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## --- 13cm Tuner ---

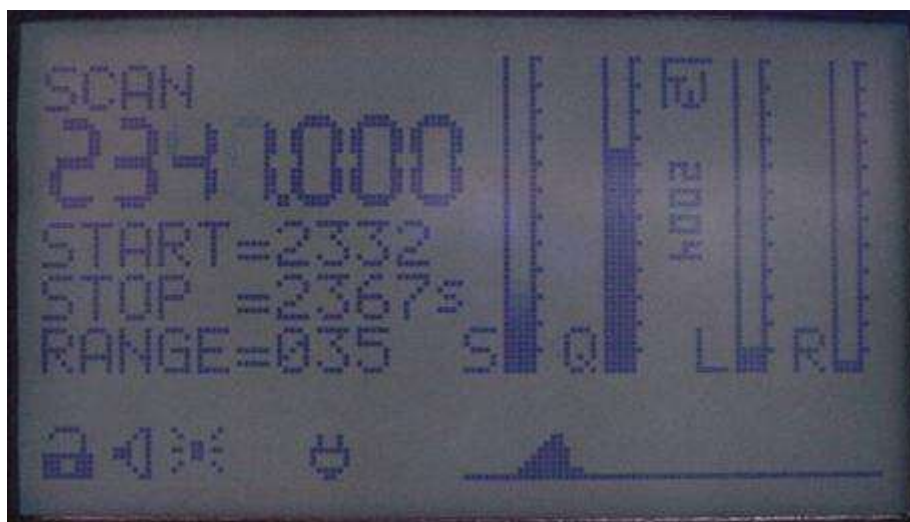
### Technical data

Frequency range - 2300 MHz – 2555 MHz

Bargraph readings for - Signal strength  
- Squelch level  
- Audio outputs

Outputs -Audio left  
-Audio right  
-Video  
-479.5 MHz I.F.  
-RS232

Power 12V, 0.3A



- User selectable scanrange
- Graphic indications for PLL lock, backlight, audio mute & RS232
- Full range spectrumview while scanning
- kHz tuning

## Manual

### MHZ

This multiturn potmeter, is for MHz tuning between 2300 & 2555 MHz.

### SQL

With this potmeter, squelch level & kHz tuning can be altered.

### MODE & SET

The mode switch is a rotary switch, with 6 positions.

A little "s" on display, indicates the value that can be modified.

These modifications can only be done in MAN mode.



*Position 1*, the unit is in standby modus

*Position 2*, push the SET button and turn SQL for kHz tuning

*Position 3*, push the SET button to set start frequency for scanning\*\*

*Position 4*, push the SET button to set stop frequency for scanning\*\*

*Position 5*, push the SET button to switch the backlight on or off \*

*Position 6*, enables the RS232 communication \*

\*\* stop frequency must be higher than start frequency

\* also works while scanning

### MAN

The manual pushbutton selects between manual tuning ( man mode ) or scanning ( scan mode )

### Spectrum view

When scanning, the lower right part of the display shows a little spectral view.

The horizontal position of the spectrum depends on the scan start & stop frequency.

The spectrum bottom line always represents the full range from 2300 to 2555 MHz.

If in maual mode, a single bargraph ( equal to the signal strength ) appears on the bottom line.

## --- 13cm Tuner ---

### PIC16F877 connections

<b>Inputs</b>	<b>16F877</b>	<b>Function</b>
AN0	PIN2	MHz tuning 10-turn potmeter
AN1	PIN3	Rotary switch -MODE-
AN2	PIN4	Signal strength – pin9 Comtech Tuner
AN3	PIN5	SQL potmeter
AN4	PIN6	N.C.
AN5	PIN7	Audio rectifier output – Audio L
AN6	PIN8	Audio rectifier output – Audio R
AN7	PIN9	N.C.
RC0	PIN15	Pushbutton – SET
RC1	PIN16	Pushbutton – MAN

<b>Outputs</b>	<b>16F877</b>	<b>Function</b>
RC3	PIN18	Audio mute ( 4066 )
RD2	PIN21	Backlight Relay
RD3	PIN22	Main Relay

### Special I/O

SUBD	Color	
PIN1	Green	ISP F877 pin 39
PIN2	Yellow	ISP F877 pin 40
PIN3	Orange	ISP F877 pin 36
PIN4	Red	+5Volt
PIN5	Brown	GROUND
PIN6	Green	ISP F877 pin 1
PIN7	Blue	GROUND
PIN8	Purple	MAX232 pin 8 – TX RS232
PIN9	Grey	MAX232 pin 7 – RX RS232

<b>I2C</b>	<b>16F877</b>	
SDA	PIN19	RD0
SCL	PIN20	RD1

**PIC16F877 connections**

**Graphic LCD**

LCD	16F877	Function
PIN1	PIN12, 31	GROUND
PIN2	PIN11, 32	+5Volt
PIN3	---	Contrast Input
PIN4	28 = RD5	Register Select
PIN5	29 = RD6	Read / Write
PIN6	30 = RD7	Enable
PIN7	33 = RB0	Data 0
PIN8	34 = RB1	Data 1
PIN9	35 = RB2	Data 2
PIN10	36 = RB3	Data 3
PIN11	37 = RB4	Data 4
PIN12	38 = RB5	Data 5
PIN13	39 = RB6	Data 6
PIN14	40 = RB7	Data 7
PIN15	24 = RC5	Chip Select 1, Lcd Left part
PIN16	23 = RC4	Chip Select 2, Lcd Right part
PIN17	PIN11, 32	Reset, +5Volt
PIN18	---	-10Volt out for contrast
PIN19	---	EL Backlight +
PIN20	---	EL Backlight -

Graphic Lcd Type = PVG120602EG01

Number of dots : 128 x 64  
Module size: 93.0 X 70.0 X 13.0 MM  
Effective display area : 70.7 x 38.8  
Dot size : 0.48 x 0.48  
Dot pitch : 0.52 x 0.52

**13cm TUNER**  
www.freddospace.nl



**MAN** manual tuning  
**SCAN** scanning

signal strength

squelch level

left audio VU meter

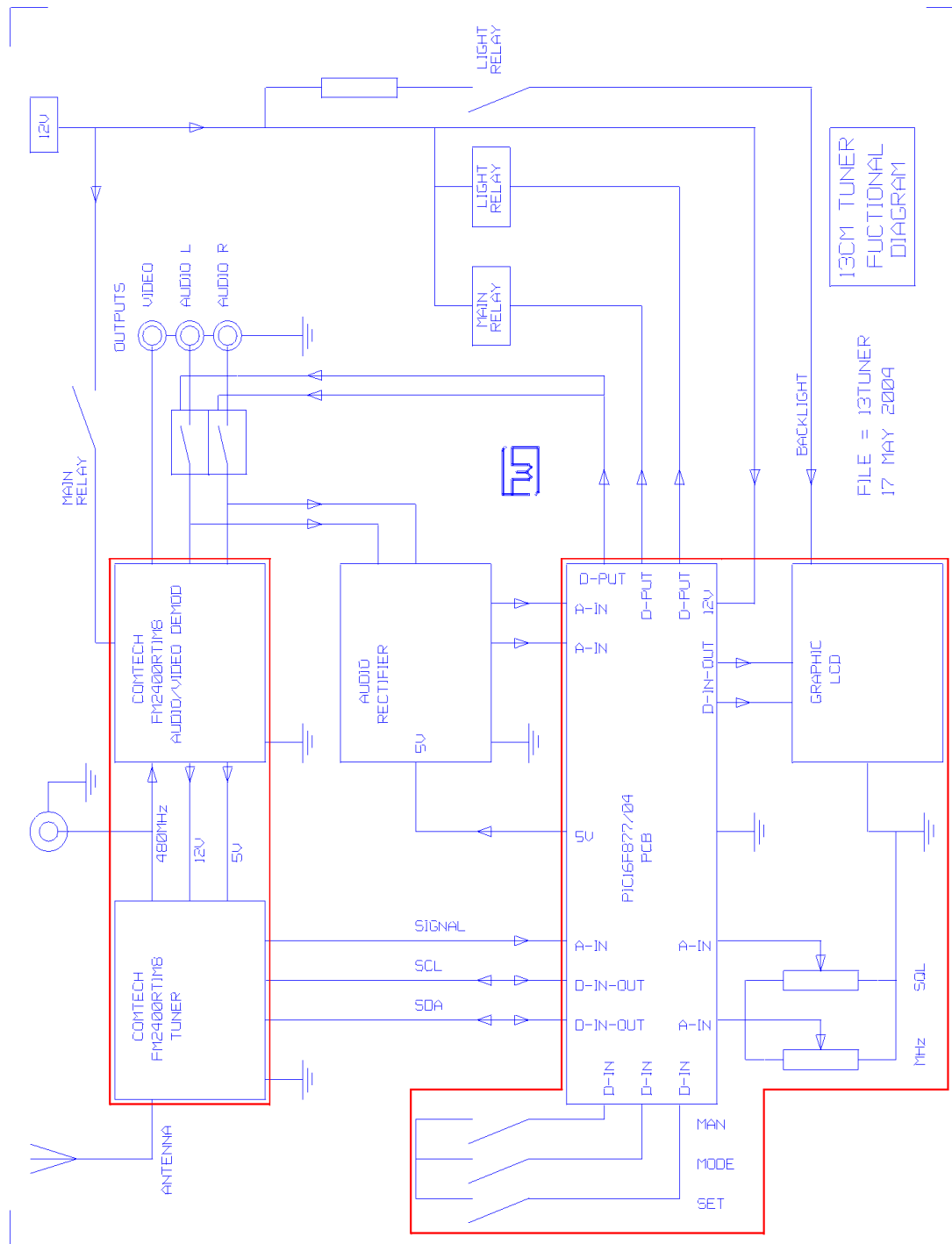
right audio VU meter

 PLL in Lock	 Audio output on
 PLL not in Lock	 Audio output off
 Backlight is on	 RS232 is off
 Backlight is off	 RS232 is on

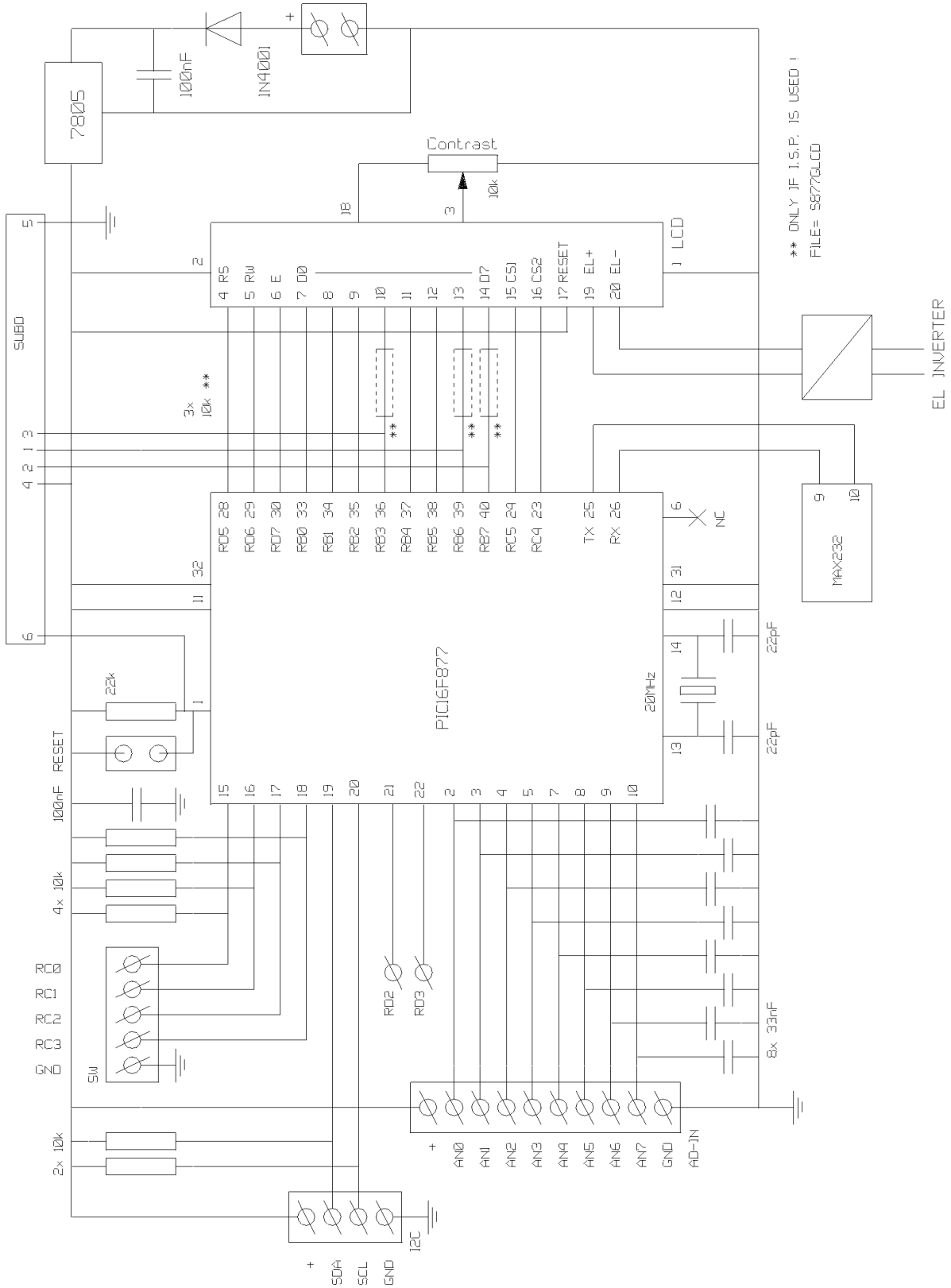


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## Functional Block Diagram

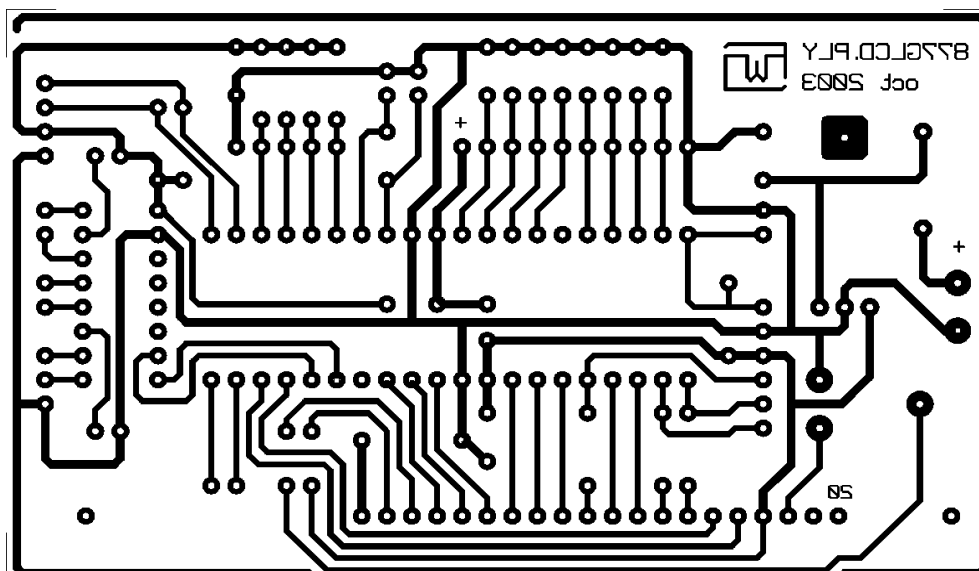
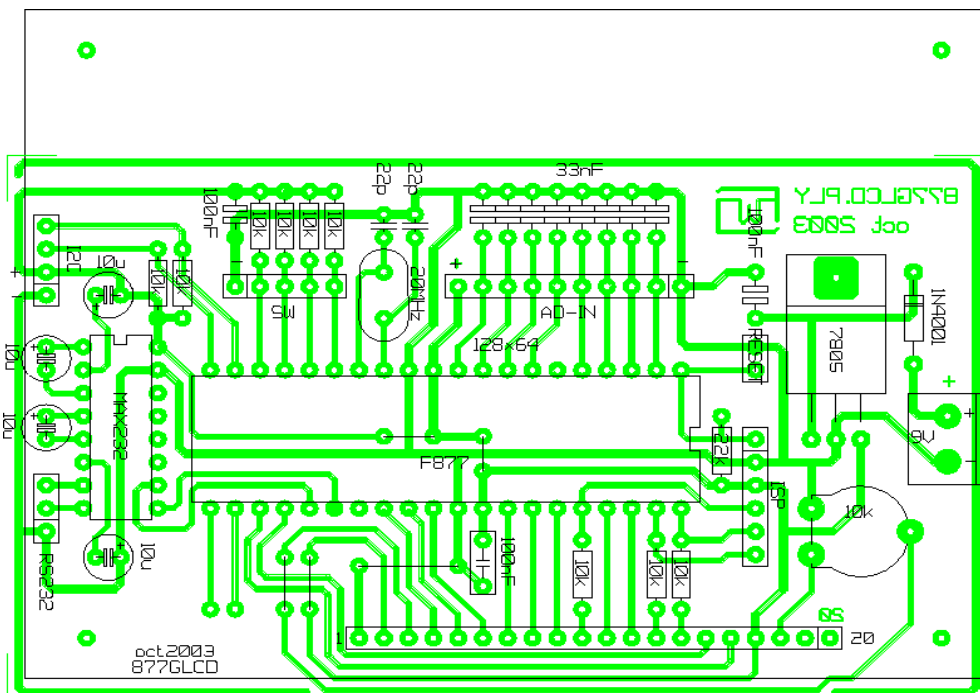


**PIC16F877 board schematic diagram**

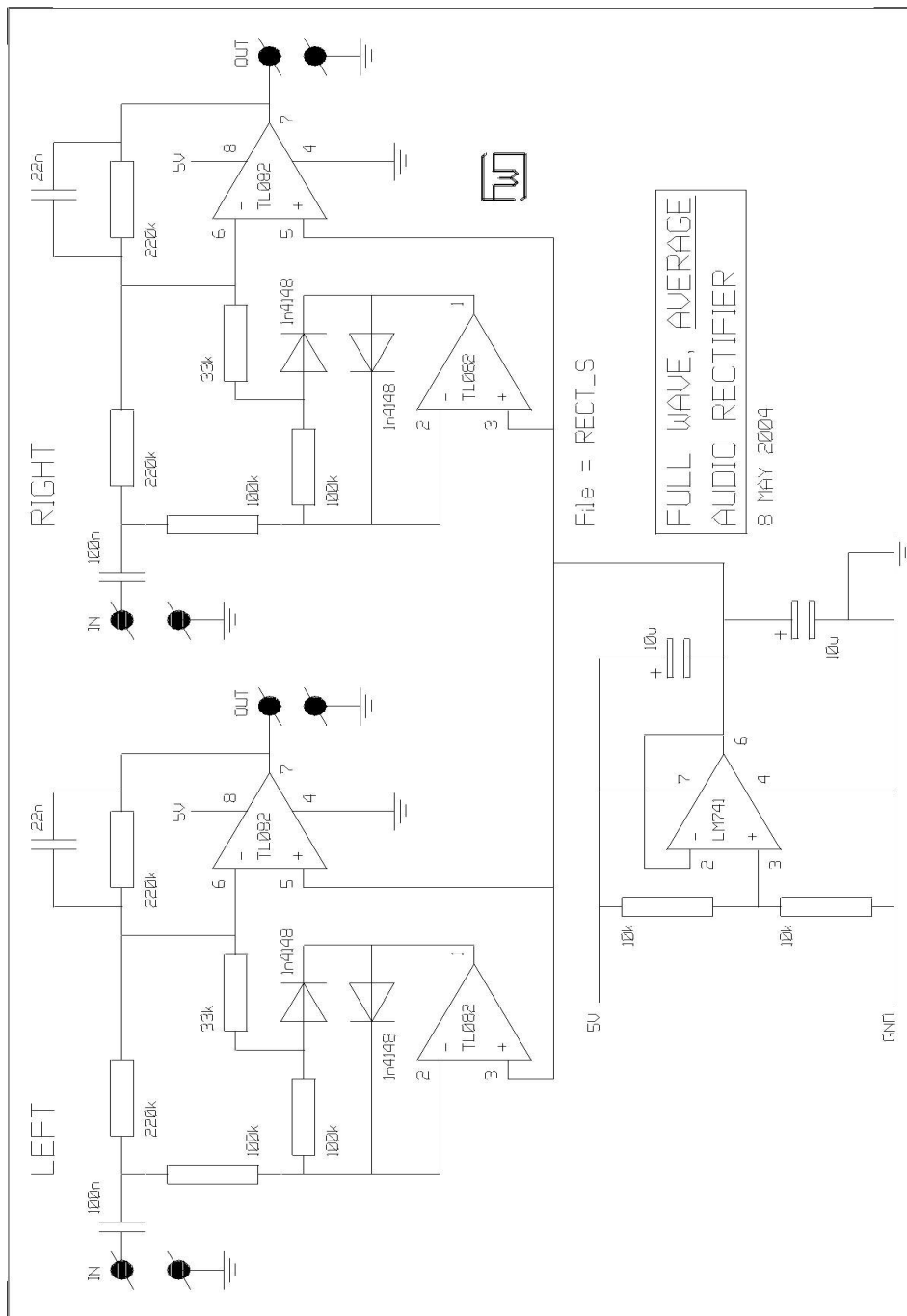




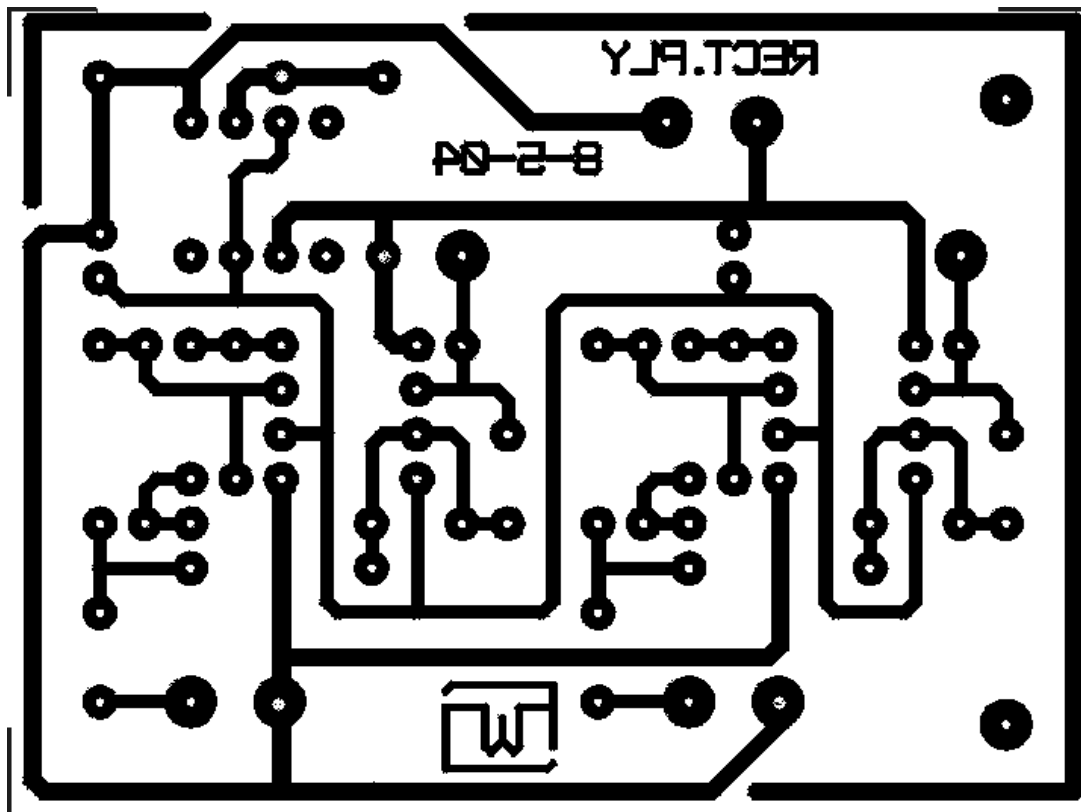
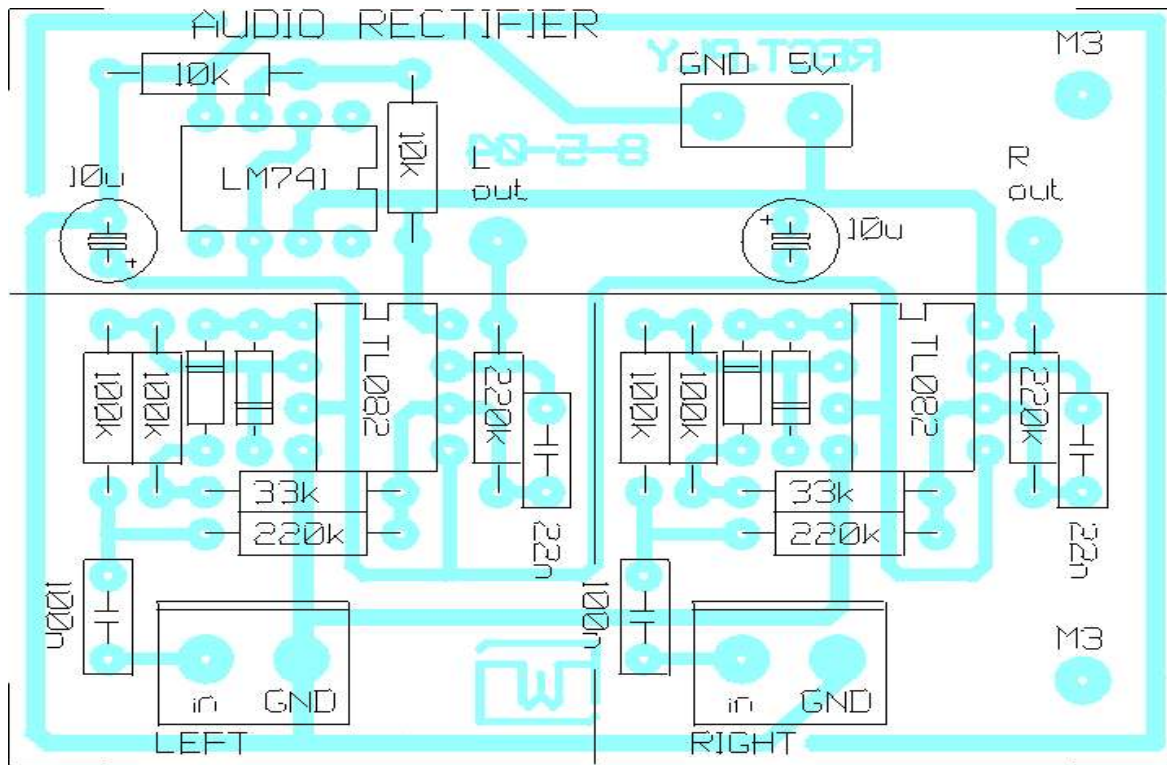
PIC16F877 board pcb layout 100x60mm



Audio rectifier schematic diagram

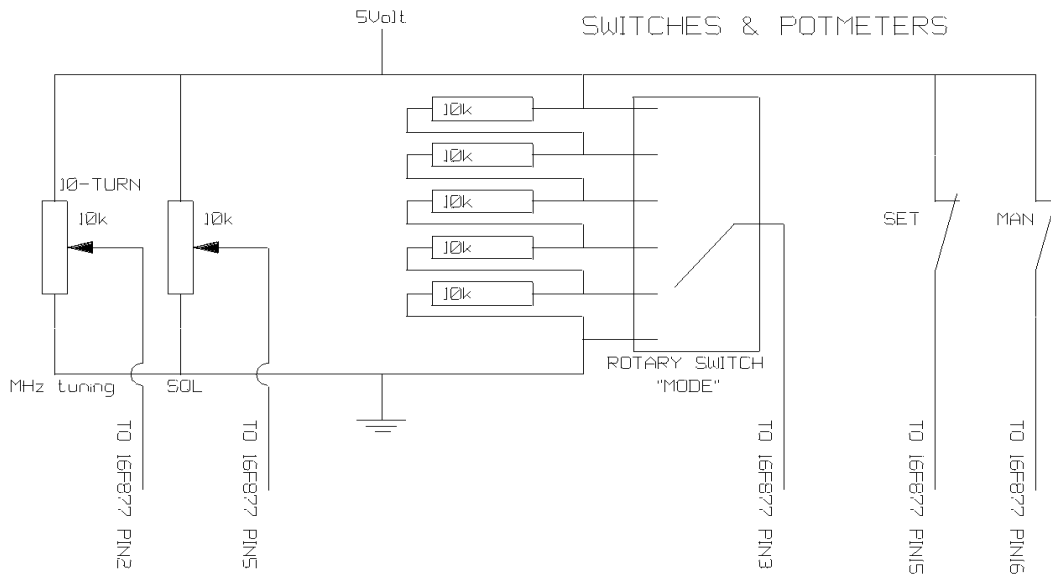


Audio rectifier pcb 60x46mm

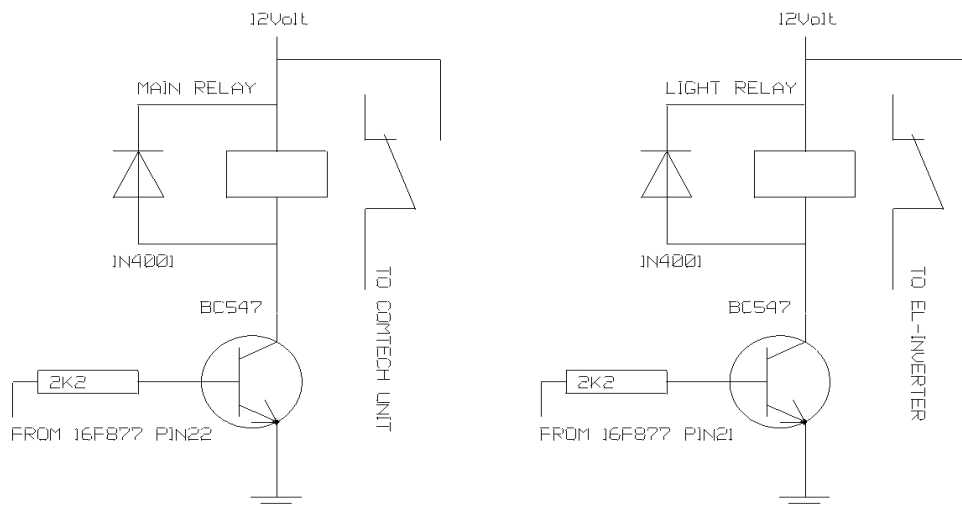


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## Switches, relays & audiomute



### RELAY OUTPUTS



### AUDIO MUTE

