

Aegis AI

Pioneering Blockchain Security with
AI-Enabled Audit Solutions.



Table of Contents

03. About Aegis AI

04. Introduction

05. Project Overview

06. Social Media

07. Audit Summary

08. Vulnerability and Risk Level

09. Auditing Strategy and Techniques

11. Overall Security

14. Ownership

20. External / Public functions

22. Capabilities

23. Inheritance Graph

25. Audit Results

26. Files Overview

27. Conclusion

29. Glossary

About **Aegis AI**

Aegis AI is a revolutionary tool designed to bring accessibility, transparency, and trust to the world of blockchain technology. With the increasing use of smart contracts in various industries, the need for efficient and user-friendly auditing tools has never been more critical. Aegis AI is the solution that bridges the gap between complex smart contract code and non-technical users, making it easy for anyone to ensure the security and reliability of their digital assets and transactions.

- Run quick audits from dApp using AI
- Generate detailed audit reports
- Monitor of smart contracts and protocols in real time.
- Automated Penetration Testing.



Introduction

Aegis AI offers an advanced AI-driven solution for smart contract auditing, designed to enhance the security of blockchain contracts with ease. Our platform caters to users of all skill levels, enabling thorough vulnerability assessments without requiring extensive coding knowledge. This user-friendly tool simplifies the auditing process, efficiently detecting potential security risks and malicious code within smart contracts.

By addressing critical security concerns, Aegis AI plays a vital role in fostering trust and growth in blockchain technology. Our solution is integral to promoting wider adoption of smart contracts, ensuring their reliability and integrity across various blockchain applications.



Project
Overview



Aegis
AI

| | |
|---------------|--|
| Project Name | Messier |
| Symbol | M87 |
| Address | 0x80122c6a83C8202Ea365233363d3f4837D13e888 |
| Type | ERC-20 |
| Decimals | 18 |
| Total Supply | 1,000,000,000,000 |
| Market Cap | 7,988,678.77 |
| Exchange Rate | 0.00000804 |
| Holders | 1,286 |

Social Media

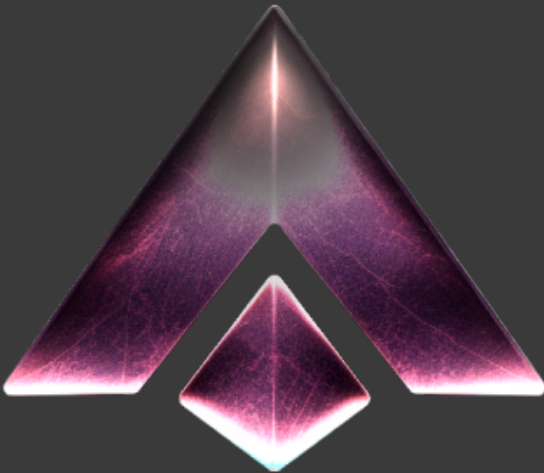


Audit Summary

| Version | Delivery Date | Changelog |
|---------|------------------|--|
| 1.0 | January 04, 2024 | Layout project Automated / Manual Security Testing Summary |

Note

This Audit report consists of a security analysis of the Messier smart contract.



Vulnerability and Risk Level

Risk assessment gauges the likelihood and impact of potential threats exploiting vulnerabilities. It is quantified using **CVSS version 3.0** standards, providing a clear metric for organizational or system security evaluation.

| Severity Level | CVSS Score | Description | Recommended Action |
|----------------|------------|---|--|
| Critical | 9-10 | Severe threat with potential for major losses or complete failure. | Immediate action required to mitigate and resolve. |
| High | 7-8.9 | Can seriously compromise functionality and security, allowing potential exploitation. | Address promptly to prevent exploitation. |
| Medium | 4-6.9 | Impact certain aspects, potentially leading to unintended behaviors. | Correct within a reasonable timeframe to maintain integrity. |
| Low | 2-3.9 | Less likely to significantly impact performance but should be addressed. | Consider remediation, may accept risk based on context. |
| Information | 0-1.9 | Highlights areas for improvement or optimization, no security risk. | Review for potential enhancements, no immediate action. |

Auditing Strategy and Techniques

In our review process, we leverage advanced, finetuned Large Language Models (LLMs) alongside sophisticated LLM agent mechanisms. This approach ensures comprehensive examination of the smart contract repository, targeting security vulnerabilities, code integrity, and adherence to the latest standards and best practices.

Our review blends the precision of machine learning models with human oversight. The finetuned LLMs efficiently parse and analyze every file, providing in-depth insights and faster results, which are then meticulously validated by our team of experts for accuracy and relevance.

Methodology

The audit of the smart contract Messier was conducted using a systematic and risk-based approach. Emphasis was placed on essential aspects such as security, code quality, compliance, gas efficiency, and overall functionality.

Security Assessment

Our approach integrates advanced AI-driven techniques, primarily leveraging Large Language Models (LLMs) and GPT agents. This blend of AI tools provides an in-depth analysis, identifying and evaluating potential security vulnerabilities. Alongside this, we conduct targeted manual reviews to validate and contextualize the AI-generated insights, ensuring comprehensive and accurate security assessments.

Code Quality Evaluation:

LLMs played a key role in examining the code's quality, focusing on readability and maintainability. The AI analysis, combined with our expert review, ensured compliance with smart contract development standards.

Compliance Review:

Our audit included an LLM-assisted compliance check against industry standards like ERC-20 and ERC-721. This process pinpointed deviations, providing a basis for our detailed compliance recommendations.

Gas Efficiency Analysis:

AI tools evaluated the contract's gas consumption, offering insights into its execution efficiency. These findings were enhanced by expert analysis to suggest practical optimization strategies.


Functionality and Logic Verification:

The audit applied LLMs to validate the contract's functionality and logic, ensuring its operations matched the intended design. This automated check was complemented by thorough manual testing.

Overall Security


Honeypot

Honeypots are smart contracts that appear to have an obvious flaw in their design, which allows an arbitrary user to drain ether (Ethereum's cryptocurrency) from the contract, given that the user transfers a priori a certain amount of ether to the contract.

| | |
|---|---|
| Is it a honeypot?  The contract is not a Honey Pot | |
| Description | Owner cannot drain your wallet through honeypot |

Antiwhale

Certain features adopted to prevent large holders (aka whales) from exerting excessive influence or engaging in manipulative behaviors within the token ecosystem. Some examples are setting maximum transaction limits, imposing penalties for transactions exceeding some specific threshold, imposing a more equitable distribution of tokens

| | |
|---|-------------------|
| Can whales dump?  The contract is Anti Whale | |
| Description | Whales can't dump |

Listing

Listings on multiple decentralized exchanges (DEX) with good amount of liquidity is a good sign

| | | | |
|--------------------|--|----------------------------|--|
| Is it on a dex? | | ✓ The contract is listed | |
| Description | | You can swap tokens on dex | |

Opensource

Open source contract is contract with source code that anyone can inspect, modify, and enhance.

| | | | |
|--------------------|--|---|--|
| Is code available? | | ✓ The contract is Open Source | |
| Description | | Contract code can be reviewed and audited by anyone | |

Proxy

Proxy contract is a contract that delegates calls to another contract. It is a contract that has a fallback function that calls another contract. If the proxy contract is well-designed, secure, and serves a legitimate purpose (such as upgradability or modularity), it may not raise concerns. However, if the proxy introduces vulnerabilities, lacks transparency, or is used in a way that compromises the security of the token, it could be flagged during a thorough audit.

Is it a proxy?

✓ The contract is not a Proxy contract

Description

This is a full contract

Ownership

| Is ownership is renounced? | |
|----------------------------|---|
| ✗ Contract has an owner | |
| Description | The owner has not renounced the ownership that means that the owner retains control over the contract's operations, including the ability to execute functions that may impact the contract's users or stakeholders. This can lead to potential issues. |
| Comments | Centralization The owner has significant control over contract's operations. |

Note

If the contract is not deployed then we would consider the ownership to be not renounced. Moreover, if there are no ownership functionalities, ownership is automatically considered renounced.

Ownership Privileges

These functions can be dangerous. Please note that abuse can lead to financial loss. We have a guide where you can learn more about these Functions.

Minting Privileges

Minting is the process of creating new tokens. This is usually done by the contract owner, and the newly minted tokens are added to the owner's balance. Minting is usually done to increase the total supply of a cryptocurrency or token.

Can mint new tokens?

✓ The owner cannot mint new tokens

Description

The owner cannot mint new tokens

Burning Tokens

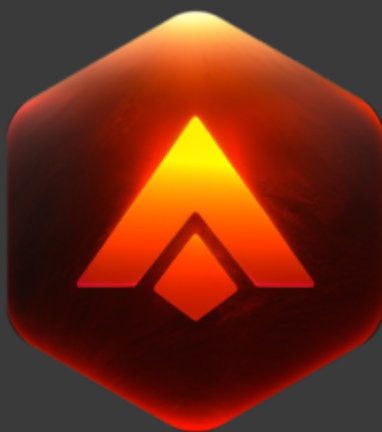
Burning tokens is the process of permanently destroying a certain number of tokens, reducing the total supply of a cryptocurrency or token. This is usually done to increase the value of the remaining tokens, as the reduced supply can create scarcity and potentially drive up demand.

Can burn
tokens?

 The owner can burn tokens

Description

The owner is able to burn tokens
without any allowance



Blacklist addresses

Blacklisting addresses in smart contracts is the process of adding a certain address to a blacklist, effectively preventing them from accessing or participating in certain functionalities or transactions within the contract. This can be useful in preventing fraudulent or malicious activities, such as hacking attempts or money laundering.

Can blacklist
addresses?

☒ Owner cannot blacklist addresses


Description

The contract owner cannot blacklist
addresses



Fees and tax

In some smart contracts, the owner or creator of the contract can set fees for certain actions or operations within the contract. These fees can be used to cover the cost of running the contract, such as paying for gas fees or compensating the contract's owner for their time and effort in developing and maintaining the contract.

| Is there a tax? | |
|--|---|
|  Contract takes a tax | |
| Description | <p>There is a tax to the contract owner when you buy and sell the token</p> <p>Tax on buy: 3% Tax on sell: 3%</p> |



Self Destruct

In a smart contract, the selfdestruct feature refers to a specific function that, when executed, destroys the contract and removes it from the blockchain. This action renders the contract inoperative and ends all its functions. When a contract is self-destructed, any remaining balance in the contract is sent to a designated address, and the contract's code and storage are removed from the state of the blockchain.

Can self
destruct?

✓ Contract cannot self destruct

Description

The smart contract does not include a self-destruct feature.



External / Public functions

External/public functions are functions that can be called from outside of a contract, i.e., they can be accessed by other contracts or external accounts on the blockchain. These functions are specified using the function declaration's external or public visibility modifier.

State variables

State variables are variables that are stored on the blockchain as part of the contract's state. They are declared at the contract level and can be accessed and modified by any function within the contract. State variables can be denoted with a visibility modifier, such as public, private, or internal, which determines the access level of the variable.

Components

| External | Internal | Private | Pure |
|----------|----------|---------|------|
| 20 | 21 | 2 | 0 |

Exposed Functions

This section lists functions that are explicitly declared public or payable. Please note that getter methods for public state variables are not included.

| Public | Payable |
|--------|---------|
| 20 | 0 |

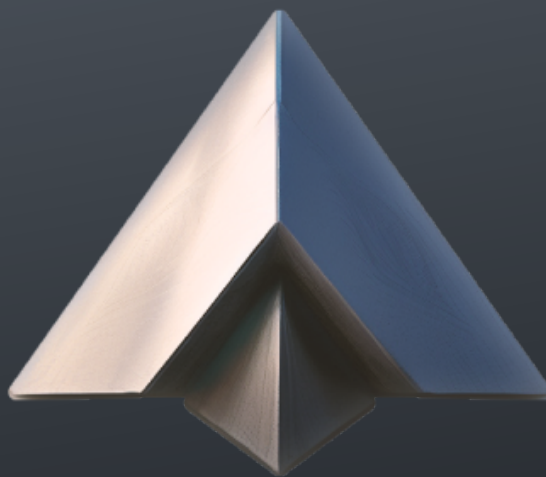
| External | Internal | Private | Pure | View |
|----------|----------|---------|------|------|
| 20 | 21 | 2 | 0 | 25 |

State Variables

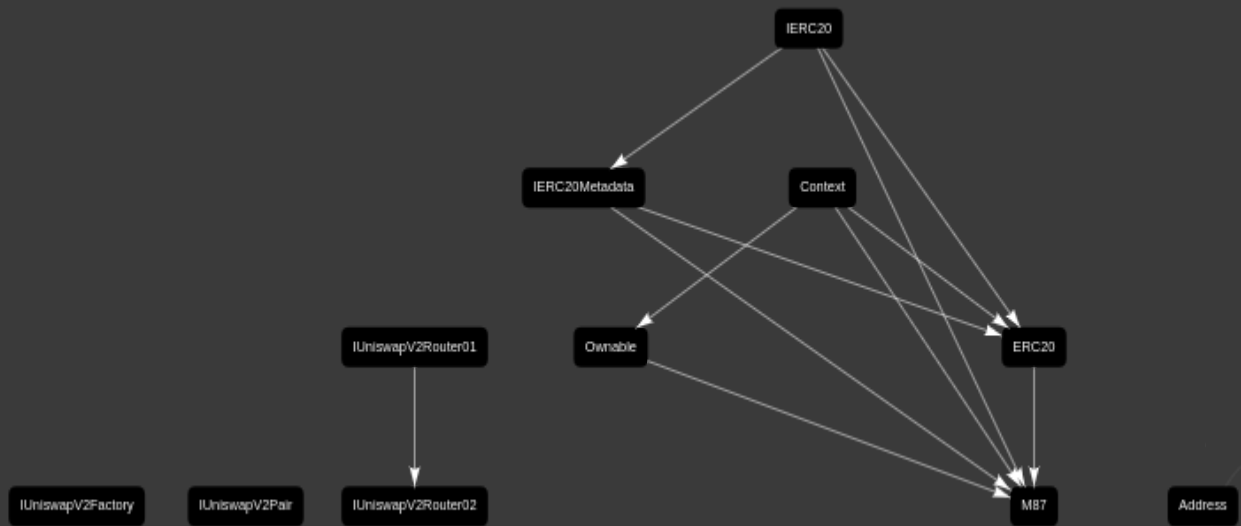
| Total | Public |
|-------|--------|
| 126 | 25 |

Capabilities

| Aegis Version observed | Transfers ETH | Can Receive Funds | Uses Assembly | Delegate Call |
|---------------------------|---------------|-------------------|---------------|---------------|
| $\geq 0.6.0$ $< 0.9.0$ | Yes | Yes | Yes | Yes |



Inheritance Graph



Centralization Privilege

Centralization can arise when one or more parties have privileged access or control over the contract's functionality, data, or decision-making. This can occur, for example, if the contract is controlled by a single entity or if certain participants have special permissions or abilities that others do not. In the project, there are authorities that have access to the following functions:

| Contract | Privileges |
|--------------------|---|
| IUniswapV2Factory | createPair, setFeeTo, setFeeToSetter |
| IUniswapV2Pair | approve, transfer, transferFrom, permit, mint, burn, swap, skim, sync, initialize |
| IUniswapV2Router01 | addLiquidity, removeLiquidity, removeLiquidityETH, removeLiquidityWithPermit, removeLiquidityETHWithPermit, swapExactTokensForTokens, swapTokensForExactTokens, swapTokensForExactETH, swapExactTokensForETH |
| IUniswapV2Router02 | removeLiquidityETHSupportingFeeOnTransferTokens, removeLiquidityETHWithPermitSupportingFeeOnTransferTokens, swapExactTokensForTokensSupportingFeeOnTransferTokens, swapExactTokensForETHSupportingFeeOnTransferTokens |
| IERC20 | transfer, approve, transferFrom |
| IERC20Metadata | N/A |
| Address | N/A |
| Context | N/A |
| Ownable | renounceOwnership, transferOwnership |
| ERC20 | transfer, approve, transferFrom, increaseAllowance, decreaseAllowance |
| M87 | claimStuckTokens, excludeFromFees, updateBuyFees, updateSellFees, changeMTreasury, enableTrading, setSwapEnabled, setSwapTokensAtAmount, swapAndSendMarketing, setEnableMaxWalletLimit, setMaxWalletAmount, excludeFromMaxWallet, |

Audit Results**#AEG-1 Reentrancy**

| FILE | Severity |
|-------------|----------|
| Messier.sol | INFO |

Description - This function interacts with an external contract (UniswapV2Router) and subsequently transfers Ether to an external address (MTreasury) without using reentrancy guards. An attacker could exploit this by creating a contract with a fallback function that calls back into `swapAndSendMarketing`, potentially draining the contract of Ether.

#AEG-2 Arbitrary Token Withdrawal by Owner

| FILE | Severity |
|-------------|----------|
| Messier.sol | INFO |

Description - This function allows the contract owner to withdraw any ERC20 token from the contract's balance. While this is intended for recovering stuck tokens, it can be abused by the contract owner to withdraw tokens that the contract is holding for other purposes, such as tokens that should be distributed to users or used in the ecosystem.

Audit Results**#AEG-3 Ownership Takeover**

| FILE | Severity |
|-------------|----------|
| Messier.sol | INFO |

Description - The function allows the current owner to transfer contract ownership to any address, including potentially malicious ones. If the owner's private key is compromised, the attacker could transfer ownership and gain control over the contract's functionality.

Files Overview

The Messier team provided us with the files that should be tested in the security assessment. This audit covered the following files listed below with an SHA-1 Hash.

File Name

M87.sol

Imported Packages

Used code from other Frameworks/Smart Contracts (direct imports).

Note for Investors:

We only audited a token contract for Messier. However, If the project has other contracts (for example, a Presale, staking contract etc), and they were not provided to us in the audit scope, then we cannot comment on its security and are not responsible for it in any way.

No external libraries used.

Source

language: solidity

version: 0.8.17+commit.8df45f5f

verified at: November 18, 2023 at 01:28:42 PM (UTC+0)

Conclusion

In conclusion, following the audit of the Messier cryptocurrency, symbolized as M87, the token is performing soundly across various aspects. As per the purchase and sales processes, both the buy and sell taxes of 3% stand within the acceptable norm. From a trader's perspective, the absence of a honeypot trap is typical and a positive aspect. There are effective measures against extreme fluctuations in token value or 'whale' transactions, thus enhancing the stability of the token. Considering the token limits, M87 is non-mintable, thereby strengthening token scarcity and enhancing its potential value. There are no blacklisting mechanisms, permitting unrestricted trading once you become a token holder. In the current setting, M87 is listed on dex, which aligns with usual protocols in crypto trading. Hence, investors can expect standard trading procedures for Messier. The adoption and diversification indicators of M87 are positive. Over 1,286 distinct holders are registered at the moment, signifying a steadily expanding community of adopters. Moreover, there are more than three liquidity providers, implying a healthy trading environment which can handle the volume of transactions and keeping the token's price stable. The most significant aspect is the absence of security threats identified in the audit. No issues of high, medium, or low severity have been found, indicating a strong, secure, and risk-free codebase. In other words, the Messier token has an untarnished security record up to the time of the audit. In summary, the Messier or M87 token possesses all the attributes of a reliable, secure, and robust token from the audits' conclusions. Investing in this token appears to be stable and has room for growth, considering its steady adoption rate and absence of security risks.

Conclusion Overview

| Overview | Notes | Result |
|-------------------------------|--|---------|
| Honeypot | The contract owner can drain the funds from the contract | ✓ False |
| Anti whale check | Features preventing whales from manipulating the Token | ✓ True |
| Opensource | The code of the contract is public | ✓ True |
| Ownership renounced | Contract owner has renounced ownership | ✗ False |
| Buy tax | Fees incurred when buying the token | ✓ |
| Sell tax | Fees incurred when selling the token | ✓ |
| High Severity Issues | Number of High severity issues | 0 |
| Medium Severity Issues | Number of Medium severity issues | 0 |
| Mintable | Can mint new tokens | ✓ False |
| Blacklist | Owner can blacklist users | ✓ False |
| Holders | Total wallets holding the token | 1286 |
| LP holder | Number of liquidity providers | 3 |

Glossary

1. Honeypot:

A honeypot refers to a deceptive contract that lures investors by appearing lucrative or profitable. These contracts typically allow users to easily purchase tokens, but selling them is restricted or impossible. This tactic is used to trap funds, misleading investors who are unable to withdraw their investments.

2. Blacklist:

A blacklist refers to a mechanism that enables the contract owner to restrict certain addresses from buying or selling the token. This feature is often implemented to block suspected bots or malicious actors from manipulating the token's market. However, it can also be used to unfairly prevent legitimate users from selling their tokens, posing a risk to token holder rights.

3. Ownership Privileges:

Ownership privileges refer to the exclusive rights and controls a contract owner possesses. These can include altering critical contract parameters, managing listings on decentralized exchanges, and updating contract logic. While revoking ownership can enhance trust among users by making the contract immutable, maintaining ownership is crucial for larger projects that require ongoing management and adaptability to evolving blockchain ecosystems.

4. Automated Penetration Testing:

Automated Penetration Testing is a cybersecurity practice that employs automated tools and technologies to identify and exploit vulnerabilities in computer systems, networks, or applications. It aims to simulate potential cyberattacks to assess the security posture and discover weaknesses in order to enhance overall defense against malicious activities.

5. LLM:

A large language model (LLM) is a type of artificial intelligence (AI) algorithm that uses deep learning techniques and massively large data sets to understand, summarize, generate and predict new content.

6. CVSS:

CVSS stands for the Common Vulnerability Scoring System. It's a way to evaluate and rank reported vulnerabilities in a standardized and repeatable way.

7. EOA:

Externally Owned Accounts (EOAs) are the most common type of blockchain account that gives us direct control. These accounts are created using private keys. The associated key gives you a unique signature and access to the blockchain. You can use it to send and receive transactions and interact with applications.