ANNEX E

SSAC REPORT – Scotland's Space Sector: Exploring potential future opportunities

A brief overview of the Industrial Strengths of the Scottish Space Sector

Introduction

The Industrial Space Sector in Scotland has been established over the last twenty years and, while still young, is rapidly expanding and diversifying. Largely dominated by SMEs, it is a mixture of hardware, mainly small satellites, and software companies offering products and services in the sector's upstream and downstream technology areas.

This document is not intended to be a comprehensive record of all relevant companies and organisations in the Scottish Space sector but rather a snapshot of the main areas of activity and focus with examples used to emphasise the areas of strength on the industrial side of the ecosystem. The introduction/summary is followed by a more detailed listing of some of these companies and their capabilities and expertise.

Definitions

"Upstream" sector refers to the transportation of objects into space and their operation, ground stations and space exploration.

"Downstream" sector refers to data and services derived from the upstream sector.

"Enabling Technologies" are general-purpose or "building block" technologies, arising from advanced science and engineering that allow the creation or improvement of products and services across a wide range of applications and sectors.

Upstream

The upstream sector in Scotland is heavily weighted towards small satellite manufacture. Starting with the formation of Clyde Space in 2005 (now **AAC Clyde Space***) designing and manufacturing nanosatellites such as CubeSats and then supplemented by multinational **Spire** locating a European office in Glasgow in 2015, also designing and manufacturing small satellites. **Alba Orbital** was founded in 2012 in Glasgow and manufacture picosatellites (<1kg).

**Clyde Space was acquired by Swedish company AAC Microtec AB in 2018.*

Several companies support the development of Ground Station technologies, especially in areas such as antenna design and manufacture. These include **Celestia**, **Sofant Technologies** and **Infinect**.

Supporting the upstream sector are launch sites. There are currently 5 sites being built across Scotland:

> **Saxavord Space Port** in Shetland will launch rockets with payloads up to 1.5 tonnes into Sun-Synchronous, Polar and High Inclination orbits (30 per year). Launch services will be supported by **Lockheed Martin** and **ABL Systems** along with **Hyimpulse UK**, a Shetland-based subsidiary of a small orbital launcher developer from Germany.
>
> **North Uist Space Port 1** is based at the former **Qinetiq** missile test site in the Outer Hebrides. It will offer vertical launches – mainly sub-orbital with payloads less than 100kg.

Prestwick Space Port in Ayrshire will offer horizontal launch within an established commercial airport. The launch partner is **Astraius**. Services will include air launch of satellites up to 800kg, microgravity flights and hypersonic flight services.

Machrihannish Space Port in Argyll will offer horizontal and vertical launch with variable payloads mainly for Sun-Synchronous and Polar orbits.

Sutherland Space Port in the north of the Scottish mainland aims to be the world's first carbon neutral spaceport offering vertical launch with payloads less than 500kg.

There are two manufacturers of small vertical launch vehicles in Scotland. The Launch partner for Sutherland Space Port is **Orbex**, based in Forres, who manufacture two-stage rockets capable of taking 150kg payloads using bio-propane fuel.

Another Scottish company, manufacturing small vertical-launch vehicles, is **Skyrora** based in Edinburgh and Cumbernauld. They are developing the XL rocket, which will stand 22m high, with 3 stages, and capable of taking 315kg payloads to Low Earth Orbit.

A new entrant to the upstream sector in Scotland is Mangata Networks. Originally targeted for £84 million in collaborative funding, this large inward investment was expected to create 600 jobs at Prestwick Aerospace Park to manufacture telecoms satellites for MEO and HEO orbits providing 5G connectivity across the world, including the manufacture of edge-processing data centres. While latest reports suggest that the manufacturing centre is unlikely to proceed, there are still plans for a dedicated R&D Centre, and to manage the satellite operations and cloud services, in Scotland.

Downstream

Currently the downstream space sector in Scotland can be broadly separated into companies working with Earth Observation data and companies offering specialist software services for space applications.

Mainly based in Edinburgh and the East of the country, examples of companies working in Earth Observation include **Econometrica**, who use EO data to inform clients about climate impact; **Global Surface Intelligence**, who's management platform is used to assess and measure natural resource data for forestry, agriculture and land use; **Space Intelligence**, providing data on forest coverage and carbon storage for climate change mitigation; **Trade in Space**, who use remote sensing data and machine learning for smart contracts and commodity trading; **Earth Blox**, who offer a EO data software analysis platform for climate and nature reporting requirements; and **Hypervine**, who use satellite data to monitor construction and mining assets across the globe.

Examples of companies providing speciality software services for the Space sector include **Bright Ascension**, offering software for satellite mission development and operation; **AstroAgency**, a marketing intelligence and communications company specialising in commercial space applications, **Craft Prospect**, offering space engineering services and Quantum Key Distribution solutions; **Scotspace**, an infrastructure development and operations company; **Responsive Access**, offering launch brokerage and consultancy; and **ThinkTank Maths**, who provide space traffic management solutions.

Supply Chain

The Scottish supply chain for space hardware manufacturing is very varied with many companies providing products and manufacturing services for the sector. Some examples include **Alter Technology** in Livingston, who provide specialist integration, assembly and packaging solutions for

optoelectronics, microelectronics and MEMS technologies; **Honeywell Aerospace**, a leader in production of space-qualified passive microwave and electronic sub-systems; and **WL Gore**, a manufacturer of cable and interconnects for spacecraft.

Compliance & Testing Services

There are several locations in Scotland offering testing services to the Scottish Space sector. **Smiths Interconnect** in Dundee have a dedicated testing lab simulating the extreme conditions of space to assure they can withstand launch and orbit. Other examples of test facilities include **Eurofins Electrical & Electronic UK Ltd** based at Grangemouth, who provide compliance, certification and testing for electrical and electronic products including aerospace/defence EMC testing. EMC testing is also available at **Forth EMC** in South Queensferry. The **Higgs Centre for Innovation** (part of STFC-UKRI) has cleanroom test and integration facilities including environmental and functional testing aimed at satellite manufacturers. Many of the universities offer commercial access to specialist test and laboratory equipment. A searchable and bookable database for this is available online at **ULab** (www.ulabequipment.com). Some of the companies working the Defence sector have test facilities including accelerated life testing which can be accessible to other organisations. For example**,** **Leonardo UK Test House** in Edinburgh.

Enabling Technologies

An area of significant strength for the Scottish Space ecosystem is in Enabling Technologies which feed both directly and indirectly into the Space sector.

Examples of this include **Photonics**, **Quantum Technologies**, **Robotics & Automation**, **Communications Technologies**, **Sensing & Imaging Systems**, **Signal Processing and Data Analytics**, **Nanotechnology** & **Compound Semiconductors**, **Advanced Manufacturing**, **Industrial Design**, **Cybersecurity**, **Engineering Biology** & **Industrial Biotech**, **Sustainable Food Production** (including **Hydroponics**), plus a thriving **Human Health & Life Sciences** sector.

Examples of supporting organisations in Enabling Technologies include **the Fraunhofer Centre for Applied Photonics, Technology Scotland**, **National Manufacturing Institute of Scotland**, the **Lightweight Manufacturing Centre**, **The Data Lab**, **CENSIS**, the **National Robotarium**, **James Watt Nanofabrication Centre**. In biotechnology, support can be found at **iBioIC;** In human health at **Digital Health Institute**, and **Precision Medicine Scotland**.

Defence

In Scotland the Defence sector is largely multi-national with companies such as **Leonardo**, **Thales** and **Raytheon** all working on space-related developments although most of this activity is outside of Scotland. **Lockhead Martin** is partnering with ABL Space (California) for launch services in Shetland. The UK is setting up **UK Space Command**, based at RAF High Wycombe, which will utilise Scottish launch sites.

Cluster Organisations

Space Scotland is the main industrial cluster organisation for the Space sector in Scotland based at the Royal Observatory in Edinburgh and promoting the interests of stakeholders. Publications of Space Scotland include “The Space Scotland Sustainability Roadmap”. Academic interests are represented by the **Scottish Space Academic Forum**. There is a grassroots online network for news sharing and information called the **Scottish Space Network**. The **Scottish International Space Advisory Committee** (SISAC) consists of members of the Scottish Government’s GlobalScot

programme – a network of Scots in business around the world – who have come together voluntarily to provide advice and identify opportunities in the sector.

Scottish Space Strategy

Produced in 2012, the Scottish Space Strategy aims to secure a £4 billion share of the global space market for the Scottish economy. The main features of the strategy include the development of the space infrastructure and research environment, consolidation of Scotland as a UK location for space technology development, supporting the Scottish launch sector, alignment with Net Zero ambitions, growing the customer base for end-to-end solutions locally and globally, and collaborating with agencies in the UK and worldwide.

Scottish Space Cluster:

Key Stakeholders:

Space Scotland, Scottish Government Space Group, Scottish Space Academic Forum, Scottish Enterprise, Scottish Development International, UK Space Agency, European Space Agency, Innovate UK, Skills Development Scotland, Highlands and Islands Enterprise, Scottish International Space Advisory Committee, Scottish Affairs Committee, UK Space Agency, Satellite AppIlcations Catapult, Aerospace Defence Security Space.

Launch:

- SaxaVord (Vertical Launch Site and Ground Station)
- Orbex (Small Vertical Launch Vehicle Manufacturer)
- Space Port Sutherland (Vertical Launch Site)
- Skyrora (Small Vertical Launch Vehicle Manufacturer)
- Glasgow-Prestwick Space Port (Horizontal Launch Site)
- Astraius (Horizontal Launch Vehicle Manufacturer)
- Spaceport Machrihanish (Horizontal, Vertical and High-Alititute Platform Launch Site)
- Spaceport 1 (Vertical Launch Site)
- HyImpulse (Hybrid Propulsion Launch Technology/Capabilities)

Upstream:

Satellite Production:

- Mangata
- AAC Clyde Space
- Spire
- Alba Orbital

Ground Stations:

- Celestia
- Sofant Technologies
- Infinect

Upstream Supply Chain:

- Star Dundee
- WL Gore
- Smiths Interconnect
- M Squared Lasers
- Alpha Data

- Walker Precision
- ALTER Technology
- Rhea Space Activity
- Plexus Corp

Downstream:

Earth Observation:

- Ecometrica
- Global Surface Intelligence
- Space Intelligence
- Trade in Space
- Earth Blox
- Hypervine
- SpaceAye
- EarthWave
- Weather Stream

Software and Services:

- Bright Ascension
- ThinkTank Maths
- Scotspace
- AstroAgency
- Responsive Access
- Craft Prospect
- Krucial (R3 IOT)
- Brainnwave
- Niras UK

Aerospace and Defense:

- Leonardo
- Thales Grou
- Raytheon

LAUNCH

SaxaVord Limited:
Company No: #SC306164
Enterprise Size: Medium
Incorporation/Registration: 2006/Scotland
Company Website: https://saxavord.com/
Company (current) Status: Private
Contact: Scott Hammon, Operations Director, scott.hammond@shetlandspacecentre.com
Additional Information:

Description:
SaxaVord is an operator of a developing vertical launch site and ground station, based on Lamba Ness in Unst – Shetland (Scotland) [1]. Having received ~£100 million GBP in investment (over 5 year period), SaxaVord aims to launch small rockets (payloads up to 1.5 tonnes) into sun-synchronous, polar and high inclination orbits. SaxaVord, and its partners, estimate ~30 launches per year, with the first planned to take place at the end of 2023 [2]. Beyond its launch site capabilities, SaxaVord's ground station will also provide storage facilities (fuel, pyrotechni, etc.), control centres (launch and range), off-site offices, the ability to transmit and receive ground station 5M SX and KA bands, and space situational awareness [3]. Scottish-based Hylmpulse, a launch company working SaxaVord and Orbex, has recently been awarded £3 million GBP in funding from the UK Space Agency, supporting spaceflight activities [4]

References:

1. SaxaVord UK Space Port Webpage: https://saxavord.com/
2. Rocket Factory Augsburg's first launch to take place from SaxaVord Spaceport [Link]
3. LAUNCH UK: A guide to UK spaceports: [Link]
4. UK Space Agency funding boosts plans for launch from SaxaVord Spaceport and Sutherland Spaceport [Link]

Orbex (Orbital Express Launch Limited):
Company No: #09580714
Enterprise Size: Medium
Incorporation/Registration: 2015/England
Company Website: https://orbex.space/
Company (current) Status: Private
Contact: sutherlandspaceport@orbex.space
Additional Information: Orbex is formerly known as Moonspike Limited (May 2015 – Jan 2016).

Description:
With headquarters and manufacturing faciltiies in Forres (north-east Scotland), and design facilities in Denmark, Orbex is Europe's leading orbital launch services company and has raised over £38 million GBP to date [1]. Orbex offers a low cost launch service for the small, micro and nano satellite industry and has developed Orbex Prime: a low carbon, high performance micro-launch vehicle. Orbex Prime is a two-stage rocket that is ~19 meters in height and capable of carrying payloads up to 150 kg into a 500 km sun-synchronous orbit (i.e., LEO). Orbex Prime utilises a more sustainable fuel known as BioLPG (bio-propane). Orbex has partnered with Sutherland Spaceport Ltd (*see additional information below*), using their vertical launch site in Sutherland (northern Scotland) to facilitate up to 12 orbital rocket launches per year for the deployment of satellites into Earth's orbit [2]. They aim to be the world's first carbon neutral spaceport. An example of how they plan to achieve this is through re-using the peat lifted during construction to repair other large already degraded peatland in different areas. Orbex will direct the construction and hold full operation management of this facilitiy, expected to support ~ 250 new jobs (40 high-quality on-site jobs and > 200 jobs in the wider region including manufacturing and supply chain opportunities) [3]. Orbex has recently received £3.3 million GBP from the UK Space Agency aimed at ensuring their space-related activities are environemntally sustainable [4].

Sutherland Spaceport Ltd:
Company No: #SC682509
Incorporation/Registration: 2020/Scotland
Contact: sutherlandspaceport@orbex.space
Additional Information: Space Hub Sutherland has a payload capacity of < 500 kg. This Spaceport houses a launch control centre, launch integration and assembly facility, antenna farm, and launch pad with commodity farm [3]

References:

1. Orbex Webpage: https://orbex.space/
2. Construction Begins at Sutherland, the UK Mainland's First Vertical Launch Spaceport [Link]
3. LAUNCH UK: A guide to UK spaceports: [Link]
4. UK Space Agency funding boosts plans for launch from SaxaVord Spaceport and Sutherland Spaceport [Link]

Skyrora:
Company No: #SC569511
Enterprise Size: Medium
Incorporation/Registration: 2017/Scotland
Company Website: https://www.skyrora.com/
Company (current) Status: Private
Additional Information: Previously known as Space Alba (Jun 2017 – Aug 2017)

Description:
Skyrora is private launch vehicle services company capable of designing, manufacturing and deploying small vertical launch rockets/vehicles [1]. Skyrora have developed the XL rocket, a ~22 meter – three-stage rocket, capable of carrying a payload (up to 315kg) into sun-synchronous LEO. The third stage of Skyrora's XL rocket features an Orbital Transfer Vehicle (OTV). This OTV can relight up to 15 times in space, allowing for the vehicle to navigate in space and maintain/replace orbiting satellites. Once payload has been delivered, the OTV can subsequently be used as a 'space tug' that can latch to non-operational satellites, de-orbitting them and reducing space debris. Skyrora's rockets use Ecosene rocket fuel, a high-grade kerosene made of waste plastics. Skyrora have also developed a recycling method for this fuel, further highlighting their sustainability efforts. Skyrora has a multi-launch agreement in place with SaxaVord Spaceport to launch their XL rockets in Shetland (Scotland). They aim to carry out 16 launches per year by 2030.

References:

1. Skyrora webpage: https://www.skyrora.com/
2. Skyrora Ecosene Rocket Fuel: https://www.skyrora.com/ecosene/
3. SKYRORA AGREES MULTI-LAUNCH DEAL WITH SHETLAND SPACEPORT FOR THE NEXT DECADE [Link]

Glasgow Prestwick Spaceport (part of Glasgow Prestwick Airport Limited):
Company No: #SC135362
Enterprise Size: Very Large
Incorporation/Registration: 1991/Scotland
Company Website: https://www.glasgowprestwick.com/business/spaceport/
Company (current) Status: Acquired/Merged
Contact: Mick O'Connor, Prestwick Spaceport Programme Director, mick@haelo.io
Additional Information: Company information relates to Glasgow Prestwick Airport Ltd, and not specifically Prestwick Spaceport. Zoe Kilpatrick is the commercial director at Glasgow Prestwick Airport.

Description:
Glasgow Prestick Spaceport offers horizontal launch services within an already well established commercial airport near Glasgow (Scotland), connected by air, road, train and sea [1]. Prestwick is therefore a well connected base and over 50% of Scotland's aerospace workforce are already being employed at Prestwick. With launch partner/service provider Astraius, the first commercial launch is planned for late 2023 [2-4]. By 2035, this spaceport plans to provide air launch of satellites up to 800kg, as well as microgravity and hypersonic flight services. Not only is Glasgow Prestwick Airport an infrastructure that supports more than 4,000 jobs in the west of Scotland already, but Prestwick Spaceport is considered to play a vital role in the creation of up to 4,000 more jobs (locally) associated with the aerospace and space sector in Scotland; supporting by £80 million GBP in investment. This site will also house several R&D and manufacturing companies in the space industry, adding to its strong existing aerospace presence (BAE systems, Collins Aerospace, GE, National Air Traffic Services, Spirit Aerosystems) [5].

References:

1. Glasgow Prestwick Spaceport Webpage: https://www.glasgowprestwick.com/business/spaceport/
2. "Ready for take-off" as Prestwick Spaceport takes a giant leap forward in rocket launches [Link]
3. Astraius Webpage: https://www.astraius.com/
4. South Ayrshire Council – Prestwick Spaceport Episodes: 1 [Link], 2 [Link], 3 [Link], 4 [Link], 5 [Link]
5. LAUNCH UK: A guide to UK spaceports: [Link]

Astraius Limited:
Company No: #12853584
Enterprise Size: Small-Medium
Incorporation/Registration: 2020/England
Company Website: https://www.astraius.com/
Company (current) Status: Private
Contact: Webpage 'Contact Us' Page: https://www.astraius.com/contact/
Additional Information: See Glasgow Prestwick Spaceport section (above) for complementary information, including relevant contact detail(s).

Description:
With its global headquarters based in Glasgow Prestwick Spaceport (Scotland), Astraius are a horizontal launch services company with already proven launch capabilities [1]. Utilised succesfully by the US Government, Astraius are using the C-17 Globemaster transport aircraft as their horizontal air-launch platform – facilitating the safe delivery of satellites (up to 800 kg) to a sun-synchronous low-earth orbit. Collaborating alongside Spirit Aerosystems (also based within Prestwick's space cluster) to advance/accelerate the development of the Astraius horizontal launch platform, Astraius are estimated to begin launching satellites in 2025 from Prestwick Spaceport [2]

References:

1. Astraius Webpage – Launch Services: [Link]
2. Spirit AeroSystems, Astraius join forces to boost UK launch ambitions: [Link]

Spaceport Machrihanish (Discover Space UK Limited):
Company No: #SC499199
Enterprise Size: Small-Medium
Incorporation/Registration: 2015/Scotland
Company Website: www.discoverspaceuk.com
Company (current) Status: Private
Contact: enquiries@maccdl.co.uk
Additional Information:

Description:
Based out of Spaceport Machrihanish in Argyll & Bute (Scotland), Discovery Space UK Ltd is a commercial launch service operator supporting small-scale rocket launches and spaceflight operations [1-2]. This spaceport offers the potential for horizontal, vertical and high-altitute platform vehicle launch into both sun-synchronous and polar orbits (i.e., LEO). Negotiations with launch providers are on-going.

References:

1. Discover Space UK Webpage: www.discoverspaceuk.com
2. LAUNCH UK: A guide to UK spaceports: [Link]

Spaceport 1:
Company No: #SC573404
Enterprise Size: Small
Incorporation/Registration: 2017/Scotland
Company Website: *in development*
Company (current) Status: Private
Contact: Allison MacCorquodale - alisonmaccorquodale@cne-siar.gov.uk, Mark Roberts - mark@reflectsolutions.com
Additional Information: Commiunity Interest Company (CIC)

Description:
Spaceport 1 represents a commercial sub-orbital vertical launch spaceport at Scolpaid in North Uist (Scotland) [1]. Compared to other previously described spaceports, Spaceport 1 is at an early phase in development. However, this spaceport aims to provie permanent infrastructure for the launch of sub-orbital sounds or research launch vehicles; a class of vehicle that does not enter Earth's orbit but is capable of operativing above the stratosphere. This site to be designed in a way that is daptable and flexible to customers, providing access to: sub-orbital launch vehicles, working accommodation, assembly facilities, licensed storage, range services and launch communciations networks [1]. Spaceport 1's project is to be supported by up to £1 million GBP from the Scottish Government [2].

References:

1. LAUNCH UK: A guide to UK spaceports: [Link]
2. Spaceport 1: [Link]

Hyimpulse UK Limited:
Company No: #SC684332
Enterprise Size: Medium (parent company, set up in 2018)
Incorporation/Registration: 2020/Scotland
Company Website: https://www.hyimpulse.de/en/
Company (current) Status: Private
Contact: contact@hyimpulse.de
Additional Information:

Description:
Hyimpulse is an aerospace launch company focused on enabling (cost-effective and rapid) access to space through development of mini-launchers for satellites, orbital launchers, sounding rockets, hybrid rocket motors and other related products that support acess to space. Hyimpulse are enabling access to space (sub-orbital and orbital) utilising their hybrid rocket propulsion technology. Hyimpulse successfully tested a full scale 75kN flight rocket motor in 2020 and 2021, the largest and most advanced hybrid motor to ever be tested in Europe (currently in operation worldwide). The role of the UK office, based in the Bayes Centre at Edinburgh University, is to support development of this technology as well as support operations at the SaxaVord spaceport in Shetland – receiving over £3 million GBP in funding from the UK Space Agency [2-3].

References:

1. Hyimpulse Webpage : https://www.hyimpulse.de/en/
2. UK Space Agency funding boosts plans for launch from SaxaVord Spaceport and Sutherland Spaceport [Link]
3. New Member: aerospace company HyImpulse [Link]

UPSTREAM

SATELLITE PRODUCTION

Mangata Networks Limited:
Company No: #12484210
Enterprise Size: Medium
Incorporation/Registration: 2020/England
Company Website: https://www.mangatanetworks.com/services
Company (current) Status: Private
Contact: brian@mangatanetworks.com (CEO), more@mangatanetworks.com
Additional Information:

Description:
The nature of Mangata's business is wireless telecommuncations activities [1]. Mangata is a satellite-enabling cloud services company that aims to facilitate high-speed, continous connectivity to everyone on the planet through its constellation/network of medium and high earth orbit (MEO;B2 / HEO;B1) satellites. Compared to lower earth orbit (LEO), MEO/HEO is believed to give Mangata a more optimal cost/coverage advantage, with edge processing (carried out by MangataEdge™ micro data centres) offseting any latency associated with MEO/HEO. Mangata signed a partnership in December 2022 with public sector partners worth ~£83.7 million GBP, including Scottish Enterprise, Scottish Government, UK Government and South Ayrshire Council [2]. This investment enables Mangata to build a manufacturing facility at Prestwick International Aerospace Park (Scotland), where they plan to manufacture and deploy ~ 80 medium class satellites (< 625 kg in mass, 10-year mission life) every year, over a 10-year timeline. Mangata will also manage/operate its satellite systems and global network from Prestwick. This operation is estimated to create 575 new jobs in Scotland, the majority of which are considered highly skilled technical engineering positions.

References:

1. Mangata Network Limited Website: https://www.mangatanetworks.com/services
2. Mangata Networks announces new space engineering, manufacturing, and operations hub in Prestwick. [Link]

Clyde Space Limited (part of the AAC Clyde Space AB Group):
Company No: #SC285287
Enterprise Size: Medium
Incorporation/Registration: 2005/Scotland
Company Website: https://www.aac-clyde.space
Company (current) Status: Private
Contact: Peter.JW.Anderson@AAC-clydespace.com (Peter Anderson – Chief Commercial Officer, AAC Clyde Space), aac.spacequest@aac-clydespace.com
Additional Information: AAC Clyde Space is a public company (STO:AAC), HQ – Sweden (Luis Gomes – CEO). In addition to Clyde Space Limited (Scottish Operations), AAC Clyde Space AB Group has five other reportable Operational) segments: AAC Clyde Space (Sweden), Hyperion Space (Netherlands), SpaceQuest (USA), Omnisys Instruments (Sweden), and AAC Space Africa (South Africa).

Description:
AAC Clyde Space specialise in small/nanosatellite technologies (CubeSat) and services. Utilising the satellites radio and laser communciation capabilities, AAC provide businesses, government and educational organisations access to high-quality real-time data from space (including precision farming, tracking of commercial shipping, weather forcasting, climate change observations) [1]. Small satellite manufacturing (particularly CubeSats) is a focus of the Glasgow operations, as well as providing turnkey space mission services and enabling space data communcation.

References:

1. AAC Clyde Space AB Group Webpage: https://www.aac-clyde.space

Spire Global UK:
Company No: #SC493745
Enterprise Size: Large (Spire Global Inc.)
Incorporation/Registration: 2014/Scotland
Company Website: https://spire.com/
Company (current) Status: Private
Contact: Peter@spire.com (CEO), Contact Us: https://spire.com/about-us/contact-us/
Additional Information: Spire Global UK are part of Spire Global Inc, a public company with headquarters in the USA (NYSE:SPIR, CEO – Peter Platzer).

Description:
Spire Global are a California satellite data company that has set up nanosatellite (CubeSats) design/manufacturing in Glasgow, Scotland [1-2]. Spire's global constellation of 'next-generation' weather satellites utilise radio communications to provide high-quality real-time data that can accurately monitor and predict weather forecasts, as well as track maritime and aviation patterns. Spire currently have 100 nanosatellites in operation providing earth obseration data to over 30 grounds stations globally.

References:

1. Spire Global Inc. Webpage: https://spire.com/
2. Why California satellite data company Spire chose to set up in Scotland: [Link]

Alba Orbital Limited:
Company No: #SC434130
Enterprise Size: Small
Incorporation/Registration: 2012/Scotland
Company Website: https://www.albaorbital.com/
Company (current) Status: Private
Contact: tom.walkinshaw@albaorbital.com (CEO), contact@albaorbital.com
Additional Information:

Description:
With the aim of 'demoncratising' access to space, Alba Orbital manufacture and support pico-satellite (PocketQube satellites) development [1]. Satellites provide real-time data through collecting earth observation information at intervals of minutes (as opposed to conventional satellited data capture, taking hours or days). PocketQube satellites developed thus far: Unicorn-1 (1P, 5x5x5 cm) and Unicorn-2 (2P, 5x5x10 cm) – weighing less than 1 kg. Alba Orbital has successful launched > 5 picosatellite missions into low earth orbit, working with multiple space companies including SpaceX [2].

References:

1. Alba Orbital Inc. Webpage: https://www.albaorbital.com/
2. Alba Orbital: News and Press Releases: https://www.albaorbital.com/

UPSTREAM

GROUND STATIONS

Celestia Technologies Group (UK) Limited:
Company No: #10756220
Enterprise Size: Celestria (UK) – Small, Celestia Parent Company – Medium
Incorporation/Registration: 2017/England
Company Website: https://celestia-tech.com/
Company (current) Status: Private
Contact: contact us page: https://www.celestia-uk.com/contact-1
Additional Information:

Description:
Celestia has a site in Edinburgh (Heriot-Watt University's enterprise park), developing electronic scanning antennas (active phase arrays) for ground stations. Celestia has built its own radio-frequency (RF) anechoic chamber hosting a spherical far field measurement capability. Celestia UK are part of the Celestia Tech Group and are focused on providing technical/cost-effective solutions in Satcoms, 5G, Position Navigation & Timing, and Software-defined Radio domains [1].

References:

1. Celestia UK Info Webpage: https://www.celestia-uk.com/

Sofant Technologies Limited:
Company No: #SC409777
Enterprise Size: Small
Incorporation/Registration: 2011/Scotland
Company Website: https://www.sofant.com/
Company (current) Status: Private
Contact: Contact us page: https://www.sofant.com/contact
Additional Information:

Description:
Utilising their radio-frequency microelectromechanical system (RF-MEMS), Sofant are focused on solving power consumption and heat dissipation issues associated with current satellite communications antenna systems (including electronically scanned antenna arrays) [1]. The development of Sofant's low power – low cost platform is being supported by ESA/UKSA funding (£6.2M) [2], aimed at commercialising their technology as a new generation of low-latency, super-fast satellite networks, enabling global wireless communications/connectivity.

References:

1. Sofant Technologies Webpage: https://www.sofant.com/
2. Sofant Technologies signs €7.3 million European Space Agency contract [Link]

Infinect Limited:
Company No: #14001369
Enterprise Size: Small
Incorporation/Registration: 2022/England
Company Website: https://infinect.space/
Company (current) Status: Private
Contact: info@infinect.space [Samuel Rothenberg, CEO/co-founder]
Additional Information:

Description:
Infinect have developed a flat panel antenna, knonw as INFINECT antenna [1]. INFINECT antenna is estimated to be 2x smaller, 3x faster and 10-15x cheaper than current comparable technologies/solutions. INFINECT antenna is capable of providing high-speed wireless connectivity to remote areas across the globe, supporting many sectors including IoT, maritime, rail, avionic, and national security (defence). Technology is 'patent pending' and is anticipated to be market ready in 2024.

References:

1. Infinect Limited Webpage: https://infinect.space/
2. Samuel Rotenberg, INFINECT – Enterprise Fellowships presentation September 2021: [Link]

UPSTREAM

SUPPLY CHAIN

STAR-Dundee Limited:
Company No: #SC230143
Enterprise Size: Medium
Incorporation/Registration: 2022/Scotland
Company Website: https://www.star-dundee.com/
Company (current) Status: Private
Contact: stuart.mills@star-dundee.com (CEO)
Additional Information:

Description:
STAR-Dundee is an aerospace engineering company that designs network (and related data handling technology) for use on-board of spacecrafts. A Dundee University spin-out (2002), STAR-Dundee support SpaceWire and SpaceFibre network standards (i.e., for spaceflight applications) through delivery of test and development equipment, chip designs and IP cores. SpaceWire is a spacecraft on-board data-handling network which connects instrumnets to the mass-memory, data processors and control processors. SpaceFibre is a multi-Gbits/s, on-board network technology for spaceflight applications, running over eletrical or fibre-optic cables. SpaceWire technology is current being used/designed for over 100 space missions already in orbit.

References:

1. STAR-Dundee Webpage: https://www.star-dundee.com/

WL Gore and Associates (UK) Limited:
Company No: #00856254
Enterprise Size: Large
Incorporation/Registration: 1965/England
Company Website: https://www.gore.co.uk/
Company (current) Status: Private
Contact: Contact Page: https://www.gore.co.uk/contact
Additional Information:

Description:
WL Gore is a materials science company that has been active in the space industry since the 1960's. Dundee is the location of Gore's Space Centre of Excellence, where they design and develop many materials capable of supporting the space sector. Examples include ultra-durable insultated wires that are used as transmission lines in space exploration. Also includes expanded ePTFE, a key material in the space sector due to it being lightweight, having a high tensile strength, low dielectric constant, UV resistance and high thermal resistance. Gore's cables have even been used in the International Space Stations and for many NASA missions, including the Perserverance Rover on Mars.

References:

1. WL Gore and Associates Webpage: https://www.gore.co.uk/

Smiths Interconnect Group Limited:
Company No: #06641403
Enterprise Size: Large
Incorporation/Registration: 2008/England
Company Website: https://www.smithsinterconnect.com/
Company (current) Status: Private
Contact: Contact us page: https://www.smithsinterconnect.com/contact/contact-us/
Additional Information:

Description:
With a facility in Dundee, Smiths Interconnect carries out both R&D and manufacturing. To ensure Smiths' products are fit for use in space, this facility contains its European Qualification and Test Laboratory. Smiths offers a wide range of radio frequency (RF), microwave, mmW systems and components, connectors and cable assemblies, and has had its products used in > 600 satellites. Smiths was recently awarded ~£2million GBP in funding from the UK Space Agency [2]. Said funding will support its Space Qualification Laboratory, where their space components will be tested in extreme conditions akin to that experience in space.

References:

1. Smiths Interconnect Webpage: https://www.smithsinterconnect.com/
2. Smiths Interconnect awarded c.£2m in funding from the UK Space Agency. [Link]

M Squared Lasers Limited:
Company No: #SC243330
Enterprise Size: Medium
Incorporation/Registration: 2003/Scotland
Company Website: https://m2lasers.com/
Company (current) Status: Private
Contact: Contact us page: https://m2lasers.com/contact.html
Additional Information:

Description:
M Squared Lasers are based in Glasgow and are developing leading edge photonics/quantum technology for the space sector (as well as many other sectors, including manufacturing, oil and gas, medical). M Squared have already supported many Earth Observation missions, including CNES/UK Space Microcarb mission (CO_2 monitoring), and ESA's Sentinel 4, 5 and 5P missions. M Squared have made an agreement with Thales Alenia Space to develop/provide their highly advanced laser system technology (spanning visible to short-wave infrared region) to support the monitoring of CO_2 and NO_2 emissions from space (part of Europe's Copernicus program) [2].

References:

1. M Squared Webpage: https://m2lasers.com/index.html
2. M SQUARED ANNOUNCES AGREEMENT WITH THALES ALENIA SPACE TO PROVIDE ADVANCED LASER SYSTEMS TO CALIBRATE ESA'S COPERNICUS CO2M SATELLITES [Link]

Alpha Data Parallel Systems Limited:
Company No: #SC147524
Enterprise Size: Medium
Incorporation/Registration: 1993/Scotland
Company Website: https://www.alpha-data.com/
Company (current) Status: Private
Contact: Contact us webpage: https://www.alpha-data.com/about-alpha-data/contact-us/ , support@alpha-data.com
Additional Information:

Description:
With HQ based in Edinburgh, Alpha Data provide embedded systems and data centre products for digital signalin proessing (DSP), imaging systems, communcations, military, aerospace and high performance computing industries [1]. Alpha Data's hardware supported/powered NASA's climate change mineral dust detector on the International Space Station [2].

References:

1. Alpha Data Webpage: https://www.alpha-data.com/
2. Alpha Data powers NASA's climate change mineral dust detector on Space Station [Link]

Walker Precision Engineering Limited:
Company No: #SC068820
Enterprise Size: Medium
Incorporation/Registration: 1979/Scotland
Company Website: http://walkerprecision.com/
Company (current) Status: Private
Contact: Contact us page: http://walkerprecision.com/contact-us/ , enquiries@walkerprecision.com
Additional Information:

Description:
Walker Precision is a contract manufacturer that produces precision equipment and complex parts for the aerospace, defense and industrial sectors. Walker has NADCAP gold status, demonstrating their commitment to the highest standards [2]. Walker has a facility in Glasgow, Scotland, as well as centres of excellence in England and Poland.

References:

1. Walker Precision Webpage : http://walkerprecision.com/
2. Walker Gains Nadcap Gold Status: [Link]

ALTER Technology TUV NORD UK Limited:
Company No: #SC244596
Enterprise Size: Medium
Incorporation/Registration: 2003/Scotland
Company Website: https://www.altertechnology-group.com/en/home/
Company (current) Status: Private
Contact: Contact us page: https://www.altertechnology-group.com/en/company/contact/ , info@uk.altertechnology.com
Additional Information:

Description:
Part of the TUV Nord Group, ALTER Technology UK Ltd has development and manufacturing facilities in Scotland. ALTER caters for many industries, including space, aeronautics, automotive, medical, defence, and nuclear (among others). ALTER's specialised products are suitably packaged for space and other harsh environment applications. This includes, contact package design and precision assemnly services for a wide range of optoelectronic, microelectronic and MEMS devices. Also includes highly integrated, miniaturised, robust photonic products for quantum enabled positioning, nagivation, timing systems, and photonic-based satellite optical communications. ALTER also provide complete turn-key solutions, covering water testing, assembly, packaging, final test and qualification.

References:

1. ALTER Technology TUV NORD Webpage: https://www.altertechnology-group.com/en/home/

Rhea Space Activity UK Limited:
Company No: #14635288
Enterprise Size: Small
Incorporation/Registration: 2023/England
Company Website: https://www.rheaspaceactivity.com/
Company (current) Status: Private
Contact: contact us webpage: https://www.rheaspaceactivity.com/
Additional Information: subsidiary of Rhea Space Activity, an Astrophysics start-up based in Washington DC.

Description:
Rhea Space (RSA) speciaise in reliable navigation and secure communication technologies, designed to support national security objectives. Support includes the development of technologies in the fields of infrared satellites, directed energy, AI, astroparticle physics, small satellites, autonomous underwater vehicles, and more. RSA's Jervis Autonomy Module (JAM) is an autonomous guidance and navigation capability adaptable for systems operating in space and on the ground. JAM's underlying software is state-of-the-art for onboard optical navigation and originates from proven software used on NASA's Deep Impact mission. RSA is also developing a secure quantum communication capability called the Quantum Lovelace Optical Augmentation Kit (QLOAK). QLOAK enables covert communication and information sharing with the strongest possible encryption. RSA are applying these advanced and disruptive technologies to solve the world's security challenges. Founded in 2018, RSA is headquartered in Washington, DC, with a wholly owned subsidiary in the United Kingdom. RSA is actively growing its Edinburgh-based UK team.

References:

1. Rhea Space Activity Webpage: https://www.rheaspaceactivity.com/

Plexus Corp (UK) Limited:
Company No: #SC146948
Enterprise Size: Large (*part of Plexus Corp. parent company*)
Incorporation/Registration: 1993/England
Company Website: https://www.plexus.com/en-us/market-sectors/aerospace-defense/space
Company (current) Status: Private
Contact: contact us webpage: https://www.plexus.com/en-us/contact
Additional Information: subsiduary of Plexus Corp.

Description:
A significant Tier 2 supplier to the space industry, Plexus Corp provide end-to-end development and manufacturing support to small, medium and large space sector companies [1]. Said support includes, Design and Development, Supply Chain Solutions, New Product Introduction, Manufacturing, Aftermarket Services, Regulatory Expertise & Compliance, Healthcare and Life Sciences Expertise, Industrial and Commercial Expertise, Communications Expertise, and Aerospace and Defense Expertise. Plexus Corp is the UK's largest Electronics Manufacturing Services company, with a Design Centre in Livingston, Scotland [2].

References:

1. Plexus Corp Webpage: https://www.plexus.com/en-us/market-sectors/aerospace-defense/space
2. Plexus' investment in Livingston Engineering and New Product Introduction facility: [Link]

DOWNSTREAM

EARTH OBSERVATION

Ecometrica Limited:
Company No: #SC339323
Enterprise Size: Medium
Incorporation/Registration: 2008/Scotland
Company Website: https://ecometrica.com/
Company (current) Status: Private
Contact: Contact us page: https://ecometrica.com/contact-us/
Additional Information:

Description:
Ecometrica Ltd is an expert in climate metrics (part of EcoOnline Global), basd in Edinburgh, Scotland. Ecometrica enable businesses and governments to accurately and transparently calculate their climate impact, subsequently supporting them in complying with the latest legislation. Ecometrica utilises their software platform that combines Earth Observation data from multiple sources including free optical data (Sentinel-2), Landsat and MODIS, high-resolution optical data, and radar (Sentinel-1). Climate and sustainability monitoring/reporting is focused on forests, commodities, land use change, emissions, supply chain risk and disaster response. Reports produced include figures that are compliant with the Streamlined Energy and Carbon Reporting (SECR) framework for annual reporting.

References:

1. Ecometrica Webpage: https://ecometrica.com/

Global Surface Intelligence Limited:
Company No: #SC439031
Enterprise Size: Small
Incorporation/Registration: 2012/Scotland
Company Website: https://www.surfaceintelligence.com/
Company (current) Status: Private/Public
Contact: Contact us page: https://www.surfaceintelligence.com/contact
Additional Information:

Description:
Based in Edinburgh Scotland, Global Surface Intelligence Ltd utilises a natural resource management platform that provides accurate insights into changes in land use, forestry and agriculture for global energy brands, retail, insurance, government and assurance. GSI's platform harnesses artificial intelligence to transform satellite optical and radar data, UAV, drone and ground survey data into commercially valuable information. With >4,500 satellites in space today, GSI's 'ultra fast platform' aims to tackle very large datasets associated with downstream earth observation, reducing processing time from months to minutes.

References:

1. Global Surface Intelligence Webpage: https://www.surfaceintelligence.com/

Space Intelligence Limited:
Company No: #SC595836
Enterprise Size: Medium
Incorporation/Registration: 2018/Scotland
Company Website: https://www.space-intelligence.com/
Company (current) Status: Private
Contact: Contact us page: https://www.space-intelligence.com/contact-us/ , enquiries@space-intelligence.com
Additional Information:

Description:
Space Intelligence are an Edinburgh based company, focused on developing satellite data analysis technologies. Said technologies leverage advanced machine learning, artificial intelligence and big data capabilities to provide information on land-use and land-use change, ecosysem carbon storage for monitoring and protecting forests (and nature-based investments). Therefore, through interpreting large volumes of satellite data and landscape information, Space Intelligence are supporting nature-based solutions and sustainability-linked financial instruments.

References:

1. Space Intelligence Limited Webpage: https://www.space-intelligence.com/

Trade in Space Limited:
Company No: #SC576433
Enterprise Size: Small
Incorporation/Registration: 2017/Scotland
Company Website: https://tradeinspace.com/
Company (current) Status: Private
Contact: Contact us page: https://tradeinspace.com/contact-us , hello@tradeinspace.com
Additional Information:

Description:
Trade in Space are a Glasgow based company who utilise geo-spatial and distributed ledger technologies to enable agriculture supply chains to be more sustainable, ethical and accesible [1]. Trade in Space offer a satellite-activated smart contracting solution and provide the tools to enable satellites to act, in real-time, as an autonomous commercial actuary, broker or dealmaker; or from a legal stand-point as trusted regulatory compliance auditors. In 2020 they completed the first satellite-brokered direct trade between coffee producers in Colombia and roasters in the UK, recording transaction details and supply chain events on their distributed ledger [2].

References:

1. Trade in Space Webpage: https://tradeinspace.com/
2. COFFEE FROM SPACE: the future of sustainable coffee: [Link]

Earth Blocks Limited:
Company No: #12711439
Enterprise Size: Small
Incorporation/Registration: 2020/England
Company Website: https://www.earthblox.io/
Company (current) Status: Private
Contact: team@earthblox.io
Additional Information:

Description:
Based in Edinburgh, Earth Blox provides climate and nature analytics from satellite imagery to help businesses accelerate their sustainability transition. Earth Blox's earth observation software allows users to turn satellite data into highly accurate risk assessments for all their economic assets and facilities worldwide. Earth Blox customers include ADM Capital Foundation, Climate Impact Partners, ForestRe, Ecologi, MercyCorps, The Nature Conservancy, and Veritree. Earth Blox is a Google Cloud Advantage Partner, Earth Engine Expert, and a member of the TNFD (Taskforce on Nature-Related Financial Disclosures) Forum. Earth Blox is the trading name of Quosient Ltd.

References:

1. Earth Blox webpage: https://www.earthblox.io/

Hypervine Limited:
Company No: #SC596608
Enterprise Size: Small
Incorporation/Registration: 2018/Scotland
Company Website: https://www.hypervine.io/
Company (current) Status: Private
Contact: Contact us page:
https://webforms.pipedrive.com/f/ceenOCBuIQx7Bgnjgrd6mIAC2CC9xnET6aY03BBDqtF9IfWjSETrmDQnEVkGWRAcsb
Additional Information:

Description:

Hypervine are a Glasgow-based start-up utilising earth observation and blockchain technology to enhance productivity within the construction and mining industries. High-resolution satellite imagery is used to analyse and interpret specific ground operations, providing comprehensive, large-scale monitoring capabilities irrespective of weather or daylight, enabling timely insights for industries, environmental conservation, and disaster management. The wide reaching nature of Hypervine's satellite surveys ensures consistent data acquisition over vast and inaccessible regions, enhancing decision-making and safety across various sectors.

References:

1. Hypervine Webpage: https://www.hypervine.io/

Space Aye Limited:
Company No: #SC422229
Enterprise Size: Small
Incorporation/Registration: 2012/Scotland
Company Website: https://spaceaye.com/
Company (current) Status: Private
Contact: info@spaceaye.com
Additional Information:

Description:
SpaceAye are a Glasgow-based company that specialise in merging user generated content and Internet of Things Data with real-time satellite imagery to provide more in-depth information surrounding satellite imagery.

References:

1. SpaceAye Webpage: https://spaceaye.com/

Earthwave Ltd:
Company No: #SC610006
Enterprise Size: Small
Incorporation/Registration: 2018/Scotland
Company Website: https://earthwave.co.uk/
Company (current) Status: Private
Contact: info@earthwave.co.uk
Additional Information:

Description:
Based in Edinburgh (Scotland), Earthwave is an operator of a satellite data science startup designed to provide earth observation, spatial data structures, system engineering, and data visualization services. The company's platform is a part of multiple Europe-wide consortiums, delivering reproducible scientific research and algorithm development using a range of satellite data, enabling users to create a fusion of large datasets, and facilitating machine learning and other computations.

References:

1. Earthwave Webpage: https://earthwave.co.uk/

Weather Stream Ltd:
Company No: #10817398
Enterprise Size: Small
Incorporation/Registration: 2017/England
Company Website: https://weatherstream.com/
Company (current) Status: Private
Contact: https://weatherstream.com/contact-us/
Additional Information:

Description:
Weather Stream is an operator of an earth weather data platform intended to improve weather forecasting. The company's platform (GEMS: Global Environmental Monitoring System) empowers the delivery of analysis-ready, accurate, and malleable datasets within minutes of observation, enabling customers to get timely, actionable insights requiring minimal processing in a device-agnostic, driven delivery model. Headquartered in the USA, Weather Stream has a hub dedicated to data science and commercial operations within the UK.

References:

1. Weather Stream Ltd Webpage: https://weatherstream.com/

Niras Group (UK) Ltd:
Company No: #01250443
Enterprise Size: Medium
Incorporation/Registration: 1976/England
Company Website: https://www.niras.com/
Company (current) Status: Private
Contact: niras@niras.com
Additional Information:

Description:
With a hub based in Edinburgh, Niras UK are a value-driven, multi-disciplinary engineering consultancy fundamentally committed to sustainable progress and service delivery. Niras are a global partner in earth observation and geographical information services, working alongside governments and space agencies on a broad range of sustainability projects, including monitoring of GHG emissions in developing countries, biodiversity management in developing countries, satellite monitoring for forest management, climate change adaptation/risk management of climate disaster(s), and much more [2]

References:

1. Niras Webpage: https://www.niras.com/
2. Niras News/Publications: https://www.niras.com/sectors/development-consulting/publications/

DOWNSTREAM

SOFTWARE & SERVICES

Bright Ascension Limited:
Company No: #SC407753
Enterprise Size: Small
Incorporation/Registration: 2011/Scotland
Company Website: https://brightascension.com/
Company (current) Status: Private
Contact: Contact us page: https://brightascension.com/about-us/contact-us/
Additional Information:

Description:
Bright Ascension are a Dundee based space software specialist company, offering consulting and engineering services aimed at simplifying/optimising space mission; from cube-satellite to larger, space craft. Bright Ascension offer complete end-to-end space mission solutions, capable of supporting/leading space-based projects from blue-sky resaerch throgh to development and delivery. Bright Ascension received a £1.5million bridging loan to further support their satellite software infrastructure, HELIX Suite [2-3].

References:

1. Bright Ascension Webpage: https://brightascension.com/
2. WE SECURED FURTHER INVESTMENT TO SUPPORT HELIX LAUNCH: [Link]
3. HELIX: [Link]

ThinkTank Maths Limited:
Company No: #SC343621
Enterprise Size: Small
Incorporation/Registration: 2008/Scotland
Company Website: https://www.thinktankmaths.com/
Company (current) Status: Private
Contact: Contact us page: https://www.thinktankmaths.com/contact/
Additional Information:

Description:
ThinkTank Maths are an Edinburgh based IT services and IT consulting company that work with clients/partners in the Space/Energy, Space Situation Awareness (SSA) and Space Surveillance and Trackin (SST) sectors. ThinkTank Maths 'DeepTech / Intelligent Systems' offer the ability to assess complex engineering processes beyond the limitations of AI/ML and statistical analysis, levaraging mathematical data fusion of heterogenous data sets. One example includes optimising the real-time monitoring of satellite localisation/congestion within space. Given the anticipated influx of satellites within LEO is to rapidly increase (5-year forecast in LEO is 11,500 to > 70,000), accurate and real-time monitoring of satellite space situational awareness is crucial, not least for the security of global satellite services and our Earth Observation capabilities [2]. ThinkTank Maths work with a large number of clients and partners, including Shetland Space Centre, UK MoD, BAE systems.

References:

1. ThinkTank Maths Webpage: https://www.thinktankmaths.com/
2. Under The Surface of Scotland's Space Industry = The Royal Society of Edinburgh: [Link]

Scotspace Limited:
Company No: #SC653831
Enterprise Size: ???
Incorporation/Registration: 2020/Scotland
Company Website: https://scotspace.scot/
Company (current) Status: Private
Contact: Bernard Farkin, Director of ScotSpace Ltd: bfarkin@scotspace.scot, info@scotspace.scot
Additional Information:

Description:
Located in Prestwick (close proximity to Prestwick Air and Spaceport), Prestwick Aerospace Park, Machrihanish launch site, and other academic/industrial aerospace R&D centres in localised in/near Glasgow. ScotSpace Ltd (Scottish Space Corporation) aims to plan, design, coordinate, operate and promote NewSpace infrastructure development in Scotland. Their mission is to provide operational design and support for commercial space transportation services at Scottish spaceports, including assembly integration and test, pre-launch, launch, in-orbit, decommissioning and de-orbit operations. ScotSpace is also focused on orbital resources and microgravity, including the commercial applications of microgravity and other environemntal resources (e.g., sunlight, pressure, radiation, temperature, electromagnetic gradients). Following the European Space agency contractual agreement with a European Consortium (focused on prividing end-to-end response space transportations services) ScotSpace and the Prestwick Spaceport are to act as a logistics, integration and operations support hub for the Scottish launch sites [2].

References:

1. ScotSpace Webpage: [Link]
2. D-Orbit signs contract with the European Space Agency [Link]

AstroAgency Limited:
Company No: #SC640997
Enterprise Size: Small
Incorporation/Registration: 2019/Scotland
Company Website: https://astroagency.co.uk/
Company (current) Status: Private
Contact: liftoff@astroagency.co.uk
Additional Information:

Description:
Located in Edinburgh, AstroAgency Ltd is a strategic marketing firm dedicated exclusively to the commercial space sector, working with the private sector and governments globally. With established space companies, AstroAgency build awareness and engagement for space companies and public bodies. This includes translating capabilities, hihglighting expertise and showcasing achievements to deliver new business opportunities. AstroAgency also support companies that are not yet within the space sector, guiding their transition into the supply chain, securing new revenue streams via market intel, key introductions and framing their offer to suit the space sector. Further, AstroAgency work with space start-ups, helping them articulate their vision/message to generate interest, leads and investment.

References:

1. AstroAgency Webpage: https://astroagency.co.uk/

Responsive Access Limited:
Company No: #SC614798
Enterprise Size: Small
Incorporation/Registration: 2018/Scotland
Company Website: https://www.responsiveaccess.com/
Company (current) Status: Private
Contact: contact us page: https://www.responsiveaccess.com/about
Additional Information:

Description:
Based at the Royal Observatory Edinburgh, Responsive Access Ltd provides launch brokerage and consultancy services to the space industry. Their aim is to provide complete space logistics solutions that cover all aspects of mission assurance, enabling their customers to remain 'focused on their payload'. With respect to logistics, Responsive Access provide assistance with initial planning, manufacturing and testing, and delivery of payload(s) to launch site(s).

References:

1. Responsive Access Webpage: https://www.responsiveaccess.com/

Craft Prospect Limited:
Company No: #SC557385
Enterprise Size: Small
Incorporation/Registration: 2017/Scotland
Company Website: https://craftprospect.com/
Company (current) Status: Private
Contact: hello@craftprospect.com
Additional Information:

Description:
A space engineering company based in Glasgow, Craft Prospect deliver mission-enabling products, services, and develop novel mission applications. Craft Prospect aim to unlock the potential of Earth-observing nano-satellites for onboard autonomy and delivery a higher mission return. Craft Prospect are to lead the OPS-SAT Versatile Optical Laboratory for Telecoms (OS2-VOLT) Mission for the European Space Agency. This 12 million Euro mission, led by Craft Prospect, will incorporate a range of their technology within a Low Earth Orbit environment [2].

References:

1. CraftProspect Webpage: https://craftprospect.com/
2. Craft Prospect to lead the OPS-SAT Versatile Optical Laboratory for Telecoms (OS2-VOLT) Mission for the European Space Agency [Link]

Krucial:
Company No: #SC600268
Enterprise Size: Small
Incorporation/Registration: 2018/Scotland
Company Website: https://www.krucial.com/
Company (current) Status: Private
Contact: Contact us page: https://www.krucial.com/contact
Additional Information: *previously known as R3 IOT Limited*

Description:
Krucial are a Glasgow (Scotland) based IoT-based satellite connectivity technology company [1]. Through Krucial CONNECT, Krucial supports businesses resilient, reliable and continuous connectivity – combining satellite communications and cellular technology with IoT. Krucial's technology can be deployed anywhere, supporting industries with minimising downtime and data loss across highly remote and hard to reach locations/data sources. Wireless remote technology enables these organisations to access, collect and transmit their real-time information through automating the collection of data. An example can be seen from Krucial's on-going role in supporting the mitigation of risks in aquaculture [2]

References:

1. Krucial Webpage: https://www.krucial.com/
2. Mitigating Risk in Aquaculture with Connected Seafarm: [Link]

Brainnwave Group Ltd:
Company No: #11786277
Enterprise Size: Small
Incorporation/Registration: 2019/England
Company Website: https://brainnwave.ai/about-us/about-brainnwave/
Company (current) Status: Private
Contact: Contact us page: https://brainnwave.ai/contact/
Additional Information:

Description:
With head offices in London and Edinburgh, Brainnwave is a developer of a decision intelligence platform (Mosaic) designed to enrich and analyze data (e.g., derived from satellite imagery to analyse data associated with climate, weather forecasts, oil & gas, etc.) by making it usable and profitable. The company's platform provides cutting-edge visualization tools powered by artificial intelligence, enabling leadership, management executives, and local sales teams to make the right strategic business decisions.

References:

1. Brainnwave Webpage: https://brainnwave.ai/about-us/about-brainnwave/

AEROSPACE & DEFENSE

Leonardo UK limited (subsidiary of Leonardo S.p.A.):
Company No: #02426132
Enterprise Size: Very Large
Incorporation/Registration: 1989/England Leonardo UK Limited (Leonardo itself, 1948/Italy)
Company Website: https://www.leonardo.com/en/
Company (current) Status: Private
Contact: automation@leonardo.com
Additional Information: Leonardo S.p.A (parent company) is a public multinational company (LDO:ITA) focused on aerospace, defence and security (Rome, Italy – HQ). Formerly known as Leonardo-Finmeccanica and originally Finmeccanica. Clive Higgins is the current UK Chair and CEO ad interim of Leonardo UK Limited.

Description:

Leonardo UK is one of the UK's leading aerospace companies and a major supplier of defence/security equipment to UK MOD [1]. Employing over 8,000 employees across 8 sites in the UK (~2000 in Edinburgh alone), Leonardo contributes significantly to UK enconomy – with revenues of ~£1.9 billion GBP – directly supporting the UK's Space Sector.

References:

1. Leonardo UK Webpage: https://uk.leonardo.com/en/home

Thales UK Limited (part of Thales Group):
Company No: #00868273
Enterprise Size: Very Large
Incorporation/Registration: 1966/England
Company Website: https://www.thalesgroup.com/en
Company (current) Status: Private
Contact: patrice.caine@thalesgroup.com (Patrice Caine, CEO), alex.cresswell@thalesgroup.com (Alex Cresswell, CEO/Chairman Thales UK Ltd)
Additional Information: Thales Group are a public aerospace and defense company (PAR:HO), HQ – France.

Description:
Thales Group is a French aerospace and defense company. As one of Europe's largest defense contractors, Thales is involved in defense & security (including providing sensors, mission systems, communications, and control systems to EU and export defense customers), avionics and satellites (for civil, defense and governmental markets), and digital identity/cyber security/data protection. Thales UK Limited therefore serves its 'customers' throughout the UK and is supporting the UK's Space Sector.

References:

1. Thales UK Webpage: https://www.thalesgroup.com/en/countries/europe/united-kingdom

Raytheon UK Limited (part of Raytheon Technologies):
Company No: #00337167
Enterprise Size: Very Large
Incorporation/Registration: 1938/England
Company Website: https://www.rtx.com/
Company (current) Status: Private
Contact: corporatecommunications@raytheon.co.uk
Additional Information: Raytheon Technologies (RTX) is a public aerospace and defense company (NYSE:RTX), HQ – USA. Jeff Lewis – CEO and Managing Director – Raytheon UK, Gregory J. Hayes - CEO of Raytheon Technologies.

Description:
Raytheon is an aerospace and defense company (a merger of United Technologies and Raytheon). Operating in three segments: Collins Aerospace (an aerospace supplier), Pratt & Whitney (an aircraft engine manufacturer) and Raytheon (a defense contractor providing missiles, missile defense systems, sensors, hardware, and communications technology to the military). Through these activities, Raytheon is supporting the UK Space Sector.

References:

1. Raytheon UK Webpage: https://www.raytheon.co.uk/