

RF SYSTEMS / SPACE

RF DECISIONS BEGIN WITH THE MISSION.

Space-focused RF capability and engineering support across mission systems

Frequency, waveform, output power, power availability, thermal limits, interfaces, environment and qualification needs determine which RF functions require evaluation.

START WITH THE CLOSEST PROVEN PATH.

Frontgrade supports RF decisions through six product categories. The first step is to determine whether an existing product fits, a relevant baseline can be configured, or a new design is required.

MISSION REQUIREMENT →

01

EXISTING PRODUCT

Does the documented performance and interface set fit the intended operating conditions? Which application requirements still need confirmation?

02

CONFIGURED BASELINE

What remains unchanged? What must change? Which design, verification and qualification questions follow?

03

NEW DESIGN

Which mission requirement rules out the existing options, and what must the new design address?

THE VALUE OF AN EARLY RF DISCUSSION

COMPARE OPTIONS BEFORE SELECTION.

An early review lets program and engineering teams compare options against mission requirements, operating and interface assumptions, and the evidence needed before selection.

The review may extend beyond amplification. Switching, distribution, passive RF, antennas, rotary interfaces and integrated assemblies can create dependencies that should be evaluated together. Scope and supplier responsibilities remain application-specific.

SIX RF CATEGORIES. ONE MISSION-LED EVALUATION.

01	RF AMPLIFICATION	→
02	RF SWITCHING & DISTRIBUTION	→
03	ANTENNAS & APERTURES	→
04	WAVEGUIDE & PASSIVE RF	→
05	ROTARY JOINTS & DATA TRANSFER	→
06	INTEGRATED RF ASSEMBLIES & SUBSYSTEMS	→

THREE MISSION PATHWAYS

01 / SPACE RF

Connect RF performance with spacecraft power, thermal limits, payload interfaces and the mission environment.

02 / ELECTRONIC WARFARE

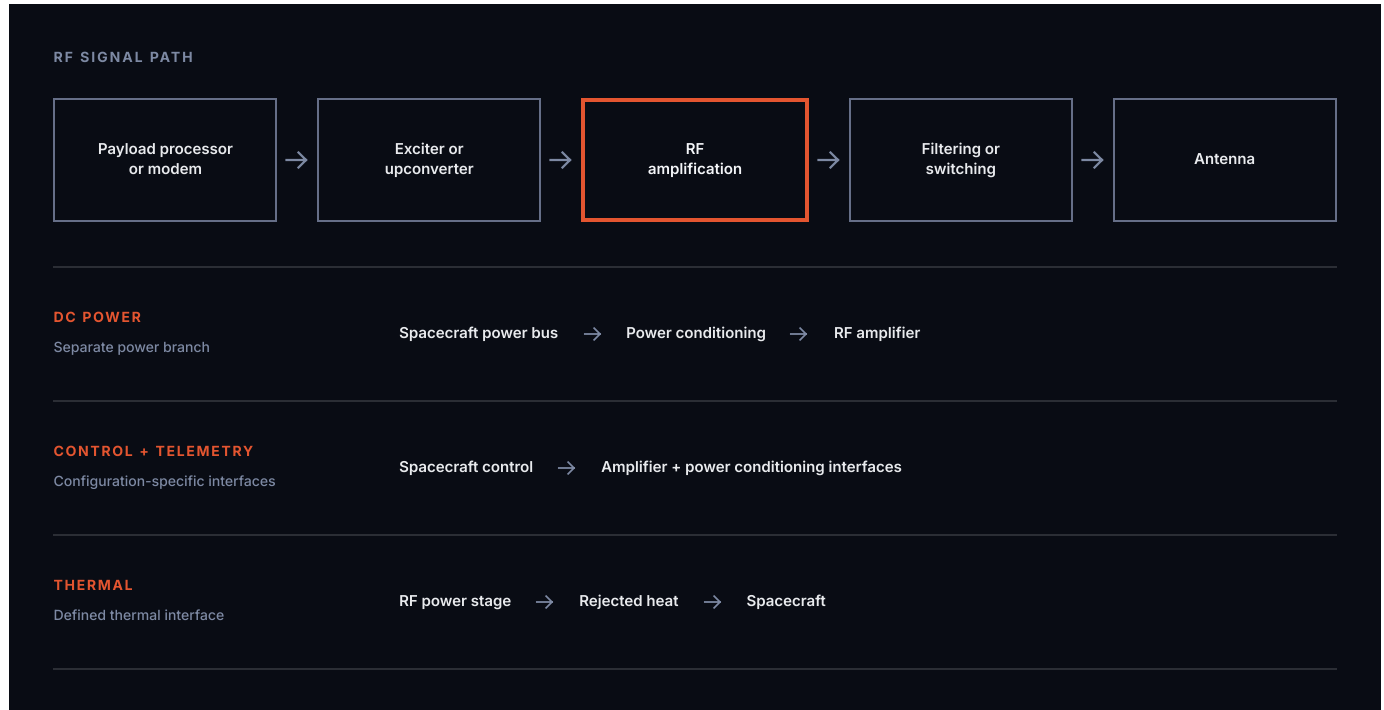
Evaluate amplification, switching and passive RF needs against waveform behavior and platform constraints.

03 / TACTICAL COMMUNICATIONS

Assess amplification, switching, antennas and integrated assemblies alongside radio and co-site requirements.

CONNECT RF PERFORMANCE TO THE SPACECRAFT.

A Space RF requirement connects several engineering decisions. RF amplification must support the required signal behavior while the spacecraft provides sufficient conditioned power, thermal management, control and telemetry.



REPRESENTATIVE, NOT A CUSTOMER DESIGN

Electronic power conditioning may be integrated with or separate from the amplifier assembly, depending on the implementation. The required scope and supplier responsibilities should be established for each application.

QUESTIONS THAT SHAPE THE SPACE RF REQUIREMENT.

- 01 What frequency range, waveform and operating point define the required RF output?
 - 02 What DC bus conditions and power allocation apply?
 - 03 What thermal interface and operating duration must the system accommodate?
 - 04 What control, telemetry and fault-response interfaces are required?
 - 05 What mission environment, operating life and qualification evidence govern the selection?
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Frontgrade's Space RF portfolio provides starting points and engineering support for this evaluation. The relevant product baseline, configuration approach and qualification evidence remain specific to the intended mission.

ELECTRONIC WARFARE CAPABILITY

Electronic Warfare requirements can span amplification, signal routing and passive RF functions. Evaluate the required frequency coverage, bandwidth, waveform behavior and operating profile together with the platform's available DC power, cooling, physical limits and control interfaces.

Relevant starting categories include RF Amplification, RF Switching & Distribution, Waveguide & Passive RF, and Integrated RF Assemblies & Subsystems. Use the mission requirement to narrow the applicable category and then assess the available product baselines and configuration options.

TACTICAL COMMUNICATIONS CAPABILITY

For Tactical Communications, evaluate RF Amplification, RF Switching & Distribution, Antennas & Apertures, and Integrated RF Assemblies & Subsystems alongside the radio, waveform, antenna arrangement and co-site environment.

Where multichannel or multi-radio operation is required, review channel behavior, isolation, control, thermal load and platform interfaces as a connected requirement. Frequency coverage alone does not establish compatibility.

PREPARE FOR A TECHNICAL DISCUSSION

BRING THE MISSION. DEFINE WHAT IS FIXED—AND WHAT IS OPEN TO TRADE.

01

A non-sensitive description of the mission and platform

02

The RF function under evaluation

03

The relevant frequency and waveform requirements

04

Power and thermal constraints

05

The interfaces or qualification questions you need to resolve

CHOOSE THE NEXT STEP

DISCUSS YOUR RF REQUIREMENTS.

RF requirement or configuration question

**DISCUSS YOUR RF REQUIREMENTS**

Known product requirement

**REQUEST A QUOTE**

Explore the broader capability

**RF SYSTEMS**

Use the current Product Finder category filters and controlled product documentation to confirm specifications, application conditions and qualification evidence.

