

Stellar Wars

2022

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.**

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.

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.

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.

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.

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

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

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.

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 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.

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

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.

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.

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”.

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”.

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”.

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”.

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.

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”.

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.

Credits Display: **21**

Balls per game (3 or 5).

The Credit/Reset button changes the value.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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

This game currently ignores the DIP switches.

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.

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.

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.)

Primary Skill Shot

At the start of each ball, one of the top lanes (1 - 2 - 3 - 4) will be lit for a skill shot. This skill shot ends as soon as any other switch is triggered, with the exception of the left spinner. Hitting the lit shot awards 10,000 on the first ball, 20,000 on the second ball, etc. This skill shot also awards a playfield multiplier for 15 seconds and increases the Bonus Multiplier by 1x.

Saucer Skill Shot

If the ball is locked in the saucer during the skill shot period, the player is awarded 50,000 points.

Normal Play

During the course of normal play, Stellar Wars has 7 goals (Win a Battle, Complete the Shield, Explore the 7 Neutral Zones, Visit the 5 Bases, Repel an Invasion, Finish the Combos, and Achieve Super Spinners). Finishing any 5 goals will allow the player to “Orbit the Enemy Planet” (wizard mode). The number of goals required to Orbit the Enemy Planet is configurable in the settings.

Win a Battle

Landing the ball in the saucer during normal play will award the lit value as well as start a battle. A battle will begin on any of the unlit S-T-E-L-L-A-R W-A-R-S letters. Once the ball is ejected, hitting the drop target or rollover associated with the battle letter will win the battle.

Landing the ball in the saucer again will add an enemy to the battle (on a different unlit S-T-E-L-L-A-R W-A-R-S letter).

With one enemy, the player has 20 seconds to complete the battle. For two enemies, the player has 120 seconds, and for three or more, they are allowed 240 seconds to hit all battle targets/rollovers.

If the player’s S-T-E-L-L-A-R W-A-R-S shield is complete, the battle will begin with the “Smart Bomb Engaged.” In this case, any S-T-E-L-L-A-R W-A-R-S target or rollover will win the battle.

The first enemy awards 25,000 for completion. The second is worth 35,000, etc.

Finishing a battle successfully counts towards the goal tally to Orbit the Enemy Planet.

Complete the Shield

Hitting all of the S-T-E-L-L-A-R W-A-R-S drop targets and rollovers completes this goal. Finishing the shield will award 50,000 points and increase the Bonus Multiplier by 1x. Completing the shield also counts towards the goal tally to Orbit the Enemy Planet.

Explore the 7 Neutral Zones

There are 7 switches behind rubber bumpers on the playfield. Finding and hitting all 7 will complete the goal to Explore the 7 Neutral Zones and will counts towards the goal tally to Orbit the Enemy Planet.

Visit the 5 Bases

Each pop bumper on the playfield is considered a base. Hitting all 5 pop bumpers in a single ball will complete the goal to Visit the 5 Bases and counts towards the goal tally to Orbit the Enemy Planet.

Repel an Invasion

When the top lanes (1-2-3-4) are clear, a lamp will move back and forth through the numbers. As the player hits other switches, the lamp will cycle faster and faster as long as no top lane is hit. After 25 seconds of play with no top lane occupied, an invasion will start.

A callout announces the lane of the invasion, and the lane lamp will flash. If the player fails to hit that top lane in 10 seconds, the invasion will spread down to one of the pop bumpers. Every 10 seconds, the invasion will spread farther down the playfield and the lamps will flash faster. To repel the invasion the player has to hit all lit features.

If the player fails to repel the invasion, the player's shield progress will be destroyed.

Fighting the invasion awards 1,000 points for every lit feature hit. Successfully repelling the invasion counts towards the goal tally to Orbit the Enemy Planet.

Finish the Combos

The four flipper in-lanes (W-A-R-S) start a combo shot. To complete a combo, the player has to hit a spinner, the captive ball, the bullseye target, or the opposite in-lane (W or S). The first combo completed awards the player 10,000 points. The second gives 20,000 points, etc. Finishing all 6 combos will award 75,000 points.

In addition, finishing 2 combos will hold the Bonus Multiplier to future balls. Finishing 4 combos will hold the Bonus to future balls. Finishing 4 (configurable to 4, 5, or 6) combos will also complete the combo goal, and counts towards the goal tally to Orbit the Enemy Planet.

Achieve Super Spinners

During the course of the game, hitting either spinner for a combined total of 250 spins will light super spinners. Super spinners award 1,000 points per spin. To accelerate the accumulation of spins, the player will receive 15 extra spins for a spinner combo, 3x spins during an invasion, and 2x spins during a battle. Spinner accelerators can be disabled in the options.

Finishing the spinner goal also counts towards the goal tally to Orbit the Enemy Planet.

Left Drop Target Bank

The left drop target bank awards the S and T letters. The value of each target is 1,000 points and +1 Bonus. Clearing the bank increases the Playfield Multiplier by 1x for 15 seconds. Additionally, clearing the bank will start a pop bumper frenzy for 15 seconds for the first clear, 20 seconds for the second, etc. During a pop bumper frenzy, the pop bumpers are worth 1,000 points.

Center Drop Target Bank

The center drop target bank awards the E-L-L-A letters. The value of each target is 1,000 points and +1 Bonus. Clearing the bank increases the Playfield Multiplier by 1x for 15 seconds.

Additionally, clearing the bank will increase the saucer value to 2k, 5k, 10k, and extra ball. If the game is set to tournament scoring the extra ball awards 25,000

points (adjustable).

After clearing the bank 4 times, a special will be lit on an out-lane. If the game is set to tournament scoring the special awards 100,000 points (adjustable).

Right Drop Target Bank

The right drop target bank awards the R letter. The value of each target is 1,000 points and +1 Bonus. Clearing the bank increases the Playfield Multiplier by 1x for 15 seconds.

Clearing the bank one time will light the captive ball to spot a S-T-E-L-L-A-R W-A-R-S letter. Clearing it a second time activates the lower pop bumpers for 1,000 points. A third time will start a spinner frenzy for 30 seconds.

Top Lanes

During normal play, completing the top lanes (1-2-3-4) will award 4,000 points the first time they're completed, 8,000 the second time, etc. Completing the top lanes will also increase the Playfield Multiplier for 30 seconds.

Orbit the Enemy Planet

Once 5 of the 7 goals (Win a Battle, Complete the Shield, Explore the 7 Neutral Zones, Visit the 5 Bases, Repel an Invasion, Finish the Combos, and Achieve Super Spinners) have been completed, the player will be prompted to park the ball in the saucer to orbit the enemy planet. If the saucer is hit within 45 seconds, the wizard mode will begin.

At the beginning of wizard mode the flippers are disabled and the ball is drained. After re-plunging, the player has 45 seconds (configurable) to build up as much bonus as possible. The wizard bonus is increased 10,000 for every S-T-E-L-L-A-R W-A-R-S target or rollover hit. The bonus is increased 5,000 per top lane, 100 per pop bumper, and 2,000 per spin.

To collect the wizard bonus, the player has to put the ball back in the saucer (gives 100% of bonus), hit the captive ball or bullseye (50% of bonus), or time will run out and the ball will drain after the flippers are disabled (10% of bonus).

To enter wizard mode again, the player must complete another 5 goals (after 7 goals are achieved, all goals are reset).

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)