SUPER SMASH SATS

ULTIMATE

A Space Warfare Module for Jaws of the Dragon
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Super Smash Sats Ultimate
Jaws of the Dragon - Space Module (d10's)[1]

Rules

Space warfare assets consist of a number of space attack package cards given to you.[2] Each attack package (kinetic, non-kinetic[3]) filled out with the target (and extra target info like the operations hex or selected unit) when played will be handed to the Control who will resolve it in the Detection step of Adjudication. Attack packages in space allow you to degrade the enemy's ability to target you and your forces.

The two types of Space Attack Packages

Once used, kinetic packages are gone, non-kinetic packages may be regenerated. Roll a d10. On a 1 or 2 the capability is lost. Otherwise, the card is given back to the team in d10 days.

Effects

Target[4]	Non-kinetic	Kinetic
ISR Satellites	-1 to ISR rolls in selected Air Sector[5]	Selected unit may not be detected this turn (except by other adjacent units).[6]
PNT (e.g. GPS) Satellites	Units in selected Operations hex move 1 less.[7]	
[Selected Country's] Comms/C2 Satellites*[8]	50% chance that each unit of that nationality may not coordinate fires this turn. *Optional: Unit has 10% chance to not receive new orders.*	Units of that nationality may not coordinate fires this turn. *Optional: Unit has 50% chance to not receive new orders.*

* For speed if required, both Non-kinetic and Kinetic attacks can use the Kinetic effect.

Deconflicted! cards

Targeting space assets without taking out satellites that are part of an adversary's nuclear network is difficult. To do so safely, for each attack package, you must acquire a Deconflicted! card from them. Alternatively, you may launch an attack package without deconfliction. If you do so, for each attack package there is a 10% chance of starting a strategic nuclear exchange on accident.[9]

A Deconfliction card

Optional Rigid Turn Sequence Change
If using the optional rigid turn sequence, change the sequence to the following:
Space ▶ Detection/Tracking ▶ Cyber/SOF ▶ Salvo Missile Fire ▶ Air ▶ Sea ▶ Land

Optional Rule: Debris
Each time a kinetic attack is used, it leaves debris. Place a debris marker on that type of satellite. For each marker there is a 1% chance that a random country's satellites of that type suffer the effects of kinetic attack each turn.[10]

Initial Setup[11]

Country	Base Inventory Starting #'s		Stalled Invasion Starting #'s	
	Non-kinetic	Kinetic	Non-kinetic	Kinetic
Australia	3	2	2	–
Canada	1	1	1	–
China	23	20	11	3
France	2	3	1	–
Japan	2	3	1	–
Philippines	2	1	1	–
Taiwan	2	1	1	–
UK	1	1	1	–
US	21	14	10	2

Appendix 1 - Anti-Satellite Capabilities

Card Generation Tables[12]

Category Weight	R&D	Testing	Operation	Used in Conflict?
# of Cards for Capability in Area	1 card	2 cards	3 cards	4 cards

Amount Multiplier (in #'s)	None	Some	Significant
#	0	1	2

Category	LEO Direct Ascent	MEO/GEO Direct Ascent	LEO Co-Orbital	MEO/GEO Co-Orbital	Directed Energy	Electronic Warfare
Kinetic/Non-Kinetic	Kinetic	Kinetic	Kinetic	Kinetic	Kinetic and Non-kinetic (50-50 split)	Non-kinetic

Cyber[13] and Kinetic[14] Options		
Small Country	Large Country	In Theater Country[15]
+1 Non-kinetic +1 Kinetic	+2 Non-kinetic +2 Kinetic	+1 Non-kinetic
Australia Canada France Japan Philippines Taiwan UK	China US	Australia China Japan Philippines Taiwan

SM-3 Block IIA Countries get +2 kinetic attacks (US, Japan)

Underlying Data[16]
Note that none of the following accounts for cyber anti-space capabilities, or ASAT capabilities of multi-purpose ground-based missiles like the SM-3, or the use of other satellites in orbit as co-orbital ASATS.

United States	R&D	Testing	Operation	Used in Conflict?
LEO Direct Ascent	Significant	Some	?	None
MEO/GEO Direct Ascent	–	–	–	None
LEO Co-Orbital	Some	?	–	None
MEO/GEO Co-Orbital	Some	?	–	None
Directed Energy	Significant	Some	?	None
Electronic Warfare	Significant	Significant	Significant	Significant
SSA (Best in the World)	Significant	Significant	Significant	Significant

Further Capabilities:
- Globally deployed uplink jamming for GEO communication satellites

- Local GNSS denial/spoof for civilian GNSS
- Likely ability for GNSS degrade/denial of military targets
- Can likely dazzle, possibly blind satellites
- SM-3's + GBMD can target LEO satellites

Australia	R&D	Testing	Operation	Used in Conflict?
LEO Direct Ascent	–	–	–	None
MEO/GEO Direct Ascent	–	–	–	None
LEO Co-Orbital	–	–	–	None
MEO/GEO Co-Orbital	–	–	–	None
Directed Energy	Some	–	–	None
Electronic Warfare	Some	–	–	–
SSA	Some	Some	Some	?

United Kingdom	R&D	Testing	Operation	Used in Conflict?
LEO Direct Ascent	–	–	–	None
MEO/GEO Direct Ascent	–	–	–	None
LEO Co-Orbital	–	–	–	None
MEO/GEO Co-Orbital	–	–	–	None
Directed Energy	–	–	–	None
Electronic Warfare	–	–	–	–
SSA	Some	Some	Some	?

France	R&D	Testing	Operation	Used in Conflict?
LEO Direct Ascent	–	–	–	None
MEO/GEO Direct Ascent	–	–	–	None
LEO Co-Orbital	–	–	–	None
MEO/GEO Co-Orbital	Some	–	–	None
Directed Energy	Some	?	?	None
Electronic Warfare	?*	?	?	?
SSA	Some	Some	Some	?

*Some as of Global Counterspace Capabilities 2022 Report

Japan	R&D	Testing	Operation	Used in Conflict?
LEO Direct Ascent	?	–	–	None
MEO/GEO Direct Ascent	–	–	–	None
LEO Co-Orbital	–	–	–	None
MEO/GEO Co-Orbital	–	–	–	None
Directed Energy	?	–	–	None
Electronic Warfare	?	–	–	–
SSA	Some	Some	Some	–

Further Capabilities:
- SM-3's can target LEO satellites

South Korea	R&D	Testing	Operation	Used in Conflict?
LEO Direct Ascent	–	–	–	None
MEO/GEO Direct Ascent	–	–	–	None
LEO Co-Orbital	–	–	–	None
MEO/GEO Co-Orbital	–	–	–	None
Directed Energy	?	–	–	None
Electronic Warfare	?	–	–	–
SSA	Some	Some	?	?

India In Support	R&D	Testing	Operation	Used in Conflict?
Electronic Warfare	Some	Some	?	?

SSA	Some	Some	?	?

China	R&D	Testing	Operation	Used in Conflict?
LEO Direct Ascent	Significant	Significant	Significant	None
MEO/GEO Direct Ascent	Some	Some	–	None
LEO Co-Orbital	Some	?	–	None
MEO/GEO Co-Orbital	Some	–	–	None
Directed Energy	Significant	Some	–	None
Electronic Warfare	Significant	Significant	Significant	Some
SSA	Significant	Significant	Significant	?

Further Capabilities:
- Likely strong EW for GNSS and satellite communications
- Limited SSA capabilities not based in mainland China, especially during wartime
- China and Russia's GPS back each other up[17]

North Korea	R&D	Testing	Operation	Used in Conflict?
LEO Direct Ascent	–	–	–	None
MEO/GEO Direct Ascent	–	–	–	None
LEO Co-Orbital	–	–	–	None
MEO/GEO Co-Orbital	–	–	–	None
Directed Energy	–	–	–	None
Electronic Warfare	Significant	Some	Some	?
SSA	?	?	?	–

Russia In Support	R&D	Testing	Operation	Used in Conflict?
Electronic Warfare	Significant	Significant	Significant	?
SSA (2nd Best in World)	Significant	Significant	Significant	Significant

Endnotes

[1] The author would like to thank Sophia Chang for her insight and help with these rules. These rules are generally informed by the following:

- *The Physics of Space War, How Orbital Dynamics Constrain Space-to-Space Engagements*, Dr. Rebecca Reesman and James R. Wilson, October 2020, Center for Space Policy and Strategy, https://csps.aerospace.org/sites/default/files/2021-08/Reesman_PhysicsWarSpace_20201001.pdf
- *Space Threat Assessment 2023*, April 23 2023, CSIS https://www.csis.org/analysis/space-threat-assessment-2023
- Global Counterspace Capabilities: An Open Source Assessment https://swfound.org/media/207567/swf_global_counterspace_capabilities_2023_v2.pdf
- A discussion with the former provider of Air Force space wargames
- Select episodes of RUSI's *War in Space* podcast
- The *Operational Wargaming System* by Tim Barrack

[2] Satellites are functionally modeled in groups that do specific things (e.g. support a specific area's communications, ISR for a specific area). Satellites are assumed to be highly redundant for ease in running the game (e.g. new LEO satellites are easy to launch and there are commercial near-equivalents for many LEO military satellites, though this is less true for satellites in MEO, GEO, and HEO). Thus an attack represents a number of assets being used to create a period of time where the effect occurs (as opposed to wiping out those satellites in that orbit forever, it is assumed they are regenerated or covered by other capabilities). Note that satellites here include both military and commercial satellites.

[3] Kinetic means that the selected satellites or space-based intelligence system (ground stations, intelligence processing locations, etc.) are taken out by kinetic action e.g. blowing things up. Non-kinetic means the use of actions like cyber, electronic warfare, jamming, or dazzling (burning out satellite optics with a laser) to degrade or destroy the space-based intelligence system.

[4] The splitting up of ISR, PNT, and Comms (C2) is as these are the three main uses of satellites for warfare. If you want someone more authoritative than me saying this, see RUSI War in Space Podcast, Ep. 40, UK Space Command, ~16:00, for Air Vice Marshal Paul Godfrey, Commander of UK Space Command saying this exactly.

[5] This represents selective denial of satellites and broad spectrum jamming and other abilities to degrade capabilities in an area.

[6] This represents the selective destruction of satellites to allow a unit to maneuver undetected.

[7] This represents the slower movement of troops and units when the denial or degradation of PNT systems forces them onto less precise systems.

[8] Assessing the effect of targeting C2 satellites is difficult. The following pieces inform my opinion:

- On the Viasat hack at the start of the 2022 invasion of Ukraine by Russia:
  - *Exclusive: U.S. spy agency probes sabotage of satellite internet during Russian invasion, sources say,* James Pearson, Raphael Satter, Christopher Bing and Joel Schectman, March 11, 2022 https://www.reuters.com/world/europe/exclusive-us-spy-agency-probes-sabotage-satellite-internet-during-russian-2022-03-11/
  - *Battle for Kyiv: Ukrainian valor, Russian blunders combined to save the capital,* by Paul Sonne, Isabelle Khurshudyan, Serhiy Morgunov and Kostiantyn Khudov, Aug. 24 2023, https://www.washingtonpost.com/national-security/interactive/2022/kyiv-battle-ukraine-survival/, "the Russians completely jammed the Ukrainians' communications and satellite networks, leaving Khoda and others without a link to front-line soldiers. Ukrainian commanders moved around to their troops' positions to communicate and issue orders. "Military communications were completely paralyzed," Khoda said, noting that his forces also drew on the local population."
  - *Viasat Hack "Did Not" Have Huge Impact on Ukrainian Military Communications, Official Says,* Kim Zetter, September 26, 2022 https://www.zetter-zeroday.com/p/viasat-hack-did-not-have-huge-impact
  - *The Satellite Hack Everyone Is Finally Talking About*, by Katrina Manson, March 1, 2023, https://www.bloomberg.com/features/2023-russia-viasat-hack-ukraine/

[9] 10% may be low or high here (and the chance may be higher with the first few attacks as opposed to later where the risk diminishes as people are more used to attacks on space assets), and is partly picked to continue using d10's throughout the space rules, so change the % as you desire. If this is being run as a facilitated or double blind game, it is best not to inform the players as to the exact risk, only that there is one.

[10] *The Physics of Space War, How Orbital Dynamics Constrain Space-to-Space Engagements*, Dr. Rebecca Reesman and James R. Wilson, October 2020, Center for Space Policy and Strategy, https://csps.aerospace.org/sites/default/files/2021-08/Reesman_PhysicsWarSpace_20201001.pdf, pg. 18

[11] See Appendix 1 - Anti-Satellite Capabilities for how these numbers are generated. Stalled Invasion is 20% of kinetic packages starting #'s and 50% of non-kinetic packages (this is a guess as to the number of packages and is not based on any data as I have no way to estimate how much would remain).

[12] The following tables are used to generate how many cards people get for a blockade scenario from the following data. These numbers are not based on any operational analysis as this area is highly classified. Tweak the numbers as you wish until you feel they are correct.

[13] As the Global Counterspace Capabilities does not include cyber, I add it in as an extra card bonus here (though in the game all the packages are generic, and could include cyber). This is also to ensure that everyone has at least one card in the space domain. For some pieces on cyber use against satellites see:
- https://www.space.com/13423-hackers-government-satellites.html
- https://www.space.com/satellite-hacking-hack-a-sat-competition-winners
- https://hackasat.com/

[14] Generic kinetic options available to all would involve attacks on ground stations and other terrestrial sites by special forces or long range missiles, as well as the adage that any satellite can be a kinetic ASAT once (provided it has the requisite delta-v available).

[15] This represents a home field advantage of only really having to focus on this theater and thus having more resources to set up in advance for such a contingency.

[16] Unless otherwise noted the following information comes from Global Counterspace Capabilities: An Open Source Assessment https://swfound.org/media/207567/swf_global_counterspace_capabilities_2023_v2.pdf (2023)

[17] https://www.airforcemag.com/space-force-can-only-mitigate-china-russia-space-cooperation/ (May 2022)
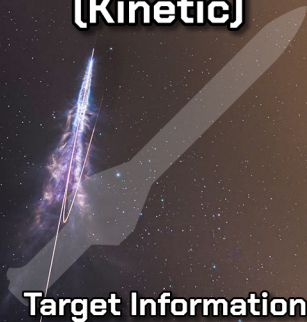
Space Attack Package
(Kinetic)

Target Information

Space Attack Package
(Kinetic)

Target Information

Space Attack Package
(Kinetic)

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