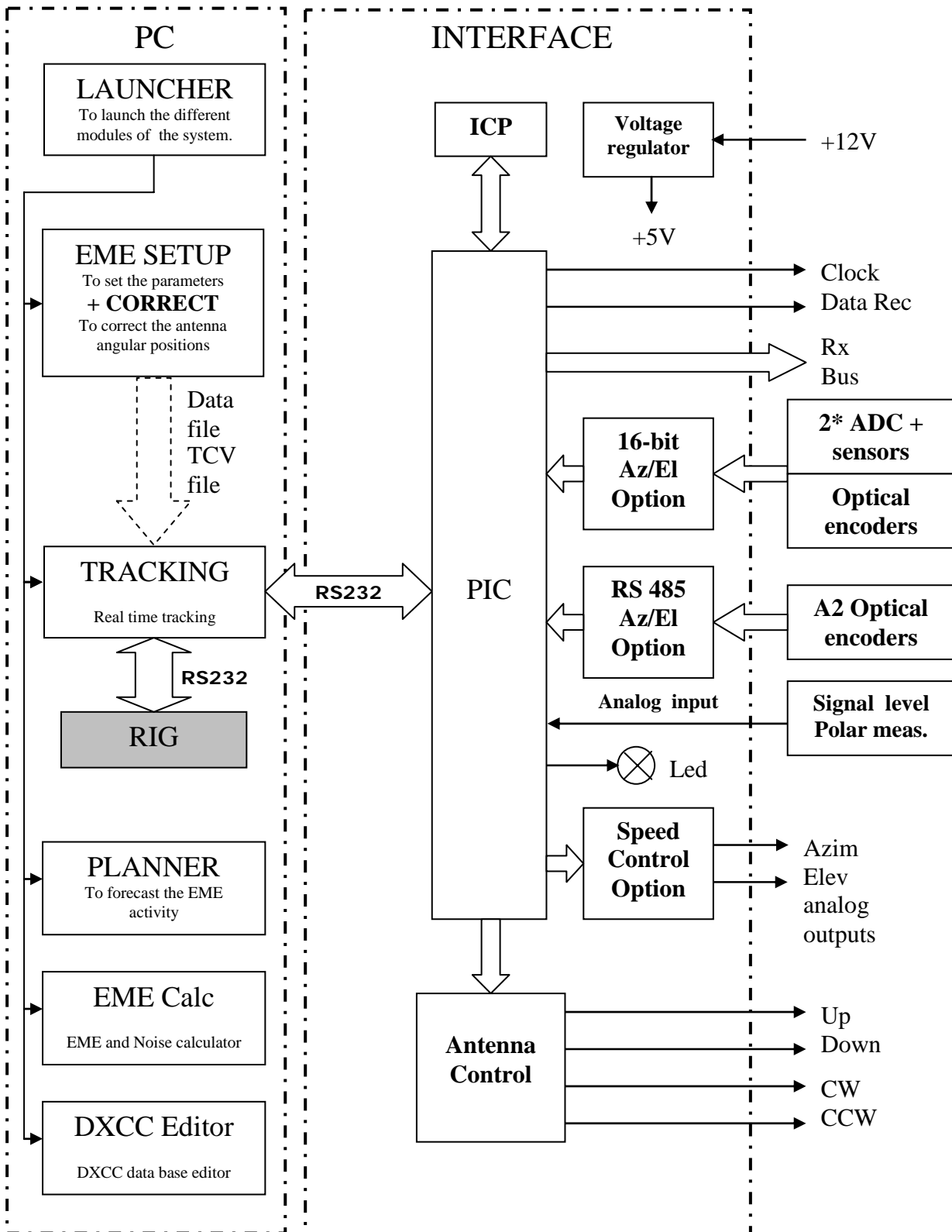
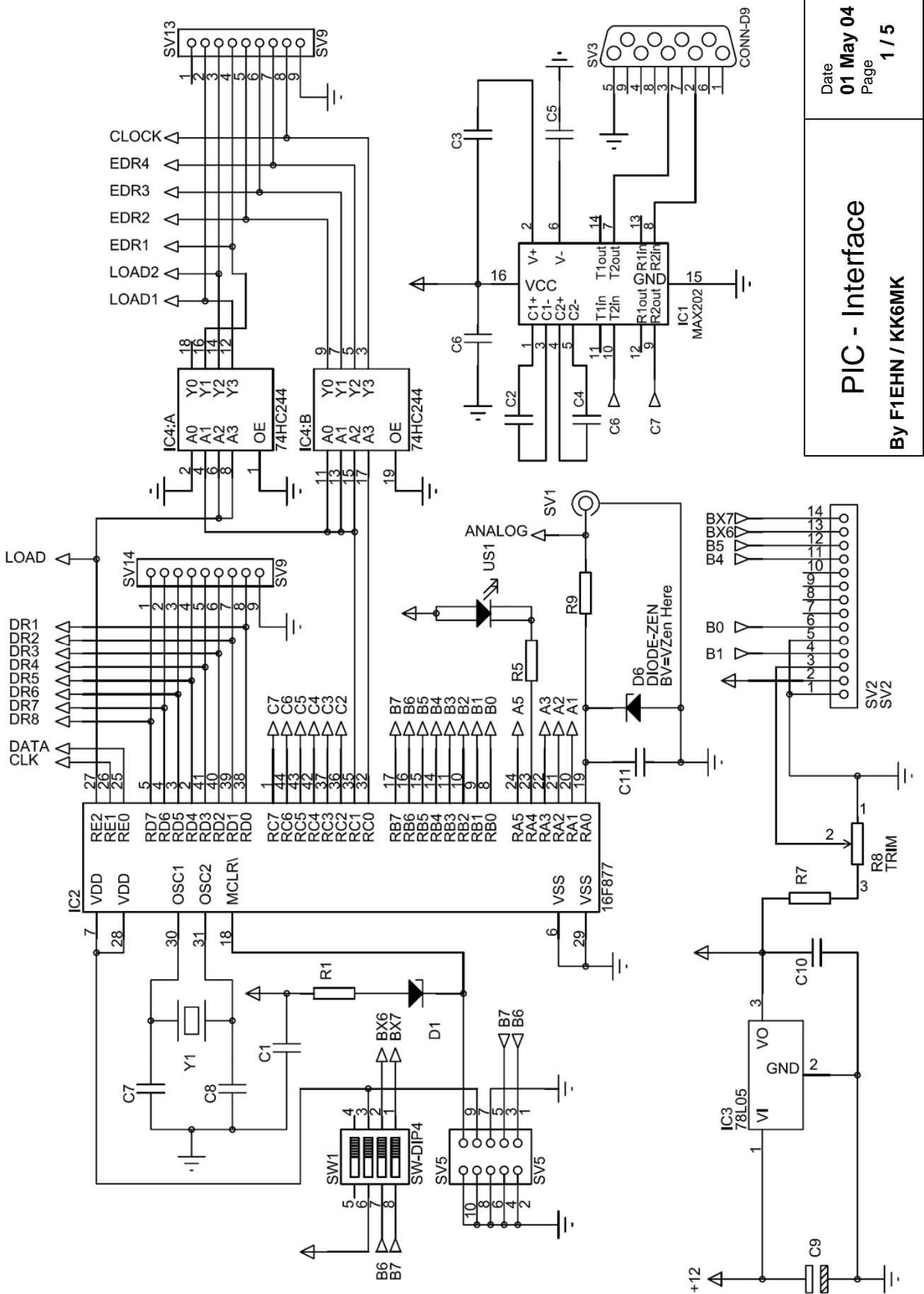


# EME System V7

by Jean-Jacques F1EHN – 08/2008



# Main function (1/2)

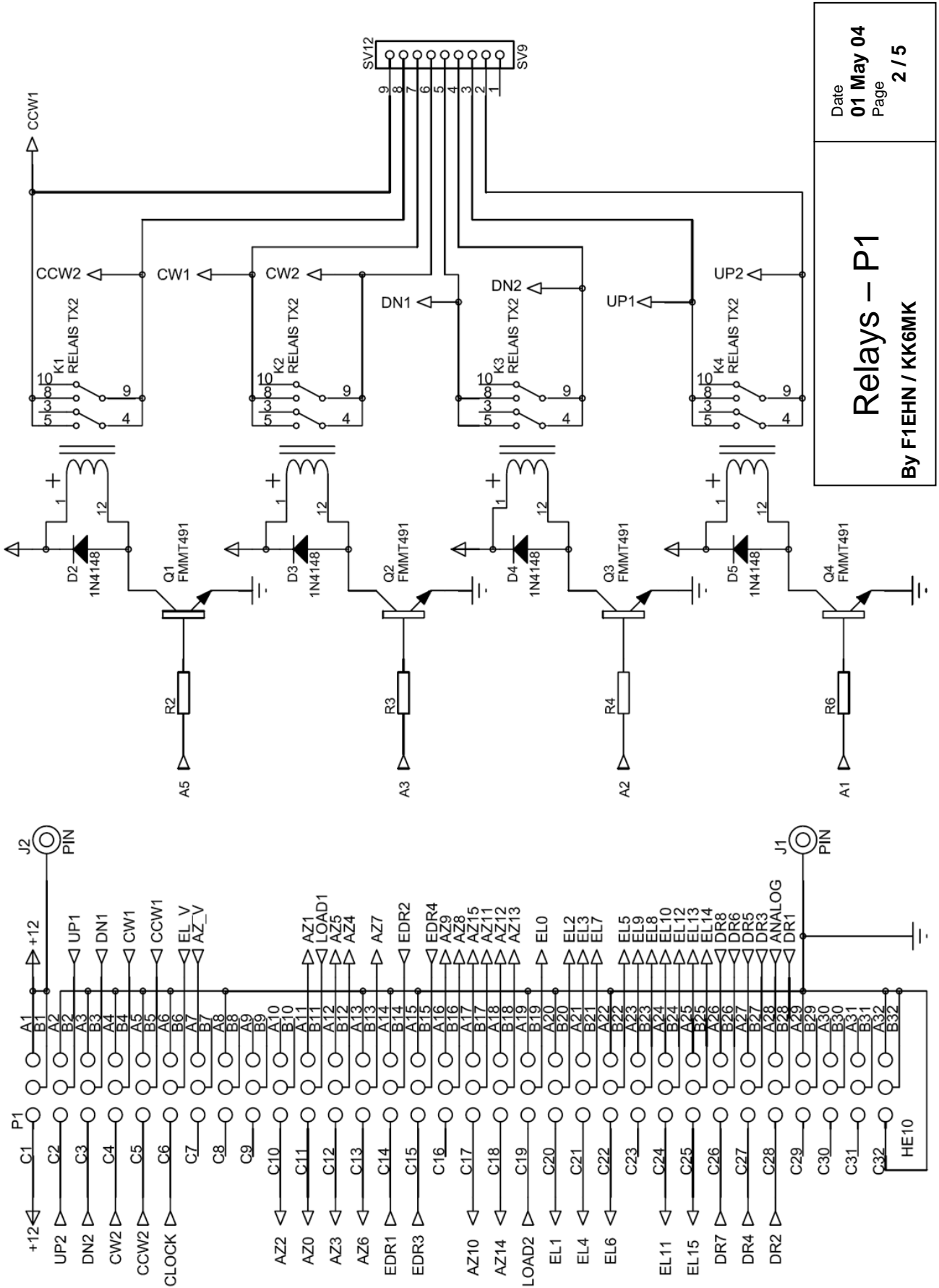


**PIC - Interface**

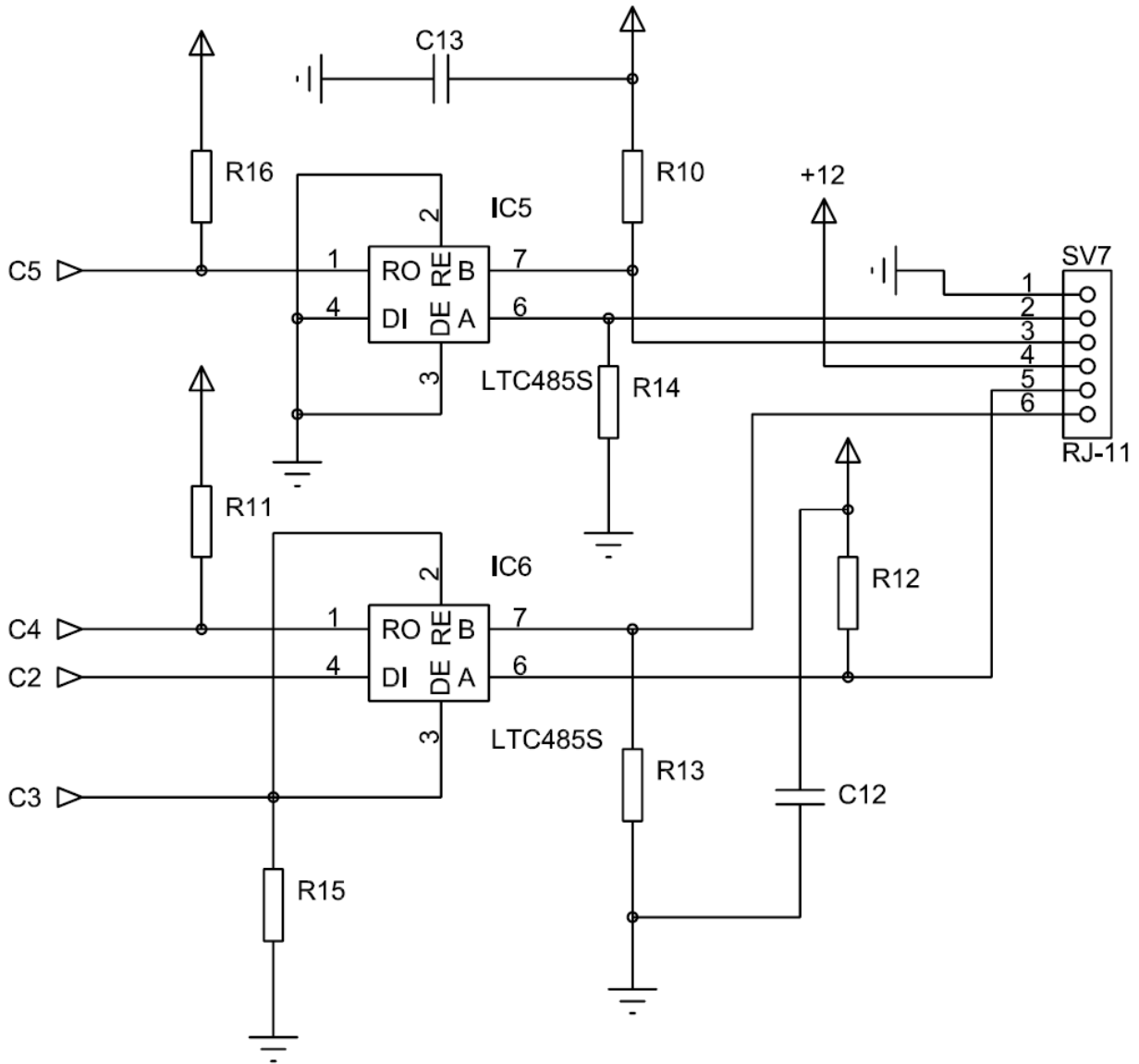
By F1EHN / KK6MK

Date **01 May 04**  
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# Main function (2/2)

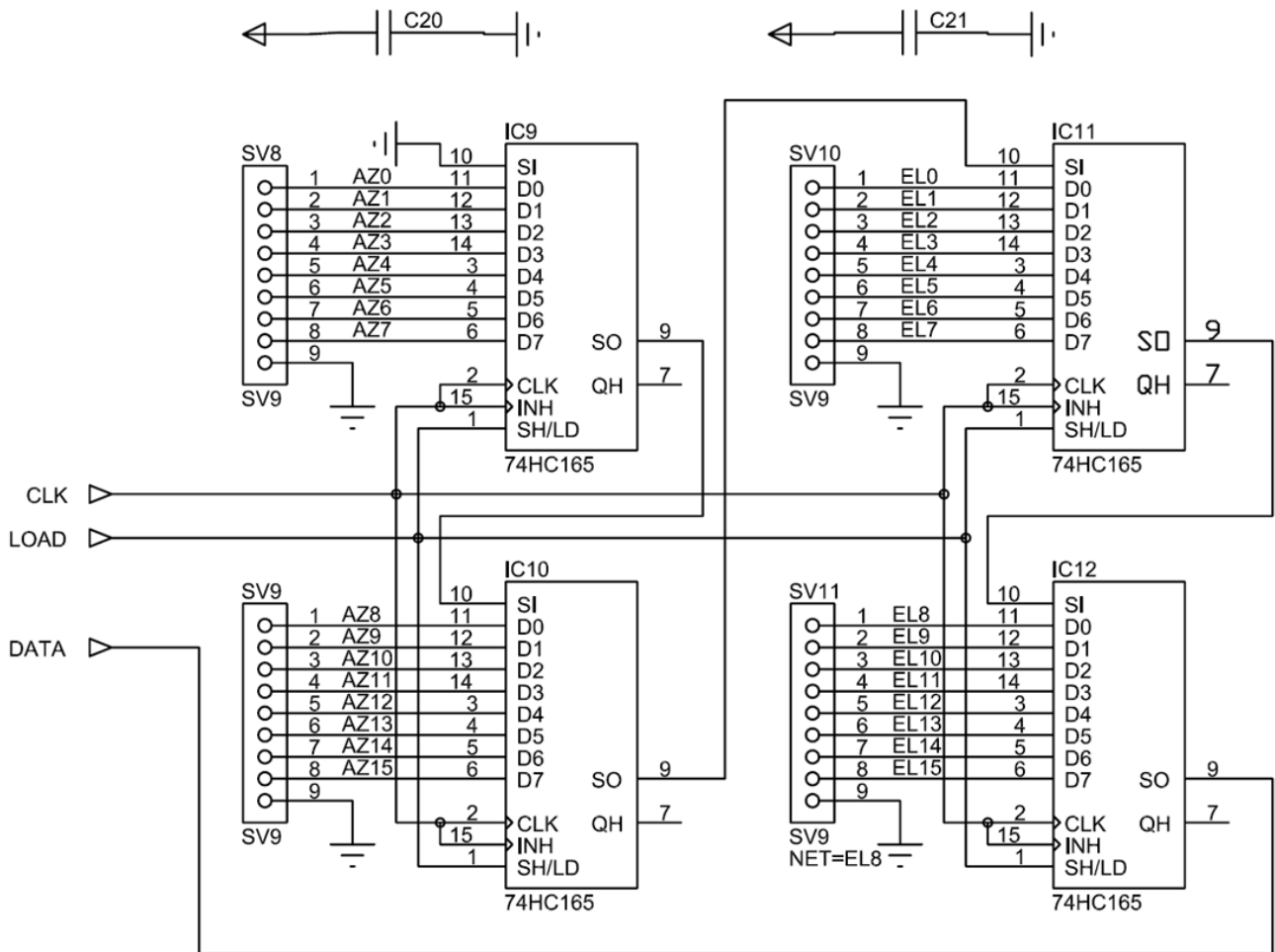


# RS 485 option



<h2>RS 485 Option</h2> <p>By F1EHN / KK6MK</p>	Date
	<b>01 May 04</b>
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# 16 bits // inputs option



<h2>16 bits // Option</h2> <p>By F1EHN / KK6MK</p>	Date
	<b>01 May 04</b>
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## Interface 16 bits // inputs

## Azimuth:

Signal Name	P1 connector	Binary format**	BCD format
Az 0 (LSB)	C11	0.005 deg	0.1 deg
Az 1	A11	0.011 deg	0.2 deg
Az 2	C10	0.022 deg	0.4 deg
Az 3	C12	0.044 deg	0.8 deg
Az 4	B12	0.088 deg	1 deg
Az 5	A12	0.176 deg	2 deg
Az 6	C13	0.351 deg	4 deg
Az 7	B13	0.703 deg	8 deg
Gnd	A14		
Az 8	B16	1.406 deg	10 deg
Az 9	A16	2.812 deg	20 deg
Az 10	C17	5.625 deg	40 deg
Az 11	B17	11.25 deg	80 deg
Az 12	A18	22.50 deg	100 deg
Az 13	B18	45.00 deg	200 deg
Az 14	C18	90.00 deg	to Gnd
Az 15 (MSB)	A17	180.0 deg	to Gnd
Gnd	A15		

## Elevation :

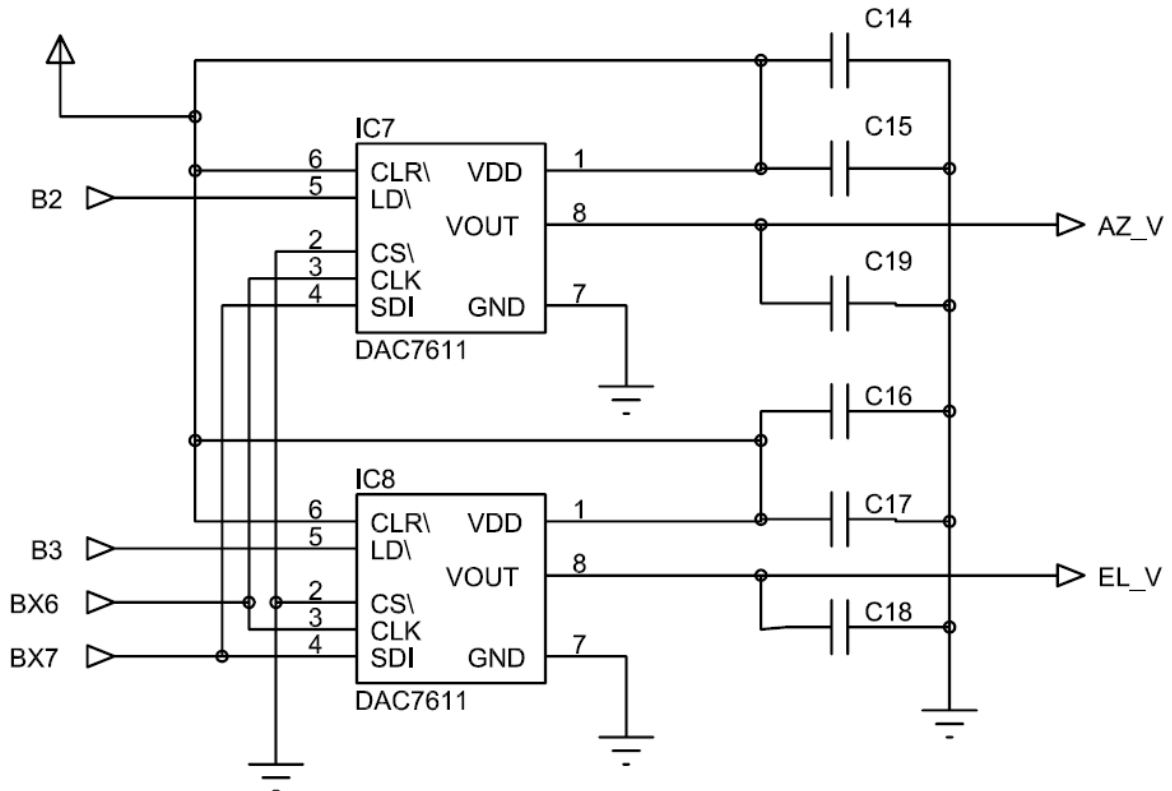
Signal Name	P1 connector	Binary format **	BCD format
EI 0 (LSB)	B19	0.005 deg	0.1 deg
EI 1	C20	0.011 deg	0.2 deg
EI 2	B20	0.022 deg	0.4 deg
EI 3	A21	0.044 deg	0.8 deg
EI 4	C21	0.088 deg	1 deg
EI 5	B22	0.176 deg	2 deg
EI 6	C22	0.351 deg	4 deg
EI 7	B21	0.703 deg	8 deg
Gnd	A19		
EI 8	B23	1.406 deg	10 deg
EI 9	A23	2.812 deg	20 deg
EI 10	A24	5.625 deg	40 deg
EI 11	C24	11.25 deg	80 deg
EI 12	B24	22.50 deg	100 deg
EI 13	A25	45.00 deg	200 deg
EI 14	B25	90.00 deg	to Gnd
EI 15 (MSB)	C25	180.0 deg	to Gnd
Gnd	A22		

\*\* These values are indicated for a binary format used with a 360° encoder range.

The unused bits must be connected to the ground (Gnd).

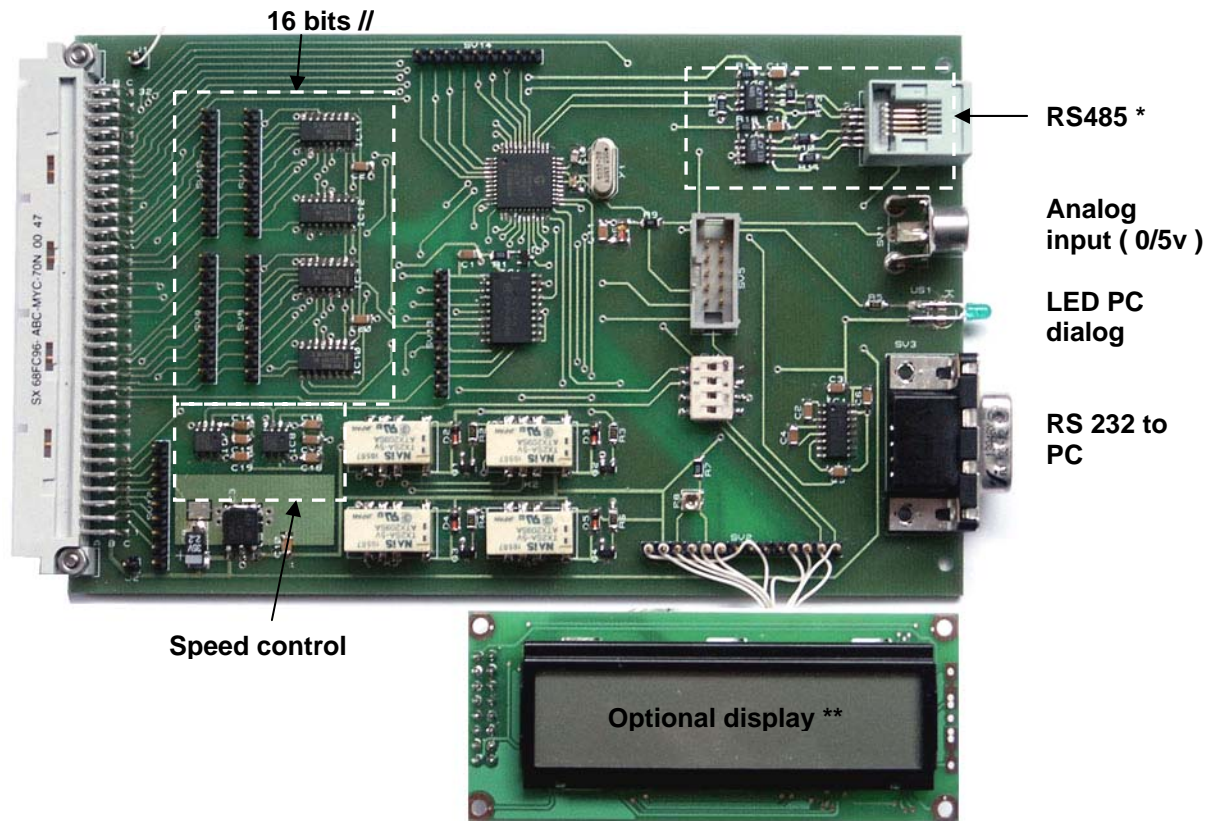
These inputs are also compatible with a Gray format.

# Speed control option



<h2>Speed control Option</h2> <p>By F1EHN / KK6MK</p>	Date
	<b>01 May 04</b>
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	<b>5 / 5</b>

## PCB - Wiring - Options



\* If RS485 option is not implemented, R11 must be wired and pin 1 of IC5 set to Gnd (pin 2 of IC5).

\*\* The LCD is wired pin to pin to SV2 ( pins 7 to 10 are not used).

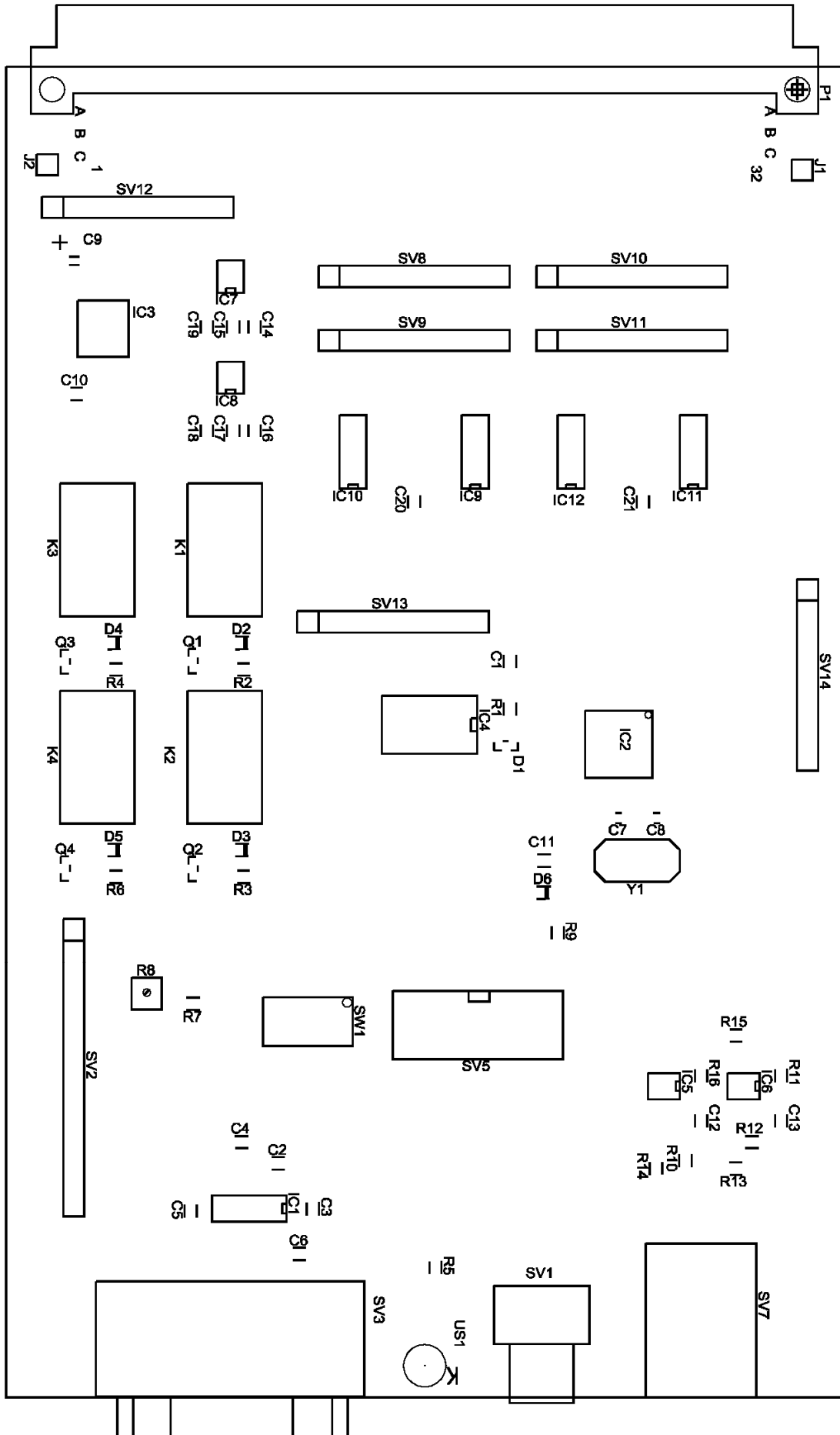


## COMPONENTS LIST

Type, Number	Value - Ref	Case	Quantity	Options	Ref RS
C1 to C6,C14,C17,C20,C21	0,1µF	1206	10		264-4179
C7,C8	12pF	0805	2		
C9	1µF	3216	1		334-9522
C10,C11,C12,C13,C15,C16 -> -> C18,C19	10nF Not wired	1206	6		264-4141
D1	BAT54T1	SOT23	1		436-7818
D2,D3,D4,D5	LS4148	SOD80	4		443-3690
D6	BZV55C5V6	SOD80	1		446-8854
IC1	MAX202CSE	SO16L	1		225-8504
IC2	PIC16F877-04/PT	TQFP44	1		379-3165
IC3	UA78M05CDT	Dpack	1		189-0977
IC5, IC6	<b>LTC485s</b>	<b>SO08</b>	<b>2 *</b>		<b>371-504</b>
IC7, IC8	<b>DAC7611U</b>	<b>SO08</b>	<b>2 *</b>		<b>378-1910</b>
IC4	<b>74HC244D</b>	<b>SO20</b>	<b>1</b>		<b>113-0168</b>
IC9,IC10,IC11,IC12	<b>74HC165D</b>	<b>SO16</b>	<b>4 *</b>		<b>177-6629</b>
K1 à K4	TX2-SA-5V	SMT	4		217-2977
Q1 à Q4	FMMT491	SOT23	4		274-879
US1	Green LED	3mm	1		180-8502
Y1	3,6864 MHz	HC49/S	1		472-0168
R1,R7,R11,R15,R16	10 K	1206	5		
R2,R3,R4,R6	1,5K	1206	4		
R5	430	1206	1		
R9	100	1206	1		
R10,R12,R13,R14	330	1206	4		
<b>R8</b>	<b>2,5K</b>	<b>TRIM</b>	<b>1 *</b>		<b>188-5694</b>
<b>P1</b>	<b>DIN41612</b>	<b>96pins</b>	<b>1 *</b>		<b>160-2584</b>
SW1	IKN04	SMC	1		251-9152
J1, J2	Molex breakable	1 pin	2		see SV
SV1	Keystone 901	90° Jack	1		181-7720
SV2	Molex breakable	14 pins	1		see SV
SV3	SubD - 9P	PCB	1		495-9805
SV5	HE10-10P	PCB	1		461-742
SV7	RJ Modular 95001-6661	RJ 6pins	1		386-2722
SV8 to SV14	Molex breakable	9 pins	7		see SV
SV (Molex breakable type)	straight PCB pin header	HE14	1		423-2841
<b>LCD</b>	<b>DMC-16230 Optrex</b>	<b>16*2</b>	<b>1 *</b>		<b>214-3244</b>

Radiospares France: <http://www.radiospares.fr>  
Radiospares Germany : <http://www.rsonline.de>  
Radiospares Global export : <http://www.rs-export.com>

# PCB - WIRING



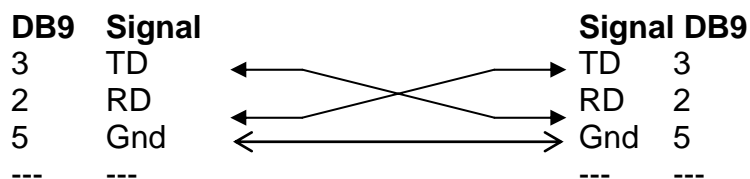
## P1 & RS232 connectors

- **P1 : 96 pins main connector (optional)**

A	Signal	B	Signal	C	Signal
1	+12V	1	+12V	1	+12V
2	Gnd	2	Up(1) - motors	2	Up(2) - motors
3	Gnd	3	Dn(1) - motors	3	Dn(2) - motors
4	Gnd	4	Cw(1) - motors	4	Cw(2) - motors
5	Gnd	5	CCw(1) - motors	5	CCw(2) - motors
6	Gnd	6	EI_V	6	Clock
7	Az_V	7	<b>Res.</b>	7	<b>Res.</b>
8	Gnd	8	<b>Res.</b>	8	<b>Res.</b>
9	<b>Res.</b>	9	<b>Res.</b>	9	<b>Res.</b>
10	<b>Res.</b>	10	<b>Res.</b>	10	Az2
11	Az1	11	Load(1)	11	Az0
12	Az5	12	Az4	12	Az3
13	Gnd	13	Az7	13	Az6
14	Gnd (Az)	14	EDR2	14	EDR1
15	Gnd (Az)	15	EDR4	15	EDR3
16	Az9	16	Az8	16	<b>Res.</b>
17	Az15	17	Az11	17	Az10
18	Az12	18	Az13	18	Az14
19	Gnd (EI)	19	EI0	19	Load(2)
20	Gnd	20	EI2	20	EI1
21	EI3	21	EI7	21	EI4
22	Gnd (EI)	22	EI5	22	EI6
23	EI9	23	EI8	23	<b>Res.</b>
24	EI10	24	EI12	24	EI11
25	EI13	25	EI14	25	EI15
26	Dr8 (Rx bus)	26	Dr6 (Rx bus)	26	Dr7 (Rx bus)
27	Dr5 (Rx bus)	27	Dr3 (Rx bus)	27	Dr4 (Rx bus)
28	Analog Sig.	28	Dr1 (Rx bus)	28	Dr2 (Rx bus)
29	Gnd (RxBus)	29	<b>Res.</b>	29	<b>Res.</b>
30	<b>Res.</b>	30	<b>Res.</b>	30	<b>Res.</b>
31	<b>Res.</b>	31	<b>Res.</b>	31	<b>Res.</b>
32	Gnd (M12V)	32	Gnd (M12V)	32	Gnd (M12V)

*Res. = Reserved (N.C.)*

- **RS 232 cable**



**Note :** Refer to the “Test\_Signals.pdf” document to test the board. There is any tune...