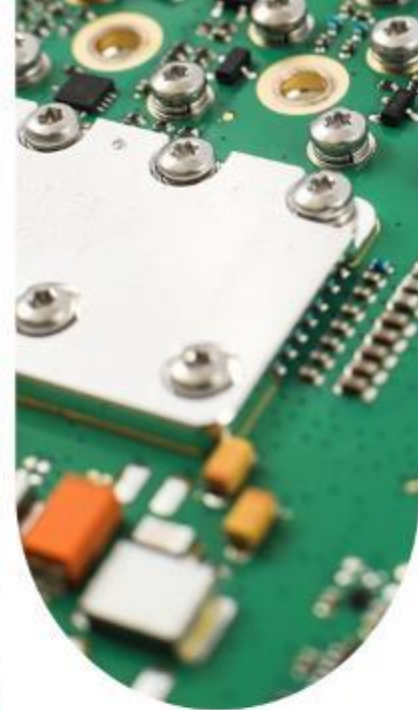




# Interim Results for Financial Year to 30 November 2023

Richard Gibbs, CEO  
Michael Tyerman, CFO



# Agenda

- Executive Overview
- Financial Report
- Markets Strategy & Growth
  - *LEO Space Opportunity*
- Summary



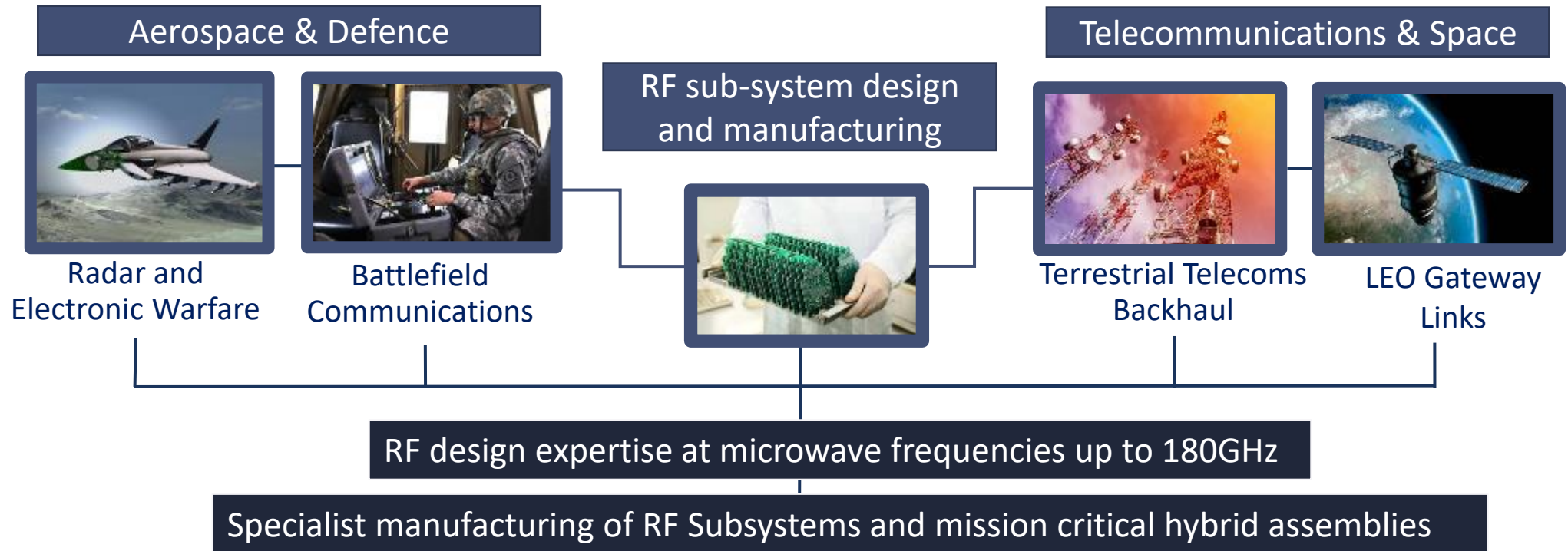
# Enabling the future of RF Microwave and mmWave communications

Creating value for our stakeholders  
through technology leadership

# Executive Overview



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



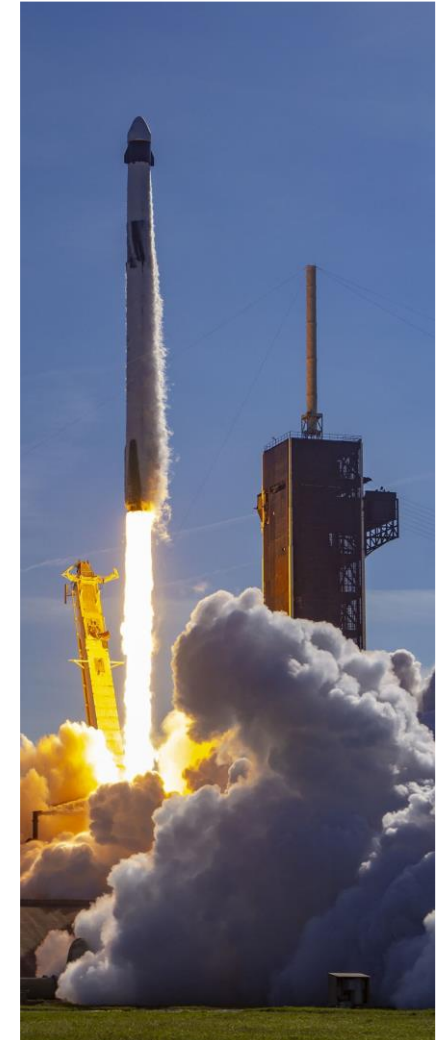
- Recognized globally as experts in high frequency RF product and subsystem design
- Flexible UK and USA manufacturing resources allowing customers to quickly scale to volume
- Accredited Defence manufacturing facilities with robust security, proven processes and traceability



# Recent Business Highlights

- Strong order inflow and good engagement with the technology leaders in our chosen markets
- Agile engineering for rapid design, prototype and product development in LEO space market
- Rapid scaling of in-house manufacturing capacity to meet urgent LEO space market demand
- Significant opportunity pipeline after three years of targeted Business Development effort
- Delivering on our technology roadmap – 12 new products launched + 3 mmIC runs

Market	Customer	Value £/\$/€	Application	Status	Deliverable
Space	Market Leader x3	\$20.0m	E-band Cerus32 SSPA for rapid deployment of ground station network	production	FY24 / FY25
Space	ESA (Artes)	€3.8m	development of multifrequency transceivers for satellite payload links	development	FY25 / FY26
Space	Market Leader	\$150k	development order for E-band dual Tx payload module	dev / prod	FY24 / FY25
Defence	QinetiQ	£2.0m	truck and helicopter mounted mobile Range Radar system	development	FY25 / FY26
Defence	BAE Maritime	£4.8m	multichip TRM module for shipborne radar upgrade	production	FY25 / FY26
Defence	DSTL	£700k	phase 2 and 3 of tuneable filter development programme	development	FY25
Aerospace	UK EW prime	£1.0m	multiple filter products for development of next generation AESA radar	development	FY24 / FY25
Telecoms	Major Telco	\$1.0m	production orders for Morpheus X2 high power backhaul module	production	FY24 / FY25
Telecoms	Private Telco x2	\$1.1m	Delivery of customised Morpheus X2 / Hercules X2 / Hades X2 modules	dev / prod	FY24 / FY25



Revenue  
**£8.5m** ▲  
(1%)

Adjusted EBITDA\*  
**£0.2m** ▼  
(-78%)

Operating loss  
**£0.4m** ▼  
(-176%)

Cash at bank  
**£4.1m** ▲  
(55%)

Net cash (net of all lease obligations  
except right of use property lease)  
**£2.4m** ▲  
(50%)

\* Adjusted EBITDA is adjusted earnings before interest, taxation, depreciation, amortisation and exceptional items

## Operational Highlights

- Revenue and profit expected to be ahead of market expectations for FY2024 and FY2025
- Contract award of £3.4m in the period from the market leader in the high-growth, low earth orbit (“LEO”) satellite communications equipment using Filtronic’s proprietary Cerus 32
- Good progress made on the development project to supply the European Space Agency (“ESA”) with next generation space payload communication systems for £3.2m
- Award of £170k grant from the Defence Technology Exploitation Programme (“DTEP”)
- Healthy cash position enables continued investment in revenue growth initiatives to deliver the strategic plan.

## Post-period Highlights

- Additional contract awards of £12.6m from the market leader in the high-growth, low earth orbit (“LEO”) satellite communications equipment market
- Development contract from the market leader of low earth orbit (“LEO”) satellite communications equipment for £150k to develop an E-band payload module
- Contract award of £4.5m BAE Maritime Systems for the development and manufacture of advanced RF electronic modules
- Contract award from QinetiQ valued at £2.0m for the development of a radio-frequency subsystem to be deployed as a vehicle mounted land system or helicopter mounted solution.

# Financial Summary



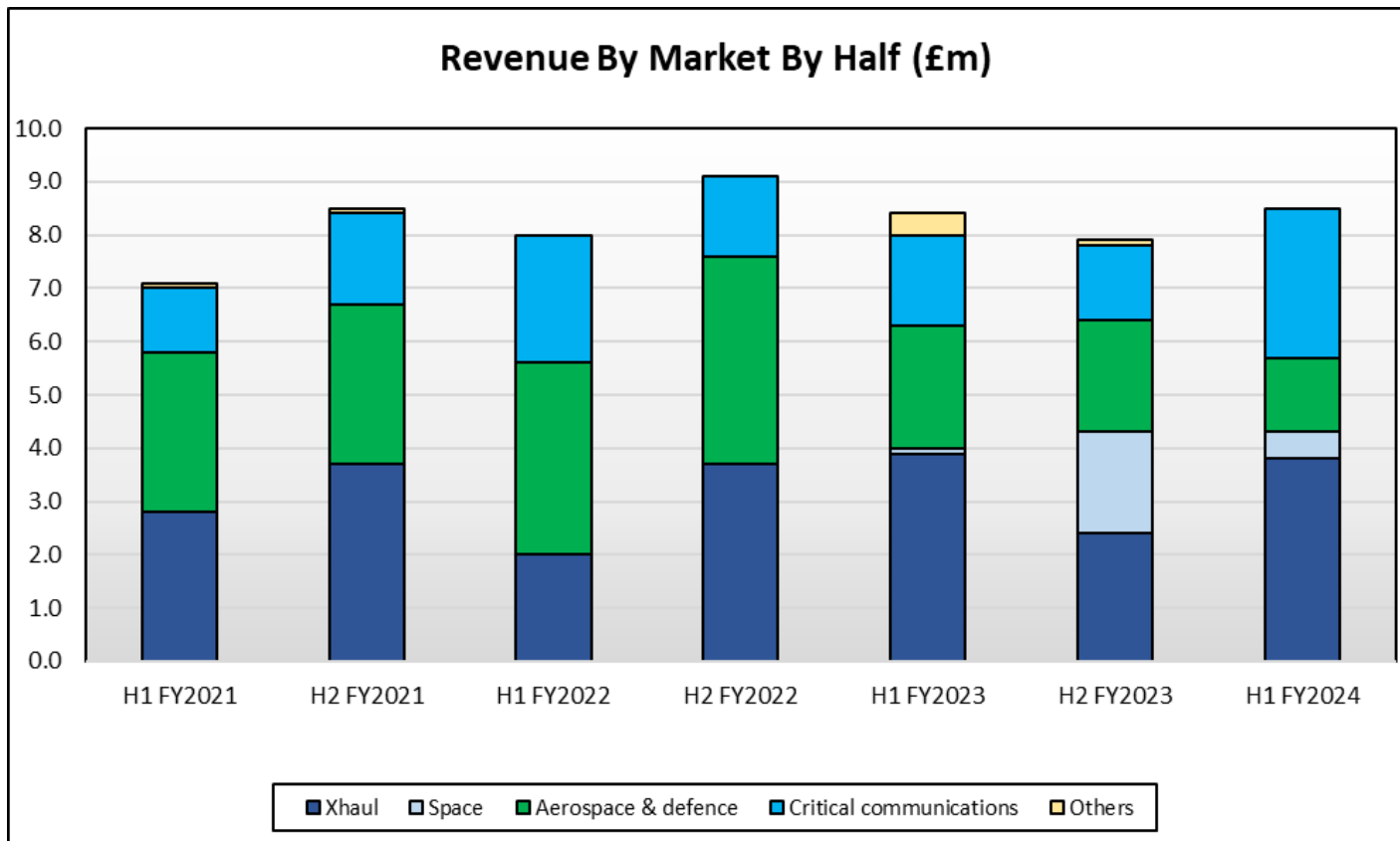


# Revenue: Increase of 1% vs FY2023

Revenue from recent key contract wins not reflected in these results

**Key strategic objective:**

**Continue to develop customer base outside of top three customers**



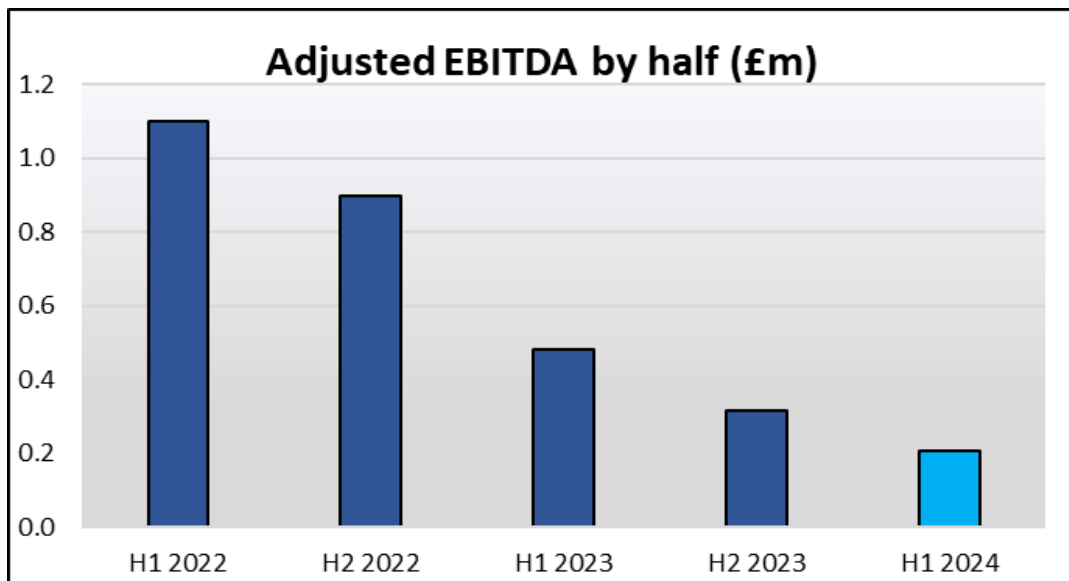
**Group revenue £8.5m** (2023: £8.4m)

- Space market expected to see very strong uplift in H2 with recent contract wins from market leading LEO player.
- Aerospace & defence projects impacted by component availability, but this is now resolved, whilst new contract wins strengthen outlook.
- Critical communications results benefitted from semiconductor supply chain issues easing.
- 5G rollouts saw good demand in the period, aligned with demand output in prior periods, but telecommunications market has seen a softening.

**1% increase against FY2023**

- **Xhaul including Space:** Increased 8% vs HY2023 with 5G rollouts recovering.
- **Defence:** Decrease of 20% vs HY2023.
- **Critical comms:** 35% revenue increase vs HY2023.

## Investment in business development and engineering to deliver growth



### Full year results (£m)

	HY2024	HY2023	Change
<b>Revenue</b>	<b>8.5</b>	<b>8.4</b>	<b>1%</b>
Material costs	(3.2)	(3.0)	(8%)
Operating costs	(5.6)	(4.9)	(15%)
Exceptional items	0.0	0.0	0%
<b>Operating (loss)/profit</b>	<b>(0.4)</b>	<b>0.5</b>	<b>(176%)</b>
<b>EBITDA (Adjusted)</b>	<b>0.2</b>	<b>1.0</b>	<b>(78%)</b>

- **Sales mix** weaker due to a higher concentration of 5G backhaul product - COGS 8% higher on a revenue increase of 1%.
- Investment in sales channels and engineering continued which increased the overhead cost base by 15% to £5.6m to support top line growth.
- **Adjusted EBITDA** fell by 78% to £0.2m impacted by weaker sales mix and investment in sales and engineering.
- EBITDA **margin** was 2% reflecting the investment in revenue growth initiatives on a modest revenue increase. Expect this to significantly increase.
  - Cost base can support much higher levels of turnover as we scale which will improve profitability and EBITDA margin as revenues increase. (Achievable EBITDA margin – 15%-25%)

	Nov-23	May-23	Nov-22
	£m	£m	£m
Goodwill and intangible assets	2.0	1.8	1.6
Right of use assets	3.6	2.9	2.6
Property, plant and equipment	0.8	1.4	0.8
Deferred tax	1.2	1.3	0.9
<b>Non-current assets</b>	<b>7.6</b>	<b>7.4</b>	<b>5.8</b>
Inventory	2.6	2.8	2.7
Trade and other receivables	4.5	5.3	4.8
Cash and cash equivalents	4.1	2.6	3.1
<b>Current Assets</b>	<b>11.2</b>	<b>10.7</b>	<b>10.6</b>
Trade creditors and other payables	2.8	3.7	2.3
Provisions	0.4	0.4	0.2
Deferred income	1.8	0.2	0.2
Lease liabilities	2.8	2.3	2.1
<b>Total liabilities</b>	<b>7.8</b>	<b>6.6</b>	<b>4.8</b>
<b>Net assets</b>	<b>11.0</b>	<b>11.5</b>	<b>11.6</b>
<b>Share capital and reserves</b>	<b>11.0</b>	<b>11.5</b>	<b>11.6</b>

## Capital expenditure and Right of use assets

- Reclassification of right of use assets following successful asset financing of £700k of capex investment from FY2023

## 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

## Debtors and creditors

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

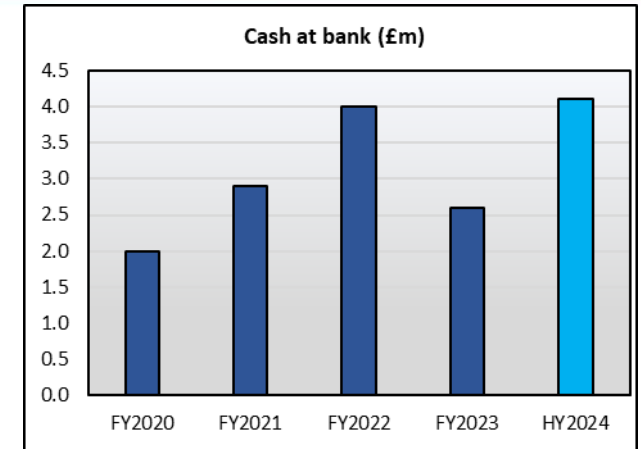
## Deferred income

- Advance payment received on European Space Agency development programme.

	Nov-23	May-23	Nov-22
	£m	£m	£m
Net cash generated from operating activities	1.8	1.1	(0.2)
Net cash used in investing activities	(0.5)	(1.2)	(0.4)
Net cash used in financing activities	0.1	(0.4)	(0.4)
<b>Movement in cash and cash equivalents</b>	<b>1.5</b>	<b>(0.4)</b>	<b>(1.0)</b>
Currency exchange movement	0.0	0.0	0.0
Opening cash and cash equivalents	2.6	3.1	4.0
<b>Closing cash and cash equivalents</b>	<b>4.1</b>	<b>2.6</b>	<b>3.1</b>

## Cashflow movement

- Generated £1.8m from operating activities: Favourable working capital movement from debtor unwind and advance payment on the ESA programme.
- Investments in product development, capital expenditure, repayment of lease liabilities saw outflow of £1.0m offset by financing of assets in period of £0.7m giving a net outflow from financing and investing activities of £0.3m.
- £1.5m total cash inflow in HY2024.



## Cash position healthy to maintain investment in growth

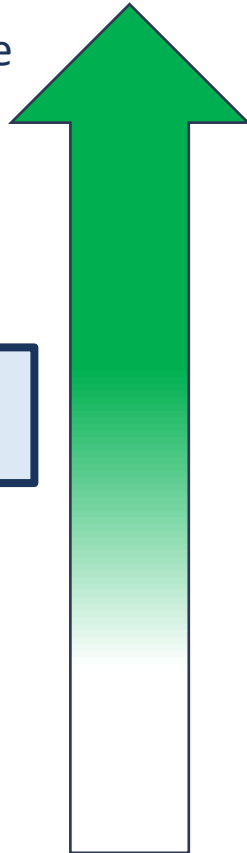
- £4.1m cash at bank at 30 November 2023 (2023: £2.6m).
- A healthy cash position to maintain investment in growth.
- Undrawn invoice discounting debt facilities available - £3.0m Barclays and \$4.0m Wells Fargo.

# Progress on Investment Initiatives

Business Activity	Investments and Progress Against Objectives
Sales and marketing	<ul style="list-style-type: none"><li>• Additional <b>BD hires</b> planned in FY2024 targeting aerospace &amp; defence and space market opportunities</li><li>• Expanding the <b>trade exhibition coverage</b>. ✓</li><li>• Further investment in the <b>CRM</b> tool. ✓</li><li>• <b>New reps</b> planned in Europe and the rest of the world expanding our indirect channels. ✓</li><li>• Continue to raise <b>brand awareness across multiple media formats</b> ✓</li></ul>
Engineering (R&D)	<ul style="list-style-type: none"><li>• Plans to <b>recruit additional engineers</b> across multiple disciplines. ✓</li><li>• Augment the team with more <b>graduates</b> and commence an <b>apprenticeship</b> programme. ✓</li><li>• Continue development of <b>W-band MMIC chipsets</b> and space products for ground &amp; payload applications. ✓</li><li>• Manufacturing process for <b>plastic encapsulation</b> will be developed. ✓</li><li>• Number of <b>grant funding</b> channels identified to support technology roadmap - several already secured. ✓</li><li>• Capex for test capability to further support <b>Ka, Q and V-band</b> engineering developments. ✓</li></ul>
Operations and business processes	<ul style="list-style-type: none"><li>• Gap analysis of <b>ISO27001</b> as we look to further augment our cyber credentials. ✓</li><li>• <b>AS9100</b> standard under review.</li><li>• <b>Penetration testing</b> demonstrated we have a robust system but will increase the cadence. ✓</li><li>• <b>MRP system</b> due for implementation in FY2024.</li></ul>

# Key Financial Themes

- Aerospace and defence
- Space
- Critical comms



Quality of Earnings

- Telecoms

Future investment	
<b>Engineering resource</b>	Target to maintain investment at 13% of revenue
<b>Sales and marketing</b>	Incremental development of direct channels to market and building of indirect channels to market with a variable cost model
<b>Operational cost base</b>	At recent revenue levels the business is sub-scale so the cost base can be leveraged to drive margin improvement
<b>Manufacturing capacity</b>	Support higher revenue without the need for significant capex spend
<b>Capex requirements</b>	Requirement for additional engineering capability to expand capacity and support new market-driven frequency band needs
<b>EBITDA margin</b>	EBITDA margin can be driven to the 15%-25% range in the near-term

- Number of **aerospace & defence** opportunities at key strategic targets.
  - Large contract wins at BAE and QinetiQ
  - Good engagement with further defence primes as the UK government encourages SME involvement.
  - A third contract win with DSTL for £400k.
  - Number of other smaller contract wins in period.
- **LEO space market** momentum building:
  - Contract wins of £16m secured with the market leading LEO company.
  - Development contract with the market leader for a payload module.
  - Key players and well-funded disruptors generating a healthy pipeline of opportunity.
  - Recent contract win with the European Space Agency for £3.2m.
- **Telecommunications infrastructure** softening market but programme rollout continues.
  - Key market to drive the technology roadmap.
  - Quality of earnings is not as strong as other markets.
- **Critical communications** seeing demand recovery in FY2024.
- Continued investment in R&D activities and the sales channels will increase the overhead cost base further but will drive top level growth.

# Markets, Strategy & Growth





# Market Dynamics



	Telecommunications Infrastructure ( <i>X-haul</i> )	LEO Space ( <i>Gateway / Payload Links</i> )	Aerospace ( <i>Radar / EW / ECM</i> )	Defence ( <i>Comms / EW / ECM</i> )	Critical Communications ( <i>LMR / P25 Networks</i> )
Primary Applications	<ul style="list-style-type: none"> <li>E-band backhaul transceivers for 5G telecoms infrastructure</li> <li>Private telecom solutions</li> </ul>	<ul style="list-style-type: none"> <li>LEO Gateway communication links – payload and ground station</li> </ul>	<ul style="list-style-type: none"> <li>RF / microwave hybrid TRM modules for airborne ASEA radar and EW systems</li> </ul>	<ul style="list-style-type: none"> <li>Battlefield communications</li> <li>EW and Cyber applications</li> <li>Electronic Counter Measures</li> </ul>	<ul style="list-style-type: none"> <li>Subsystems for LMR secure public safety / first responder communications networks</li> </ul>
Market Growth Rate	<ul style="list-style-type: none"> <li><b>5G V/E-band Backhaul growth: 20% p/a CY2023-28*</b></li> <li>2024/25 outlook less optimistic due to geopolitical disruption</li> </ul>	<ul style="list-style-type: none"> <li><b>&gt;60,000 LEO satellites launched by 2029*</b></li> <li>OneWeb (EU) + Private Network constellations (US) set the pace</li> </ul>	<ul style="list-style-type: none"> <li><b>£750m p/a EW defence budget*</b></li> <li><b>£16.5bn increase in UK Defence Spending CY2020-27*</b></li> </ul>	<ul style="list-style-type: none"> <li><b>£850m defence Comms budget</b></li> <li><b>£6.6b DSTL S&amp;T budget*</b></li> </ul>	<ul style="list-style-type: none"> <li><b>LMR market growth: 7% p/a CY2022-26*</b></li> </ul>
Market Drivers	<ul style="list-style-type: none"> <li><b>Global 5G telecoms rollout</b></li> <li>Release of E-band licences</li> <li>High density urban networks</li> <li>Low installed fibre in backhaul</li> </ul>	<ul style="list-style-type: none"> <li><b>Ubiquitous broadband access</b></li> <li>Release of Q/V E-band licences</li> <li>Economic network coverage</li> <li>Future operating revenues</li> </ul>	<ul style="list-style-type: none"> <li><b>Outsourced RF design capability</b></li> <li>Sovereign OSAT hybrid facility</li> <li>UK Defence Strategy / Exports</li> </ul>	<ul style="list-style-type: none"> <li><b>Outsourced RF design &amp; build</b></li> <li>Sovereign OSAT hybrid facility</li> <li>UK Defence Strategy</li> </ul>	<ul style="list-style-type: none"> <li><b>Reliability P25 LMR solutions</b></li> <li>Upgrade + MRO installed base</li> <li>Introduction of LTE solutions</li> <li>Integration LTE LMR solutions</li> </ul>
Filtronic USP	<ul style="list-style-type: none"> <li><b>Partnership with market leader</b></li> <li>Quality /reputation / brand</li> <li>Proven IP / Performance</li> <li>History of volume delivery</li> </ul>	<ul style="list-style-type: none"> <li><b>Partnership with market leader</b></li> <li>Tx /Rx Power SSPA performance</li> <li>Telecoms reputation / cost</li> <li>Volume manufacture + ramp-up</li> </ul>	<ul style="list-style-type: none"> <li><b>Partnership with market leaders</b></li> <li>Accredited UK RF hybrid facility</li> <li>Strong RF design / DFM support</li> <li>Manufacturing processes</li> <li>Cyber security accreditation</li> </ul>	<ul style="list-style-type: none"> <li><b>Partnership with DSTL / DASA</b></li> <li><b>Accredited UK hybrid facility</b></li> <li>RF design / DFM support</li> <li>Manufacturing processes</li> <li>Cyber security accreditation</li> </ul>	<ul style="list-style-type: none"> <li><b>Partnership with Motorola</b></li> <li>Quality /reputation / brand</li> <li>US manufacturing facility</li> </ul>

\*Dell'Oro Backhaul 5-Year Forecast (Dec 2023)

\* Ref: Research and Markets (Mar 2023)

\* Ref: Defence Budget (April 2023)

• Ref: DSTL Spending Review (Nov 2022)

• Ref: Customer forecast (Jan 2023)



# Market Size and Opportunity



	Telecommunications Infrastructure (X-haul)	LEO Space (Gateway / Payload Links)	Aerospace (Radar / EW / ECM)	Defence (Comms / EW / ECM)	Critical Communications (LMR / P25 Networks)
Primary Applications	<ul style="list-style-type: none"> <li>E-band backhaul transceivers for 5G telecoms infrastructure</li> <li>Private telecom solutions</li> </ul>	<ul style="list-style-type: none"> <li>LEO Gateway communication links – payload and ground station TX/ Rx modules + SSPA's</li> </ul>	<ul style="list-style-type: none"> <li>RF / microwave hybrid TRM modules for airborne ASEA radar and EW systems</li> </ul>	<ul style="list-style-type: none"> <li>Battlefield communications</li> <li>EW and Cyber applications</li> <li>Electronic Counter Measures</li> </ul>	<ul style="list-style-type: none"> <li>Subsystems for LMR secure public safety / first responder comms networks</li> </ul>
Market Growth Rate	<ul style="list-style-type: none"> <li>Microwave backhaul growth: 20% p/a CY2023-28*</li> <li>200k radios CY23 to 400k CY27</li> </ul>	<ul style="list-style-type: none"> <li>&gt;60,000 LEO satellites by 2029*</li> <li>OneWeb (EU) + Private Network constellations set the pace</li> </ul>	<ul style="list-style-type: none"> <li>£750m EW defence budget p/a*</li> <li>£16.5bn increase in UK Defence Spending CY2020-24*</li> </ul>	<ul style="list-style-type: none"> <li>£850m ECM/Comms budget p/a</li> <li>£6.6b DSTL 5-year S&amp;T budget*</li> <li>EW/ECM growth 5% p/a*</li> </ul>	<ul style="list-style-type: none"> <li>LMR market growth: 7% p/a CY2022-26*</li> </ul>
Filtronic TAM Assumptions FF25 - FY27	<ul style="list-style-type: none"> <li>V/E band revenue = <b>\$2.4b p/a</b></li> <li>V/E Tx/Rx ~20% = <b>\$480m p/a</b></li> <li>Huawei / Ericsson ~70% share</li> <li>Nokia / Siklu / NEC + ZTE ~30%</li> <li>Private network opportunities</li> </ul>	<ul style="list-style-type: none"> <li>30,000 Ka/E/QV satellite = <b>\$1.5b</b></li> <li>&gt; 2-5 Tx/Rx links per = <b>\$300m</b></li> <li>&gt; \$4-10k total per satellite</li> <li>15,000 E/Q G/way SSPA = <b>\$200m</b></li> <li>&gt; \$10k-\$15k per antenna</li> </ul>	<ul style="list-style-type: none"> <li>Legacy radar TRM wafers ~<b>£47m</b></li> <li>Typhoon Upgrade x 589 ~<b>£58m</b></li> <li>&gt; MkII radar content £100k</li> <li>Build to print EW/ECM hybrids</li> <li>Build to print Plastic QFN</li> </ul>	<ul style="list-style-type: none"> <li>DSTL designs move into field use</li> <li>New DSTL funded engagements</li> <li>Future missile and EW programs</li> <li>Defence communications filters</li> <li>Maritime SatCom/radar upgrade</li> </ul>	<ul style="list-style-type: none"> <li>Legacy P25 LMR ~<b>\$10m p/a</b></li> <li>TTA and filters ~<b>\$15m p/a</b></li> <li>Mars Platform ~<b>\$3m p/a</b></li> </ul>
Opportunity Value (SAM) FY25 - FY27 (£185 - £496m)	<ul style="list-style-type: none"> <li>5-10% 5G market = <b>\$20-\$40m</b></li> <li>30% &gt;5km link products = <b>\$6m</b></li> <li>Cost pressures continue</li> <li>Slow India 5G fulfilment</li> <li>Developing nations licence 5G</li> </ul>	<ul style="list-style-type: none"> <li>LEO Constellation = <b>\$250m</b></li> <li>&gt; payload = \$150m /GS = \$100m</li> <li>Other LEO Networks = <b>\$100m</b></li> <li>&gt; payload = \$40m / GS = \$60m</li> </ul>	<ul style="list-style-type: none"> <li>Typhoon radar revenues = <b>£15m</b></li> <li>&gt; Legacy TRM's <b>£10m</b></li> <li>&gt; MkII – 40 UK aircraft = <b>£5m</b></li> <li>EW/ECM O&amp;G OSAT = <b>£15m</b></li> <li>Custom Defence Filters = <b>£5m</b></li> </ul>	<ul style="list-style-type: none"> <li>DSTL Swift Program = <b>£4-6m</b></li> <li>DSTL SME programs = <b>£3m</b></li> <li>X-band Skynet G/station <b>£7m</b></li> <li>Range radar project = <b>£3m</b></li> <li>Type 31 Samsom radar = <b>£4m</b></li> </ul>	<ul style="list-style-type: none"> <li>Legacy Networks = <b>\$10m</b></li> <li>&gt; 30% TTA market</li> <li>&gt; legacy combiners / filters</li> <li>&gt; Mars filters</li> </ul>

**£20-£45m Opportunity**

**£100-£300m Opportunity**

**£30-£50m Opportunity**

**£25-£35m Opportunity**

**£8-£15m Opportunity**





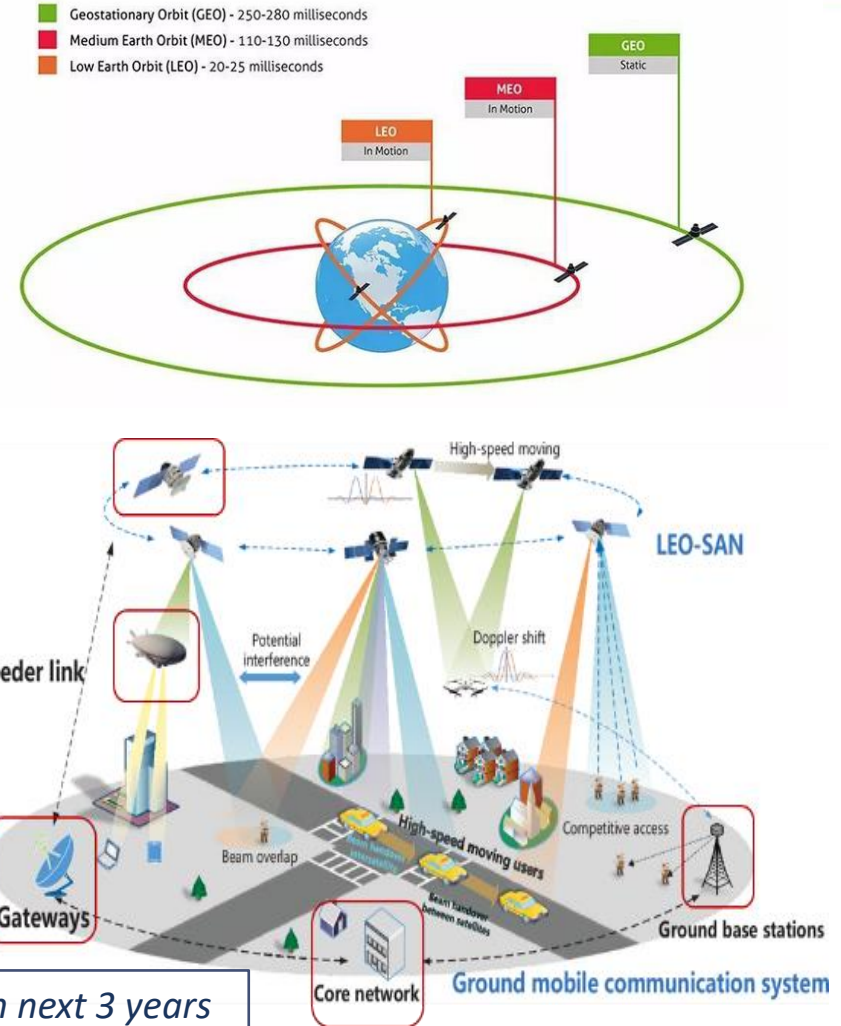
- LEO constellations are **converging with 5G** terrestrial telecom networks to provide low latency and global broadband connectivity
- **Core IP Reuse** - the fast-growing LEO market represent a significant opportunity for Filtronic to supply customised products based on core telecoms semiconductor and manufacturing IP
- The **Starlink Network** supported by **SpaceX** is the clear market leader in LEO Space infrastructure. 300 launches, 5,000 LEO satellites deployed (80% of all payload in CY23) and more than 4m subscribers
- **Agile design and development** and the ability to scale quickly into manufacturing are key enablers for success in the aggressive LEO market
- Proposed **Direct to Cell** constellations applications will not detract from the need for a high frequency backhaul feeder links and robust ground station network
- **MEO and GEO applications** - ground station products can be sold into MEO / GEO where ratio of ground stations to satellites is much higher



Cerur 16 Gateway SSPA



Cerur 32 Gateway SSPA



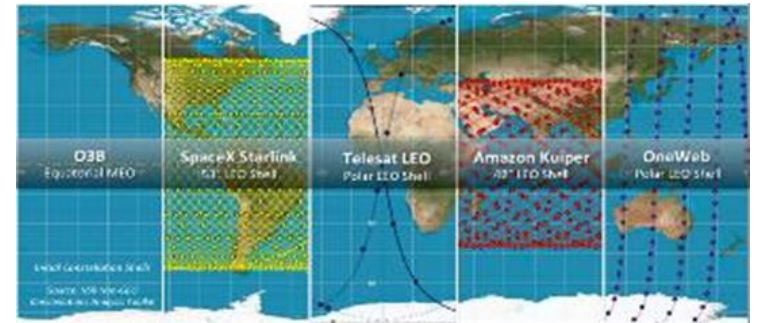
**TAM:** \$1.5b the RF communications element of 30,000 LEO satellites launched in next 3 years  
**SAM Opportunity:** £100m to £300m based on identified and well-funded space programmes

# Primary LEO Space Constellations

Program	Target Segments	Target Constellation Size	HQ	Launch Partners	Satellite OEM	Bands	Comments
StarLink	Consumer and Enterprise Internet / Government	30,000	Redmond, USA	SpaceX	SpaceX	Ka, E, V/Q, D	Service live across, US, EU and SE Asia inc Australia and NZ
Amazon Kuiper	Consumer and Enterprise Internet / Government	3,236	Seattle, USA	Arianespace, Blue Origin, United Launch Alliance	Amazon Kuiper	Ka	Trials ongoing but delayed, expecting launch first satellite in 2024, service starts in 2025/6
OneWeb	Consumer and Enterprise Internet / Government	648	London, UK	SpaceX	Airbus / LHM	Ka	Limited service available / OWG2 under review
TeleSat	Enterprise Internet / Government	188	Ottawa, Canada	Arianespace, SpaceX, ILS (Russian)	Boeing, Space Systems Loral, EADS Astrium, BAE,	Ku, Ka	GEO service available, LEO undergoing trials
AST	Direct to Cellular	95	Texas, USA	SpaceX	AST	Ka, V/Q	Trials - some objections to their 700sq ft satellite
Rivada	Enterprise Internet / Government	600	Munich, Germany	TBA RFQ out	TBA - RFQ out	Ka	Trials, Deployment starts 2025, expected service 2028
Lynk	Direct to Mobile Connections	5000	Washington, USA	?	?	Ka	Trials
SES O3B	Media and Private Networking	20	Luxemburg	SpaceX	?	Ka / E	MEO service for media today

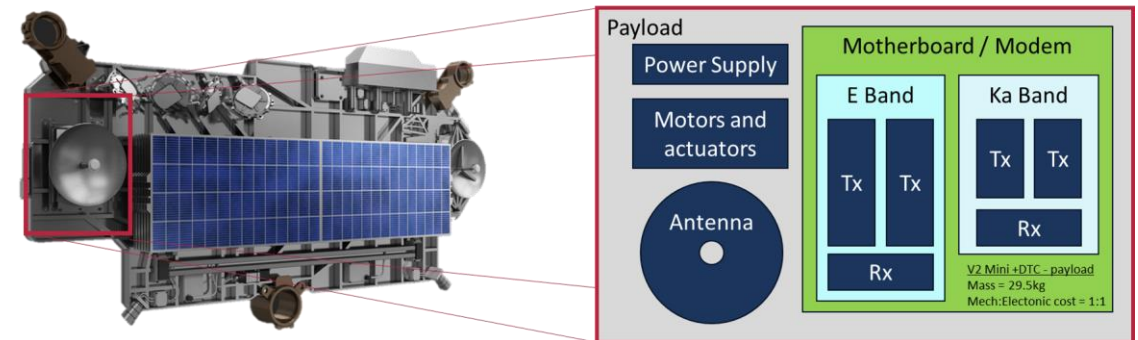
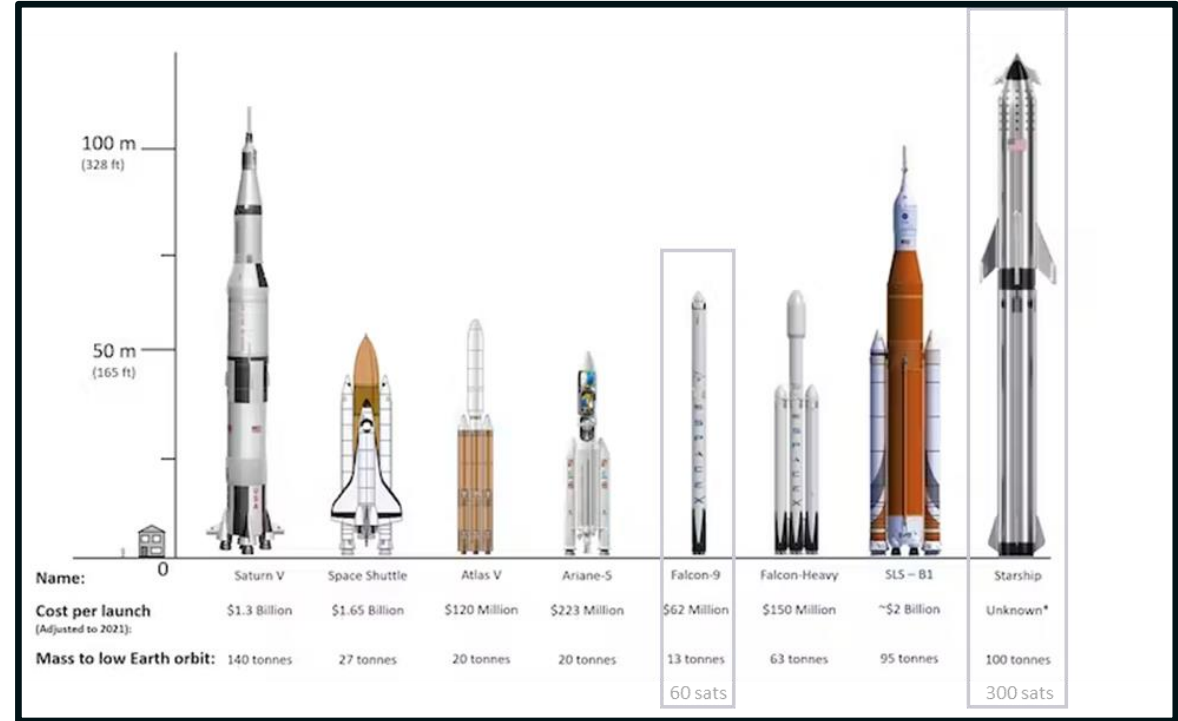
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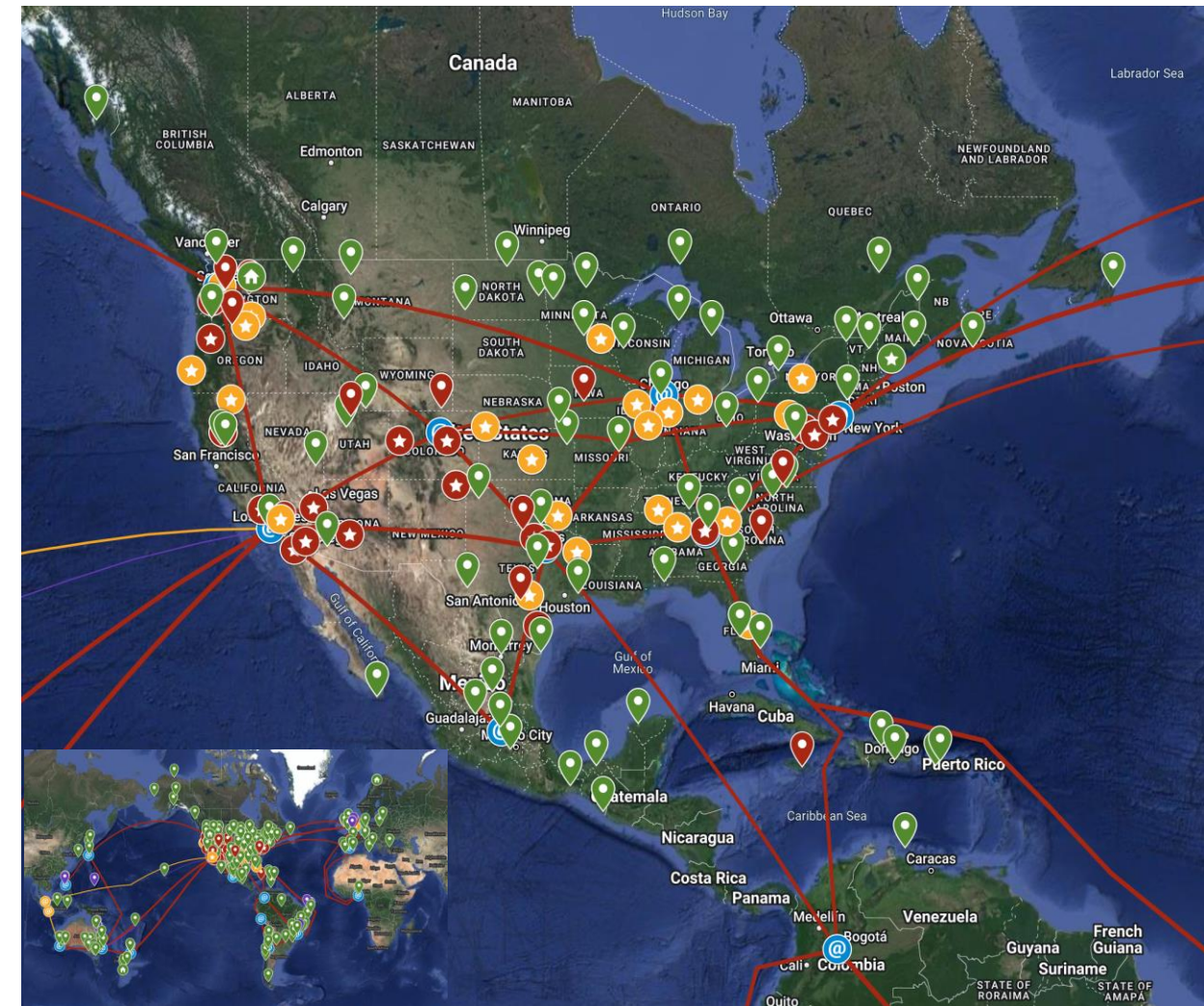
# LEO Space - Satellite Payload Opportunity

- Solving the cost of launch and deployment has been the key to unlocking the economic potential of LEO satellite constellations
- The speed of network deployment will depend on launch capacity and the size and weight of satellite payload – SpaceX Starship is planning for up to 600 Starlink v2mini satellites per launch
- User links operate at low frequency Ka-bands. 1<sup>st</sup> generation ground station links also use Ka-band - but this now limits network capacity and latency
- Future LEO deployment will have multifrequency connectivity Ka to Q/V, E-band and D-band to maximise capacity and optimise latency
- Payload solutions must consider size weight power and cost and be designed to survive in a radiation environment – this requires significant qualification effort – ref: ESA contract award
- LEO intersatellite links (ISLs) are almost exclusively optical as they provide unlimited bandwidth and there are no safety concerns
- Current market assumption is 30,000 LEO constellation satellites in service by 2028 – between 1 and 5 payload links per satellite



# LEO Space - Ground Station Opportunity

- Ground stations or Gateway Links provide high speed, low latency links to and from the LEO satellite as it passes overhead
- Uplinks require high performance amplification at mmWave frequencies – currently ~400 (5%) antenna are E-band enabled
- The current Starlink network has over 200 ground station locations in the USA with 8 to 40 antenna per site
- The Starlink network will have another 200+ sites worldwide in locations where they are licenced to operate their services
- Current market assumption is that LEO networks have a ratio of 2:1 satellites to antennas but this will be highly dependent on user demand, service standards and network configuration



8 / 32 / 40 antenna per site ... 400 US sites ... Green = Live / Yellow = Construction / Red = Licensed



## TAM: £3.2b UK Defence Budget / approx. 2.3% GDP

- £750m Electronic Warfare (EW) annual spend - growing to £1.0b by 2027
- £2.4b funding to upgrade current UK Typhoon fleet radar system
- £10b committed to Tempest a next generation fast jet platform
- SkyNet 5/6 investment – secure MoD GEO Space communications

## DSTL - 5-year budget for Science & Technology £6.6b

- entry level funding for technology and product developments that form part of future defence spending requirements

**Sovereign capability** - Filtronic secure UK facilities with full defence accreditation provides a unique combination of RF filter design, mmIC design, RF sub-system design and RF hybrid assembly & test

**Current conflicts** highlight the importance of Electronic Warfare (EW) and Electronic Counter Measures (ECM) into an integrated Battlefield Communications solutions – including terrestrial and space applications

**RF Technology** requirements for defence lag the commercial telecom market but provide long-term revenues with good payback on IP investment

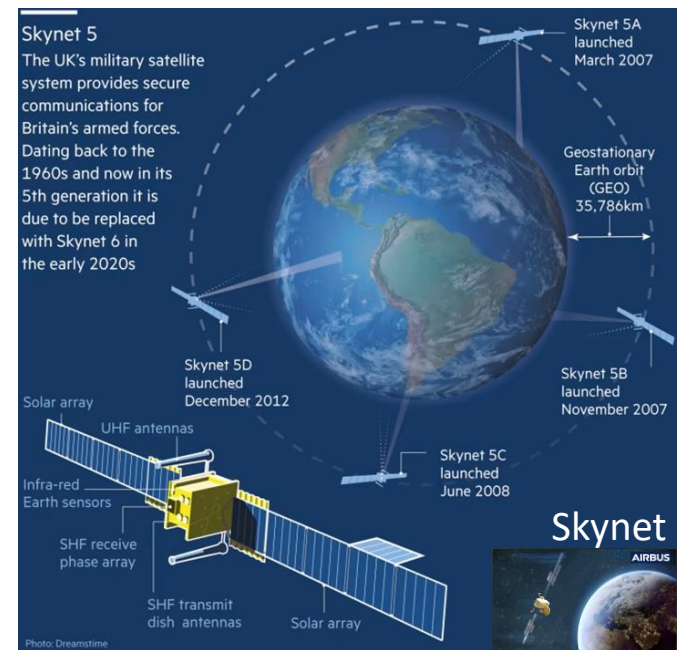
**TAM: UK MoD - EW / ECM + future Battlefield Communication requirements**  
**SAM Opportunity: £55m to £85m based on identified programmes**



Radar Hybrid and Modules



Switch Filter banks



# Telecoms Infrastructure Market



**Unrelenting demand for 5G performance** over the next 5 years with high frequency mmWave backhaul a key enabler for true 5G network deployment

**IP Ownership** - Owning the core mmIC semiconductor chip-sets allows us to differentiate product offerings and offer enhanced product performance for higher power / lower latency

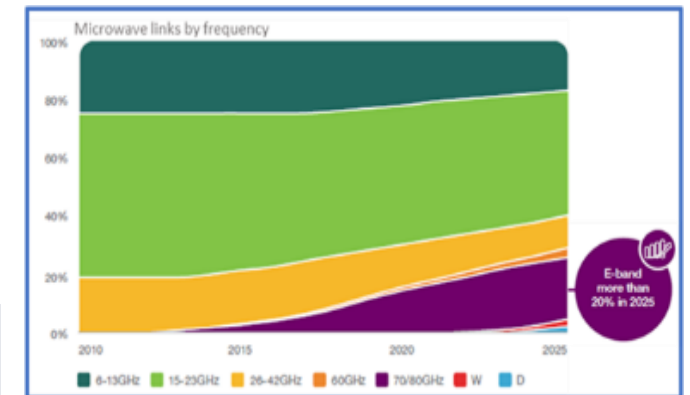
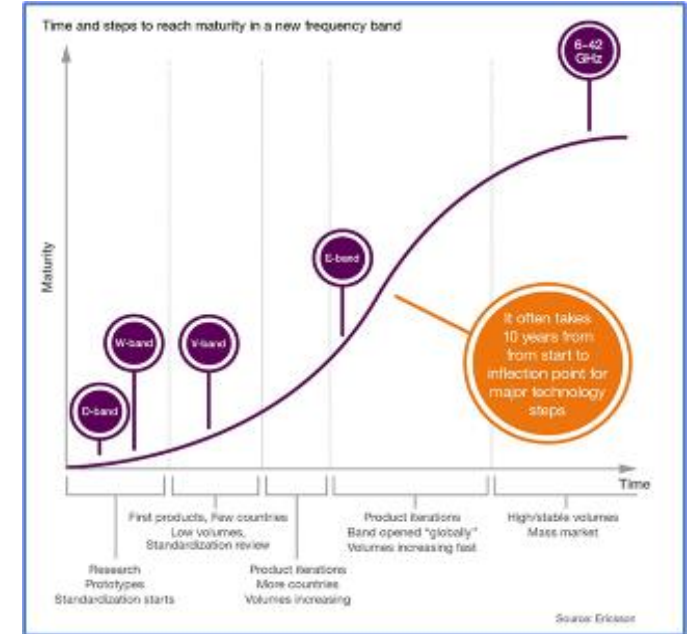
**Private communication network** opportunities continue to grow and create demand innovative products ... enabled our entry into the LEO space market

Five customer driven **E-band products** launched in FY2023 delivering higher power, lower latency and flexible form factors – rapid turnkey design and manufacture

**Future telecom infrastructure** will integrate HAPS and LEO satellites with terrestrial networks - mmWave frequencies are required to enable backhaul convergence

**Technology Roadmap** - mmIC development in progress to deliver higher performance solutions and open extended telecom frequency bands at Q/V-band W-band and D-band

**TAM: \$1.5b** - the approximate 3-year infrastructure spend on mmWave backhaul  
**SAM Opportunity: £20m to £45m** based on identified programs and customers



Morpheus II XHaul Module



Hercules II Xhaul Module



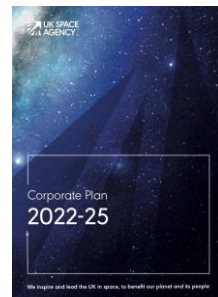


# Summary



# Summary - Investment Proposition

- **Filtronic - build momentum and positioned for growth**
  - Focused on four strategic verticals - LEO space, aerospace, defence and terrestrial telecommunications
    - *serving the market leader in each of our target markets - adding value and commanding sustainable margins*
    - *Investing to strengthen sales and engineering to open the aperture on multiple new business opportunities*
    - *delivering our technology roadmap, creating core IP and developing innovative products*
  - Aligned with UK Government investment priorities – UK defence - sovereign supply chains - space
  - Resources in place to deliver a strategic plan designed for revenue growth and shareholder value
  - Strong orderbook and an increasingly positive trading outlook for FY2024
  - Significant orderbook and opportunity pipeline heading into FY2025



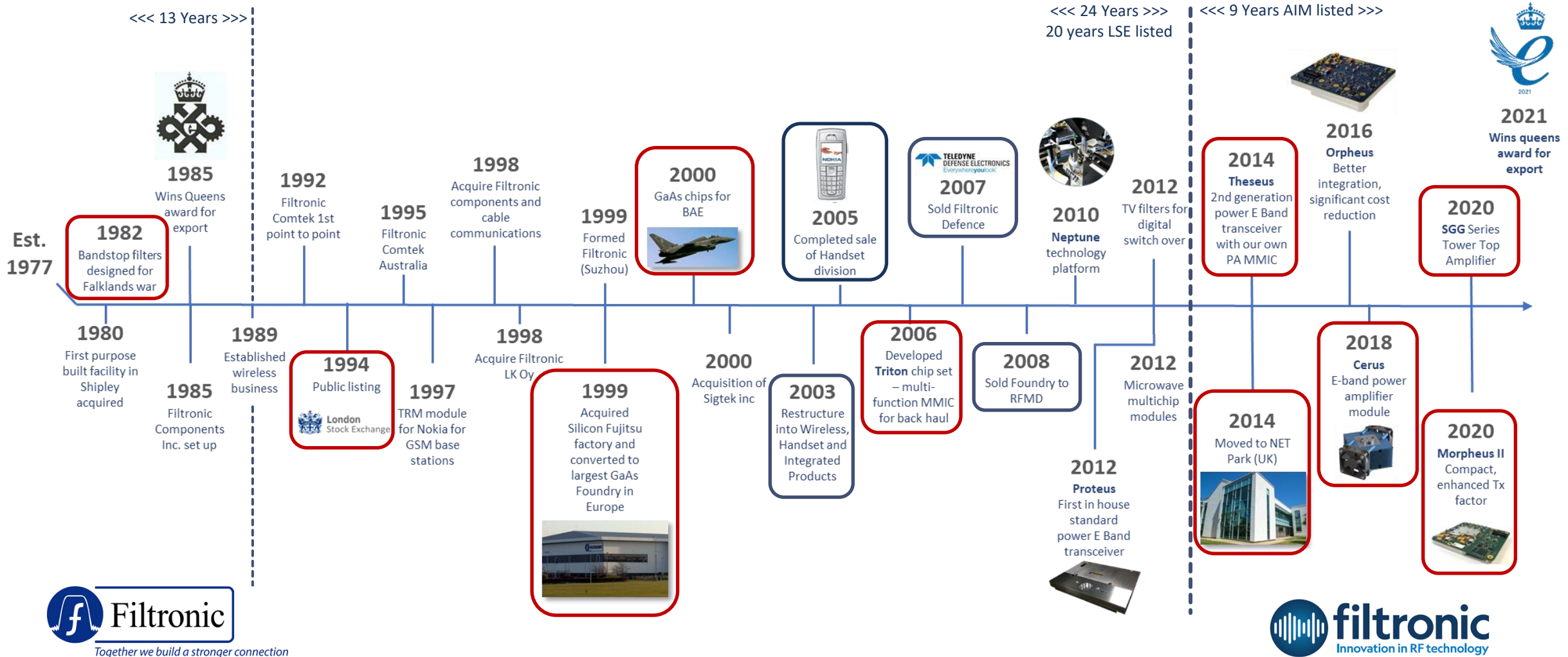


# Enabling the future of RF Microwave and mmWave communications

# Appendices



# Filtronic Timeline



# Experienced Board



**CEO**  
**Richard Gibbs**

Richard Gibbs was appointed as Chief Executive Officer in September 2020. Richard has over 35 experience in the electronics industry and prior to joining Filtronic was Managing Director at Micross Components, President of Hi-Rel Semiconductors at E2V plc, and the beneficiary of 20-year career with Honeywell in a variety of leadership roles including 10 years of International assignments in Asia Pacific and the USA



**CFO**  
**Michael Tyerman**

Michael Tyerman was appointed Chief Financial Officer in April 2016 having joined Filtronic in 2007 as a Financial Controller and subsequently Group Financial Controller. Prior to joining Filtronic, Michael held various positions within Procter and Gamble, Huntsman Polyurethanes and Komatsu which included time in the Benelux and Nordic regions. Michael is a Chartered Management Accountant.



**Non-Exec Chairman**  
**Jonathan Neale**

Jonathan Neale was appointed Non-Executive Chairman at Filtronic in October 2022. Prior to this Jonathan had been Chief Operating Officer of McLaren Group for the previous five years. Between 2001 and 2016, he held a number of executive positions, including Chief Executive Officer of McLaren Racing F1. Prior to McLaren, Jonathan had been at BAE Systems, UK, as Managing Director – Hawk Military Aircraft.



**Non-Exec Director**  
**Pete Magowan**

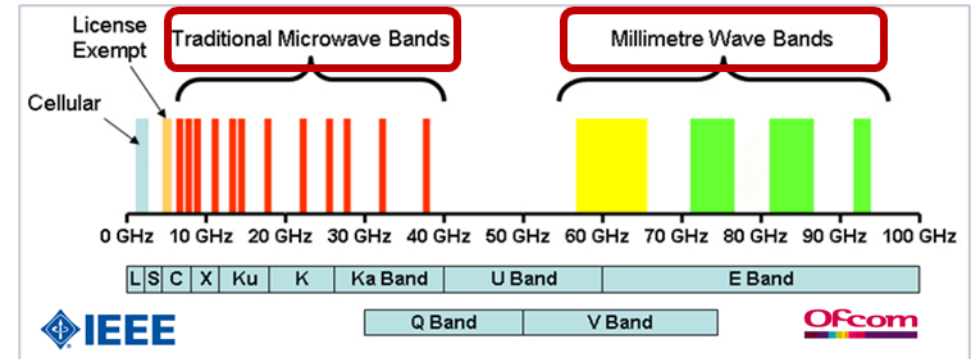
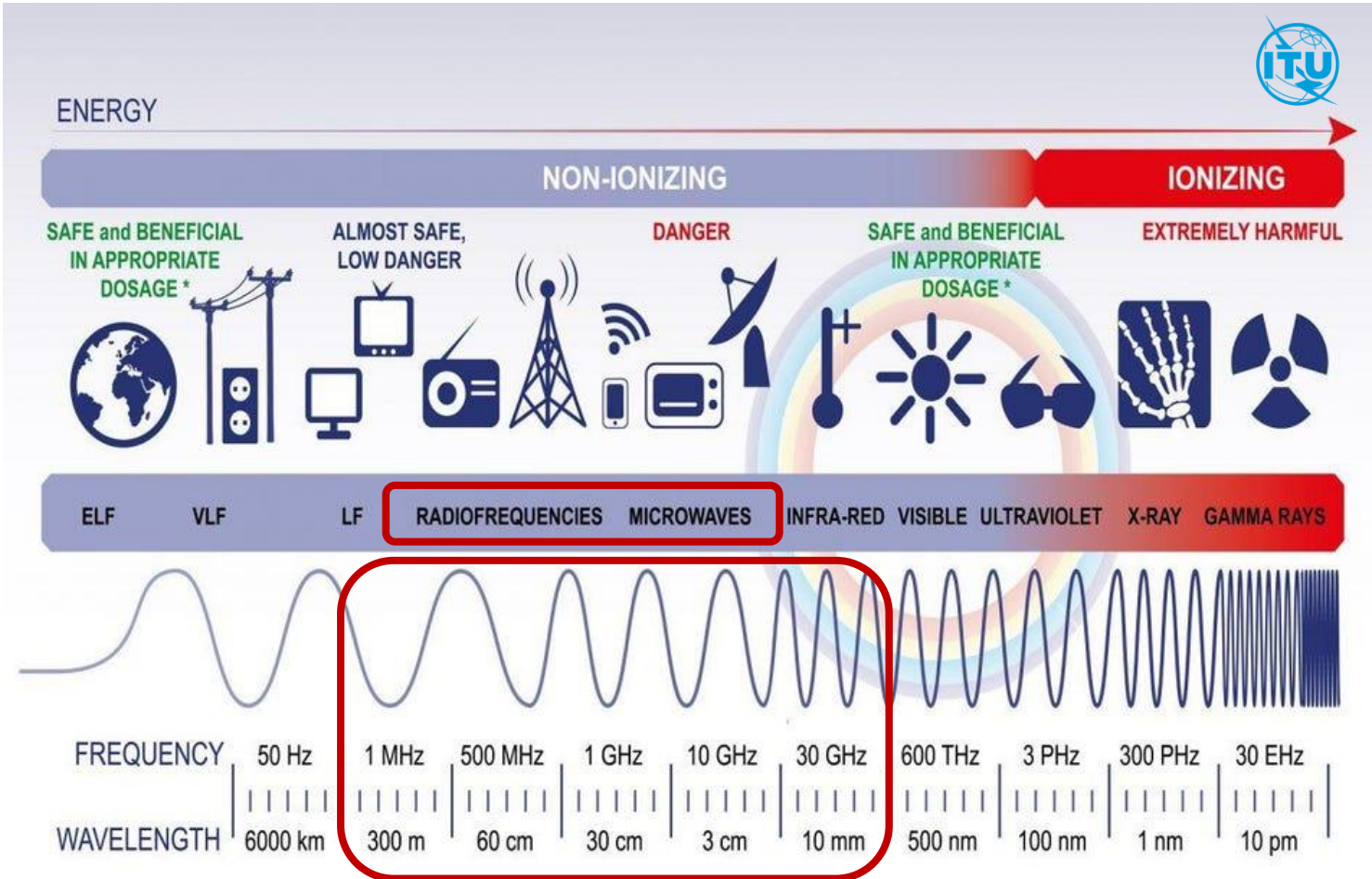
Peter (Pete) Magowan has served as Non-Executive Director and as Chairman of the Filtronic Remuneration Committee since 2018. He also serves as a Non-Executive Director of Solid-State Group plc. After an operational career in the development and marketing of technology Pete was an early employee and main board member of ARM Holdings, an Executive at Fidelity International Ltd and General Partner at Alta Berkeley Venture Partners.



**Non-Exec Director**  
**John Behrendt**

John Behrendt was appointed as a Non-Executive Director in January 2021. John was Head of Principal Investments with Eight Roads, part of the Fidelity network of companies until January 2020. Prior to this John held several leadership and operational roles, including, CEO of Optegra, CEO/CFO of Frontier Silicon Ltd and CFO for Teraview Ltd. John is a Chartered Management Accountant.

# The EM Spectrum – RF Frequencies



- Frequency / spectrum allocation is coordinated by a United Nations body the International Telecommunication Union (ITU) and local regulating agencies (ie: FCC and OFCOM)
- Terrestrial telecommunications take advantage of well-defined frequencies where atmospheric absorption is lower
- Stratospheric and Space communications are not as constrained by atmospheric absorption
- The ability to commercialise mmWave frequency bands is limited by advances in compound semiconductor technology







# Income statement





	HY2024	HY2023
	£000	£000
Revenue from goods and services	8,031	7,927
Revenue from non-recurring engineering (NRE)	449	441
<b>Revenue</b>	<b>8,480</b>	<b>8,368</b>
<b>Material costs of goods sold</b>	<b>3,245</b>	<b>2,994</b>
Staff costs	3,677	3,437
Depreciation, amortisation and impairment	575	469
Other operating income	(153)	(33)
Other expenses	1,505	1,018
<b>Total operating costs</b>	<b>5,604</b>	<b>4,891</b>
<b>Operating profit</b>	<b>(369)</b>	<b>483</b>
Exceptional items	0	0
<b>Adjusted operating profit</b>	<b>(369)</b>	<b>483</b>
Depreciation, amortisation and impairment	575	469
<b>Adjusted EBITDA</b>	<b>206</b>	<b>952</b>
<b>Adjusted EBITDA margin</b>	<b>2%</b>	<b>12%</b>



# Strategy & Growth – operations / capability update

Business Function	Progress in 1 <sup>st</sup> year	Target near term	Current Update	Target long term
 <p>Sales &amp; Marketing</p>	<ul style="list-style-type: none"> <li>• Build the roster of sales reps in North America</li> <li>• Develop direct sales network in Europe / Israel</li> <li>• Relaunch the Filtronic brand and build online presence</li> </ul>	<ul style="list-style-type: none"> <li>• Expand UK defence sales and business development team</li> <li>• Build CRM tool capability and develop sales methodology</li> <li>• Engage in selected technical associations + industry groups</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Full BD team driving strong opportunity pipeline &gt;£180m</b></li> <li>• <b>Good engagement in UK agencies ESA / DSTL / DTEP</b></li> </ul>	<ul style="list-style-type: none"> <li>• Complete representative network in US and EU</li> <li>• Bring Channel Management skills into the company</li> <li>• Develop technical proposal/ grant application writing team</li> </ul>
 <p>Engineering</p>	<ul style="list-style-type: none"> <li>• Build stronger programme management organisation so we can scale design programs</li> <li>• Strengthen inhouse SIP design and engineering capability</li> <li>• Build OEM engineering links</li> </ul>	<ul style="list-style-type: none"> <li>• Build alignment with key UK universities specialising in RF subsystem design</li> <li>• Engage engineering staff in technical associations + industry groups</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Secured the ESA ARTES partnership program €3.7m</b></li> <li>• <b>Established links with UK universities specialising in RF</b></li> <li>• <b>Graduate / apprentice program initiated</b></li> </ul>	<ul style="list-style-type: none"> <li>• Significantly increased engineering capacity &gt;15 eng</li> <li>• £2-3m of external funding p/a</li> <li>• Multi-year graduate/ apprentice programme in place</li> </ul>
 <p>Operations &amp; Facilities</p>	<ul style="list-style-type: none"> <li>• Maximise efficiencies from hybrid manufacturing line</li> <li>• Build accredited UK defence “box-build” capability.</li> <li>• Consolidate USA Critical Comms build / test facility</li> </ul>	<ul style="list-style-type: none"> <li>• Manufacturing process for plastic encapsulation.</li> <li>• Develop assembly process for Compound Semi materials.</li> <li>• Improve prototype development Eng. capability</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Plastic QFN line installed</b></li> <li>• <b>Auto wedge bonding added</b></li> <li>• <b>Manchester development lab established and equipped</b></li> <li>• <b>W-band test &amp; measurement equipment added</b></li> </ul>	<ul style="list-style-type: none"> <li>• Space level cleanroom manufacturing facilities</li> <li>• Expansion of in-house qualification + DPA capability</li> </ul>
 <p>People &amp; Processes</p>	<ul style="list-style-type: none"> <li>• Improve materials planning and inventory management systems for turnkey OSAT*</li> <li>• Explore Filtronic Leadership Academy – Management Development Training</li> </ul>	<ul style="list-style-type: none"> <li>• Gain Cyber Security IASME accreditation</li> <li>• Develop ESCC level assembly process flows ESCC9000.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Achieved IASME Gold cybersecurity accreditation</b></li> <li>• <b>Develop ESCC level assembly process flows ESCC9000</b></li> <li>• <b>Filtronic Leadership Academy programme initiated</b></li> </ul>	<ul style="list-style-type: none"> <li>• Gain Cyber Security ISO27001 accreditation</li> <li>• AS9100 accreditation</li> <li>• Qualified space level assembly process flow</li> </ul>

# Strategy & Growth – markets / applications update

Vertical Market & Application	Progress in 1 <sup>st</sup> year	Target mid term	Current Update	Next Steps	
	<b>Aerospace Radar and EW</b>	<ul style="list-style-type: none"> <li>• TRM + filter development contracts for MKII upgrade.</li> <li>• TRM + filter research and for next gen radar - Tempest</li> <li>• Consolidate business model for hybrid manufacturing</li> </ul>	<ul style="list-style-type: none"> <li>• Tx Rx Module + filter prototype for MKII upgrade.</li> <li>• TRM + filter research and for next gen radar - Tempest</li> <li>• Portfolio of OEM customers for CMS and OSAT services</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Investments made in QFN module for MkII upgrade</b></li> <li>• <b>8 separate filter projects delivered to defence primes</b></li> <li>• <b>Completed Tx module prototype for next gen radar</b></li> </ul>	<ul style="list-style-type: none"> <li>• Qualification of prototypes for MKII radar upgrade.</li> <li>• TRM + filter qualification for next gen radar - Tempest</li> <li>• Turnkey OSAT* offering for UK Defence OEMs</li> </ul>
	<b>UK Defence Battlefield Comms</b>	<ul style="list-style-type: none"> <li>• Achieve full security accreditation for Leeds site</li> <li>• Filtering process for UK DSTL SME programmes</li> <li>• Complete battlefield comms project design and initial build</li> </ul>	<ul style="list-style-type: none"> <li>• Support development of emerging 900MHz product</li> <li>• Win TTA orders with Tier 1 LMR providers in US/ Europe</li> <li>• Establish flexible 3<sup>rd</sup> party filter design relationship</li> </ul>	<ul style="list-style-type: none"> <li>• <b>First DSTL program qualified for MoD procurement list</b></li> <li>• <b>Two new DSTL program wins for prototype development</b></li> <li>• <b>First choice filter design house for three UK primes</b></li> </ul>	<ul style="list-style-type: none"> <li>• Develop portfolio of DSTL / MoD products for Wireless Battlefield Communications</li> <li>• Secure radar subsystem design contracts currently under consideration</li> </ul>
	<b>Telecoms Terrestrial 5G Infrastructure</b>	<ul style="list-style-type: none"> <li>• Promote superior Morpheus power performance to tier 1's</li> <li>• Secure funding for mmWave development program</li> <li>• Start mmic design for W-band in accordance with roadmap</li> </ul>	<ul style="list-style-type: none"> <li>• Develop E-band active SiP/ active diplexer solution</li> <li>• Develop Track to Train solution based on UK trials</li> <li>• Move test equipment development to production</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Launched Hades diplexer</b></li> <li>• <b>Orders for Morpheus X2</b></li> <li>• <b>First pass at W-band chipset design – promising results</b></li> <li>• <b>Multiple design wins for private telecom solutions</b></li> </ul>	<ul style="list-style-type: none"> <li>• Develop W-band transceiver and active diplexer for lead customer.</li> <li>• Develop D-band project plan in conjunction with lead customer(s)</li> </ul>
	<b>LEO Space Gateway links</b>	<ul style="list-style-type: none"> <li>• Look for fast turn OSAT business opportunities that can provide space heritage</li> <li>• Promote IP developed as part of initial HAP's engagements to LEO constellation OEMs</li> </ul>	<ul style="list-style-type: none"> <li>• Align Filtronic with OneWeb for development of gen 2</li> <li>• Development of 10w PA for volume manufacturing</li> <li>• Play active role in HAPS Alliance to promote E-band</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Success in consortium bids for commercial LEO programs</b></li> <li>• <b>Launched scalable Cerus SSPA product in E and Q/V</b></li> <li>• <b>E-band / Q-band viable frequency for LEO backhaul</b></li> </ul>	<ul style="list-style-type: none"> <li>• Build on relationships with LEO primes and agencies</li> <li>• Develop qualified payload solutions at E and Q/V-band</li> <li>• Win LEO backhaul programs with standard product set</li> </ul>



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