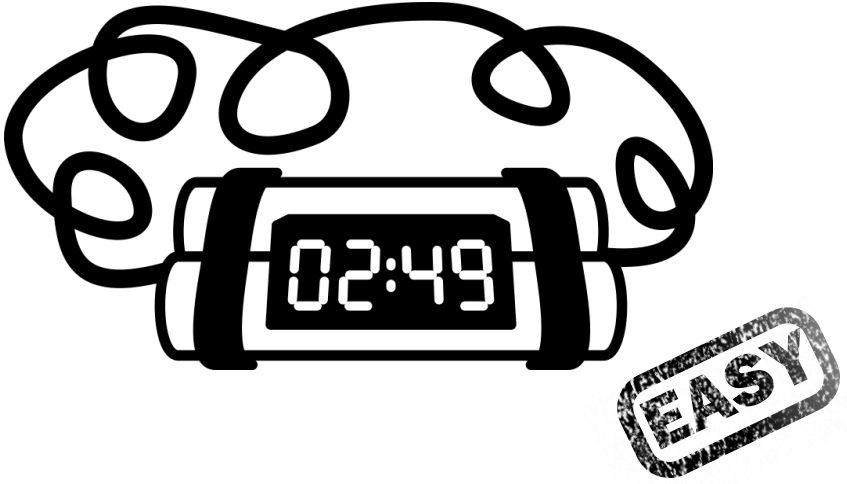
Bomb Defusal Manual



Tetopia

Theresa Thoma, DC1TH
In cooperation with AATiS e.V.
English translation by Florian Schmid, DL1FLO/WZ6Y

Version 2.2.7

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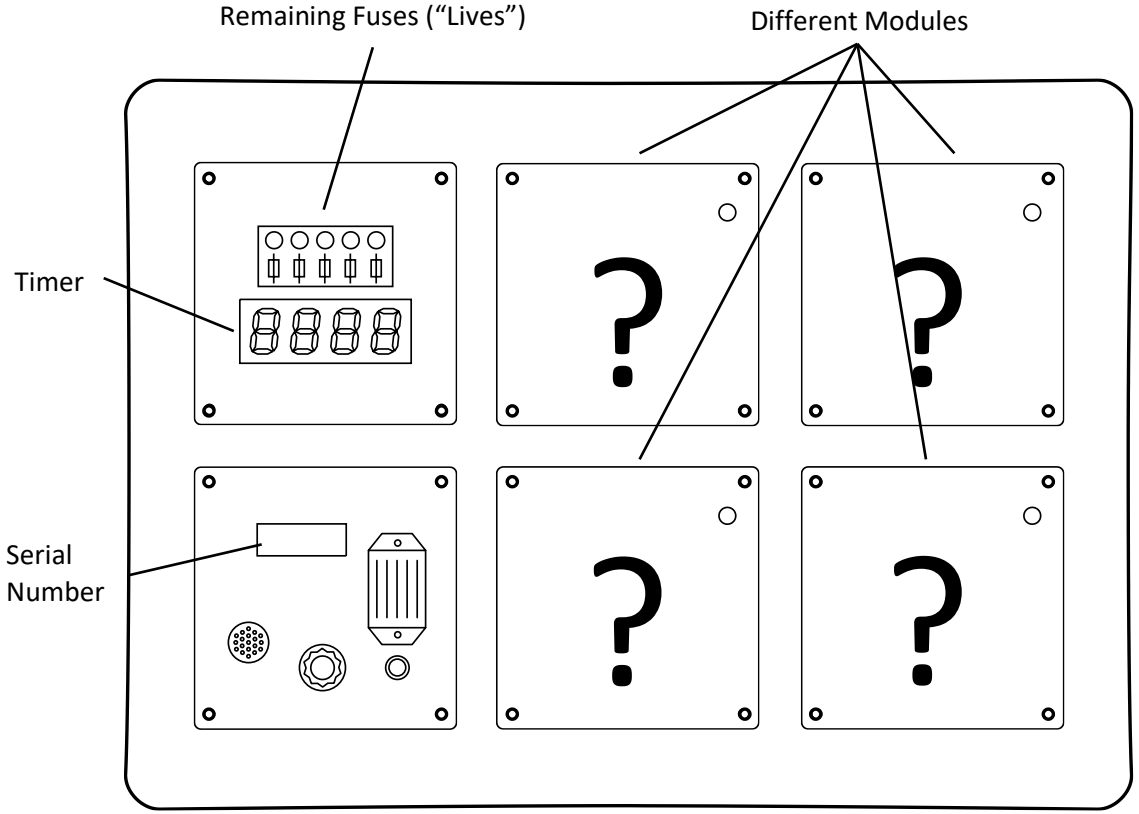
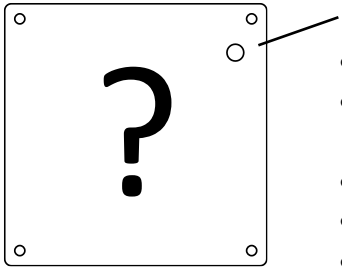
The bomb


Remaining Fuses (“Lives”)
Different Modules
Timer
Serial Number
?
?
?
?

- The bomb explodes when the timer reaches 00:00.
- For each mistake made by the defuser, one fuse burns out. If no fuses remain, the bomb will explode on the next mistake.

- Each module must be defused individually.
- The modules can be defused in any order.
- Each module has its own set of instructions.

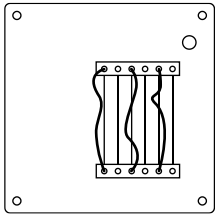


Status-LED:

- Yellow (fading in and out): The module must be solved.
- Yellow (steady): The module does not need to be solved at the moment, but may start flashing red.
- Red (flashing): The module requires immediate attention.
- Green: The module has been defused.
- No light: The module does not need to be defused

In the appendix, you will find additional references showing what special connectors and tools look like, as well as other useful information.

Module overview



01 – Wires

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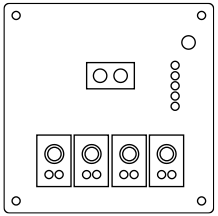

02 – Binary Numbers

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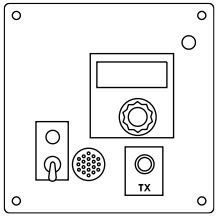

03 – Morse

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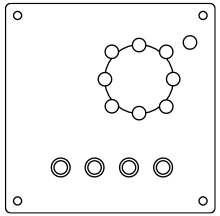

04 – LED Circle

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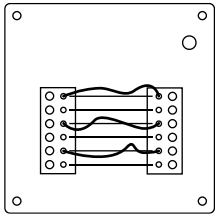

05 – Twisted Wires

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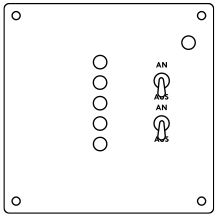

06 – Logic Gates

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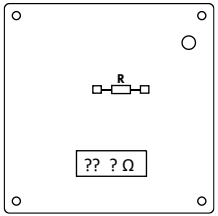

07 – Resistor

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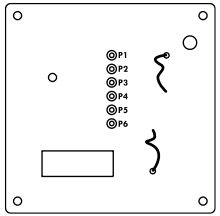

08 – Measuring Device

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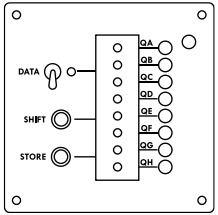

09 – Shift Register

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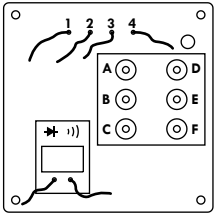

10 – Circuit Diagram

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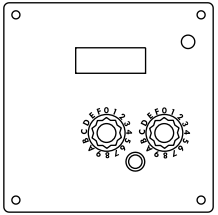

11 – ASCII

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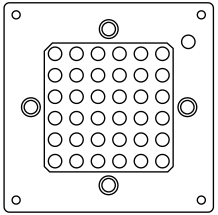

12 – Maze

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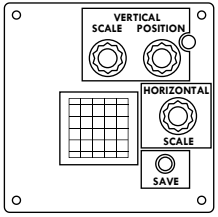
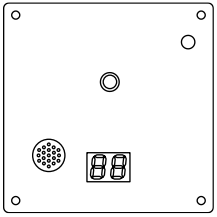


13 – Oscilloscope



50 – Nervous Button

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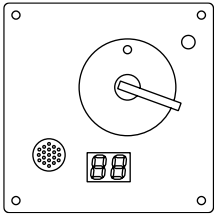

51 – Rotary Thing

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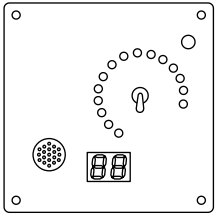

52 - Tone Generator

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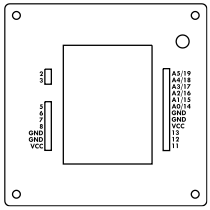

99 - Prototype

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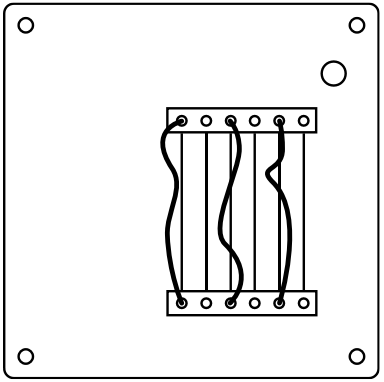
PART 1
Normal Modules

Module 01: Wires



- A wire module can have 3 to 6 single-colored wires.
- Only one correct wire needs to be disconnected to defuse the module.
- The counting of wires starts with the first wire on the left.
- The number of wires **does not change**, even if a wire is completely removed. The original number at the start of defusal always applies.

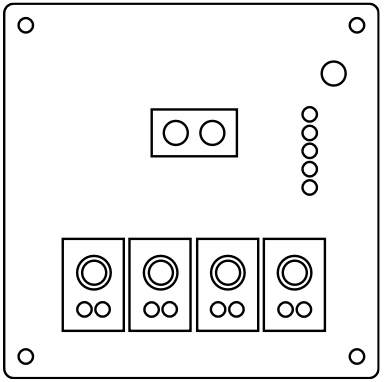
3 Wires:
If there are no blue wires, disconnect the third wire.
Otherwise, if there is exactly one red wire, disconnect the red wire.
Otherwise, if the last wire is black, disconnect the first wire.
Otherwise, disconnect the second wire.

4 Wires:
If there are no red wires and the last wire is yellow, disconnect the last wire.
Otherwise, if the last digit of the serial number is odd and there is more than one yellow wire, disconnect the last yellow wire.
Otherwise, if there are no white wires, disconnect the second wire.
Otherwise, disconnect the third wire.

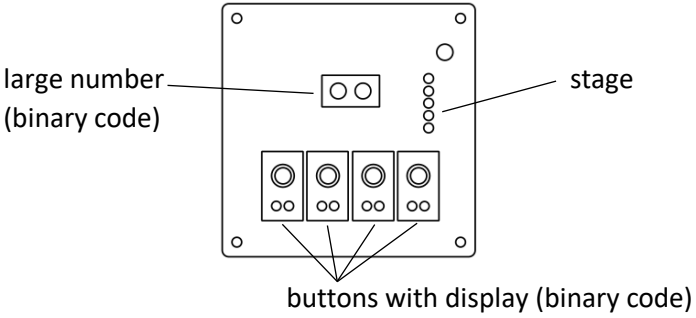
5 Wires:
If there is exactly one yellow wire and exactly one red wire, disconnect the first wire.
Otherwise, if the last digit of the serial number is even and there is exactly one black wire, disconnect the fourth wire.
Otherwise, if the last wire is red and there are no white wires, disconnect the third wire.
Otherwise, disconnect the last wire.

6 Wires:
If the last wire is yellow, disconnect the fifth wire.
Otherwise, if the last wire is white and there are no blue wires, disconnect the last wire.
Otherwise, if there is more than one black wire and the last digit of the serial number is odd, disconnect the last black wire.
Otherwise, disconnect the third wire.

Module 02: Binary Numbers

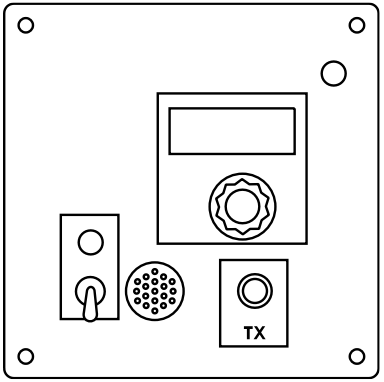


- The digits of the large number and the indicators below the buttons are displayed as binary numbers.
  The following values are possible (● = on = 1, ○ = off = 0):
  ○○ 0, ○● 1, ●○ 2, ●● 3.
- Press the correct button to advance the module to the next stage. Complete all stages to defuse the module.
- Pressing the wrong button will reset the module to stage 1.
- The positions of the buttons are counted from left to right.



Stage 1:
If the large number is 0, press the button in the second position.
If the large number is 1, press the button in the second position.
If the large number is 2, press the button in the third position.
If the large number is 3, press the button in the fourth position.
Stage 2:
If the large number is 0, press the button with the label "3".
If the large number is 1, press the button in the same position as before.
If the large number is 2, press the button in the first position.
If the large number is 3, press the button in the same position as before.
Stage 3:
If the large number is 0, press the button with the label "2".
If the large number is 1, press the button with the label "1".
If the large number is 2, press the button in the third position.
If the large number is 3, press the button with the label "3".
Stage 4:
If the large number is 0, press the button with the same label as the large number.
If the large number is 1, press the button in the first position.
If the large number is 2, press the button in the same position as before.
If the large number is 3, press the button with the label "2".
Stage 5:
If the large number is 0, press the button with the label "2".
If the large number is 1, press the button in the first position.
If the large number is 2, press the button with the label "0".
If the large number is 3, press the button with the label "2".

Module 03: Morse



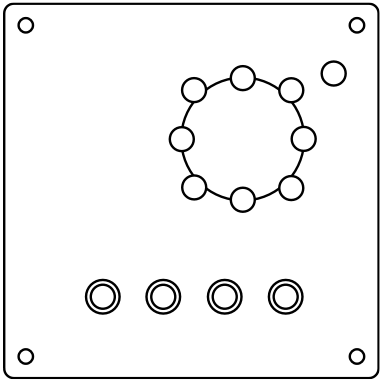
- The toggle switch turns the tone on and off.
- Decode the Morse code, which is given by the blinking light and the tone (if it is turned on). The right-hand table shows the corresponding letters.
- The signal repeats, with a long break between repetitions.
- Once the letter is identified, set the corresponding frequency using the control dial and press the transmit (TX) button.
- Morse code is interpreted as follows:
    - A short signal represents a dot.
    - A long signal represents a dash.
    - A longer break separates individual letters.
    - A very long break separates words.

If the signal is:	Transmit on frequency:
Z	3.503 MHz
C	3.507 MHz
K	3.512 MHz
W	3.518 MHz
V	3.525 MHz
F	3.529 MHz
G	3.532 MHz
U	3.535 MHz
J	3.538 MHz
R	3.541 MHz
P	3.547 MHz
D	3.553 MHz
L	3.558 MHz
Q	3.561 MHz
A	3.564 MHz
N	3.567 MHz

Morse code:

A	• –	U	• • –
B	– • • •	V	• • • –
C	– • – •	W	• – –
D	– • •	X	– • • –
E	•	Y	– • – –
F	• • – •	Z	– – • •
G	– – •		
H	• • • •		
I	• •		
J	• – – –		
K	– • –	1	• – – – –
L	• – • •	2	• • – – –
M	– –	3	• • • – –
N	– •	4	• • • • –
O	– – –	5	• • • • •
P	• – – •	6	– • • • •
Q	– – • –	7	– – • • •
R	• – •	8	– – – • •
S	• • •	9	– – – – •
T	–	0	– – – – –

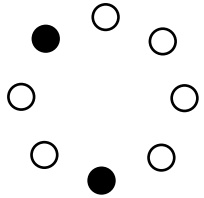
Module 04: LED Circle



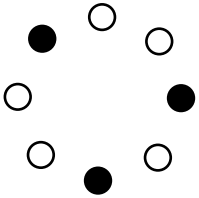
- The LED pattern indicates which button needs to be pressed.
- The buttons are counted starting from the first button on the left.

LED on: ●

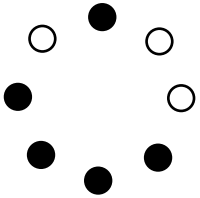
LED off: ○



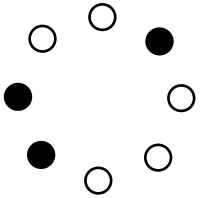
Third Button



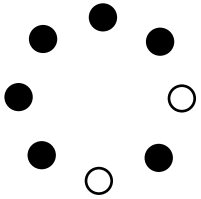
Second Button



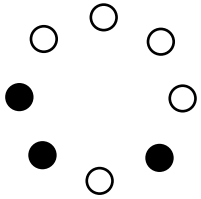
Fourth Button



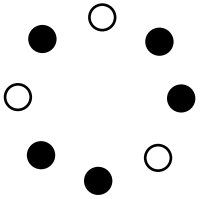
First Button



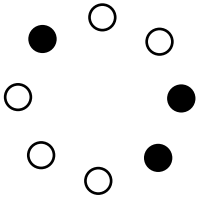
Fourth Button



First Button

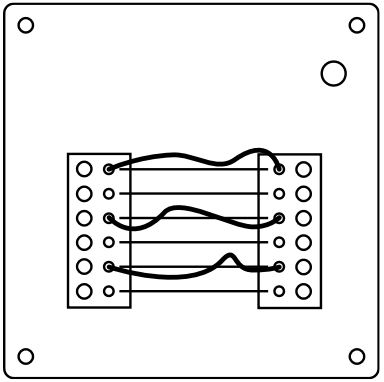


Third Button



Second Button

Module 05: Twisted Wires



- Examine each wire individually: there is a red LED to the left of the wire and a yellow LED to the right.
- For each wire-LED combination, use the diagram and the instructions below to determine whether the wire should be disconnect.
- If a condition applies, look inside the corresponding circle in the diagram — if not, look outside the circle.

Eigenschaften:

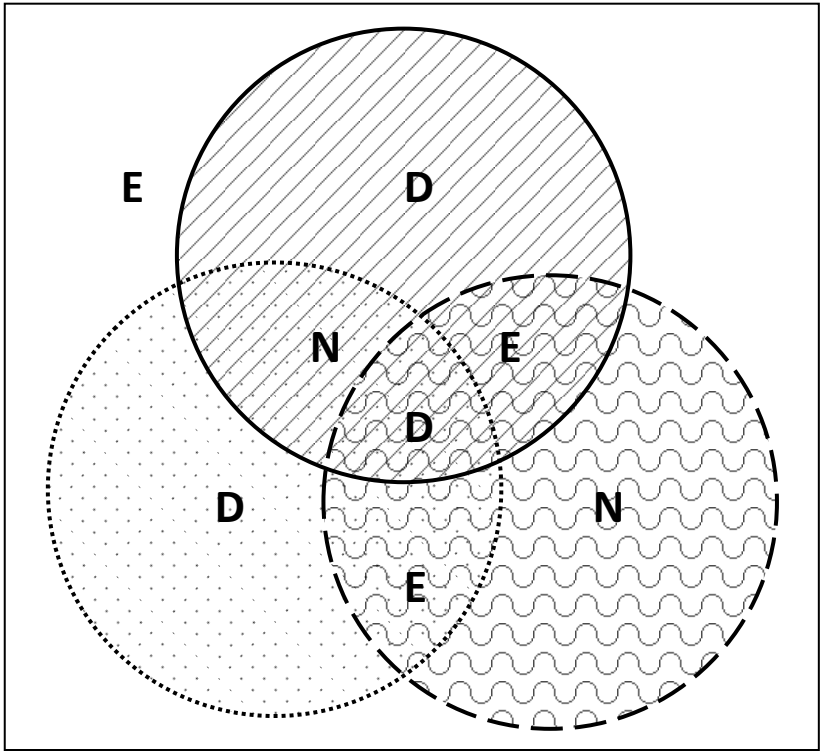
Wire is blue or blue-striped.

Yellow LED (right) is on.

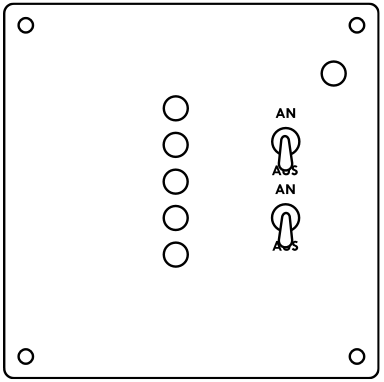
Red LED (left)is on.

Letter	Instruction
E	Disconnect the wire
N	Do not disconnect the wire
D	Disconnect the wire if the bomb has more than one rotary knob

diagram:



Module 06: Logic Gates



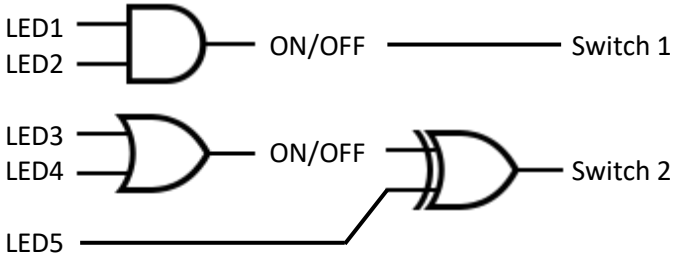
- Use the LEDs to determine whether the two switches should be turned on or off.
- Use the logic gates shown on the right to help you decide.
- Each gate has two inputs on the left and one output on the right.
- The inputs can be defined either by LEDs or by the outputs of previous gates.
- The logic gates have the following meanings:


AND: If **both** inputs are **ON**, the output is **ON**; otherwise, it is **OFF**.

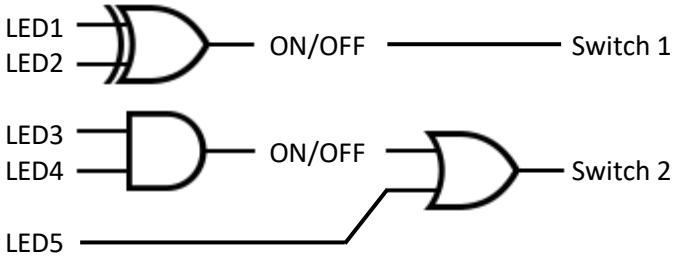

OR: If **at least** one input is **ON**, the output is **ON**; otherwise, it is **OFF**.


XOR: If **exactly one** input is **ON**, the output is **ON**; otherwise, it is **OFF**.

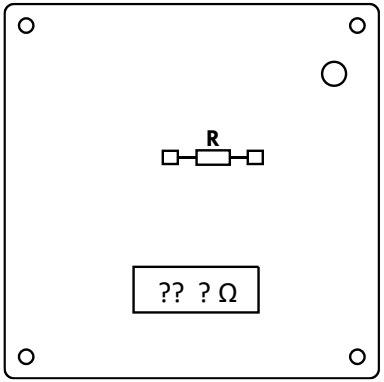
If the last digit of the serial number is <u>even</u>:



If the last digit of the serial number is <u>odd</u>:

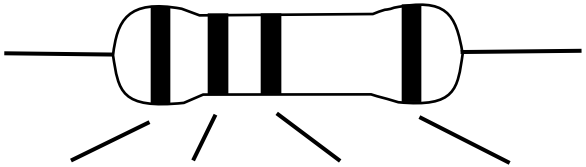


Module 07: Resistor



- The display shows which resistor must be placed between the test points.
- The value of the resistors can be calculated using the table.
- 1 kΩ equals 1,000 Ω, 1 MΩ equals 1,000,000 Ω.
- The last band is always gold.

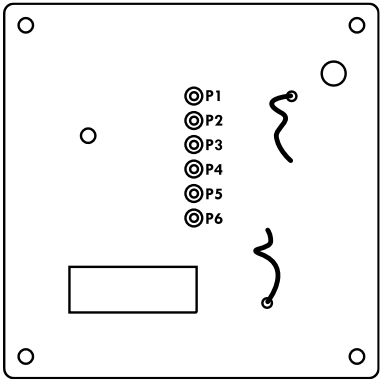
- **WARNING:** Touching the metal leads of the resistor during insertion may cause an error! Only handle the resistor by its body.



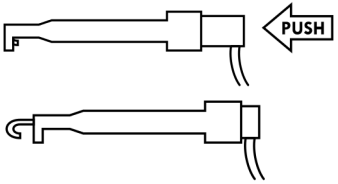
Color	1st Digit	2nd Digit	Zeros (Multiplier)	Gold
Black	-	0	-	
Brown	1	1	0	
Red	2	2	00	
Orange	3	3	000	
Yellow	4	4	0000	
Green	5	5	00000	
Blue	6	6	000000	
Violet	7	7	-	
Gray	8	8	-	
White	9	9	-	
Gold	-	-	x 0,1	
Silver	-	-	x 0,01	
None	-	-	-	

Example: A resistor with a value of **3.9 kΩ** equals **3900 Ω**. That corresponds to the colors**: Orange (3), White (9), Red (00)**, and Gold.

Module 08: Volt Meter

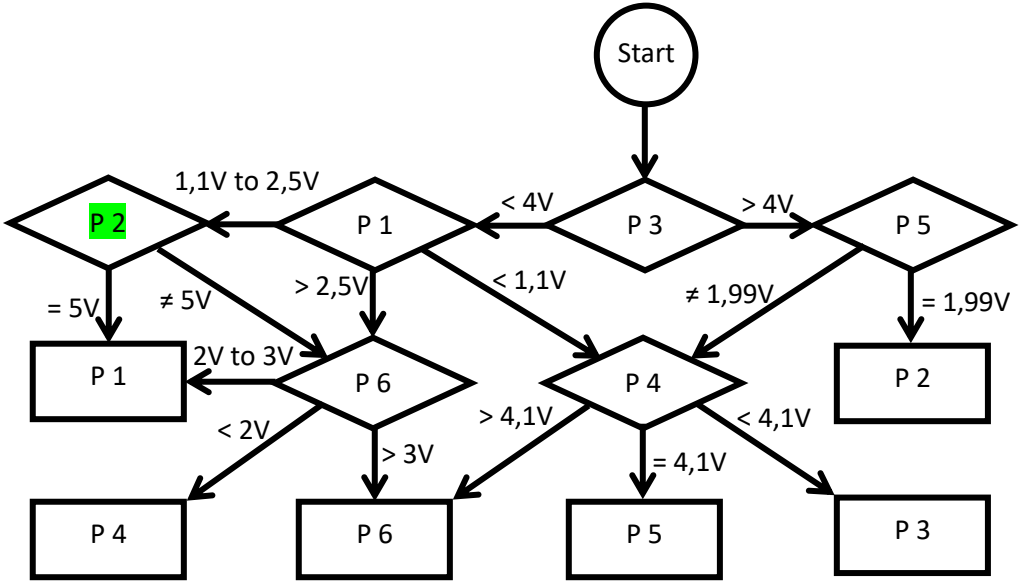


- Follow the flowchart. The starting point is the circle.
- Diamonds (◇) indicate where a measurement must be taken with the probe tip. Then follow the correct arrow based on the result.
- Measurements may only be taken when the alligator clip is not connected to any point.
- Rectangles (▭) indicate the point where the alligator clip must be connected.

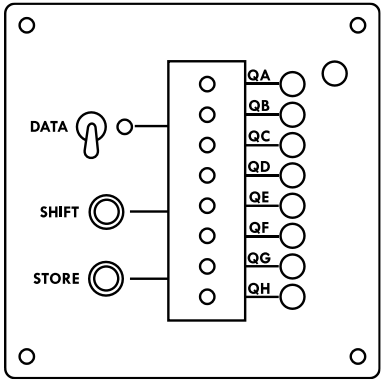


Probe tip

alligator clip

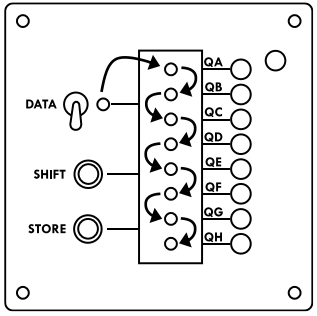

Start
P 3
< 4V
> 4V
P 1
1,1V to 2,5V
P 2
P 5
= 5V
≠ 5V
> 2,5V
< 1,1V
≠ 1,99V
= 1,99V
P 1
2V to 3V
P 6
P 4
P 2
< 2V
> 3V
> 4,1V
= 4,1V
< 4,1V
P 4
P 6
P 5
P 3

Module 09: Shift Register

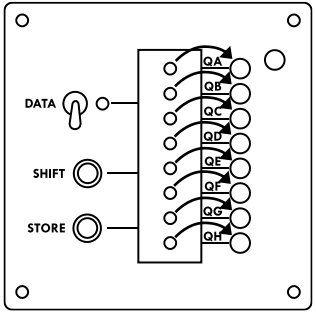


- The large LEDs show the current outputs.
- Use the table and the current outputs QA to QH to determine which pattern must be entered next.
- Only one row in the table matches the current outputs.
- Enter the target pattern digit by digit:
  - For a 0, turn "DATA" off (DATA LED off).
  - For a 1, turn "DATA" on (DATA LED on).
  - Then press "SHIFT" (this shifts all LEDs down by one position).
  - Repeat this process until all digits of the target pattern have been shifted into the shift register (small LEDs).
- When the target pattern is correctly set on the small LEDs, press "STORE" to initiate the check.

SHIFT:

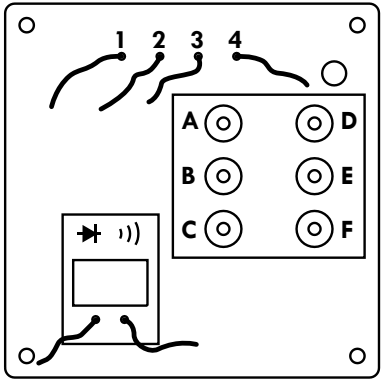


STORE:

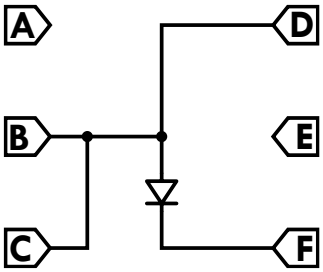


Current Outputs	**Target Pattern**
QB on, QE on, QG off	0110 0110
QB off, QC off, QE on	1101 1011
QB off, QE off	1001 1001
QB on, QE off, QF on	0100 0010
QB on, QE on, QG on, QH off	1011 1101
QB off, QC on, QE on	0111 1110
QB on, QE off, QF off	1000 0001
QB on, QE on, QG on, QH on	0011 1100

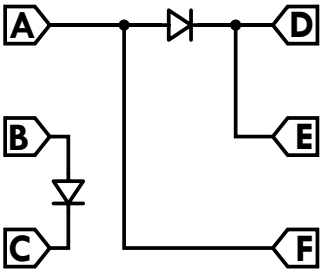
Module 10: Schematic



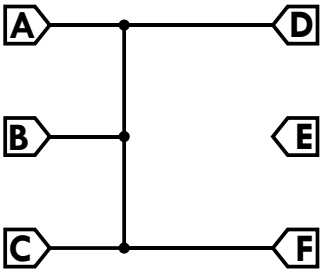
- Use the continuity tester at the bottom left to find out which circuit matches.
- Connect the numbered wires accordingly.
- The continuity tester has a red and a black test lead. It works as follows:
  - If there is no connection, the tester shows “OL” (for "Open Load").
  - If there is a short circuit (direct connection), the tester shows “0,0 V” and beeps.
  - When the tester measures a diode (▷|):
    In forward direction (*red lead* ▷| *black lead*), it shows “0,7 V” and beeps.
    In reverse direction (*red lead* |◁ *black lead*), it shows “OL”.



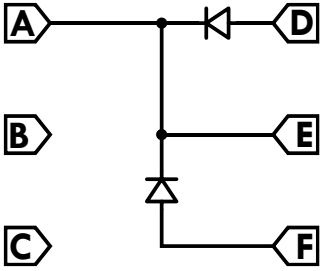
1 -> C
2 -> A
3 -> B
4 -> F



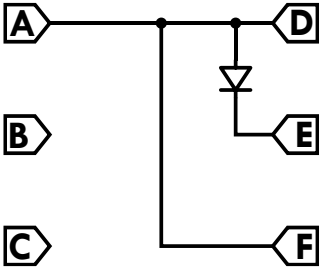
1 -> C
2 -> E
3 -> A
4 -> F



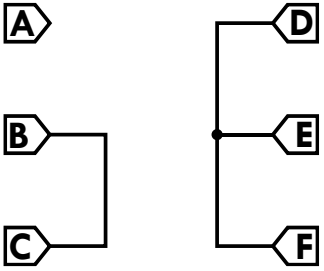
1 -> E
2 -> A
3 -> F
4 -> C



1 -> F
2 -> C
3 -> E
4 -> D

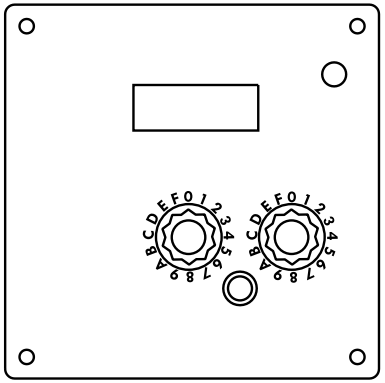


1 -> E
2 -> C
3 -> B
4 -> F



1 -> C
2 -> F
3 -> D
4 -> A

Module 11: ASCII

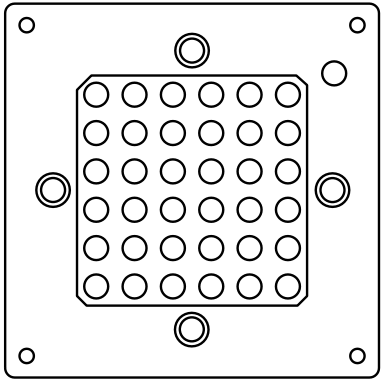


“Johanssen’s Notebook is an inexhaustible source of information. I know she had an ASCII table somewhere. Every computer nerd has one.” – Mark Watney, The Martian

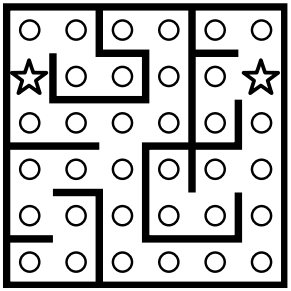
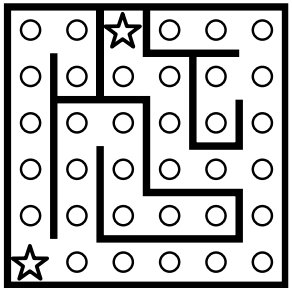
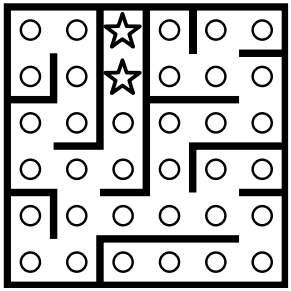
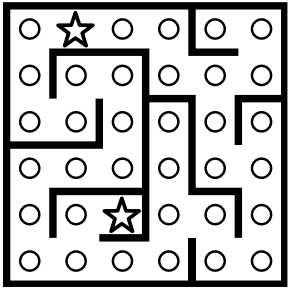
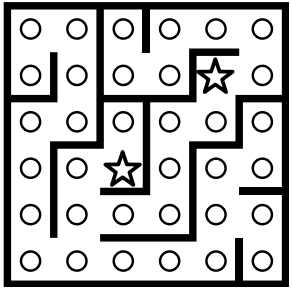
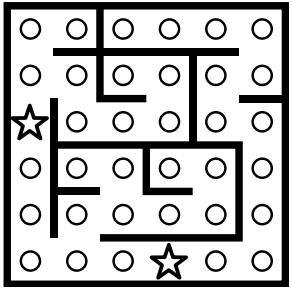
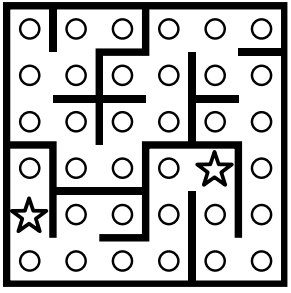
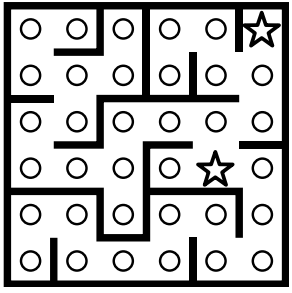
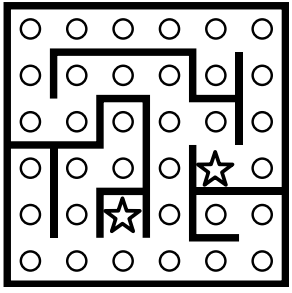
- The text on the display must be entered as ASCII code using the coded rotary switches.
- The small letters in the corners do not belong to the text; they show the current settings of the rotary switches.
- Each letter is confirmed by pressing the button.
- The displayed table shows the mapping of letters and symbols to their corresponding code.

	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F
2_		! 21	" 22	# 23	$ 24	% 25	& 26	' 27	(28	) 29	* 2A	+ 2B	, 2C	- 2D	. 2E	/ 2F
3_	0 30	1 31	2 32	3 33	4 34	5 35	6 36	7 37	8 38	9 39	: 3A	; 3B	< 3C	= 3D	> 3E	? 3F
4_	@ 40	A 41	B 42	C 43	D 44	E 45	F 46	G 47	H 48	I 49	J 4A	K 4B	L 4C	M 4D	N 4E	O 4F
5_	P 50	Q 51	R 52	S 53	T 54	U 55	V 56	W 57	X 58	Y 59	Z 5A	[5B	\ 5C	] 5D	^ 5E	

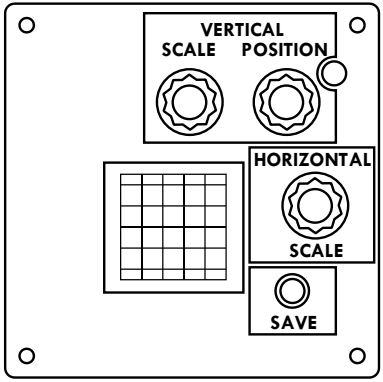
Module 12: Maze



- Identify the correct maze using the yellow glowing stars in the maze.
- Navigate the blue dot to the white goal using the four buttons on the side.
- The top button moves the blue dot up, the right button moves it right, the bottom button moves it down, and the left button moves it left.
- The blue dot must not cross any walls, which are only visible in the manual.

Module 13: Oscilloscope



- Use the instructions to determine how the oscilloscope must be configured.
- Once all settings are correct, save the image.
- The “Oscilloscope Quick Guide” explains how to operate an oscilloscope.
- The “Basics of Periodic Signals” explain how to identify and measure a signal.

Instructions

Temporarily set the oscilloscope using the control knobs so that the entire signal is clearly visible.
If the signal is a sine wave: If U_{PP} is less than 8 volts, set 3 V/div. Otherwise, set 5 V/div.
If the signal is a triangle wave: If U_{PP} is at least 3.5 volts, move the zero level all the way to the bottom, otherwise move it all the way to the top.
If the signal is a square wave: If U_{PP} is greater than 5 V, set 10 V/div, otherwise set 2 V/div.

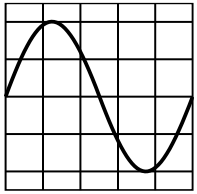
Oscilloscope Quick Guide

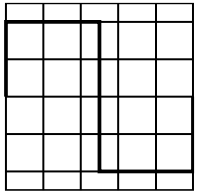
The oscilloscope screen is divided into a grid of squares called divisions (short: “div”).
At the bottom edge of the screen, it shows how many volts (V) each division represents (“V/div”).

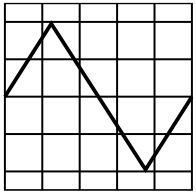
- “Vertical Scale” adjusts the number of volts per division, making the signal appear larger or smaller.
- “Vertical Position” adjusts the zero level, shifting the entire signal up or down.
- “Horizontal Scale” is not used and is disabled.
- Press “Save” to store the current image in the oscilloscope’s internal memory.

Basics of Periodic Signals

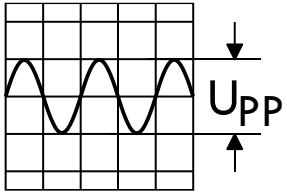
Waveforms


Sine wave


Square wave


Triangle wave

Amplitude (Size):



The peak-to-peak voltage U_{PP} represents the size of the signal from the lowest to the highest point.
To determine this, count how many boxes (= divisions) the signal spans vertically.
Then multiply this by the number of volts per division (V/div) shown at the bottom of the display.

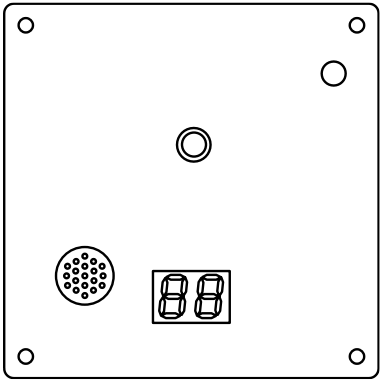
In this image, the peak-to-peak voltage U_{PP} is two divisions (squares) high.

Example calculation:
If the display reads 4 V/div and the signal spans 2 divisions, then:
$U_{PP} = 2 \times 4 = 8$ volts.

PART 2
Urgent Modules

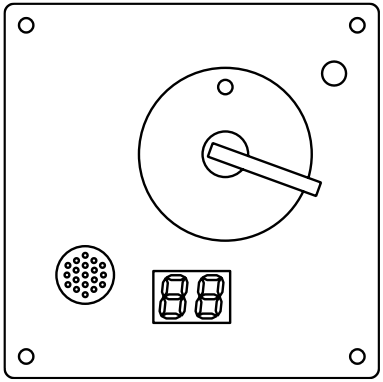
Module 50: Nervous Button

- When the module activates, press the button before the small timer runs out.
- If the last digit of the serial number is even, the button may only be pressed during odd seconds on the small timer.
- If the last digit of the serial number is odd, the button may only be pressed during even seconds on the small timer.



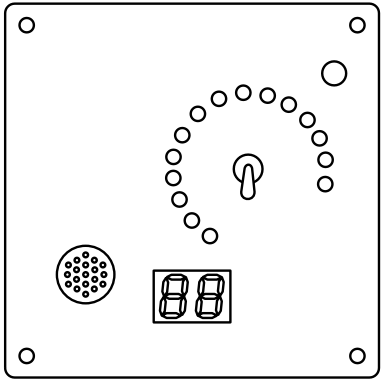
Module 51: Rotating Thingy

- When the module activates, the rotating thing in the middle must not touch the movable contact.
- The movable contact (outer ring) can be rotated freely.



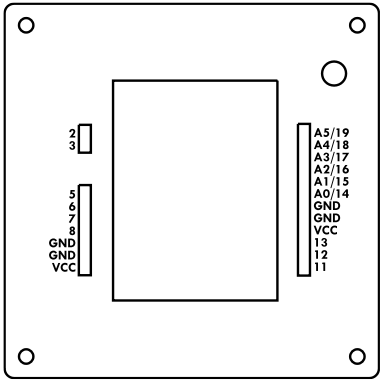
Module 52: Tone Generator

- The tone frequency must be kept stable.
- When the module activates, the moving LED must not reach the red zone.
- The toggle switch changes the direction of movement.
- If the toggle switch is set to the middle (neutral) position when only the blue LED is lit, the module deactivates.



Module 99: Prototype

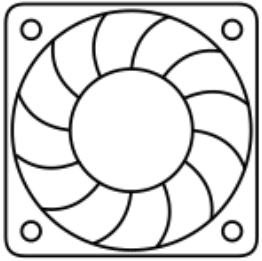
- This module is a prototype.
- The instructions may vary. In case of doubt, consult the external expert.
- The external expert can occasionally be reached on Wednesdays from 18:30 to 22:00 on frequency 145.275 MHz in area C28.



APPENDICES

Appendix A – Identification Marks

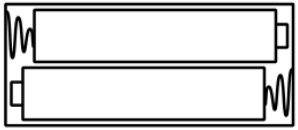
Fan



The fan may be present with or without a protective grille.

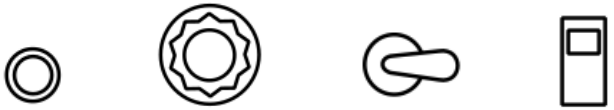
Batteries

Batteries in a double holder count as inserted only if both batteries are present.



Batteries in single holders are counted individually.

Buttons and Switches



Push Button Rotary Knob Toggle Switch Slide Switch

Displays

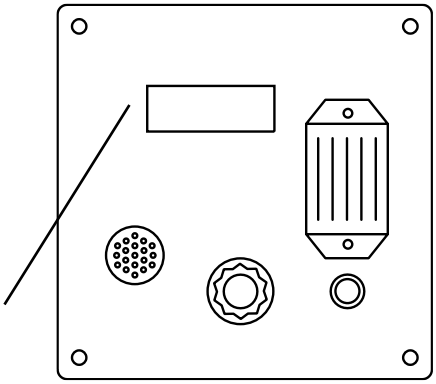
Displays show information using pixels in a rectangular area.

OLED: Monochrome LCD: Color

Serial Number

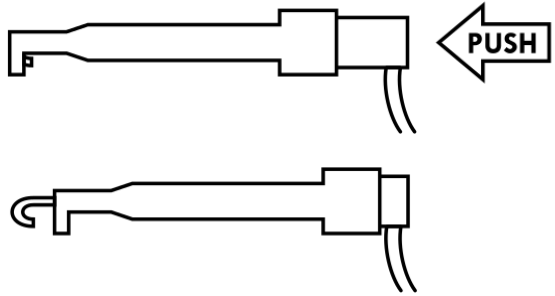
The serial number is located on the display below the timer.

The cross sum of the serial number is calculated by adding the individual digits together. Letters and other characters are ignored.



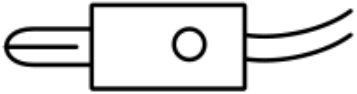
Appendix B – Plugs and Connectors

Probe Tip



Alligator Clip

Miniature Plug



Wire

Appendix C – Assembly Instructions

Materials that are not permanently installed but required for a module are highlighted in **bold**.

Module 01 Wires

Insert **3 to 6 random red, yellow, white, blue, or black wires** side by side into the pin headers. The wires must not cross each other.

- The red wire has a value of 100Ω.
- The yellow wire has a value of 330Ω.
- The white wire has a value of 680Ω.
- The black wire has a value of 2.2kΩ.
- The blue wire has a value of 33kΩ.

For the version with wires to be cut, include a **wire cutter**.

Module 02 Binary Numbers

-/- (no special disarming step)

Module 03 Morse

-/-

Module 04 LED Circle

-/-

Module 05 Twisted Wires

Insert **three to six random red, white, blue, red-white, blue-white, or red-blue wires** horizontally into the connectors.

- The red and red-white wires have a value of 100Ω.
- The white wire has a value of 680Ω.
- The red-blue wire has a value of 2.2kΩ.
- The blue and blue-white wires have a value of 33kΩ.

The wires must be inserted at the same height on both sides.

For the version with wires to be cut, include a **wire cutter**.

Module 06 Logic Gate

Set both switches to the middle position.

Module 07 Resistors

Prepare 22 resistors with the following **values:**

- 100Ω, 180Ω, 330Ω, 470Ω, 680Ω
- 1kΩ, 1.5kΩ, 2.2kΩ, 3.3kΩ, 4.7kΩ, 6.8kΩ
- 10kΩ, 15kΩ, 22kΩ, 33kΩ, 47kΩ, 68kΩ
- 100kΩ, 150kΩ, 220kΩ, 330kΩ, 560kΩ

No resistor should be inserted into the test points.

Include a **flashlight** if working in a dark environment.

Module 08 Volt Meter

Disconnect the connection.

Module 09 Shift Register

-/-

Module 10 Schematic

Remove all plugs.

Module 11 ASCII

-/-

Module 12 Maze

-/-

Module 13 Oscilloscope

-/-

Module 50 Nervous Button

-/-

Module 51 Rotating Thingy

Turn the screw away from the movable arm.

Module 52 Tone Generator

-/-

Appendix D – Game Master Operation

- Reset: The button at the bottom right of the timer restarts the game.
- Menu:
    - Press and hold the rotary knob on the timer within 5 seconds of opening the case for at least one second to enter the menu.
    - Settings:
        - Change Time (**Zeit ändern**): Set the desired starting time for the timer.
        - Setup Number (**Setup Nr.:**) (only effective after restart):
            - Random (**Zufall**): Modules are initialized with a random value. Modules that assign themselves other initial values behave differently each time.
            - Number between 1 and 255: Modules are always initialized with this value and behave identically for the same build.
        - Difficulty (**Schwierigkeit**) (only effective after restart): Defines the difficulty level for the modules. The corresponding manual must be used. (Easy = **Einfach**)
        - Fuses (**Sicherungen**): Number of allowed mistakes before the bomb explodes.
        - When Closed (**Wenn zu**): Defines what happens when the case is closed:
            - Pause: Timer pauses and resumes at the same position when reopened.
            - Reset: Timer resets to the initial time.
            - Continue (**Weiter**): Timer continues running uninterrupted.

- Start: When the bomb should begin countdown:
  - Immediately (**Sofort**): Countdown starts as soon as possible—no further action needed.
  - On Opening (**öffnen**): Bomb must be closed once and then starts when opened.
- Software/Hardware version: The current version is shown here
- Restart Now (Jetzt Neustart?): Option to restart the bomb immediately. (No = **Nein**, Yes = **Ja**)

- Modules blinking green after startup were not recognized or are incorrectly assembled. Check the module, then press the reset button.
- Modules blinking red-green during startup are still in DEBUG mode and must be reprogrammed.
- If the bomb detonates due to excessive errors, the module that triggered the final mistake will display a solid red status LED, while all other modules flash in multiple colors.

Appendix E – Campaign

Required Modules: 01 Wires, 02 Binary Numbers, 03 Morse, 04 LED Circle

Easy

No.	Title	Modules	Time	Fuses	Difficulty
1.1	Every Beginning...	Wires, LED Circle	05:00	5	Easy
1.2	Secret Message	Wires, Morse	05:00	5	Easy
1.3	One, two, 11	Wires, Binary Numbers, LED-Circle	06:00	5	Easy
1.4	A Bit of Everything	Wires, Binary Numbers, Morse, LED Circle	06:00	5	Easy
1.5	How hurry up	Wires, Binary Numbers, Morse, LED Circle	04:00	3	Easy

Hardcore

No.	Title	Modules	Time	Fuses	Difficulty
2.1	You Have to Remember That	Wires, Binary Numbers, LED Circle	06:00	5	Hardcore
2.2	Incoming Message	Wires, Morse, LED Circle	06:00	5	Hardcore
2.3	All Knowledge Combined	Wires, Binary Numbers, Morse, LED Circle	06:00	3	Hardcore
2.4	Now Hurry Up	Wires, Binary Numbers, Morse, LED Circle	04:00	2	Hardcore
2.5	Zero Tolerance	Wires, Binary Numbers, Morse, LED Circle	02:30	0	Hardcore

Required Modules: 01 Wires, 02 Binary Numbers, 03 Morse, 04 LED Circle, 05 Twisted Wires, 06 Logic Gates, 07 Resistor, 08 Measuring Device, 09 Shift Register, 50 Nervous Button

Easy

No.	Title	Modules	Time	Fuses	Difficulty
1.1	Every Beginning...	Wires, LED Circle	05:00	5	Easy
1.2	Secret Message	Wires, Morse	05:00	5	Easy
1.3	One, two, 11	Binary Numbers, LED Circle, Measuring Device	06:00	5	Easy
1.4	Logical Matter	Morse, Twisted Wires, Logic Gates, Measuring Device	06:00	5	Easy
1.5	I Want Attention Now!	Binary Numbers, Twisted Wires, Measuring Device, Nervous Button	05:00	2	Easy
1.6	The Rest of the Party	Wires, Logic Gates, Resistor, Shift Register	05:00	2	Easy
1.7	Now Hurry Up	Binary Numbers, Twisted Wires, Logic Gates, Shift Register	03:00	3	Easy

Hardcore

No.	Title	Modules	Time	Fuses	Difficulty
2.1	Memory Test	Wires, Binary Numbers, Logic Gates	06:00	5	Hardcore
2.2	Long Message	Measuring Device, Morse, LED Circle	06:00	5	Hardcore
2.3	Side Job	Binary Numbers, Logic Gates, Shift Register, Nervous Button	06:00	3	Hardcore

2.4	So Many Wires	Wires, Twisted Wires, Resistor, Measuring Device	06:00	2	Hardcore
2.5	Step On It	Morse, LED Circle, Resistor, Nervous Button	04:00	2	Hardcore
2.6	This Is Too Slow!	Measuring Device, Twisted Wires, Logic Gates, Shift Register	02:30	0	Hardcore

Massive Setup

No.	Title	Modules	Time	Fuses	Difficulty
3.1	A Little Bit More	Binary Numbers, LED Circle, Logic Gates, Measuring Device, Shift Register	07:00	5	Easy
3.2	Workload	Wires, Binary Numbers, Morse, Twisted Wires, Logic Gates, Resistor, Nervous Button	07:30	5	Easy
3.3	A Bit of Everything	Wires, Binary Numbers, Morse, LED Circle, Twisted Wires, Logic Gates, Resistor, Measuring Device, Shift Register, Nervous Button	08:00	3	Easy
3.4	The Full Package	Wires, Binary Numbers, Morse, LED Circle, Twisted Wires, Logic Gates, Resistor, Measuring Device, Shift Register, Nervous Button	08:00	3	Hardcore
3.5	Zero Error Tolerance	Wires, Binary Numbers, Morse, LED Circle, Twisted Wires, Logic Gates, Resistor, Measuring Device, Shift Register, Nervous Button	05:00	0	Hardcore

Required Modules: 01 Wires (2x), 02 Binary Numbers (2x), 03 Morse, 04 LED Circle (2x), 05 Twisted Wires, 06 Logic Gates, 07 Resistor, 08 Measuring Device (2x), 09 Shift Register (2x), 50 Nervous Button, 52 Tone Generator

Clearance Assistant

No.	Title	Modules	Time	Fuses	Difficulty
1.1	Every Beginning…	01, 02, 04	6:00	5	Easy
1.2	Something Old, Something New	01, 02, 07	6:00	5	Easy
1.3	Double Trouble	01, 01, 02, 02, 04, 04	6:00	5	Easy
1.4	Next Level	01, 04, 07, 08	6:00	3	Easy
1.5	Hurry Up!	01, 02, 04	3:00	3	Easy

Ordnance Technician

No.	Title	Modules	Time	Fuses	Difficulty
2.1	Secret Message	02, 04, 03	05:00	5	Easy
2.2	Something's Off	02, 07, 05	05:00	5	Easy
2.3	No More Easy Mode	03, 05, 07, 08	05:00	3	Easy
2.4	This Should Be Familiar	01, 01, 03, 07, 08	05:00	3	Easy
2.5	Rush It!	01, 02, 04, 05, 07	03:00	3	Easy

Explosive Ordnance Disposal

No.	Title	Modules	Time	Fuses	Difficulty
3.1	That's Just Mean	03, 05, 07, 08, 09	05:00	3	Easy
3.2	Zero Tolerance	01, 03, 05, 07, 09	04:00	0	Easy
3.3	A Logical Matter	02, 05, 06, 08	04:00	3	Easy
3.4	Workload Overload	01, 02, 02, 03, 05, 08, 08	05:00	3	Easy
3.5	Chop-Chop!	01, 04, 05, 07	02:30	3	Easy
3.6	A Bit of Everything	01, 02, 03, 04, 05, 06, 07, 08, 09	08:00	5	Easy

Blasting Expert

No.	Title	Modules	Time	Fuses	Difficulty
4.1	What the Hell…?	02, 04, 07, 08	03:00	3	Hardcore
4.2	Take Your Time	01, 03, 05, 06, 08	06:00	3	Hardcore
4.3	The Right Direction	02, 03, 04, 09, 09	04:00	2	Hardcore
4.4	That's Too Slow!	01, 02, 03, 05, 07, 09	03:00	2	Hardcore

Detonator

No.	Title	Modules	Time	Fuses	Difficulty
5.1	I Demand Attention	02, 02, 04, 07, 08, 09, 50	06:00	2	Hardcore
5.2	All Around	03, 05, 04, 09, 52	04:00	2	Hardcore
5.3	Multitasking	01, 05, 06, 09, 50, 52	04:00	0	Hardcore
5.4	The Full Package	01, 02, 03, 06, 07, 08, 09, 50, 52	08:00	2	Hardcore
5.5	It Doesn’t Get Any Worse	01, 02, 03, 04, 05, 06, 07, 08, 09	04:00	0	Hardcore