Ham Rotor V 1.0

Ham Rotor is a program created for Arduino pro mini, which allows to manage CDE, HYGAIN of the CD family and HAM rotors from the RS232 serial communication port or through LAN, supporting the Prosistel protocol so it can be controlled from a PC . In addition to being able to use it both in rotors with a center in the North or with a center in the South, Ham Rotor, adds Start / Stop ramp, and resolution of + - 1 degree. It is easy to install inside the rotor control and simple to calibrate, you only need to indicate the left stop and the right stop and Ham Rotor will calculate all the necessary data for its correct use.

Thank you for trusting Ham Rotor

FEATURES

- Easy installation and use.
- Braking / Soft start and Ramp (between 5 and 10 degrees).
- Connection to the PC via LAN, RS232, with Prosistel protocol at 9600 baud or Web Server.
- Pushbuttons for left and right turn.No need for brake pushbutton. The brake is controlled by the software automatically.
- Allows rotor with center in North or center in South.
- Etc.

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Ham Rotor Usage:

Once the control knob is turned on, you must wait for the LED diode to turn on. Its lighting indicates that the control is fully operational. Then start the program with which you are going to control the rotor (PSTRotator, etc) or your internet browser, or both to be able to handle the rotor automatically. You can also operate it manually using the twist levers on your hand control. The brake button does not need to be pressed as Ham Rotor activates / deactivates it automatically.

Ham Rotor setup and calibration:

Setting up and calibrating Ham Rotor is very simple. It is done through the RS232 serial port. The program called Termite allows you to configure Ham Rotor through a series of commands. The program is free and you can download it at https://www.compuphase.com/software_termite.htm

Once Termite is installed, select the Config button. In the configuration window we will select the COM port to which Ham Rotor is connected, and we will select the parameters as shown in the following screen.
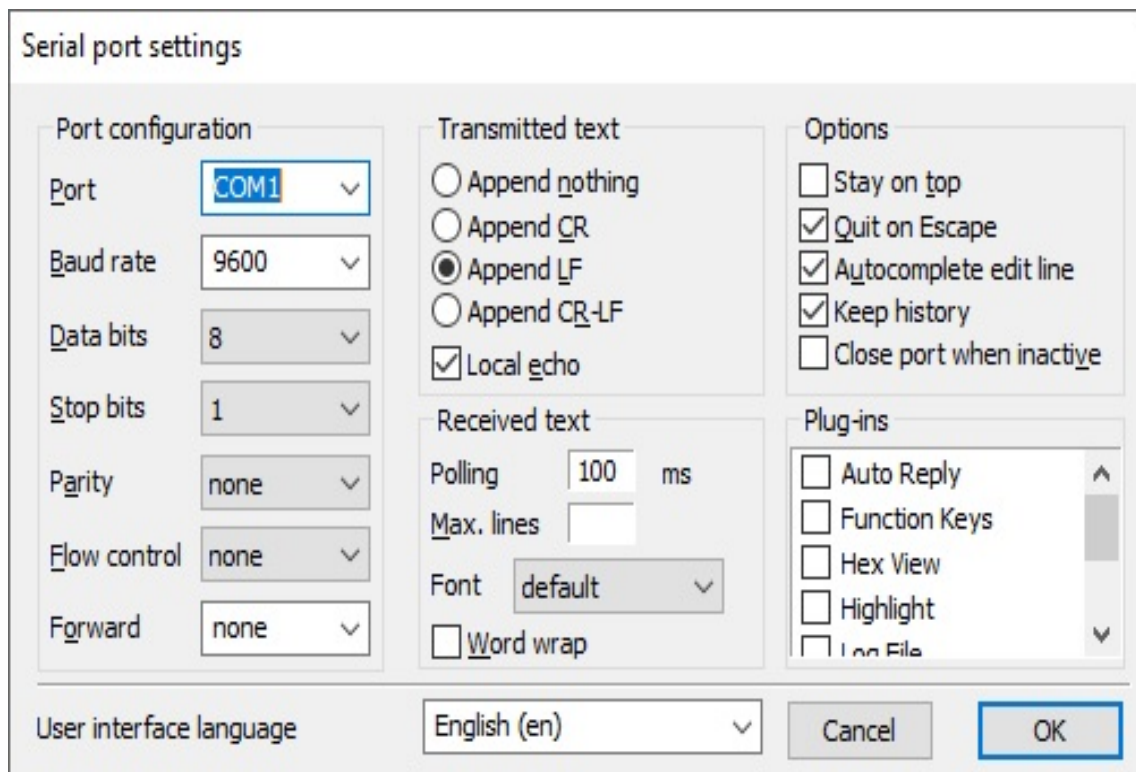
Once Termite is configured and with the control knob turned on and the RS232 port connected to the PC, you can use the following commands to configure Ham Rotor.

Command listing for Ham Rotor

All Ham Rotor commands begin with the format ** followed by the command in capital letter and followed by a numeric value if necessary. Once a command has been sent, Ham Rotor will return its configuration information if it has been correct or it will return ERROR in case the command has not been configured correctly.

Command C: Allows you to change the format of the rotor center. Adding the value 0 allows the control of the rotor with its center in the North (S-N-S meter). If we add the value 1 this allows the control of the rotor with its center in the South (N-S-N meter). Example **C0 allows North-centered rotor (S-N-S meter).

Command I: Displays the status information of the rotor configuration. No need to add any value to it. Example **I, returns the configuration status.

Command L: Allows you to record the left top of the rotor. No need to add any value to it. Example **L

Command M: Allows you to change the last digit of the MAC address of the Ethernet module. Values allowed between 0 and 255. Example ** M3.

**Command N**: Reset Ham Rotor to default values. It is not necessary to add any value to it.Example **N

Command R: Allows you to record the Right top of the rotor. No need to add any value to it. Example **R

Command V: Record the value for the ramp. Allowed values between 5 and 10. Example **V6

Command W: Allows to activate the Ethernet module for the control of Ham Rotor through Web. Adding the value 0 allows you to disable the Ethernet module. If we add the value 1 this activates the Ethernet module.Example **W0

IMPORTANT. When you activate or deactivate the module, you must turn off your remote and turn it on again.

Example of configuration information returned by Ham Rotor when using the I command:
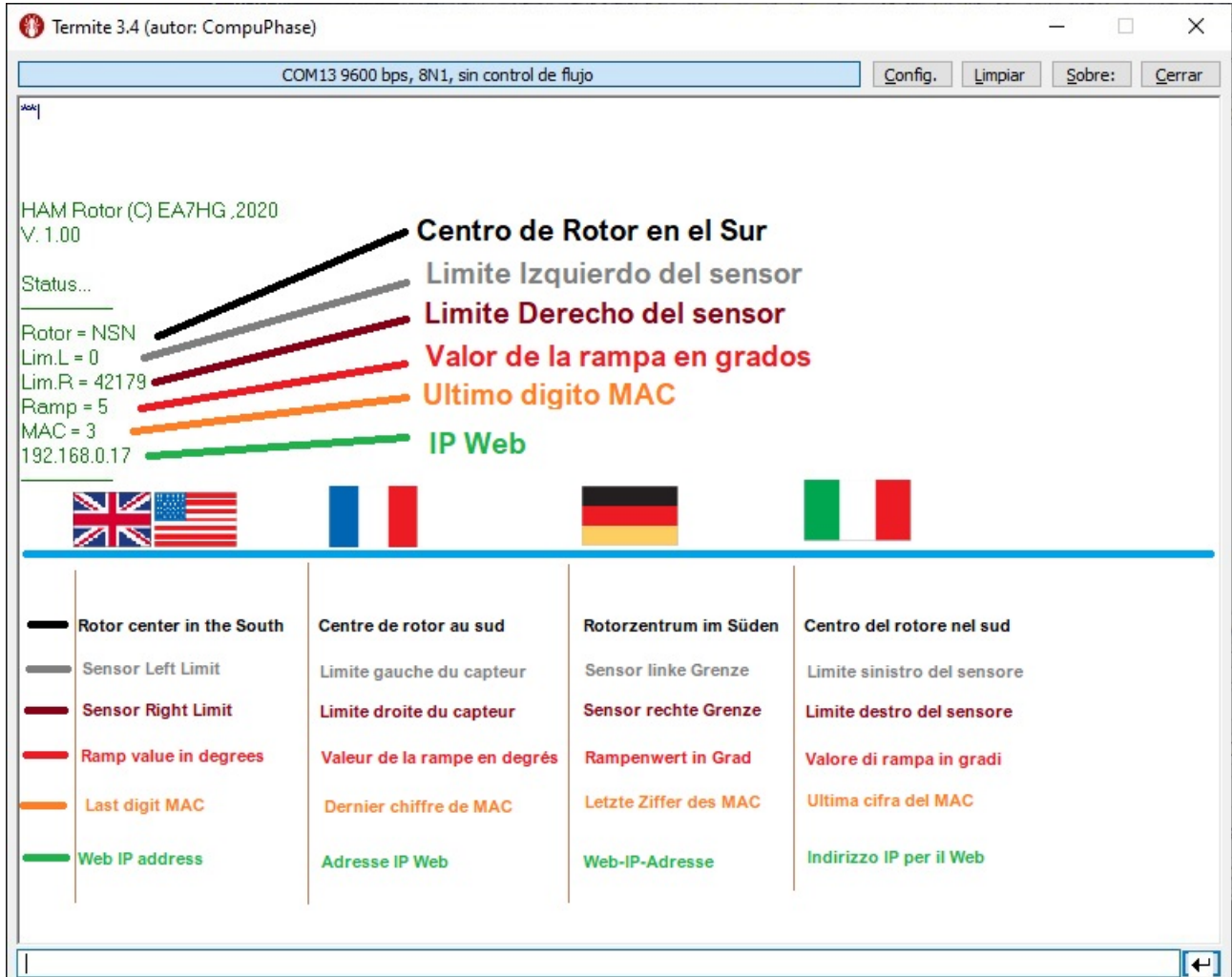
The IP address will be returned by Ham Rotor when it is connected to the router.

Ham Rotor default parameter table:

Parameter	Value
Center	0 … S-N-S
Limit Left sensor	1
Limit Right sensor	50000
Ramp value in degrees	5
Last MAC Digit	3 (MAC 0x00, 0xAA, 0xBB, 0xCC, 0xDE, 0x03)

Ham Rotor PIN table on Arduino:

| PIN ARDUINO	FUNCTION
A3	Heading reading voltage <=5V
0	TX TTL
1	RX TTL
2	Relay CW
3	Relay CCW
4	Relay Brake
5	PWM
6	Right Turn Pushbutton
7	Left Turn Pushbutton
8	Led
10	SS W5100 o W5500
11	MO W5100 o W5500
12	MI W5100 o W5500
13	SCK W5100 o W5500

Ham Rotor Kit Contents:

The Ham Rotor kit consists of :

Control board containing :
–   relay circuit for rotor rotation.
–   voltage adapter circuit for heading reading.
–   Rotor start / stop ramp control circuit and + - 1 degree resolution.
–   converter circuit for RS232.
Arduino board with Ham Rotor software installed.
**1000 Ohm resistor, Axial Inductance and 10 nF capacitor.**
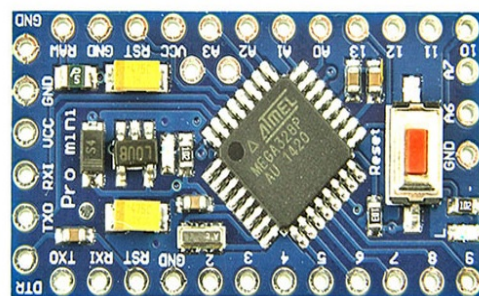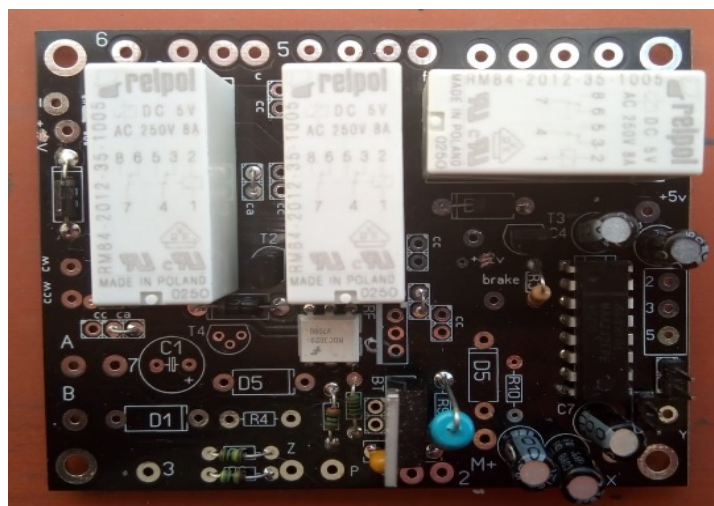
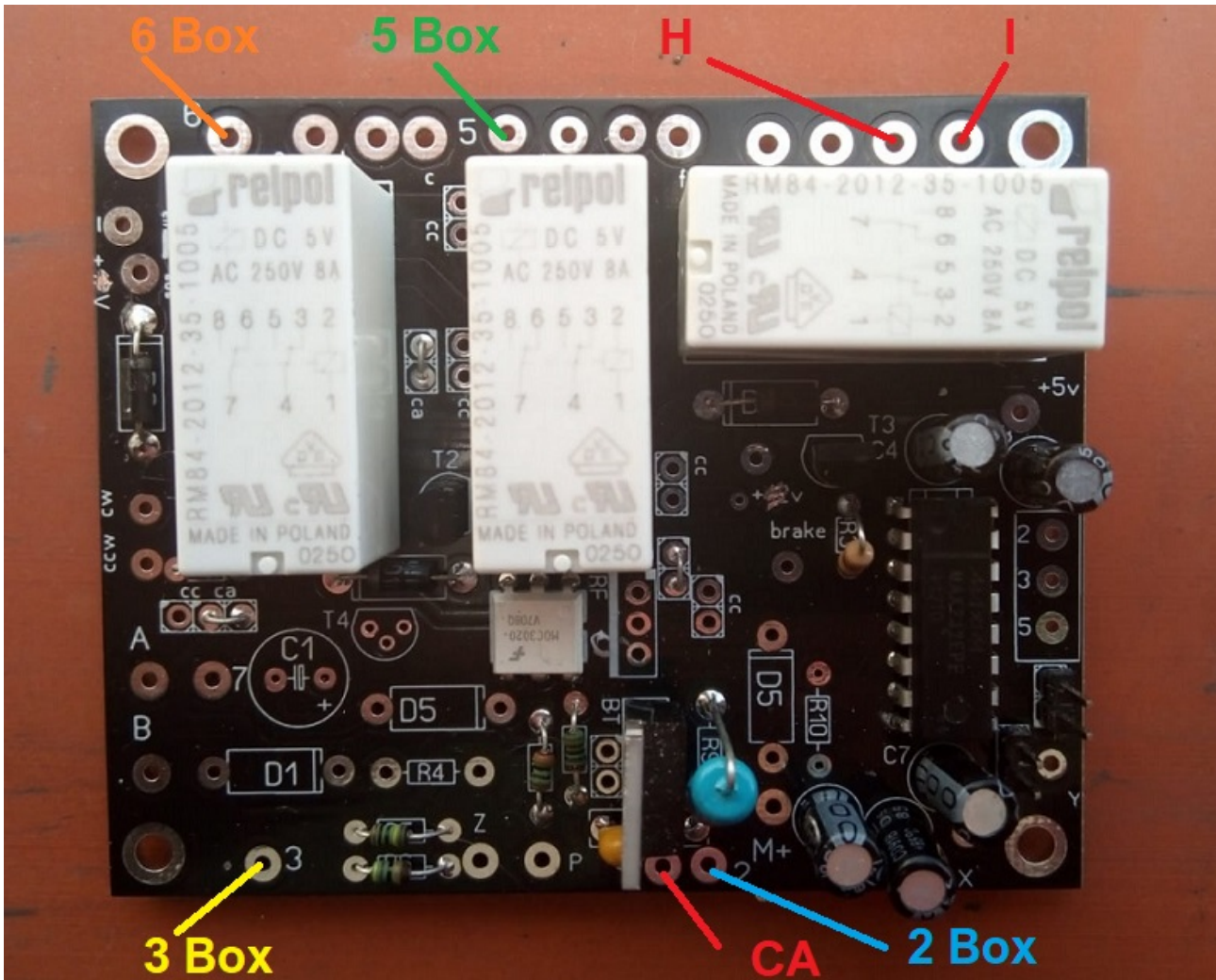For the installation and operation of Ham Rotor you will also need and not included in the Kit:
–   Diode Led
–   Resistance 1000 ohm ¼ watt.
–   RS232 Male Connector.
–   1A 5V Power Supply (Good quality).
–   W5100 or W5500 Ethernet module, for control from WEB. (Optional)
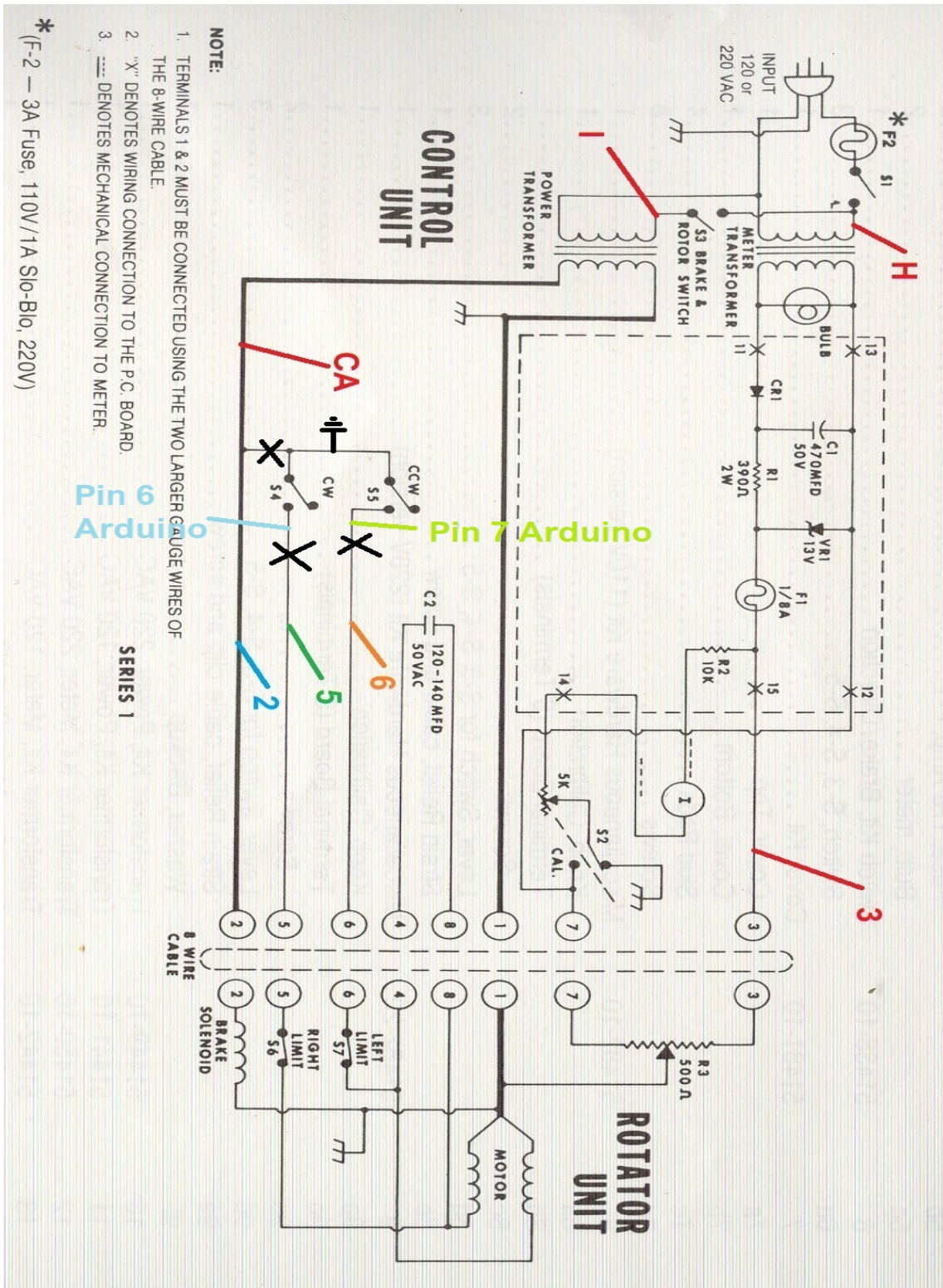
Ham Rotor Control Board Description:

Connection with Arduino and RS232 connector.
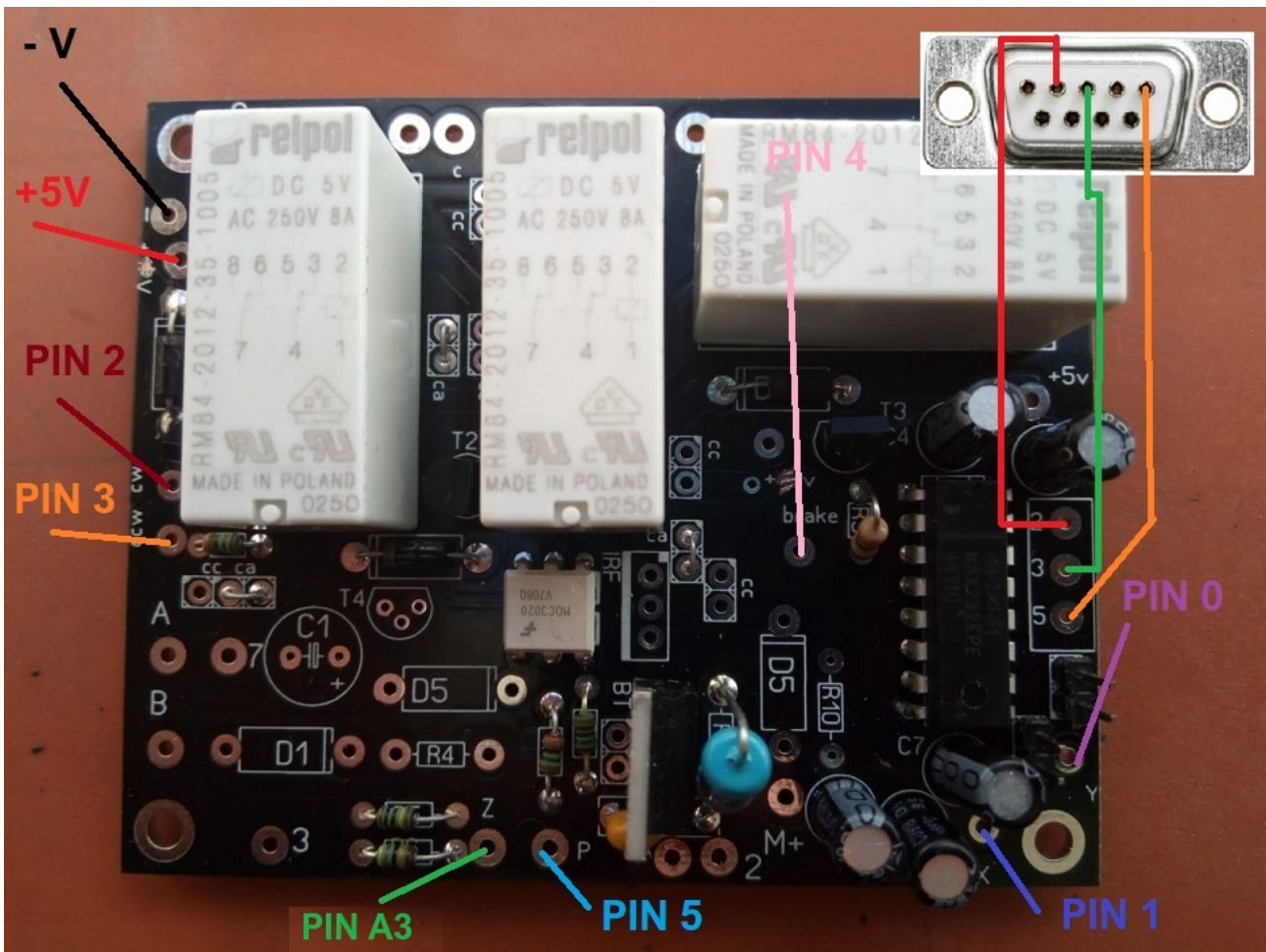
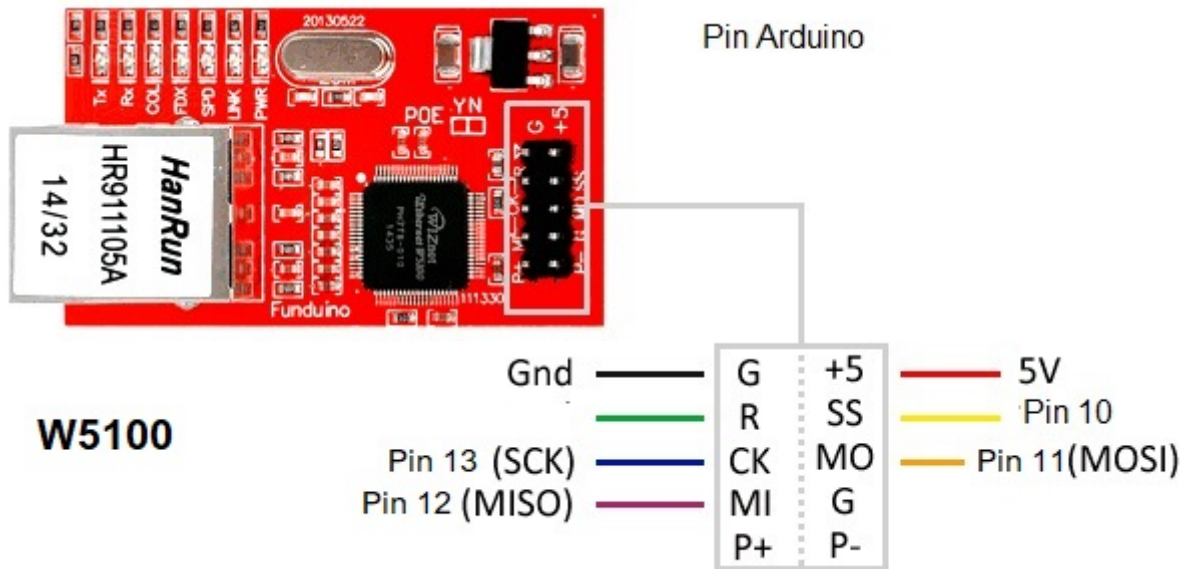Connection with the rotor control.
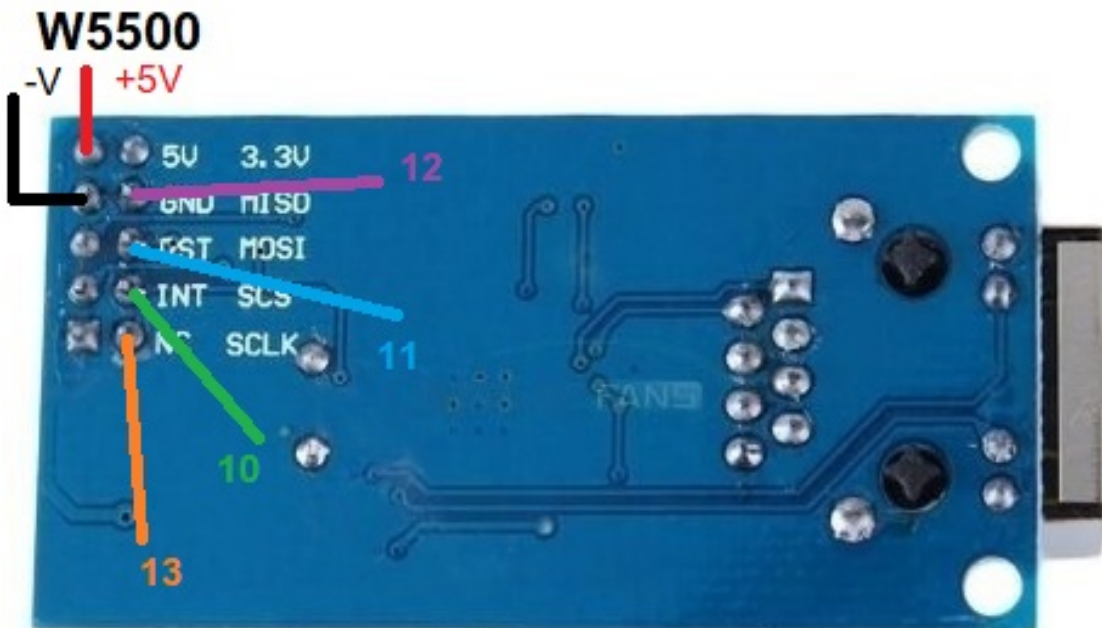
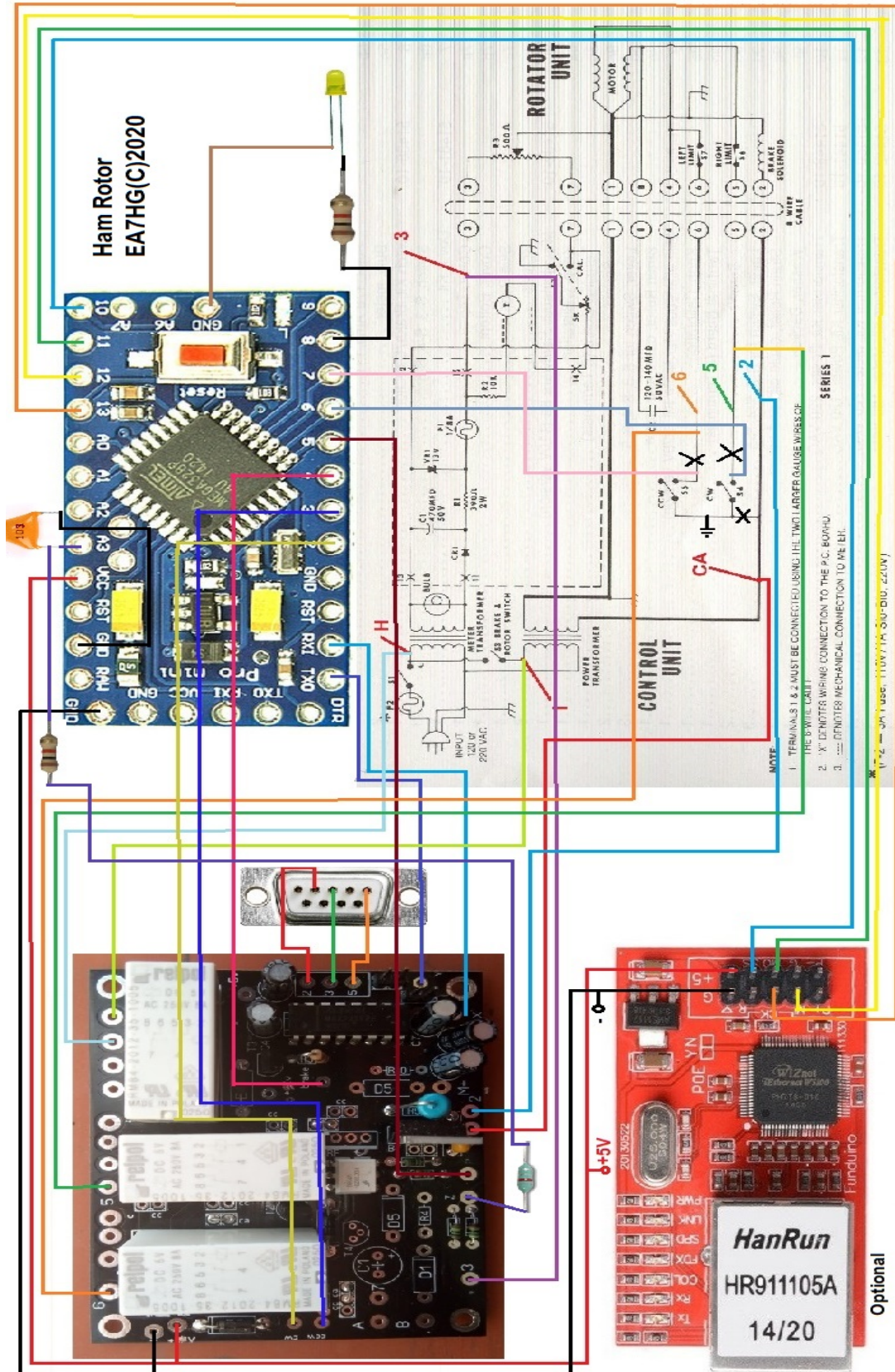# Rotor Drive Modification Scheme for Ham Rotor:

LAN circuit:

In order to use Ham Rotor from your internet browser you need to install this **W5100 or W5500 LAN module with SPI connection**. The connection is very simple:

W5500 LAN with SPI connection.

Ham Rotor connection with W5100:

Ham Rotor connection with W5500:
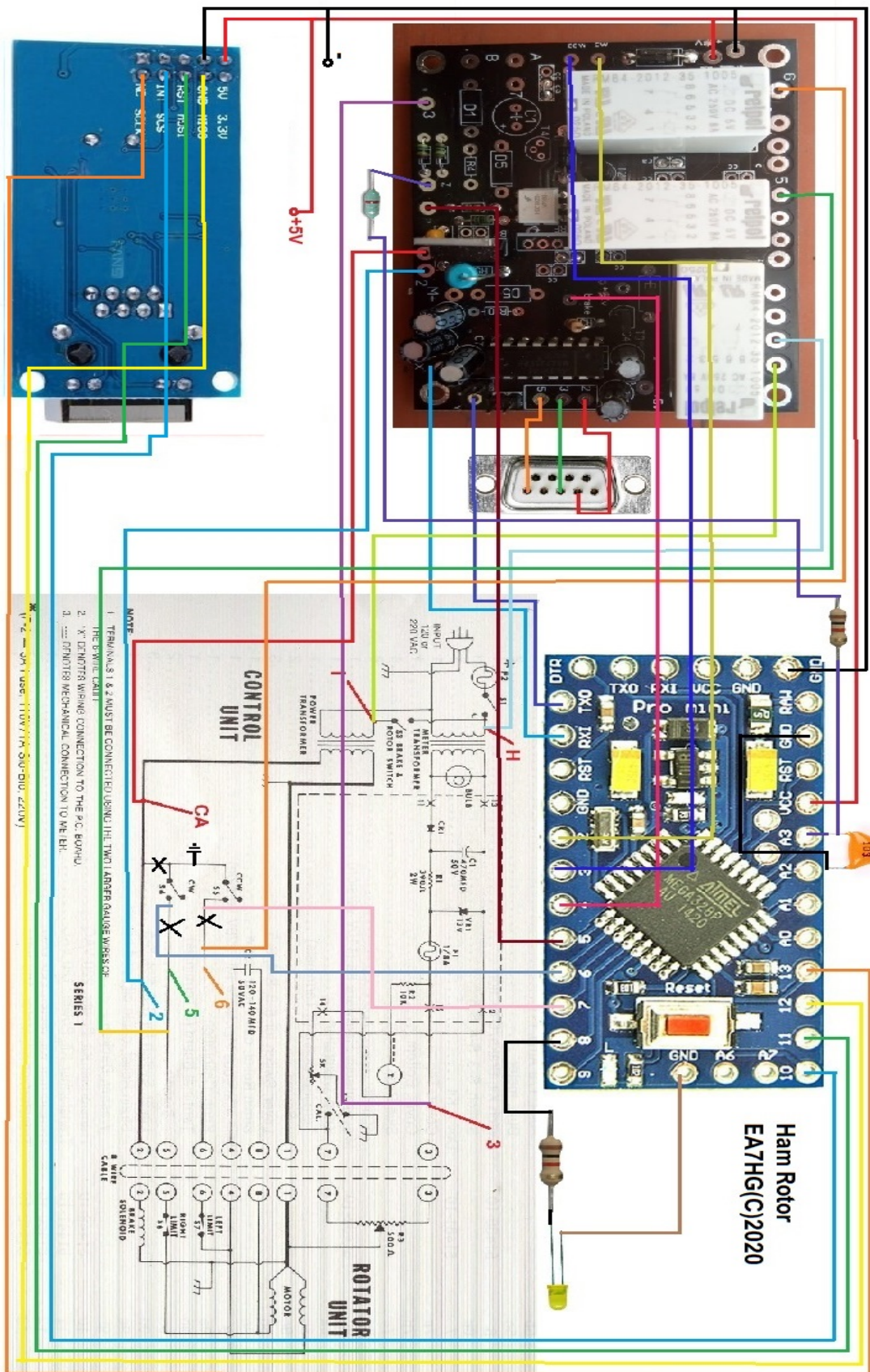
INSTALLATION IN THE HAM IV, CD45, ETC CONTROL:

CD45, HAM II, HAM III, HAM IV, HAM V, HAM VI,HAM VII

NOTE: At no time am I responsible for any damage that you may cause to your remote control.

USE SHORT CABLES OF GOOD QUALITY FOR THE CONNECTION BETWEEN THE HAM ROTOR CIRCUITS, TO AVOID MALFUNCTION.

At the bottom of the box control you can install the entire Kit Ham Rotor.

Drill the necessary holes to screw the PCBs and connectors.Once placed we will proceed to solder the wiring as indicated in the diagram.The cables that are in the upper part of the box can be passed to the bottom of the box through the large hole inside the box rotor control.
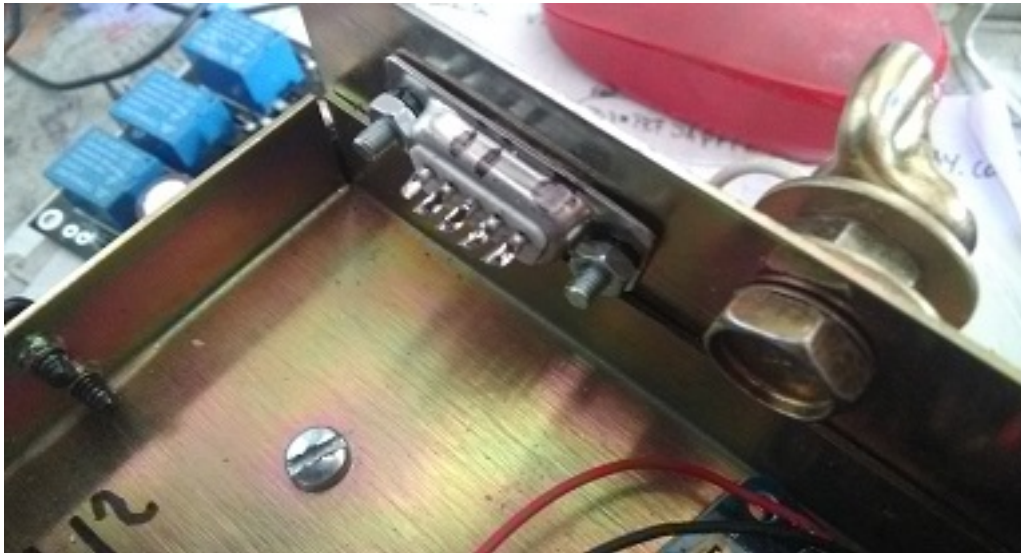
Solder the cables that go to the RS232 connector to the control board.

If you also install the LAN option, solder all the wiring to the Arduino following the connection diagram.

Unsolder the cables from the heading buttons located at the bottom of the control box and solder them on the control board following the numbers and letters indicated.
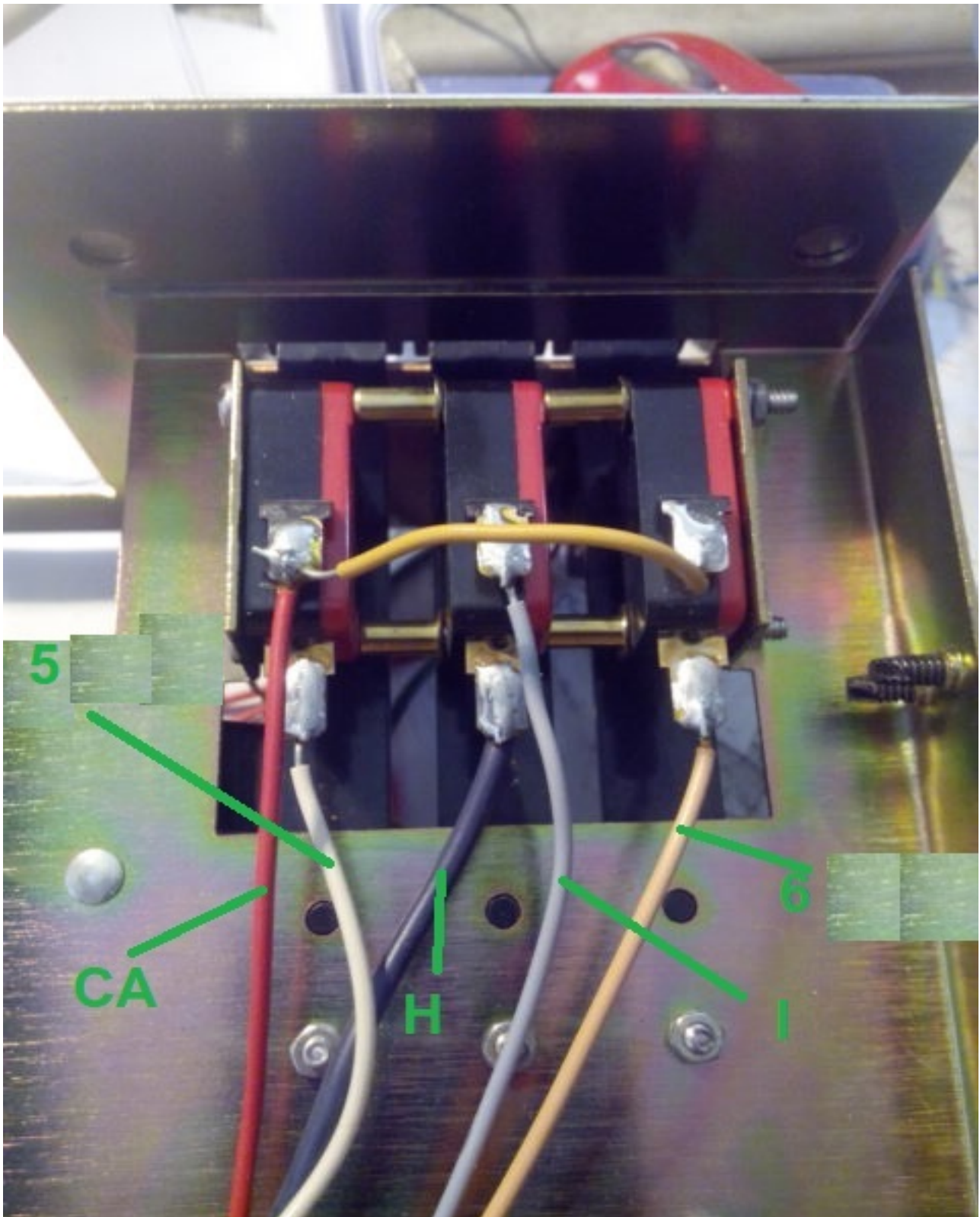
Solder three wires on the heading pushbuttons that will connect to the Ardunio.
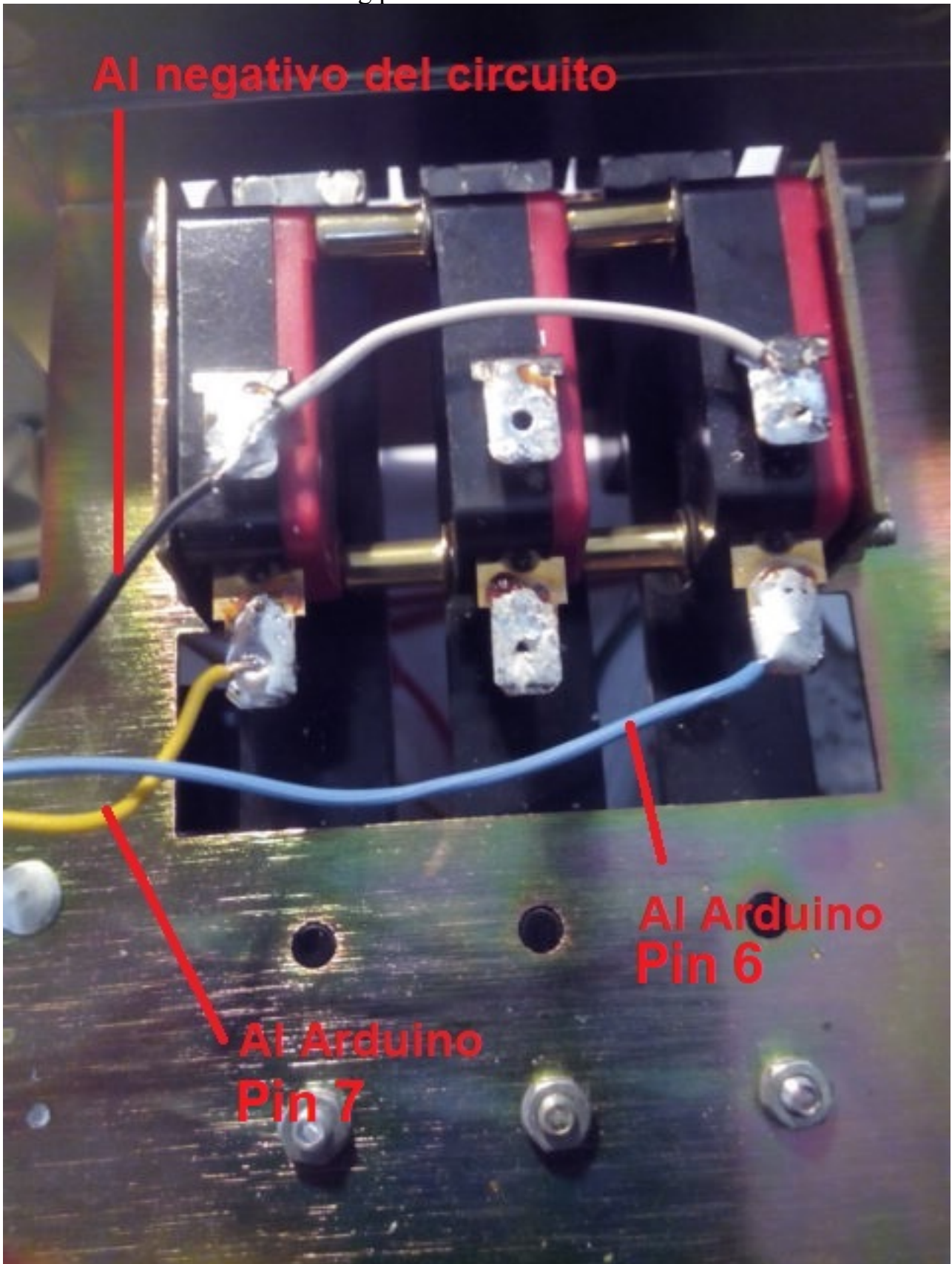
Solder the rest of the cables from the Arduino to the control board following the wiring diagram.

The led diode with its resistance can be placed on the meter itself just below the meter adjustment screw. (Not included in the Kit)

Solder the 5V + and - wires from the control board to the power supply for the operation of the whole kit (Not included in the kit). Solder two Vcc and GND wires to power the Arduino board. The + of 5V connect it to the pin of the Arduino marked VCC and the - of 5V to the pin marked GND

Once this is done, check that all the wiring is correct.

Rotor Calibration:

Rotor calibration is very easy. We will connect the RS232 serial port to our computer. We will turn on the rotor control and once the Led is on, we will open the Termite program.
We will select in this the port to which our Rotor is connected. Through Termite we will send Ham Rotor the command **I. Ham Rotor will give us back the status information.
We will turn the rotor to the left with the CCW lever until it reaches its stop.
Once at the top we will send the command **L and the left top of the Rotor will be recorded. We will turn the rotor to the right with the CW lever until it reaches its stop.
Once at the stop we will send the command **R and the right stop of the Rotor will be recorded.

Once this is done, we will close the Termite program, turn off the rotor control and wait a few seconds and turn it on again so that it is operational.

<u>Rotor connection via Web:</u>

We will connect the Ethernet cable to the W5100 or W5500 LAN module and this to our router. Once connected we will turn on our remote. Once the IP address is known through the configuration of our router or by the status of Ham Rotor, simply type this address in our browser to be able to control Ham Rotor.

Remote rotor connection via Ethernet:

(Information courtesy of Jose Ramón EC1CS).
We will connect the Ethernet cable to the W5100 or W5500 LAN module and this to our router. Once connected we will turn on our remote control, we will access the configuration of our router to see what address it has assigned and we will assign a fixed IP within our network. We will do this through the DHCP reservation.

DHCP Address Reservation

This page displays the static IP address assigned by the DHCP Server and allows you to adjust these configurations by clicking the corresponding fields.

	MAC Address	IP Address	Status	Edit
☐	00:1f:d0:b6:78:d4	192.168.0.165	Enabled	Edit
☐	10:fe:ed:68:33:2d	192.168.0.110	Enabled	Edit
☐	00:AA:BB:CC:DE:03	192.168.0.101	Enabled	Edit

Add New   Enable Selected   Disable Selected   Delete Selected

Refresh

You have to redirect port 8080 to 80, so when I access from my ddns I can access as if I were doing it locally
To do this, it is configured again in the Virtual Server, giving the Service Port 8080 and the Internal Port 80

Virtual Server

	Service Port	IP Address	Internal Port	Protocol	Status	Edit
☐	2567	192.168.0.101	2567	UDP	Enabled	Edit
☐	8080	192.168.0.101	80	TCP or UDP	Enabled	Edit
☐	1201	192.168.0.110	1201	TCP or UDP	Enabled	Edit
☐	843	192.168.0.110	843	TCP or UDP	Enabled	Edit

Add New   Enable Selected   Disable Selected   Delete Selected

From this moment I can access the web service through the internet as if I were at home.

Example....
http://adcbefghijk.ddns.net:8080

Rotor connection via RS232:

Ham Rotor uses the Prosistel protocol for handling rotors. Any program that allows the handling of rotors with the prosistel protocol (Prosistel "D") will work with Ham Rotor, such as PSTROTATORAZ, HRD, etc.
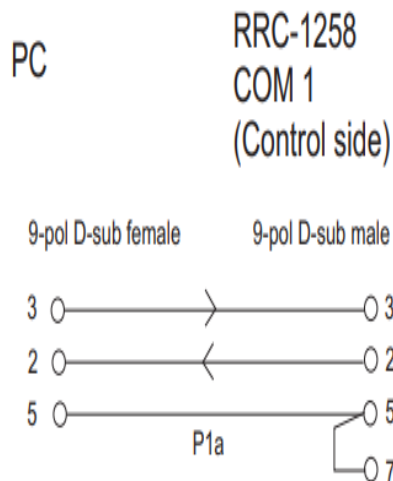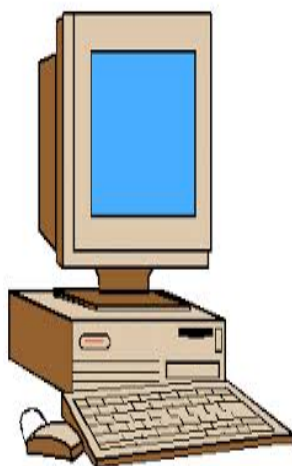
Rotor connection with RemoteRig and PSTRotator:

(Information courtesy of Jose Ramón EC1CS).
For this we will use the front COM1 port of the RRC-1258 MkII box, making a cable as described below:
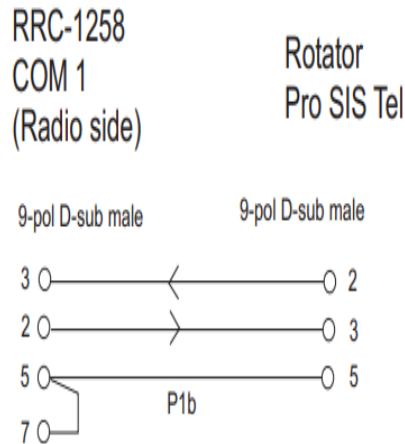
In the remote radio room, from the other RRC-1258 MkII box, we will make another cable to connect it with our PC, for this we will follow the following diagram.

In addition to making the cables correctly as described, we have to make the correct configurations in the boxes, for this the following configuration will be made:

RRC-1258 MkII: Control [MICROBIT REMOTE DISPLAY]

microbit

Info
Status
Wi-Fi scan

Profiles

IP settings
Radio settings
Serial settings
Advanced settings
Dynamic DNS settings
Keyer settings
IO settings
Ping settings
Wi-Fi settings

Export settings(HTML)
Export settings(bin)
Import settings(bin)

Application upgrade
Bootloader upgrade

Restart device

[Log in]

Serial settings

COM1 mode	Mode-3, char-timeout
COM1 baudrate	9600
COM1 data bits	8
COM1 stop bits	1
COM1 parity	0 - Off
COM1 rts/cts	No
COM1 terminator (hex)	00
Use USB Com Port as COM1	No
COM2 mode	Mode-4, Kenwood, Yaesu, Elecraft
COM2 baudrate	9600
COM2 data bits	8
COM2 stop bits	1
COM2 parity	0 - Off
COM2 terminator (hex)	00
Use USB Com Port as COM2	No
COM3(Extra) mode (USB-COMFSK)	Inactive

[Submit]

RRC-1258 MkII: Radio [MICROBIT BODY EQUIPMENT]

microbit

Info
Status
Wi-Fi scan

Profiles

IP settings
Radio settings
Serial settings
Advanced settings
Dynamic DNS settings
Keyer settings
IO settings
Ping settings
Wi-Fi settings

Export settings(HTML)
Export settings(bin)
Import settings(bin)

Application upgrade
Bootloader upgrade

Restart device

Serial settings

COM1 mode	Mode-3, char-timeout
COM1 baudrate	9600
COM1 data bits	8
COM1 stop bits	1
COM1 parity	0 - Off
COM1 rts/cts	No
COM1 terminator (hex)	00
COM2 mode	Mode-4, Kenwood, Yaesu, Elecraft
COM2 baudrate	9600
COM2 data bits	8
COM2 stop bits	1
COM2 parity	0 - Off
COM2 terminator (hex)	00

[Submit]

Bear in mind that for the configuration to work, the radio equipment must be switched on. If it needs to work without the radio equipment being switched on, it must be activated in Radio Settings / Auto Connect / YES

RRC-1258 MkII: Control [MICROBIT REMOTE DISPLAY]

microbit

Info
Status
Wi-Fi scan

Profiles

IP settings
Radio settings
Serial settings
Advanced settings
Dynamic DNS settings
Keyer settings
IO settings
Ping settings
Wi-Fi settings

Export settings(HTML)
Export settings(bin)
Import settings(bin)

Application upgrade
Bootloader upgrade

Restart device

Log in

Radio settings

Program mode	5 - TS480/TM-D710/TM-V71
Sip password	••••••• Show
Sip contact(Radio RRC IP/hostname)	fdvlcam.ddns.net
Auto connect	Yes
	No
Audio quality	Yes _ar 16 bits 8 kHz_
Codec out gain	255
Codec inp gain	18
Codec inp HPF Hz	261
Codec inp preamp	Yes
COM0 baudrate	57600
COM0 data bits	8
COM0 stop bits	1
COM0 parity	0 - Off
COM0 Program mode 3 char timeout	4
Use USB Com Port as COM0	No

Submit

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Video ; https://www.youtube.com/watch?v=Zko1FWKGmrU

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EA7HG
Eugenio F.Medina Morales
23001 Jaén
España
Email : EA7HG@hotmail.com
WWW.EA7HG.COM