

Galaxy 2021

Galaxy 2021 Test/Audit/Parameters

00:01 - Lamps

XX:XX - Displays

00:03 - Solenoids

00:04 - Switches

00:05 - Sound

01 - Award Score Level 1

02 - Award Score Level 2

03 - Award Score Level 3

04 - High Score to Date

05 - Current Credits

06 - Total plays (Audit)

07 - Total replays (Audit)

08 - Total times high score beaten (Audit)

09 - Chute #2 coins (Audit)

10 - Chute #1 coins (Audit)

11 - Chute #3 coins (Audit)

12 - Free play off/on (0, 1)

13 - Ball Save Num Seconds (0, 6, 11, 16, 21)

14 - Sound Effects & Soundtrack Selector (0, 1, 2, 3, 4)

15 - Music Volume (1-10)

16 - Sound Effects Volume (1-10)

17 - Callouts Volume (1-10)

18 - Tournament Scoring (0-no, 1-yes)

19 - Tilt Warning (0, 1, 2)

20 - Award Score Override (0 - 7)

21 - Balls per game Override (3, 5)

22 - Scrolling Scores (0-no, 1-yes)

23 - Extra Ball Award (0 - 100,000) [only used for Tournament Scoring]

24 - Special Award (0 - 100,000) [only used for Tournament Scoring]

25 - Dim Level (2=50%, 3=33%)

26 - Rank to light Extra Ball (1-10, 10 disables)

27 - Rank to light Special (1-10, 10 disables)

28 - Rank to light Sun Mission (1-10, 10 disables)

**CHECK ALL VALUES YOUR
FIRST RUN -
THERE ARE NO DEFAULTS!**

**Activating the Slam Switch at any
time will reboot into Attract Mode.**

Lamps

Credits Display: **00** / Ball in Play Display: **01**

When first entered, all lamps will flash at 2Hz.

Pressing the Credit/Reset button will change the Player 1 score to 00 and the first lamp will flash. Repeated pressing of Credit/Reset button will cycle through all lamps (00-59) and then loop back around to 99, which will flash all lamps.

Displays

Credits Display: **XX** / Ball in Play Display: **XX**

When this mode is entered, all displays will cycle through the digits (1-9), changing at 4Hz. Pressing the Credit/Reset button will move through the digits one at a time so they can be tested individually.

Solenoids

Credits Display: **00** / Ball in Play Display: **03**

When this mode is entered, the solenoids (0-14) will be energized one at a time and the solenoid number will be displayed in the Player 1 score box. Each solenoid will be energized for $3/120^{\text{ths}}$ of a second.

Pressing the Credit/Reset button will toggle the automatic advance of the solenoid number to energize the same solenoid multiple times in a row.

Switches

Credits Display: **00** / Ball in Play Display: **04**

When this mode is entered, the ID of the first closed switch will be shown in Player 1 score box. Further closed switches will be displayed in Player 2, 3, and 4 boxes. Displays will be blank if there are no closed switches to show.

Sound

Credits Display: **00** / Ball in Play Display: **05**

This mode tests the sound features (playing a different sound every second).

Award Score Levels

Credits Display: **01, 02, 03**

The game keeps three Award Score Levels. They are set using the Self Test switch (modes 1, 2, and 3). If an Award Score is set to zero, there is no award given. Otherwise, the award is controlled by the Award Score Override (Self Test mode 17). The current Award Score (1, 2, or 3) is shown in the Player 1 score box.

During game play, when an Award Score Level is crossed, the player receives the award (extra ball or credit). For tournament scoring mode (when available), the Award Score Levels will be ignored.

In these three setting modes (1, 2, and 3), the scores are changed with the Credit/Reset button. Pressing the button once increases the score by 1,000 points. Pressing and holding the Credit/Reset button will gradually increase the score. Double-clicking the Credit/Reset button will return the given score to zero.

The Award Score Override (Self Test mode 17) can be set to 0-7.

High Score to Date

Credits Display: **04**

When a player's score exceeds the High Score to Date, the new High Score is recorded and shown during the Attract Mode. The game will award 3 Credits when a high score is reached.

In this mode, the score can be changed with the Credit/Reset button. Pressing the button once increases the score by 1,000 points. Pressing and holding the Credit/Reset button will gradually increase the score. Double-clicking the Credit/Reset button will return the score to zero.

Credits

Credits Display: **05**

This mode allows the operator to see/change the number of credits currently on the machine. The number of credits will appear in the Player 1 score box.

Pressing the Credit/Reset button will increase the number of credits up to 20, and then cycle back around to 0.

Audits

Credits Display: **06, 07, 08, 09, 10, 11**

The audit features allow the operator to inspect/reset usage values of the machine.

Double-clicking the Credit/Reset button will reset any of the audit values back to zero.

06 - Total plays - total number of games that have been played since this value was reset.

07 - Total replays - total number of credits awarded since this value was reset.

08 - Total times high score was beaten - total number of times the high score has been beaten since this value was reset.

09 - Chute #2 coins

10 - Chute #1 coins

11 - Chute #3 coins

Free Play

Credits Display: **12**

Player 1 score display will show a “0” meaning Free Play is OFF, or a “1” meaning Free Play is ON. The 0 and 1 are toggled by pressing the Credit/Reset button. As soon as the value is toggled, it is written to memory and the machine can be reset into Free Play mode.

If off, the machine will require a positive credit count in order to start a game. Credits can be added through the coin chutes or through setting mode 5.

If Free Play is on, hitting the Credit/Reset button will start a game (if in Attract mode), add a player (if ball 1 is in play), or restart the game if ball 2 or more is in play.

Ball Save

Credits Display: **13**

The Ball Save timer is controlled through this mode. The Player 1 score display will read 0, 6, 16, or 21. Why those values? I don’t know. Write your own software if you want values that make sense to you. Or, change this software—it’s easy.

Pressing the Credit/Reset button cycles through the different values. Setting the Ball Save to “0” turns off the Ball Save feature.

Sound Effect and Sound Track Selector

Credits Display: **14**

This value controls the amount of sound effects played in the game. Setting to “0” turns the sound effects off. A “1” plays sound effects only. “2” play sound effects and voice callouts. “3” turns on sound effects, callouts, and sound track #1. “4” turns on sound effects, callouts, and sound track #2.

The current level is displayed in the Player 1 score box.

The Credit/Reset button cycles between “0”, “1”, “2”, “3”, and “4”.

Music Volume

Credits Display: **15**

This value controls the volume of the background music played through the Wav Trigger. Setting this to “1” will play at the lowest volume compared to the sound effects, and “10” will be loudest. To turn off music completely, set the Sound Effects and Sound Track Setting (setting 14) to less than “3”.

The Credit/Reset button cycles through “1” to “10”.

Sound Effects Volume

Credits Display: **16**

This value controls the volume of the sound effects played through the Wav Trigger. Setting this to “1” will play at the lowest volume compared to the other sounds, and “10” will be loudest. To turn off sound effects completely, set the Sound Effects and Sound Track Setting (setting 14) to “0”.

The Credit/Reset button cycles through “1” to “10”.

Callouts Volume

Credits Display: **17**

This value controls the volume of the voice callouts played through the Wav Trigger. Setting this to “1” will play at the lowest volume compared to the other sounds, and “10” will be loudest. To turn off callouts completely, set the Sound Effects and Sound Track Setting (setting 14) to less than “2”.

The Credit/Reset button cycles through “1” to “10”.

Tournament Scoring

Credits Display: **18**

A value of “0” indicates that Tournament Scoring is off. With a value of “1”, Extra Balls and Credits will not be awarded. Instead, the player will get a point bonus (set by parameters 20 & 21). In Tournament Scoring, Award Scores will be deactivated. Pressing the Credit/Reset button toggles between these values.

The Credit/Reset button changes the value.

Tilt Warning

Credits Display: **19**

This parameter can be set to 0, 1, or 2, and it represents the number of warnings the player gets before the machine Tilts. At “0”, the machine will tilt at the first hard nudge. A value of “2” will warn the player twice and tilt on the third hit. A tilt warning consists of a sound.

The Credit/Reset button cycles between “0”, “1”, and “2”.

Award Score Override

Credits Display: **20**

This setting lets the operator set extra ball or credit for each of the 3 award scores (set in modes 1, 2, and 3) individually.

The Credit/Reset button cycles through the values 0-7 and then jumps to 99. The award is based on the table below.

Award Score Override	Score 1	Score 2	Score 3
0	Extra ball	Extra ball	Extra ball
1	Credit	Extra ball	Extra ball
2	Extra ball	Credit	Extra ball
3	Credit	Credit	Extra ball
4	Extra ball	Extra ball	Credit
5	Credit	Extra ball	Credit
6	Extra ball	Credit	Credit
7	Credit	Credit	Credit

The Credit/Reset button changes the value.

Balls Per Game Override

Credits Display: **21**

Balls per game (3 or 5).

The Credit/Reset button changes the value.

Scrolling Scores

Credits Display: **22**

When the player's score exceeds 999,999, the scores will either wrap around to 0 or they will begin to scroll. A setting of "0" in this parameter will make the scores wrap to 0. A setting of "1" will allow the scores to scroll through the 6-digit displays.

Pressing the Credit/Reset button will toggle this value.

Extra Ball Award

Credits Display: **23**

The Extra Ball Award is only relevant in Tournament Scoring mode. If Tournament Scoring is activated, collecting the Wow! Targets will give this award instead of Shoot Again.

In this mode, the score is changed with the Credit/Reset button. Pressing the button once increases the score by 1,000 points. Pressing and holding the Credit/Reset button will gradually increase the score. Double-clicking the Credit/Reset button will return the given score to zero.

Special Award

Credits Display: **24**

The Special Award is only relevant in Tournament Scoring mode. If Tournament Scoring is activated, collecting the Special Targets will give this award instead of a credit.

In this mode, the score is changed with the Credit/Reset button. Pressing the button once increases the score by 1,000 points. Pressing and holding the Credit/Reset button will gradually increase the score. Double-clicking the Credit/Reset button will return the given score to zero.

Dim Level

Credits Display: **25**

The Dim Level adjustment allows the operator to choose the duty cycle of “dim” lights. At a level of 2, a dim bulb will be lit 50% of the time. At a level of 3, a dim bulb will be lit 33% of the time. With some bulbs, a noticeable flash will be present at a duty cycle of 33%. With other bulbs, a 50% duty cycle will appear nearly the same as a fully-lit lamp. This adjustment should be re-checked on new

machines or if the bulbs are changed.

When in this mode, the bonus lamps will toggle between the dim value and the full-lit value (every second). This allows the operator to see the contrast between the two.

Pressing the Credit/Reset button will toggle the dim level between 2 & 3.

Rank for Extra Ball

Credits Display: **26**

As a player earns rank (shown in the 1s digit of the player score), the game can light an Extra Ball. By default, the Extra Ball is lit at Rank 3. This value can be anything from 1-10. Setting the value to 10 (an unachievable rank) will disable the Extra Ball from lighting on the playfield. In tournament mode, the Extra Ball will be a point award instead of a shoot again.

Pressing the Credit/Reset button cycles through the different values.

Rank for Special

Credits Display: **27**

As a player earns rank (shown in the 1s digit of the player score), the game can light a Special. By default, the Special is lit at Rank 5. This value can be anything from 1-10. Setting the value to 10 (an unachievable rank) will disable the Special from lighting on the playfield. In tournament mode, the Special will be a point award instead of a credit.

Pressing the Credit/Reset button cycles through the different values.

Rank for Sun Mission

Credits Display: **28**

As a player earns rank (shown in the 1s digit of the player score), the game can start the Sun Mission. By default, the Sun Mission is qualified at Rank 7. This value can be anything from 1-10. Setting the value to 10 (an unachievable rank) will disable the Sun Mission from starting.

Pressing the Credit/Reset button cycles through the different values.

Side Quest Start

Credits Display: **29**

By default, a qualified Side Quest will be started when the ball lands in the saucer during Normal Play. This setting allows other switches to start a Side Quest (3 upper pop bumper hits, or Right “A” rollover). The following values control which methods start a Side Quest:

- 0 - Only the Saucer will start a Side Quest
- 1 - Hitting the Top Pop Bumper 3 times will start a Side Quest
- 2 - Rolling over the Right “A” start rollover will start a Side Quest
- 3 - Hitting the Top Pop 3 times OR rolling over the Right “A” starts a Side Quest

(The saucer always starts a Side Quest)

Pressing the Credit/Reset button cycles through the different values.

Galaxy Ball Save

Credits Display: **30**

This setting allows the operator to enable a Ball Save after the ball is kicked from the GALAXY turnaround. A setting of 0 disables the Ball Save. Settings 1-10 will activate the Ball Save for 1 to 10 seconds.

Pressing the Credit/Reset button cycles through the different values.

Save Mission Progress

Credits Display: **31**

This setting allows the player to retain mission progress between balls. A setting of 0 will reset mission progress at the end of a ball. A setting of 1 will cause missions to pick up where they left off when the player starts their next ball.

Pressing the Credit/Reset button cycles through the different values.

DIP Switches

DIP Switches

This game currently ignores the DIP switches.

Coin Chutes

Right now, any of the coin chute switches will add 1 credit. A sound is played when a credit is added.

This ignores the Credits/Coin DIP switches entirely.

Coin Lockout

If the number of credits is at the maximum value (40), then the coin lockout will be energized. Otherwise, it's not. The credits display will be off if the game is set to Free Play Mode.

Credit Reset

Pressing the Credit/Reset button in Attract Mode will start a 1-player game if the machine is in Free Play or there is at least 1 credit. (Pressing the button again during ball 1 will add a player.)

Skill Shot

At the start of each ball, there are two skill shots available:

Saucer Skill Shot

During the skill shot, the saucer's value is 10x the lit amount. The saucer's value starts at 20,000 and ranges briefly up to 10,000 every few seconds. If the ball lands in the saucer during the skill shot, the player will be awarded the amount corresponding with the lit value.

GALAXY Turnaround Skill Shot

If the player manages to get the ball to a flipper without hitting a major switch, the GALAXY Turnaround will be worth the amount lit on the bonus lamps. The 10k lamp is always lit for the skill shot, and the fluctuating value will be added for a total of between 12k and 42k.

During the skill shot period, the GI lamps are off. Hitting the top pop bumper or "A" rollover will not end the skill shot period. Any other switch will end the skill shot and move the game into normal play.

Normal Play

During the course of normal play, Galaxy2021 has Missions and Side Quests in addition to the normal scoring activities.

Galaxy2021 has four side quests available during normal play. When one or more side quests have been qualified, they are started by landing the ball in the saucer. Once qualified, sides quests can be activated for up to 60 seconds. If the ball ends or a mission is started, the qualified quest(s) will be held until the next time the player is in normal play.

Pirate Encounter

To qualify a Pirate Encounter, each of the three Star Standup Targets (Black, Blue, and Yellow) has to be hit during normal play in a single ball.

Refueling Opportunity

During normal play, the game keeps a counter on the player's spins. Flipping the spinner 250 times will qualify a Refueling Opportunity.

Welcoming Passengers Aboard

Completing the GALAXY lamps (three top lanes, two in lanes, and "A" rollover) will qualify the side quest of Welcoming Passengers Aboard.

Collect Cargo

To qualify the Collect Cargo side quest, the player has to complete the drop targets 4 times during the course of a game.

Side quests can be stacked and started simultaneously. Each active Side Quest gives the player +1X playfield multiplier (2X, 3X, 4X, or 5X for stacking all 4 Side Quests).

If a Side Quest is in progress when a mission is started, the Side Quest timer will pause and the Side Quest (and associated playfield multiplier) will be in effect during the entire mission.

During Normal Play, landing the ball in the GALAXY turnaround in the upper left-hand corner of the playfield will start a mission. The mission is selected from the 8 planets based on the number of GALAXY lamps that are lit in the turnaround.

Once a mission is selected, the player must fuel the ship. The player displays will show how much fuel is needed. Each spin of the spinner will collect one unit of fuel. Once enough fuel has been collected for the mission, the drop targets will fall, leaving one target up. Hitting that target will launch the mission. Depending on the planet selected, the mission will have 1, 2, or 3 legs.

Mission	Fuel	Legs	End Shot	Feature Shot	Time
Mercury	40	1	Galaxy	Drop Targets	60
Venus	20	1	Top Pop	Lower Pops	60
Mars	20	2	Galaxy	Standups	75
Jupiter	32	2	Standup	Top Lanes	75
Saturn	40	3	Galaxy	Top Pop	90
Uranus	72	3	Galaxy	Sling Shots	90
Neptune	120	3	Top Pop	Lower Pops	90
Pluto	136	3	Standup	Spinner	90

Leg 1 = Increase Playfield Multiplier with Pop Bumpers (15 seconds)

Leg 2 = Cryo Sleep (play through or saucer to skip)

Leg 3 = Build Mission Bonus (60 seconds or End Shot)

Missions to Mercury and Venus will only have Leg 3 - building mission bonus. Hitting the End Shot at any time will finish the mission and award the player one level of rank. The rank of a player can be seen in the 1s digit of their score.

Mission to Mars and Jupiter have two legs — Legs 2 & 3. Those missions begin with a Cryo Sleep period. During Cryo Sleep, the feature shot awards more points, and the timer only runs when a switch has been hit in the last three seconds. The Cryo Sleep period requires the player to keep the ball in play to advance the timer.

The other four missions (Saturn, Uranus, Neptune, and Pluto) have all three legs

and begin with the opportunity to build a playfield multiplier with the Pop Bumpers. The current tally of pop bumper hits is shown in the player display. Collecting 10 pop bumper hits will result in 2x playfield. 20 will give 3x. The top pop bumper advances the tally by three.

Leg 2 (Cryo Sleep) can be terminated with the saucer.

Leg 3 (Mission Bonus) can be terminated with the “End Shot” of the mission. Once the End Shot is hit, or the mission timer runs out, the player will be awarded 1 rank and a bonus multiplier. Any playfield multipliers earned for the mission will end with the mission.

Achieving certain player rank goals (rank is shown in the 1s digit of the player score) will activate different features.

Rank 3 will activate the Extra Ball on Mid Lanes. In tournament mode the Extra Ball grants a point award.

Rank 5 will activate the Special on Out Lanes. In tournament mode the Special grants a point reward.

Rank 7 will start the Sun Mission.

(Rank award levels can be changed with coin-door settings)

If all 8 planet missions are completed, starting another mission will reset the Player Rank, allowing them to build up to the next Sun Mission.

When the player achieves a rank of 7 (this setting is controllable with a coin-door setting), the Sun Mission will be activated. The Sun Mission can be launched by either landing the ball in the Saucer or the GALAXY Turnaround. The Saucer start gives the player 100,000 points, and the GALAXY Turnaround start gives them 50,000.

After the ball is ejected (from the Saucer or the GALAXY Turnaround) the drop targets will cycle, showing one target a time. The mission jackpot begins at 10,000 points. Each drop target hit will add 25,000 to the mission jackpot. Hitting the GALAXY Turnaround again will award the player the current mission jackpot. Hitting the Saucer will give the player twice the current mission jackpot. Once awarded, the jackpot is reset to zero points and more drop targets need to be hit to build up the value again. The Sun Mission lasts 60 seconds and cannot be ended early.

Side Quest playfield multipliers do not alter the mission jackpots.

All of the sound for Galaxy2021 is produced with a Wav Trigger sound card. The card plays WAV files loaded onto a micro SD, so they're easy to replace or alter. Each file is preceded with a three digit number, an underscore, and then the name. For example, sound 001_BonusCount.wav is the sound played when the bonus is counted down.

Sound Effects

The sound effects are mostly contained in the range 001 - 100, with a couple of exceptions. The incrementing spinner sounds are stored from 200 to 250, and there are prompts for the different Self Test & Audit modes in the 100s.

Voice Prompts

This game uses Voice Prompts to guide the player through the game script. Voice Prompts differ from other sound effects because when they're played they will drop the background music to make them more audible. Because of this, when a voice prompt is loaded, the length of the prompt needs to be inserted into an array. These prompts live in the range of 500-599 in the file system. When a prompt is changed, the number of seconds should be altered in the array named "VoiceNotificationDurations".

Songs

Like Voice Prompts, the duration of each song has a timing entry in the array "MusicLengths". The array is ordered by [soundtrack][type of music][song]. If a song is updated, the appropriate timing array entry should be altered in "MusicLengths". If a song is added, the appropriate number in "MusicNumEntries" has to be changed, and then the duration needs to be added to "MusicLengths".

Songs - Soundtrack 1

700 - 709	Unstructured Play Background
725 - 749	Side Quest Music
750 - 774	Mission Music
775 - 789	Wizard Music
790-799	Looped Rally Music (no timing required)

Songs - Soundtrack 2

800 - 809	Unstructured Play Background
825 - 849	Side Quest Music
850 - 874	Mission Music
875 - 889	Wizard Music
890-899	Looped Rally Music (no timing required)