	LPO La Silla Division. Engineering Department	
	<b>Procedure</b> <b>Taking Out the 220 Telescope when Limit Below Pole Limit Switch has been Reached</b>	Date: 2/18/2008 Document Name: 220BelowPoleSystem.doc LSO-PRO-ESO-60000-0001 Page 1 of 4

## Procedure for Taking Out the 220 Telescope when Limit Below Pole Limit Switch has been Reached.

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### INTRODUCTION

In January 2008 an Action Point was required to protect the 220 Telescope from a Below Pole reversing condition. That can be possible because the operation of the GROND instrument.

SciOps fix the limit position in the alpha axis at hour angle of -07:29:14 and 10:45:32 (Figure 2). Two Limit switches were installed at these specific positions in the rear telescope basement. Both of them are operated by a mechanic piece mounted in the movable part of the alpha axis. This piece is called blue camon (Figure 1)

The electronic control system (Figure 3 and 4), was designed without using the standard 220 interlock system. When the telescope stops by a limit below pole condition, the motion direction before to reach the limit is disabled. In that way the operator can move the telescope only in the opposite direction. Because of that the telescope can be take out from limit condition. It is impossible to the operator make a mistake.

See also:

<http://www.lis.eso.org/lasilla/support/electronics/Documentation/telma/image/220BelowPoleProt.gif>

There are a mechanical feature that it can be dangerous when you on purpose want to go beyond the below pole limit switch. The correct way to do that is to take out the mechanic blue camon that you can see at figure 1 of this document. Otherwise when you go over the limit switch and then you try to go back, the switch mechanism will be destroyed.

How the Operator knows that the below pole protection is activated?

Because the telescope doesn't move to the presetting object or it stop the object tracking. There is no indication on the operator's panel. When this happened means that there is a (big) problem with the software because before to reach the hardware limit there are a software limit. In normal conditions it is impossible to achieve the hardware limit.

### PROCEDURE

1. Call to the Software & Electronic specialists and inform him the problem you have.
2. Go to the TCS Rack Telescope Computer Room. You will hear a alarm noise in this rack.
3. In the VME chassis change the switch selection from DIGITAL to ANALOG.
4. Go to the dome a take the Handset.
5. Press alpha + or alpha -, depending of the limit activated. Do not hesitate what is the correct direction, because the system only enables you to activate the right choice.
6. Once the telescope is in a secure position, go to the TCS Rack at Computer Room. The alarm noise stops. Then you can change again the switch from ANALOG to DIGITAL.
7. Wait for the software & electronic specialists to investigate why the software limit doesn't work properly.
8. Now the telescope is ready to work again.

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Figure 1: The Blue Camon (When telescope at Zenith it is just in front of you)



Figure 2: The East Below Pole Limit Switch. (When telescope at Zenith it is at your left side)

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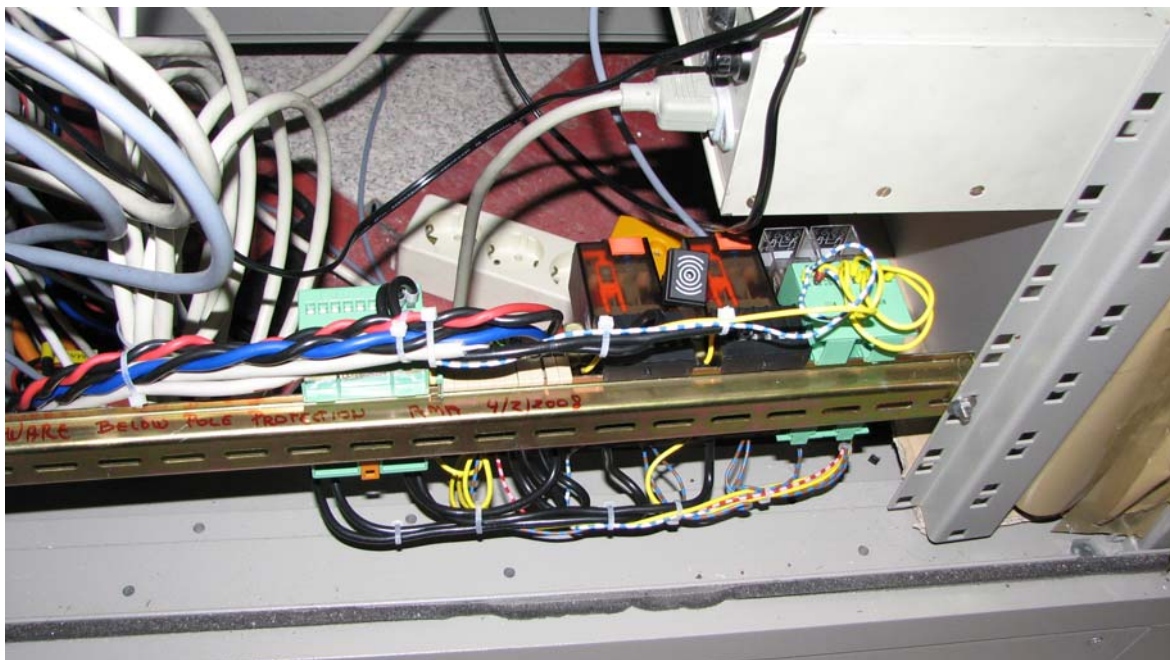


Figure 3: Electric Circuit (Mounted on a DIN Rail inside the TCS Rack at the left lower side)

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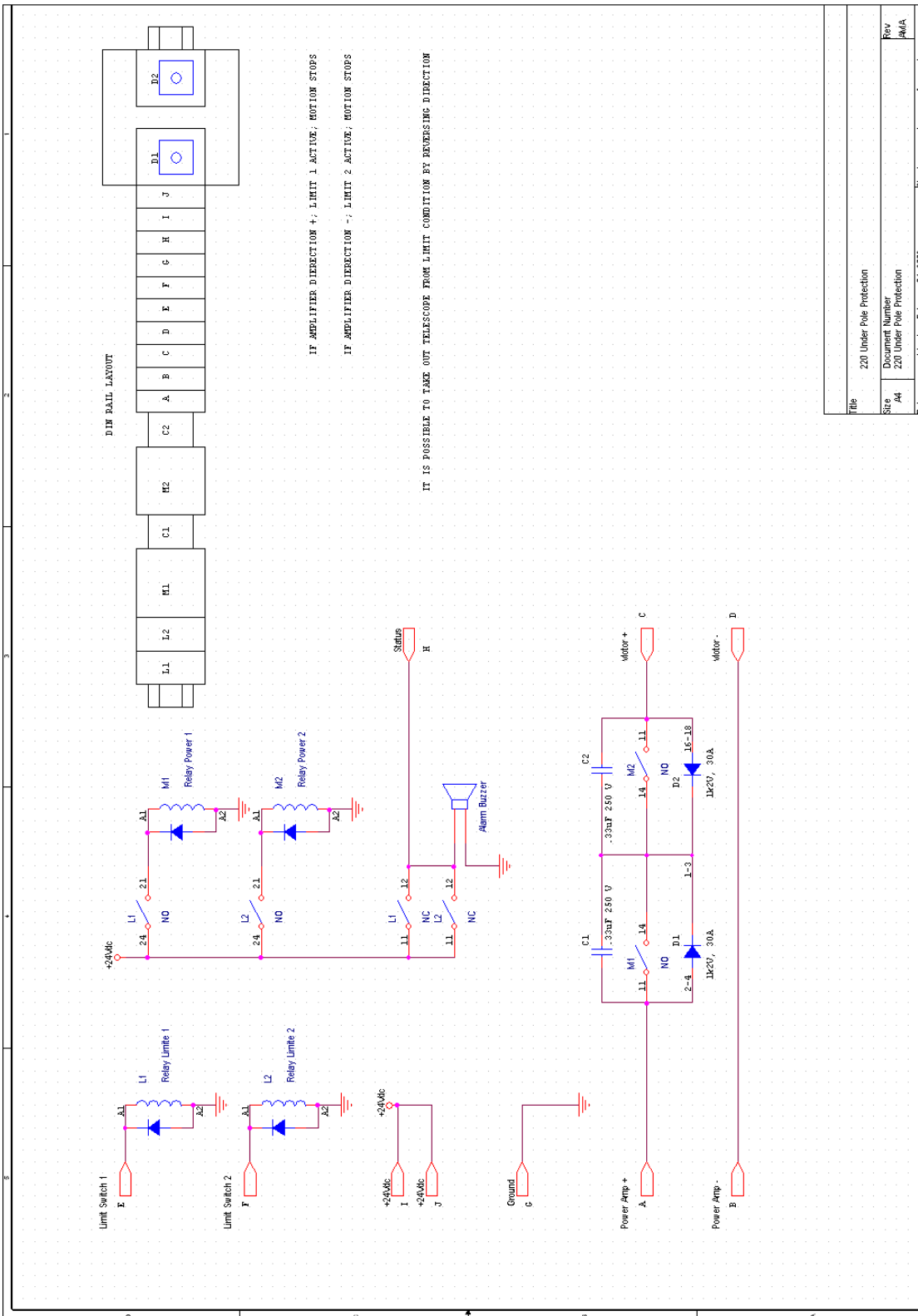
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