Secure Communications and Military Air Traffic Control

FULL PORTFOLIO PROVIDER FOR AIR-TO-AIR AND GROUND-TO-AIR COMMUNICATIONS

Pieter Coates
Sebastian Golletz

ROHDE&SCHWARZ
Make ideas real

AGENDA

- Motivation & overview
- Full portfolio provider: from takeoff to landing
- Customer benefits
- Safely guiding military aircraft: operation control solutions
- Software defined radio for secure airborne communications
- Summary
- Q&A

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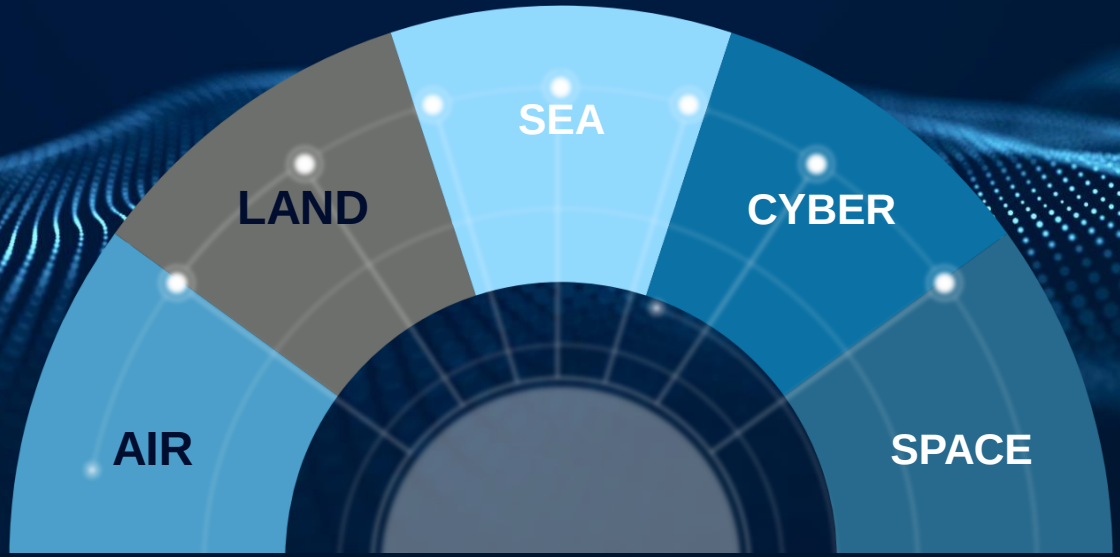
DOMINATING THE ELECTROMAGNETIC SPECTRUM

THE CRITICAL SUCCESS FACTOR FOR MILITARY OPERATIONS

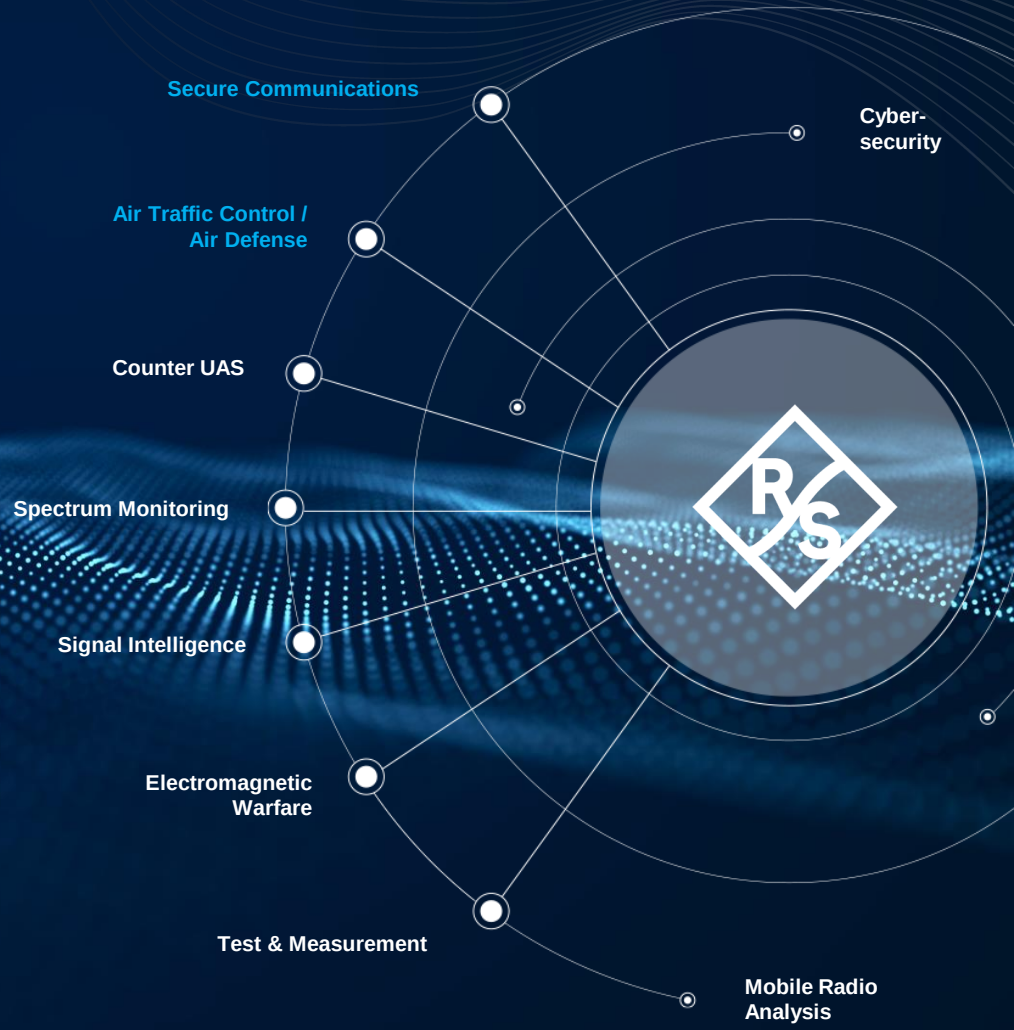


SITUATIONAL AWARENESS AND INFORMATION SUPERIORITY

ROHDE & SCHWARZ DEFENSE PORTFOLIO

ONE-STOP SHOP FOR TURNKEY DEFENSE SOLUTIONS

Rohde & Schwarz develops, designs, manufactures and implements end-to-end turnkey solutions for various fields



TRUE SPECTRUM DOMINANCE IN ALL DOMAINS

SIGNAL MASTERY

ONE-STOP SHOP

SENSOR FUSION

VERTICAL INTEGRATION

INDEPENDENT PARTNER

RELIABILITY & AVAILABILITY

CUSTOMER PROXIMITY

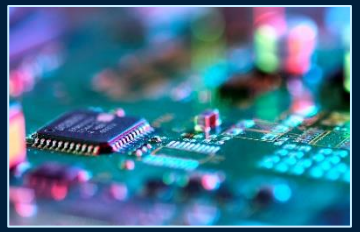
WE DEVELOP WORLD-LEADING SECURE COMMUNICATIONS SOLUTIONS FOR ARMED FORCES

- We are one of the leading companies for secure radios worldwide, designing novel waveforms
- We are an active member of corresponding working groups
- We have extensive experience in the establishment and design of nationwide secure communication systems
- We are the national expert for the Future Combat Air System (FCAS)

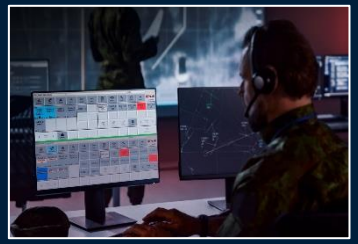
COMMUNICATIONS SOLUTIONS ON THE GROUND AND IN THE AIR

Ground/air SDRs

Waveforms



Crypto solutions



Air force operations & mission control

NAVIC communications

FCAS communications

FROM GROUND-TO-AIR TO AIR-TO-AIR COMMUNICATIONS: ONE-STOP SHOP

Secure communications AIR/GROUND + Operation control solution MATC/AD =

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FULL PORTFOLIO PROVIDER FROM TAKEOFF TO LANDING

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Taxiing on the ground – civil airport

- Fixed frequency communications in a civil environment between airborne radios and stationary radios
- R&S®M3SR / R&S®M3AR / SOVERON AR meet civil aviation standards

FULL PORTFOLIO PROVIDER FROM TAKEOFF TO LANDING

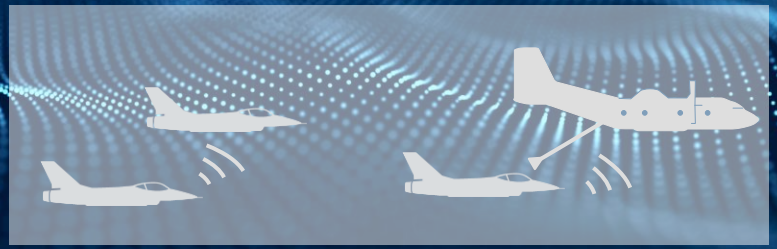
Air-to-ground communications

- ► Encrypted communication via SATURN waveform
- ► Fast shift in between waveforms
- ► Data link communication possible

FULL PORTFOLIO PROVIDER FROM TAKEOFF TO LANDING

Air-to-air wingman communication

- ► Encrypted communication on various waveforms (e.g., SATURN)
- ► Data link communication possible
- ► SOVERON AR holds numerous different waveforms



FULL PORTFOLIO PROVIDER FROM TAKEOFF TO LANDING

Air-to-ground – landing on a military base

- Encrypted communication via SATURN waveform
- Full interoperability between R&S®M3AR / SOVERON AR and R&S®M3SR
- Switch between MILATC and ATC frequency band

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FULL PORTFOLIO PROVIDER: CUSTOMER BENEFITS

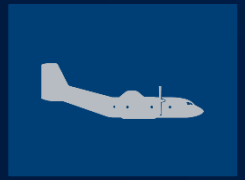
SOVERON AR

- Mission proven, high performance and interoperable radio solutions
- Fulfills civil and military communication standards
- Communicate via NATO SATURN waveform
- One face to the customer - service on all Rohde & Schwarz products
- Interfaces for external modems

R&S®M3SR

FULL MISSION SUPPORT

Fighters



Transporters

Helicopters

UAVs

- Airborne solutions can be integrated into all flying platforms
- High level of resilience and availability
- Full interoperability for air-to-ground and air-to-air

Stationary

Naval

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SAFELY GUIDING MILITARY AIRCRAFT

OUR VOICE SOLUTIONS SCALE FROM NATIONWIDE SYSTEMS TO REMOTE VOICE TERMINALS

R&S®M4ACS RED/BLACK VCS

- Multi-domain redundant advanced communications solution
- Certified C2 voice communications solution
- Red & black domains visible on one screen
- Supports automated audio routing to secure & unsecure traffic domains
- Supports crypto pooling
- Future-proof IP based architecture

Federal Office for Information Security
Deutsches IT-Sicherheitszertifikat
Zertifikat Nummer: BSI-DSZ-CC-1081-2020

NATO OTAN

Common Criteria

R&S®M3SR SERIES4400
VHF/UHF RADIO PORTFOLIO

V/UHF antennas

V/UHF filters

Timing systems

Radio control devices

Fill devices

Headsets/microphones

Cipher units

OUR STRONG PORTFOLIO FOR FIXED GROUND COMMUNICATIONS SYSTEMS

CUSTOMER REFERENCE: BELGIUM CRC

- 24/7 comms & surveillance of the airspace over Belgium and Luxembourg
- VCS system certified to operate in a NATO Secret environment
- Redundant VCS system handling classified/unclassified information from a single device
- 40+ CWPs connected to 45+ R&S®M3SR Series4400 VHF/UHF radios in a national network
- Integration with various thrid-party networks & systems

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AIRBORNE COMMUNICATIONS DEEP DIVE
SOVERON AR

1 Numerous waveforms loadable using SCA standard

2 Embedded mobile ad hoc networking (MANET) capability

3 High data rate capability

4 Designed for ease of integration

5 Simoultanous voice and data transmission

AIRBORNE COMMUNICATIONS DEEP DIVE

R&S®M3AR DEEP DIVE

Over 9,000 units installed

R&S®MR6000L/R

Built for weight and space constraints:

- Less than 4.0 kg at 10 W AM/15 W FM output power
- Multi-waveform capable
- Optional installation in cockpit or avionic bay

R&S®MR6000A

Best performance:

- 20 W AM and 30 W FM output power
- Development in line with civil airborne software and hardware standards (RTCA/DO-178B, RTCA/DO-254, both DAL C)
- Embedded NATO COMSEC (optional)

ROHDE & SCHWARZ AIRBORNE COMMUNICATIONS SOLUTIONS: DEPLOYED WORLDWIDE

JUST A FEW EXAMPLES

A400M
Meeting civil safety avionic standard

NH90
State-of-the-art communication methods

C-390
Wideband waveforms

T-7A
Ease of integration

SUPER TUCANO
Secure data links

F16
Secure airborne communictations

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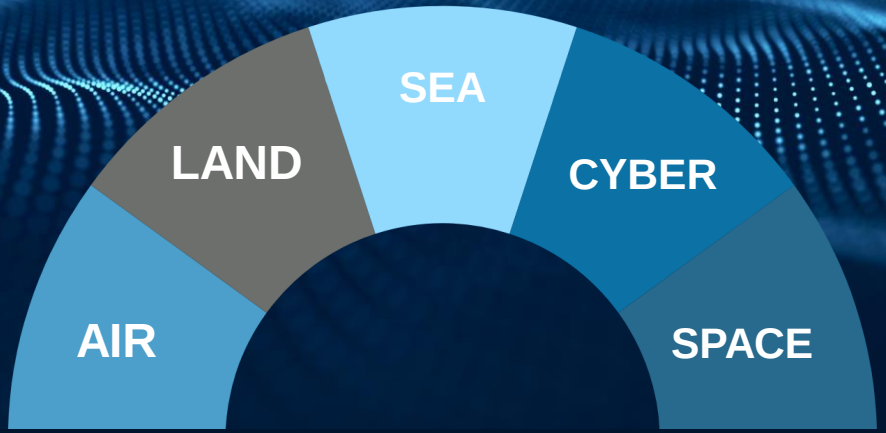

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Q&A

- Please ask questions using the chat function