

Interim Results

for Financial Year to 30 November 2022

Richard Gibbs, CEO Michael Tyerman, CFO













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Enabling the future of RF Microwave and mmWave communications

Creating value for our stakeholders through technology leadership

filtronic.com

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Executive Overview

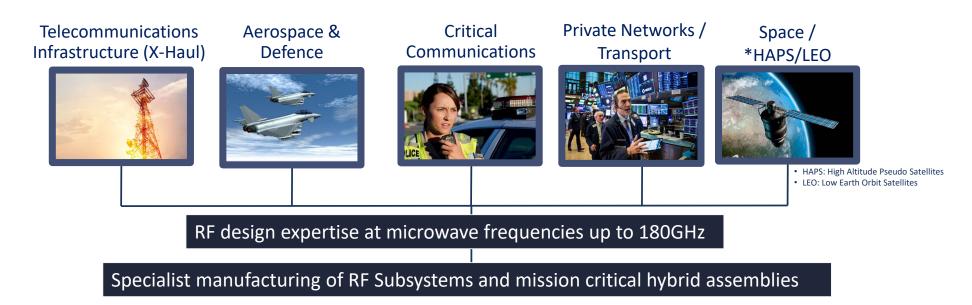




Overview



Filtronic plc is a **designer** and **manufacturer** of advanced RF communications products serving five core markets:



We deliver high-performance solutions based on:

- Flexible UK / USA manufacturing allowing OEMs to quickly scale to volume
- Dedicated facilities with UK security accreditation, proven processes and full traceability
- Order fulfilment options which including turn-key design, manufacture and test, inventory hub and kitting

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Half Year Highlights



£8.4m (+5%)

Adjusted EBITDA*



Adjusted operating profit**

£0.5m (-20%)



Cash at bank



Net cash (net of all lease obligations except right of use property lease)

- ation, depreciation, amortisation and
- Adjusted operating profit is operating profit/(loss) before exceptional items.

Awarded a \$2.8m (£2.3m) contract with a leading global provider of low earth orbit ("LEO") satellite communications equipment expanding our presence in the new space market.

- Increased level of engagement with key strategic target customers in the aerospace & defence and space markets.
- E-band spectrum India was licenced in H1 in addition to high demand and a robust order book for 5G backhaul products.
- Implementation of new engineering and manufacturing capability to provide plastic encapsulation technology; a grant of £150k has been secured towards the capital expenditure.
- Achieved IASME Cyber Assurance accreditation improving our cyber security credentials. Enabler to satisfy the strategic objective of winning further aerospace & defence work.
- New site officially opened in Manchester which increases engineering capacity with the addition of a highly skilled and experienced team.



Financial Summary





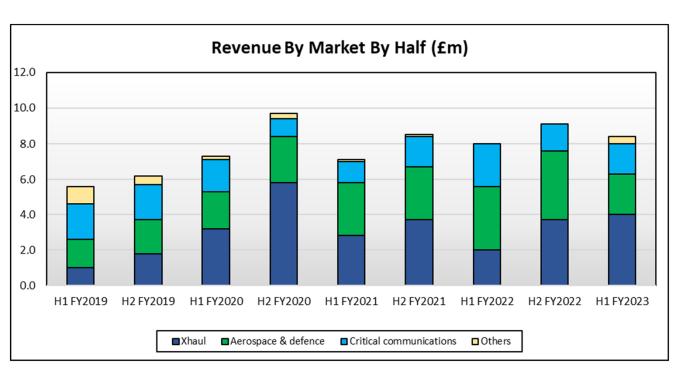
Revenue: Growth of 5% over FY2022



Strongest H1 revenue for over 5 years

Key strategic objective:

Continue to develop customer base outside of top three customers



Group revenue £8.4m (2022: £8.0m)

- 5G rollouts generating strong demand evidenced through improved order book, particularly with E-band licenced in India.
- Aerospace & defence project concluded but opportunity pipeline is developing.
- Critical communications benefitted from good traction on the TTA product whilst the customer had component issues in their system-level product.

5% growth over same period last year.

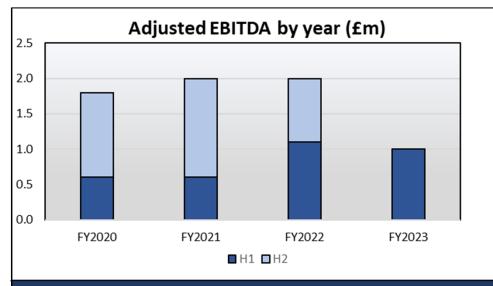
- Xhaul: Increased 100% vs H1 22 with 5G rollouts gathering pace.
- **Defence:** Decrease of 36% vs H1 22.
- Critical comms: 29% revenue decline vs H1 22.

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Component shortages defers progress in H2



Adjusted EBITDA in line with internal forecasts



Half year results (£m)			
	H1 2023	H1 2022	Change
Revenue	8.4	8.0	5%
COGS	(3.0)	(2.6)	(16%)
Operating costs	(4.9)	(4.8)	(2%)
Operating profit (Adjusted)	0.5	0.6	(20%)
EBITDA (Adjusted)	1.0	1.1	(15%)

- Weaker sales mix from stronger trading in 5G backhaul offsets the sales uplift - COGS 16% higher on 5% revenue increase.
- Investment in sales channels and engineering 'bench strength' increases the overhead cost base by 2% to £4.9m to support top line growth.
- Adjusted EBITDA fell by 15% to £1.0m impacted by component supply chain issues.
- EBITDA margin in H1 was 11%.
- Cost base can support higher levels of turnover as we scale which will improve profitability as revenues increase.
- Component shortages in H2 will affect output.

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Balance sheet



	Nov. 22	N/ov. 22	Nov. 21
	Nov-22	May-22	Nov-21
	£m	£m	£m
Goodwill and intangible assets	1.6	1.5	1.6
Property, plant and equipment	0.8	0.7	1.0
Right of use assets	2.6	2.3	2.1
Deferred tax	0.9	0.9	1.3
Non-current assets	5.9	5.4	6.0
Inventory	2.7	2.6	2.4
Trade and other receivables	4.8	4.5	4.1
Cash and cash equivalents	3.1	4.0	3.0
Current Assets	10.6	11.1	9.5
Trade creditors and other payables	2.2	3.0	2.8
Provisions	0.3	0.3	0.3
Deferred income	0.2	0.3	0.3
Financial liabilities	0.0	0.0	0.1
Lease liabilities	2.1	1.8	1.8
Total liabilities	4.8	5.4	5.3
Net assets	11.6	11.0	10.2
Share capital and reserves	11.6	11.0	10.2

Capital expenditure

- Depreciation > capital expenditure reflecting low level of capex in H1 but a couple of sizeable projects in H2 to install plastic encapsulation technology and Q/V-band capability for Space projects. Financed with asset finance.
 - £0.2m on wedge bonding capability in H1.

Right of use assets

• The increase relates to the property leases that were entered into during the period in Salisbury, Yeadon and Manchester. Offset seen through the increase in lease liabilities.

Capitalised development costs

- Execution of the strategic plan and technology roadmap have led to capitalisation of development costs in line with IAS38.
 - W-band chipset development
 - Space market product development

Inventory

• Inventory grown, as planned, to attempt to mitigate component shortages.

Debtors and creditors

• All within terms and in-line with industry standard.

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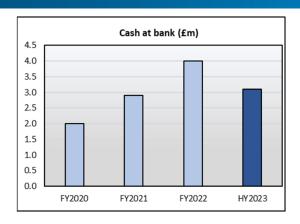
Cash



	Nov-22	May-22	Nov-21
	£m	£m	£m
Net cash generated from/(used in) operating activities	(0.2)	1.7	0.6
Net cash (used in)/generated from investing activities	(0.4)	(0.2)	(0.1)
Net cash used in financing activities	(0.4)	(0.6)	(0.4)
Movement in cash and cash equivalents	(1.0)	1.0	0.1
Currency exchange movement	0.0	0.0	0.0
Opening cash and cash equivalents	4.0	3.0	2.9
Closing cash and cash equivalents	3.1	4.0	3.0



- The Group used £0.2m in operating activities: EBITDA generation offset by working capital adverse movement with creditors unwinding as inventory build-up was paid for.
- Investments in product development, capital expenditure and repayment of lease liabilities saw further outflow of £0.8m.
- £1.0m total cash outflow in H1.



Cash position healthy to maintain investment in growth

- £3.1m cash at bank at 30 November (31 May 2022: £4.0m).
- A healthy cash position to maintain investment in growth.
- Further strengthening of the balance sheet.
- Undrawn invoice discounting debt facilities available - £3.0m Barclays and \$4.0m Wells Fargo.

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Revenue and EBITDA – outlook



- Strong order book rolling into FY2024 gives good level of coverage particularly on 5G backhaul product.
- Number of aerospace & defence opportunities at key strategic targets.
- **LEO space market** momentum building with current key players and well-funded disruptors entering the market in addition to our recent contract win.
- Telecommunications infrastructure growth driving turnover but the quality of earnings is not as strong as
 those in our other markets. Key market for the technology roadmap.
- **Critical communications** combiner products coming back online having resolved component shortages at the system-level.
- Continued investment into engineering activities and direct sales channels likely to increase the overhead cost base but will drive top level growth.







Operational Summary

Recent Business Highlights



- Awarded significant production order (£2.3m) with a leading global provider of low earth orbit ("LEO") satellite communications equipment
- Robust order book for 5G backhaul products as India awards first tranche of 5G licences including E-band backhaul
- Second DSTL development program award for the development of portable RF communications test platform
- Recurrent flow of filter design wins from UK defence primes based on defence accreditation of Leeds facility
- First production orders for cryogenic filters for us in the Quantum Computing applications
- Expanded capability
 - Business Development two experienced Defence specialists added
 - Engineering opened and equipped the Manchester Engineering Centre
 - Manufacturing improved prototyping, wire bonding and QFN plastic encapsulation
 - Achieved IASME Cyber Assurance accreditation improving chances of winning sensitive defence work
 - Relationships strong links into UK Space Agency, ESA and European aerospace primes for funding and consortium opportunities

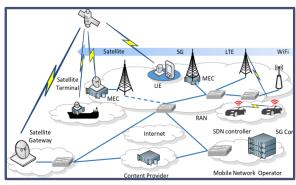


Building Momentum



Terrestrial telecommunications infrastructure and commercial LEO space investment continues to build momentum and opportunity for Filtronic technology:

- 5G deployment continues world wide
 - Consumer demand drives a migration to higher frequency bands in backhaul
 - Countries with underdeveloped infrastructure push demand for RF solutions
- Convergence of terrestrial telecoms and LEO space communications
 - LEO satellite investment accelerating and robust business models being developed
 - Network capacity and bandwidth demand driving licencing of higher frequency bands
 - Sovereign space strategy is creating high levels of government funding



The convergence of terrestrial telecoms and LEO satellites will drive X-haul and ground stations to mmWave frequencies

Defence primes very active and making strategic technology decisions

- Good visibility of repeat export orders for existing EW defence platforms
- Next generation airborne / shipborne EW platforms in an advanced design phase
- Ukraine conflict driving increased focus on resilience of battlefield communications

UK defence primes lack critical RF design resources

- Primes actively developing strategic partnerships with UK SME's
- DSTL development programs provide a good platform for IP development
- High level of funding support to create UK sovereign supply chains and capability



Next generation Electronic Warfare (EW) platforms will incorporate multiple RF communication and sensing solutions

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Strategy & Growth

Market Dynamics





Telecommunications





Critical



Private Telecom

Networks

Private Telecom links, Low

Latency Trading Networks,

Track to Train Networks,

Telecom Test Equipment



	Infrastructure (X-haul)
Primary Application	E-band mmWave backhaul transceivers for 5G telecommunications infrastructure
Market Growth Rate	5G V/E-band Backhaul growth: 20% p/a CY2023-28*
Market Drivers	Global 5G telecoms rollout Release of E-band licences High density urban networks Low installed fibre in backhaul
Filtronic USP	Partnership with market leader Quality /reputation / brand Proven IP / Performance History of high volume delivery

Aeros	pace &

Defence

£16.5bn increase in UK Defence

Outsourced RF design capability

Sovereign OSAT hybrid facility

UK Defence Strategy / Exports

Partnership with market leaders

Accredited UK RF hybrid facility

Strong RF design / DFM support

Manufacturing processes

RF / microwave hybrid TRM

modules for airborne ASEA

Spending CY2020-24*

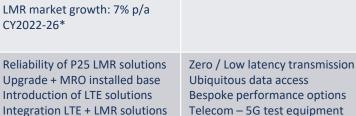
radar systems

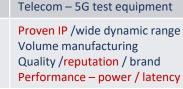
Communications
Subsystems for LMR secure public safety / first responder communications networks
LMR market growth: 7% p/a CY2022-26*

Partnership with market leader

Quality /reputation / brand

US manufacturing facility





Space Telecoms

HAPS/LEO Up-link / Down-link - mmWave

high frequency transmission

systems for HAPS / LEO

>60,000 LEO satellites by 2029* OneWeb (EU) + Private Network constellations (USA)

Ubiquitous data access Economic network coverage Future operating revenues

Partnership with market leader Tx / Rx Power SSPA performance Telecoms reputation / cost Volume manufacture + ramp-up

^{*} Ref: AGI.com 2022



^{*}Dell'Oro Backhaul 5-Year Forecast (Jan 2023) * Ref: Defence News (Jan 2021)

^{*} Ref: Research and Markets (Mar 2022)

Strategy & Growth – markets / applications update



Vertical N	Market	& Ani	olication
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Progress in 1st year

Target mid term > Interim Update

Target long term



Aerospace

- TRM + filter development contracts for MKII upgrade.
- TRM + filter research and for next gen radar
- Consolidate business model for hybrid manufacturing
- Tx Rx Module + filter prototype for MKII upgrade.
- TRM + filter research and for next gen radar
- Portfolio of OEM customers for CMS and OSAT services
- Investments made in QFN module for MkII upgrade
- 8 separate filter projects delivered to defence primes
- Completed Tx module prototype for next gen radar
- Qualification of prototypes for MKII radar upgrade.
- TRM + filter development for next gen radar
- Turnkey OSAT* offering for UK Defence OEMs



Terrestrial 5G Telecom Infrastructure

- Promote superior Morpheus power performance to tier 1's
- Secure funding for mmWave development program
- Start mmic design for W-band in accordance with roadmap
- Develop E-band active SiP/ active diplexer solution
- Develop Track to Train solution based on UK trials
- Move test equipment development to production
- Launched Hades diplexer
- Launched Morpheus X2
- First pass at W-band chipset design – promising results
- Secured 5G test equipment production order
- Develop W-band transceiver and active diplexer for lead customer.
- Develop D-band project plan in conjunction with lead customer(s)



UK Defence & Critical Comms

- Achieve full security accreditation for Leeds site
- Filtering process for UK DSTL SME programmes
- Complete battlefield comms project design and initial build
- Support development of emerging 900MHz product
- Win TTA orders with Tier 1 LMR providers in US/ Europe
- Establish flexible 3rd party filter design relationship
- Delivered first DSTL program
- Second DSTL program win
- First choice filter design house for three UK primes
- Secured TTA orders with Tier1 LMR providers in USA
- Develop portfolio of DSTL / MoD products for Wireless Battlefield Communications



Space – HAPS / LEO

- Look for fast turn OSAT business opportunities that can provide space heritage
- Promote IP developed as part of initial HAP's engagements to LEO constellation OEMs
- Align Filtronic with OneWeb for development of gen 2
- Development of 10w PA for volume manufacturing
- Play active role in HAPS Alliance to promote E-band
- Active in consortium bids for commercial LEO programs
- Launched scalable Cerus SSPA product platform
- E-band seen as a viable LEO ground station frequency
- Establish strong relationships with LEO primes and agencies
- Develop demonstrator for scalable ground station link at E / V band
- Win multiple LEO programs





^{*} OSAT = outsourced assembly & tes

Strategy & Growth – operations / capability update



Business Function

Progress in 1st year

Target near term > Interim Update

Target long term



Sales & Marketing

- Build the roster of sales reps in North America
- Develop direct sales network in Europe / Israel
- Relaunch the Filtronic brand and build online presence
- Expand UK defence sales and business development team
- Build CRM tool capability and develop sales methodology
- Engage in selected technical associations + industry groups
- Full BD team in place driving strong opportunity pipeline >£40m
- Increased engagement in agencies ESA / DSTL / DTEP
- Bring Channel Management skills into the company
- Develop technical proposal/ grant application writing team



Engineering

- Build stronger programme management organisation so we can scale design programs
- Strengthen inhouse SIP design and engineering capability
- Build OEM engineering links
- Build alignment with key UK universities specialising in RF subsystem design
- Engage engineering staff in technical associations + industry groups
- Director of Technology driving partnership program
- Established links with UK universities specialising in RF subsystem design
- Manchester design office
- Significantly increased engineering capacity
- £2-3m of external funding p/a
- Graduate development programme



Operations & Facilities

- Maximise efficiencies from hybrid manufacturing line
- Build accredited UK defence "box-build" capability.
- Consolidate USA Critical Comms build / test facility
- Manufacturing process for low cost plastic encapsulation.
- Develop assembly process for Compound Semi materials.
- Improve prototype development Eng. capability
- Building process for low cost plastic QFN SiP
- Secured funding to explore Compound Semi packaging
- Third Evo line added for process development work
- Space level cleanroom manufacturing facilities
- Expansion of in house qualification + DPA capability



People & Processes

- Improve materials planning and inventory management systems for turnkey OSAT*
- Explore Filtronic Leadership Academy – Management Development Training
- Gain Cyber Security IASME accreditation
- Develop ESCC level assembly process flows ESCC9000.
- Achieved IASME Governance accreditation
- Develop ESCC level assembly process flows ESCC9000
- Filtronic Leadership Academy programme
- Gain Cyber Security ISO27001 accreditation
- Turnkey manufacturing of secure programmes
- Qualified space level assembly process flow

filtronic.com



Key Investments in HY2023



Business Activity	Investments and Progress Against Objectives	
Sales and marketing	 Senior BD hires in place since Q2 FY2023 targeting aerospace & defence and space market opportunities. Expanded trade exhibition coverage with increased number of shows on the roster. Further investment in the CRM to augment lead generation capability and targeted marketing campaigns. New rep added in south-east USA and new reps identified in western Europe. Raised brand awareness with structured marketing campaigns and further development of the filtronic.com website. 	
Engineering (R&D)	 New design centre opened in Manchester with a highly-skilled and experienced team in place. Promising results from the first run of MMIC chipsets at W-band and improvement of our E-band power amplifier ("PA"). Manufacturing capability for plastic encapsulation expected to be implemented in H2. Cerus power amplifier development completed and first order received from leading LEO satellite constellation provider for £2.3m. Number of grant funding channels identified to support the technology roadmap. Procurement of test capability equipment to support Q and V-band engineering developments. 	
Operations and business processes	 IASME Cyber Assurance level 1 awarded in H1, currently undergoing audit to attain level 2. Enabler of higher-level defence contract wins. Wedge bonding capability now in place. Filtronic Leadership Academy underway improving management leadership skills to drive the business forward. Partnership formed with leading academic provider to supply apprentice talent, building our engineering capacity for the future. Continued investment with our annual commitment recruit graduate talent. 	
Balance sheet	Built a robust level of inventory and capitalised on competitors weakness with TTA supply. Unfortunately, we encountered our own issue in H2 with some unique semiconductors in short supply on telecommunications infrastructure programme.	

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Summary





Summary



- Filtronic continues to evolve
 - Focused on four strategic pathways (X-haul telecoms / defence comms / EW aerospace and LEO space)
 - Well positioned in markets where we can differentiate, add value and command sustainable margins
 - Strengthening sales and engineering to open the aperture on new business opportunities
 - Delivering our technology roadmap, creating IP and developing innovative products
 - Driving a roadmap to development facilities, people and business processes
 - New customers offsetting the declining demand for legacy products
 - Good alignment with UK Government investment priorities UK defence, sovereign supply chain and space
 - Served markets remain robust despite economic headwinds and ongoing supply chain challenges
 - Resources are in place to deliver on a strategic plan designed for growth and shareholder value
 - Record orderbook and strong opportunity pipeline heading into FY2024
 - Positive trading outlook for the medium term





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Appendices

Income statement



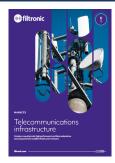
	H1 2023
	£000
Revenue from goods and services	7,924
Revenue from non-recurring engineering (NRE)	441
Revenue	8,365
Material costs of goods sold	2,994
Employee costs	3,437
Depreciation, amortisation and impairment	469
Other operating income	(33)
Other expenses	1,015
Total operating costs	4,888
Operating profit	483
Exceptional items	0
Adjusted operating profit	483
Depreciation, amortisation and impairment	469
Adjusted EBITDA	952

H1 2022	Variance
£000	£000
7,428	496
576	(135)
8,004	361
2,584	(410)
3,047	(390)
516	47
(24)	9
1,160	145
4,699	(189)
721	(238)
(113)	(113)
608	(125)
516	(47)
1,124	(172)

H2 2022	Variance
£000	£000
9,152	(1,228)
(104)	545
9,048	(683)
3,045	51
3,381	(56)
709	240
(305)	(272)
962	(53)
4,747	(141)
1,256	(773)
(279)	(279)
977	(494)
709	(240)
1,686	(734)

Telecoms Infrastructure





- Unrelenting demand for 5G performance over the next 5 years and high frequency E-band backhaul will be a key enabler for network deployment (20% p/a growth*)
- Filtronic has a long history in the design and manufacturing of Xhaul communications equipment at Q/V and E-band frequencies
- Owning the core mmIC chip-sets allows us to differentiate product offerings and offer enhanced product performance
- New customer driven E-band products launched in 2022 higher power and flexible form factors – 2x transmit power / 12km transmission distance
- Future telecom infrastructure will integrate HAPS and LEO satellites with terrestrial networks E-band is a logical frequency to enable this convergence
- mmic development in progress to deliver higher performance PA's more and extended frequency bands at W-band and D-band



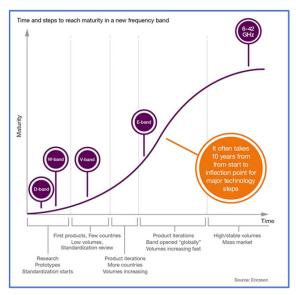
Morpheus II - XHaul Module - Dec 2022

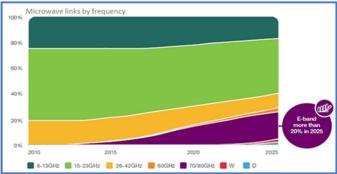


Hades - Active Diplexer - June 2022



Hercules II – Xhaul Module in development







Aerospace & Defence





- The MoD has announced £2.4b funding to develop the next generation ECRS radar system for upgrade of the current UK Typhoon fleet
- The UK is committed to Tempest a next generation fast jet platform that will incorporate leading edge electronic warfare solutions
- Filtronic secure facilities have a unique combination of filter design, MMIC design, RF sub-system design and hybrid assembly & test for EW applications
- DSTL programs offer entry level funding for products that ultimately form part of future defence spending requirements
- Established security accreditations and robust manufacturing processes allow Filtronic to work on UK classified defence programs
- Critical next generation EW solutions and battlefield communication systems are fully funded and in the active design phase



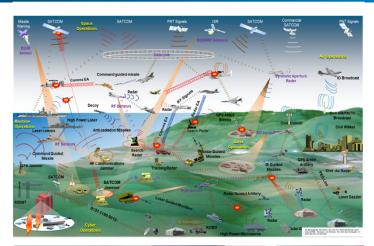
Switch Filterbanks for Radar and Comms



RF Communication Test Systems



Radar Hybrid and SiP Modules







HAPS and LEO Space





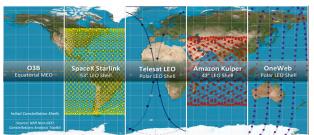
- Rapid convergence of satellite and terrestrial telecom networks to provide ubiquitous network coverage
- The race to build infrastructure and secure market share is accelerating UK and EU investment strategy in LEO communications
- Filtronic successfully developed and deployed two separate E-band HAPS solutions for West Coast technology companies ... high value placed on fast time to market
- The configurable Cerus solid state amplifier (SSPA) the ideal platform for ground based antenna applications ... Cerus32 module family currently in development
- Satellite to ground communications require a level of space qualification ... project EDEN with agency funding currently in development
- High levels of IP reuse possible across different LEO satellite platforms / constellations with core IP developed for terrestrial telecoms



Cerus16 Power Module with control board



HAPs + Leo E-Band Solutions

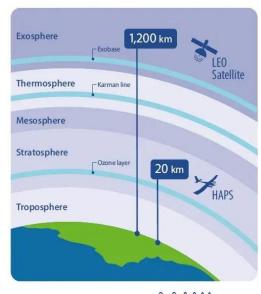


Engagement with major HAPS and LEO consortiums



Cerus8 Power Modules with power combining





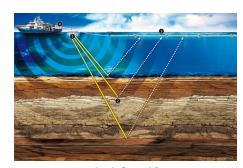


Adjacent Market Applications





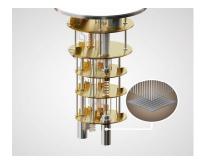
- Filtronic investment in core semiconductor technology coupled with a hybrid manufacturing capability for Aerospace and Defence, Telecom and Critical Comms enables access to adjacent high reliability markets
- Adjacent markets help to diversify customer base, justify capital investment and fill available manufacturing capacity
- Opportunities assessed on available capacity, engineering resource, competitive overlap, opportunity to develop process IP and potential to deliver volume
- Turn-key hybrid manufacturing solutions enable control of the supply chain and retention of Filtronic manufacturing IP and know-how
- Exploring to opportunities to form strategic engineering partnership agreements with target telecom and defence primes who need to secure on shore capability
- Private network opportunities in Track to Train, High Frequency Trading, Last Mile Connectivity, Security and Border Control and Industrial Controls



Seismic Sensor Hybrids for Oil & Gas prospecting



Customised and scalable SSPA solutions



Quantum Computing Cryogenic Filters



RF Design + OSAT Services

