

PARTS LIST AND ACURATE PRICES:

ITEM	AMOUNT	PRICE	TOTAL
RTC TINY	1	7	7
ATMEGA 328P	1	11	11
BC547B	4	0.9	3.6
4 digit disply	1	7	7
LCD 1602	1	12	12
LCM1602 based on PCF8574	1	8	8
quartz 16Mhz	1	1	1
switch 12x12	5	1	5
LM7805CV 5V1.5A	1	5	5
Radiator	1	3	3
TEA5767	1	10	10
AMP PAM8403 with POT	1	12	12
DC input	1	5	5
PCB 9x12 (aprox 800-900 pins)	1	10	10
PCB 5x7 (aprox 400 pins)	1	5	5
thin copper wires	4	2	8
male-male wires	20	0.3	6
male-female wires	20	0.3	6
female-female	20	0.3	6
speakers (3W)	2	15	30
Capacitors	10	0.5	5
Resistors	10	0.3	3
Antenna	1	8	8
Breakfast Box	1	17	17
M3 screws	20	0.2	4
M3 screw holders	12	0.1	1.2
4 screws for speakers size unknow	4	1	4
Goldpins	1	15	15
TOTAL			217.8
Prices are in Polish Zloty [PLN]			

Required parts with links to shops I used:

Wiring might be done in several ways so be aware amount of wires are just very approximate. 4 meters of copper wire (3 colour) should be more than enough, other wires depend on the way you soldier your pins and space you have.

RTC tiny: x1

<https://botland.com.pl/pl/moduly-rtc/12507-rtc-ds1307-32kb-eprom-24c32-i2c-zegar-czasu-rzeczywistego-z-pamiecia.html>

ATMEGA 328:x1

https://botland.com.pl/pl/avr-w-obudowie-tht/1264-mikrokontroler-avr-atmega328p-u-dip.html?search_query=atmega+328+P&results=52

Transistor NPN BC547B: x4

<https://botland.com.pl/pl/tranzystory-bipolarne/254-tranzystor-bipolarny-npn-bc547b-50v01a-5szt.html>

4 digit display 3642BH: x1

<http://www.picbasic.co.uk/forum/showthread.php?t=23968>

LCD 16x02a + i2C LCM1602 based on expander PCF8574 : x1

https://botland.com.pl/pl/wyswietlacze-alfanumeryczne-i-graficzne/2351-wyswietlacz-lcd-2x16-znakow-niebieski-konwerter-i2c-lcm1602.html?search_query=lcd+1602&results=6

8-20 KHz quartz: x1 (16 in this case but you can use internal, built-in quarts of your Atmel chip):

https://botland.com.pl/pl/rezonatory/166-rezonator-kwarcowy-16mhz-hc49-niski.html?search_query=rezonator+16&results=13

switch (size does not matte, only height – if you want to install it in a case): x5

https://botland.com.pl/pl/tact-switch/11133-tact-switch-12x12mm-z-nasadka-kwadrat-zolty-5szt.html?search_query=switch+12&results=127

voltage stabilizer LM7805CV 5V 1,5 AMP: x1

https://botland.com.pl/pl/napiecie-wyjscowe-10v/6993-stabilizator-10v-l7810cv-tht-to220.html?search_query=LM7805&results=4

Little radiator for your stabilizer:

https://botland.com.pl/pl/radiator/1500-radiator-rad13-13x13x11-mm.html?search_query=radiator&results=82

TEA5767 chip FM TUNER 1x1[cm] (best buy two as they are easy to damage while soldering! 10-30 Wat, thin needle solder iron needed):

https://botland.com.pl/pl/moduly-radiowe/6639-modul-tunera-radiowego-stereo-fm-tea5767-i2c.html?search_query=TEA5767&results=1

Hint: you can one already with breadboard but the price is 4-5 times higher:

<https://elty.pl/pl/p/Modul-z-TEA5767-Radio-FM/1588>

Amplifier PAM 8403 2x 3W : x1 (best get with integrated dual channel linear potentiometer 10kOhm, with switch function)

https://botland.com.pl/pl/odtwarzacz-mp3-wav-oog-midi/6641-wzmacniacz-audio-stereo-pam8403-5v-3w-dwukanalowy.html?search_query=PAM8403&results=3

If you can't get one with POT, follow this link:

<https://www.instructables.com/id/PAM8403-6W-STEREO-AMPLIFIER-TUTORIAL/>

POT, dual channel, linear 10k (if you bought amp without POT.):

https://pl.aliexpress.com/item/PAM8403-Mini-5V-Power-Digital-Audio-Amplifier-Board-2-Channel-3W-Volume-Control-With-Switch-Potentiometer/2024410761.html?af=191415&aff_platform=aaf&cpt=1553808234126&afref=https%253A%252F%252Fwww.google.com%252F&dp=cd44973e581a0e52d8ed55a5013e1efc&onelink_item_from=2024410761&onelink_thrd=0.0&onelink_page_from=ITEM_DETAIL&cv=47843&onelink_item_to=2024410761&pvid=56b4c229-2bc7-49cc-afb0-0a06793a9877&mall_affr=pr3&onelink_duration=0.785106&sk=VnYZvQVf&aff_trace_key=305b0ca79d734e6889a2c05367ffaf6-1553808234126-05599-VnYZvQVf&onelink_status=noneresult&scm=1007.22893.125764.0&terminal_id=0a0411043e254dea18a5b8f1a4028e8&onelink_page_to=ITEM_DETAIL

DC input :

https://botland.com.pl/pl/przewody-i-zlaczka-zasilajace/411-gniazdo-dc-55-x-21-mm-do-druku-poziome.html?search_query=gniazdo+dc&results=285

Prototype board for soldering around 9x12 [cm]: x1

(below just an example, get one about 830 fields):

https://botland.com.pl/pl/plytki-universalne/2744-plytka-universalna-dwustronna-40x60mm.html?search_query=prototyp&results=70

Prototype board 5 x 7 [cm] for buttons: x1

https://botland.com.pl/pl/plytki-universalne/2744-plytka-universalna-dwustronna-40x60mm.html?search_query=prototyp&results=70

3-4 meters of copper wires just in case (red for +, black -, any colour for data):

Any Cheapest copper wire from your local shop.

Some other common wiring to connect your stuff:

- Male-male
- Female-male
- Female-female

https://botland.com.pl/pl/przewody-polaczeniowe/11906-przewody-polaczeniowe-zensko-meskie-20cm-zolte-100szt.html?search_query=przewod&results=866

Speakers : (2 x 3W would be perfect, but you can install any bigger speakers and limit them. In this case you might need to adjust resistors R3 and R4, in my example (schematics) there are 40 Ohm resistors, as I installed 16 W / 6 Ohm speakers, it works just fine.)

Capacitors and resistors pack (take a look at schema and count the amount yourself):

Hint: install big capacitor before VCC of the Amplifier – something like 1000 [uF]

https://botland.com.pl/pl/zestawy-kondensatorow/2146-zestaw-kondensatorow-ceramicznych-tht-100szt.html?search_query=kondensatory&results=6

https://botland.com.pl/pl/kondensatory-elektrolityczne-tht/898-kondensator-elektrolityczny-100uf35v-6x12mm-105c-tht-10szt.html?search_query=kondensator+100&results=36

https://botland.com.pl/pl/kondensatory-ceramiczne-tht/5584-kondensator-monolityczny-470nf50v-x7r-10szt.html?search_query=kondensator+monolityczny&results=4

Antenna or copper wire 75 cm:

Hint: plan mounting your self

https://botland.com.pl/pl/aparatury-sterujace/12610-antena-teleskopowa-m3-7mm.html?search_query=antena+teleskopowa&results=2

Breakfast box:

In my opinion Plastic, 1.2L box from *Plast Team* is just perfect.

<https://www.ceneo.pl/25013903;15853-0v>

M3 screws (the longer the better):

Hint (plan and adjust screws for your speakers mount.)

https://botland.com.pl/pl/srubki-i-nakretki/7352-srubki-m3-dlugosc-20mm-naciecie-proste-100szt.html?search_query=sruba+m3&results=14

Any DC impulse power supply 9-35 [V] 1 - 1.5 [A]:

Best – 9 V / 1.5 A.

You can also modify the schema and apply direct 5V / 2A.

You need power: $P = U \times I$

7 W for speakers and AMP, 1W for rest of components, so 5 [V] ~2 [A] would be optimal.

Goldpins:

https://botland.com.pl/pl/gniazda-szpilkowe-goldpin/1451-zestaw-goldpin-raster-254mm-maxi.html?search_query=goldpin&results=59

Hope I did not forget anything. **Recheck** with the schematics.