

RUST:

THE ELECTRICAL HANDBOOK



A continually updated all inclusive guide to everything electrical in the game Rust. This handbook will include everything you need to find, craft, wire, and utilize different useful circuits in game. These designs have been curated from many community submissions into the simplest, cheapest, and most effective versions possible. Please contact the author if you have an addition you think could help another player!

RUST: THE ELECTRICAL HANDBOOK

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INTRODUCTION

ELECTRICITY IN RUST

Welcome to what I hope to be a helpful lesson or tool in Rust's electrical system. Over the years Rust has gone through drastic changes and through feedback and gameplay has developed into the game it is today. One of the most recent newly introduced items is the electrical system. Initial appearances allowed for simple light circuits to allow us to not feel like we were still living in the stone ages! A brighter, crisper, more white light came with this and with it a storm of love and hate from the community. Through time it seems the supporters have won over the developers and it looks as though power is here to stay in Rust! Since it's stage entrance Facepunch studios has continued to add more components that have allowed players to get creative and make some elaborate contraptions that absolutely change the gameplay and what you are able to accomplish in game with a little know how.

ADVANTAGES OF LEARNING RUST CIRCUITRY

If you are reading this, you have probably finally decided you are sick of dying in trap bases, being interrupted by base owners coming home during your raid, or are jealous of your neighbors sweet minicopter garage that closes on its own as he flies off into the sunset. If not anyone of those, you would have to be here to learn to be the envy of the player I described above.

Electricity in rust has vast benefits and will continue to be more useful as more components are added. If you think that the only thing you can do with electricity is hook up a few lights, then you are definitely in for a learning experience! Below are a few examples of things you will learn here that can save you time, play more efficiently, and more:

- Light Systems
- Door Controllers
- Automatic Hidden Sentry Defense Systems
- Automatic Garage Bays for Minicopters
- Raid Detection and Alarm System
- Door Camper Alert and Counter
- Monument Player Detectors

This list does not begin to cover all the possibilities, but a good understanding of the electrical system is essential to using it properly and effectively. There are small things about this system that if not paid careful attention to can leave an effective machine rendered useless and sometimes at the worst time!

INTRODUCTION

THINGS YOU SHOULD KNOW

This area is designed to go over some basic mechanics and concepts that will help you understand your circuits better as you learn and recreate them. It is fully recommended to look over the entire section including Bugs & Exploits as it can save you time, resources, and frustration later on.

Each electrical item is placed slightly different and is used differently than others. Some items are large and need to be placed directly on a flat surface. The items include:

- Large Battery (Roughly 1/4 of 1 Square)
- Small Battery (Roughly half the size of a Small Wooden Box)
- Turbines (Take up an entire 1x1 area, and typically require a Square to the side to place)
- Solar Panels (Roughly half the size of a Large Wooden Box) *Panels Must See Sunlight in Order to Produce Sunlight. Be aware of surrounding structures that may cast shadows
- RF Broadcaster/RF Receiver (Roughly size of Small Wooden Box but Twice as Tall)
- Generator (Will not be covered until released to Main Branch)
- Pressure Pad (Roughly size of Small Wooden Box and can be placed under sleeping bags currently)
- Siren (Very Small)
- Samsite (Very Large placing area, also required visibility to function)

The following items can only be placed on walls and cannot be placed on the ground:

- Splitter
- XOR, OR, & AND Switch
- Standard Switch
- Door Controller
- Laser Detector

The following items can be placed on any surface excluding doors:

- Root Combiner
- Electrical Branch
- RAND Switch
- Memory Cell
- Blocker
- HBHF Sensor
- Counter

The final item can only be placed on ceilings:

- Ceiling Light

INTRODUCTION

ROOT COMBINERS ONLY WORK ON ROOTS

Root Combiners are used to combine separate power sources to create a larger output of power. This is an important note to remember as you cannot use other end sources of powers to combine them such as a Branch or a Splitter. Root sources are the used on the following outputs only:

- Turbines
- Solar Panels
- Large & Small Batteries
- Generators
- Additional Root Combiners

IMPORTANT NOTE ON BATTERY POWER MEASUREMENT

Batteries do not export power in the same way as a Turbine or Solar Panel. Large batteries always put out 100 power and Small Batteries always put out 10 power, similar to how a AA battery is designed to always put out 1.5V. While that is the case they amount of power they have is measured by time. You can measure this by holding a Wire Tool to the battery and it will display the amount of time left. Solar panels and Turbines put out a range of power dependant on the amount of input.

HOW MUCH POWER DOES THIS MAKE?

Solar Panels and Turbines are currently the only ways in game to generate power. Turbines can be a powerhouse in the most literal sense while solar panels are more reliable but don't output nearly as much power.

During full exposure to the sun one solar panel will output its maximum of 20. As the sun rises/sets this will deplete. A standard day in rust is 45 minutes long with a 15 minute night period. This is important to know to calculate how much power you will need with this option.

Turbines are a little different in the sense that they create power most of the time. It is important to know that the higher you place the turbine the more wind it will receive and in turn will generate more power. You will see some players elevate the turbine to the maximum height possible above their base to take advantage of this. Building turbine powered bases is also much easier in higher elevations due to this fact. While turbines can generally output anywhere from 60-200 power, they can also completely stop generating power at any point due to natural winds to being present. Overall the solar panels are more consistent in power generation while turbines if used correctly are a more expensive but more powerful option.

INTRODUCTION

THINGS YOU SHOULD KNOW (CONT'D)

HOW MUCH WIRE TOOL DO I NEED?

You only need one wire tool. You can stretch any wire up to 30 meters and connect to up to 30 different points in the distance. The wire tool is reusable and does not take any damage.

WHERE DO I FIND COMPONENTS?

Components are found in loot boxes. The type of box will vary on which type of component. Majority of all items can be found in the blue strap wooden crates, while a few hire tier items can only be found in Military, Elite, and Timed Crates. The RF Receiver, Broadcaster, Antenna and Large Battery must be found in Military or better crates. At this time I was unable to find any percentages. Most items are Tier 1 Workbench items and if you struggle that much to find them can be gambled for at 75 each with the Workbench. You can find more information on each items location in the Components section of this Handbook.

BUGS & EXPLOITS

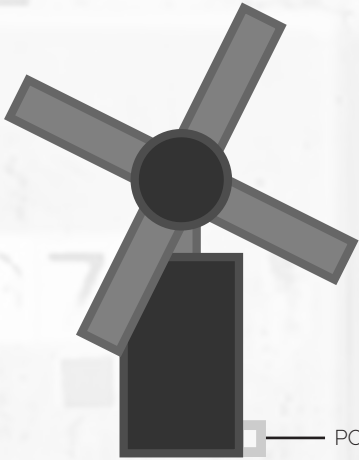
Facepunch has done their best to consistently update this game and correct any major bugs and issues. With that being that, this section of this handbook will be updated dependant on when/where you find it. As changes happen and issues arise, this area will be home to new information, work-arounds, and other tips to to help address these problems.

BATTERY DISCHARGE NOTICE:

Currently Large and Small batteries have a known issue that causes a lot of players new to electricity some struggle. A battery hooked up to any component besides an activated blocker or a standard switch will draw power slowly. To avoid this problem you will need to incorporate a blocker or a switch into your Battery power out.

COMPONENTS

POWER SOURCES

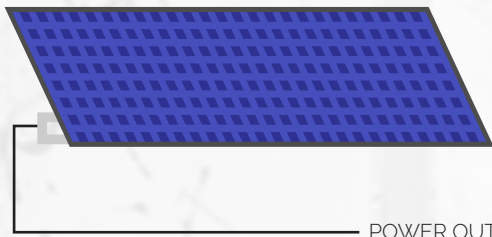


TURBINE

CRAFTING RECIPE: 10 SHEET METAL, 3 GEARS, 1500 WOOD, 30 HQM
WORKBENCH REQUIRED: LEVEL 2
RESEARCH COST: 250 SCRAP
USED FOR: LESS RELIABLE SOURCE OF HIGHER POWER
INPUTS/OUTPUTS: POWER OUT
WHERE TO FIND: MILITARY, ELITE, & TIMED CRATES; BANDIT (500 SCRAP)
POWER OUTPUT: 0-200

NOTES:

Output based on elevation and wind presence. Can completely stop generating power for periods in some cases. Requires a full 1x1 square to place and cannot have anything within reaching range.



SOLAR PANEL

CRAFTING RECIPE: 25 HQM
WORKBENCH REQUIRED: LEVEL 1
RESEARCH COST: 75 SCRAP
USED FOR: RELIABLE SOURCE OF SMALL POWER
INPUTS/OUTPUTS: POWER OUT
WHERE TO FIND: WOODEN BLUE STRAP CRATES/SUNKEN CHESTS
POWER OUTPUT: 0-20

NOTES:

Output based on direct sunlight reaching the solar panels. Be aware of sun direction and obstacles in your path as shadow will reduce/eliminate any power generation. These are typically run in series with root combiners and also can be used by a blocker to detect if sunlight is present for automatic lights.

THE WIRE TOOL



WIRE TOOL

CRAFTING RECIPE: 5 HQM
WORKBENCH REQUIRED: LEVEL 1
RESEARCH COST: AUTOMATICALLY LEARNED
USED FOR: USED TO CONNECT ELECTRICAL COMPONENTS
WHERE TO FIND: ONLY CRAFTED

NOTES:

This tool does not take damage. You can connect wire up to 30 meters and connect to 30 points along that route. You will only ever need one of these.

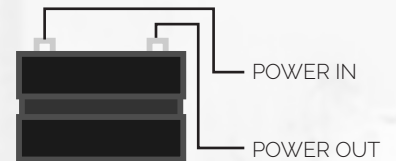
COMPONENTS

BATTERIES & AIR-DEFENSE

SMALL BATTERY

CRAFTING RECIPE: 10 HQM
WORKBENCH REQUIRED: LEVEL 1
RESEARCH COST: 20 SCRAP
USED FOR: SMALL POWER STORAGE SOURCE
INPUTS/OUTPUTS: POWER IN, POWER OUT
WHERE TO FIND: WOODEN BLUE STRAP CRATES/SUNKEN CHESTS
POWER OUTPUT: 10 (Up to 4 hours)
NOTES:

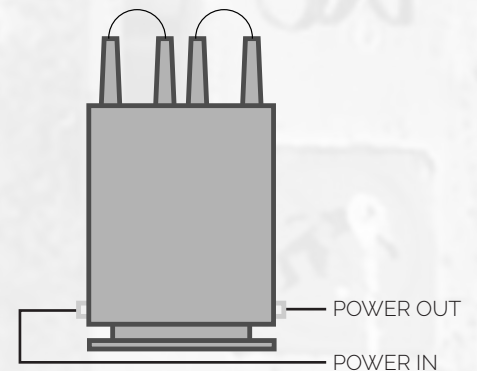
Battery has 2 minutes of charge when placed. Outputs a constant 10 power. Power left is measured in hours and minutes and can be read by holding a wire tool up to the battery. Battery will drain if hooked into any component except for an activated blocker or an off switch.



LARGE BATTERY

CRAFTING RECIPE: 50 HQM
WORKBENCH REQUIRED: LEVEL 2
RESEARCH COST: 75 SCRAP
USED FOR: LARGE POWER STORAGE SOURCE
INPUTS/OUTPUTS: POWER IN/POWER OUT
WHERE TO FIND: MILITARY, ELITE, & TIMED CRATES
POWER OUTPUT: 100 (Up to 4 hours)
NOTES:

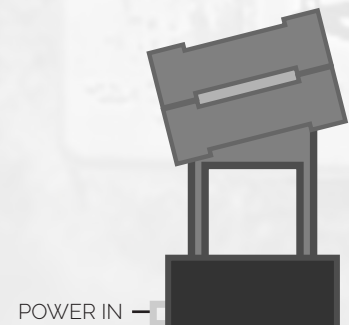
Battery has 2 minutes of charge when placed. Outputs a constant 100 power. Power left is measured in hours and minutes and can be read by holding a wire tool up to the battery. Battery will drain if hooked into any component except for an activated blocker or an off switch.



SAM SITE

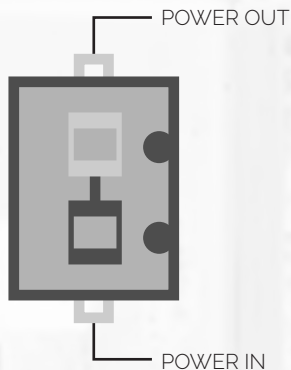
USED FOR: SHOOTS ANTI-AIR MISSILES
INPUTS/OUTPUTS: POWER IN (REQUIRES 25 POWER)
WHERE TO FIND: CAN ONLY BE BOUGHT AT OUTPOST (500 SCRAP)
NOTES:

This item requires a large area clear of objects to place and needs a hefty 25 power to function. It is important to know that this turret does not authorize like others and will fire at any air vehicle it sees. Adding a switch or toggle to turn it off is important. See the circuits later in the handbook for more information.



COMPONENTS

SWITCHES



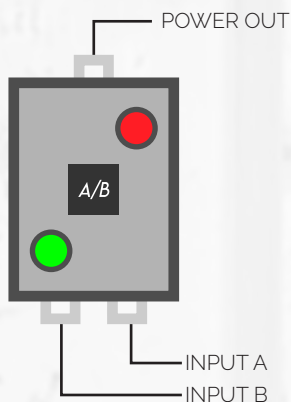
SWITCH

CRAFTING RECIPE:
WORKBENCH REQUIRED:
RESEARCH COST:
USED FOR:
INPUTS/OUTPUTS:
WHERE TO FIND:

5 HQM
LEVEL 1
20 SCRAP
TOGGLE POWER ON/OFF
POWER IN, POWER OUT
WOODEN BLUE STRAP CRATES/SUNKEN CHESTS

NOTES:

This is a basic toggle on/off switch. This can be used on any component to connect or disconnect power at will.



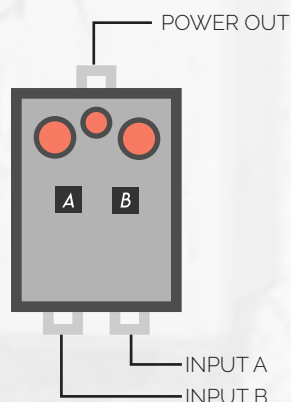
OR SWITCH

CRAFTING RECIPE:
WORKBENCH REQUIRED:
RESEARCH COST:
USED FOR:
INPUTS/OUTPUTS:
WHERE TO FIND:

5 HQM
LEVEL 1
20 SCRAP
SELECTS MORE POWERFUL OF 2 INPUTS
INPUT A, INPUT B, POWER OUT
WOODEN BLUE STRAP CRATES/SUNKEN CHESTS

NOTES:

This switch takes 2 inputs and the greater of the 2 is passed through. If only one is powered that one is automatically chosen.



AND SWITCH

CRAFTING RECIPE:
WORKBENCH REQUIRED:
RESEARCH COST:
USED FOR:

5 HQM
LEVEL 1
20 SCRAP
SWITCH MUST BE POWERED BY BOTH INPUTS,
PASSTHROUGH IS THEN GREATER OF 2 INPUTS

INPUTS/OUTPUTS:

INPUT A, INPUT B, POWER OUT

WHERE TO FIND: WOODEN BLUE STRAP, MILITARY, ELITE, & TIMED CRATES

NOTES:

This switch takes 2 inputs and the greater of the 2 is passed through only if both inputs are powered simultaneously.

COMPONENTS

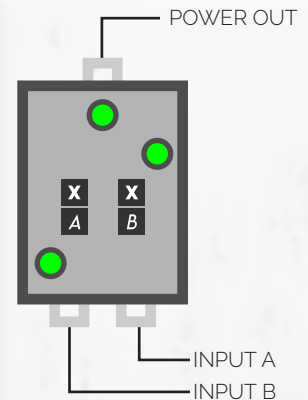
SWITCHES (CONT'D)

XOR SWITCH

CRAFTING RECIPE: 5 HQM
WORKBENCH REQUIRED: LEVEL 1
RESEARCH COST: 20 SCRAP
USED FOR: ALLOWS POWER PASSTHROUGH IF ONLY ONE
INPUT RECEIVES POWER
INPUTS/OUTPUTS: INPUT A, INPUT B, POWER OUT
WHERE TO FIND: WOODEN BLUE STRAP CRATES/SUNKEN CHESTS

NOTES:

This switch will only allow passthrough if one input is powered alone. Passthrough is the value of that input.

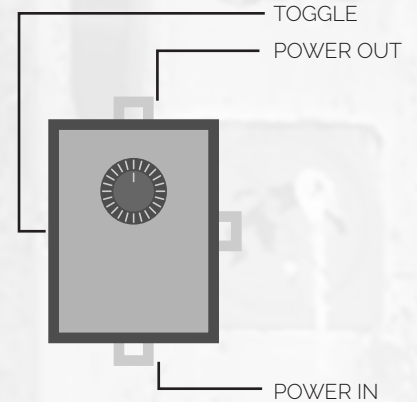


TIMER

CRAFTING RECIPE: 1 GEAR, 5 HQM
WORKBENCH REQUIRED: LEVEL 1
RESEARCH COST: 20 SCRAP
USED FOR: EMITS POWER FOR A DESIGNATED AMOUNT OF
TIME ONCE TOGGLE IS TRIGGERED
INPUTS/OUTPUTS: POWER IN, TOGGLE, POWER OUT
WHERE TO FIND: WOODEN BLUE STRAP CRATES/SUNKEN CHESTS

NOTES:

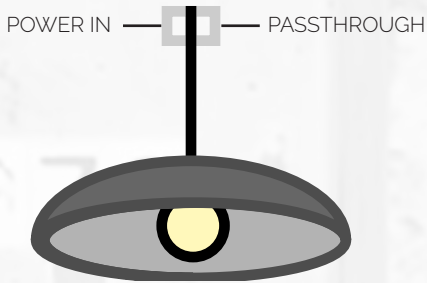
This switch uses the toggle input on the side as a trigger to initiate a timer. While the timer is active all input power will be passed through to the output. Timer can be set to a specific time but requires power in to be adjusted at all. Please note that timer cannot be reset until it has drained the timer left. You can override this by picking it up and replacing it.



COMPONENTS

LIGHTS

CEILING LIGHT



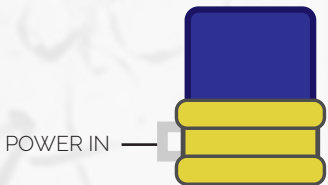
CRAFTING RECIPE:
WORKBENCH REQUIRED:
RESEARCH COST:
USED FOR:
INPUTS/OUTPUTS:
WHERE TO FIND:

50 Metal Fragments
LEVEL 1
20 SCRAP
LIGHTING A ROUGH 1.5X1.5 SQUARE AREA
POWER IN, PASSTHROUGH
WOODEN BLUE STRAP CRATES, OUTPOST (20 SCRAP)

NOTES:

This light takes a power input of 1 to power each light. Leftover power can be taken from the passthrough and directed to more lights or another component of choice. Note that these cannot be placed on ladder hatches.

BLUE FLASHER LIGHT



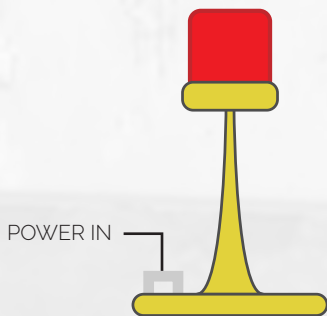
CRAFTING RECIPE:
WORKBENCH REQUIRED:
RESEARCH COST:
USED FOR:
INPUTS/OUTPUTS:
WHERE TO FIND:

5 HQM
LEVEL 1
20 SCRAP
FLASHING LIGHT, MINICOPTER PADS, ALERTS
POWER IN
WOODEN BLUE STRAP CRATES/SUNKEN CHESTS

NOTES:

This light emits a very bright blue light once roughly every second. This light does not have an electrical passthrough and will therefore need to be branched for each light.

RED SIREN LIGHT



CRAFTING RECIPE:
WORKBENCH REQUIRED:
RESEARCH COST:
USED FOR:
INPUTS/OUTPUTS:
WHERE TO FIND:

5 HQM
LEVEL 1
20 SCRAP
FLASHING LIGHT, ALERTS
POWER IN
WOODEN BLUE STRAP CRATES/SUNKEN CHESTS

NOTES:

This light emits a rotating red light continuously. This light does not have an electrical pass-through and will therefore need to be branched for each light.

COMPONENTS

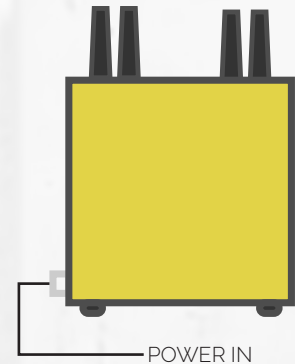
RADIO FREQUENCY ITEMS

RF BROADCASTER

CRAFTING RECIPE: 5 HQM, 1 TECH TRASH
WORKBENCH REQUIRED: LEVEL 1
RESEARCH COST: 20 SCRAP
USED FOR: BROADCASTS SIGNAL VIA SPECIFIED CHANNEL
INPUTS/OUTPUTS: POWER IN
WHERE TO FIND: MILITARY, ELITE, & TIMED CRATES

NOTES:

This item is ground placed and has only a power in. When powered it will emit a radio signal on a channel designated by the user by pressing "E". This required only 1 power to function.

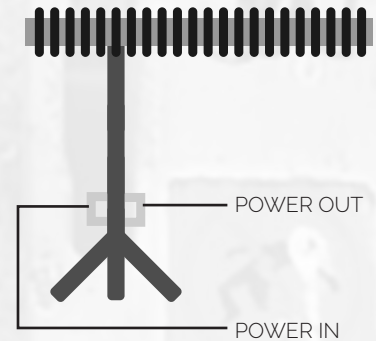


RF RECEIVER / ANTENNA

CRAFTING RECIPE: 5 HQM, 1 TECH TRASH
WORKBENCH REQUIRED: LEVEL 1
RESEARCH COST: 20 SCRAP
USED FOR: RECEIVES SIGNAL ON SPECIFIC CHANNEL
INPUTS/OUTPUTS: POWER IN/POWER OUT
WHERE TO FIND: WOODEN BLUE STRAP, MILITARY, ELITE, & TIMED CRATES

NOTES:

This item requires 2 power to properly output a signal. When an RF Broadcaster or a Transmitter is activated on the same frequency this will produce an output usable on items such as Timers, Memory Cells, or Blockers.

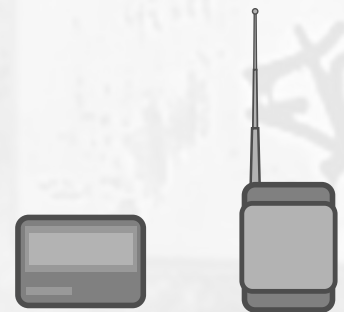


RF TRANSMITTER / RF PAGER

CRAFTING RECIPE: 5 HQM, 1 TECH TRASH
WORKBENCH REQUIRED: LEVEL 1
RESEARCH COST: 20 SCRAP
USED FOR: BROADCASTS SIGNAL VIA SPECIFIED CHANNEL
WHERE TO FIND:
TRANSMITTER: WOODEN BLUE STRAP CRATES/SUNKEN CHESTS
PAGER: MILITARY, ELITE, & TIMED CRATES

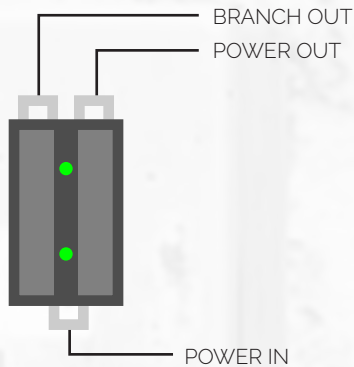
NOTES:

These are handheld items requiring no power that operate similar to an RF Broadcaster and RF Receiver but in a handheld form. The Pager can be silenced, and makes a beeping sound when triggered. The beeping sound will always emit from boxes if placed inside.



COMPONENTS

CONTROLLERS & MISCELLANEOUS



ELECTRICAL BRANCH

CRAFTING RECIPE:

WORKBENCH REQUIRED:

RESEARCH COST:

USED FOR:

INPUTS/OUTPUTS:

WHERE TO FIND:

NOTES:

3 HQM

LEVEL 1

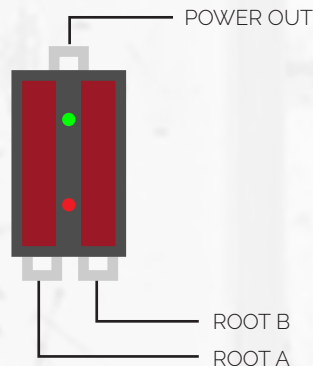
20 SCRAP

SPLITTING A LINE INTO A MAIN POWER AND
BRANCH OUT WITH ADJUSTABLE OUTPUT AMOUNT

POWER IN, POWER OUT, BRANCH OUT

WOODEN BLUE STRAP CRATES/SUNKEN CHESTS

This item takes a main line of power in and separates it into 2 outputs. 1 Output strength (BRANCH OUT) can be defined to a specific amount while the remainder will be directed to the output if any left available.



ROOT COMBINER

CRAFTING RECIPE:

WORKBENCH REQUIRED:

RESEARCH COST:

USED FOR:

INPUTS/OUTPUTS:

WHERE TO FIND:

NOTES:

5 HQM

LEVEL 1

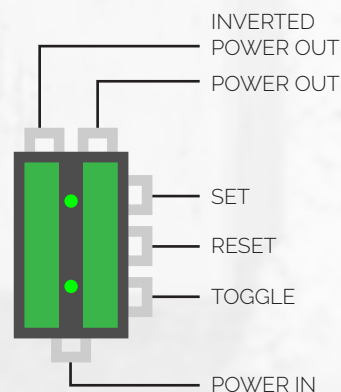
20 SCRAP

COMBINING 2 ROOT SOURCES INTO 1 OUTPUT

ROOT A, ROOT B, POWER OUT

WOODEN BLUE STRAP CRATES/SUNKEN CHESTS

This item combines 2 power sources (Turbine, Solar Panel, Small & Large Battery) into one output. This is useful to create larger power sources and in turn more advanced and elaborate curcuitry. It is important to note you cannot send power from anything but a root source to this device.



MEMORY CELL

CRAFTING RECIPE:

WORKBENCH REQUIRED:

RESEARCH COST:

USED FOR:

INPUTS/OUTPUTS:

WHERE TO FIND:

NOTES:

5 HQM

LEVEL 1

20 SCRAP

D TYPE FLIP FLOPS

POWER IN, SET, TOGGLE, RESET,
POWER OUT, INVERTED POWER OUT

WOODEN BLUE STRAP CRATES/SUNKEN CHESTS

This item takes a power input and outputs it dependant on the state of the memory cell. By powering set the state changes to "1" which will allow power to pass through the main power out. Toggle will set the state to "0" which will allow power through the inverted output. Applying power to reset will remove both states and all passthrough.

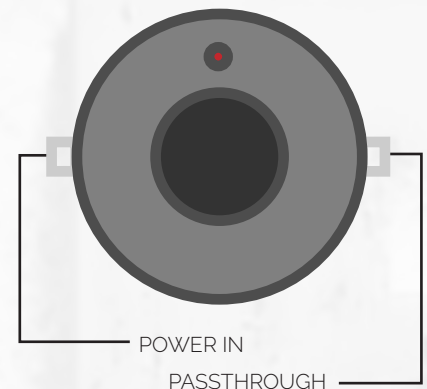
COMPONENTS

CONTROLLERS & MISCELLANEOUS (CONT'D)

HBHF SENSOR

CRAFTING RECIPE: 15 HQM, 1 TECH TRASH
WORKBENCH REQUIRED: LEVEL 1
RESEARCH COST: 75 SCRAP
USED FOR: DETECTS AUTHORIZED/UNAUTHORIZED PLAYERS WITHIN 3 BLOCKS
INPUTS/OUTPUTS: POWER IN, PASSTHROUGH
WHERE TO FIND: WOODEN BLUE STRAP, MILITARY, ELITE, & TIMED CRATES
NOTES:

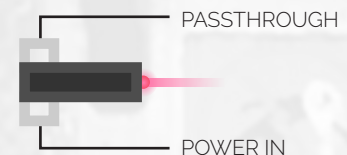
This item detects players within 3 meters of placement. It can also be set to detect authorized/unauthorized players or both. This can also be hooked into a counter to determine how many players are being detected. It is important to know that this item only provides a passthrough of 1 no matter how used.



LASER DETECTOR

CRAFTING RECIPE: 15 HQM
WORKBENCH REQUIRED: LEVEL 1
RESEARCH COST: 20 SCRAP
USED FOR: DETECTS PLAYERS THAT CROSS LASER PATH
INPUTS/OUTPUTS: POWER IN, PASSTHROUGH
WHERE TO FIND: WOODEN BLUE STRAP CRATES/SUNKEN CHESTS
NOTES:

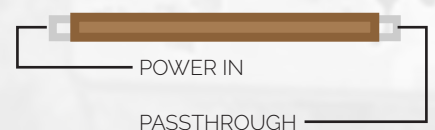
This item requires one power to function. Once powered it will detect when a player passes through the beam and emit a signal when triggered. Note that this does not currently detect NPCs or Physical Entities. These can be strategically placed to not allow the beam to be seen for neatness or stealth.



PRESSURE PAD

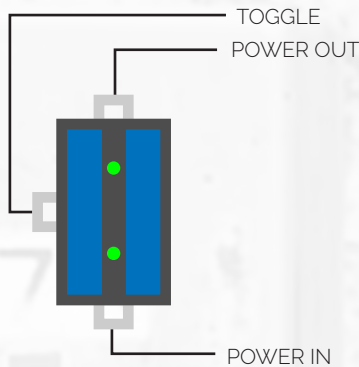
CRAFTING RECIPE: 150 WOOD, 1 GEAR, 1 SPRING
WORKBENCH REQUIRED: LEVEL 1
RESEARCH COST: 20 SCRAP
USED FOR: EMITS SIGNAL WHEN PLAYER STEPS ON
INPUTS/OUTPUTS: POWER IN, PASSTHROUGH
WHERE TO FIND: WOODEN BLUE STRAP CRATES/SUNKEN CHESTS
NOTES:

This item requires one power to function. Once powered it will detect when a player steps on the plate and emit a signal when triggered. Note that this does not currently detect NPCs or Physical Entities. These can also be placed under sleeping bags to be visually hidden.



COMPONENTS

CONTROLLERS & MISCELLANEOUS (CONT'D)



BLOCKER

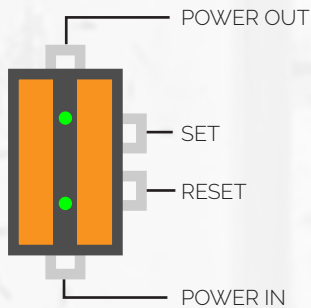
CRAFTING RECIPE:
WORKBENCH REQUIRED:
RESEARCH COST:
USED FOR:

1 GEAR, 5 HQM
LEVEL 1
20 SCRAP

ALLOWS PASSTHROUGH ONLY WHEN TOGGLE
INPUT DOES NOT RECEIVE POWER
POWER IN, POWER OUT, TOGGLE
WOODEN BLUE STRAP CRATES/SUNKEN CHESTS

INPUTS/OUTPUTS:
WHERE TO FIND:
NOTES:

This item is designed to allow power to be transferred through the component only when power is also applied to the toggle. This is useful for safety features in door switches, emergency cut offs, and limiting battery consumption.



RAND SWITCH

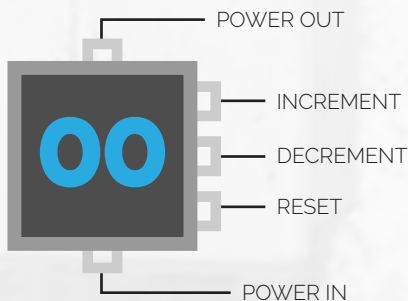
CRAFTING RECIPE:
WORKBENCH REQUIRED:
RESEARCH COST:
USED FOR:

5 HQM
LEVEL 1
20 SCRAP

COMBINING 2 ROOT SOURCES INTO 1 OUTPUT
ROOT A, ROOT B, POWER OUT
WOODEN BLUE STRAP CRATES/SUNKEN CHESTS

INPUTS/OUTPUTS:
WHERE TO FIND:
NOTES:

This item will return a true or false outcome once triggered via the set input. Any power applied to the power in will be transferred if true is chosen. The switch must then be toggled via the reset to be used again.



COUNTER

CRAFTING RECIPE:
WORKBENCH REQUIRED:
RESEARCH COST:
USED FOR:
INPUTS/OUTPUTS:

5 HQM
LEVEL 1
20 SCRAP

USED TO MAINTAIN A COUNT
POWER IN, INCREMENT, DECREMENT, RESET,
POWER OUT
WOODEN BLUE STRAP CRATES/SUNKEN CHESTS

WHERE TO FIND:
NOTES:

This device requires a power in and can be set to allow passthrough once it reaches a set number by pressing "E". Signals can be added to increase, decrease, or reset the counter. This can also be linked to a heartbeat sensor to read how many entities are currently triggering it.

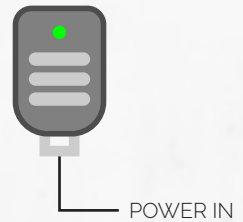
COMPONENTS

CONTROLLERS & MISCELLANEOUS (CONT'D)

DOOR CONTROLLER

CRAFTING RECIPE: 5 HQM
WORKBENCH REQUIRED: LEVEL 1
RESEARCH COST: 20 SCRAP
USED FOR: OPEN AND CLOSE DOORS
INPUTS/OUTPUTS: POWER IN
WHERE TO FIND: WOODEN BLUE STRAP CRATES/SUNKEN CHESTS
NOTES:

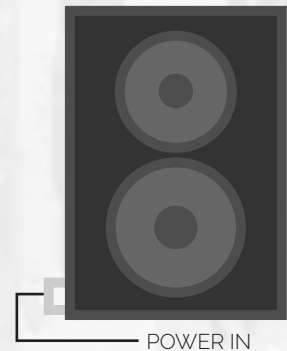
This item is used to operate doors. When powered a door will open and when power is removed the door will close. These can be placed beside or above a door and need to be paired to work. To pair the door must be unlocked.



SIREN

CRAFTING RECIPE: 5 HQM
WORKBENCH REQUIRED: LEVEL 1
RESEARCH COST: 20 SCRAP
USED FOR: CREATES LOUD SIREN WHEN TRIGGERED
INPUTS/OUTPUTS: POWER IN
WHERE TO FIND: WOODEN BLUE STRAP CRATES/SUNKEN CHESTS
NOTES:

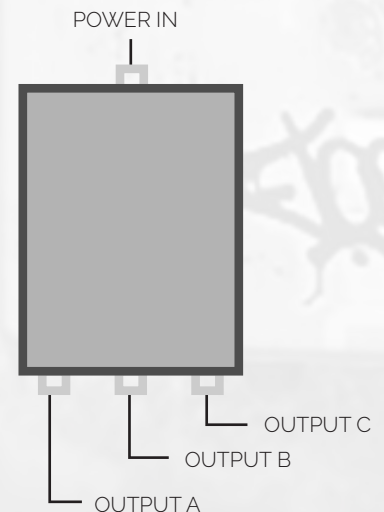
This item will create a loud siren alarm when triggered. This is useful for alarm systems and scaring out potential raiders.



SPLITTER

CRAFTING RECIPE: 10 HQM
WORKBENCH REQUIRED: LEVEL 1
RESEARCH COST: 20 SCRAP
USED FOR: SPLITS AN INPUT INTO 3 OUTPUTS
INPUTS/OUTPUTS: POWER IN, OUTPUT A, OUTPUT B, OUTPUT C
WHERE TO FIND: WOODEN BLUE STRAP CRATES/SUNKEN CHESTS
NOTES:

This device takes one input and outputs three separate outputs. Do not that when reading the output with wire tool it will read the total output on any of the three, not what is remaining to be used.



SMALL REGENERATIVE POWER SOURCE

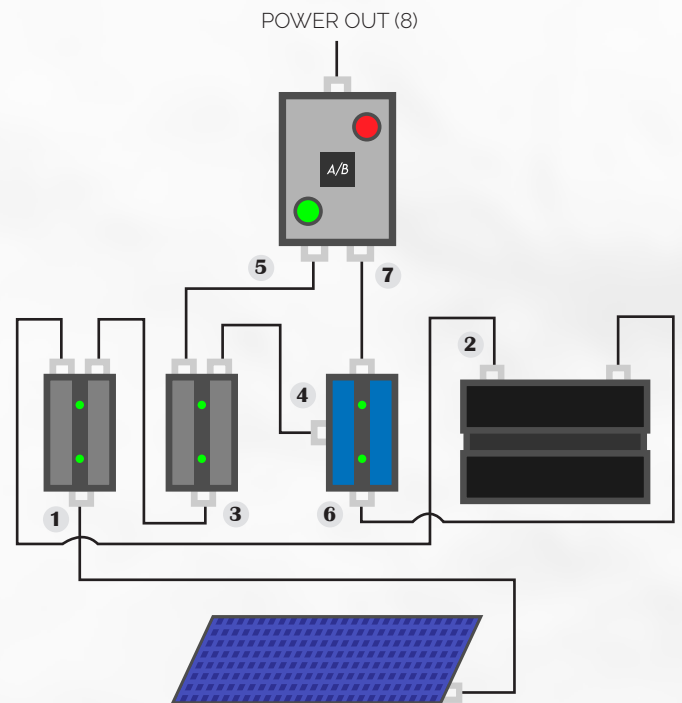
GENERATES A CONSTANT OUTPUT OF 8 POWER

- 1 CONNECT THE SOLAR PANEL TO THE BRANCH INPUT
- 2 BRANCH THE BRANCH OUT TO THE BATTERY INPUT AND SET TO 7
- 3 CONNECT THE MAIN BRANCH OUTPUT TO THE NEXT BRANCH
- 4 CONNECT THE MAIN POWER OUT OF THE BRANCH TO TOGGLE OF THE BLOCKER
- 5 CONNECT THE BRANCH OUTPUT TO THE OR SWITCH AND SET IT TO 9
- 6 CONNECT THE BATTERY OUTPUT INTO THE BLOCKER INPUT
- 7 CONNECT THE BLOCKER OUTPUT INTO THE OR SWITCH

This circuit draws power from a solar panel and directs a portion to a small battery while the remaining is used during the day. When power from the solar panel drops under needed amount the last branch will trigger the toggle and the circuit will automatically switch to battery. This is a small scale but very reliable source of power for things like door circuits and RF systems.

The main power is taken from the solar panel which can create up to 20 power each in brightest time of day. This is directed into the main branch of the circuit. The branch output it to be set at 7 and connected to the battery input. The branch main output then connects to the next branch. This part is tricky to understand. Connect the main power out to the toggle of the blocker, then connect the branch output to the OR switch and set it to 9. The reason we use the main output for the toggle is because the branch out is prioritized over the main output. This means that the battery won't be triggered until it realizes it can't power the OR switch and the additional output.

You do lose a slight amount of power throughout the components and therefore the final output between both inputs and regeneration becomes 8. This circuit is very cheap and functional once you learn the parameters of what you need it for. It can also be combined with more of the same setup to power separate parts of circuit. Unfortunately as of the time of writing this there is no way to series batteries together, so if this just doesn't cut it for power, take a look at the larger version on the next page!



BASIC CIRCUITS

LARGE REGENERATIVE POWER SOURCE

REQUIRED COMPONENTS:

(8) SOLAR PANEL, (2) ELECTRICAL BRANCH, (1) LARGE BATTERY, (7) ROOT COMBINER (1) BLOCKER, (1) OR SWITCH

MATERIAL COST:

PURPOSE:

GENERATES A CONSTANT OUTPUT OF 98 POWER

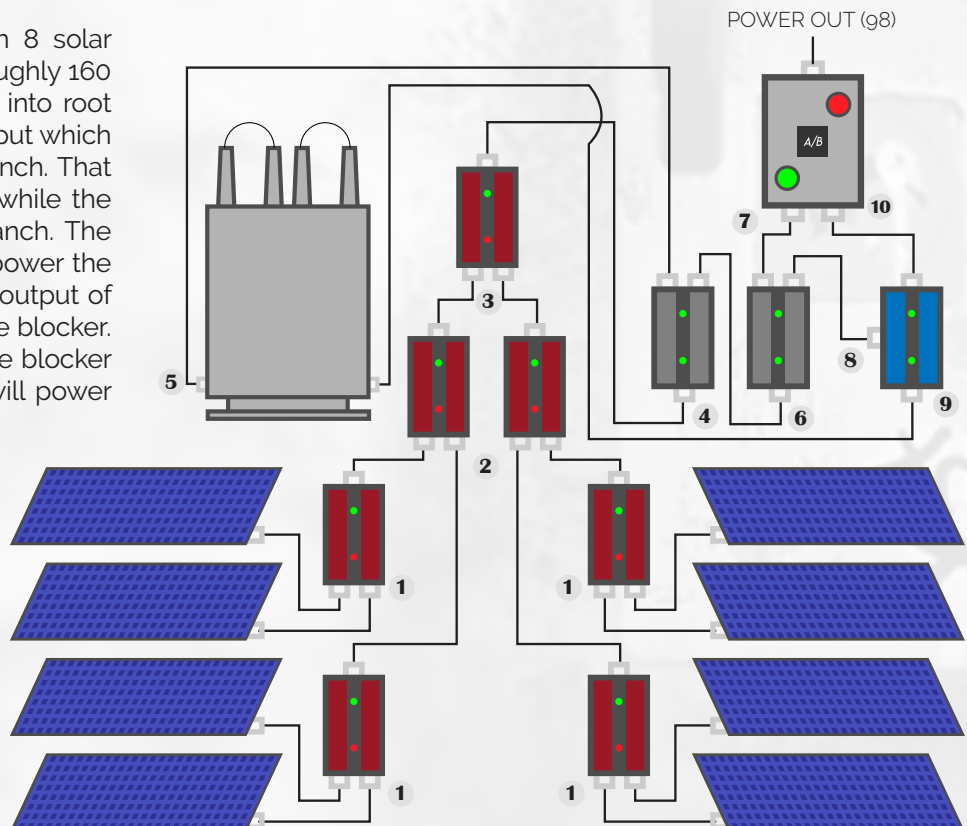
INSTRUCTIONS:

- 1 CONNECT THE 8 SOLAR PANELS TO THE FIRST 4 ROOT COMBINERS
- 2 CONNECT THOSE 4 ROOT COMBINER OUTPUTS TO THE NEXT 2 ROOT COMBINERS
- 3 CONNECT THE LAST 2 ROOT COMBINERS INTO THE FINAL ROOT COMBINER
- 4 CONNECT THE FINAL ROOT COMBINER OUTPUT TO THE FIRST BRANCH
- 5 CONNECT THE BRANCH OUTPUT TO THE BATTERY INPUT AND SET IT TO 45
- 6 CONNECT THE MAIN OUTPUT OF THAT BRANCH TO THE NEXT BRANCH INPUT
- 7 SET THIS BRANCH OUT TO 99 AND CONNECT IT TO THE OR SWITCH
- 8 CONNECT THE BRANCH MAIN OUTPUT TO THE TOGGLE ON THE BLOCKER
- 9 CONNECT THE BATTERY OUTPUT TO THE BLOCKER INPUT
- 10 CONNECT THE BLOCKER OUTPUT TO THE THE REMAINING OR SWITCH INPUT

DESCRIPTION:

This circuit draws power from 8 solar panels to create an output power of roughly 160 at the peak time of day. This is taken into root combiners until it reaches one final output which is then pushed through to the first branch. That branch send 45 power to the battery while the remaining output powers the next branch. The branch output of the next branch will power the OR switch and be set to 99. The main output of that branch will power the toggle on the blocker. The output of the battery will power the blocker and the power out from the blocker will power the additional slot on the OR switch

Similar to the small regenerative power source, this utilizes a system that prioritizes battery power, then your power on the daytime circuit until it loses full capability of doing so at which moment the blocker is deactivated and the battery will take over as the primary source.



BASIC CIRCUITS

AUTOMATIC MINICOPTER GARAGE DOORS

REQUIRED COMPONENTS:

(1) GARAGE DOOR, (1) SWITCH, (1) BRANCH,
(1) TIMER (1) HBHF SENSOR, (1) DOOR CONTROLLER

MATERIAL COST:

PURPOSE:

AUTOMATICALLY OPENS/CLOSES MINICOPTER GARAGE DOORS TO ENSURE EXITING THE VEHICLE IS NOT NECESSARY

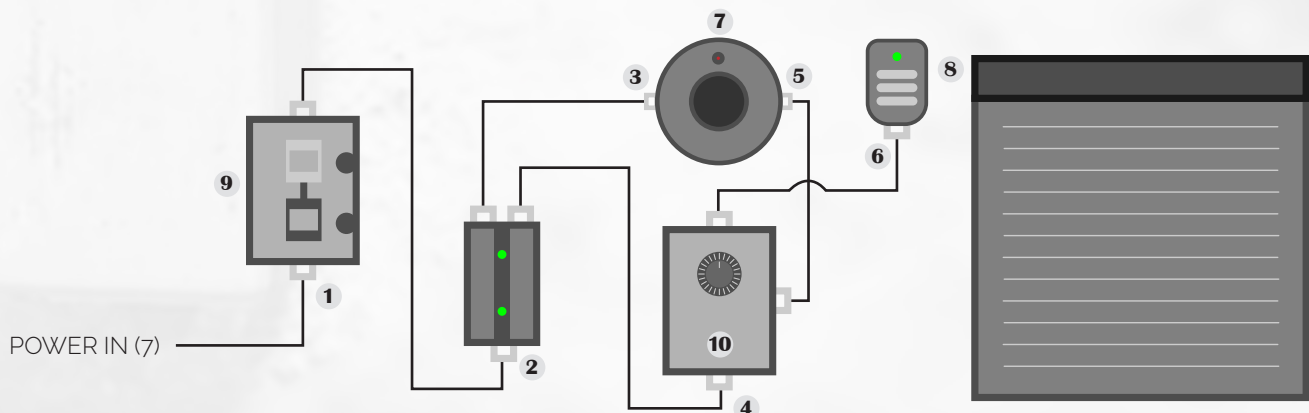
INSTRUCTIONS:

- 1 CONNECT THE POWER SOURCE TO THE SWITCH POWER IN
- 2 CONNECT THE POWER OUT OF THE SWITCH INTO THE POWER IN OF THE BRANCH
- 3 CONNECT THE BRANCH OUTPUT TO THE HBHF SENSOR INPUT
- 4 CONNECT THE MAIN POWER OUT OF THE BRANCH TO THE POWER IN OF THE TIMER
- 5 CONNECT THE OUTPUT OF THE HBHF SENSOR TO THE TOGGLE OF THE TIMER
- 6 CONNECT THE OUTPUT OF THE TIMER TO THE DOOR CONTROLLER INPUT
- 7 USING A HAMMER SET THE HBHF SENSOR TO AUTHORIZED PLAYERS ONLY
- 8 UNLOCK THE CODE LOCK ON THE GARAGE DOOR AND CLOSE IT TO PAIR THE CONTROLLER
- 9 TURN THE SWITCH ON TO BEGIN USAGE
- 10 SET THE TIMER TO YOUR DESIRED AMOUNT OF TIME (30 SECONDS OR MORE IS AMPLE)

DESCRIPTION:

This circuit allows you to enter your minicopter garage without leaving the aircraft. Once you are within range of the sensor it will pulse a signal to the timer which will power the door opener. This door will stay open for the amount of time you designate and then close automatically. The placement of the HBHF sensor should go on the outside of the door to enable it to engage when you arrive home, as well as activate it closing when you leave. You can additionally make another identical on the interior wall but the outputs from the timers should both go to an OR Switch which would then power the door controller. You would need to add roughly 3 power to each side of the circuit to ensure proper function.

Pairing the door with the controller is important! To do this the door must have no lock or be unlocked as well as be in the closed position. It does not require any power to pair so this can be placed and paired ahead of time for large circuit preparation as well.



ADVANCED CIRCUITS

HH:MM:SS TIMER WITH AUTO RESET

REQUIRED COMPONENTS:

(2) OR SWITCH, (3) COUNTER, (9) BRANCH,
(1) SPLITTER, (2) BLOCKER, (1) TIMER, (1) SWITCH

MATERIAL COST:

PURPOSE:

CREATES AN HH:MM:SS TIMER THAT ONLY RESETS WHEN TURNED OFF

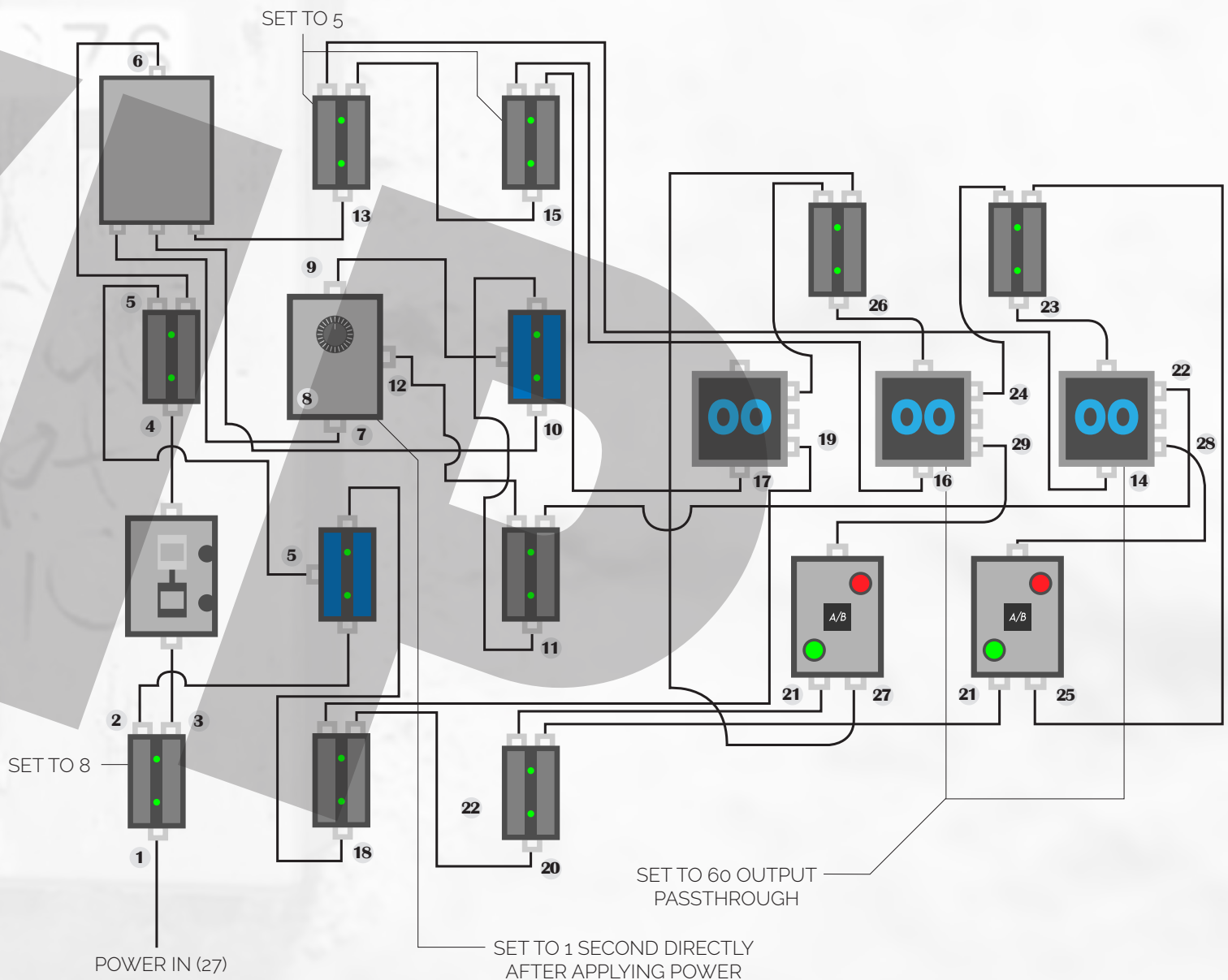
INSTRUCTIONS:

- 1 CONNECT THE FIRST BRANCH TO YOUR INPUT POWER
- 2 CONNECT THE BRANCH OUTPUT (SET TO 8) TO THE FIRST BLOCKER INPUT
- 3 CONNECT THE BRANCH MAIN OUTPUT TO THE SWITCH INPUT
- 4 CONNECT THE SWITCH OUTPUT TO THE NEXT BRANCH ABOVE IT
- 5 CONNECT THE BRANCH OUTPUT TO THE FIRST BLOCKER TOGGLE
- 6 CONNECT THE REMAINING BRANCH MAIN OUTPUT TO SPLITTER
- 7 CONNECT THE FIRST OUTPUT OF THE SPLITTER TO THE INPUT OF THE TIMER
- 8 SET THE TIMER TO ONE SECOND
- 9 CONNECT THE OUTPUT OF THE TIMER TO THE TOGGLE OF THE NEXT BLOCKER
- 10 CONNECT THE SECOND OUTPUT OF THE SPLITTER INTO THE SECOND BLOCKER INPUT
- 11 CONNECT THE OUTPUT OF THE SECOND BLOCKER INTO THE INPUT OF THE NEXT BRANCH
- 12 CONNECT THE BRANCH OUTPUT TO THE TOGGLE ON THE TIMER
- 13 CONNECT THE THIRD OUTPUT OF THE SPLITTER TO THE TOP LEFT BRANCH INPUT
- 14 CONNECT THE BRANCH OUTPUT (SET TO 5) TO THE RIGHT COUNTER INPUT (SET TO 60 PASSTHROUGH)
- 15 CONNECT THE MAIN OUTPUT OF THE BRANCH TO THE NEXT BRANCH TO THE RIGHT
- 16 CONNECT THE BRANCH OUTPUT (SET TO 5) TO THE MIDDLE COUNTER INPUT (SET TO 60 PASSTHROUGH)
- 17 CONNECT THE FINAL MAIN OUTPUT ON THE BRANCH TO THE LEFT COUNTER INPUT
- 18 CONNECT THE OUTPUT FROM THE FIRST BLOCKER TO THE NEXT BRANCH ON THE BOTTOM ROW
- 19 CONNECT THE BRANCH OUTPUT TO THE RESET OF THE LEFT COUNTER
- 20 CONNECT THE MAIN OUTPUT OF THE BRANCH TO THE NEXT BRANCH TO THE BOTTOM
- 21 CONNECT BOTH OUTPUTS OF THE REMAINING BRANCH OUTPUTS TO EITHER OF THE OR SWITCHES
- 22 CONNECT THE OUTPUT OF THE OPEN BRANCH TO THE INCREMENT INPUT ON THE RIGHTSIDE COUNTER
- 23 CONNECT THE OUTPUT OF THE RIGHTMOST COUNTER TO THE INPUT OF THE ABOVE BRANCH
- 24 CONNECT THE BRANCH OUTPUT TO THE INCREMENT INPUT ON THE MIDDLE COUNTER
- 25 CONNECT THE BRANCH MAIN OUTPUT TO THE RIGHT OR SWITCH
- 26 CONNECT THE OUTPUT OF THE MIDDLE COUNTER TO THE INPUT OF THE ABOVE BRANCH
- 27 CONNECT THE BRANCH MAIN OUTPUT TO THE LEFT OR SWITCH
- 28 CONNECT THE RIGHT OR SWITCH OUTPUT TO THE RIGHT COUNTER RESET
- 29 CONNECT THE LEFT OR SWITCH OUTPUT TO THE MIDDLE COUNTER RESET

DESCRIPTION:

This circuit draws a total of 27 power and creates an almost perfect timer for minutes, seconds, and hours. It also features a blocker addition to reset the timer anytime the circuit is turned off to be at 0:00:00 when turned back on. The engine of this circuit relies on a timer and a blocker which create a loop which repeats once every second. The output from the runs into the increment input on the counter which is set to 60 for output. Once 60 is reached the branch above is split into 2 signals, one of which powers a reset on the 60 second counter and also sends an increment up input to the minute counter. The same process is repeated into the hour counter, but does not receive a output as is not necessary.

The OR switches are branched in with the counters as well as before the switch through a blocker. This allows that anytime the timer is turned off an additional pulse is received at all points of reset on the counters. This circuit can be useful for a number of reasons. This can also be wired a little differently to be used as a countdown timer in which an alarm can be signaled. Additionally it can be used to detect how long since someone has been in range of an HFBF Sensor to monitor how populated an area is. This would also need to be wired in with some additional components.



ADVANCED CIRCUITS

SAM SITE DISENGAGE

REQUIRED COMPONENTS:

(2) ELECTRICAL BRANCH, (1) MEMORY CELL, (1) SWITCH,
(1) SAMSITE, (1) RF RECEIVER, (1) RF BROADCASTER,
RF PAGER & RF TRANSMITTER*

MATERIAL COST:

PURPOSE:

WIRELESSLY TOGGLES SAMsites ON AND OFF WITH A VERIFYING SIGNAL TO ENSURE SAFE ENTRANCE AND EXIT FROM BASE WITH THE MINICOPTER WHILE MAINTAINING AIR DEFENSE

INSTRUCTIONS:

- 1 CONNECT THE INITIAL SWITCH TO THE POWER IN SOURCE
- 2 CONNECT THE BRANCH TO THE SWITCH OUTPUT
- 3 CONNECT THE BRANCH OUTPUT TO THE ANTENNA INPUT
- 4 CONNECT THE MAIN OUTPUT OF THE BRANCH TO THE POWER IN OF THE MEMORY CELL
- 5 CONNECT THE OUTPUT OF THE ANTENNA INTO THE TOGGLE INPUT ON THE MEMORY CELL
- 6 CONNECT THE NORMAL POWER OUT OF THE MEMORY CELL TO THE SAM SITE
- 7 CONNECT THE INVERTED POWER OUT TO THE BROADCASTER
- 8 SET YOUR PAGER AND THE RF BROADCASTER TO THE SAME FREQUENCY
- 9 SET THE ANTENNA AND TRANSMITTER TO THE SAME SIGNAL
- 10 USE THE THE RF TRANSMITTER TO TOGGLE THE CIRCUIT ON/OFF

DESCRIPTION:

This circuit is a useful tool to allow you to fly to and from a location while leaving it protecting from minicopter or air balloon strikes. This design makes use of the RF electrical components in order to wireless engage/disengage the Samsite from any location. Using the transmitter it toggles a memory cell which will in turn activate the Samsite and deactivate the broadcaster, or if already in that state will reverse. This allows the broadcaster to transmit a signal to the pager only when the Samsite is fully disarmed to allow to safely land and store your minicopter. Once landed you can retrigger the device and your base will be again defended against air attacks. In case of an emergency the entire system can be shut down by using the main switch!

