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HOW GROUND STATION LICENSING WORKS: A COMPLETE GUIDE

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HOW GROUND STATION LICENSING WORKS

A COMPLETE GUIDE TO U.S. EARTH STATION LICENSING

Every commercial satellite needs a ground segment. Whether it is a single tracking antenna for a CubeSat or a multi-million-dollar teleport with a dozen dishes, transmitting earth stations require federal authorization under 47 CFR Part 25. This guide is the definitive reference for U.S. ground station licensing: which stations need licenses, what the FCC requires on Form 312, how frequency coordination works, which bands trigger NTIA review, and how much it all costs.

Quick summary. Any earth station that *transmits* needs an FCC license under **47 CFR Part 25**, filed on **Form 312** with **Schedule B** through the International Communications Filing System (ICFS). Receive-only stations need no license but can optionally register for interference protection. Application fees run **$425 to $7,650**; FY2026 annual regulatory fees are **$2,970 per authorization**. Routine processing takes **2 to 6 months**; the simplified Form 312EZ path is deemed granted **35 days** after public notice. Licenses are valid **15 years**. Terrestrial frequency coordination is required in bands shared co-equally with terrestrial services, chiefly C-band; NTIA review is required wherever federal systems share the spectrum, such as S-band and X-band.

WHAT LICENSING REQUIREMENTS GOVERN

COMMERCIAL GROUND STATION OPERATIONS?

U.S. commercial ground stations that transmit to satellites are licensed by the Federal Communications Commission (FCC) under **47 CFR Part 25**. The answer to whether your station needs a license depends on one question: **does your ground station transmit?** If yes, you must hold an earth station authorization issued on **Form 312** with the technical **Schedule B** exhibit, filed through the International Communications Filing System (ICFS). If no, you are not required to license, though optional registration is available.

STATION TYPE	TRANSMITS?	FCC LICENSE REQUIRED?
Transmit/receive earth station	Yes	**Yes.** File Form 312 + Schedule B
Receive-only earth station	No	**No**, but optional registration provides interference protection
Consumer satellite dish (≤1m)	No	**No.** Exempt from licensing
VSAT remote terminal	Yes	Covered under network operator's **blanket license**
ESIM (ship, aircraft, vehicle)	Yes	**Yes**, blanket license under 47 CFR 25.228
Amateur satellite station	Yes	Covered under **Part 97** amateur radio license ($35)

Receive-only stations, including ground-based remote sensing data receive stations, can operate without any FCC authorization if they receive from U.S.-licensed satellites or non-U.S. satellites approved for U.S. market access; receiving from other non-U.S.-licensed satellites requires a license (47 CFR 25.115(b)(9)). Voluntary registration (Form 312 + Schedule B, 15-year term, granted automatically after a 30-day public notice if no one objects) gives you legal protection against interference from terrestrial microwave stations in shared frequency bands. Without registration, you have no right to interference protection.

15 years.

Standard term for an FCC earth station license under Part 25. Part 100, adopted in July 2026 and not yet effective, sets a 20-year default term.

REGULATORY FRAMEWORK: THE CFR SECTIONS THAT GOVERN GROUND STATIONS

Every earth station authorization in the United States traces back to a specific subsection of **47 CFR Part 25**. The table below maps each operational decision to the controlling rule, so you can cite the exact authority when drafting filings, briefing legal, or coordinating with frequency consultants.

CFR SECTION	SUBJECT	PRACTICAL EFFECT
47 CFR 25.104	Preemption of local zoning	Limits what cities can restrict for antennas ≤2 m
47 CFR 25.115	Filing requirements for earth stations	Defines what Form 312/Schedule B must contain
47 CFR 25.203	Choice of sites and frequencies	Triggers terrestrial frequency coordination
47 CFR 25.209	Antenna performance standards	Routine processing eligibility
47 CFR 25.218	EIRP density limits	Routine processing eligibility
47 CFR 25.220	Non-routine transmit/receive earth station operations	Path for waivers and non-conforming antennas
47 CFR 25.228	Earth Stations in Motion (ESIM)	ESV, ESAA, VMES operating and coordination rules
47 CFR 25.251	Special requirements for coordination	Defines great-circle coordination distance methodology
47 CFR 1.4000	OTARD rule	Preempts restrictions on antennas ≤1 m in any zone

CFR SECTION	SUBJECT	PRACTICAL EFFECT
47 CFR Part 97	Amateur radio service	Covers amateur satellite ground stations
FCC OET Bulletin 65	RF exposure analysis	Required radiation hazard study for transmit stations

EFFECTIVE DATES AND CURRENT RULEMAKINGS

Key dates that matter for current ground station planning:

- **November 2024:** The FCC granted the first Supplemental Coverage from Space (SCS) authorization to SpaceX, partnered with T-Mobile (DA 24-1193), defining the regulatory contour for satellite-to-smartphone feeder link gateways.
- **December 2025:** Deadline for the FCC's 3.7 GHz Order (FCC 20-22) C-band transition, which repurposed 280 MHz of downlink spectrum to 5G.
- **July 2026:** The FCC adopted the Space Modernization Report and Order (FCC 26-47), replacing Part 25 with Part 100 and adding a Nationwide, Non-Site earth station license and 20-year default terms. Not yet effective.
- **July 2026:** The FCC's Upper C-band Report and Order (FCC 26-46, GN Docket No. 25-59) set up an auction of 160 MHz at 3.98-4.14 GHz for terrestrial wireless, with a guard band at 4.14-4.16 GHz and FSS repacked into 4.16-4.2 GHz.
- **Ongoing:** The 2018 freeze on new and modified earth station filings across 3.7–4.2 GHz remains in place.

Tracking ground station filings at scale? Orbit Sentinel monitors 418,000+ extracted FCC, ITU, UNOOSA, and FAA filings, including earth station applications, ESIM blanket authorizations, and Part 25 waivers. Sign up at console.viventine.com (https://console.viventine.com/sign-in/).

TYPES OF GROUND STATIONS

Ground stations range from handheld amateur setups to multi-million-dollar teleport complexes, and the licensing requirements scale accordingly:

FIXED SATELLITE SERVICE (FSS) EARTH STATIONS

Traditional large-dish stations used for video distribution, enterprise connectivity, and satellite backhaul. Antenna sizes range from 2.4 meters (Ku-band) to 18+ meters (C-band). Licensed individually at a specific location via Form 312 under 47 CFR 25.115. These are the workhorses of the satellite industry. Teleport operators like SES, Intelsat, and Telesat run networks of these facilities worldwide.

GATEWAY AND TELEPORT FACILITIES

Multi-antenna complexes that serve as the ground-side hub for satellite networks. No separate "gateway license" exists; each antenna is licensed as a standard earth station, with multiple antennas covered under one authorization using multiple Schedule B pages. NGSO constellation operators like SpaceX (Starlink) and Amazon (Kuiper) need dozens of geographically distributed gateway sites to maintain

continuous connectivity as satellites pass overhead. Starlink operates an extensive global gateway network (exact count not publicly confirmed, but FCC filings list over 100 U.S. sites).

EARTH STATIONS IN MOTION (ESIMS)

Terminals that operate while moving: on ships (ESV), aircraft (ESAA), and vehicles (VMES). Blanket-licensed by terminal type rather than location, since they don't stay in one place. Governed by **47 CFR 25.228**. All three categories require a U.S. point of contact available 24/7 with authority to cease emissions.

VSAT NETWORKS

Hub-and-spoke satellite networks where small remote terminals (0.75m–2.4m dishes) communicate through a central hub station. The network operator holds a blanket license covering the hub plus all remote terminal types. Individual remote sites don't need separate licenses. Used for enterprise WAN, ATM/POS networks, SCADA monitoring, maritime connectivity, and rural broadband.

TT&C STATIONS

Tracking, Telemetry, and Command stations monitor satellite health, track position, and send commands. Essential during launch, orbit-raising, on-orbit operations, and decommissioning. Licensed on the same Form 312 as other earth stations, with TT&C-specific parameters in Schedule B. A subset of gateway sites often doubles as TT&C stations.

REMOTE SENSING RECEIVE STATIONS

Stations that only receive data downlinked from Earth observation satellites. No FCC license required when receiving from U.S.-licensed or market-access satellites, though optional registration provides

interference protection. Note that the satellite system operator still needs a NOAA remote sensing license for the space segment.

AMATEUR SATELLITE STATIONS

Any FCC amateur radio licensee (Technician class or higher; the FCC charges a $35 license application fee) can operate a satellite ground station under 47 CFR Part 97. No commercial use permitted. Equipment costs range from a few hundred dollars for a handheld with a directional antenna to several thousand for a motorized tracking station. AMSAT coordinates amateur satellite operations.

DIRECT-TO-DEVICE GROUND INFRASTRUCTURE

An emerging category supporting satellite-to-smartphone services under the FCC's Supplemental Coverage from Space (SCS) framework. Consumer handsets are "licensed by rule" (no individual device licensing). But the feeder link gateway stations connecting satellites to the mobile core network still need standard earth station licensing under Part 25. SpaceX, partnered with T-Mobile, received the first SCS authorization in November 2024 (DA 24-1193).

HOW TO FILE FCC FORM 312 FOR GROUND STATION LICENSING

The FCC licenses earth stations under 47 CFR Part 25. All applications are filed electronically on Form 312 with Schedule B (the technical exhibit) through the International Communications Filing System (ICFS).

WHAT SCHEDULE B CAPTURES

Schedule B is the technical core of your application. It includes your frequency assignments, EIRP (effective isotropic radiated power), antenna characteristics, emission designators, and **points of communication** (the specific satellites your station will talk to). Each antenna at your site gets its own Schedule B page.

TWO PROCESSING TRACKS

- **Routine processing:** Applications that meet all Part 25 Subpart C technical standards (antenna performance per 47 CFR 25.209, EIRP density limits per 47 CFR 25.218). Placed on public notice (Part 25 sets no binding deadline for this step), followed by a 30-day comment period. Typically granted in **2 to 6 months**.
- **Non-routine processing:** Applications with non-conforming antennas, waiver requests, or non-standard parameters. Requires individual technical review under 47 CFR 25.220. No fixed timeline, and can take significantly longer.

THE SIMPLIFIED PATH: FORM 312EZ

For single fixed stations communicating with GSO satellites in standard frequency bands (C-band uplink, Ku-band uplink, Ka-band uplink) that meet all technical criteria: **deemed granted 35 days after public notice** if no objection is filed. This is the fastest path to authorization.

> **35 days.**
>
> The deemed-grant window for Form 312EZ filings after public notice, the fastest path to an FCC earth station authorization when no objection is filed.

WHAT YOU NEED BEFORE FILING

- **Frequency coordination report.** Required for all transmitting stations in bands shared with terrestrial services. Must be less than 6 months old at filing. Prepared by an independent frequency coordination firm; the FCC does not certify coordinators.
- **Radiation hazard analysis:** Demonstrates RF exposure compliance per FCC OET Bulletin 65. Generally required for fixed and temporary-fixed transmitting stations, with limited exceptions such as renewals.
- **Antenna radiation patterns**, required for Ka-band GSO FSS transmit applications.

LICENSE TERM

Earth station licenses are valid for **15 years** from grant (Part 100, adopted in July 2026 but not yet effective, sets a 20-year default term). Renewals are filed on Form 312R no earlier than 12 months and no later than 30 days before expiration (25.121(e), as amended in 2025).

HOW LONG DOES FCC EARTH STATION LICENSING TAKE?

There is no statutory processing deadline for FCC earth station applications. Realistic timelines depend entirely on your filing path:

FILING PATH	TYPICAL TIMELINE	DRIVER
Form 312EZ (single fixed, conforming)	~35 days after public notice	Deemed-grant if no objection
Routine Form 312 (conforming antenna, standard bands)	2 to 6 months	Public notice + 30-day comment period
Non-routine (47 CFR 25.220)	6 to 18+ months	Individual technical review, possible petitions
Waiver request	Highly variable	Bureau discretion; can extend a year or more
NTIA-coordinated bands (S/X/shared Ka)	Add 3 to 9 months	NTIA review through the IRAC Frequency Assignment Subcommittee before FCC can grant
Renewal (Form 312R)	File 12 months to 30 days before expiration (90 to 30 days for receive-only registrations)	Routine if no operational changes

The single most common cause of delay is a deficient Schedule B that triggers a follow-up letter from the Satellite Division. Each round of correspondence resets the clock by weeks. Filing a clean application with current frequency coordination and a complete radiation hazard analysis is the fastest path to grant.

FREQUENCY COORDINATION UNDER 47 CFR 25.203

If your earth station operates in a frequency band shared with terrestrial microwave services, you must coordinate before filing your FCC application. This is governed by **47 CFR 25.203**, with the great-circle distance methodology defined in **47 CFR 25.251**.

HOW IT WORKS

1. Hire a **frequency coordination firm** (such as Comsearch or Micronet Communications). The FCC does not certify coordinators.
2. The coordinator computes **great circle coordination distance contours** for your proposed station per 47 CFR 25.251.
3. They perform **interference analysis** for every terrestrial station within the contour, both existing stations and pending applications.
4. The result is a **Frequency Coordination and Interference Analysis Report** submitted as an exhibit with your Form 312.

The report must be **less than 6 months old** at the time of filing. If your application sits too long before submission, you will need to redo the coordination, an expensive delay.

6 months.

Maximum age of a frequency coordination report at the time of FCC filing. A missing or stale report is on the FCC's own list of common earth station application defects.

WHICH BANDS REQUIRE COORDINATION?

BAND	FREQUENCIES	COORDINATION REQUIRED?
C-band	3.7–4.2 GHz / 5.925–6.425 GHz	**Yes.** Shared with terrestrial fixed service
Ku-band	11.7–12.2 GHz / 14.0–14.5 GHz	**No.** Conventional Ku-band is not shared co-equally with terrestrial FS in the U.S. (no NTIA coordination)
Ka-band (standard)	18.3–20.2 GHz / 28.35–30.0 GHz	**Generally no.** Most sub-bands are not shared co-equally with terrestrial FS; Federal FSS earth stations in 17.8–20.2 GHz must be coordinated under footnote US334
Ka-band (shared)	20.2–21.2 GHz / 30–31 GHz	**Federal bands.** Military FSS (47 CFR 2.106, footnote G117); commercial use requires NTIA coordination

BAND	FREQUENCIES	COORDINATION REQUIRED?
S-band	2.025–2.110 / 2.200–2.290 GHz	Yes. Shared with NASA/DoD (requires NTIA)
V-band	37.5–51.4 GHz	Varies by sub-band

Conventional Ku-band and standard Ka-band operations are the simplest from a coordination perspective: where there is no co-equal terrestrial sharing, no coordination report is required. Form 312EZ, for example, requires terrestrial coordination only for transmissions in 5925–6425 MHz (47 CFR 25.115(a)(2)).

ESIM-SPECIFIC COORDINATION

Earth Stations in Motion in the 14.0–14.2 GHz band must coordinate with NASA if operating within 125 km (ESV/VMES) or radio line of sight (ESAA) of NASA TDRSS facilities. All ESIMs in 14.47–14.5 GHz must protect radio astronomy observatories through NSF coordination.

EARTH STATIONS IN MOTION (47 CFR 25.228)

ESIMs are mobile terminals that communicate with satellites while in motion. The FCC consolidated ESIM rules under **47 CFR 25.228**, with service-specific requirements layered on top.

CATEGORY	PLATFORM	KEY RULE	NOTABLE REQUIREMENTS
ESV	Ships and vessels	25.228(e), (h)	In C-band, coordinate with fixed service operators within 200 km of the U.S. baseline or offshore FS installations
ESAA	Aircraft	25.228(g), (i)	All terminals in U.S. airspace must be FCC-licensed, including non-U.S. aircraft
VMES	Land vehicles	25.228(f), (j)	Trains, buses, emergency vehicles; must maintain pointing accuracy

200 km.

The coordination radius from the U.S. baseline for C-band ESV operations with U.S. fixed service operators under 47 CFR 25.228(h).

All ESIMs are **blanket-licensed**, meaning one authorization covers the entire fleet of terminals. All three categories must maintain a **24/7 U.S. point of contact** with authority to cease emissions if interference occurs. ESIM applicants can designate the FCC's **Permitted Space Station List** as their point of communication, providing flexibility to work with any authorized satellite without amending the license.

BLANKET LICENSING

Blanket licensing lets an operator cover multiple terminals of the same type under a single FCC authorization, instead of licensing each site individually.

WHO USES IT

- **VSAT network operators.** The primary use case. One license covers the hub station(s) plus all remote terminals in the network. Individual remote sites don't need separate licenses.
- **ESIM operators:** All ESIMs are blanket-licensed by nature, since they move.
- **Direct-to-user terminal operators**, such as Starlink user terminals, which operate under SpaceX's blanket authorization.

HOW IT WORKS

File a single Form 312 with separate Schedule B pages: one for each hub station antenna and one for each different type of remote terminal. Hub stations (typically 5m+) get individual radio station authorizations. Remote terminals get blanket authorization by terminal type. The key requirement: terminals must meet **routine processing criteria** (conforming antennas per 47 CFR 25.209, standard EIRP density limits per 25.218). Non-conforming terminals generally must be individually licensed under 25.220.

THE PRACTICAL EFFECT

Without blanket licensing, deploying a 10,000-terminal VSAT network would require 10,000 individual license applications. Blanket licensing reduces that to one. It is what makes large-scale commercial satellite

networks operationally feasible.

NTIA AND FEDERAL SPECTRUM COORDINATION

When your earth station operates in frequency bands shared between commercial and federal government users, the FCC will not grant your license until coordination with **NTIA** (National Telecommunications and Information Administration) is complete.

THE PROCESS

1. You file Form 312 with the FCC as normal.
2. The FCC routes your application to NTIA.
3. Coordination runs through the **Frequency Assignment Subcommittee (FAS)** of NTIA's Interdepartment Radio Advisory Committee (IRAC).
4. Affected federal agencies (such as DoD, NASA, and NOAA) review the proposal through FAS.
5. The FCC acts once federal coordination is complete.

The FCC **strongly encourages** informal pre-coordination with NTIA before filing. Engaging federal agencies early significantly reduces processing delays. Most operators that skip pre-coordination report adding 3 to 9 months to total processing time.

WHICH BANDS TRIGGER NTIA COORDINATION?

- **S-band** (2.025–2.290 GHz), heavily used by NASA and DoD for space operations TT&C
- **X-band** (8.025–8.400 GHz). Primarily government; commercial access very limited

- **Ka-band shared segments** (20.2–21.2 GHz / 30–31 GHz): government satellite systems

Conventional Ku-band and standard Ka-band commercial sub-bands do **not** generally require NTIA coordination. Terrestrial coordination under 47 CFR 25.203 applies only in bands shared co-equally with terrestrial services.

THE C-BAND TRANSITION

The FCC's 3.7 GHz Order (FCC 20-22) repurposed 280 MHz of C-band spectrum from satellite downlink to 5G, compressing FSS operations into the upper 200 MHz (4.0–4.2 GHz), with a guard band at 3.98–4.0 GHz. The transition deadline was December 2025. In July 2026 the FCC adopted the Upper C-band Report and Order (FCC 26-46), which will auction another 160 MHz (3.98–4.14 GHz) for terrestrial wireless, add a guard band at 4.14–4.16 GHz, and repack FSS into 4.16–4.2 GHz. The 2018 **application freeze** on new or modified earth station filings across 3.7–4.2 GHz remains in place. If you are planning a C-band earth station, this is a moving target. Track GN Docket No. 25-59.

280 MHz.

Amount of C-band downlink spectrum repurposed to 5G under FCC 20-22, with the transition deadline reached December 2025.

LOCAL PERMITS, ZONING, AND FAA

An FCC license authorizes your radio operations. Building the physical station may require additional approvals.

FEDERAL PREEMPTION OF LOCAL ZONING

The FCC limits what local governments can restrict:

- **Antennas ≤2 meters** in commercial/industrial zones: local regulations are **presumed unreasonable and preempted** (47 CFR 25.104)
- **Antennas ≤1 meter** in any zone, including residential, protected under the **OTARD rule** (47 CFR 1.4000) when on property the antenna user owns or controls
- **Larger commercial antennas.** Local zoning applies, but must be "reasonable" and serve a clearly defined health, safety, or aesthetic objective

WHAT LOCAL PERMITS YOU MAY NEED

- **Building permits** for antenna foundations, equipment shelters, fencing
- **Conditional use / special use permits** in zones where telecom facilities aren't permitted by right
- **Environmental review:** NEPA compliance if the site is in sensitive areas (wetlands, historic sites, tribal lands)

The FCC does not require a construction permit for earth stations. Construction may begin before license grant, **at your own risk**.

FAA COORDINATION

FAA notification (Form 7460-1) is required if your antenna structure:

- Exceeds **200 feet above ground level**, or
- Penetrates an **imaginary surface** extending from a nearby public-use or military airport runway

File at least **45 days before construction** via oeaaa.faa.gov. The FAA conducts an aeronautical study and issues a Determination of No Hazard (or Hazard, which may require obstruction marking and lighting). Most earth station antennas are well under 200 feet, so FAA review is typically triggered only for stations near airports.

GROUND STATION AS A SERVICE

You don't have to build a ground station to use one. Ground Station as a Service (GaaS) providers hold the earth station licenses and offer antenna time on demand.

MAJOR PROVIDERS

- **AWS Ground Station.** Pay-per-minute antenna time integrated with AWS cloud, priced separately for narrowband (up to 40 MHz) and wideband contacts, with discounts for reserved commitments. Data ingests directly into S3/EC2 with no backhaul costs. Partnered with KSAT for global coverage.
- **KSAT** (Kongsberg Satellite Services): a global ground station network, including polar stations in Svalbard and Antarctica. Serves government, commercial, and scientific missions.
- **SSC** (Swedish Space Corporation). Global network including Esrange (Sweden) and stations across multiple continents. Full TT&C and data reception services.

Microsoft Azure Orbital was retired in October 2024, with antenna assets sold to Space Leasing International (SLI).

WHAT GAAS CHANGES ABOUT LICENSING

The GaaS provider holds the earth station license, not you. As a satellite operator, you need only your space station license and market access. GaaS eliminates capital expenditure, site acquisition, local permitting, and frequency coordination. You give up direct control over your ground segment and take on per-minute costs that can exceed own-station economics at high utilization rates. Industry estimates place the GaaS market at over $1 billion and growing rapidly (source: NSR, Euroconsult reports).

HOW MUCH DOES AN FCC EARTH STATION LICENSE COST?

Filing fees are a small line item; the real cost lives in coordination, construction, and operations. The table below maps the full cost stack.

COST CATEGORY	RANGE	NOTES
FCC application fee	$425 – $7,650	Single-site vs. multi-site; 47 CFR 1.1107, Table 7
FCC annual regulatory fee	$2,970/authorization (FY2026)	Plus $2,970 per associated hub station; reset each fiscal year
Frequency coordination	$10,000 – $30,000	Required in bands shared with terrestrial

COST CATEGORY	RANGE	NOTES
		services (chiefly C-band); not for conventional Ku-band or most Ka-band sub-bands
Small Ku/Ka station (single antenna)	$200,000 – $700,000	2.4–4.5m antenna + RF chain + site prep
Full teleport facility	$5M – $50M+	Multiple antennas, C/Ku/Ka, fiber, power, building
NGSO gateway site	$2M – $10M+	10+ tracking antennas; fiber backhaul a major cost driver
VSAT remote terminal	$1,000 – $5,000	Per terminal; hub station $500K–$2M+
Amateur/educational station	$2,000 – $50,000	DIY UHF/VHF to basic S-band receive
GaaS (AWS Ground Station)	Per-minute	Pay-per-use; rates vary by bandwidth; discounts for commitments

COST CATEGORY	RANGE	NOTES
Annual operations (staffed teleport)	$500K – $5M+	Staff, power, maintenance, backhaul

The cost asymmetry between filing fees and actual build costs is dramatic. The FCC application fee for a single earth station is a few hundred dollars. The antenna, RF electronics, site preparation, frequency coordination, and fiber backhaul to make it operational can cost hundreds of thousands to millions. For many operators, especially those launching their first satellite, GaaS is the pragmatic starting point.

COMMON MISTAKES THE FCC FLAGS IN EARTH STATION FILINGS

The FCC publishes its own list of common defects in earth station filings. These are the mistakes that cause the most delays:

1. 1 **Submitting a stale frequency coordination report.** The report must be less than 6 months old at filing. If your application preparation drags on, you will need to redo the coordination at full cost. Time the coordination work to your filing schedule.

2. 2 **Listing the wrong frequency bands.** Applicants often list every band their antenna is capable of, rather than the bands actually authorized on their target satellite. Your Schedule B should match the satellite's authorization, not the antenna's spec sheet.

3. 3 **Missing the radiation hazard analysis.** Generally required for fixed and temporary-fixed transmitting stations per FCC OET Bulletin 65, with limited exceptions. Omitting it is a listed deficiency that sends your application back to the queue.

4. 4 **Inconsistent technical parameters.** The FCC flags applications where maximum EIRP density per carrier is listed as less than average EIRP density, a mathematical impossibility. Double-check your Schedule B numbers.

5. 5 **Skipping NTIA pre-coordination in shared bands.** If you are operating in S-band, X-band, or shared Ka-band segments, the FCC will not grant your license until NTIA coordination is complete. Engaging NTIA informally before filing can save months.

6. 6 **Assuming receive-only means zero paperwork.** You do not need a license, but without registration, you have no legal protection against interference. If you are investing significant capital in a receive station, register it.

7. 7 **Ignoring local zoning for large antennas.** The FCC preempts local rules for small antennas under 47 CFR 25.104, but a 9-meter C-band dish needs local approval. Some operators discover zoning restrictions after they have already poured the foundation.

8. 8 **Not budgeting for frequency coordination.** At $10,000–$30,000 per report, coordination is a material cost, especially if you need to redo it because the first report expired. Conventional Ku-band and most Ka-band sub-bands avoid this.

AUTHORITY AND SOURCES

The defect categories above are drawn from the FCC's own Common Defects in Earth Station Application Filings (https://www.fcc.gov/general/common-defects-earth-station-application-filings) guidance, plus the technical eligibility framework in 47 CFR Part 25 Subpart C (25.209, 25.218, 25.220). Every filing should be reviewed against both before submission.

GROUND STATION LICENSING FAQS: FCC RULES & COSTS

+ Do I need a license to operate a satellite ground station?

+ How much does it cost to license an earth station?

+ How long does it take to get an earth station license?

+ What is blanket licensing?

+ What is the difference between a fixed earth station and an ESIM?

+ Do I need local permits to build a ground station?

+ Can I skip building a ground station and use Ground Station as a Service?

+ What's changing with the FCC's Part 100 rules?

FURTHER READING

→ How Satellite Licensing Works: A Complete Guide. The companion guide covering FCC, FAA, NOAA, and ITU licensing for the space segment

→ Space Regulatory Glossary: Definitions for the terminology used throughout this guide

→ The FCC 5-Year Deorbit Rule, covering how the FCC's orbital debris mandate affects LEO mission planning

→ FAA Part 450: The New Era of Launch Licensing. The performance-based framework for launch and reentry

→ The Operator's Playbook. The complete four-agency regulatory guide for commercial space missions

→ NOAA Remote Sensing License. What Part 960 actually requires for commercial Earth observation

→ The Trust Problem. Why AI-generated regulatory data needs architectural safeguards

→ Download this guide as PDF

Key Regulatory References

- → 47 CFR Part 25 -Satellite Communications (FCC) (https://www.ecfr.gov/current/title-47/chapter-I/subchapter-B/part-25)
- → 47 CFR 25.228 -ESIM Operating and Coordination Requirements (https://www.ecfr.gov/current/title-47/chapter-I/subchapter-B/part-25/subpart-C/section-25.228)
- → 47 CFR 25.203 -Choice of Sites and Frequencies (https://www.ecfr.gov/current/title-47/chapter-I/subchapter-B/part-25/subpart-C/section-25.203)
- → 47 CFR 25.104 -Preemption of Local Zoning (https://www.ecfr.gov/current/title-47/chapter-I/subchapter-B/part-25/subpart-A/section-25.104)
- → FCC Overview of Earth Station Licensing (https://www.fcc.gov/space/overview-earth-station-licensing-and-license-contents)
- → FCC Common Defects in Earth Station Filings (https://www.fcc.gov/general/common-defects-earth-station-application-filings)
- → FCC 26-47: Space Modernization Report and Order (https://docs.fcc.gov/public/attachments/FCC-26-47A1.pdf)
- → FCC-25-69: Space Modernization NPRM (https://docs.fcc.gov/public/attachments/FCC-25-69A1.pdf)

FREQUENTLY ASKED QUESTIONS

Do I need a license to operate a satellite ground station?

If your ground station transmits, yes - you need an FCC earth station license filed on Form 312 with Schedule B through the International Communications Filing System (ICFS). Receive-only earth stations working with U.S.-licensed or market-

access satellites do not require a license, but can optionally register with the FCC to receive interference protection from terrestrial microwave stations in shared frequency bands.

How much does it cost to license an earth station?

FCC application processing fees for earth stations range from roughly $425 for a single-site transmit/receive station to $7,650 for multi-site applications. Annual regulatory fees for FY2026 are $2,970 per earth station authorization (reset each fiscal year). Beyond filing fees, frequency coordination reports cost $10,000 to $30,000, and total ground station construction costs range from $200,000 for a small Ku-band station to $50 million or more for a full multi-antenna teleport facility.

How long does it take to get an earth station license from the FCC?

There is no statutory deadline for FCC earth station applications. Routine applications that meet all Part 25 technical standards typically process in 2 to 6 months. The simplified Form 312EZ path is deemed granted 35 days after public notice if no objection is filed. Non-routine applications involving waiver requests, non-conforming antennas, or contested frequencies can take significantly longer.

What is blanket licensing for earth stations?

Blanket licensing allows an operator to cover multiple earth station terminals of the same type under a single FCC authorization, rather than licensing each site individually. It is commonly used for VSAT networks (where one license covers the hub plus all remote terminals) and Earth Stations in Motion (ESIMs) that move between locations. Blanket licensing requires meeting routine processing criteria, including conforming antennas and standard EIRP density limits.

What is the difference between a fixed earth station and an ESIM?

A fixed earth station operates at a specific geographic location and is licensed on a site-by-site basis. An Earth Station in Motion (ESIM) operates while moving and is blanket-licensed by terminal type rather than location. ESIMs come in three

categories: Earth Stations on Vessels (ESV) for maritime, Earth Stations Aboard Aircraft (ESAA) for aeronautical, and Vehicle-Mounted Earth Stations (VMES) for land-mobile. All three are governed by 47 CFR 25.228.

Do I need local permits to build a ground station?

Possibly. The FCC preempts local zoning for commercial antennas 2 meters or smaller in commercial/industrial zones and 1 meter or smaller in any zone (including residential, under the OTARD rule). Larger commercial antennas are subject to local zoning, building permits, and potentially FAA obstruction review if the structure exceeds 200 feet or is near an airport. Environmental review under NEPA may also be required if the site is in a sensitive area such as wetlands, historic sites, or tribal lands.

Can I skip building a ground station and use Ground Station as a Service?

Yes. Ground Station as a Service (GaaS) providers like AWS Ground Station, KSAT, and SSC hold the earth station licenses and offer antenna time on a pay-per-minute basis. AWS Ground Station rates vary by bandwidth and commitment level. GaaS eliminates capital expenditure, site acquisition, and frequency coordination - but at high utilization rates, operating your own station may be more cost-effective.

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