unit. The green LED indicator lights up with the device is on
2. The “VOL” button is used to increase/decrease the volume.
3. The “CHG” LED is a battery charge indicator.
  - a. Light on: battery is charging
  - b. Blinking: the battery is fully charged
4. Refer to the on-line Archos 7 users manual for further operating instructions.
  - a. Display the root menu
  - b. Choose “Tools”
  - c. Choose “Help”
  - d. Choose “00 English Users Manual”

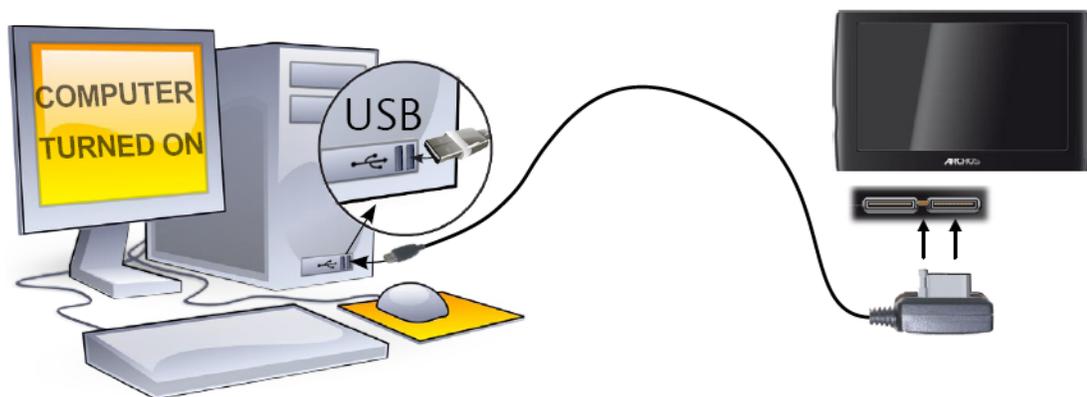
**5.5 File Management of recorded videos:**

1. From the home screen, tap the “Play” button, then the “Video” button and then the “Record” button. You should now see a list of the recorded videos.
2. Tap the Menu icon  (upper right hand corner of screen). A set of Menu items will appear.
3. “Info” displays a message box with information about the highlighted video file.

4. “File Management” allows you to manage the files:
  - a. “Rename”: allows you to change the name of the highlighted video file.
  - b. “Delete”: allows you to delete the highlighted video file.
  - c. “Permissions”: allows you to define the permissions of the highlighted video file.
5. “Create Home Shortcut” creates a shortcut to this video on the Home screen.
6. “Search”: allows you to search for a particular video by entering a few letters or a word.
7. “Settings”: allows you to modify the “Video Player” settings screen or the “Sound” settings screen.

**5.6 To transfer files from the Archos 7 to a computer:**

1. Remove the Archos from the system. See above for instructions on Monitor/Recorder Installation.
2. Remove the DVR-SnapON from the bottom of the Archos.
3. There will be an Archos USB cable in the Archos box that came with your system. Plug the Archos USB cable into the Archos
4. Plug the USB end of the cable into your computer.
5. A message will come up on the Archos indicating that it is attached to Windows.



6. The Archos icon will appear on your computer. You can now start transferring files to it.
7. The Archos manual has more details instructions on transferring files to the various operating systems (Windows XP, Mac, Linux etc.)



8. When completed, disconnect the USB cable from the computer and the Archos.
9. Plug in the DVR-SnapON and re-install the Archos into the system See the Push Cam Manual for instructions on Monitor/Recorder Installation.

**5.7 Creating a short-cut to recorded video files:**

It is fairly simple to rename the recorded video folder and to create a short-cut to it. This will enable you to directly access the recorded inspections files from the main menu on the Archos.

1. From the home screen, tap the “Play” button, then the “Video” button.
2. Tap the “Record” folder once. This will select the folder.
3. Tap the Menu icon  (upper right hand corner of screen). A set of Menu items will appear.
4. Tap the “File Management Button” and then the “Rename” button
5. Type a more meaningful name, such as “Inspection Videos”
6. Tap “OK” to confirm the name change.
7. With the “Inspection Videos” folder selected, tap the Menu icon again and “Create Home Shortcut”
8. Return to the home screen. There should be a shortcut to the folder with the recorded video files.



## 6. MAINTENANCE

### 6.1 Rinsing and Cleaning

After every mission check to see if the camera needs cleaning.

1. If the system has been used in salt water, thoroughly rinse the camera with fresh water prior to being stored away. Accelerated corrosion will result if the inspection system is not rinsed properly. Pay close attention to rinsing and cleaning the camera LED lights and the spaces between moving parts. Avoid pressing against the light LED's, they are circuit board mounted inside. This could compromise the ability to go to the rated depth safely.
2. Use an open hose or tap at regular water line pressure for rinsing. **Do not use pressure washing equipment – water will be forced into the camera at these high pressures.**
3. Avoid scratching the camera port. Use glass cleaner and a soft cloth to clean the port.

#### **Periodically:**

4. Use a damp cloth or spray cleaner for the power supply / controller box. The box must never be sprayed down or immersed in water. Unplug the controller before cleaning.
5. For general cleaning of the camera, use a mild detergent.

### 6. Factory Maintenance

The Spectrum 45™ Micro PT camera is equipped with a number of rotary surface seals that have to operate with close tolerances to achieve the 100Ft depth rating. It is of the utmost importance that the sealing surfaces are protected from scratches during maintenance work. When seals are removed or replaced the sealing surfaces and seals must be clean and sufficiently lubricated before installation.

To re-certify a camera's depth rating we recommend the camera be serviced at Inuktun's in-house repair shop.

### 6.2 Caring For Seals and O-rings

**NOTICE:** **INUKTUN SERVICES LTD.** recommends the use of Dow Corning #4 Silicon Grease, or an equivalent, as a lubricant for O-rings used as seals.

#### Handling Sealed Components

O-rings and other components having sealing surfaces should never be handled with dirty or gritty hands. A small amount of dirt trapped next to an O-ring can cause leakage which could result in serious damage to the equipment they are intended to protect. Should an O-ring or sealing surface become dirty, wash it with mild soap and water, then rinse it with clean water. Avoid scratching the surfaces of O-rings and the components which contact them. Do not use sharp objects such as a knife or screw-driver to pry apart sealed assemblies or remove O-rings as serious damage to the O-ring or the seat may result. When components require storage with the sealing surfaces exposed they should be stored in a clean, dry location for protection.



O-rings wear out over time. Inspect all O-rings whenever a sealed assembly is apart. "Healthy" O-rings are soft, flexible and have not been pinched or nicked. Should an O-ring appear brittle, or have apparent cracks, nicks, or evidence of being pinched or permanently compressed, it will require replacement. Sealing surfaces should also be inspected while an assembly is apart. The surfaces should be examined to determine that they are free of dirt, nicks, scratches, or damage which may result in seal failure once reassembled.

O-rings should be stored in clean plastic bags to protect them from dust when not in use. Avoid prolonged storage in direct sunlight as this may result in deterioration of the O-ring material. Stored O-rings should be sorted with regard to type and size with that information noted on the storage bag. Use of an incorrect O-ring can result in an ineffective seal.

### **Installation**

Before installing, ensure that the correct O-ring is being used and that it and the sealing surfaces are clean. Cover the O-ring with a layer of silicon grease and fit it into the seal area. Use caution during installation to avoid damaging the O-ring on any edges or surfaces it must travel over.

### **Rule of Thumb**

**WHEN IN DOUBT THROW IT OUT!** Generally, when compared to the equipment they are protecting, O-rings are very inexpensive. Should an incorrectly sized or damaged O-ring be installed, the result can be most damaging. If there is any doubt as to the suitability or condition of an O-ring it should be replaced.



## **7. PARTS & REPAIRS**

Spare and / or replacement parts are available for the Spectrum 45™ Micro PT Camera.

They can be ordered directly from:

**Inuktun Services Ltd.  
Suite C  
2569 Kenworth Road  
Nanaimo, B.C.  
V9T 3M4**

**Phone: (250) 729-8080  
Fax: (250) 729-8077  
Toll Free: 1-877-INUKTUN**

For Customer Service by Internet, E-mail [service@inuktun.com](mailto:service@inuktun.com)

When ordering, always make sure you quote the **SOC# of your system** and the **Serial number** of your Spectrum 90™ PTZ Camera (both can be found on the front page of the Manual), the part number, description and the quantity required.

### **7.1 Warranty Repairs**

The warranty conditions are specified in Section 7. In the event any conditions of the manufacturer's warranty have been breached, the warranty may be considered void. All returned items must be sent prepaid to Inuktun at the above address.

### **7.2 Factory Repairs**

Some sub-assemblies of the Spectrum 90™ PTZ Camera are not field-serviceable and will need to be returned to the factory if they malfunction. Also, in some instances warranty claims must be sent back to the factory for evaluation.

To return an item for evaluation or repair, first contact Inuktun at the Toll-Free Number above for an RMA number. Inuktun will return to you an RMA number with detailed shipping instructions including codes for customs. Items shipped without an RMA number will be held at Inuktun until the correct paperwork is completed. If cross-boarder shipments are not labeled properly as per the instructions, the items may be held by customs, or additional fees may be charged by customs.

All returned items must be sent prepaid unless other specific arrangements have been made.

**Please refer to Section 3.1 in regards to shipping practices of electrical equipment. Inuktun cannot be held responsible for damages due to improper packaging. Improper packing may significantly affect the turn around time and increase repair costs.**



## **8. LIMITED WARRANTY**

### **LIMITED WARRANTY POLICY**

Inuktun will repair or replace, at its expense and at its option, any system or component, subject to the limitations and / or exclusions specified herein, which in normal use has proven to be defective in workmanship or material provided that, within one (1) year of the purchase date, the original purchaser returns the product prepaid, accompanied by proof of purchase, from a sales agent authorized by Inuktun, and provides Inuktun with reasonable opportunity to verify the alleged defect by inspection.

#### **Warranty Limitations And/Or Exclusions:**

1. This warranty does not apply to light bulbs.
2. Batteries, fuses, transistors, integrated circuit modules (IC's), voltage regulating devices and electrical plugs and / or connectors are warranted to be free from defects in material and workmanship for a period of ninety (90) days from the date of shipment to the original purchaser.
3. Any article purchased from, but not manufactured by, Inuktun is sold with only such warranties as are made by the manufacturer therein. Inuktun only warrants that it has title thereto, free of all liens or encumbrances.
4. This warranty does not apply to units which are damaged by connection to improperly wired AC receptacles.
5. Track belts, tethers, view ports and other components subject to wear through abrasion are warranted to be free from defects in material and workmanship for a period of ninety (90) days from the date of shipment to the original purchaser.
6. Any damage caused by failure to observe proper packing or to observe instructions for operation and maintenance as contained in the Instruction Manual furnished with the equipment, by accident in transit or elsewhere, will not be covered by the warranty.
7. Repairs are warranted for 90 days.

Inuktun may require that certain components may be returned, prepaid, to a manufacturer's authorized station for inspection and repair or replacement.

Inuktun will not be responsible for any asserted defect which has resulted from Acts of God, normal wear, misuse, abuse, improper configuration, repair, or alteration made, or specifically authorized by, anyone other than a representative of Inuktun authorized to do so. The giving of, or failure to give, any advice or recommendation by Inuktun shall not constitute any warranty by, or impose any liability on, Inuktun

The foregoing constitutes the sole and exclusive remedy of the purchaser and the exclusive liability of Inuktun and is in lieu of any and all other warranties, express, implied or statutory as to merchantability, fitness for purpose sold, description, quality productiveness, or any other matter. Under no circumstances shall Inuktun be liable for special, incidental or consequential damages, or for delay in performance of this warranty.



**INUKTUN**  
CRAFTSMANSHIP IN HIGH TECHNOLOGY

2569 Kenworth Road  
Nanaimo, BC, Canada V9T 3M4

Toll Free: 1-877-INUKTUN

Tel: (250) 729-8080

Fax: (250) 729-8077

<http://www.inuktun.com>

## 9. Warranty Registration

Name				Date		
Company						
Address				City/Town		
State/ Province			Country			Zip/Postal
Phone Number	( )		Fax Number	( )		

Product	Spectrum 45™ Micro PT	Serial Number:		SOC #:	
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Please fill out the above information and fax this sheet to Inuktun Services Ltd. to register your system's warranty.

### LIMITED WARRANTY

Inuktun Services Ltd. will repair or replace, at its expense and at its option, any system or component, subject to the limitations and / or exclusions specified herein, which in normal use has proven to be defective in workmanship or material provided that, within one (1) year of the purchase date, the original purchaser returns the product prepaid, accompanied by proof of purchase, from a sales agent authorized by Inuktun Services Ltd., and provides Inuktun Services Ltd. with reasonable opportunity to verify the alleged defect by inspection.

#### Warranty Limitations And/Or Exclusions:

1. This warranty does not apply to light bulbs.
2. Batteries, fuses, transistors, integrated circuit modules (IC's), voltage regulating devices and electrical plugs and / or connectors are warranted to be free from defects in material and workmanship for a period of ninety (90) days from the date of shipment to the original purchaser.
3. Any article purchased from, but not manufactured by, Inuktun Services Ltd. is sold with only such warranties as are made by the manufacturer therein. Inuktun Services Ltd. only warrants that it has title thereto, free of all liens or encumbrances.
4. This warranty does not apply to units which are damaged by connection to improperly wired AC receptacles.
5. Track belts, tether cables, viewports, rotary seals and other components subject to wear through abrasion are warranted to be free from defects in material and workmanship for a period of ninety (90) days from the date of shipment to the original purchaser.
6. Any repairs, parts replacement or overhauls not effected by Inuktun will not be covered by the warranty.

7. Any damage caused by failure to observe proper packing or to observe instructions for operation and maintenance as contained in the Instruction Manual furnished with the equipment, by accident in transit or elsewhere, will not be covered by the warranty.
8. Repairs are warranted for 90 days.

Inuktun Services Ltd. may require that certain components may be returned, prepaid, to a manufacturer's authorized station for inspection and repair or replacement.

Inuktun Services Ltd. will not be responsible for any asserted defect which has resulted from Acts of God, normal wear, misuse, abuse, improper configuration, repair, or alteration made, or specifically authorized by, anyone other than a representative of Inuktun Services Ltd. authorized to do so. The giving of, or failure to give, any advice or recommendation by Inuktun Services Ltd. shall not constitute any warranty by, or impose any liability on, Inuktun Services Ltd.

The foregoing constitutes the sole and exclusive remedy of the purchaser and the exclusive liability of Inuktun Services Ltd. and is in lieu of any and all other warranties, express, implied or statutory as to merchantability, fitness for purpose sold, description, quality productiveness, or any other matter. Under no circumstances shall Inuktun Services Ltd. be liable for special, incidental or consequential damages, or for delay in performance of this warranty.



**INUKTUN**  
CRAFTSMANSHIP IN HIGH TECHNOLOGY

2569 Kenworth Road  
Nanaimo, BC, Canada V9T 3M4  
Toll Free: 1-877-INUKTUN  
Tel: (250) 729-8080  
Fax: (250) 729-8077  
<http://www.inuktun.com>

### 10. Spare Parts Order Form

Name				Date	
Company					
Address				City/Town	
State/ Province		Country		Zip/Postal	
Phone Number	( )		Fax Number	( )	

Product:	Spectrum 45™ Micro PT	Serial #		SOC #:	
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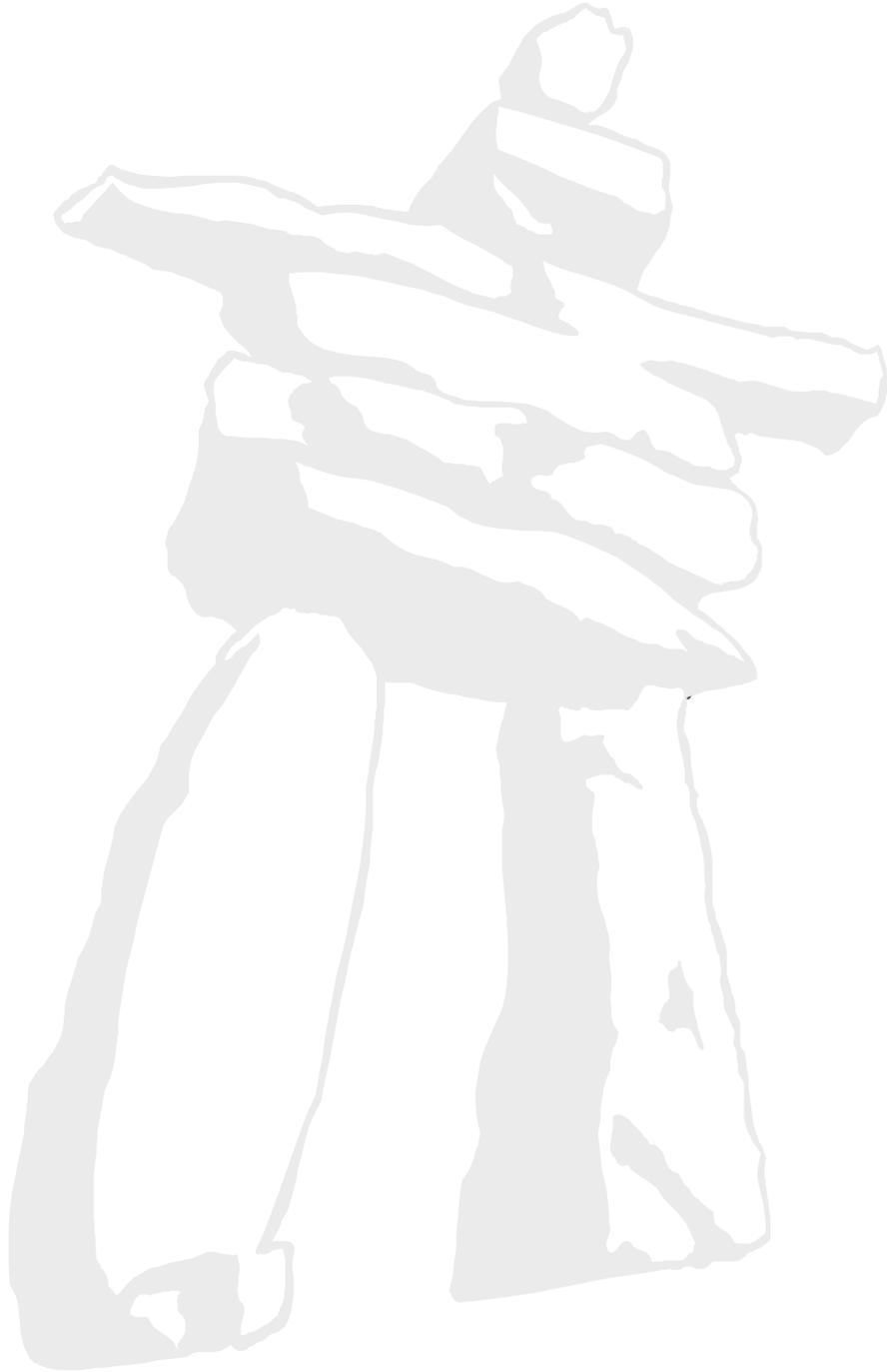
Qty.	Unit	Product	Price (\$US)	Total
			Subtotal	
			<b>Total</b>	

Shipping instructions: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

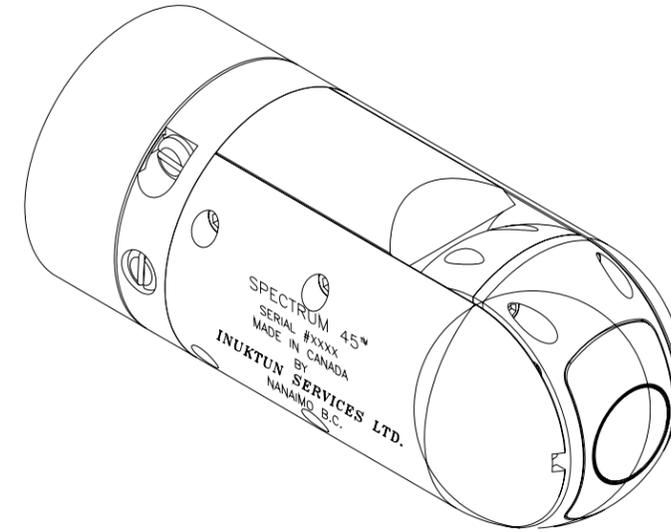
Fax to: **Inuktun Services Ltd.**  
**Fax: (250) 729-8077**  
**Phone: (250) 729-8080**  
**Toll free: 1-877-INUKTUN**

Listed prices are exclusive of any applicable taxes, duties and/or shipping costs.  
 Please call for payment options. We accept VISA, Master Card & American Express.

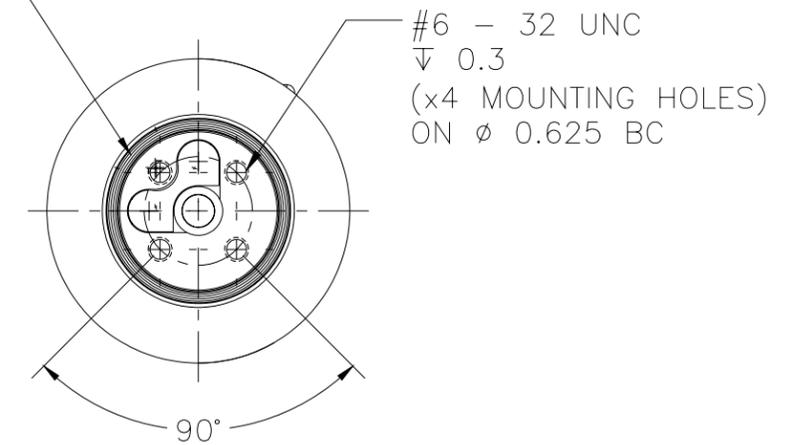
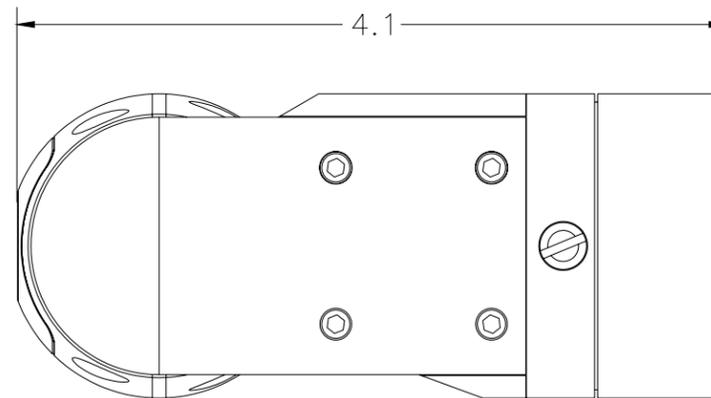
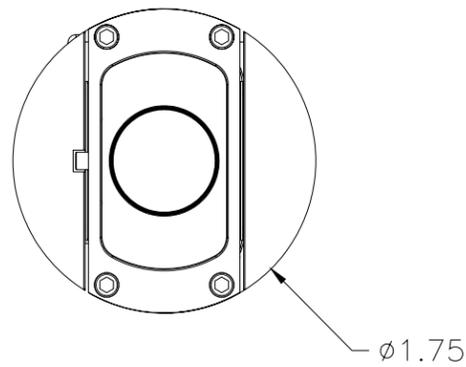
## 11. MECHANICAL & ELECTRIC DRAWINGS



REFER TO ASSEMBLY INSTRUCTIONS  
IW 431 FOR SP 45 ASSEMBLY.



USE O-RING #127 WHEN  
USING THIS MOUNTING METHOD



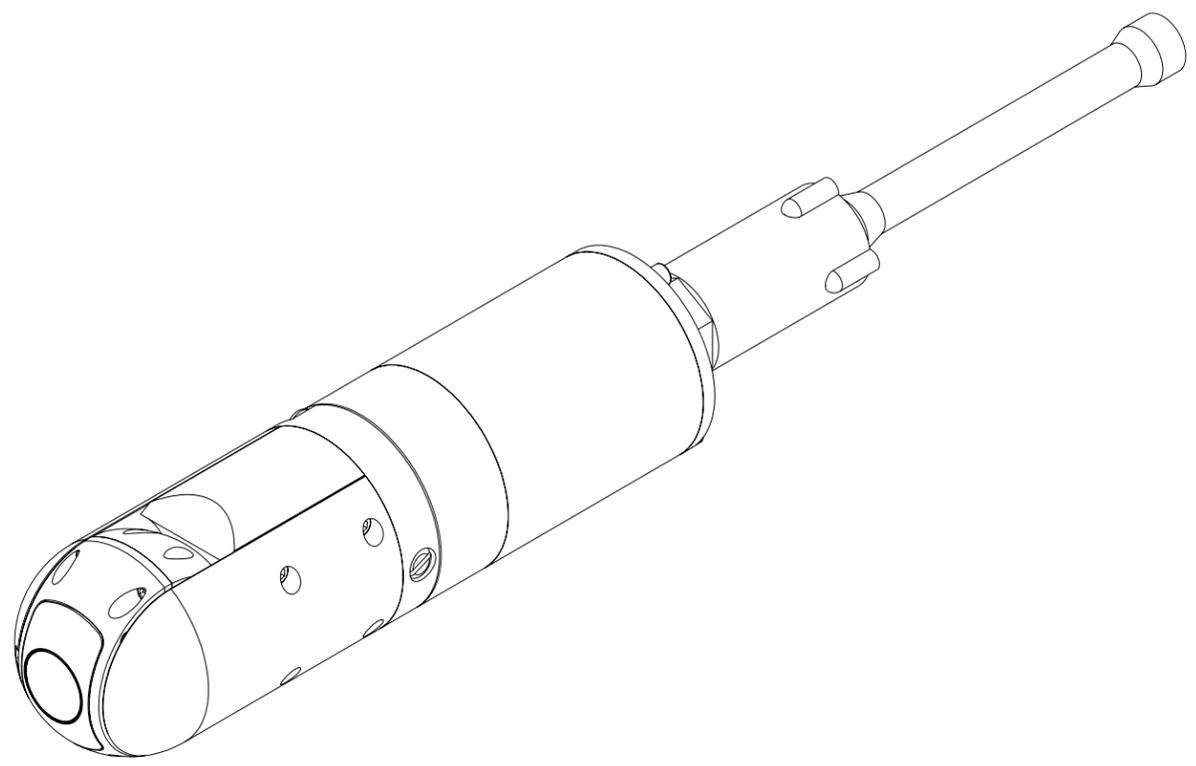
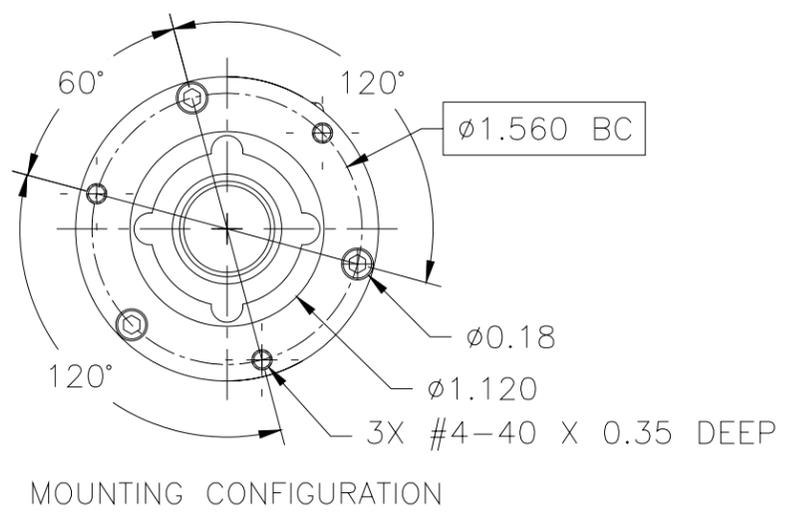
PAN & TILT CAMERA ONLY:  
NO DRIVE ELECTRONICS

03	JS	09/01/30	REMOVED PAN & TILT FEEDBACK ITEMS
REV	BY	DATE	DESCRIPTION

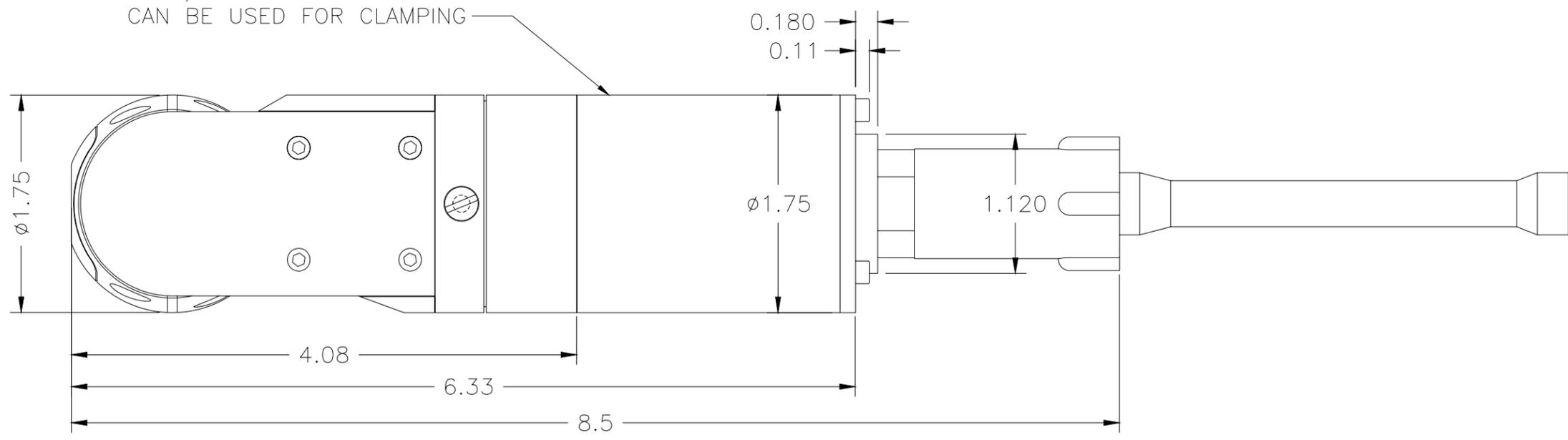
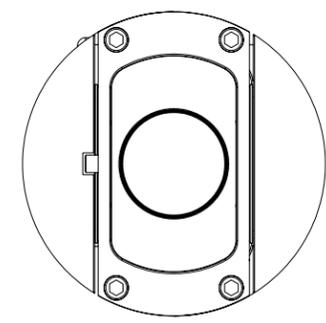
STANDARD TOLERANCES BREAK SHARP EDGES DE-BURR HOLES	X.X	±0.050"	± 1.0mm
	X.XX	±0.010"	± 0.25mm
	X.XXX	±0.003"	± 0.06mm
	X.XXXX	±0.0005"	± 0.01mm
	FRACTIONS	± 1/16	
ANGLES	±0.5		
CONC	0.003"/0.06mm		
OR AS NOTED			

<b>INUKTUN SERVICES LTD.</b>			
2569 Kenworth Rd., Suite C, Nanaimo, B.C., Canada V9T 3M4 (250)729-8080 FAX (250)729-8077 www.inuktun.com			
DSN: BP	03/05/22	TITLE: SP45 MICRO AL- NO FBC	
DRN: JS	06/12/13	SCALE: NTS	UNITS: IN
CHK:		SHT: 1 OF 9	IPN:
APR:		ME-AD - AAA0005 - 03	

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CAMERA Ø1.75, BACK END OF CAMERA CAN BE USED FOR CLAMPING



FULL MICROCONTROLLED CAMERA:  
INCLUDES DRIVE ELECTRONICS CASISTER.

03	JS	09/01/30	REMOVED PAN & TILT FEEDBACK ITEMS
REV	BY	DATE	DESCRIPTION

STANDARD TOLERANCES

X.X	±0.050"	± 1.0mm
X.XX	±0.010"	± 0.25mm
X.XXX	±0.003"	± 0.06mm
X.XXXX	±0.0005"	± 0.01mm
FRACTIONS	± 1/16	
ANGLES	±0.5	
CONC	0.003"/0.06mm	
OR AS NOTED		

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2569 Kenworth Rd., Suite C, Nanaimo, B.C., Canada V9T 3M4 (250)729-8080 FAX (250)729-8077 www.inuktun.com

DSN: BP	03/05/22	TITLE: SP45 MICRO AL- NO FBC
DRN: JS	06/12/13	SCALE: NTS UNITS: IN
CHK:		SHT: 2 OF 9 IPN:
APR:		ME-AD - AAA0005 - 03

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CONTROLLED DOCUMENT STAMP ONLY

NOTE: USE BLUE LOCTITE 243 WITH ALL INTERNAL FASTENERS.  
FOR EXTERNAL FASTENERS REFER TO CAMERA EXTERNAL FASTENER TREATMENT PROCEDURE IP073

ITEM	QTY	DESCRIPTION	MATERIAL	PART/DWG.#	NOTE	OEM PART #
1	3	O-RING	Buna-N		KAMAN	#021
2	1	PAN CLUTCH HOUSING	AL 6061-T6	ME-MP-XAA0001-03		
3	1	O-RING	BUNA-N			#127
4	1	CLUTCH DISK 2	MICARTA G11	ME-MP-XAA0051-00	0.050	
5	1	CLUTCH DISK 2	MICARTA G11	ME-MP-XAA0050-01	0.047	
6	1	CLUTCH DISK 2	MICARTA G11	ME-MP-XAA0049-01	0.053	
7	1	CLUTCH DISK 2	MICARTA G11	ME-MP-XAA0048-01	0.056	
8	1	RING	DELTRIN	ME-MP-XAA0047-02		
9	1	PAN GEAR MOD	S.S	ME-MP-XAA0002-00	STOCK DRIVE	S1E05ZM05S072
10	1	CLUTCH DISK 1	MICARTA G11	ME-MP-XAA0046-01		
11	1	RET RING MOD	STL	ME-MP-XAA0045-00		VH-162
12	1	SEAL RETAINER	AL 6061-T6	ME-MP-XAA0003-00		
13	1	BAL SEAL	UPC POLYETHYLENE		BALL SEAL ENG.	X560799
14	2	BEARING			KAMAN	61800
15	1	BEARING SPACER	S.S 303	ME-MP-XAA0004-00		
16	1	SNAP RING			ROTO CLIP	N1400-0039
17	1	MOTOR PAD	UHMW	ME-MP-XAA0005-01		
18	1	SET SCREW (CUP POINT)	STEEL	#6-32 x 1/8"	FASTENAL	25101
19	1	SLOT P.H. SEAL SCREW	S.S / BUNA-N	#6-32 x 1/8	ZAGO	
20	2	SLOT P.H. SEAL SCREW	S.S. / BUNA-N	#6-32 x 3/16	ZAGO	
21	2	SET SCREW (CUP POINT)	STL	#6 - 32 x 3/16	FASTENAL	25103
22	1	CONNECTOR		MCBH8M x 1/2	SEE ELEC. BOM	
23	1	O-RING	Buna-N		KAMAN	#014
24	1	SNAP RING	S.S.		WITH LOCK COLLAR	
25	1	LOCKING COLLAR	PLASTIC		SEE ELEC BOM	MCDLS-F
26	3	SOCKET CAP SCREW	S.S.	#4-40 x 5/16"	FASTENAL	72635
27	1	END CAP		ME-MP-XAA0117-01		
28	1	O-RING	Buna-N		KAMAN	#026
29	3	TERMINAL STANDOFF	6061-T6	ME-MP-XAA0123-00		
30	1	TERMINATION BOARD			SEE ELEC.BOM	
31	3	PAN HEAD SCREW	S.S.	#4 - 40 x 5/16"	FASTENAL	
32	3	STACK STANDOFF	6061-T6	ME-MP-XAA0122-01		
33	3	PAN HEAD SCREW	S.S.	#4 - 40 x 5/8"	FASTENAL	
34	1	SP 45 BOARDSTACK			SEE ELEC BOM	
35	4	FLAT HEAD SCREW	S.S.	#6-32 x 5/16"	FASTENAL	72630
36	1	ELEX HOUSING	AL	ME-MP-XAA0118-00		
37	1	DUMMY PLUG	RUBBER		SUBCON	MCDC8F

CHOOSE THE "BEST FIT" CLUTCH DISK DURING ASSEMBLY.

O-RING INCLUDED WITH CONNECTOR

INSTALL SNAP RING USING TOOL ME-MP-XAA0061-00

O-RING IS INCLUDED WITH SEAL SCREW.

OPTIONAL COMPONENTS.

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03	JS	09/01/30	REMOVED PAN & TILT FEEDBACK ITEMS
REV	BY	DATE	DESCRIPTION

STANDARD TOLERANCES

X.X	±0.050"	± 1.0mm
X.XX	±0.010"	± 0.25mm
X.XXX	±0.003"	± 0.06mm
X.XXXX	±0.0005"	± 0.01mm

ANGLES ±0.5  
CONC 0.003"/0.06mm  
OR AS NOTED

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DSN: BP 03/05/22 TITLE: SP45 MICRO AL- NO FBC  
DRN: JS 06/12/13 SCALE: NTS UNITS: IN  
CHK: SHT: 3 OF 9 IPN:  
APR: ME-AD-AAA0005-03

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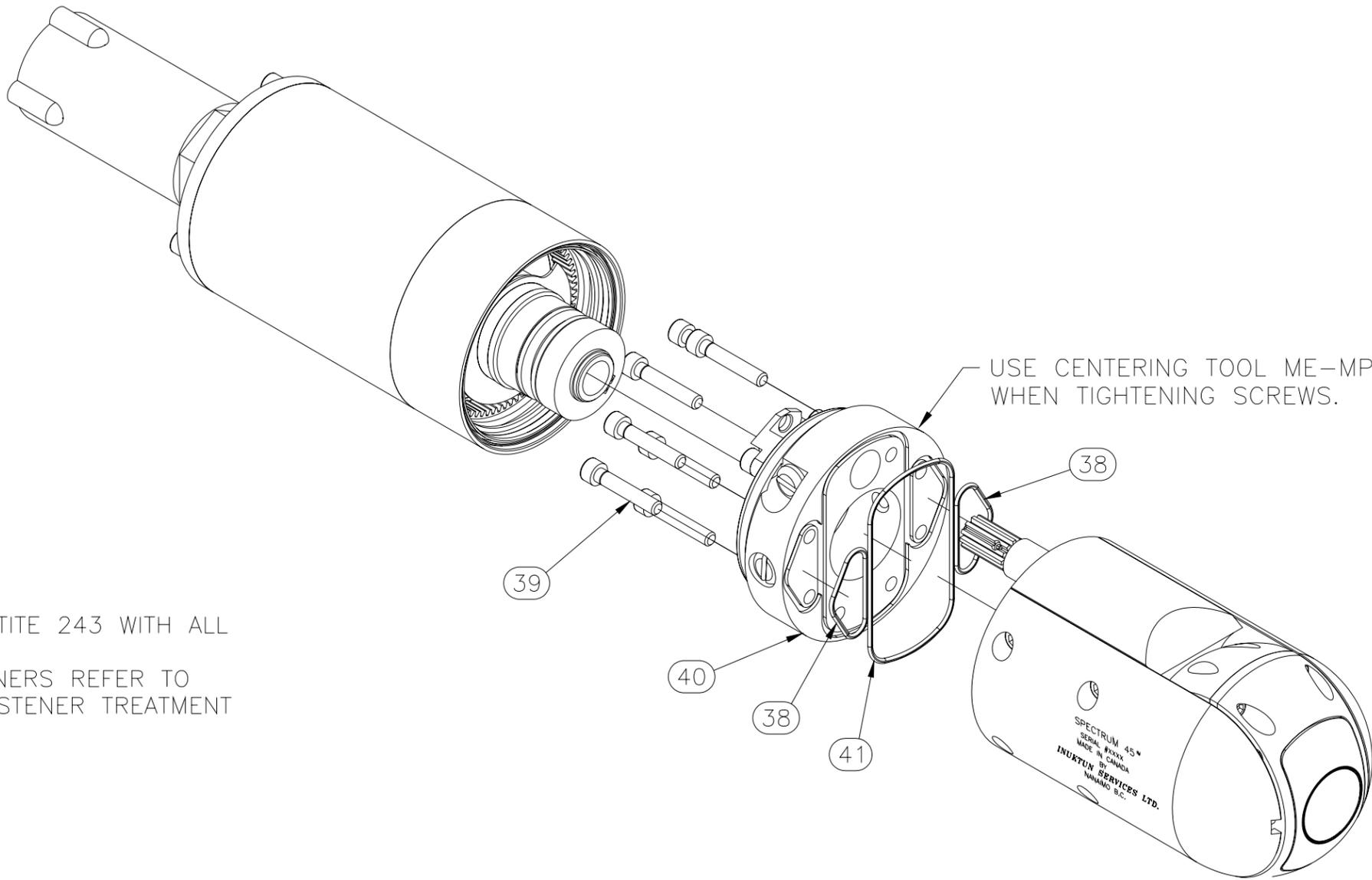
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CONTROLLED DOCUMENT STAMP ONLY

Parts List						
ITEM	QTY	DESCRIPTION	MATERIAL	PART/DWG.#	NOTE	OEM PART #
38	2	O-RING	BUNA-N	O-RING 0.543 X 0.039	APPLE	Ø0.543 X 0.039
39	7	SOCKET CAP SCREW	S.S.	#4-40 X 5/8"	FASTENAL	73405
40	1	BEARING CARRIER	AL 6061-T6	ME-MP-XAA0011-05		
41	1	O-RING	BUNA-N		APPLE	Ø1.358 X 0.039



NOTE: USE BLUE LOCTITE 243 WITH ALL INTERNAL FASTENERS.  
 FOR EXTERNAL FASTENERS REFER TO CAMERA EXTERNAL FASTENER TREATMENT PROCEDURE IP073

USE CENTERING TOOL ME-MP-XAA0044-01 WHEN TIGHTENING SCREWS.

03	JS	09/01/30	REMOVED PAN & TILT FEEDBACK ITEMS																																
REV	BY	DATE	DESCRIPTION																																
<b>STANDARD TOLERANCES</b>																																			
<table border="0"> <tr> <td>STANDARD FINISH</td> <td>X.X</td> <td>±0.050"</td> <td>± 1.0mm</td> </tr> <tr> <td>HOLES</td> <td>X.XX</td> <td>±0.010"</td> <td>± 0.25mm</td> </tr> <tr> <td>DE-BURR HOLES</td> <td>X.XXX</td> <td>±0.003"</td> <td>± 0.06mm</td> </tr> <tr> <td></td> <td>X.XXXX</td> <td>±0.0005"</td> <td>± 0.01mm</td> </tr> <tr> <td></td> <td></td> <td>FRACTIONS</td> <td>± 1/16</td> </tr> <tr> <td></td> <td></td> <td>ANGLES</td> <td>±0.5</td> </tr> <tr> <td></td> <td></td> <td>CONC</td> <td>0.003"/0.06mm</td> </tr> <tr> <td></td> <td></td> <td>OR AS NOTED</td> <td></td> </tr> </table>				STANDARD FINISH	X.X	±0.050"	± 1.0mm	HOLES	X.XX	±0.010"	± 0.25mm	DE-BURR HOLES	X.XXX	±0.003"	± 0.06mm		X.XXXX	±0.0005"	± 0.01mm			FRACTIONS	± 1/16			ANGLES	±0.5			CONC	0.003"/0.06mm			OR AS NOTED	
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DRN: JS	06/12/13	SCALE: NTS	UNITS: IN																																
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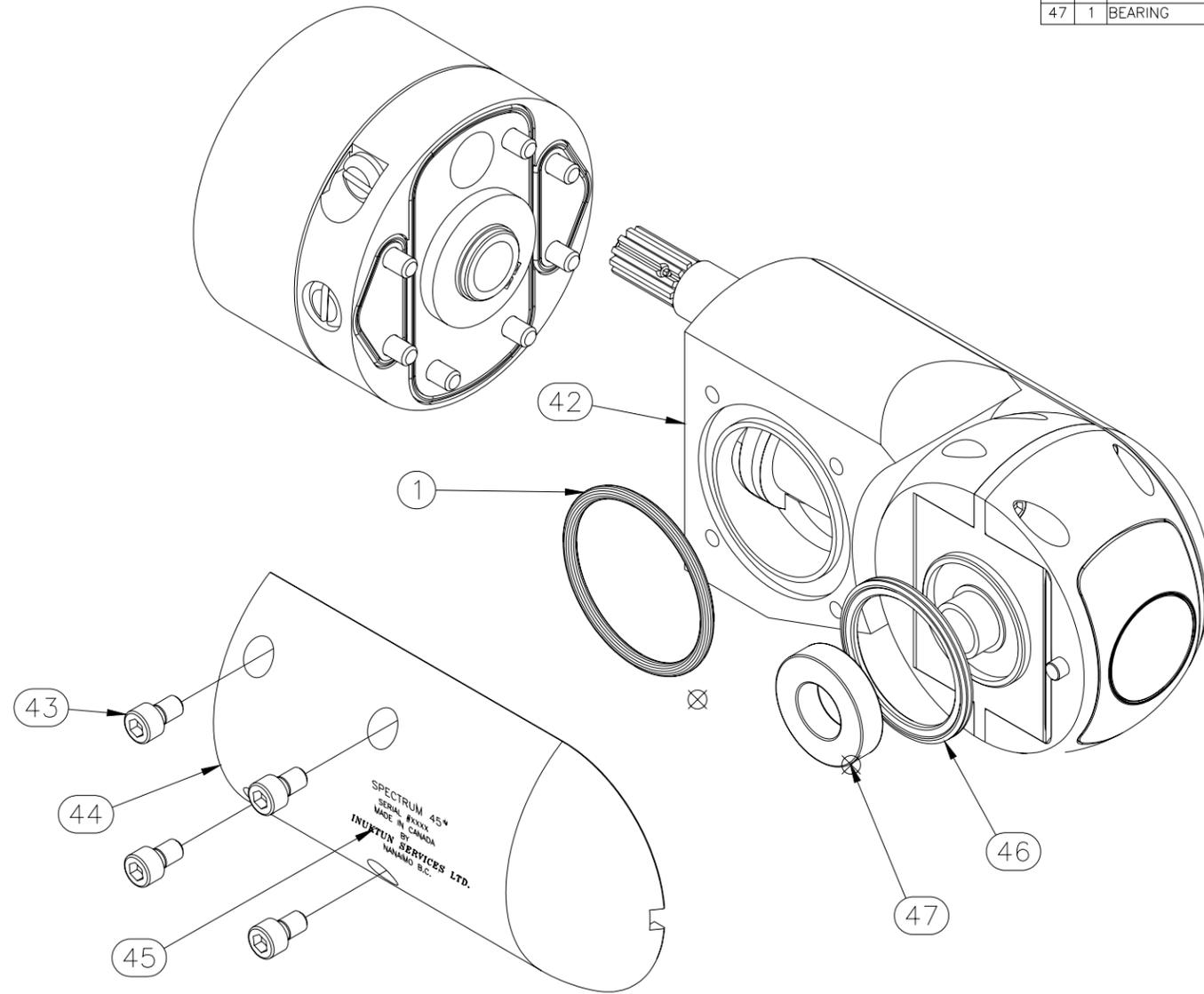
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Parts List						
ITEM	QTY	DESCRIPTION	MATERIAL	PART/DWG.#	NOTE	OEM PART
1	3	O-RING	Buna-N		KAMAN	#021 #
42	1	BLOCK	AL 6061-T6	ME-MP-XAA0012-00		
43	9	SOCKET CAP SCREW	S.S.	#4-40 X 3/16"	FASTENAL	0171050
44	1	SIDE PLATE B	AL 6061-T6	ME-MP-XAA0013-01		
45	1	ENGRAVING	LASER	ME-MP-XAA0052-01		
46	2	BAL SEAL	UPC POLYETHYLENE		BALL SEAL ENG.	X217759
47	1	BEARING	STEEL		KAMAN	618/8

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NOTE: USE BLUE LOCTITE 243 WITH ALL INTERNAL FASTENERS.  
FOR EXTERNAL FASTENERS REFER TO CAMERA EXTERNAL FASTENER TREATMENT PROCEDURE IP073



03	JS	09/01/30	REMOVED PAN & TILT FEEDBACK ITEMS																																				
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<table border="1"> <tr> <td colspan="2">STANDARD TOLERANCES</td> <td colspan="2"> </td> </tr> <tr> <td>X.X</td> <td>±0.050"</td> <td>± 1.0mm</td> <td></td> </tr> <tr> <td>X.XX</td> <td>±0.010"</td> <td>± 0.25mm</td> <td></td> </tr> <tr> <td>X.XXX</td> <td>±0.003"</td> <td>± 0.06mm</td> <td></td> </tr> <tr> <td>X.XXXX</td> <td>±0.0005"</td> <td>± 0.01mm</td> <td></td> </tr> <tr> <td>FRACTIONS</td> <td>± 1/16</td> <td></td> <td></td> </tr> <tr> <td>ANGLES</td> <td>±0.5</td> <td></td> <td></td> </tr> <tr> <td>CONC</td> <td>0.003"/0.06mm</td> <td></td> <td></td> </tr> <tr> <td>OR AS NOTED</td> <td></td> <td></td> <td></td> </tr> </table>				STANDARD TOLERANCES				X.X	±0.050"	± 1.0mm		X.XX	±0.010"	± 0.25mm		X.XXX	±0.003"	± 0.06mm		X.XXXX	±0.0005"	± 0.01mm		FRACTIONS	± 1/16			ANGLES	±0.5			CONC	0.003"/0.06mm			OR AS NOTED			
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DRN:	JS	06/12/13	SCALE: NTS UNITS: IN																																				
CHK:			SHT: 5 OF 9 IPN:																																				
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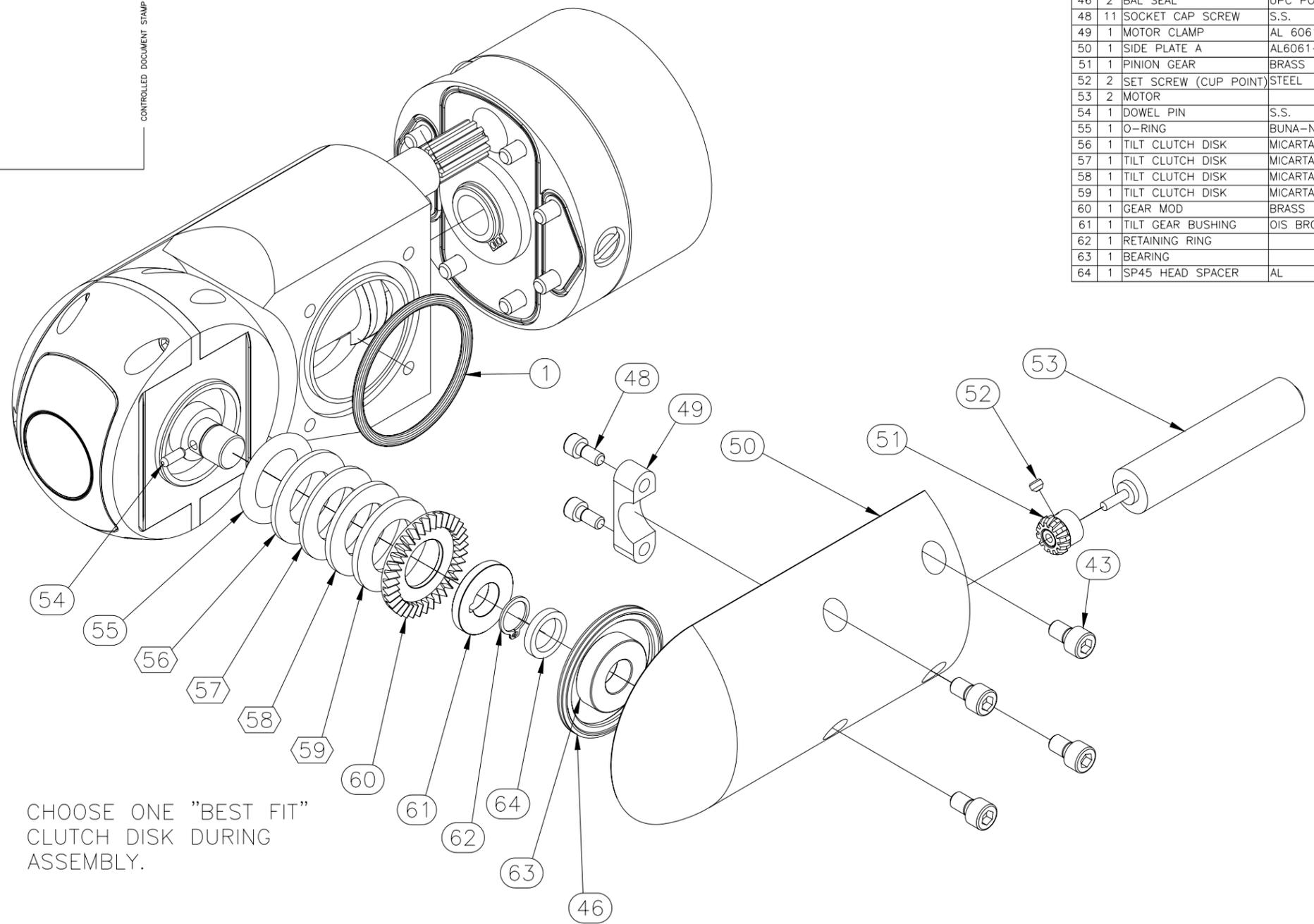
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Parts List						
ITEM	QTY	DESCRIPTION	MATERIAL	PART/DWG.#	NOTE	OEM PART #
1	3	O-RING	Buna-N		KAMAN	#021
43	9	SOCKET CAP SCREW	S.S.	#4-40 X 3/16"	FASTENAL	0171050
46	2	BAL SEAL	UPC POLYETHYLENE		BALL SEAL ENG.	X217759
48	11	SOCKET CAP SCREW	S.S.	#2-56 X 3/16"	FASTENAL	73398
49	1	MOTOR CLAMP	AL 6061-T6	ME-MP-XAA0015-01		
50	1	SIDE PLATE A	AL6061-T6	ME-MP-XAA0016-00		
51	1	PINION GEAR	BRASS	ME-MA-AAA0001-00	SUB ASSY	
52	2	SET SCREW (CUP POINT)	STEEL	#2-56 X 3/32"	FASTENAL	25011
53	2	MOTOR			MICRO MOTOR	0816P006S+08/1,1024:1
54	1	DOWEL PIN	S.S.	#1/16 X 3/16"	FASTENAL	74123
55	1	O-RING	BUNA-N	#111	KAMAN	#111
56	1	TILT CLUTCH DISK	MICARTA G11	ME-MP-XAA0053-00	0.040	
57	1	TILT CLUTCH DISK	MICARTA G11	ME-MP-XAA0054-00	0.035	
58	1	TILT CLUTCH DISK	MICARTA G11	ME-MP-XAA0055-00	0.045	
59	1	TILT CLUTCH DISK	MICARTA G11	ME-MP-XAA0056-00	0.050	
60	1	GEAR MOD	BRASS	ME-MP-XAA0021-01	STOCK DRIVE	A 1B 3-Y48036A
61	1	TILT GEAR BUSHING	OIS BRONZE	ME-MP-XAA0020-01		
62	1	RETAINING RING				5100-23
63	1	BEARING			SKF	618/6
64	1	SP45 HEAD SPACER	AL	ME-MP-XAA0141-00		




 CHOOSE ONE "BEST FIT" CLUTCH DISK DURING ASSEMBLY.

NOTE: USE BLUE LOCTITE 243 WITH ALL INTERNAL FASTENERS.  
 FOR EXTERNAL FASTENERS REFER TO CAMERA EXTERNAL FASTENER TREATMENT PROCEDURE IP073

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03	JS	09/01/30	REMOVED PAN & TILT FEEDBACK ITEMS
REV	BY	DATE	DESCRIPTION

STANDARD TOLERANCES 

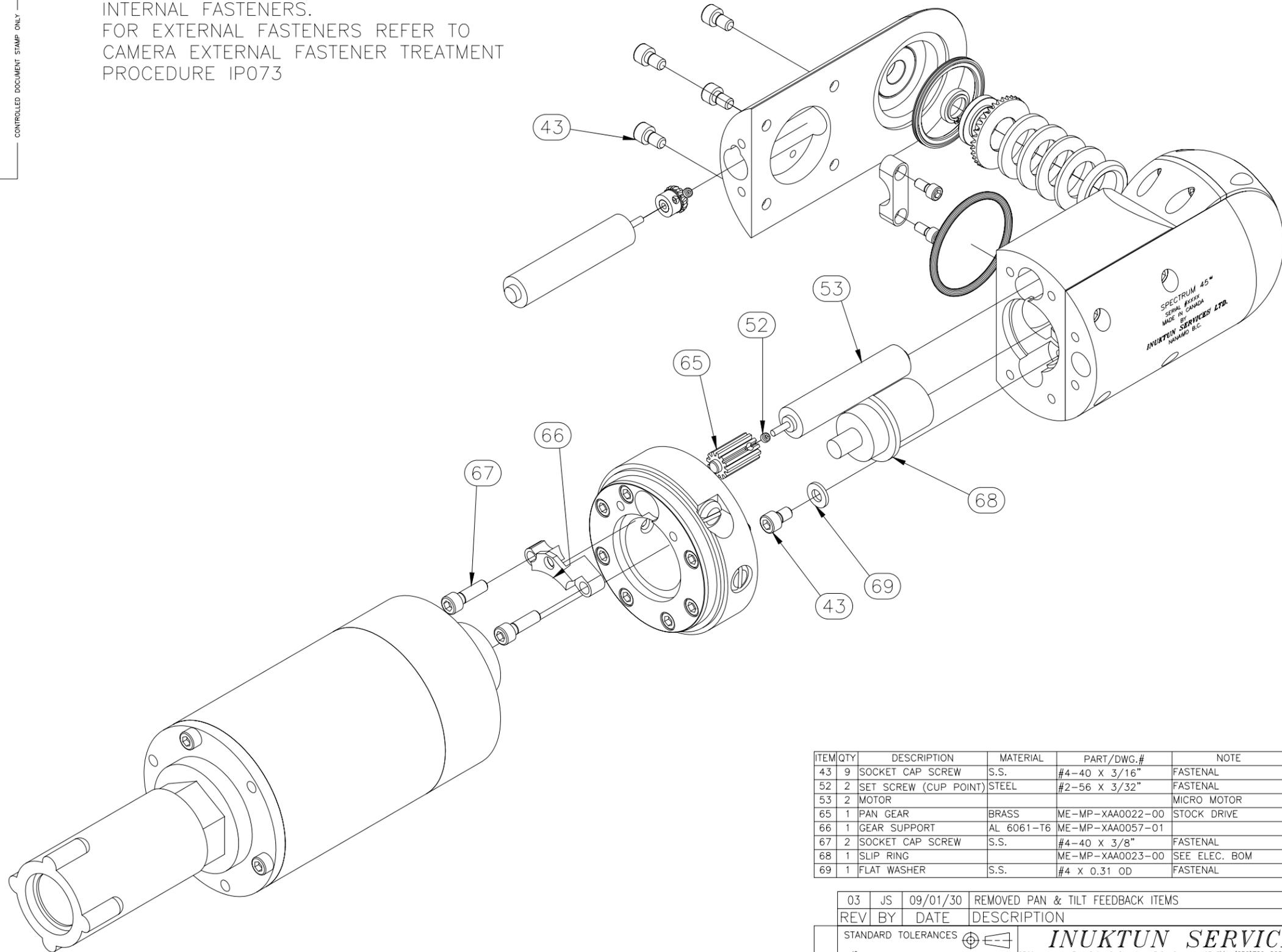
STANDARD FINISH	X.X	±0.050"	± 1.0mm
BREAK SHARP EDGES	X.XX	±0.010"	± 0.25mm
DE-BURR HOLES	X.XXX	±0.003"	± 0.06mm
	X.XXXX	±0.0005"	± 0.01mm
		FRACTIONS ± 1/16	
		ANGLES ±0.5	
		CONC 0.003"/0.06mm	
		OR AS NOTED	

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DSN: BP	03/05/22	TITLE: SP45 MICRO AL- NO FBC
DRN: JS	06/12/13	SCALE: NTS UNITS: IN
CHK:		SHT: 6 OF 9 IPN:
APR:		ME-AD - AAA0005-03

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NOTE: USE BLUE LOCTITE 243 WITH ALL INTERNAL FASTENERS.  
FOR EXTERNAL FASTENERS REFER TO CAMERA EXTERNAL FASTENER TREATMENT PROCEDURE IP073



ITEM	QTY	DESCRIPTION	MATERIAL	PART/DWG.#	NOTE	OEM PART #
43	9	SOCKET CAP SCREW	S.S.	#4-40 X 3/16"	FASTENAL	0171050
52	2	SET SCREW (CUP POINT)	STEEL	#2-56 X 3/32"	FASTENAL	25011
53	2	MOTOR			MICRO MOTOR	0816P006S+08/1,1024:1
65	1	PAN GEAR	BRASS	ME-MP-XAA0022-00	STOCK DRIVE	A 1B 9MY05012
66	1	GEAR SUPPORT	AL 6061-T6	ME-MP-XAA0057-01		
67	2	SOCKET CAP SCREW	S.S.	#4-40 X 3/8"	FASTENAL	73411
68	1	SLIP RING		ME-MP-XAA0023-00	SEE ELEC. BOM	
69	1	FLAT WASHER	S.S.	#4 X 0.31 OD	FASTENAL	71003

03	JS	09/01/30	REMOVED PAN & TILT FEEDBACK ITEMS
REV	BY	DATE	DESCRIPTION

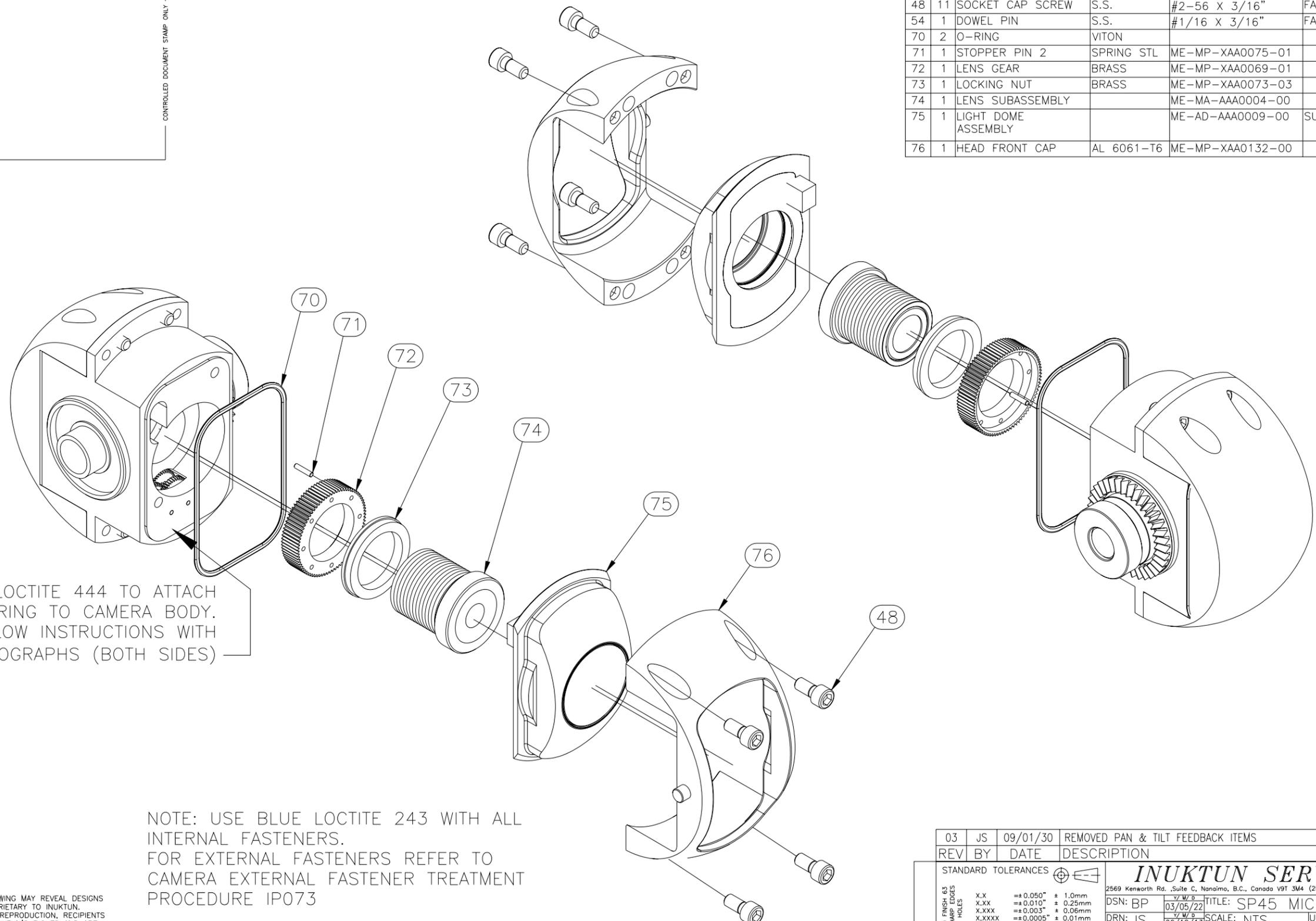
MASS: STANDARD FINISH DIMENSIONS DE-BURR HOLES	X.X	±0.050"	± 1.0mm	<b>INUKTUN SERVICES LTD.</b> 2569 Kenworth Rd., Suite C, Nanaimo, B.C., Canada V9T 3M4 (250)729-8080 FAX (250)729-8077 www.inuktun.com DSN: BP 03/05/22 TITLE: SP45 MICRO AL- NO FBC DRN: JS 06/12/13 SCALE: NTS UNITS: IN CHK: SHT: 7 OF 9 IPN: APR: ME-AD-AAA0005-03
	X.XX	±0.010"	± 0.25mm	
	X.XXX	±0.003"	± 0.06mm	
	X.XXXX	±0.0005"	± 0.01mm	
	FRACTIONS	± 1/16		
ANGLES	±0.5			
CONC	0.003"/0.06mm			
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Parts List						
ITEM	QTY	DESCRIPTION	MATERIAL	PART/DWG.#	NOTE	OEM PART #
48	11	SOCKET CAP SCREW	S.S.	#2-56 X 3/16"	FASTENAL	73398
54	1	DOWEL PIN	S.S.	#1/16 X 3/16"	FASTENAL	74123
70	2	O-RING	VITON			28.0 X 1.0 mm
71	1	STOPPER PIN 2	SPRING STL	ME-MP-XAA0075-01		
72	1	LENS GEAR	BRASS	ME-MP-XAA0069-01		
73	1	LOCKING NUT	BRASS	ME-MP-XAA0073-03		
74	1	LENS SUBASSEMBLY		ME-MA-AAA0004-00		
75	1	LIGHT DOME ASSEMBLY		ME-AD-AAA0009-00	SUB-ASSY	
76	1	HEAD FRONT CAP	AL 6061-T6	ME-MP-XAA0132-00		



USE LOCTITE 444 TO ATTACH O-RING TO CAMERA BODY. FOLLOW INSTRUCTIONS WITH PHOTOGRAPHS (BOTH SIDES)

NOTE: USE BLUE LOCTITE 243 WITH ALL INTERNAL FASTENERS. FOR EXTERNAL FASTENERS REFER TO CAMERA EXTERNAL FASTENER TREATMENT PROCEDURE IP073

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03	JS	09/01/30	REMOVED PAN & TILT FEEDBACK ITEMS
REV	BY	DATE	DESCRIPTION

STANDARD TOLERANCES		
STANDARD FINISH	X.X	± 0.050" ± 1.0mm
BREAK SHARP EDGES	X.XX	± 0.010" ± 0.25mm
DE-BURR HOLES	X.XXX	± 0.003" ± 0.06mm
	X.XXXX	± 0.0005" ± 0.01mm
	FRACTIONS	± 1/16
	ANGLES	± 0.5
	CONC	0.003"/0.06mm
	OR AS NOTED	

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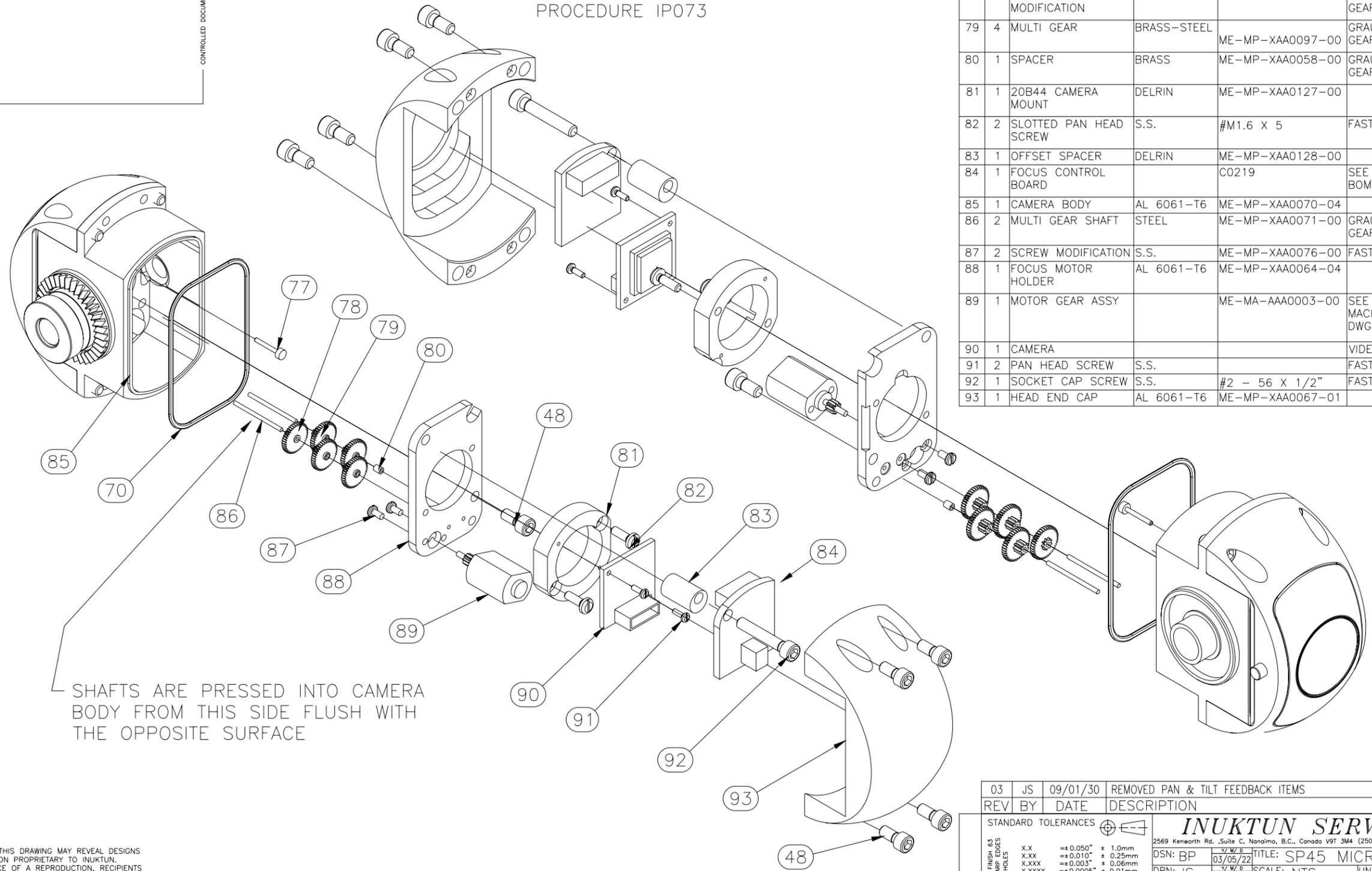
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DRN: JS	06/12/13	SCALE: NTS
CHK:		UNITS: IN
APR:		SHT: 8 of 9
		IPN:
		ME-AD-AAA0005-03

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NOTE: USE BLUE LOCTITE 243 WITH ALL INTERNAL FASTENERS.  
FOR EXTERNAL FASTENERS REFER TO CAMERA EXTERNAL FASTENER TREATMENT PROCEDURE IP073

Parts List						
ITEM	QTY	DESCRIPTION	MATERIAL	PART/DWG.#	NOTE	OEM PART #
48	11	SOCKET CAP SCREW	S.S.	#2-56 X 3/16"	FASTENAL	73398
70	2	O-RING	VITON			28.0 X 1.0 mm
77	1	STOPPER PIN	S.S 303	ME-MP-XAA0078-00		
78	1	MULTI GEAR MODIFICATION	BRASS-STEEL	ME-MP-XAA0072-00	GRAUPNER GEAR BOX	MICRO T05 (1670:1)
79	4	MULTI GEAR	BRASS-STEEL	ME-MP-XAA0097-00	GRAUPNER GEAR BOX	MICRO T05 (1670:1)
80	1	SPACER	BRASS	ME-MP-XAA0058-00	GRAUPNER GEAR BOX	MICRO T05 (1670:1)
81	1	20B44 CAMERA MOUNT	DELTRIN	ME-MP-XAA0127-00		
82	2	SLOTTED PAN HEAD SCREW	S.S.	#M1.6 X 5	FASTENAL	M1.6X5 PH SS
83	1	OFFSET SPACER	DELTRIN	ME-MP-XAA0128-00		
84	1	FOCUS CONTROL BOARD		C0219	SEE ELEC BOM	
85	1	CAMERA BODY	AL 6061-T6	ME-MP-XAA0070-04		
86	2	MULTI GEAR SHAFT	STEEL	ME-MP-XAA0071-00	GRAUPNER GEAR BOX	MICRO T05 (1670:1)
87	2	SCREW MODIFICATION	S.S.	ME-MP-XAA0076-00	FASTENAL	10109-01132
88	1	FOCUS MOTOR HOLDER	AL 6061-T6	ME-MP-XAA0064-04		
89	1	MOTOR GEAR ASSY		ME-MA-AAA0003-00	SEE MACHINE DWGS.	
90	1	CAMERA			VIDEOLOGY	20B44
91	2	PAN HEAD SCREW	S.S.		FASTENAL	M1X3 PH SS
92	1	SOCKET CAP SCREW	S.S.	#2 - 56 X 1/2"	FASTENAL	73402
93	1	HEAD END CAP	AL 6061-T6	ME-MP-XAA0067-01		

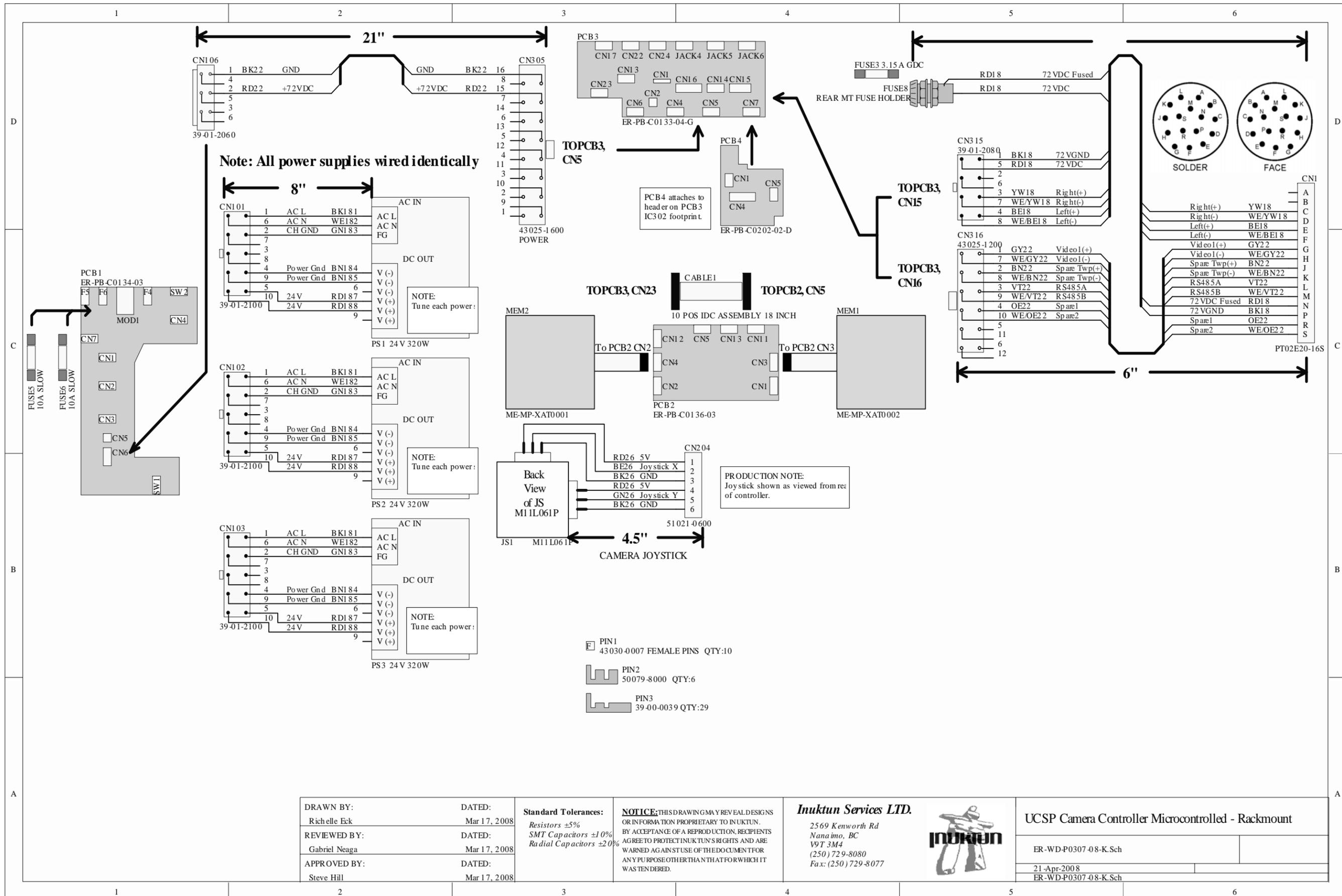


SHAFTS ARE PRESSED INTO CAMERA BODY FROM THIS SIDE FLUSH WITH THE OPPOSITE SURFACE

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HOLES	X.XXX	±0.003"	± 0.06mm
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	FRACTIONS	± 1/16	
	ANGLES	±0.5	
	CONC	0.003"/0.06mm	
	OR AS NOTED		
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Note: All power supplies wired identically

NOTE: Tune each power:

NOTE: Tune each power:

NOTE: Tune each power:

PRODUCTION NOTE:  
Joystick shown as viewed from rear of controller.

- PIN1  
43030-0007 FEMALE PINS QTY:10
- PIN2  
50079-8000 QTY:6
- PIN3  
39-00-0039 QTY:29

DRAWN BY: Rich elle Eck	DATED: Mar 17, 2008
REVIEWED BY: Gabriel Neaga	DATED: Mar 17, 2008
APPROVED BY: Steve Hill	DATED: Mar 17, 2008

Standard Tolerances:  
Resistors ±5%  
SMT Capacitors ±10%  
Radial Capacitors ±20%

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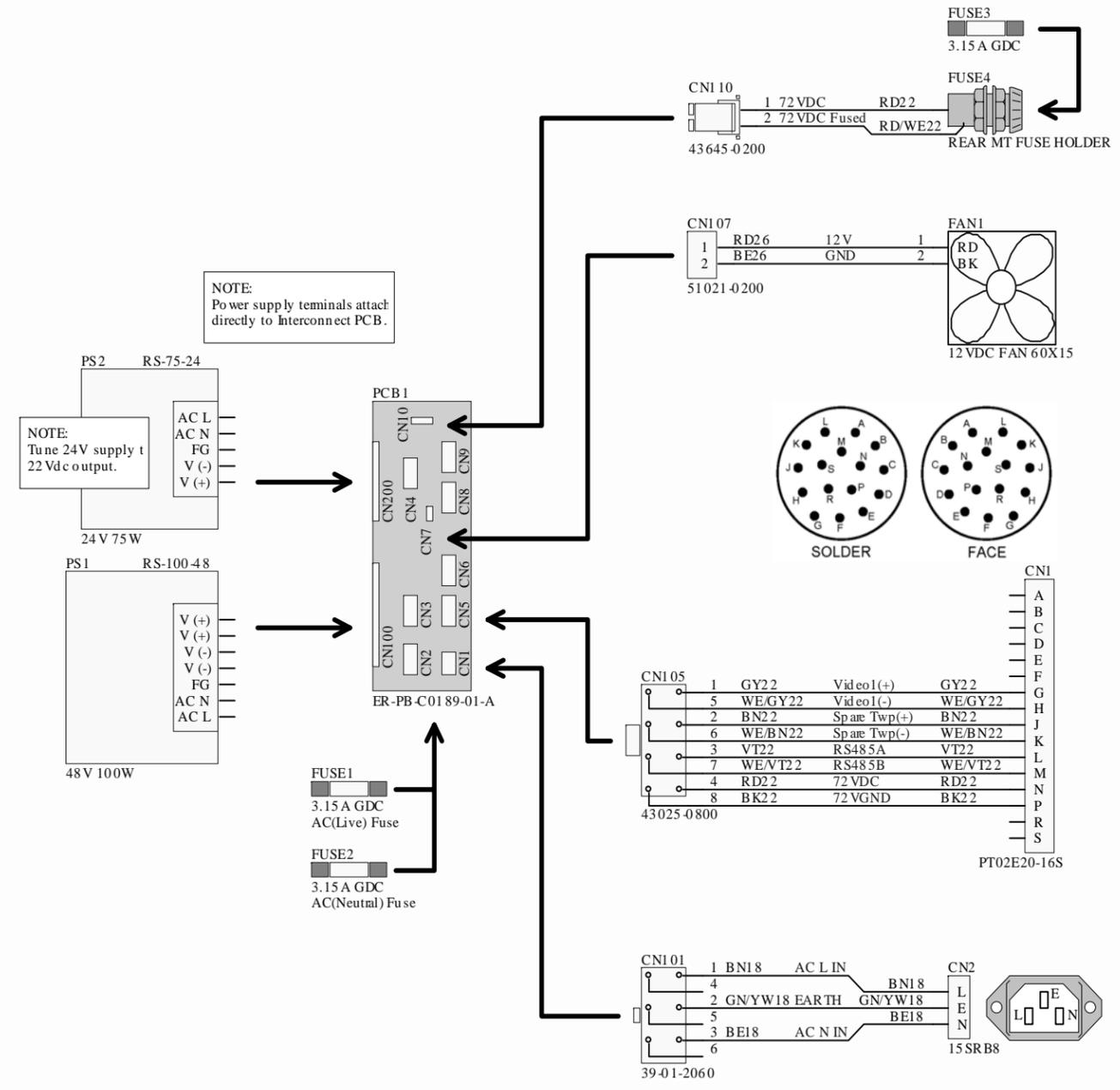
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UCSP Camera Controller Microcontrolled - Rackmount	
ER-WD-P0307-08-K.Sch	
21-Apr-2008	
ER-WD-P0307-08-K.Sch	

WIRE ASSEMBLY	LENGTH (INCHES)
TETHER FUSE	5-1/2"
FAN	4-1/2"
TETHER	4"
AC INPUT	3-1/2"

\*\* ALL LENGTHS MEASURED TO CONNECTOR FACE (OR FLANGE FOR PANEL MOUNTS)\*\*



NOTE:  
Power supply terminals attach directly to Interconnect PCB.

NOTE:  
Tune 24V supply to 22Vdc output.

- PIN2  
43031-0007 MALE PINS QTY:2
- PIN1  
43030-0007 FEMALE PINS QTY:37
- PIN3  
50079-8000 QTY:16
- PIN4  
39-00-0039 QTY:13

Control Panel Wiring  
ER-WD-P0342\_02-05.Sch

Sheet 2

DRAWN BY: Richelle Eck	DATED: April 17, 2008
REVIEWED BY: Adam Koppel	DATED: April 17, 2008
APPROVED BY: Gabriel Neaga	DATED: April 17, 2008

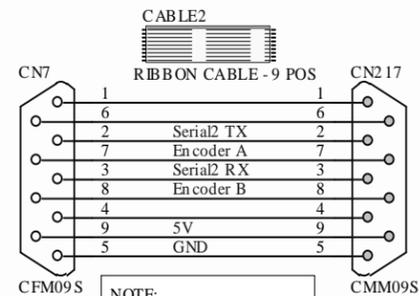
**Standard Tolerances:**  
Resistors ±5%  
SMT Capacitors ±10%  
Radial Capacitors ±20%

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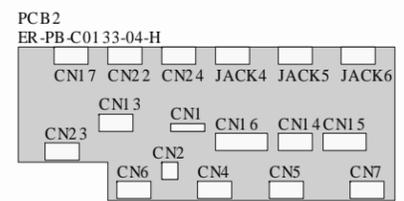


<b>UCSP Portable Controller</b>	
Sheet 1 of 2 - Main Case Wiring	
ER-WD-P0342_01-05.Sch	
21-Apr-2008	
ER-WD-P0342_01-05.Sch	

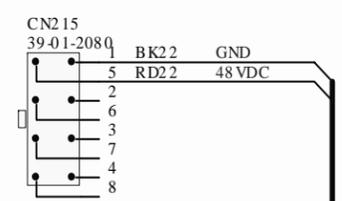


NOTE:  
DB9 interconnect assembled with IDC ribbon connectors

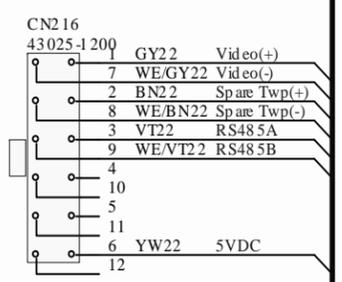
Production Note:  
This Controller PCB (PCB2) should include mod level A to route near video to the LCD.



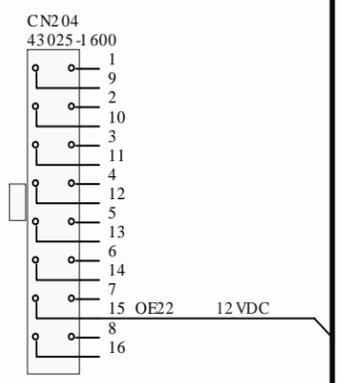
TOP PCB2, CN15



TOP PCB2, CN16

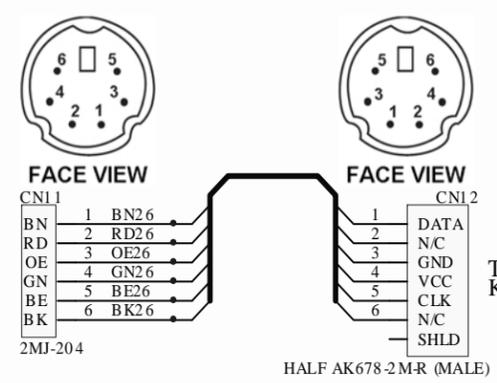


TOP PCB2, CN4

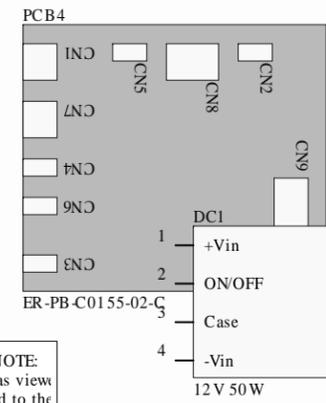
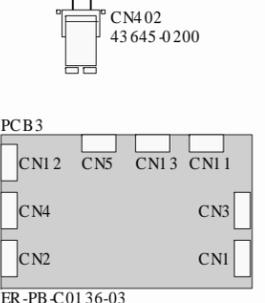
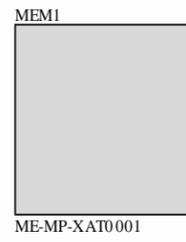
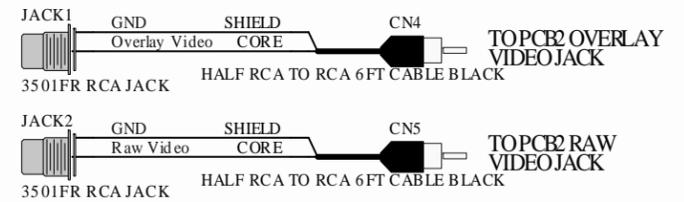
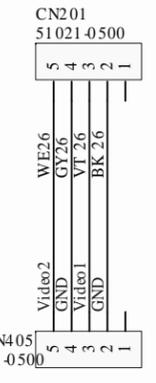
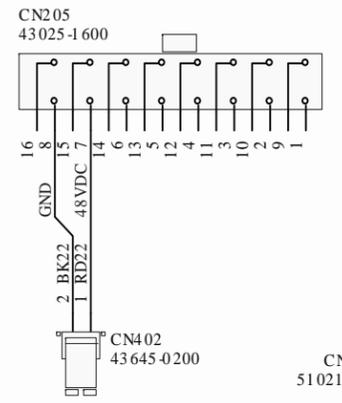
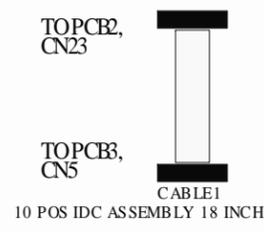


WIRE ASSEMBLY	LENGTH (INCHES)
DB9 INTERCONNECT	TBD
KEYBOARD INTERCONNECT	TBD
VIDEO INTERCONNECTS	TBD
MONITOR INTERCONNECT	TBD
CN205 - CN402	TBD
CN201 - CN405	TBD
JOYSTICK	4-1/2"
CN109 - CN215	TBD
CN109 - CN216	TBD
CN109 - CN204	TBD
CN102 - POWER SWITCH	TBD
CN102 - GND TERMINAL	TBD

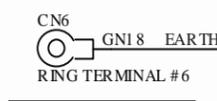
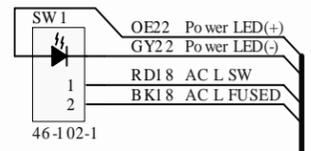
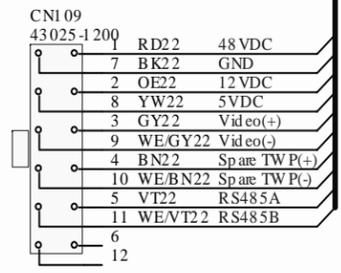
\*\* ALL LENGTHS MEASURED TO CONNECTOR FACE (OR FLANGE FOR PANEL MOUNTS) \*\*



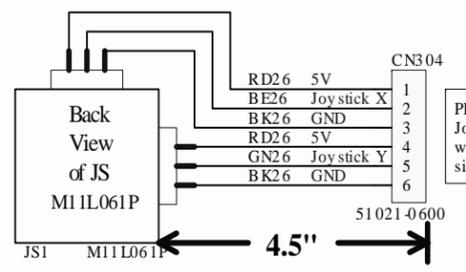
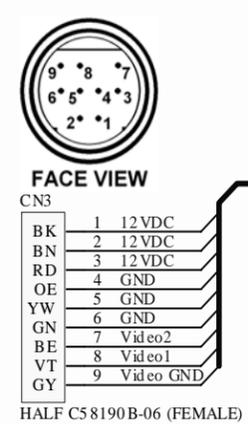
TOP PCB2 KEYBOARD JACK



TO INTERCONNECT PCB (SHEET 1)

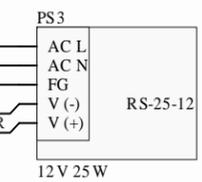
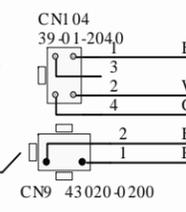


PRODUCTION NOTE:  
Ground terminal screwed to aluminum main plate.

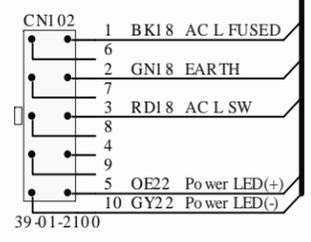


PRODUCTION NOTE:  
Joystick shown as view with panel flipped to the side (right side up).

TO INTERCONNECT PCB (SHEET 1)



TO INTERCONNECT PCB (SHEET 1)



DRAWN BY: Richelle Eck	DATED: April 17, 2008
REVIEWED BY: Adam Koppel	DATED: April 17, 2008
APPROVED BY: Gabriel Neaga	DATED: April 17, 2008

Standard Tolerances:  
Resistors ±5%  
SMT Capacitors ±10%  
Radial Capacitors ±20%

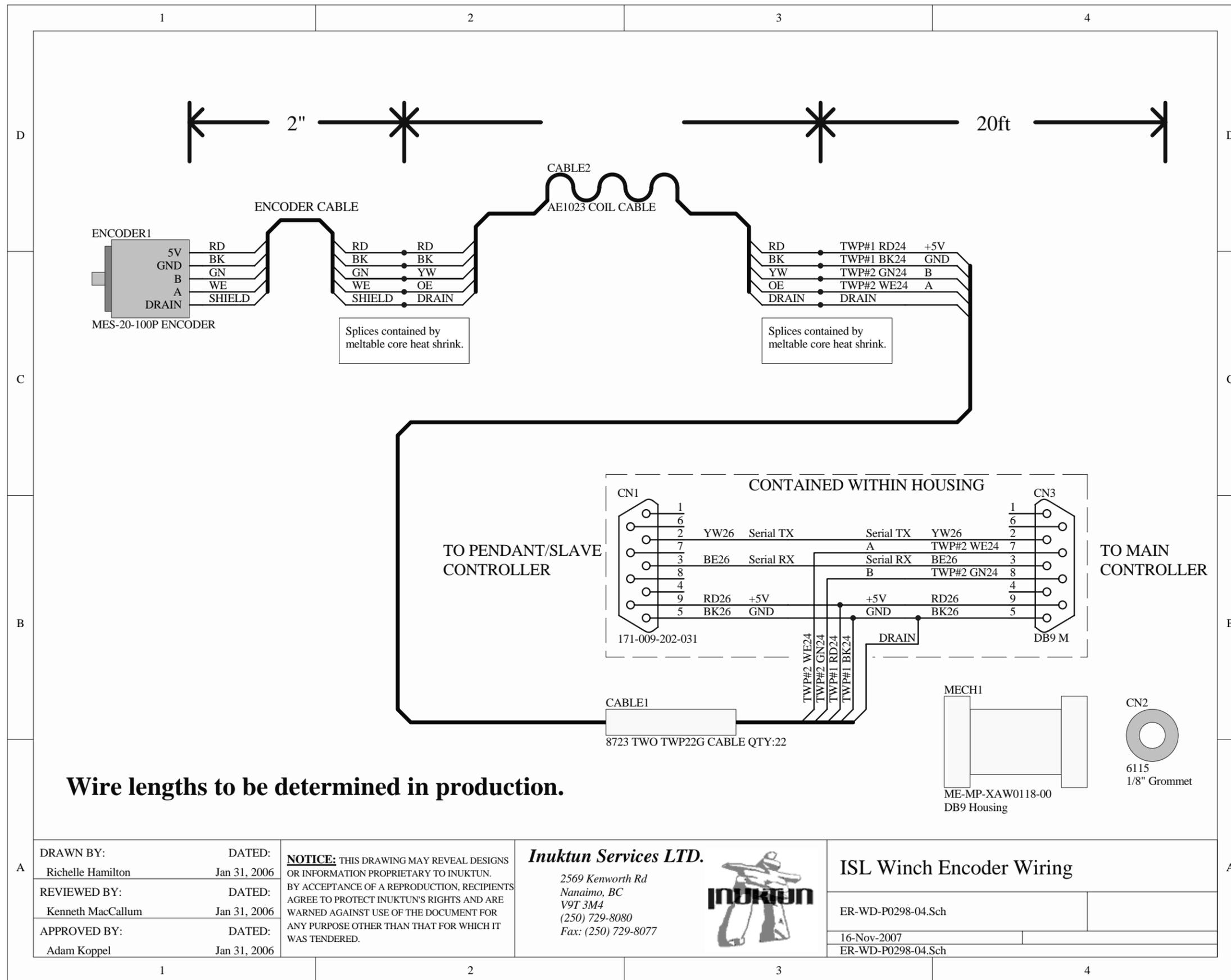
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**UCSP Portable Controller**  
Sheet 2 of 2 - Control Panel Wiring

ER-WD-P0342\_02-05.Sch  
21-Apr-2008  
ER-WD-P0342\_02-05.Sch



DRAWN BY: Richelle Hamilton	DATED: Jan 31, 2006
REVIEWED BY: Kenneth MacCallum	DATED: Jan 31, 2006
APPROVED BY: Adam Koppel	DATED: Jan 31, 2006

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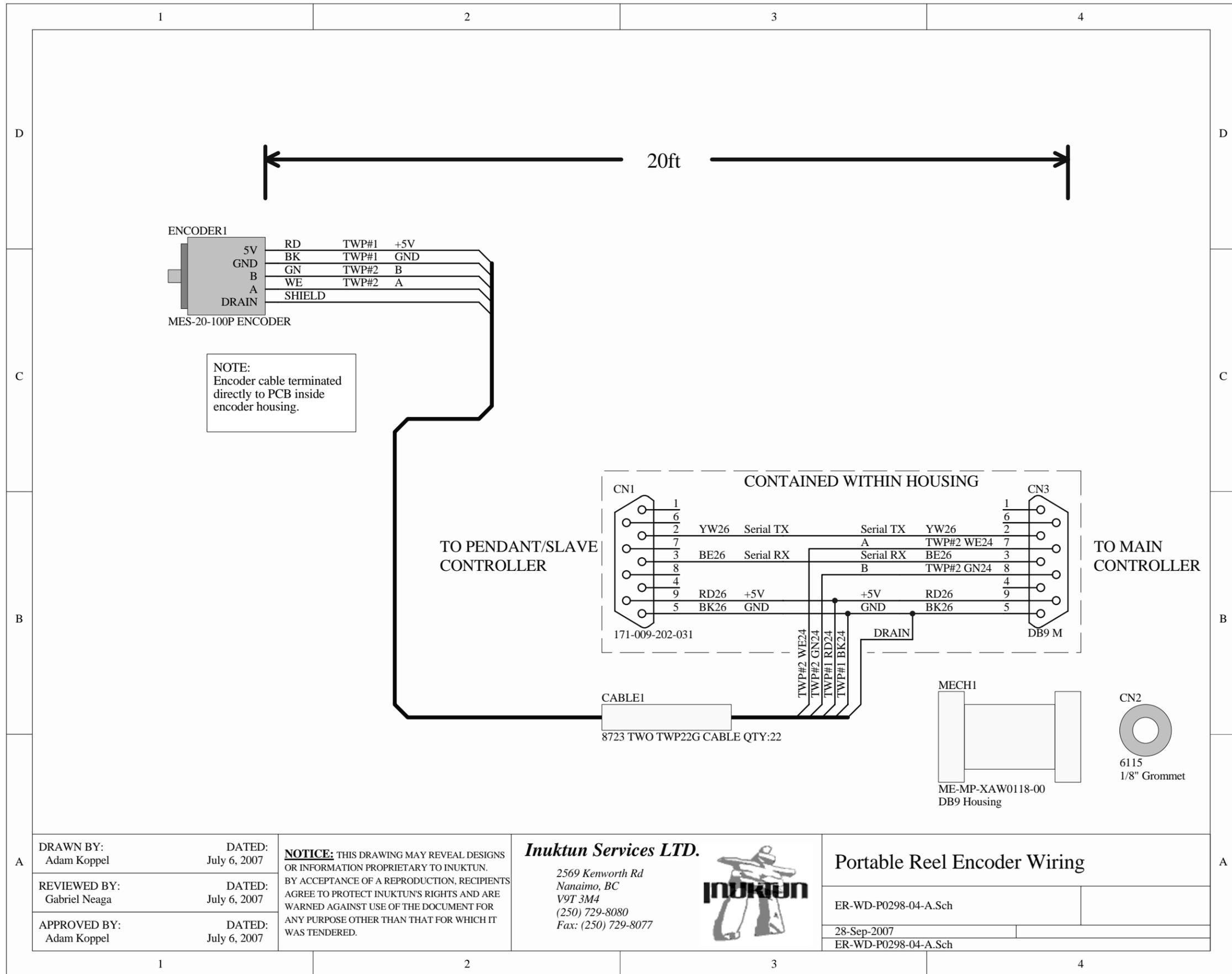
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**ISL Winch Encoder Wiring**

ER-WD-P0298-04.Sch

16-Nov-2007  
ER-WD-P0298-04.Sch



DRAWN BY: Adam Koppel	DATED: July 6, 2007
REVIEWED BY: Gabriel Neaga	DATED: July 6, 2007
APPROVED BY: Adam Koppel	DATED: July 6, 2007

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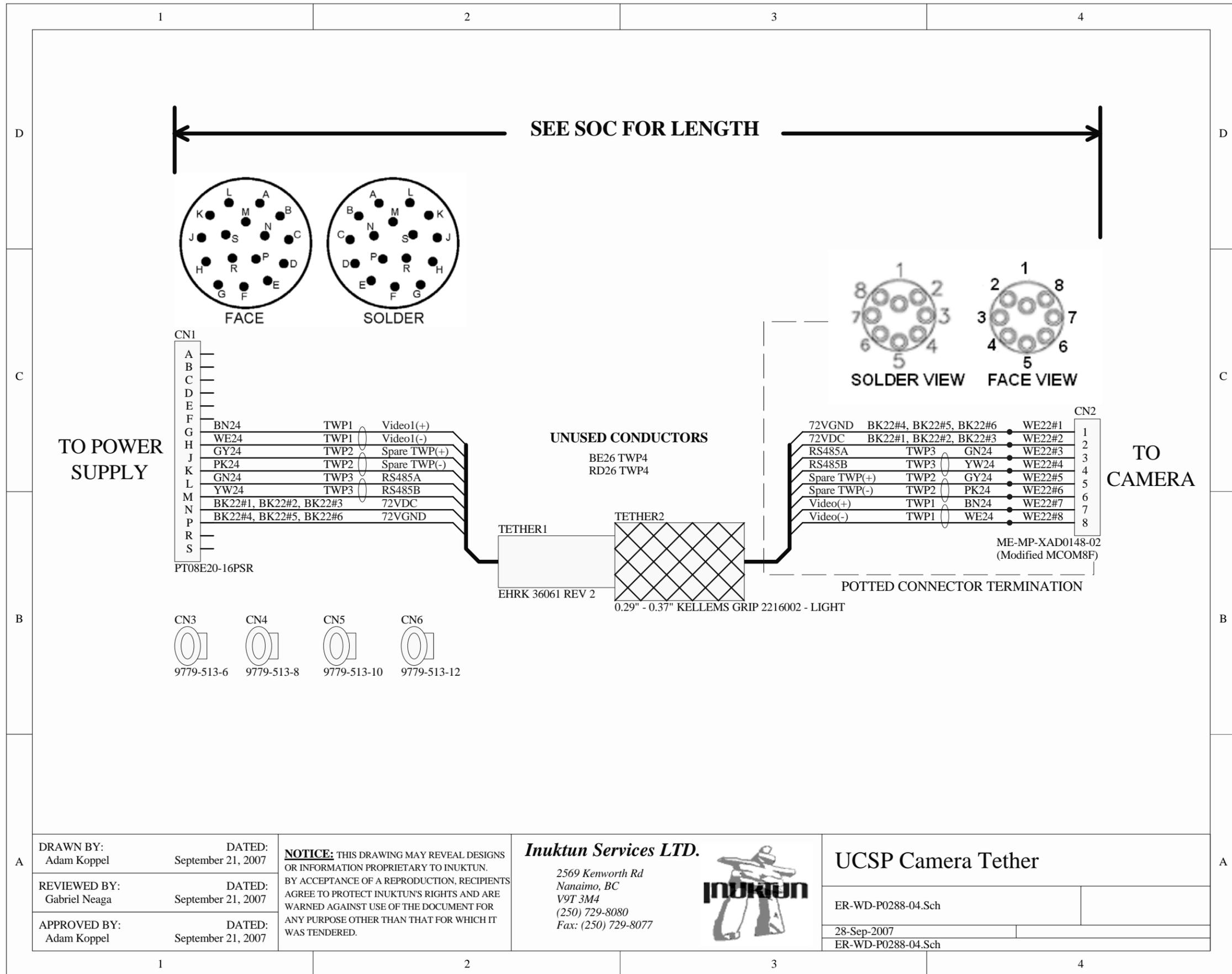
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**Portable Reel Encoder Wiring**

ER-WD-P0298-04-A.Sch  
28-Sep-2007  
ER-WD-P0298-04-A.Sch



**DRAWN BY:**  
Adam Koppel

**DATED:**  
September 21, 2007

**REVIEWED BY:**  
Gabriel Neaga

**DATED:**  
September 21, 2007

**APPROVED BY:**  
Adam Koppel

**DATED:**  
September 21, 2007

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**Inuktun Services LTD.**

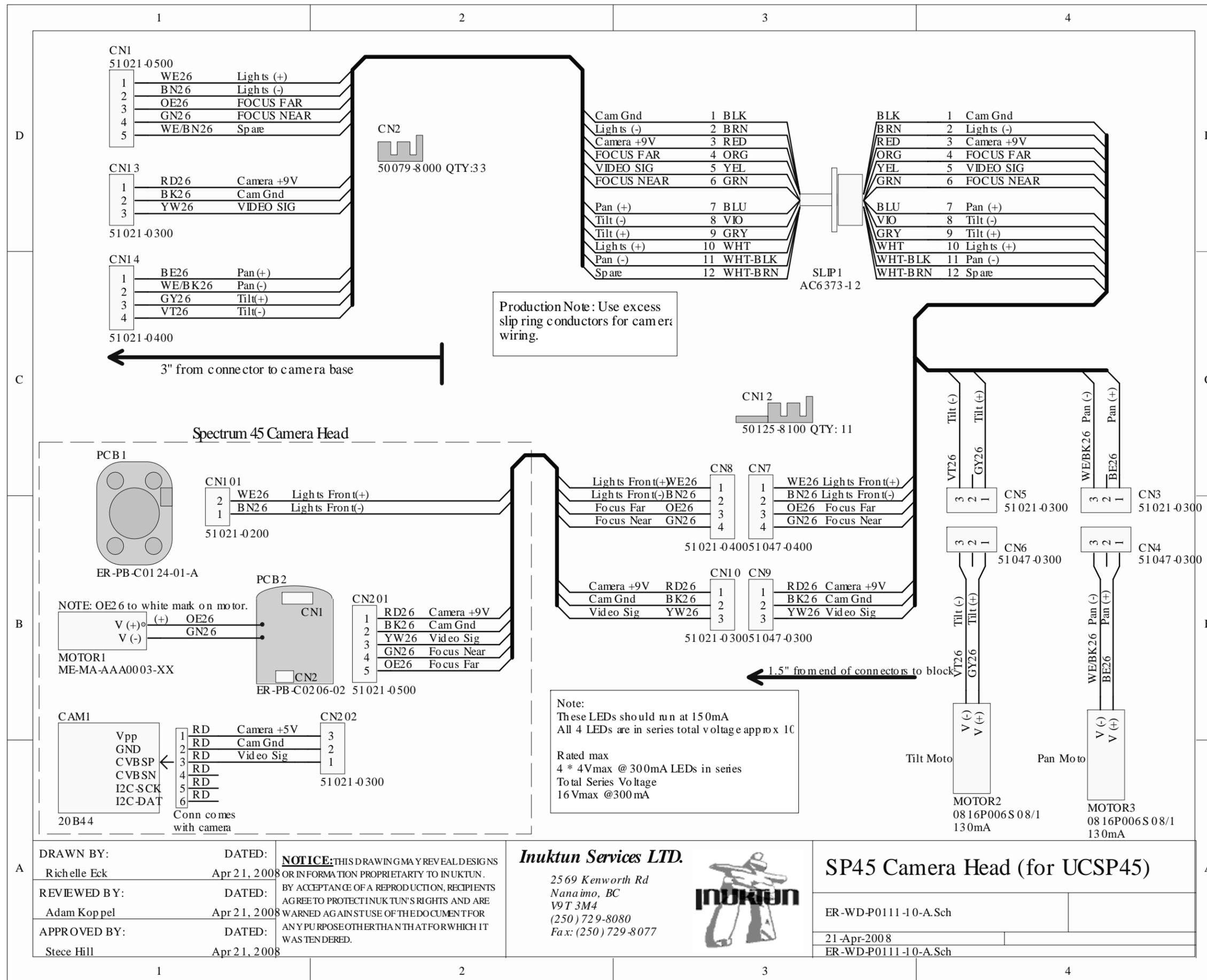
2569 Kenworth Rd  
Nanaimo, BC  
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Fax: (250) 729-8077

**UCSP Camera Tether**

ER-WD-P0288-04.Sch

28-Sep-2007

ER-WD-P0288-04.Sch



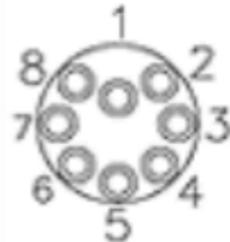
**DRAWN BY:** Richelle Eck  
**DATED:** Apr 21, 2008  
**REVIEWED BY:** Adam Koppel  
**DATED:** Apr 21, 2008  
**APPROVED BY:** Stece Hill  
**DATED:** Apr 21, 2008

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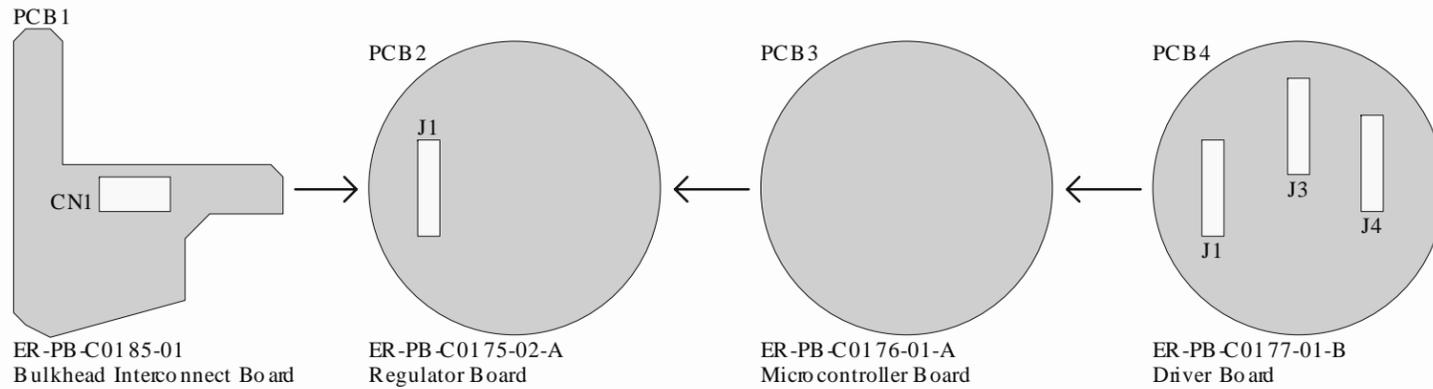
**SP45 Camera Head (for UCSP45)**  
 ER-WD-P0111-10-A.Sch  
 21-Apr-2008  
 ER-WD-P0111-10-A.Sch



**FACE VIEW**

CNI	WE22#1	GND	WE22#1
1	WE22#2	VIN	WE22#2
2	WE22#3	RS485(+)	WE22#3
3	WE22#4	RS485(-)	WE22#4
4	WE22#5	Video-2(+)	WE22#5
5	WE22#6	Video-2(-)	WE22#6
6	WE22#7	Video-1(+)	WE22#7
7	WE22#8	Video-1(-)	WE22#8

MCBH8M



**Assembly Note:**  
 The sockets should be on the Regulator Board (PCB2)  
 The pins on the two other boards should be pointing towards the Regulator Board.

<b>DRAWN BY:</b> Richelle Eck	<b>DATED:</b> Apr 7, 2008
<b>REVIEWED BY:</b> Adam Koppel	<b>DATED:</b> Apr 7, 2008
<b>APPROVED BY:</b> Gabriel Neaga	<b>DATED:</b> Apr 7, 2008

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**UCSP45 Camera Bulkhead Wiring**

ER-WD-P0366-02.Sch

21-Apr-2008

ER-WD-P0366-02.Sch