

Analytical Study on The Legality of Use of Sonic Boom as a “Psywar” Tool Under International and Humanitarian Law

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Abstract

The topic of sonic warfare and its legality under international and humanitarian law is critically relevant in modern conflicts and their evolving nature. Sonic weapons comprise a growing type of non-lethal weaponry that overlays the limits of recognized legal norms and ethical considerations and employs sound waves to harm, disable, or impede individuals. This article aims to investigate the complex legal frameworks governing the use of force and observe how sonic warfare reconciles with these standards, questioning the legality of the use of sonic booms as a tool of terror in psywar. To the same end, this research will inspect international treaties, customary law, and general principles of international law to elucidate the legal holes and uncertainties surrounding this controversial subject, taking the case of Lebanon as an example. The literature on the topic demonstrates that while sonic booms have no direct physical effect, they produce deep psychological repercussions, creating fear and terror commemorating the pervasive menace of military aggression. This twofold perspective of airspace sovereignty and psychological warfare through sonic booms denotes a give-and-take, intricate connection of power, law, and humanitarian considerations, requiring a refined, discerning, and solid international inspection. This study is normative-empirical research based on legal principles and facts and employs a descriptive-analytical method.

The findings indicate that International Humanitarian Law (IHL) does not explicitly regulate the use of sonic boom as a tool of terror in international armed conflicts, thus contributing to the discourse on the humanitarian implications of sonic weapons, advocating for clear legal guidelines to prevent their misuse and ensure compliance with IHL principles.

Keywords: Psywar; Airspace sovereignty; Sonic warfare; Territorial integrity; Tool of terror; Lebanon; Israel; Qatar

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مشروعية استخدام جدار الصوت كأداة للحرب النفسية: دراسة في إطار القانون الدولي العام والإنساني

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ملخص

لل قانون الدولي والإنساني مسؤولية في مناقشة شرعية «الحرب الصوتية» نظرًا لدوره الحاسم في النزاعات الحديثة وتطورها الطبيعي. قد تكون الأسلحة الصوتية غير فتاكة، إلا أنها تتجاوزت المعايير القانونية والاعتبارات الأخلاقية المعترف بها، حيث ينتج عن الموجات الصوتية الأذى أو التعطيل وحتى إعاقة الأشخاص المستهدفين.

يهدف هذا البحث إلى التحقيق في الأطر القانونية المعقدة التي تحكم استخدام القوة وسبل التدقيق في كيفية خرق هذه المعايير. فيتناول المعاهدات الدولية والقوانين العرفية ومبادئ القانون الدولي العام، موضحة الثغرات القانونية والشكوك المحيطة بهذا الموضوع المثير للجدل، من خلال اعتماد نموذج لبنان كمسرح لهذه المواجهات مع الأخذ على سبيل المثال حالة لبنان مع تقييم انطباق القانون الدولي الإنساني على استخدام الانفجارات الصوتية كأداة للإرهاب ضد المدنيين في الحرب النفسية.

وإن كانت التقارير والأدبيات تجمع على أن الانفجارات الصوتية، وإن لم يكن لها تأثير مادي مباشر، إلا أنها تسبب تداعيات نفسية عميقة كالخوف والرعب خاصة مع التهديد الدائم بالعدوان العسكري. فمفهوم السيادة الوطنية في المجال الجوي والحرب النفسية نتيجة الانفجارات الصوتية إنما تشكل دعوة إلى الترابط بين السلطة والقانون والاعتبارات الإنسانية، مما يلزم بتدقيق دولي خبير ومدرّك لعوامل الصراع القائم.

هذه الدراسة تعدّ بحثاً معيارياً تجريبياً يستند إلى المبادئ والحقائق القانونية وتستخدم منهجاً وصفيًا تحليليًا. تُظهر النتائج أنه ليس هناك لغاية اليوم تعريفًا صريحًا في القانون الدولي الإنساني يصنّف استخدام الانفجار الصوتي كأداة لتهريب المدنيين في النزاعات المسلحة الدولية، مما يلزم الخطاب السياسي بإظهار الآثار الإنسانية للأسلحة الصوتية، وأن يتزامن ذلك مع وضع مبادئ توجيهية قانونية واضحة لمنع استغلال هذه الأنواع من المواجهات وضمان الامتثال لمبادئ القانون الدولي الإنساني.

الكلمات المفتاحية: الحرب النفسية؛ سيادة المجال الجوي؛ الحرب الصوتية؛ سلامة الدول؛ أداة الإرهاب؛ لبنان؛ إسرائيل؛ قطر

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Introduction

Throughout history, nations have strived to manage and control activities within their borders, with the ultimate principle of border control being ingrained in sovereignty. As sovereign entities, States possess the absolute right to defend their sovereignty on land, at sea, and in the air.¹ Airspace sovereignty is a foundational principle of international law that constitutes the cornerstone of aviation law, and grants each State the exclusive authority to control its air territory, treating any unauthorized aircraft as intruders. The principle of airspace sovereignty is established in Article 1 of the Chicago Convention on International Civil Aviation (1944), which states: “The contracting States recognize that every State has complete and exclusive sovereignty over its airspace.”² The developments in military aviation technology have defied this concept and introduced complexities in maintaining and enforcing airspace sovereignty. These tools play a major role in psychological warfare. The use of sonic boom produced by a military jet as a tool of terror against civilians is emerging as a significant violation of airspace sovereignty and International Humanitarian Law (IHL). The main characteristic of these tools is that they constitute a major aspect of psychological warfare.

The use of military jets in violating the airspace of sovereign nations is a subtle topic of universal importance, as it not only threatens territorial integrity but also interrogates the effectiveness of international legal frameworks in dealing with such invasions. In the same vein, sonic boom, a spinoff of supersonic flight, appears to be in today’s international armed conflicts a psychological tool in warfare employed as a tactic to terrorize civilians. This method utilizes the powerful noise produced by aircraft exceeding the speed of sound to create fear and distress among civilian populations, as evidenced in recent conflicts.

To date, insights from the literature around the use of sonic booms in psychological warfare are few. This paper addresses a crucial knowledge gap in Public International Law and International Humanitarian Law studies concerning the legality of the use of such tools in psywar. Research work revolving around topics on military jets and airspace sovereignty provides a comprehensive overview of the subject and serves as a solid foundation for our research. On the topic of airspace sovereignty, the literature discusses challenges posed by military violations of sovereign airspace, highlighting the need for a refined consideration of international law in the framework of modern aviation technology. The research on the psychological impact of sonic booms in conflict zones reveals that while the physical damage caused by sonic booms is commonly negligible, their psychological effects are profound. K. Osta (2024) discusses in his recent publication on “The Psychological Impact of Israel’s Sonic Booms Over Lebanon,”³ the use of supersonic flyovers as psychological warfare. Sonic booms can prompt

1 Nadia Schadow, ‘The Erosion of Border Control and Its Threat to National Sovereignty’ (Hoover Institution 2022). <https://www.hoover.org/research/erosion-border-control-and-its-threat-national-sovereignty> accessed 2 December 2024.

2 International Civil Aviation Organization (ICAO), Convention on International Civil Aviation (1944). <https://www.icao.int/Meetings/atconf6/Documents/WorkingPapers/ATConf.6.WP.080.1.en.pdf> accessed 28 November 2024.

3 Karl Osta, ‘The Psychological Impact of Israel’s Sonic Booms Over Lebanon’ (ANERA, 12 August 2024).

fear, anxiety, and traumatic recalls, mainly in regions with recent or ongoing conflicts. In Lebanon, sonic booms have intensified the shared trauma of a nation still recuperating from past wounds, triggering signs similar to post-traumatic stress disorder among the population. Steve Goodman (2012) explores in “Sonic Warfare: Sound, Affect, and the Ecology of Fear,”⁴ the concept of sonic warfare and its implications on populations. Other authors like Robert Traynor (2023) in “Sonic Warfare: Noise as a Weapon” have analyzed the weaponization of sound. Additionally, Rashi, T., & Schleifer, R. (2023), in “The Ethics of Psychological Warfare – Lessons from Israel,” supply a perspective on the ethical considerations of such tactics. On the topic of airspace sovereignty, the article by Chrystel Erotokritou (2012) on “Sovereignty Over Airspace: International Law, Current Challenges, and Future Developments for Global Aviation” provides a comprehensive look at the evolution of airspace sovereignty and its challenges. Sonic warfare underlines the changing nature of conflict, where the combat field rises above physical territories to the thoughts and insights of individuals. The use of sonic booms as a form of psychological warfare serves to remind those affected of the threat of military aggression and can paralyze communities with fear. The development of the concept of sovereignty in the air and the consequences of such violations on territorial integrity and international relations constitute a priority area.

This article examines, in the first place, the contemporary understanding of airspace sovereignty under Public International Law (section 1). It then delves into the rules governing the use of sonic boom in an international armed conflict, particularly concerning its legality under International Humanitarian Law (section 2). It also discusses the global controversy surrounding the use of this weapon in psywar as a tool against civilians and the applicability of IHL, relying on a case study from the recent conflict in Lebanon (section 3), and provides a glimpse into the conclusion, future trends, and recommendations.

1. Fundamental Principles of Airspace Sovereignty under Public International Law (PIL)

Sovereignty, a core concept in international law, originates from Latin terms like *sui juris* and *superanus*, signifying supreme authority, historically of a prince or king, and now of a State. A widely accepted definition of sovereignty comes from the 1928 Island of Palmas arbitral award,⁵ stating that sovereignty between States means independence, which is the right to exercise State functions exclusively within a portion of the globe. Various principles and rules of conventional and customary international law stem from the general principle of sovereignty.

Sovereignty in international law encompasses three main elements:

1. Expression of Statehood: Having all the attributes of an independent state and being recognized as such by other states.
2. Protection of National Identity: Maintaining national identity and independence of a State.

4 Steve Goodman, *Sonic Warfare: Sound, Affect, and the Ecology of Fear* (Technologies of Lived Abstraction, The MIT Press 2012).

5 *United States v Netherlands, Island of Palmas* (4 April 1928) Permanent Court of Arbitration, 2 UN Rep Int'l Arb Awards 829.

3. Expression of Self-Determination: This includes two aspects: the first is the Internal Self-Determination, meaning the right of individuals to select their social, political, and economic systems and decide their degree of political involvement in governance. The second aspect is External Self-Determination, taking place, for instance, when resisting colonialism or apartheid, and advocating for sovereignty over their territory, as well as their linguistic, socio-cultural, ethnic, and religious interests.

These principles are explicitly addressed by the 1960 UN Declaration on the Granting of Independence to Colonized Countries.⁶ Article 1 of the United Nations Charter⁷ emphasizes the significance of social, economic, and cultural relations in promoting peace and security while respecting the sovereignty and political integrity of member States based on equal rights and self-determination. Similarly, Article 1 of both the International Covenant on Civil and Political Rights (ICCPR)⁸ and the International Covenant on Economic, Social and Cultural Rights (ICESCR)⁹ of 1966 reaffirms the right to self-determination as a fundamental right of all people allowing them to freely determine their political status and pursue their development, thereby supporting national sovereignty through autonomy in political and economic decisions. Additionally, articles 2 and 21 to 24 of the African Charter on Human and Peoples' Rights¹⁰ set forth standards to eliminate all forms of colonialism and promote both internal and external self-determination as a developmental right for African peoples by guaranteeing rights related to non-discrimination, control over resources, development, and promoting peace and security. These provisions underscore the interconnectedness of civil, political, economic, social, and cultural rights, which are essential for holistic national development, and they commonly emphasize self-determination and respect for sovereignty to create a stable international environment where nations can thrive both independently and cooperatively.

Sovereignty pertains to the principle of non-use of force, which is generally prohibited by PIL, except in cases of self-defense or when authorized by the UN Security Council to maintain international peace and security. However, in contemporary international law and practice, the principle of sovereignty is not absolute due to several recognized exceptions to the general rule against non-intervention in the internal affairs of sovereign States.¹¹ The territorial scope of exclusive sovereignty extends both upwards into space and downwards to the center of the earth. Within this territory, the State exercises

6 United Nations General Assembly Resolution 1514 (Declaration on the Granting of Independence to Colonial Countries and Peoples) (14 December 1960) UNGA Res 1514 (XV).

7 Charter of the United Nations (24 October 1945).

8 International Covenant on Civil and Political Rights (adopted 16 December 1966, entered into force on 23 March 1976) 999 UNTS 171.

9 International Covenant on Economic, Social and Cultural Rights (adopted 16 December 1966, entered into force on 3 January 1976) 993 UNTS 3.

10 Organization of African Unity, African Charter on Human and Peoples' Rights (adopted 27 June 1981, entered into force on 21 October 1986) Articles 2, 21-24.

11 Andrey L. Kozik, 'The Concept of Sovereignty as a Foundation for Determining the Legality of the Conduct of States in Cyberspace' (2014) 14 *Baltic Yearbook of International Law* 93, 94; Jupillat (n 6) 938.

unlimited monopolistic power. This concept developed alongside rules prohibiting States from exercising power within the legal territories of other States. In today’s “one village” world, where commercial air travel is more prevalent and military aerial conflicts have increased, this legal domain holds particular importance. International aviation law plays a vital role in guaranteeing the safety and security of air travel, managing the legal use of airspace, and resolving disagreements between states. However, does the concept of airspace sovereignty align with the principles of international law?

The term “air space” refers to the area where air exists, specifically within the atmosphere, aligning with the intentions of the drafters of the 1919 Paris Convention.¹² The English text uses “airspace,” while the French and Italian texts use terms equivalent to “atmospheric space.”

Essentially, International Aviation Law regulates a State’s control over its land and nearby waters. Specifically, a nation’s territorial waters stretch 12 nautical miles (approximately 22 kilometers) from its shore. The main objective of international aviation law is to ensure the safety of commercial flights between states and to manage the use of military jets during conflicts or emergencies. Therefore, under international law, a country has the authority to supervise all activities, being military or commercial, inside its surrounding area.

The issue of airspace jurisdiction has been a prominent subject in international law for many years. Despite the unresolved issue of the precise “vertical” extent of territorial airspace, there is a crucial need for a robust statute that governs all facets of international aviation law. Such a statute is essential for safeguarding nations’ rights to preserve their sovereignty and for fostering transnational order and global harmony.

One of the core principles of PIL is airspace sovereignty, which grants each State complete and exclusive control over the airspace above its territory. This principle is crucial for national sovereignty and is upheld by various international conventions, including the 1944 Chicago Convention on International Civil Aviation. The Paris Convention of 1919 and the Chicago Convention of 1944 were established following two devastating world wars, founding the principles of aviation law, particularly concerning State sovereignty over airspace. Many airlines were founded by National Defence authorities and served as strategic assets for military forces during conflicts. Similarly, a significant portion of airspace was, and still is, allocated for military use. This division of airspace between civilian and military users underscores the national security priorities inherent in the concept of sovereignty. Article 1 of the Chicago Convention explicitly states that each contracting State has full sovereignty over its airspace, prohibiting any unauthorized entry or use by other States or entities. The Paris Convention introduced the concept of airspace sovereignty and the doctrine of innocent passage, which allows aircraft from contracting States to traverse each other’s territories under certain conditions. It also specified that aircraft must be registered with a State to possess the latter’s nationality.¹³ The Chicago

12 This Convention marked the first successful effort to regulate international air navigation and laid the groundwork for air law, available in French, English, and Italian, comprising 43 articles and addressing all technical, operational, and organizational aspects of civil aviation.

13 Particularly in Articles 1 and 3 bis. See also: League of Nations, Convention Relating to the Regulation of Aerial Navigation (1919) Articles 1, 2, 5, 15 <https://treaties.un.org/Pages/showDetails.aspx?objid=0800000280168604> accessed 2 December 2024.

Convention further developed these principles by reaffirming State sovereignty over airspace and detailing provisions for non-scheduled flights. These flights may transit or enter another State's territory without prior permission, although States retain the right to require a landing. Additionally, the Convention mandates that aircraft entering a State's territory must land at designated customs airports if required by that State's regulations.¹⁴ These conventions ensure that states control their airspace while promoting international air travel through standardized rules. This framework is essential for safe international civil aviation, balancing sovereignty with cooperation.

Despite this, there have been violations of airspace sovereignty. A notable example is the 2014 downing of Malaysia Airlines flight MH17¹⁵ over eastern Ukraine, an area controlled by pro-Russian separatists.¹⁶ Under the PIL, States are obligated to ensure the safety of civil aviation within their airspace, as stipulated in the Chicago Convention of 1944.¹⁷ The incident also raises important questions about State responsibility for the actions of non-state actors. According to the International Law Commission's Articles on the Responsibility of States for Internationally Wrongful Acts (ARSIWA),¹⁸ a State can be held accountable for the actions of non-state actors if it can be proven that the State exercised effective control over them. In the case of MH17, the Dutch-led Joint Investigation Team concluded that the missile system used to shoot down the aircraft was transported from Russia and operated by Russian-backed separatists, implicating Russia in the incident. This finding aligns with the International Court of Justice's (ICJ) ruling in the *Nicaragua v. United States* case.¹⁹ Therefore, the MH17 tragedy is relevant in illustrating these principles, demonstrating how States can be held accountable for failing to prevent non-State actors from violating airspace sovereignty.

Certainly, all States have the right to respond to airspace violations. PIL establishes several essential standards for addressing intrusions into the internal affairs of States, placing significant emphasis on the principles of sovereignty and political integrity.²⁰ At the heart of these standards is the principle of the prohibition of the threat or use of force, which is articulated in Article 2(4) of the United Nations Charter. This article explicitly prohibits the threat or use of force against the territorial integrity or political independence of any State. Additionally, Article 2(7) of the UN Charter limits the UN's ability to intervene in matters that are fundamentally within the domestic jurisdiction of any State, except in

14 International Civil Aviation Organization (ICAO), Convention on International Civil Aviation (1944) Articles 1, 5, 6, 10 https://www.icao.int/publications/documents/7300_orig.pdf accessed 2 December 2024.

15 This tragic incident resulted in the loss of 298 lives highlighting the responsibility of States and the severe consequences of failing to protect airspace from hostile actions.

16 Robert Lewis, 'Malaysia Airlines Flight 17' (Encyclopaedia Britannica, 19 April 2025) <https://www.britannica.com/event/Malaysia-Airlines-flight-17> accessed 23 April 2025.

17 Ibid (ICAO) at Art. 1, 3 bis.

18 International Law Commission (ILC), Articles on the Responsibility of States for Internationally Wrongful Acts (2001) Article 8.

19 United Nations, Military and Paramilitary Activities in and against Nicaragua (*Nicaragua v United States of America*) ICJ Reports 1986.

20 Ibid (ICAO) art 1, 5, 6, 10; League of Nations, Convention Relating to the Regulation of Aerial Navigation (1919) art 1, 2, 5, 15; United Nations, Charter of the United Nations (1945) art 2(4).

situations where international peace and security are at risk. The ICJ further reinforced this principle in the case of *Nicaragua v. USA*, ruling that States must abstain from coercive actions that infringe upon the sovereignty of other nations. Moreover, the Declaration on the Inadmissibility of Intervention in the Domestic Affairs of States (UN General Assembly Resolution 2131),²¹ emphasizes the significance of non-interference, asserting that no State possesses the right to intervene in the internal affairs of another. A pertinent example of these principles in practice is the international response to Russia’s annexation of Crimea in 2014, which drew widespread condemnation as a violation of Ukraine’s sovereignty and territorial integrity. This situation led to imposing sanctions and other diplomatic measures against Russia. Together, these standards aim to uphold the sovereignty and political integrity of States, ensuring that international relations are conducted with due respect for the autonomy of each nation. An illustration of States’ efforts to protect and oversee their airspace sovereignty under the PIL concerns the State of Qatar. In 2020, the ICJ²² ruled in favor of Qatar to control its airspace in a diplomatic dispute involving its neighbors- Bahrain, Saudi Arabia, Egypt, and the UAE.

If a State chooses not to use the permitted means, it does not necessarily imply that the State views these means as unlawful. Restraint might indicate a lack of resources or other practical or humanitarian considerations. There may not be a customary international law rule on this matter. The Permanent Court of International Justice in the *Lotus Case*²³ highlights the principle of sovereign autonomy, meaning restrictions cannot be externally imposed on sovereign States. The court further noted that “every State remains free to adopt the principles which it regards as best and most suitable.” Therefore, it is more accurate to describe this as a legal right or privilege for each State to respond. Even without a universally accepted rule on permissible actions, certain standards of behavior must be followed. This implies that States possess the legal right to determine their policies and responses to airspace violations, viewing it as a legal privilege to protect their sovereignty and national security. The absence of universally accepted rules on permissible actions in such cases further emphasizes the flexibility States have in tailoring their responses to specific situations. Despite this flexibility, States must adhere to certain standards of behavior consistent with international norms to maintain order and stability. The *Lotus* case sets a precedent that State practice and customary international law significantly shape the legal landscape, reinforcing the importance of State sovereignty and the legal rights of States to respond to airspace violations.²⁴

Violations of airspace sovereignty can lead to international sanctions and other repercussions, such as diplomatic protests, economic sanctions, or military actions, depending on the severity of the breach and the affected State’s response. PIL, particularly aviation law, places a significant emphasis on State

21 UN General Assembly, ‘Declaration on the Inadmissibility of Intervention in the Domestic Affairs of States’ (1965) UN Doc A/RES/2131(XX) <http://un-documents.net/a20r2131.htm> accessed 2 December 2024.

22 ICJ, ‘Judgment of 14 July 2020’ (Document # 173-20200714-JUD-01-00-EN) <https://www.icj-cij.org/en/case/173/judgments> accessed 2 December 2024.

23 Permanent Court of International Justice, *The Case of the S.S. “Lotus” (France v Turkey)* Judgment No 9, 7 September 1927 <https://www.icj-cij.org/en/pcij-series-a> accessed 1 December 2024.

24 Ibid.

sovereignty and airspace control, whereby States are accountable for ensuring that their airspace is not utilized for unauthorized military activities. For instance, if a State conducts sonic booms over another State's territory, it may be held liable for violating that State's sovereignty as stipulated in the Chicago Convention on International Civil Aviation.²⁵ Affected States can utilize diplomatic channels to register protests and seek resolutions, as illustrated by the case of Israel's use of sonic booms over Gaza in 2005. Human rights organizations monitored this practice and reported it to the UN, where the UN Special Rapporteur on Human Rights in the Palestinian Territories condemned the sonic booms for their detrimental psychological effects on civilians.²⁶ Moreover, Palestinian authorities and international organizations employed diplomatic avenues to challenge the legality of these actions under IHL and human rights law.²⁷ Previously, the historical use of sonic booms in Nicaragua as a tactic of psychological warfare has established a precedent in international law, highlighting the urgent need for clearer legal standards and accountability mechanisms to address the psychological impact of such military tactics on civilians.²⁸

Upholding airspace sovereignty is essential for maintaining stability and security in international aviation. International conventions and agreements provide a framework for cooperation among States to ensure safe and orderly use of airspace. Any breach of this principle not only undermines State sovereignty but also endangers the safety of aircraft and passengers. Undoubtedly, non-compliance with international obligations and standards on airspace sovereignty can lead to international sanctions and severe consequences, as violations of airspace sovereignty are seen as acts of aggression or breaches of the PIL, potentially causing diplomatic tensions and military responses. PIL prohibits States from threatening or using force in their relations, as outlined in Article 2(4) of the UN Charter, which is a fundamental norm. This prohibition is vital for international peace and security. However, States often act contrary to this, and while the UN Charter permits the use of force under specific circumstances, many States exceed these limits, indicating potential shortcomings in the Charter's rules. For instance, an unlicensed overflight by a military aircraft violates primary rules and constitutes not only a breach of sovereign airspace or sovereignty, but also a violation of the principle of non-intervention and the prohibition on the use of force. If a military aircraft enters another State's sovereign airspace without proper authorization, it may be stopped and recognized, and if necessary, its flight is terminated.²⁹

25 Convention on International Civil Aviation (Chicago Convention), signed 7 December 1944, entered into force 4 April 1947, 15 UNTS 295, art 1

26 International Committee of the Red Cross (ICRC), 'Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I)' (1977) <https://ihl-databases.icrc.org/ihl/INTRO/470> accessed 28 November 2024.

27 John Dugard, 'Report of the Special Rapporteur on the Situation of Human Rights in the Palestinian Territories Occupied since 1967' (United Nations Human Rights Council, 2005) <https://www.ohchr.org/en/hr-bodies/hrc/regular-sessions/session28/list-reports> accessed 28 November 2024.

28 James Parker, 'Sonic Warfare: On the Jurisprudence of Weaponised Sound' (Academia.edu, 2015) https://www.academia.edu/36045930/Sonic_Warfare_On_the_Jurisprudence_of_Weaponised_Sound accessed 28 November 2024.

29 Ademola Abass, *Complete International Law: Text, Cases, and Materials* (OUP Oxford 2012) ch 10.

Does unlicensed overflight by a military aircraft potentially amount to an armed attack under Article 51 of the UN Charter? Should the prohibited “use of force” mean only military force? What would be the legal consequences? The subsequent analysis will try to answer these questions.

Article 2(4) of the UN Charter provides that: “All Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any State, or in any other manner inconsistent with the Purposes of the United Nations”. This article is loaded with substance, arguably making it the most controversial provision. It seems to forbid only force directed against the “territorial integrity” or “political independence” of a State. So, does this mean that States can threaten or use force that is not against the “territorial integrity or political independence” of other States? And when is use or threat of force not “inconsistent with the purposes of the UN”? The general understanding among writers and States is that Article 2(4) only prohibits the use of military force.³⁰ The UN General Assembly (GA) Declaration on Principles of International Law Friendly Relations and Cooperation among States by the Charter of the United Nations, confirmed by GA Resolution 2625(XXV) of 24 October 1970, provides that: “No State may use or encourage the use of economic, political or any other type of measures to coerce another State to obtain from it the subordination of the exercise of its sovereign rights and to secure from it advantages of any kind.”³¹

In addition to actual force, Art. 2(4) prohibits the “threat of force”, which constitutes “a form of coercion.”³² A threat is unlawful under Art. 2(4) if the threatened force would be illegal when used, and deterrence does not justify a threat to make it legal, as was clearly stated by the Advisory Opinion of the ICJ requested by the UN General Assembly on December 19, 1995, and issued by the ICJ in 1996 on the question whether the threat or use of nuclear weapons was in any circumstance permissible.³³ Territorial integrity, especially where coupled with political independence, is synonymous with territorial inviolability. Thus, a State would be acting in breach of its obligations under the Charter if it were to invade or commit an act of force within the territory of another State, in anticipation of an alleged impending attack or to obtain redress, without the intention of interfering permanently with the territorial integrity of that State. The prohibition of paragraph 4 is absolute except for the use of force in fulfillment of the obligations to give effect to the Charter in pursuance of action in self-defense consistent with the provisions of Article 51.

Besides, a no-fly zone means a part, or the whole, of a country’s airspace that is cordoned off either to that country’s aircraft and/or to those of foreign countries. The 1970 Friendly Relations Declaration,

30 For further discussion, see James A Delanis, “‘Force’ under Article 2(4) of the United Nations Charter: The Question of Economic and Political Coercion” (1979) 12 *Vand J Transnat’l L* 101; and Oliver Dörr and Albrecht Randelzhofer, ‘Article 2(4)’ in Bruno Simma and others (eds), *The Charter of the United Nations: A Commentary* (3rd edn, OUP 2012) vol I.

31 UN General Assembly, ‘Declaration on Principles of International Law Friendly Relations and Cooperation among States in Accordance with the Charter of the United Nations’ (GA Res 2625 (XXV), 24 October 1970) para 1 <https://legal.un.org/avl/ha/dpilfrscun/dpilfrscun.html> accessed 2 December 2024.

32 R Sadurska, ‘Threats of Force’ (1988) 82 *American Journal of International Law* 239, 241.

33 *Legality of the Threat or Use of Nuclear Weapons* (Advisory Opinion) [1996] ICJ Rep 226.

operative paragraph 23, states that: "... No State or group of States has the right to intervene, directly or indirectly, for any reason whatever, in the internal or external affairs of any other State. Consequently, armed interventions and all other forms of interference or attempted threats against the personality of the State or its political, economic and cultural elements, are in violation of international law."³⁴ There is no doubt that the reference to "any reasons whatever" is broad enough to cover such other motives or reasons on which a State may want to rely as a justification for the use of force against another State.

The use of force by one State against another without the authorization of relevant international bodies, such as the UN Security Council, is considered unilateral. Exceptions to the prohibition on the use of force according to the UN Charter include the use of force in self-defense (art. 51) and the use of force authorized by the UNSC (collective security, Chapter VII). The response of the overflown State must adhere to the basic norms of PIL regarding the use of force. The deployment of force against military or State aircraft during such breaches is a delicate matter in times of peace. Article 49 of the Articles on Responsibility of States for Internationally Wrongful Acts (ARSIWA) outlines the conditions under which an injured State may take countermeasures against a State responsible for an internationally wrongful act. The main goal of these countermeasures is to encourage compliance with obligations under ARSIWA, such as stopping the wrongful act and providing reparation. Countermeasures are temporary and should not permanently alter the legal relationship between States, ensuring they can be reversed. They must also allow for the resumption of obligations once the responsible State complies, adhering to the principle of proportionality and maintaining international legal order.³⁵ The principles of proportionality, military necessity, and humanity regulate the use of force when a State claims its right to self-defense to explain shooting down an aircraft during times of peace."³⁶

Thus, Article 49 of ARSIWA provides a framework for countermeasures that balances enforcement of international obligations with proportionality and reversibility. It limits countermeasures to temporary non-performance aimed at inducing compliance, thus upholding international law's integrity while allowing States to address wrongful acts. States must uphold airspace sovereignty principles to maintain territorial integrity, ensure airspace safety, and contribute to international aviation stability and security.

2. The Use of Sonic Boom in Psywar under International and Humanitarian Law

The early twenty-first century saw significant shifts in the nature of warfare. Beyond traditional maritime, air, and land combat, psychological warfare, or "psywar", has become a crucial military

³⁴ Ibid 'Declaration on Principles of International Law Friendly Relations and Cooperation among States in Accordance with the Charter of the United Nations' para 23.

³⁵ International Law Commission (ILC), 'Articles on the Responsibility of States for Internationally Wrongful Acts' (2001) art 49.

³⁶ On August 2, 1975, Air Force One, carrying President Ford, was cleared to fly over Sweden en route from Helsinki to Bucharest. However, the plane inadvertently entered the restricted area of Karlskrona and was swiftly intercepted by a Swedish fighter jet.

strategy. This rise is fueled by advancements in information and communication technologies, such as the web, worldwide real-time communication, mobile phones, and online social networks. These platforms have transformed into arenas for conflict, wielding significant influence over leaders, military forces, and entire populations. Rapid advancements in military technology may outpace the development of legal frameworks, making it difficult to regulate new methods of warfare effectively. Democracies are often reluctant to engage in psychological warfare due to ethical, legal, and public policy concerns. Ethical issues arise because PSYOP can blur the line between acceptable military actions and manipulative tactics, similar to totalitarian propaganda. The complex and unclear legal framework surrounding PSYOP adds to this reluctance. Additionally, democratic societies value transparency and truth, which can conflict with the deceptive nature of psychological warfare.³⁷ However, in recent years, democracies have increasingly acknowledged the significance of psychological warfare and have begun to utilize it more extensively. The emergence of digital communication and social media has revolutionized the information landscape, and PSYOP is a potent tool in modern conflicts.³⁸ Democracies have acknowledged that neglecting psychological warfare places them at a strategic disadvantage, particularly when confronting adversaries who adeptly employ these tactics. As a result, there has been a shift towards integrating psychological operations into broader military and strategic frameworks to influence perceptions, attitudes, and behaviors in support of political and military objectives.³⁹ The use of sonic booms in Nicaragua as a form of psychological warfare set a precedent for how such tactics are viewed under PIL. It highlighted the need for clear legal standards and accountability mechanisms to address the psychological impact on civilian populations. Unlike other forms of warfare, which are subject to international ethical regulations, psychological warfare lacks such oversight. While IHL allows for information and psychological operations that are militarily necessary, it imposes restrictions, particularly on those targeting civilians or military personnel who are *hors de combat* and likely to cause harm. Among the several tools utilized in psywar figures, the use of sonic booms exemplifies a wider trend in psychological warfare, primarily aimed at instilling fear among the civilian population. The deployment of sonic booms is a component of Israel’s broader psychological warfare strategy against the Lebanese population. But what causes a sonic boom, and are military aircraft legally permitted to break the sound barrier?

A sonic boom occurs when an aircraft approaches the speed of sound, creating pressure waves in

37 For further reading about this subject, see: Phil Parvin and Ben Saunders, ‘The Ethics of Political Participation: Engagement and Democracy in the 21st Century’ (2018) 24 Res Publica 3, 3-8 <https://link.springer.com/article/10.1007/s11158-017-9389-7> accessed 2 December 2024; Viktor Valgarðsson et al, ‘Political Disengagement’ in Marco Giugni and Maria Grasso (eds), *The Oxford Handbook of Political Participation* (Oxford University Press 2022) 744-762 <https://academic.oup.com/edited-volume/44007/chapter/371816273> accessed 2 December 2024.

38 T Rashi and R Schleifer, ‘The Ethics of Psychological Warfare – Lessons from Israel’ (2023) 19(2) *Democracy and Security* 199-210 <https://www.tandfonline.com/doi/pdf/10.1080/17419166.2023.2210472> accessed 1 December 2024.

39 M Zelcer, G VanPelt and D Casey, ‘Military Psychological Operations: Ethics and Policy Considerations’ in *The Palgrave Handbook of Philosophy and Public Policy* (2018) https://link.springer.com/chapter/10.1007/978-3-319-93907-0_9 accessed 1 December 2024.

front of and behind it, similar to a ship moving through water. As the aircraft's speed increases, these waves compress and merge into a single wave at Mach 1 (the speed of sound), resulting in a sonic boom. People on the ground can hear sonic booms, but the pilot does not, as the boom happens behind the aircraft. The loudness of a sonic boom depends on the aircraft's size, shape, and the amount of air it displaces. There are two types of sonic booms: The N-wave and the U-wave. The N-wave occurs during steady supersonic flight and is shaped like the letter "N." The U-wave, or focused boom, is generated when an aircraft maneuvers at supersonic speeds, creating a pressure wave shaped like the letter "U." Modern supersonic jets typically produce an N-wave boom of one to ten pounds per square foot, while U-waves can be three to five times stronger. A sonic boom, which sounds like thunder or a large explosion, is heard on the ground when this happens. For instance, in the summer of 2023, an Air National Guard F-16 fighter jet went supersonic while intercepting an unresponsive aircraft, and the boom was heard across Washington, DC, Maryland, and Virginia in the United States. Military jets can indeed break the sound barrier if they can fly at speeds exceeding Mach 1, which is 767.269 mph.⁴⁰ Restricted airspace, such as the area around the Baltimore-Washington Metropolitan Area established after the September 11, 2001, terrorist attacks,⁴¹ is known as an "air defense identification zone" (ADIZ). Civilian pilots sometimes enter this airspace without the required permission. When this occurs, military jets are scrambled to intercept the potential threat and escort the aircraft to the nearest airport.

IHL does not explicitly regulate the use of sonic booms in armed conflict. The use of a sonic boom could potentially violate several fundamental principles of IHL, such as proportionality, distinction, and military necessity,⁴² and limitation. The tactics or strategies used in hostilities⁴³ aim to conquer the enemy by leveraging existing information, weapons, movement, and surprise.

PIL has established the ensuing principles concerning the means and methods of warfare:

- a. The sole legitimate objective of war is to weaken the enemy's military, primarily by disabling as many enemy combatants as possible.
- b. The right to choose methods and means of fighting is not unrestricted.
- c. It is prohibited to use methods and means of warfare that cause unnecessary injury or suffering.

⁴⁰ Read more about this topic: Mark Finlay, 'BOOM! Can Military Jets Break the Sound Barrier?' (Simple Flying, 28 May 2024) <https://simpleflying.com/can-military-jets-break-sound-barrier/> accessed 2 December 2024.

⁴¹ On September 11, 2001, the United States closed its airspace and for national security reasons, no aircraft were allowed to fly to or from any U.S. airport for an unprecedented 96 hours. The U.S. government feared that other aircraft could be used as weapons of mass destruction by terrorist groups.

⁴² The principle of distinction means distinguishing between combatants and civilians. The principle of military necessity refers to the unnecessary suffering by combatants.

⁴³ To effectively implement the core principles of International Humanitarian Law (IHL), various treaties and provisions exist that ban certain weapons, control the use of others, or restrict specific military strategies or behaviors. These regulations are commonly known as rules on "means and methods." "Means" refers to all kinds of weapons and weapon systems, while "methods" pertain to how these weapons are utilized, including any tactical or strategic approaches to warfare that are not directly related to weapons.

- d. When developing, acquiring, or adopting new means or methods of combat, it must be specified whether their use is banned in any circumstances.

IHL expressly prohibits acts or threats of violence that primarily aim to instill terror in the civilian population. This principle is encapsulated in Article 51(2)⁴⁴ of Additional Protocol I (AP I) to the Geneva Conventions. The concepts of distinction and proportionality are fundamental within IHL. Specifically, the principle of distinction, outlined in Article 48 of AP I, mandates that parties involved in a conflict differentiate between combatants and civilians. Meanwhile, the principle of proportionality forbids attacks that could inflict excessive harm on civilians relative to the expected military advantage. The use of sonic booms, which affect civilians indiscriminately, could breach these principles, as they do not target a specific military objective.⁴⁵ The principle of proportionality, as outlined in Articles 51(5)(b) and 57(2)(a)(iii) of AP I to the Geneva Conventions,⁴⁶ requires that incidental harm to civilians must not be excessive to the anticipated military advantage. Sonic booms, which can cause widespread damage and panic, may result in disproportionate harm. The principle of distinction, codified in Article 48 of AP I, mandates that parties to a conflict distinguish between civilian objects and military objectives, but sonic booms affect both indiscriminately. Military necessity permits measures necessary to achieve a legitimate military objective, but the use of sonic booms must be justified by a clear military benefit, which is often not the case.⁴⁷ The principle of limitation requires that warfare methods avoid unnecessary suffering, and sonic booms, causing psychological trauma and physical damage, may violate this principle.⁴⁸ An example is the use of sonic booms by Israeli jets over Gaza, criticized for causing fear and trauma among civilians without significant military benefit, thus violating the principles of proportionality, distinction, and limitation.⁴⁹

44 This article stipulates: “The civilian population as such, as well as individual civilians, shall not be the object of attack. Acts or threats of violence the primary purpose of which is to spread terror among the civilian population are prohibited.” These acts include targeting civilians, taking hostages, and carrying out indiscriminate attacks. The phrase “the primary purpose of which” refers to the main intention behind acts or threats of violence, specifically to instill fear in the civilian population. It underscores that the goal is to spread terror and panic, rather than to gain a direct military advantage.

45 See John Dugard, ‘Report of the Special Rapporteur on the Situation of Human Rights in the Palestinian Territories Occupied since 1967’ (United Nations Human Rights Council, 2005) <https://www.ohchr.org/en/hr-bodies/hrc/regular-sessions/session28/list-reports> accessed 28 November 2024; David Suisman, ‘The American Environmental Movement’s Lost Victory: The Fight against Sonic Booms’ (2015) 37(4) *The Public Historian* 111-131 <https://www.jstor.org/stable/10.1525/tph.2015.37.4.111> accessed 28 November 2024.

46 International Committee of the Red Cross (ICRC), ‘Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I)’ (1977) art 48, 51(5)(b), 57(2)(a)(iii).

47 Doctors Without Borders, *The Practical Guide to Humanitarian Law* (2024) <https://www.doctorswithoutborders.org> accessed 1 December 2024.

48 International Committee of the Red Cross (ICRC), ‘Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949’ (1987) art 1.

49 Human Rights Watch, *Razing Rafah: Mass Home Demolitions in the Gaza Strip* (2005) <https://www.hrw.org> accessed 1 December 2024.

Proscribed methods of warfare include perfidy, terror, starvation, retaliations against non-military targets, indiscriminate attacks, harm to the natural environment or installations comprising dangerous material, orders to leave no survivors, pillage, taking hostages, exploiting the presence of civilians or their movements to facilitate hostilities, inappropriate use of typical emblems and signs, and attacks on persons who are *hors de combat* or parachuting from a distressed aircraft.⁵⁰

While a sonic boom is considered a prohibited method of terror to be used by the parties to a conflict under IHL, effective ‘advance warning’ of attacks that may impact the civilian population must be given by each party, lest circumstances prevent it. This rule is a norm of customary international law, applicable in both international and non-international armed conflicts.⁵¹

The use of sonic booms as a method of terror is prohibited under IHL, specifically under Article 51(2) of AP I to the Geneva Conventions, which bans acts or threats of violence aimed at spreading terror among civilians. This prohibition is recognized as a norm of customary international law, applicable in both international and non-international armed conflicts. Additionally, Article 57(2) of AP I mandates that effective ‘advance warning’ be given for attacks that may impact the civilian population, unless circumstances prevent it.⁵² The International Committee of the Red Cross (ICRC) has affirmed these principles as part of customary international law, supported by State practice and case law from international tribunals such as the International Criminal Tribunal for the former Yugoslavia (ICTY).⁵³ These rules underscore the obligation of parties to a conflict to protect civilians and minimize harm, reinforcing the legal framework that governs the conduct of hostilities.⁵⁴ The obligation to give ‘advance warning’ is a long-standing principle documented in the Lieber Code, the Brussels Declaration, and the Oxford Manual. It was first inscribed in the Hague Regulations and is reiterated in Article 57(2) of AP I, with no applicable reservations. This obligation is included in many military manuals and some national legislation. It is also supported by official statements and practices, including those of States not party to AP I to the Geneva Conventions.⁵⁵ For example, during the 1973 Middle East con-

50 For more information check the online casebook of the International Committee of the Red Cross: International Committee of the Red Cross (ICRC), ‘Methods of Warfare | How Does Law Protect in War? - Online Casebook’ <https://casebook.icrc.org> accessed 1 December 2024.

51 Lieber Code, art 19 (cited in Vol II, Ch 5, § 424); Brussels Declaration, art 16 (ibid, § 425); Oxford Manual, art 33 (ibid, § 426).

52 International Committee of the Red Cross (ICRC), ‘Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I)’ (1977) <https://ihl-databases.icrc.org/ihl/INTRO/470> accessed 1 December 2024.

53 International Committee of the Red Cross (ICRC), Customary International Humanitarian Law, Volume I: Rules (2005) https://ihl-databases.icrc.org/customary-ihl/eng/docs/v1_rul accessed 1 December 2024.

54 International Criminal Tribunal for the former Yugoslavia (ICTY), Prosecutor v Dusko Tadic (Appeal Judgment) IT-94-I-A, 15 July 1999 <https://www.refworld.org/cases,ICTY,40277f504.html> accessed 1 December 2024.

55 Article 48 of this Additional Protocol I reminds that “the Parties to the conflict shall at all times distinguish between the civilian population and combatants and between civilian objects and military objectives”, and article 51(4) states that indiscriminate attacks are prohibited.

flict, Egypt, Iraq, Israel, and Syria responded favorably to the ICRC’s appeal for ‘advance warnings.’⁵⁶ Also, the International Criminal Tribunal for the Former Yugoslavia’s judgment in the Kupreškić case supports the customary nature of this regulation. The ICTY’s judgment emphasizes that certain norms, such as the principles of distinction and proportionality, are widely accepted and uncontested. While the use of sonic booms as a form of psychological warfare might serve to warn or intimidate without causing direct physical harm, it must align with the established practice of issuing warnings to minimize civilian casualties. To be considered lawful, the use of sonic booms must comply with customary international law.⁵⁷

3. The Applicability of IHL on the Use of Sonic Boom as a Tool of Terror against Civilians in the Case of Lebanon

In August 2024, Lebanon’s Ministry of Foreign Affairs announced that a complaint was filed following directives from caretaker Minister Abdallah Bou Habib denouncing the use of sonic booms by Israel against the Lebanese civilian population as blatant infringements on its sovereignty and airspace, as well as violations of UN Security Council Resolution 1701 (2006).⁵⁸ The complaint also highlighted that these breaches contravene IHL, which forbids collective punishment and psychological intimidation, particularly targeting civilians and vulnerable groups like children. Since October 7, 2024, Israel has been creating loud noises that evoke memories of Beirut’s catastrophic port explosion caused by a fire in a warehouse storing highly combustible ammonium nitrate on August 4, 2020, devastating large parts of the city, killing over 200 people, and injuring thousands, to instill fear among the population. Hezbollah and Israel have been involved in a low-intensity conflict. During the Gaza war, however, Israel has been creating sonic booms by flying aircraft at low heights over Lebanon, seemingly to intimidate and frighten the population.⁵⁹ In response, Lebanon filed a complaint with the UN Security Council, accusing Israel of breaching the sound barrier with its warplanes over several areas, including Beirut. The Foreign Ministry’s statement highlighted these violations of Lebanese airspace, specifically mentioning the sound barrier breach over the capital. The complaint condemned these actions as blatant violations of Lebanon’s sovereignty and UN Security Council Resolution 1701 (2006). It also stated that such actions contravene IHL, which forbids collective punishment and psychological intimidation, particularly those aimed at terrorizing civilians and increasing the suffering of vulnerable groups like children. Israeli warplanes frequently break the sound barrier over various parts of Lebanon, causing loud noises similar to bomb explosions and inducing panic among residents. Tensions between Israel and Hezbollah escalated, especially after the assassination of senior Hezbollah com-

56 Hague Regulations, art 26 (cited in Vol II, §§ 420–421); Additional Protocol I, art 57(2)(c) (adopted by 90 votes in favour, none against and 4 abstentions) (ibid, § 423).

57 Customary IHL Rule 20 on the ICRC website <https://ihl-databases.icrc.org/en/customary-ihl/v1/rule20> accessed 1 December 2024.

58 UN Security Council, ‘Resolution 1701 (2006)’ adopted at its 5511th meeting, 11 August 2006 <https://digitallibrary.un.org/record/581053> accessed 1 December 2024. This resolution calls for the full implementation of the Taef Accords and resolutions 1559 and 1680, which demand the disarmament of all armed groups in Lebanon.

59 Al Jazeera, ‘Features’ <https://www.aljazeera.com/features> accessed 1 December 2024.

mander Fouad Shukr in Beirut on July 30, 2024.⁶⁰ Lebanon urged Israel to cease its repeated attacks and to end the war in Gaza, emphasizing Beirut's commitment to peace and the implementation of Resolution 1701, urging the implementation of International Resolution No. 2735, describing the threats as a form of psychological warfare. The Israeli attacks on southern Lebanon resulted in civilian casualties and forced thousands of families to flee their homes, coinciding with Israel's aggression against the Gaza Strip since October 7, 2023.

To what extent do sonic booms used against civilians in Lebanon constitute a violation of IHL? Before assessing the applicability of IHL to the use of sonic boom as a tool of terror against civilians, the nature of the 2024 conflict between Lebanon and Israel should be elucidated and classified. The classification of the conflict presents a complex challenge, primarily due to the ambiguous legal status governing the relationship between the two entities. Before Israel's military escalation, one could reasonably contend that there was no active armed conflict. Nevertheless, the dynamics thence transformed, necessitating an exploration of whether this situation qualifies as an international or a non-international conflict. This distinction is of significant importance, particularly given that one of the involved parties is Hezbollah, a non-state actor, as opposed to the Lebanese Armed Forces.⁶¹

In 2006, the UN Commission's view⁶² classified the 2006 conflict between Hezbollah and Israel as an International Armed Conflict (IAC), based on Hezbollah's status as a recognized political party with government representation, its inferred link with the Lebanese government as a resistance movement, and the direct hostilities against Lebanon, including a maritime blockade and attacks on civilians and infrastructure. Also, the legal test of 'overall control' established by the ICTY in the Tadic case for classifying conflicts⁶³ has determined that an armed group 'belongs' to a State, when there is a relationship of dependence and allegiance, and overall control by the State, which includes coordinating and planning military activities but not necessarily issuing specific orders. By this definition, the conflict between Israel and Lebanon qualifies as an IAC. In addition, the International Committee of the Red Cross (ICRC) asserts that an IAC exists whenever one state resorts to armed forces against another, regardless of the intensity and duration. While Hezbollah is an integral part of Lebanese society and government, the mere suggestion of links between Hezbollah and the Lebanese State does not automatically classify the conflict as international, as it depends on whether the conditions of the 'overall control' test are met. Applying a similar analysis to the 2024 Lebanese-Israeli conflict, the relationship between Hezbollah and the Lebanese State does not meet the test threshold. The conflict between Israel and Hezbollah is a Non-International Armed Conflict (NIAC) due to the protracted armed violence. However, Israel's targeting of Lebanese State infrastructure, civilians, and civilian objects suggests

⁶⁰ This escalation is set against the backdrop of a deadly Israeli offensive on Gaza, which has resulted in over 40,100 deaths since October 2023 following an attack by Hamas.

⁶¹ CBS News, 'Israel-Hezbollah ceasefire takes effect, halting deadly war in Lebanon' (27 November 2024) <https://www.cbsnews.com/news/israel-hezbollah-ceasefire-netanyahu-war-lebanon-gaza-hamas/> accessed 1 December 2024.

⁶² United Nations, 'Report of the Commission of Inquiry on Lebanon pursuant to Human Rights Council resolution S-2/1' (23 November 2006) <https://www.ohchr.org/en/hr-bodies/hrc/iic-lebanon/index> accessed 1 December 2024.

⁶³ International Criminal Tribunal for the former Yugoslavia (ICTY), Prosecutor v Dusko Tadic (Appeal Judgment) IT-94-1-A, 15 July 1999 <https://www.refworld.org/cases,ICTY,40277f504.html> accessed 1 December 2024.

that Israel resorted to armed forces against the State of Lebanon, thus indicating the existence of an IAC.⁶⁴

IHL and International Human Rights Law (IHRL) offer essential frameworks for understanding and regulating armed conflicts. A key component of IHL is the Geneva Conventions of 1949, particularly Common Article 3, which pertains to NIAC. This article mandates humane treatment for all individuals who are not actively participating in hostilities and includes strict prohibitions against violence to life and person, as well as the taking of hostages. This provision is especially significant in conflicts involving non-State actors such as Hezbollah.⁶⁵ In circumstances where IHL may not be fully applicable, IHRL comes into play to regulate State conduct. With the growing frequency of NIACs and the prevalence of prolonged belligerent occupation, different branches of PIL are becoming more interconnected. The effects of NIACs on civilian populations are profound, making it understandable that IHRL is increasingly regarded as an essential tool for bolstering the protection of civilians in these circumstances.⁶⁶ For instance, the ICCPR mandates that States respect and ensure the rights of all individuals within their territory and under their jurisdiction, even amid armed conflict. Article 6 of the ICCPR, which safeguards the right to life, is particularly relevant regarding Israel’s use of sonic booms and other military actions that affect civilian populations.⁶⁷ Although these legal frameworks are significant, discussions surrounding the conflict frequently neglect the full spectrum of human rights law. This gap highlights the necessity for a holistic legal approach that merges both IHL and IHRL to guarantee the protection of civilians and respect of international standards.⁶⁸

The utilization of sonic booms is indicative of a larger strategy rooted in “psywar.” By frequently violating Lebanese airspace, Israel sought to instill a persistent sense of fear and uncertainty among the populace. Lawrence Abu Hamdan,⁶⁹ a sound specialist and the founder of Earshot—an organization

64 Hussein Badreddine, ‘Israel, Hezbollah, and Lebanon: A Tripartite Conflict?’ (Opinio Juris, 18 September 2024) <https://opiniojuris.org/2024/09/18/israel-hezbollah-and-lebanon-a-tripartite-conflict/> accessed 1 December 2024.

65 Human Rights Watch, ‘How Does International Humanitarian Law Apply in Israel and Gaza?’ (27 October 2023) <https://www.hrw.org/news/2023/10/27/how-does-international-humanitarian-law-apply-israel-and-gaza> accessed 1 December 2024.

66 In 1968, the UN launched an initiative at the Tehran Conference on Human Rights to uphold human rights during armed conflicts. The aim was to extend IHRL to better protect civilians and detainees. This led to various international agreements and resolutions establishing a specific branch of IHRL for emergencies and armed conflicts. As a result, IHRL bodies began addressing alleged human rights violations, initially focusing on civil wars and later on international conflicts, involving entities such as the UN Treaty Bodies and regional human rights courts.

67 United Nations, International Legal Protection of Human Rights in Armed Conflict (2011) https://www.ohchr.org/sites/default/files/Documents/Publications/HR_in_armed_conflict.pdf accessed 1 December 2024.

68 AP News, ‘The Israel-Hezbollah war by the numbers’ (26 November 2024) <https://apnews.com/article/israel-lebanon-war-numbers-hezbollah-military-6f1a651ebba0a88fbd7ca59a57acd1e> accessed 1 December 2024.

69 Lawrence Abu Hamdan, is a contemporary Jordanian artist residing in Beirut. His work investigates the political implications of listening, utilizing different types of audio to examine its impact on human rights and legal matters. Due to his expertise in sound, Abu Hamdan has served as an expert witness in asylum hearings in the United Kingdom. See, Abu Hamdan, Official Website <http://lawrenceabuhamdan.com/> accessed 4 December 2024; Laurence Abu Hamdan, ‘Earshot’ (Tate Modern, 2016) <https://www.tate.org.uk/whats-on/tate-modern/exhibition/turner-prize-2019/lawrence-abu-hamdan> accessed 4 December 2024; Laurence Abu Hamdan, ‘The Freedom of Speech Itself’ (2012) <https://www.forensic-architecture.org/investigation/the-freedom-of-speech-itself> accessed 4 December 2024.

dedicated to analyzing audio to identify human rights violations and instances of State violence—has extensively documented and illuminated the profound impact of this tactic. Abu Hamdan noted that following the 2006 war between Hezbollah and Israel, Israeli fighter jets have repeatedly transgressed Lebanese airspace, generating sonic booms that serve to intimidate civilians. This phenomenon functions as an “acoustic reminder” of Israel’s daunting military capabilities. The noise from military jets and other sounds of blasts can re-traumatize populations that have survived previous explosions and wars. These sonic booms are not simply loud noises; they are intentionally employed to instill fear and anxiety among the Lebanese population. The psychological impact is significant, as these sounds can evoke memories of past traumas, such as the devastating Beirut port explosion in 2020.⁷⁰ This re-traumatization can lead to heightened stress, anxiety, and other mental health challenges among civilians. Beyond their immediate psychological effects, the systematic deployment of sonic booms can have far-reaching consequences for civilian well-being. According to several medical studies,⁷¹ exposure to such loud and sudden noises may heighten the risk of cardiovascular problems. Over time, recurring jet and blast sounds may increase cardiovascular stress, and drain calcium deposits in the heart. This stresses the urgent need for international awareness and intervention to address these tactics and their detrimental impact on civilian populations.⁷²

There are at least three reasons why Israel employs this technique. Firstly, Israel aims to assert its air superiority over Lebanese skies, reminding Hezbollah of their dominance. Secondly, the psychological impact is significant. The goal is to demoralize Hezbollah’s supporters and instill fear. Thirdly, and less commonly known, breaking the sound barrier aids in detecting enemy radars. Hezbollah’s radar systems can detect Israeli planes or missiles through various means, including heat, emitted communications, and sound. By breaking the sound barrier, an Israeli pilot can trigger Hezbollah’s radar, revealing their equipment and transmissions.⁷³ About this latter reason, and from the perspective of IHL, the legality of Israel’s employment of sonic booms is contingent upon the underlying intent and primary purpose associated with this military tactic. Article 51(2) of AP I to the Geneva Conventions expressly prohibits “acts or threats of violence, the primary purpose of which is to spread terror among the civilian population.” The Arms Trade Treaty (ATT) regulates the international trade of conventional weapons to prevent misuse and reduce human suffering. While it does not explicitly address sonic warfare, its principles apply. The ATT requires states to assess weapons exports to ensure they are not used for human rights abuses or violations of IHL, which can include sonic weapons. It emphasizes responsible

70 RNZ, ‘The Israeli military has repeatedly used fighter jets to create sonic booms over Beirut, some say it’s psychological warfare’ (22 September 2024) <https://www.rnz.co.nz/news/world/528665/the-israeli-military-has-repeatedly-used-fighter-jets-to-create-sonic-booms-over-beirut-some-say-it-s-psychological-warfare> accessed 1 December 2024.

71 See for more information, The UT Southwestern Medical Center studies (www.utswnmed.org) which explain the impact of sound waves on cardiovascular health. See also the Centers for Disease Control and Prevention (CDC) (www.cdc.gov) studies which discuss how noise pollution can increase the risk of heart diseases.

72 Ibid.

73 Al Jazeera, ‘Sonic booms – the psychological warfare Israel uses to sow fear in Lebanon’ (10 August 2024) <https://www.aljazeera.com/features/2024/8/10/sonic-booms-the-psychological-warfare-israel-uses-to-sow-fear-in-lebanon> accessed 1 December 2024.

arms transfers and establishes common international standards, ensuring emerging technologies like sonic weapons receive the same scrutiny and control.⁷⁴

Consequently, for an action to be deemed unlawful under this provision, its principal aim must be the instillation of fear and terror among civilians. Should Israel reasonably assert that the primary purpose of utilizing sonic booms is to detect Hezbollah’s radar installations, this assertion could constitute a legitimate military objective. The ability to detect and neutralize enemy radar systems is a recognized military necessity, as such capabilities enhance operational effectiveness and safeguard Israeli aircraft from potential targeting. In this context, the utilization of sonic booms would not primarily be aimed at inducing terror within the civilian population, but rather at fulfilling a specific military objective. Nevertheless, even if the primary intent is fulfillment of military objectives, the use of sonic booms remains subject to compliance with other fundamental principles of IHL, particularly the principles of proportionality and distinction. The principle of proportionality, as delineated in Article 51(5)(b) of AP I, mandates that any incidental harm to civilians and civilian objects must not be excessive concerning the concrete and direct military advantage anticipated. Also, the principle of distinction, enshrined in Article 48 of AP I, obliges parties to a conflict to always differentiate between civilian objects and military objectives.⁷⁵ Therefore, while the detection of enemy radar installations could potentially justify the use of sonic booms from a military perspective, Israel must ensure this tactic does not result in disproportionate harm to civilians or civilian infrastructure. Moreover, the psychological impact on the civilian population, including the risk of re-traumatization and long-term mental health effects, necessitates careful consideration and must be weighed against the expected military advantages. The legality of Israel’s use of sonic booms under IHL depends on the intent behind the tactic and adherence to proportionality and distinction principles. If the aim is to locate military targets, Article 51(2) of AP I may not apply, but compliance with other IHL principles is essential.⁷⁶

Conclusion

The use of sonic warfare against civilians is a multifaceted subject that interconnects with various legal and ethical principles of general international and humanitarian law. The legality of such practices must be examined in light of the fundamental rules of armed conflict governing the means and methods of warfare, which prioritize the protection of civilians and prohibit weapons that cause unnecessary suffering and have indiscriminate effects. While specific treaties on sonic warfare are not yet established, existing frameworks such as the Arms Trade Treaty and the Geneva Conventions provide a basis for evaluating the permissibility of these methods. The IHL fundamental principles of distinction and proportionality maintain that civilians must be kept aside from war hostilities, and prohibit the means or methods of warfare from causing unnecessary suffering or redundant harm. Sonic weapons,

74 Arms Trade Treaty (adopted 2 April 2013, entered into force 24 December 2014) UNGA Res 67/234B (2013).

75 International Committee of the Red Cross (ICRC), ‘Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I)’ (1977) <https://ihl-databases.icrc.org/ihl/INTRO/470> accessed 1 December 2024.

76 Ibid.

and in particular sonic booms used by a party in an international armed conflict as a tool of terror against civilians, defy by their very nature these principles, because of the indiscriminate and long-term harmful effects they have on civilians.

It is recommended that the international community assess seriously and precisely the legal status of sonic weapons under existing frameworks of PIL and verify their compliance with IHL, to ensure the strict regulation of their use and compliance with principles of humanity and the commands of public conscience. Also, the development, disposition, and use of such weapons should be transparent and subject to public inspection to avert mismanagement and respect the principles of humanity and the rule of law. To this end, States should engage in an effective dialogue and cooperate to set explicit norms and regulations. As warfare technology progresses, the international community must remain cautious and proactive in dealing with these new encounters to safeguard and protect civilians, human rights, and the preservation of international peace and security.

Undeniably, threats infringing the State's airspace sovereignty, which bans any exercise of power within its legal area, are proscribed by PIL and IHL. Violations of airspace sovereignty are seen as acts of aggression or breaches of international law, triggering military responses. When they take the form of sonic booms, they become a tool of psychological warfare, targeting civilians and military personnel who are *hors de combat* and are likely to cause harm. Lebanon has undergone the worst of this psychological warfare. The international community needs to take immediate action to ease the grief and create a future free from fear and suffering. Drawing from this case, future interventions should emphasize early prevention of provocative actions between conflicting parties, coupled with enhanced protection frameworks for vulnerable populations who may face displacement and the subsequent challenges of rebuilding their lives. Qatar has played a major role in mediating this regional conflict by using its economic strength and strategic position to promote dialogue. This role has facilitated significant resolutions, particularly in Lebanon, where Qatar provided crucial financial aid to the Lebanese army amid ongoing clashes between the Israeli military and Hezbollah.

Sonic boom as a tool of terror on civilians is a prohibited method of warfare that neither respects the rule of 'advance warning' nor the principles of distinction and proportionality. While the precise vertical extent of territorial airspace is still unsettled, an international ethical framework for psychological wars and a strong statute governing all aspects of international aviation law remain a key necessity.

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