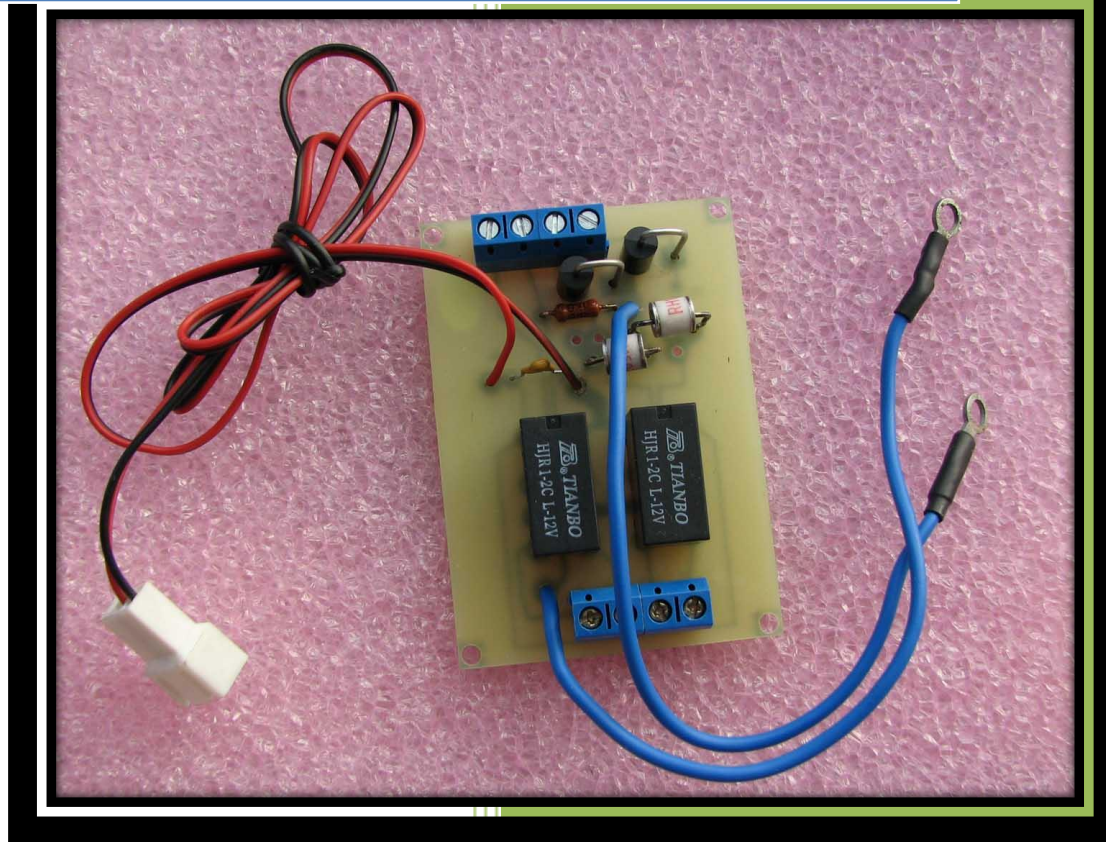


# 2014

## Lightning Protection for the Rotors



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# Lightning Protection for the Rotors (LPR)

*by Ivan RA3WDK*

## Before we start let's read some important articles



The primary goal in any lightning protection system is to control the massive energy generated during a lightning strike so it will dissipate before it can enter our homes. Lightning contains awesome levels of energy in a wide range of frequencies, and travels fast (1ns per foot) with very fast rise times. It can travel through the power lines, coax feed line, control lines, telephone, CATV or satellite coax and our equipment looking for the easiest path to ground unless we can provide a better path for it to follow. To control this energy, we have to provide a better path to ground than anything else around. A single, low inductance ground point system can

ensure a simultaneous rise and fall of the currents across all of our equipment, so no current will flow across the equipment in search of ground potential.

Build a ground system that uses conductors with low inductance and impedance across a wide frequency spectrum to provide a good path for the energy to follow. A wide and thin conductor like copper strap is better than wire or cable for longer runs. A heavy solid, rather than stranded, wire will work if the connection is direct and short.

Even with a well designed ground system, some of the current generated during a lightning event may flow along feed lines, control and equipment grounds and AC power lines. Lightning protectors should therefore be used on all of these lines before they enter our house. Lightning protectors work by diverting the surge to a low inductance ground path that we must provide.

*DX Engineering, Inc*



## **REMEMBER!**

**Lightning cannot be prevented or eliminated.**

### **What is the LPR?**

**LPR – Lightning Protection for the Rotors.**

It's the electrical circuit which connects between a rotor and control unit. The circuit has relays and other parts which help to protect your control unit against the static and dangerous voltage during the lightning storm or thunderstorm.

### **What do I need it for?**

You need it for protection. Without the proper protection of your rotor and control unit the chance to get damage during a lightning is very high. There is a few important steps that needs to be done before rotor installation. Some people prefer disconnect the all cables during the lightning storm but that is only option and it's not a right way to do. If your system is not GROUNDED or hasn't any lightning protection the cable disconnecting won't work.

The lightning strike is the natural hazard. Stay smart!

### **from Author Ivan RA3WDK**

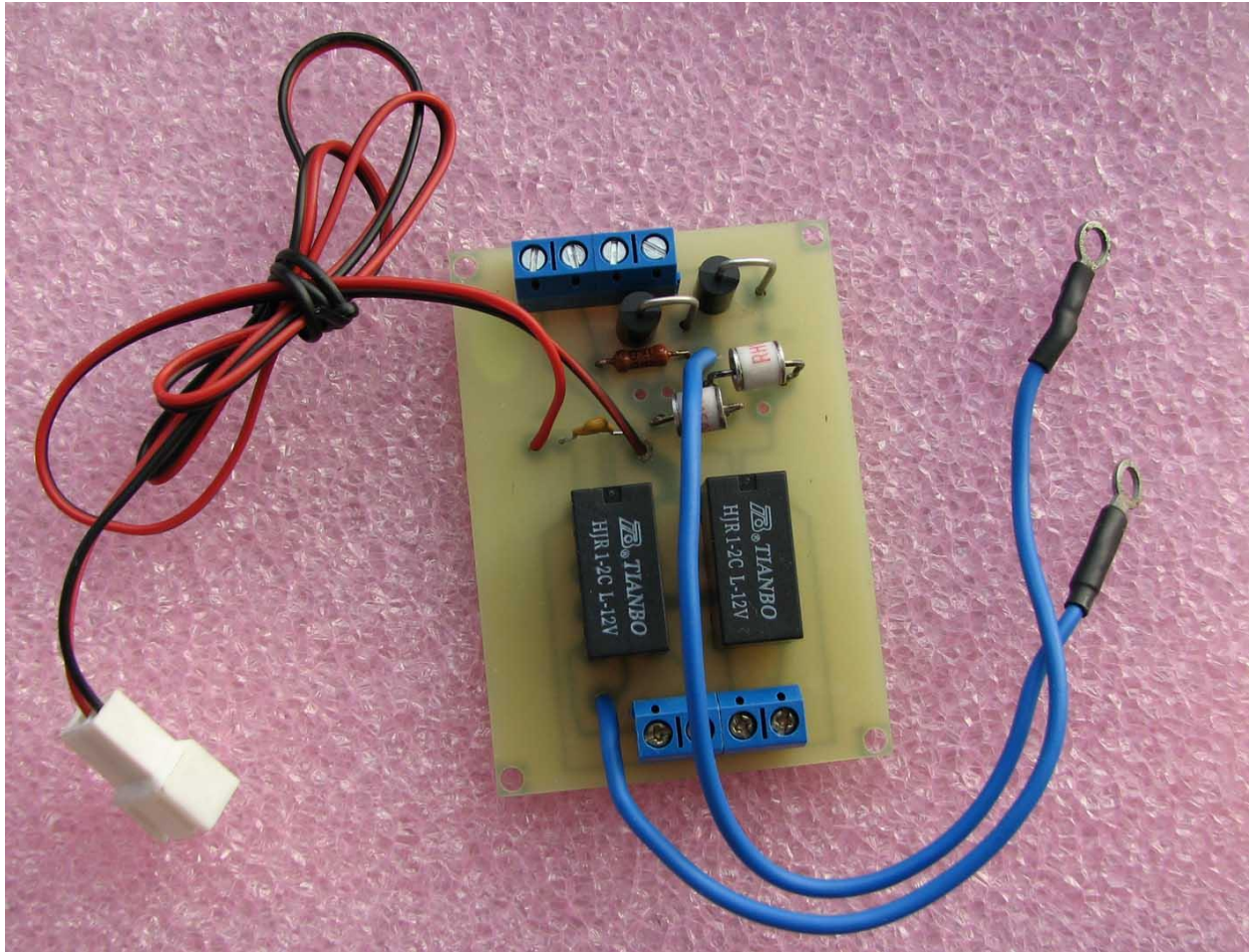
*I hope you thinking about protection your antenna rotors and station. How many HAMs ground or disconnect their rotor cables?*

*So much information has been posted on lightning protection for Rotor in Internet, but not many HAMs used those recommendations. Isn't good idea!*

*You have to be always prepared. It's better spend \$\$ for protection instead spend your \$\$\$\$ for repairing and replacing.*



## Lightning Protection for the Rotors (LPR)

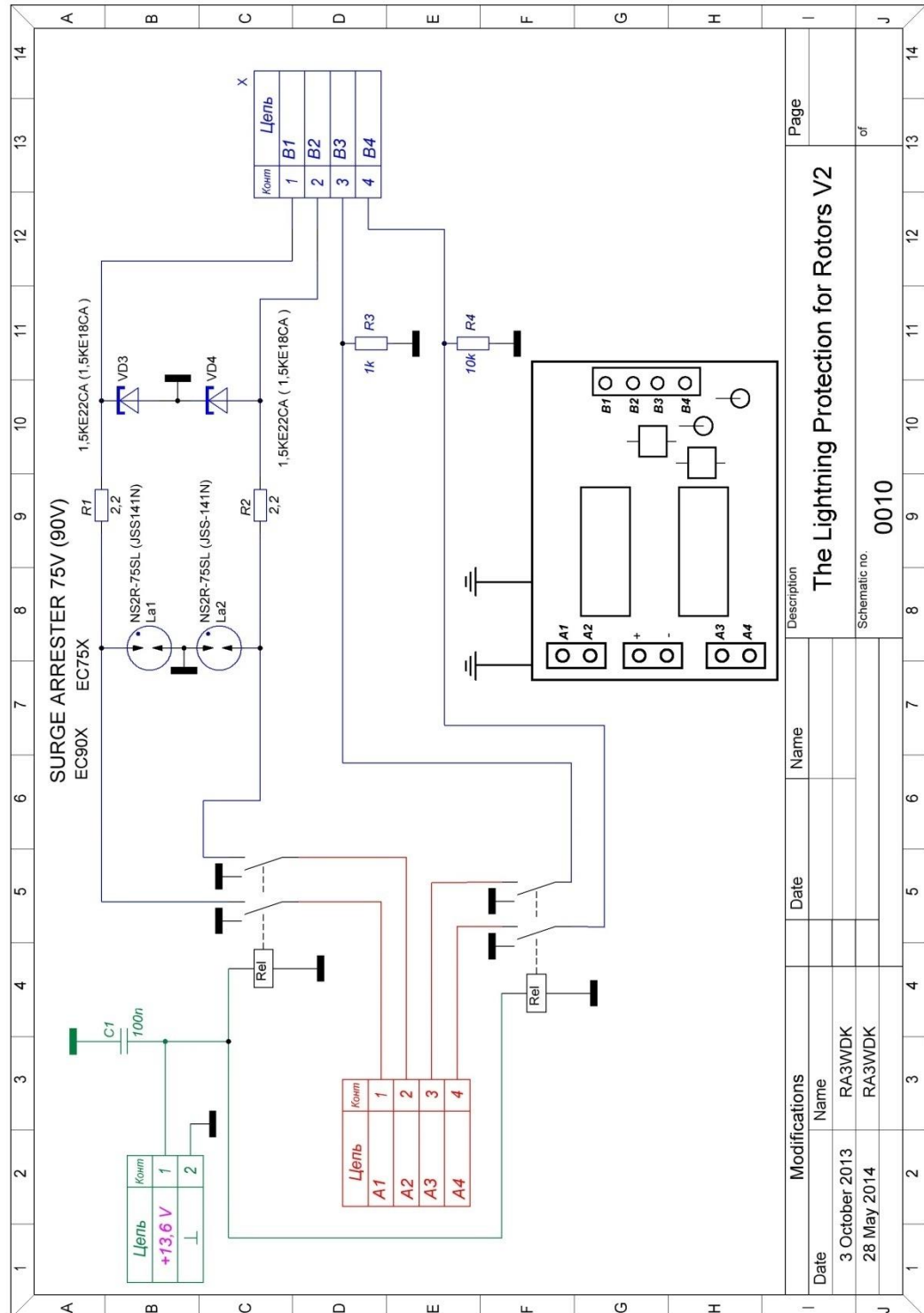


### Description

- Easy to install, have TVS-diode/Gas tube Arrestor and relays to disconnect the rotor from control unit.
- TVS diode shunts RF current and voltage over 18V, Gas Tube Arrestor shunts voltages over 80v. The relay connects the rotor only for work period.

It's very simple circuit but could save your time and money.

## LPR V2 ELECTRICAL DIAGRAM





The LPR compatible with many types of rotors:

Type	COMPABILITY	Notes
YAESU G-250	X	
YAESU G-450A	X	
YAESU G-650A	X	
YAESU G-800DXA(SA)	X	
YAESU G-1000A(DX,SDX)	X	
YAESU G-2800A	X	
YAESU G-550	X	
YAESU G-5500	X	[*] Available with restrictions
KENPRO KR-400 (RC)	X	
KENPRO KR-500	X	
KENPRO KR-600 (RC)	X	
HY-GAIN HDR-300A	X	
HY-GAIN T-2x (T-2xx)	X	Also for use with DCU-3
HY-GAIN AR-40 (500)	X	Available for other old models of rotors and models with digital controller (DCU-1, e.t.c.)
HY-GAIN HAM-V (VX) HAM IV with DCU-3 with digital controller	X	

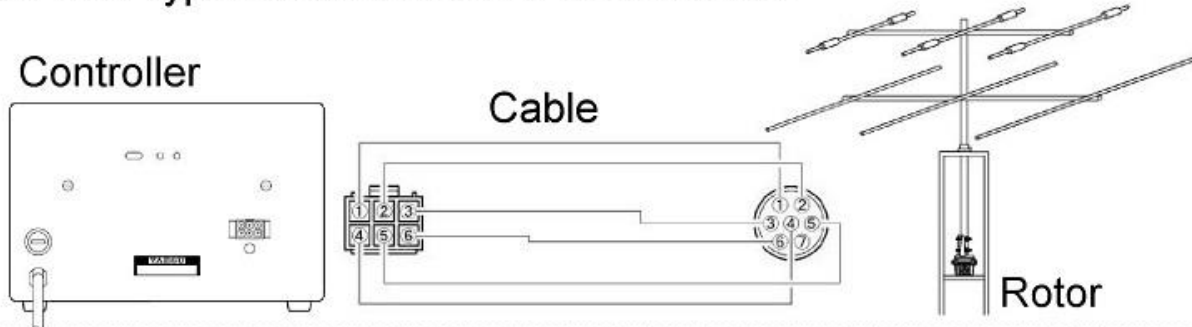
[\*] recommend use of two LPR to increase protection

If you don't see in the table your rotor or controller please contact with  
RA3WDK

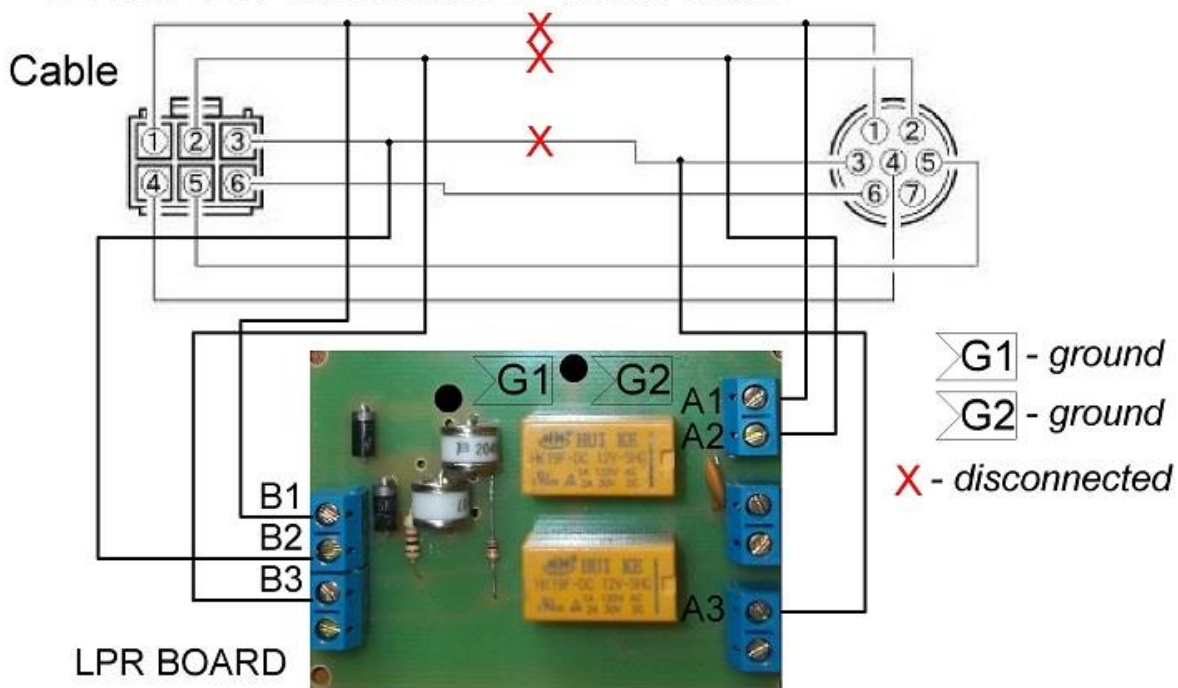


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... radio amateurs are not born, they become

## #1 The Typical Connection of Yaesu rotors



## #2 The LPR Connection to Yaesu rotors



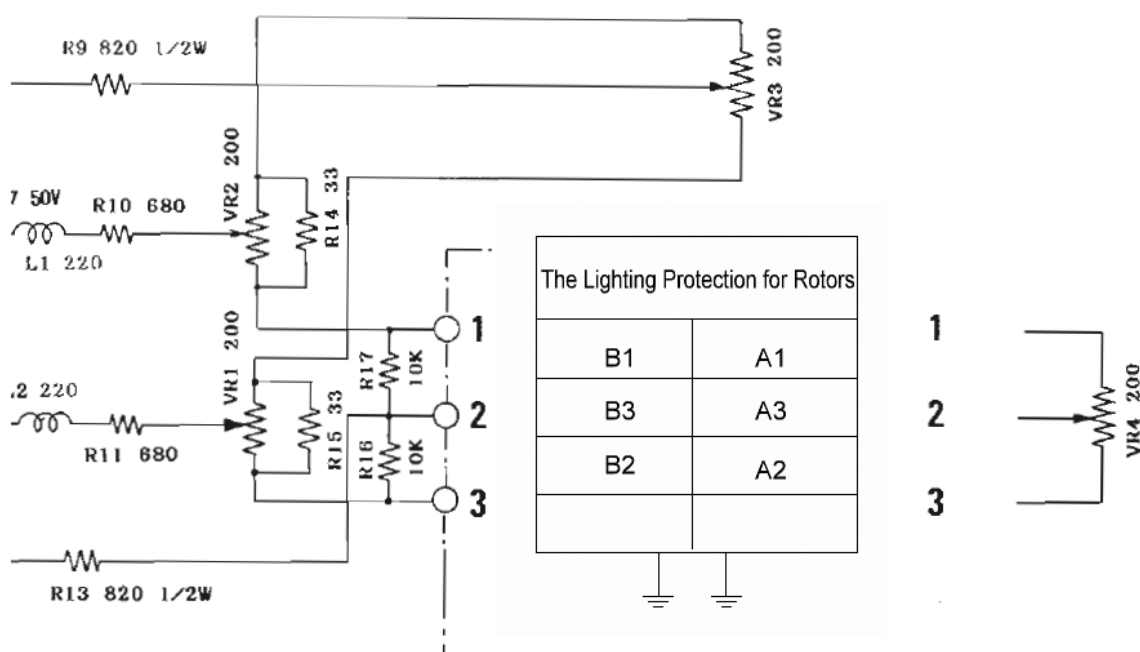
**G1, G2 Must be connected to the main GROUND POINT of the shack**

### IMPORTANT INFORMATION ABOUT GROUNDING:

- Amateur radio equipment should be grounded in the single ground point (better outside of house/shack).
- You must connect PLR ground wire to that ground point.
- TURN OFF and UNPLUG the control rotor equipment and TRX (included PS) before start grounding.

## LPR Connection Diagram for Yaesu G-250A rotor:

### DIAGRAM of G-250 Yaesu

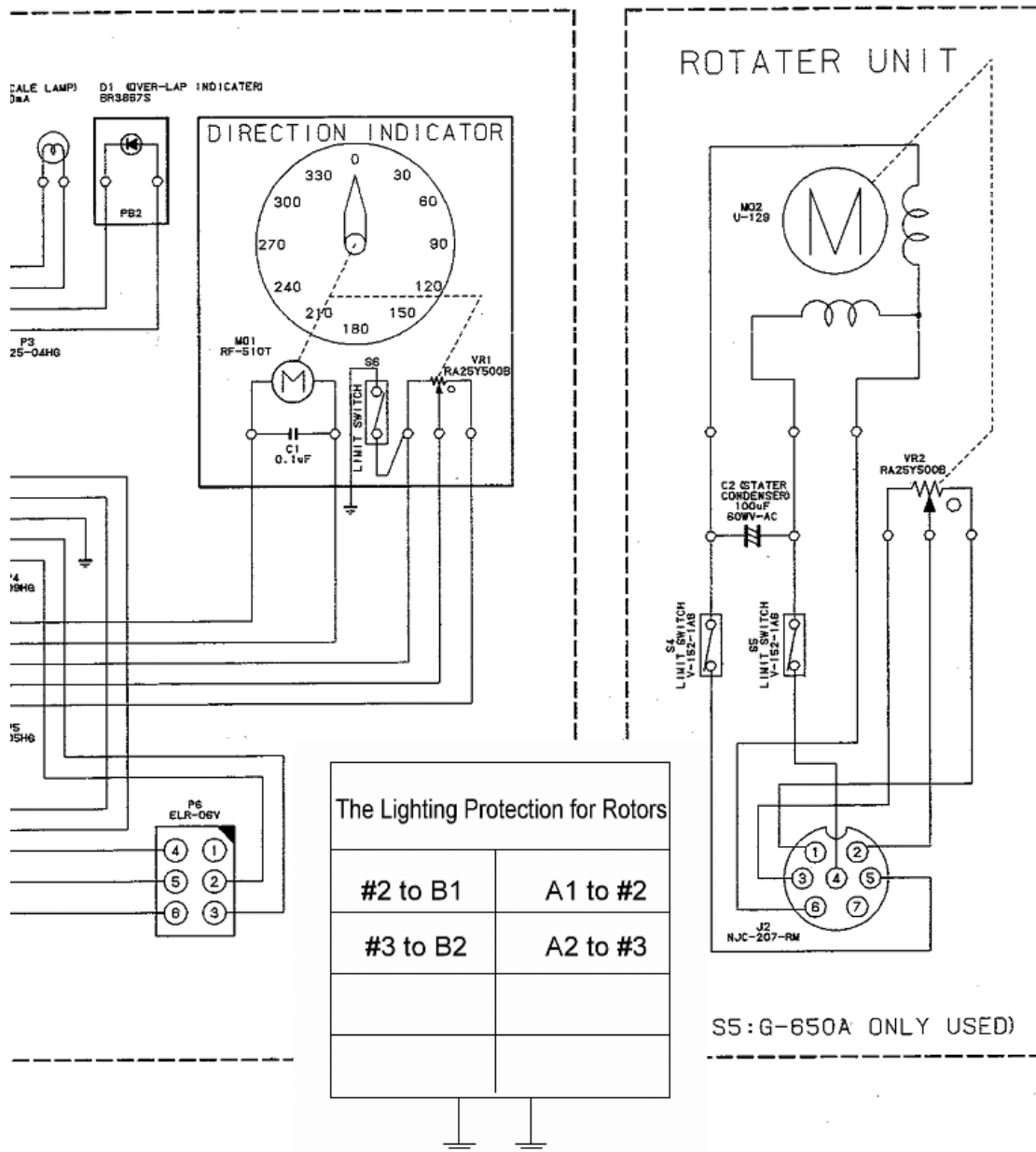


## Table of connection LPR to Yaesu G-250 rotor

CONTROL UNIT	LPR OUTPUT	ROTOR	LPR INPUT
Pin 1	B1	Pin 1	A1
Pin 2	B2	Pin 2	A2
Pin 3	B3	Pin 3	A3

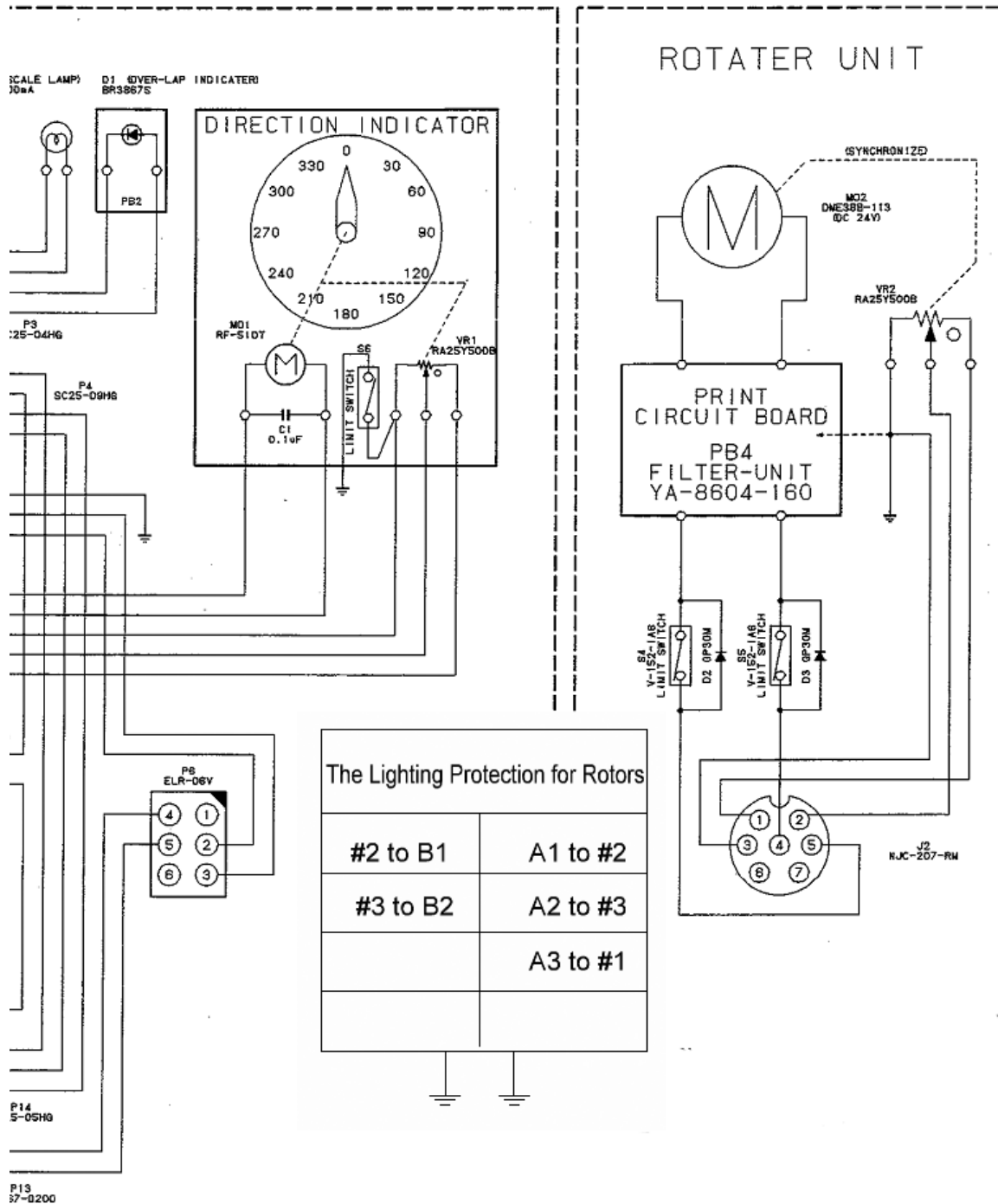


## LPR Connection Diagram for Yaesu G-450A/650A rotors:



## G-450A/-650A Connection Diagram

## LPR Connection Diagram for Yaesu G-1000A rotor:

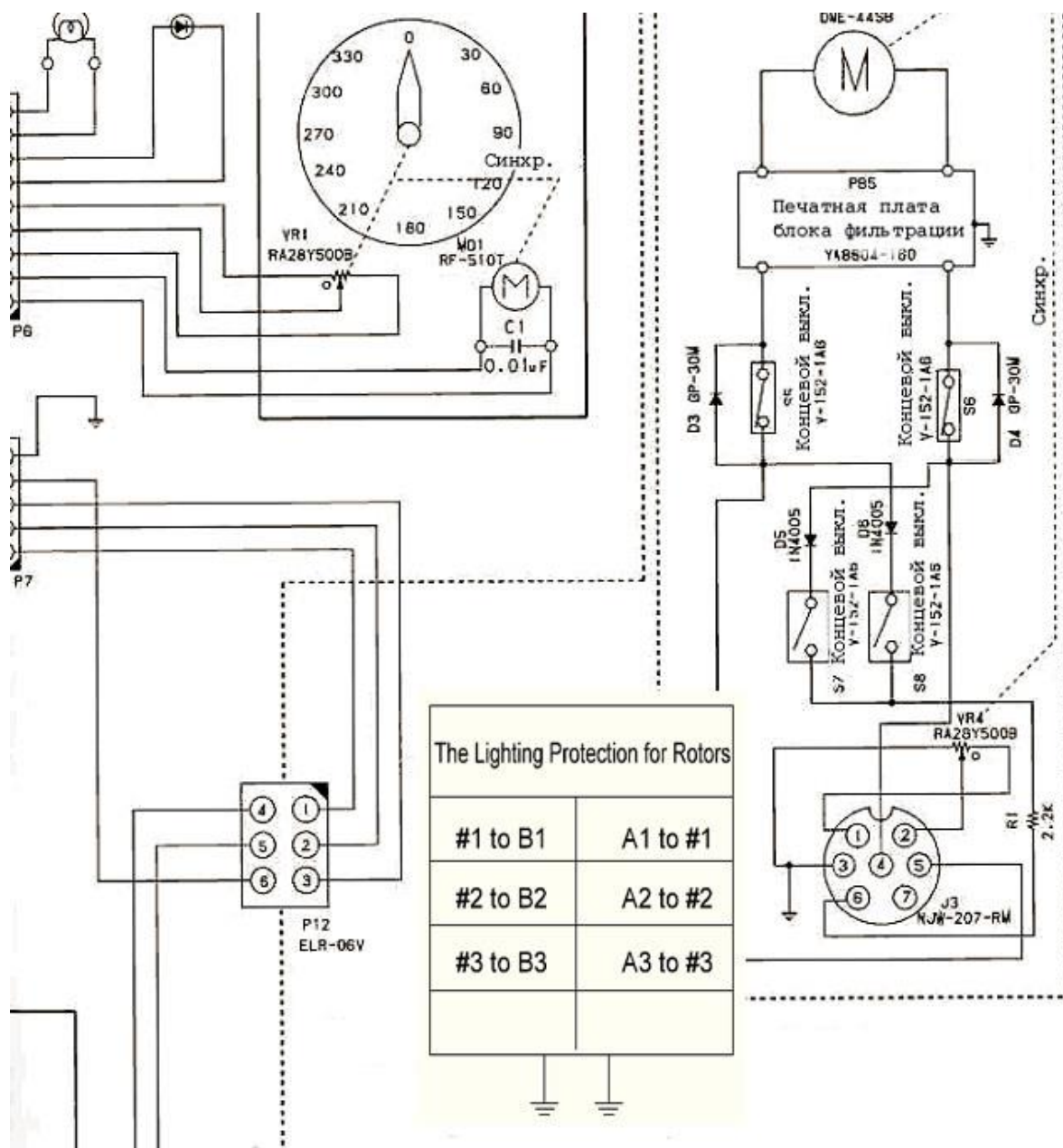


## G-1000A Connection Diagram



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### LPR Connection Diagram for Yaesu G-2800A rotor:



*More connection diagrams for other rotors will be available soon...*

Check <http://k6vhf.com> and <http://ra3wdk.grz.ru> for updates and manuals.



## Lightning Protection for the Rotors (LPR)

*by Ivan RA3WDK*

- Current LPR **version V2** - available from May 2014
- Previews version V1 is *discounted* since April 2014

*For more information please contact 24/7:*

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*Also please visit:*

K6VHF Website – <http://k6vhf.com>

RA3WDK Website – <http://ra3wdk.qrz.ru>

LPR author and designer – *Ivan RA3WDK*

Support and USA official distributor – *Alex K6VHF*

**ASSEMBLED IN USA**

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*Stay in Touch!*