



Cyberscope

# Audit Report

## **Space Grok**

January 2024

Network    BSC

Address    0x58718Fd4567517d9a713a1f9f3de6cbF9404E59e

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# Analysis

● Critical   ● Medium   ● Minor / Informative   ● Pass

Severity	Code	Description	Status
●	ST	Stops Transactions	Unresolved
●	OTUT	Transfers User's Tokens	Passed
●	ELFM	Exceeds Fees Limit	Passed
●	MT	Mints Tokens	Passed
●	BT	Burns Tokens	Passed
●	BC	Blacklists Addresses	Passed

# Diagnostics

● Critical ● Medium ● Minor / Informative

Severity	Code	Description	Status
●	IAC	Insecure Access Control	Unresolved
●	ZD	Zero Division	Unresolved
●	STVI	Swap Token Variable Inconsistency	Unresolved
●	DDP	Decimal Division Precision	Unresolved
●	IDI	Immutable Declaration Improvement	Unresolved
●	MEM	Misleading Error Messages	Unresolved
●	MEE	Missing Events Emission	Unresolved
●	RED	Redundant Event Declaration	Unresolved
●	RSML	Redundant SafeMath Library	Unresolved
●	RSW	Redundant Storage Writes	Unresolved
●	RVD	Redundant Variable Declaration	Unresolved
●	L04	Conformance to Solidity Naming Conventions	Unresolved
●	L05	Unused State Variable	Unresolved
●	L07	Missing Events Arithmetic	Unresolved

●	L09	Dead Code Elimination	Unresolved
●	L13	Divide before Multiply Operation	Unresolved
●	L15	Local Scope Variable Shadowing	Unresolved
●	L16	Validate Variable Setters	Unresolved
●	L20	Succeeded Transfer Check	Unresolved

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## Review

Contract Name	SpaceGrok
Compiler Version	v0.8.18+commit.87f61d96
Optimization	9999 runs
Explorer	<a href="https://bscscan.com/address/0x58718fd4567517d9a713a1f9f3de6cbf9404e59e">https://bscscan.com/address/0x58718fd4567517d9a713a1f9f3de6cbf9404e59e</a>
Address	0x58718fd4567517d9a713a1f9f3de6cbf9404e59e
Network	BSC
Symbol	sGrok
Decimals	18
Total Supply	1,000,000,000
Badge Eligibility	Must Fix Criticals

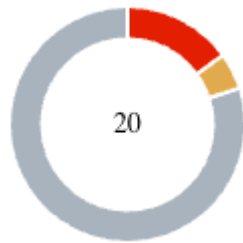
## Audit Updates

Initial Audit	07 Jan 2024
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## Source Files

Filename	SHA256
SpaceGrok.sol	86eec785e46f02c69efedc838183bb855405d21f19f63d36a2d0ccfc643402a5

## Findings Breakdown



Critical	3
Medium	1
Minor / Informative	16

Severity	Unresolved	Acknowledged	Resolved	Other
Critical	3	0	0	0
Medium	1	0	0	0
Minor / Informative	16	0	0	0



## ST - Stops Transactions

Criticality	Critical
Location	SpaceGrok.sol#L756
Status	Unresolved

### Description

The transactions are initially disabled for all users excluding the authorized addresses. The owner can enable the transactions for all users. Once the transactions are enabled the owner will not be able to disable them again.

```
if (!tradingActive) {  
    require(!_isExcludedFromFees[from] || !_isExcludedFromFees[to], "Trading  
is not active.");  
}
```

Additionally, the contract owner has the authority to stop the sales for all users excluding the owner, as described in detail in sections ZD. As a result, the contract may operate as a honeypot.

### 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.

## IAC - Insecure Access Control

Criticality	Critical
Location	SpaceGrok.sol#L614,621,670,684,720,826
Status	Unresolved

### Description

The contract includes certain functions that lack an access control mechanism. These functions are crucial for the behavior of the contract as they mutate critical state variables.

For instance, the `removeLimits` function, intended to disable the `limitsActive` variable, lacks proper access control, allowing any user to call it. The `require(_msgSender() == _msgSender())` statement does not provide effective authorization protection, as it merely checks if the sender is equal to itself, which is always true. This exposes a security vulnerability, as unauthorized users can disable limits without proper authentication.

```
function removeLimits() external returns (bool) {  
    require(_msgSender() == _msgSender());  
  
    limitsActive = false;  
    return true;  
}
```

### Recommendation

The team is strongly advised to implement robust access control mechanisms to restrict the execution of the `removeLimits` function to authorized addresses. The contract could use the `onlyOwner` modifier to ensure that only the contract owner can invoke this function. This ensures that critical functionalities like removing limits are performed only by authorized entities, enhancing the security of the contract.

## ZD - Zero Division

<b>Criticality</b>	Critical
<b>Location</b>	SpaceGrok.sol#L865
<b>Status</b>	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.

```
uint256 ethForDev = ethBalance.mul(tokensForDev).div(totalTokensToSwap);
```

### 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 the execution of the corresponding statements.

## STVI - Swap Token Variable Inconsistency

Criticality	Medium
Location	SpaceGrok.sol#L725,826
Status	Unresolved

### Description

The `manualSwap` function allows users to trigger a manual swap of tokens for ETH. However, the contract does not reset or decrease the `tokensForDev` and `tokensForMarketing` variables after the manual swap. This could result in an inconsistency between the actual contract balance and the amounts stored in these variables, leading to potential inaccuracies in future operations. Additionally, the same issue appears if the owner calls the `recoverTokens`.

```
function manualSwap(uint256 amount) external {
    require(_msgSender() == _msgSender());
    require(amount <= balanceOf(address(this)) && amount > 0, "Wrong amount.");
    swapTokensForEth(amount);
}
```

### Recommendation

The team is advised to modify the two functions to reset or decrease the `tokensForDev` and `tokensForMarketing` variables after their execution. This ensures that these variables accurately reflect the remaining tokens for future operations.

## DDP - Decimal Division Precision

<b>Criticality</b>	Minor / Informative
<b>Location</b>	SpaceGrok.sol#L802,803,808,809
<b>Status</b>	Unresolved

### Description

Division of decimal (fixed point) numbers can result in rounding errors due to the way that division is implemented in Solidity. Thus, it may produce issues with precise calculations with decimal numbers.

Solidity represents decimal numbers as integers, with the decimal point implied by the number of decimal places specified in the type (e.g. decimal with 18 decimal places). When a division is performed with decimal numbers, the result is also represented as an integer, with the decimal point implied by the number of decimal places in the type. This can lead to rounding errors, as the result may not be able to be accurately represented as an integer with the specified number of decimal places.

Hence, the splitted shares will not have the exact precision and some funds may not be calculated as expected.

```
fees = amount.mul(sellTotalFees).div(100);
tokensForDev += (fees * sellDevFee) / sellTotalFees;
tokensForMarketing += (fees * sellMarketingFee) / sellTotalFees;
...
fees = amount.mul(buyTotalFees).div(100);
tokensForDev += (fees * buyDevFee) / buyTotalFees;
tokensForMarketing += (fees * buyMarketingFee) / buyTotalFees;
```

### Recommendation

The team is advised to take into consideration the rounding results that are produced from the solidity calculations. The contract could calculate the subtraction of the divided funds in the last calculation in order to avoid the division rounding issue.

## IDI - Immutable Declaration Improvement

<b>Criticality</b>	Minor / Informative
<b>Location</b>	SpaceGrok.sol#L562
<b>Status</b>	Unresolved

### Description

The contract declares state variables that their value is initialized once in the constructor and are not modified afterwards. The `immutable` is a special declaration for this kind of state variables that saves gas when it is defined.

```
uniswapV2Pair
```

### 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.

## MEM - Misleading Error Messages

<b>Criticality</b>	Minor / Informative
<b>Location</b>	SpaceGrok.sol#L615,625,674,688,721,827
<b>Status</b>	Unresolved

### Description

The contract is using misleading error messages. These error messages do not accurately reflect the problem, making it difficult to identify and fix the issue. As a result, the users will not be able to find the root cause of the error.

```
require(_msgSender() == _msgSender())

require(
    _msgSender() == _msgSender()
)
```

### Recommendation

The team is suggested to provide a descriptive message to the errors. This message can be used to provide additional context about the error that occurred or to explain why the contract execution was halted. This can be useful for debugging and for providing more information to users that interact with the contract.

## MEE - Missing Events Emission

<b>Criticality</b>	Minor / Informative
<b>Location</b>	SpaceGrok.sol#L610,617,662,666
<b>Status</b>	Unresolved

### Description

The contract performs actions and state mutations from external methods that do not result in the emission of events. Emitting events for significant actions is important as it allows external parties, such as wallets or dApps, to track and monitor the activity on the contract. Without these events, it may be difficult for external parties to accurately determine the current state of the contract.

```
tradingActive    = true;  
limitsActive     = false;  
_isExcludedFromMaxTx[updAds] = isEx;  
swapEnabled     = enabled;
```

### Recommendation

It is recommended to include events in the code that are triggered each time a significant action is taking place within the contract. These events should include relevant details such as the user's address and the nature of the action taken. By doing so, the contract will be more transparent and easily auditable by external parties. It will also help prevent potential issues or disputes that may arise in the future.



## RED - Redundant Event Declaration

<b>Criticality</b>	Minor / Informative
<b>Location</b>	SpaceGrok.sol#L536,734
<b>Status</b>	Unresolved

### Description

There are code segments that could be optimized. A segment may be optimized so that it becomes a smaller size, consumes less memory, executes more rapidly, or performs fewer operations.

The contract declares certain events in its code. However, these events are not emitted within the contract's functions. As a result, these declared events are redundant and serve no purpose within the contract's current implementation.

```
event UpdateUniswapV2Router(  
    address indexed newAddress,  
    address indexed oldAddress  
);  
event BoughtEarly(address indexed sniper);
```

### Recommendation

The team is advised to take these segments into consideration and rewrite them so the runtime will be more performant. That way it will improve the efficiency and performance of the source code and reduce the cost of executing it.

## RSML - Redundant SafeMath Library

Criticality	Minor / Informative
Location	SpaceGrok.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>.

## RSW - Redundant Storage Writes

Criticality	Minor / Informative
Location	SpaceGrok.sol#L610,617,662,666,698
Status	Unresolved

### Description

The contract modifies the state of the following variables without checking if their current value is the same as the one given as an argument. As a result, the contract performs redundant storage writes, when the provided parameter matches the current state of the variables, leading to unnecessary gas consumption and inefficiencies in contract execution.

```
tradingActive    = true;
limitsActive     = false;
_isExcludedFromMaxTx[updAds] = isEx;
swapEnabled      = enabled;
_isExcludedFromFees[account] = excluded;
```

### Recommendation

The team is advised to implement additional checks within to prevent redundant storage writes when the provided argument matches the current state of the variables. By incorporating statements to compare the new values with the existing values before proceeding with any state modification, the contract can avoid unnecessary storage operations, thereby optimizing gas usage.

## RVD - Redundant Variable Declaration

<b>Criticality</b>	Minor / Informative
<b>Location</b>	SpaceGrok.sol#L506
<b>Status</b>	Unresolved

### Description

There are code segments that could be optimized. A segment may be optimized so that it becomes a smaller size, consumes less memory, executes more rapidly, or performs fewer operations.

The contract declares certain variables that are not used in a meaningful way by the contract. As a result, these variables are redundant.

```
address private constant deadAddress = address(0xdead);
```

### Recommendation

The team is advised to take these segments into consideration and rewrite them so the runtime will be more performant. That way it will improve the efficiency and performance of the source code and reduce the cost of executing it.

## L04 - Conformance to Solidity Naming Conventions

<b>Criticality</b>	Minor / Informative
<b>Location</b>	SpaceGrok.sol#L382,404,442,506,534,542,547,671,672,685,686
<b>Status</b>	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 MINIMUM_LIQUIDITY() external pure returns (uint256);
function WETH() external pure returns (address);
address private constant deadAddress = address(0xdead)
mapping(address => bool) private AMM

event marketingWalletUpdated(
    ...
);

event devWalletUpdated(
    address indexed newWallet,
    address indexed oldDevWallet
);
uint256 _marketingFee

...
```

## 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>.

## L05 - Unused State Variable

<b>Criticality</b>	Minor / Informative
<b>Location</b>	SpaceGrok.sol#L506
<b>Status</b>	Unresolved

### Description

An unused state variable is a state variable that is declared in the contract, but is never used in any of the contract's functions. This can happen if the state variable was originally intended to be used, but was later removed or never used.

Unused state variables can create clutter in the contract and make it more difficult to understand and maintain. They can also increase the size of the contract and the cost of deploying and interacting with it.

```
address private constant deadAddress = address(0xdead)
```

### Recommendation

To avoid creating unused state variables, it's important to carefully consider the state variables that are needed for the contract's functionality, and to remove any that are no longer needed. This can help improve the clarity and efficiency of the contract.

## L07 - Missing Events Arithmetic

<b>Criticality</b>	Minor / Informative
<b>Location</b>	SpaceGrok.sol#L646,655
<b>Status</b>	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.

```
maxTx = newNum * (10**18)
maxWallet = newNum * (10**18)
```

### 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	SpaceGrok.sol#L195,822
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 _burn(address account, uint256 amount) internal virtual {
    require(account != address(0), "ERC20: burn from the zero address.");

    _beforeTokenTransfer(account, address(0), amount);

    uint256 accountBalance = _balances[account];
    ...
}
_totalSupply -= amount;

emit Transfer(account, address(0), amount);

_afterTokenTransfer(account, address(0), amount);
}
```

## 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.

## L13 - Divide before Multiply Operation

<b>Criticality</b>	Minor / Informative
<b>Location</b>	SpaceGrok.sol#L801,802,803,807,808,809
<b>Status</b>	Unresolved

### Description

It is important to be aware of the order of operations when performing arithmetic calculations. This is especially important when working with large numbers, as the order of operations can affect the final result of the calculation. Performing divisions before multiplications may cause loss of precision.

```
fees = amount.mul(sellTotalFees).div(100)
tokensForDev += (fees * sellDevFee) / sellTotalFees
```

### Recommendation

To avoid this issue, it is recommended to carefully consider the order of operations when performing arithmetic calculations in Solidity. It's generally a good idea to use parentheses to specify the order of operations. The basic rule is that the multiplications should be prior to the divisions.

## L15 - Local Scope Variable Shadowing

Criticality	Minor / Informative
Location	SpaceGrok.sol#L573
Status	Unresolved

### Description

Local scope variable shadowing occurs when a local variable with the same name as a variable in an outer scope is declared within a function or code block. When this happens, the local variable "shadows" the outer variable, meaning that it takes precedence over the outer variable within the scope in which it is declared.

```
uint256 totalSupply = 1_000_000_000 * 1e18
```

### Recommendation

It's important to be aware of shadowing when working with local variables, as it can lead to confusion and unintended consequences if not used correctly. It's generally a good idea to choose unique names for local variables to avoid shadowing outer variables and causing confusion.

## L16 - Validate Variable Setters

<b>Criticality</b>	Minor / Informative
<b>Location</b>	SpaceGrok.sol#L708,713
<b>Status</b>	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.

```
marketingWallet = newMarketingWallet  
devWallet = newWallet
```

### 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.

## L20 - Succeeded Transfer Check

<b>Criticality</b>	Minor / Informative
<b>Location</b>	SpaceGrok.sol#L731
<b>Status</b>	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.

```
token.transfer(msg.sender, amountToRecover)
```

### 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
<b>Context</b>	Implementation			
	_msgSender	Internal		
	_msgData	Internal		
<b>Ownable</b>	Implementation	Context		
		Public	✓	-
	owner	Public		-
	renounceOwnership	Public	✓	onlyOwner
	transferOwnership	Public	✓	onlyOwner
	_transferOwnership	Internal	✓	
<b>IERC20</b>	Interface			
	totalSupply	External		-
	balanceOf	External		-
	transfer	External	✓	-
	allowance	External		-
	approve	External	✓	-
	transferFrom	External	✓	-

<b>IERC20Metadata</b>	Interface	IERC20		
	name	External		-
	symbol	External		-
	decimals	External		-
<b>ERC20</b>	Implementation	Context, IERC20, IERC20Meta data		
		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	✓	



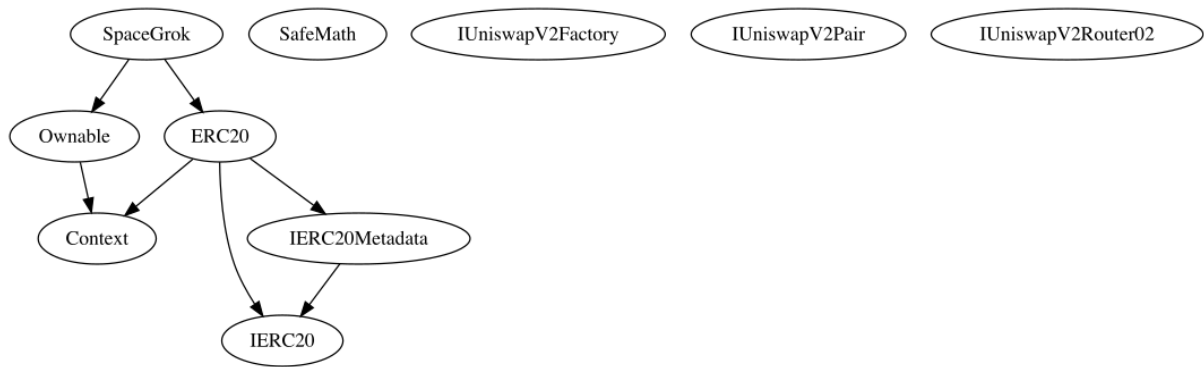
	_approve	Internal	✓	
	_beforeTokenTransfer	Internal	✓	
	_afterTokenTransfer	Internal	✓	
<b>SafeMath</b>	Library			
	tryAdd	Internal		
	trySub	Internal		
	tryMul	Internal		
	tryDiv	Internal		
	tryMod	Internal		
	add	Internal		
	sub	Internal		
	mul	Internal		
	div	Internal		
	mod	Internal		
	sub	Internal		
	div	Internal		
	mod	Internal		
<b>IUniswapV2Factory</b>	Interface			
	feeTo	External		-
	feeToSetter	External		-
	getPair	External		-

	allPairs	External		-
	allPairsLength	External		-
	createPair	External	✓	-
	setFeeTo	External	✓	-
	setFeeToSetter	External	✓	-
<b>IUniswapV2Pair</b>	Interface			
	name	External		-
	symbol	External		-
	decimals	External		-
	totalSupply	External		-
	balanceOf	External		-
	allowance	External		-
	approve	External	✓	-
	transfer	External	✓	-
	transferFrom	External	✓	-
	DOMAIN_SEPARATOR	External		-
	nonces	External		-
	MINIMUM_LIQUIDITY	External		-
	factory	External		-
	token0	External		-
	token1	External		-
	getReserves	External		-

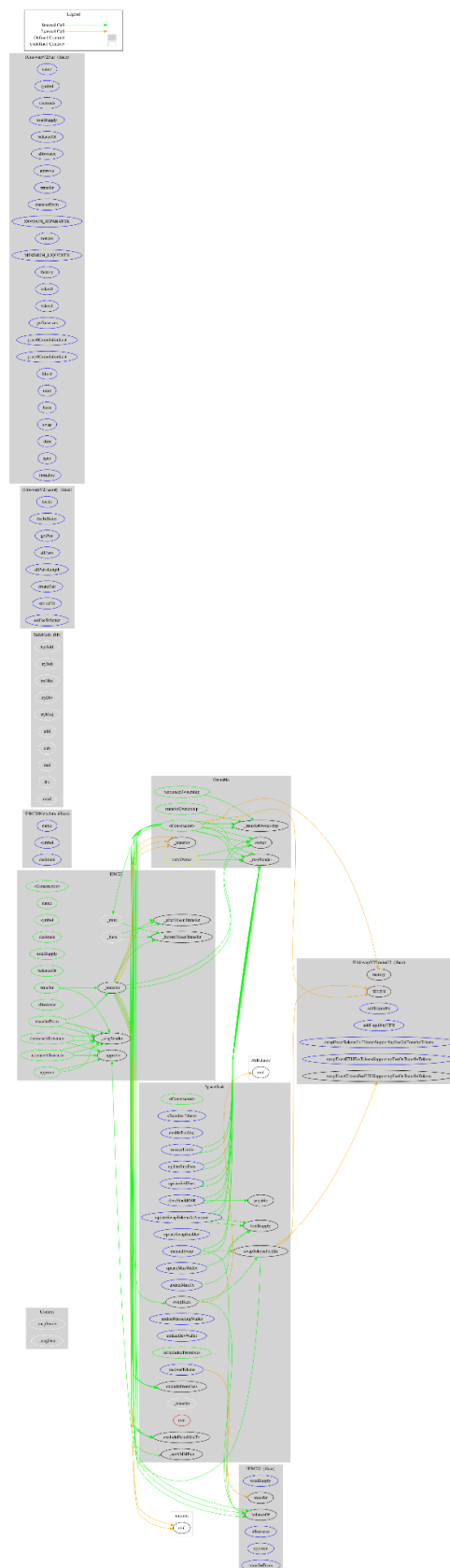
	price0CumulativeLast	External		-
	price1CumulativeLast	External		-
	kLast	External		-
	mint	External	✓	-
	burn	External	✓	-
	swap	External	✓	-
	skim	External	✓	-
	sync	External	✓	-
	initialize	External	✓	-
<b>IUniswapV2Router02</b>	Interface			
	factory	External		-
	WETH	External		-
	addLiquidity	External	✓	-
	addLiquidityETH	External	Payable	-
	swapExactTokensForTokensSupportingFeeOnTransferTokens	External	✓	-
	swapExactETHForTokensSupportingFeeOnTransferTokens	External	Payable	-
	swapExactTokensForETHSupportingFeeOnTransferTokens	External	✓	-
<b>SpaceGrok</b>	Implementation	ERC20, Ownable		
		Public	✓	ERC20
		External	Payable	-

	enableTrading	External	✓	onlyOwner
	removeLimits	External	✓	-
	updateSwapTokensAtAmount	External	✓	-
	updateMaxTx	External	✓	onlyOwner
	updateMaxWallet	External	✓	onlyOwner
	excludeFromMaxTx	Public	✓	onlyOwner
	updateSwapEnabled	External	✓	onlyOwner
	updateBuyFees	External	✓	-
	updateSellFees	External	✓	-
	excludeFromFees	Public	✓	onlyOwner
	_setAMMPair	Private	✓	
	updateMarketingWallet	External	✓	onlyOwner
	updateDevWallet	External	✓	onlyOwner
	isExcludedFromFees	Public		-
	clearStuckBNB	External	✓	-
	recoverTokens	External	✓	onlyOwner
	_transfer	Internal	✓	
	min	Private		
	manualSwap	External	✓	-
	swapTokensForEth	Private	✓	
	swapBack	Private	✓	

## Inheritance Graph



## Flow Graph



## Summary

Space Grok 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. A multi-wallet signing pattern will provide security against potential hacks. There is also a limit of max 5% buy and sell 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.

Cyberscope is one of the leading smart contract audit firms in the crypto space and has built a high-profile network of clients and partners.



**The Cyberscope team**

<https://www.cyberscope.io>