Cyberscope

# Audit Report

# Arb Axolotl

May 2023

| | |
|---|---|
| Network | Arbitrum |
| Address | 0x72949aaf5c685856883c27f9fc4bc5f338e5e1f9 |
| Audited by | © cyberscope |

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# Review

| | |
|---|---|
| **Contract Name** | Axolotl_AI |
| **Compiler Version** | v0.8.19+commit.7dd6d404 |
| **Optimization** | 200 runs |
| **Explorer** | https://arbiscan.io/address/0x72949aaf5c685856883c27f9fc4bc5f338e5e1f9 |
| **Address** | 0x72949aaf5c685856883c27f9fc4bc5f338e5e1f9 |
| **Network** | ARBITRUM |
| **Symbol** | ARBAX |
| **Decimals** | 6 |
| **Total Supply** | 8,000,000,000 |

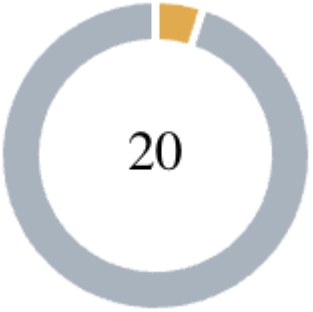
## Audit Updates

| | |
|---|---|
| **Initial Audit** | 14 May 2023 |
| **Corrected Phase 2** | 15 May 2023 |
| **Corrected Phase 3** | 16 May 2023 |
| **Corrected Phase 4** | 22 May 2023 |

## Source Files

| | |
|---|---|
| **Filename** | SHA256 |
| **Axolotl_AI.sol** | 3394a77ba2a989cf3eb33cbe0ad12cb2763088279d622086656ab549ec614a4d |

# Findings Breakdown




| Severity | Unresolved | Acknowledged | Resolved | Other |
|---|---|---|---|---|
| Critical | 0 | 0 | 0 | 0 |
| Medium | 1 | 0 | 0 | 0 |
| Minor / Informative | 19 | 0 | 0 | 0 |

# Analysis

Critical Medium Minor / Informative Pass

| Severity | Code | Description | Status |
|---|---|---|---|
| | ST | Stops Transactions | Unresolved |
| | OCTD | Transfers Contract's Tokens | Passed |
| | OTUT | Transfers User's Tokens | Passed |
| | ELFM | Exceeds Fees Limit | Passed |
| | ULTW | Transfers Liquidity to Team Wallet | Passed |
| | MT | Mints Tokens | Passed |
| | BT | Burns Tokens | Passed |
| | BC | Blacklists Addresses | Passed |

## ST - Stops Transactions

| | |
|---|---|
| **Criticality** | Minor / Informative |
| **Location** | contracts/testingDeploy/Contract.sol#L2066 |
| **Status** | Unresolved |

### Description

As part of the launch process, initially, the transfers are disabled for all the users excluding the authorized addresses. Once the trades are enabled it will not be able to stop again.

```
if (!canAddLiquidityBeforeLaunch[sender]) { //If trading isn't
opened yet, and you are not specially authorized, you cant transfer
or trade tokens
    require(launched(), "Trading not open yet");
}
```

### Recommendation

The team should carefully manage the private keys of the owner's account. We strongly recommend a powerful security mechanism that will prevent a single user from accessing the contract admin functions. Some suggestions are:

- Introduce a multi-sign wallet so that many addresses will confirm the action.
- Introduce a governance model where users will vote about the actions.

# Diagnostics

Critical Medium Minor / Informative

| Severity | Code | Description | Status |
|---|---|---|---|
| Medium | ZD | Zero Division | Unresolved |
| Minor / Informative | PAP | Pair Address Preexistence | Unresolved |
| Minor / Informative | CR | Code Repetition | Unresolved |
| Minor / Informative | RMBS | Redundant Mint Burn Sequence | Unresolved |
| Minor / Informative | RTCI | Reward Token Change Inconsistency | Unresolved |
| Minor / Informative | UFD | Unbalanced Fees Distribution | Unresolved |
| Minor / Informative | RLS | Redundant Liquidation Swaps | Unresolved |
| Minor / Informative | RSML | Redundant SafeMath Library | Unresolved |
| Minor / Informative | RSK | Redundant Storage Keyword | Unresolved |
| Minor / Informative | IDI | Immutable Declaration Improvement | Unresolved |
| Minor / Informative | L02 | State Variables could be Declared Constant | Unresolved |
| Minor / Informative | L04 | Conformance to Solidity Naming Conventions | Unresolved |
| Minor / Informative | L07 | Missing Events Arithmetic | Unresolved |
| Minor / Informative | L09 | Dead Code Elimination | Unresolved |

| | | | |
|---|---|---|---|
| ● | L16 | Validate Variable Setters | Unresolved |
| ● | L17 | Usage of Solidity Assembly | Unresolved |
| ● | L18 | Multiple Pragma Directives | Unresolved |
| ● | L19 | Stable Compiler Version | Unresolved |
| ● | L20 | Succeeded Transfer Check | Unresolved |

# ZD - Zero Division

| | |
|---|---|
| **Criticality** | Medium |
| **Location** | contracts/Contract_V5.sol#L2173 |
| **Status** | Unresolved |

## Description

The contract is using variables that may be set to zero as denominators. This can lead to unpredictable and potentially harmful results, such as a transaction revert.

The `totalFee` is the sum of `holderFee`, `liquidityFee`, `flexFee`, `marketingFee` and `devFee`. If the sum of `flexFee`, `marketingFee` and `devFee` is zero, then the `totalFee - holderFee - liquidityFee` will produce a zero result and the `backTokenTotalFee` will revert as a denominator.

```
uint256 backTokenTotalFee = totalFee - holderFee - liquidityFee;
uint256 amountBackTokenFlex = (amountBackToken * flexFee) /
(backTokenTotalFee);
```

## Recommendation

It is important to handle division by zero appropriately in the code to avoid unintended behavior and to ensure the reliability and safety of the contract. The contract should ensure that the divisor is always non-zero before performing a division operation. It should prevent the variables to be set to zero, or should not allow executing of the corresponding statements.

## PAP - Pair Address Preexistence

| | |
|---|---|
| **Criticality** | Minor / Informative |
| **Location** | contracts/testingDeploy/Contract.sol#L2039 |
| **Status** | Unresolved |

### Description

The contract initializes the pair address in the `initializePair()` method. If a third user create the pair address prior the `initializePair()` , then this method will not be able to be called again since the `createPair()` will revert.

```
function initializePair() external onlyOwner {
    require(!initialized, "Already initialized");
    address pair = factory.createPair(address(WETH),
address(this));
    isDividendExempt[pair] = true;
    _pairs.add(pair);
    initialized = true;
}
```

### Recommendation

The team is advised to move the pair creation in the constructor to guarantee that the pair will not exist. Otherwise, the team could exploit the `getPair()` method to check if the pair address already exists.

## CR - Code Repetition

| | |
|---|---|
| **Criticality** | Minor / Informative |
| **Location** | contracts/testingDeploy/Contract.sol#L2250 |
| **Status** | Unresolved |

### Description

The contract contains repetitive code segments. There are potential issues that can arise when using code segments in Solidity. Some of them can lead to issues like gas efficiency, complexity, readability, security, and maintainability of the source code. It is generally a good idea to try to minimize code repetition where possible.

All of the three methods `clearStuckBalance` , `rescueToken` and `rescueArbax` are subset of the `rescueToken` method.

```
function clearStuckBalance() external onlyOwner {
    backToken.transfer(_msgSender(), backToken.balanceOf(address(this)));
}

function rescueToken(address tokenAddress) external onlyOwner {

IERC20(tokenAddress).safeTransfer(msg.sender,IERC20(tokenAddress).balanceOf(ad
dress(this)));
}

function rescueArbax() external onlyOwner {
    _transfer(address(this), msg.sender, this.balanceOf(address(this)));
}
```

### Recommendation

The team is advised to avoid repeating the same code in multiple places, which can make the contract easier to read and maintain. The authors could try to reuse code wherever possible, as this can help reduce the complexity and size of the contract. For instance, the contract could reuse the common code segments in an internal function in order to avoid repeating the same code in multiple places.

Both `rescueArbax` and `clearStuckBalance` methods could be removed since the `rescueToken` method can produce the same result with the proper arguments.

## RMBS - Redundant Mint Burn Sequence

| | |
|---|---|
| **Criticality** | Minor / Informative |
| **Location** | contracts/testingDeploy/Contract.sol#L2271 |
| **Status** | Unresolved |

### Description

As part of the tokens distribution process, the $ARBAX address mints 20% of tokens, and then it burns the same amount. The balances and the total supply before and after this sequence is exactly the same. As a result, this execution is redundant.

```
_mint(address(this),  (_targettotalSupply * 20) / 100);
_burn(address(this), (_targettotalSupply * 20) / 100);
```

### Recommendation

The team is adviced to remove the mint and burn sequence since it will produce the same result.

## RTCI - Reward Token Change Inconsistency

| | |
|---|---|
| **Criticality** | Minor / Informative |
| **Location** | contracts/testingDeploy/Contract.sol#L2383 |
| **Status** | Unresolved |

## Description

The contract owner has the authority to change the distribution token address by calling the `setRewardToken()` method. This may produce several issues in the distribution process.

1. There should be a valid pair address between the ETH and the new token address.
2. The internal state of the distributor should reset since variables like `dividendsPerShare` are based on the previous token's balance.

```
function setRewardToken(address _rewardToken) external onlyOwner {
    dividendDistributor.setRewardTokenInternally(_rewardToken);
}
```

## Recommendation

The team is advised to either remove the option of changing the reward address or resolve the side-effects of the change.

## UFD - Unbalanced Fees Distribution

| | |
|---|---|
| **Criticality** | Minor / Informative |
| **Location** | contracts/Contract_V5.sol#L2113 |
| **Status** | Unresolved |

## Description

During the execution of the swap method, the contract split the amounts that will be distributed on each feature. The fees are not distributed equally since the division does not proceed on the same value but in the deducted.

For instance, liquidityFee: 100 holderFee: 200 totalFee: 600 taxAmount: 1000

| Variable | Expected | Actual |
|---|---|---|
| amountAxoLp | 100 | 100 |
| amountAxoReflection | 200 | 180 |

```
uint256 amountAxoLp = (taxAmount * liquidityFee) / (totalFee);
taxAmount -= amountAxoLp; //Keep these tokens to add them to LP
automatically, Swap the Rest into Backtoken (ARB)

uint256 amountAxoReflection = (taxAmount * holderFee) / (totalFee);
taxAmount -= amountAxoReflection; //In a few steps, swap this for
ETH to deposit for reflections
```

## Recommendation

The team is advised to revisit the fees distribution calculations and split equally the shares.

## RLS - Redundant Liquidation Swaps

| | |
|---|---|
| **Criticality** | Minor / Informative |
| **Location** | contracts/Contract_V5.sol#L2113 |
| **Status** | Unresolved |

### Description

The contract performs executes twice the `.swapExactTokensForETH` method with the same path during the execution of the `swapBack` method. The execution of the external call increases unnecessarily the gas consumption and decreases the code readability.

### Recommendation

The team is advised to execute the `.swapExactTokensForTokens` method once providing the sum of `taxAmount` and `amountAxoLp` and split proportionally the received ETH to the corresponding feature.

## RSML - Redundant SafeMath Library

| | |
|---|---|
| **Criticality** | Minor / Informative |
| **Location** | Axolotl_AI.sol |
| **Status** | Unresolved |

## Description

SafeMath is a popular Solidity library that provides a set of functions for performing common arithmetic operations in a way that is resistant to integer overflows and underflows.

Starting with Solidity versions that are greater than or equal to 0.8.0, the arithmetic operations revert to underflow and overflow. As a result, the native functionality of the Solidity operations replaces the SafeMath library. Hence, the usage of the SafeMath library adds complexity, overhead and increases gas consumption unnecessarily.

```
library SafeMath {...}
```

## Recommendation

The team is advised to remove the SafeMath library. Since the version of the contract is greater than `0.8.0` then the pure Solidity arithmetic operations produce the same result.

If the previous functionality is required, then the contract could exploit the `unchecked { ... }` statement.

Read more about the breaking change on https://docs.soliditylang.org/en/v0.8.16/080-breaking-changes.html#solidity-v0-8-0-breaking-changes.

## RSK - Redundant Storage Keyword

| | |
|---|---|
| **Criticality** | Minor / Informative |
| **Location** | Axolotl_AI.sol#L1193,1200,1214,1226,1259,1266,1280,1292,1333,1340,1354,1366,1407,1414,1428,1440 |
| **Status** | Unresolved |

### Description

The contract uses the `storage` keyword in a view function. The `storage` keyword is used to persist data on the contract's storage. View functions are functions that do not modify the state of the contract and do not perform any actions that cost gas (such as sending a transaction). As a result, the use of the `storage` keyword in view functions is redundant.

```
Set storage set
Bytes32Set storage set
AddressSet storage set
UintSet storage set
```

### Recommendation

It is generally considered good practice to avoid using the `storage` keyword in view functions because it is unnecessary and can make the code less readable.

## IDI - Immutable Declaration Improvement

| | |
|---|---|
| **Criticality** | Minor / Informative |
| **Location** | Axolotl_AI.sol#L2016,2026,2027 |
| **Status** | Unresolved |

### Description

The contract is using variables that initialize them only in the constructor. The other functions are not mutating the variables. These variables are not defined as `immutable`.

```
backToken
router
dividendDistributor
```

### Recommendation

By declaring a variable as immutable, the Solidity compiler is able to make certain optimizations. This can reduce the amount of storage and computation required by the contract, and make it more gas-efficient.

## L02 - State Variables could be Declared Constant

| | |
|---|---|
| **Criticality** | Minor / Informative |
| **Location** | Axolotl_AI.sol#L1589,1601,1977,1979,2005 |
| **Status** | Unresolved |

### Description

State variables can be declared as constant using the constant keyword. This means that the value of the state variable cannot be changed after it has been set. Additionally, the constant variables decrease gas consumption of the corresponding transaction.

```
address routerAddress = 0x1b02dA8Cb0d097eB8D57A175b88c7D8b47997506
uint256 public dividendsPerShareAccuracyFactor = 10 ** 36
uint256 public devFee = 100
uint256 public feeDenominator = 10000
```

### Recommendation

Constant state variables can be useful when the contract wants to ensure that the value of a state variable cannot be changed by any function in the contract. This can be useful for storing values that are important to the contract's behavior, such as the contract's address or the maximum number of times a certain function can be called. The team is advised to add the constant keyword to state variables that never change.

## L04 - Conformance to Solidity Naming Conventions

| | |
|---|---|
| **Criticality** | Minor / Informative |
| **Location** | Axolotl_AI.sol#L627,1524,1580,1590,1717,1747,1751,1755,1760,1771,1951,1997,2006,2280,2281,2282,2283,2298,2299,2300,2301,2302,2303,2321,2325,2379 |
| **Status** | Unresolved |

## Description

The Solidity style guide is a set of guidelines for writing clean and consistent Solidity code. Adhering to a style guide can help improve the readability and maintainability of the Solidity code, making it easier for others to understand and work with.

The followings are a few key points from the Solidity style guide:

1. Use camelCase for function and variable names, with the first letter in lowercase (e.g., myVariable, updateCounter).
2. Use PascalCase for contract, struct, and enum names, with the first letter in uppercase (e.g., MyContract, UserStruct, ErrorEnum).
3. Use uppercase for constant variables and enums (e.g., MAX_VALUE, ERROR_CODE).
4. Use indentation to improve readability and structure.
5. Use spaces between operators and after commas.
6. Use comments to explain the purpose and behavior of the code.
7. Keep lines short (around 120 characters) to improve readability.

```
function DOMAIN_SEPARATOR() external view returns (bytes32);
function WETH() external pure returns (address);
address _token
IBEP20 RewardToken =
IBEP20(0x912CE59144191C1204E64559FE8253a0e49E6548)
address _rewardToken

function _getMinPeriod() public view returns(uint256){
        return minPeriod;
    }

function _getMinDistribution() public view returns(uint256){
        return minDistribution;
    }

...
```

## Recommendation

By following the Solidity naming convention guidelines, the codebase increased the readability, maintainability, and makes it easier to work with.
Find more information on the Solidity documentation
https://docs.soliditylang.org/en/v0.8.17/style-guide.html#naming-convention.

## L07 - Missing Events Arithmetic

| | |
|---|---|
| **Criticality** | Minor / Informative |
| **Location** | Axolotl_AI.sol#L1625,2287,2376 |
| **Status** | Unresolved |

### Description

Events are a way to record and log information about changes or actions that occur within a contract. They are often used to notify external parties or clients about events that have occurred within the contract, such as the transfer of tokens or the completion of a task.

It's important to carefully design and implement the events in a contract, and to ensure that all required events are included. It's also a good idea to test the contract to ensure that all events are being properly triggered and logged.

```
minPeriod = newMinPeriod
holderFee = _holderFee
distributorGas = gas
```

### Recommendation

By including all required events in the contract and thoroughly testing the contract's functionality, the contract ensures that it performs as intended and does not have any missing events that could cause issues with its arithmetic.

# L09 - Dead Code Elimination

| | |
|---|---|
| **Criticality** | Minor / Informative |
| **Location** | Axolotl_AI.sol#L690,715,744,775,785,800,810,849,902,918,933,942,955,1226,1252,1259,1266,1280,1292,1366,1400,1407,1414,1428,1440 |
| **Status** | Unresolved |

## Description

In Solidity, dead code is code that is written in the contract, but is never executed or reached during normal contract execution. Dead code can occur for a variety of reasons, such as:

- Conditional statements that are always false.
- Functions that are never called.
- Unreachable code (e.g., code that follows a return statement).

Dead code can make a contract more difficult to understand and maintain, and can also increase the size of the contract and the cost of deploying and interacting with it.

```
function sendValue(address payable recipient, uint256 amount)
internal {
        require(address(this).balance >= amount, "Address:
insufficient balance");

        (bool success, ) = recipient.call{value: amount}("");
        require(success, "Address: unable to send value, recipient
may have reverted");
    }

function functionCall(address target, bytes memory data) internal
returns (bytes memory) {
        return functionCallWithValue(target, data, 0, "Address:
low-level call failed");
    }

...
```

## Recommendation

To avoid creating dead code, it's important to carefully consider the logic and flow of the contract and to remove any code that is not needed or that is never executed. This can help improve the clarity and efficiency of the contract.

## L16 - Validate Variable Setters

| | |
|---|---|
| **Criticality** | Minor / Informative |
| **Location** | Axolotl_AI.sol#L2305,2306,2307,2308,2309,2310 |
| **Status** | Unresolved |

### Description

The contract performs operations on variables that have been configured on user-supplied input. These variables are missing of proper check for the case where a value is zero. This can lead to problems when the contract is executed, as certain actions may not be properly handled when the value is zero.

```
flexWallet = _flexWallet
marketingWallet = _marketingWallet
devWallet = _devWallet
airdropWallet = _airdropWallet
liqWallet = _liqWallet
ownerWallet = _ownerWallet
```

### Recommendation

By adding the proper check, the contract will not allow the variables to be configured with zero value. This will ensure that the contract can handle all possible input values and avoid unexpected behavior or errors. Hence, it can help to prevent the contract from being exploited or operating unexpectedly.

## L17 - Usage of Solidity Assembly

| | |
|---|---|
| **Criticality** | Minor / Informative |
| **Location** | Axolotl_AI.sol#L866,1297,1371,1445 |
| **Status** | Unresolved |

### Description

Using assembly can be useful for optimizing code, but it can also be error-prone. It's important to carefully test and debug assembly code to ensure that it is correct and does not contain any errors.

Some common types of errors that can occur when using assembly in Solidity include Syntax, Type, Out-of-bounds, Stack, and Revert.

```
assembly {
                let returndata_size := mload(returndata)
                revert(add(32, returndata), returndata_size)
            }

assembly {
            result := store
        }
```

### Recommendation

It is recommended to use assembly sparingly and only when necessary, as it can be difficult to read and understand compared to Solidity code.

## L18 - Multiple Pragma Directives

| | |
|---|---|
| **Criticality** | Minor / Informative |
| **Location** | Axolotl_AI.sol#L9,89,131,159,185,572,634,880,994,1078,1455,1766,1867,1926,1947 |
| **Status** | Unresolved |

### Description

If the contract includes multiple conflicting pragma directives, it may produce unexpected errors. To avoid this, it's important to include the correct pragma directive at the top of the contract and to ensure that it is the only pragma directive included in the contract.

```
pragma solidity ^0.8.0;
pragma solidity ^0.8.1;
pragma solidity >=0.5.0;
pragma solidity >=0.6.2;
pragma solidity =0.8.19;
```

### Recommendation

It is important to include only one pragma directive at the top of the contract and to ensure that it accurately reflects the version of Solidity that the contract is written in.

By including all required compiler options and flags in a single pragma directive, the potential conflicts could be avoided and ensure that the contract can be compiled correctly.

## L19 - Stable Compiler Version

| | |
|---|---|
| **Criticality** | Minor / Informative |
| **Location** | Axolotl_AI.sol#L9,89,131,159,185,572,634,880,994,1078 |
| **Status** | Unresolved |

### Description

The `^` symbol indicates that any version of Solidity that is compatible with the specified version (i.e., any version that is a higher minor or patch version) can be used to compile the contract. The version lock is a mechanism that allows the author to specify a minimum version of the Solidity compiler that must be used to compile the contract code. This is useful because it ensures that the contract will be compiled using a version of the compiler that is known to be compatible with the code.

```
pragma solidity ^0.8.0;
pragma solidity ^0.8.1;
```

### Recommendation

The team is advised to lock the pragma to ensure the stability of the codebase. The locked pragma version ensures that the contract will not be deployed with an unexpected version. An unexpected version may produce vulnerabilities and undiscovered bugs. The compiler should be configured to the lowest version that provides all the required functionality for the codebase. As a result, the project will be compiled in a well-tested LTS (Long Term Support) environment.

## L20 - Succeeded Transfer Check

| | |
|---|---|
| **Criticality** | Minor / Informative |
| **Location** | Axolotl_AI.sol#L1701,1714,2175,2176,2177,2247 |
| **Status** | Unresolved |

### Description

According to the ERC20 specification, the transfer methods should be checked if the result is successful. Otherwise, the contract may wrongly assume that the transfer has been established.

```
RewardToken.transfer(shareholder, amount)
RewardToken.transfer(to, RewardToken.balanceOf(address(this)))
backToken.transfer(flexWallet, amountBackTokenFlex)
backToken.transfer(marketingWallet, amountBackTokenMarketing)
backToken.transfer(devWallet, amountBackTokenDev)
backToken.transfer(_msgSender(),
backToken.balanceOf(address(this)))
```

### Recommendation

The contract should check if the result of the transfer methods is successful. The team is advised to check the SafeERC20 library from the Openzeppelin library.

# Functions Analysis

| Contract | Type | Bases | | |
|---|---|---|---|---|
| | **Function Name** | **Visibility** | **Mutability** | **Modifiers** |
| | | | | |
| | | | | |
| **Context** | Implementation | | | |
| | _msgSender | Internal | | |
| | _msgData | Internal | | |
| | | | | |
| **ERC20** | Implementation | Context, IERC20, IERC20Metadata | | |
| | | Public | ✓ | - |
| | name | Public | | - |
| | symbol | Public | | - |
| | decimals | Public | | - |
| | totalSupply | Public | | - |
| | balanceOf | Public | | - |
| | transfer | Public | ✓ | - |
| | allowance | Public | | - |
| | approve | Public | ✓ | - |
| | transferFrom | Public | ✓ | - |
| | increaseAllowance | Public | ✓ | - |

| | | | | |
|---|---|---|---|---|
| | decreaseAllowance | Public | ✓ | - |
| | _transfer | Internal | ✓ | |
| | _mint | Internal | ✓ | |
| | _burn | Internal | ✓ | |
| | _approve | Internal | ✓ | |
| | _spendAllowance | Internal | ✓ | |
| | _beforeTokenTransfer | Internal | ✓ | |
| | _afterTokenTransfer | Internal | ✓ | |
| | | | | |
| **IERC20Permit** | Interface | | | |
| | permit | External | ✓ | - |
| | nonces | External | | - |
| | DOMAIN_SEPARATOR | External | | - |
| | | | | |
| **Address** | Library | | | |
| | isContract | Internal | | |
| | sendValue | Internal | ✓ | |
| | functionCall | Internal | ✓ | |
| | functionCall | Internal | ✓ | |
| | functionCallWithValue | Internal | ✓ | |
| | functionCallWithValue | Internal | ✓ | |
| | functionStaticCall | Internal | | |
| | functionStaticCall | Internal | | |

| | | | | |
|---|---|---|---|---|
| | functionDelegateCall | Internal | ✓ | |
| | functionDelegateCall | Internal | ✓ | |
| | verifyCallResultFromTarget | Internal | | |
| | verifyCallResult | Internal | | |
| | _revert | Private | | |
| | | | | |
| **SafeERC20** | Library | | | |
| | safeTransfer | Internal | ✓ | |
| | safeTransferFrom | Internal | ✓ | |
| | safeApprove | Internal | ✓ | |
| | safeIncreaseAllowance | Internal | ✓ | |
| | safeDecreaseAllowance | Internal | ✓ | |
| | safePermit | Internal | ✓ | |
| | _callOptionalReturn | Private | ✓ | |
| | | | | |
| **Ownable** | Implementation | Context | | |
| | | Public | ✓ | - |
| | owner | Public | | - |
| | _checkOwner | Internal | | |
| | renounceOwnership | Public | ✓ | onlyOwner |
| | transferOwnership | Public | ✓ | onlyOwner |
| | _transferOwnership | Internal | ✓ | |
| | | | | |

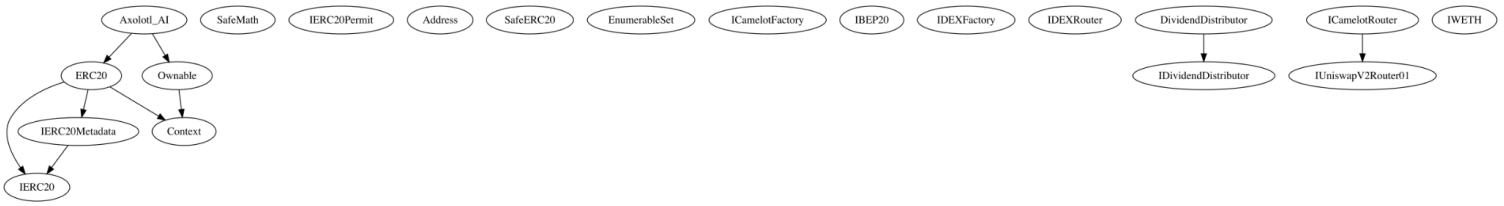
| | | | | |
|---|---|---|---|---|
| **IDividendDistributor** | Interface | | | |
| | setDistributionCriteria | External | ✓ | - |
| | setShare | External | ✓ | - |
| | deposit | External | Payable | - |
| | process | External | ✓ | - |
| | | | | |
| **DividendDistributor** | Implementation | IDividendDistributor | | |
| | | Public | ✓ | - |
| | setDistributionCriteria | External | ✓ | onlyToken |
| | setShare | External | ✓ | onlyToken |
| | deposit | External | Payable | onlyToken |
| | process | External | ✓ | onlyToken |
| | shouldDistribute | Internal | | |
| | distributeDividend | Internal | ✓ | |
| | claimDividend | External | ✓ | onlyToken |
| | rescueDividends | External | ✓ | onlyToken |
| | setRewardTokenInternally | External | ✓ | onlyToken |
| | getUnpaidEarnings | Public | | - |
| | getCumulativeDividends | Internal | | |
| | addShareholder | Internal | ✓ | |
| | removeShareholder | Internal | ✓ | |
| | _getMinPeriod | Public | | - |

| | | | | |
|---|---|---|---|---|
| | _getMinDistribution | Public | | - |
| | _readyToDistribute | Public | | - |
| | _pendingRewards | Public | | - |
| | | | | |
| | | | | |
| **ICamelotRouter** | Interface | IUniswapV2 Router01 | | |
| | removeLiquidityETHSupportingFeeOnTransferTokens | External | ✓ | - |
| | removeLiquidityETHWithPermitSupportingFeeOnTransferTokens | External | ✓ | - |
| | swapExactTokensForTokensSupportingFeeOnTransferTokens | External | ✓ | - |
| | swapExactETHForTokensSupportingFeeOnTransferTokens | External | Payable | - |
| | swapExactTokensForETHSupportingFeeOnTransferTokens | External | ✓ | - |
| | getAmountsOut | External | | - |
| | | | | |
| **IWETH** | Interface | | | |
| | totalSupply | External | | - |
| | balanceOf | External | | - |
| | allowance | External | | - |
| | approve | External | ✓ | - |
| | deposit | External | Payable | - |
| | transfer | External | ✓ | - |
| | withdraw | External | ✓ | - |
| | | | | |

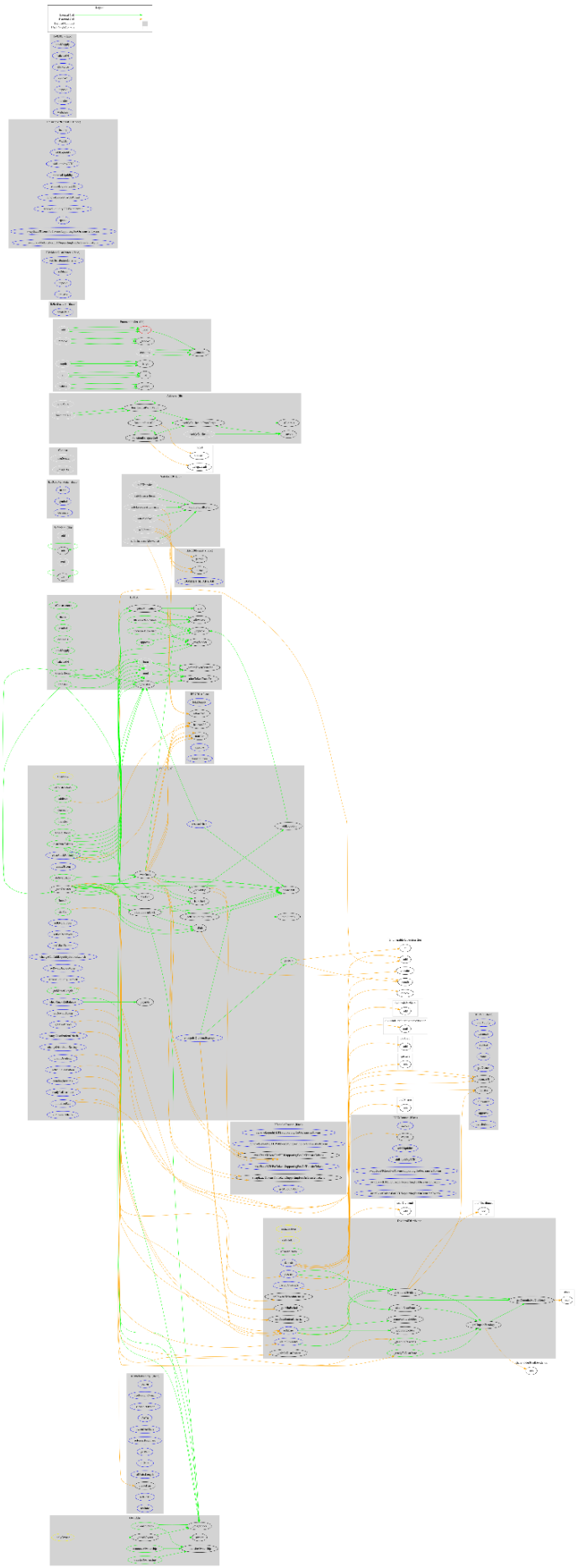
| | | | | |
|---|---|---|---|---|
| **Axolotl_AI** | Implementation | ERC20, Ownable | | |
| | | Public | ✓ | ERC20 |
| | initializePair | External | ✓ | onlyOwner |
| | decimals | Public | | - |
| | transfer | Public | ✓ | - |
| | transferFrom | Public | ✓ | - |
| | _axoTransfer | Internal | ✓ | |
| | shouldSwapBack | Internal | | |
| | swapBack | Internal | ✓ | swapping |
| | _doAddLp | Internal | ✓ | |
| | _addLiquidity | Internal | ✓ | |
| | doSwapBack | Public | ✓ | onlyOwner |
| | launched | Internal | | |
| | takeFee | Internal | ✓ | |
| | rescueToken | External | ✓ | onlyOwner |
| | rescueArbax | External | ✓ | onlyOwner |
| | clearStuckEthBalance | External | ✓ | onlyOwner |
| | clearStuckBalance | External | ✓ | onlyOwner |
| | getCirculatingSupply | Public | | - |
| | launch | Public | ✓ | onlyOwner |
| | distributeTokens | Public | ✓ | onlyOwner |
| | setOverallFees | External | ✓ | onlyOwner |
| | setFeeReceivers | External | ✓ | onlyOwner |

| | | | | |
|---|---|---|---|---|
| | setIsFeeExempt | External | ✓ | onlyOwner |
| | changeCanAddLiquidityBeforeLaunch | External | ✓ | onlyOwner |
| | setSwapBackSettings | External | ✓ | onlyOwner |
| | setAddLiquidityEnabled | External | ✓ | onlyOwner |
| | isPair | Public | | - |
| | addPair | Public | ✓ | onlyOwner |
| | delPair | Public | ✓ | onlyOwner |
| | getMinterLength | Public | | - |
| | getPair | Public | | - |
| | claimDividend | External | ✓ | - |
| | changeIsDividendExempt | External | ✓ | onlyOwner |
| | changeDistributionCriteria | External | ✓ | onlyOwner |
| | changeDistributorSettings | External | ✓ | onlyOwner |
| | setRewardToken | External | ✓ | onlyOwner |
| | getMinPeriod | External | | - |
| | getMinDistribution | External | | - |
| | readyToDistribute | External | | - |
| | pendingRewards | External | | - |
| | | External | Payable | - |

# Inheritance Graph



# Flow Graph



# Summary

Arb Axolotl contract implements a token mechanism. This audit investigates security issues, business logic concerns, and potential improvements. There are some functions that can be abused by the owner like stopping transactions. The team is advised to reconsider segments of the business logic and revisit some parts of the implementation. There is also a limit of max 25% fees.

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Cyberscope is a blockchain cybersecurity company that was founded with the vision to make web3.0 a safer place for investors and developers. Since its launch, it has worked with thousands of projects and is estimated to have secured tens of millions of investors' funds.

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**The Cyberscope team**

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