

UPDATE ON THE 5G MITIGATION ROLLOUT

MARK JOHNSON, PRESIDENT



C-BAND / 5G ISSUE REVIEW FCC ORDER

- Add a mobile allocation, except aeronautical mobile, to the 3.7-4.0 GHz band.
- Transition 280 megahertz, plus a 20-megahertz guard band, from incumbent use to flexible-use in the contiguous United States by December 5, 2025, through a Commission-led public auction.
- Provide eligible space station operators with the option to accelerate the clearing according to the following accelerated timeline: (1) clearing 120 megahertz (3.7-3.82 GHz) by December 5 2021, and (2) clearing the remaining 180 megahertz (3.82-4.0 GHz) by December 5, 2023. If they meet those benchmarks, they will receive accelerated relocation payments from flexible-use licensees.
- Require incumbent FS licensees in the contiguous United States to relocate their point-to-point links to other bands, by December 5, 2023.

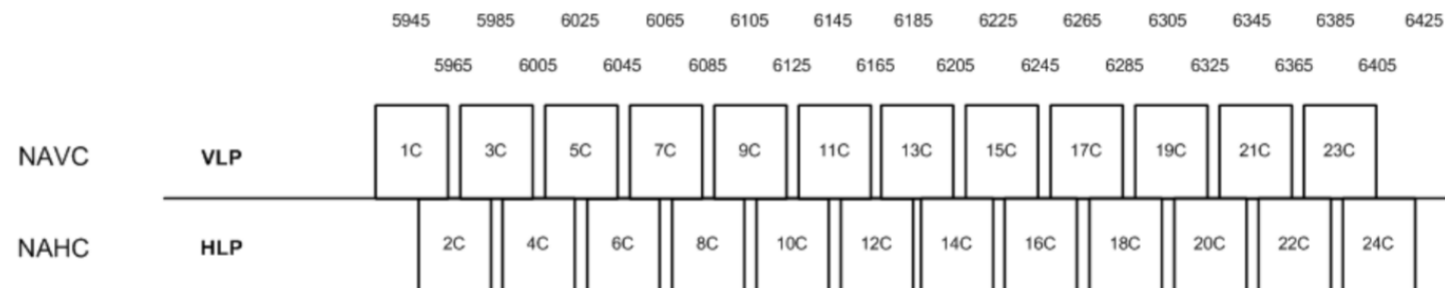


C-BAND / 5G ISSUE REVIEW FCC ORDER

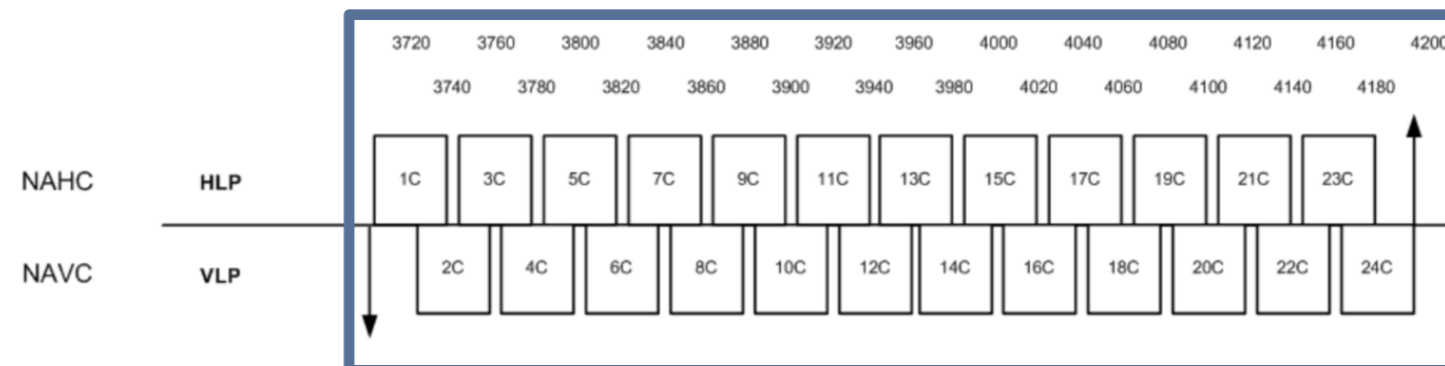
- Provide both incumbent FSS and FS licensees with reimbursement of reasonable relocation costs paid by flexible-use licensees as a condition on their license.
- Establish a Relocation Payment Clearinghouse to manage the intake, payout, and auditing of relocation funds, mediate cost-related disputes, and provide progress reports to the Commission.
- Establish a Relocation Coordinator to coordinate the migration and filtering of incumbent earth stations to ensure uninterrupted service during and following the transition.
- Adopt service and technical rules for flexible-use licensees in the 280 megahertz of spectrum designated for transition to flexible-use

C-Band Frequency Plan

UPLINK 5925 – 6425 MHz



DOWNLINK 3700 – 4200 MHz





C-BAND / 5G ISSUE KEY ENTITIES OUTLINED IN THE FCC ORDER

- A. FCC - auction spectrum; final arbitrator for all issues
- B. Relocation Payment Clearinghouse – Approves cost reimbursements for filtering and transition upgrades
- C. Relocation Coordinator – manages clearing schedule; appointed by satellite owners
- D. Space Station Operators – Decided to choose the accelerate transition. Transition satellite services & related earth stations
- E. Earth Station Operators – may elect cost reimbursement to remain on C-band, or accept the opt-out amount. Facilitate satellite operator transition plans
- F. Customers – part of the Earth Station population as well as key stakeholder in transition plan



C-BAND / 5G ISSUE TIMELINE AND MILESTONES IN FCC ORDER

- **March 31, 2020** — Clearinghouse search committee convenes (DONE)
- **May 29, 2020** — Satellite operators file Accelerated Relocation Election (DONE - ALL OPERATORS CHOSE AR)
- **June 05, 2020** — Public Notice if 80% clearing super-majority met (if so – clearing coordinator committee is formed) (DONE)
- **June 12, 2020** — Satellite operators file transition plans (DONE)
- **July 13, 2020** — Window for Stakeholder comments closes (on transition plans) DONE
- **July 31, 2020** — Clearinghouse & Clearing Coordinator search committees announce choice (DONE)



C-BAND / 5G ISSUE TIMELINE AND MILESTONES IN FCC ORDER

- **August 14, 2020** — Satellite operators submit revisions to transition plans (DONE)
- **December 08, 2020** — Auction begins (DONE... Revenue was \$90 Billion)
- **30 Day Trigger** — Earth stations decide after WTB releases public notice for the earth-station opt-out fixed sum (\$8,948 DONE)
- **December 05, 2021** — Phase 1 deadline: 3700-3820 to be cleared in 46 top PEAs
- **December 05, 2023** — Phase 2 deadline: 3700-4000 to be clear nationally
- **December 05, 2025** — Sunset of all FSS license protection for 3700-4000



C-BAND / 5G ISSUE TRANSITION PLANS

7 defined components in the Space Station Operator transition plan

- A. List of existing space stations (satellites) that must be re-packed
- B. Number of new satellites required to maintain sufficient capacity post-transition
- C. Specific grooming plan for migrating customer services to the upper 200 MHz
- D. List of necessary technology upgrades – required to complete repack plan
- E. Number and location of earth stations receiving signals from operators satellites
- F. Estimate of the number of earth station antennas that will require retuning or repointing
- G. Specific timeline and milestone plan



C-BAND / 5G ISSUE TRANSITION PLANS

Satellite Owners

- A. Satellite Owners were required to deliver transition plans to the FCC June 12, 2020 / This was changed to June 19. SES and Intelsat both delivered their plans to the FCC. They are both available on line.**
- B. <https://www.satellitetoday.com/5g/2020/06/22/intelsat-ses-detail-c-band-transition-plans/>**
- C. Satellite Owners will determine**
 - A. Capacity Plan**
 - B. Timing Plan**
 - C. Technology Plan**
- D. FCC Plan also includes additional satellite launches to increase capacity**
- E. Building a comprehensive plan requires engagement from satellite users & their affiliates**



C-BAND / 5G ISSUE

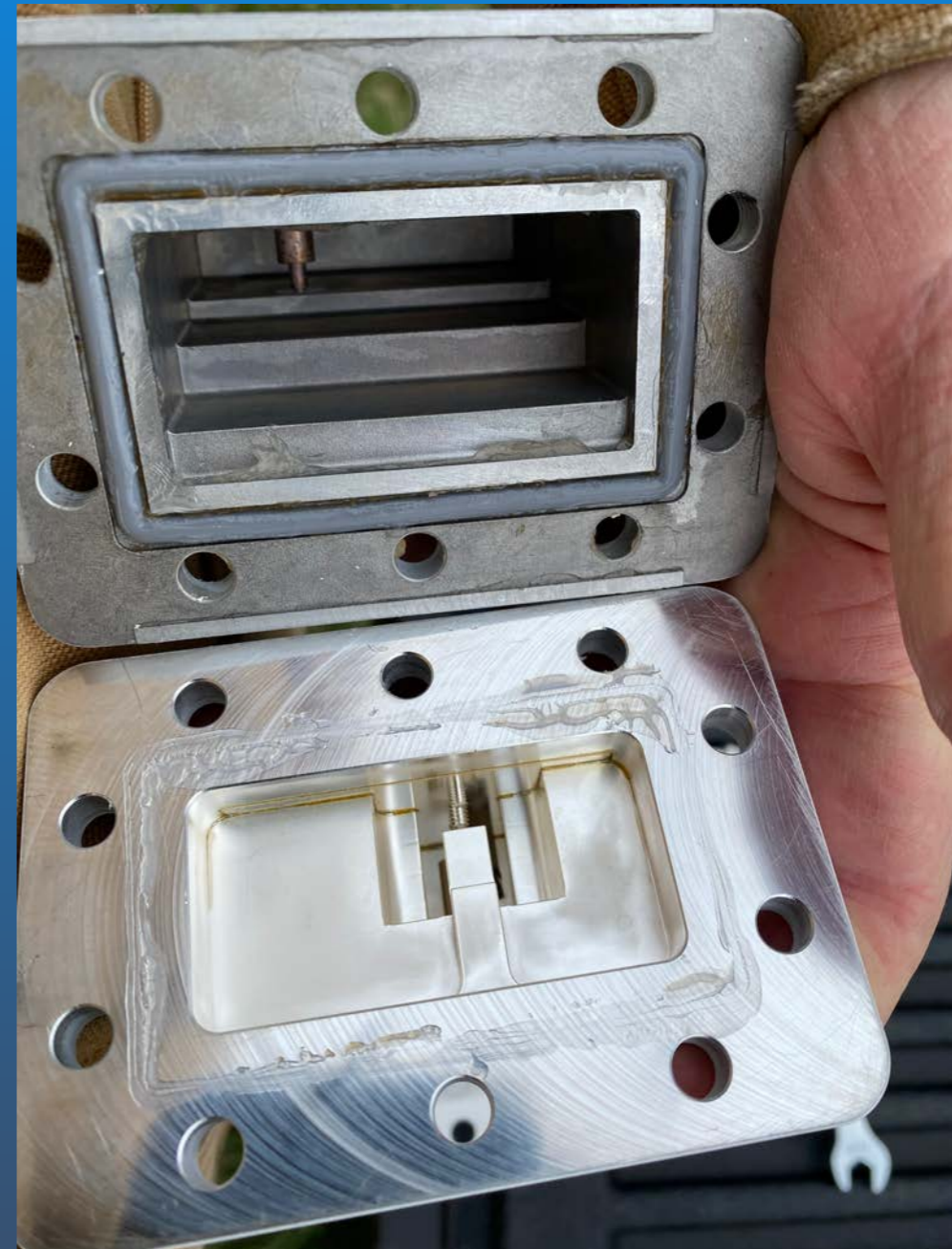
EARTH STATION CATEGORIES

Qualified Earth Stations / Non Qualified / Non Responsive

- A. Qualified Earth Stations (QES) are defined as only those in the FCC's IBFS database
- B. Unless they elect to opt-out, QESs receive two primary benefits – cost reimbursement and continued C-band operating protection (ACA, Cox and several other MVPDs (multichannel video-programming distributors) have chosen OPT out.
- C. Cost reimbursement is for i) filtering and ii) modifications required due to repack “so that Earth Stations can provide materially the same service after the transition as before”
- D. QES must “facilitate” the activities for an accelerated clearing
- E. The order has redefined power limits for the areas surrounding the QES
- F. Non-responsive Earth-Stations may be waived (we want to minimize this number)
- G. No earth-station is protected for all 500 MHz – FCC did not accept gateway concept
- H. Telemetry Tracking and Control protected through 05 Dec 2025, then non-protected
- I. Looking to compare affiliate list vs. FCC database – inquiries to clients



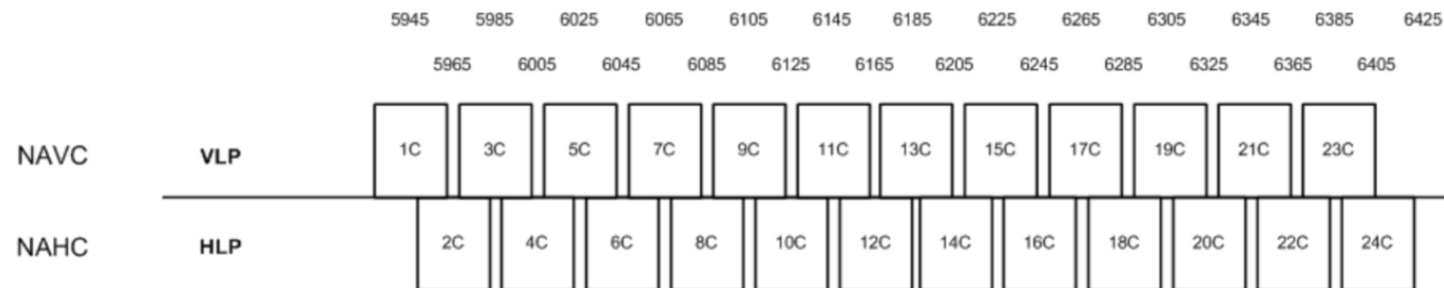
**C-BAND / 5G PHASE 1
TOP 46 PEA INITIAL
CLEARING BY 12/5/2021
“THE RED FILTER”**



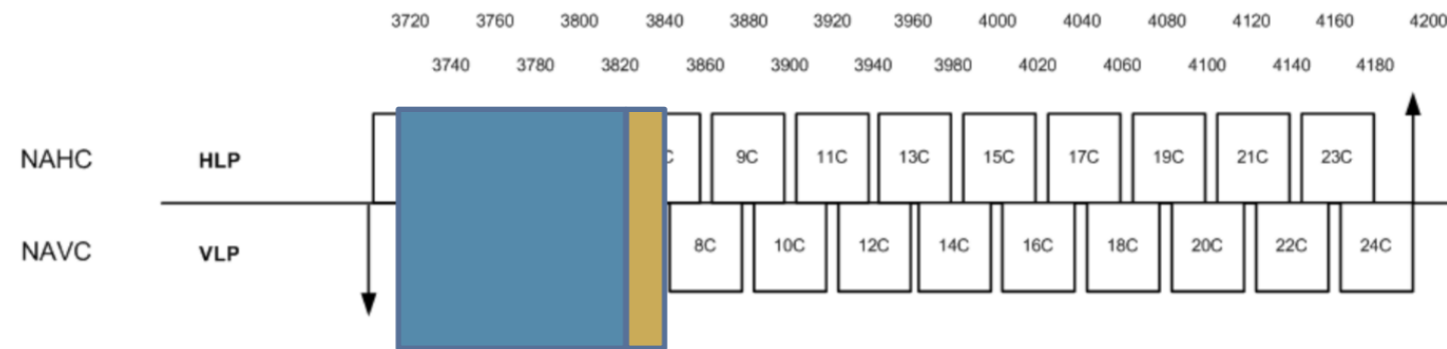


C-Band Frequency Plan

UPLINK 5925 – 6425 MHz



DOWNLINK 3700 – 4200 MHz





C-BAND / 5G PHASE 2 NATIONAL CLEARING BY 12/5/2023 “THE BLUE FILTER”



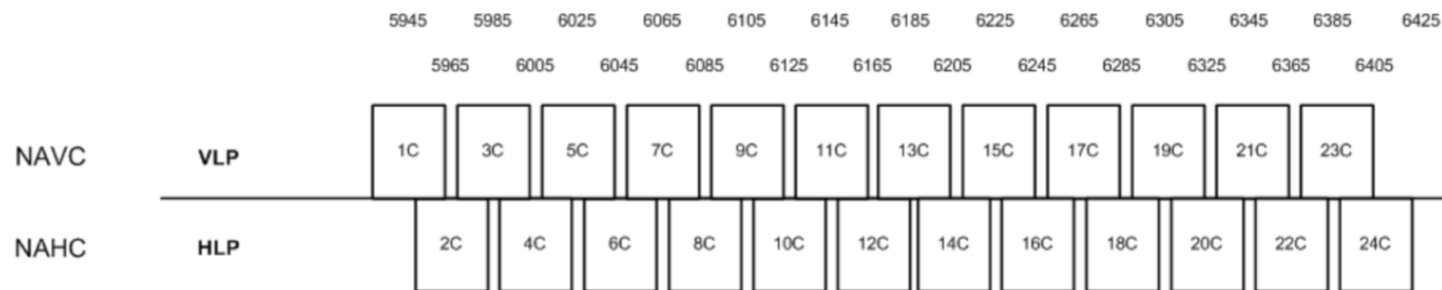


C-BAND / 5G PHASE 2 NATIONAL CLEARING BY 12/5/2023

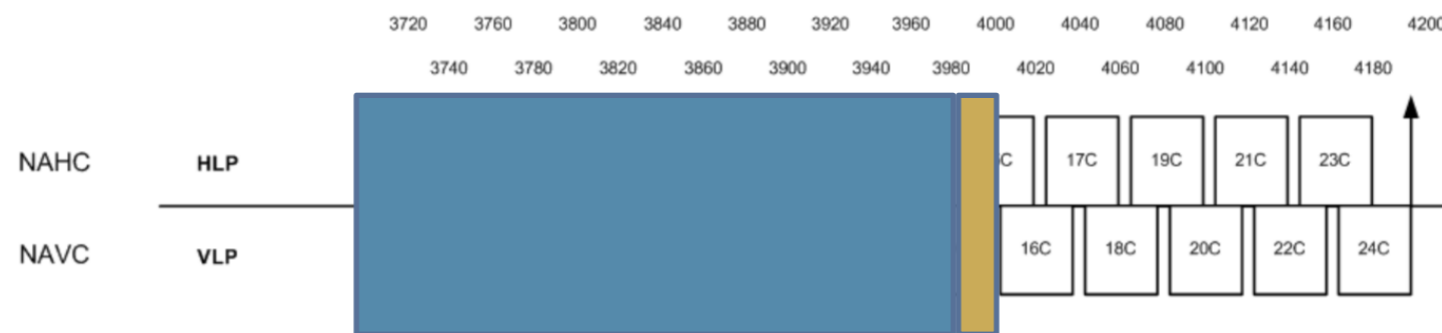


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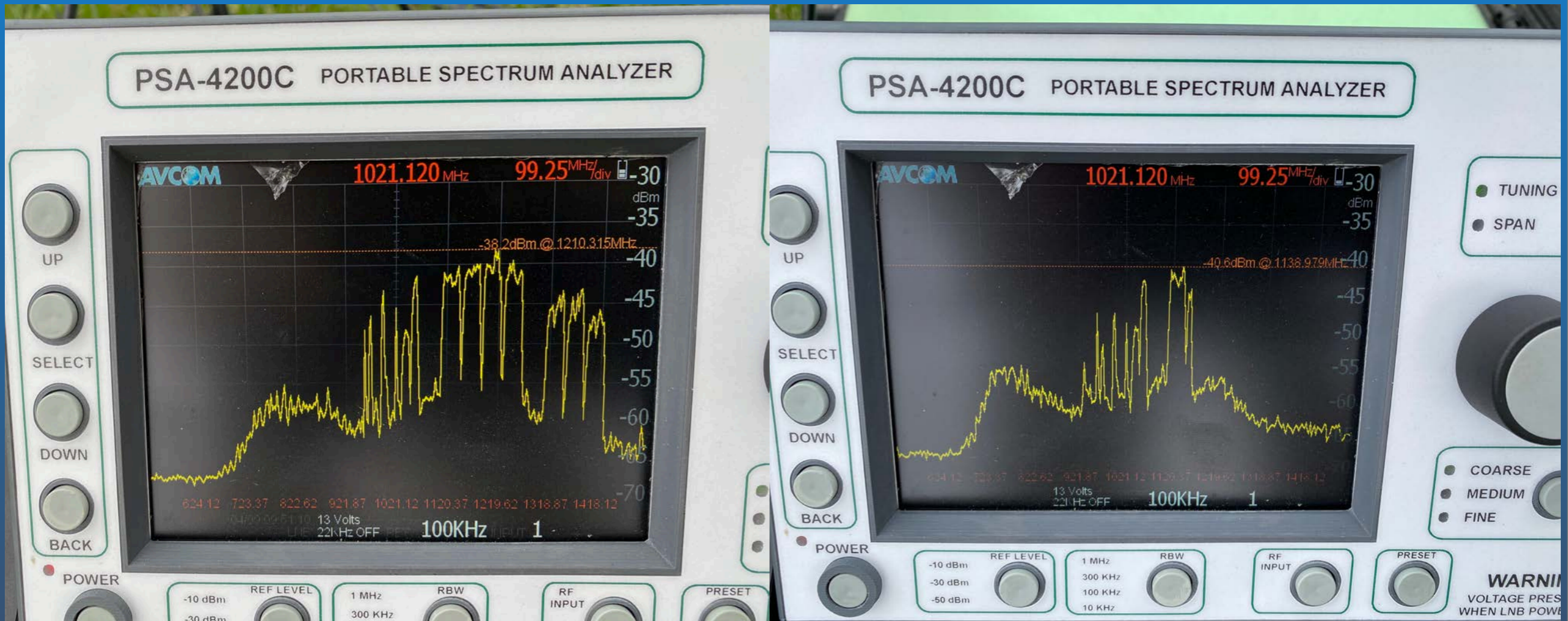
DOWNLINK 3700 – 4200 MHz





C-BAND / 5G PHASE 2 NATIONAL CLEARING BY 12/5/2023 "THE BLUE FILTER"

Before and After Installation





What does the recent TV Repack tell us about how the FCC works in similar operations.

- A. All invoices for reimbursement must be specific to a site
- B. Site registration (downlink) not station call letters must be on invoice
- C. Vendor's EIN must be on invoice
- D. Equipment ID's must be accurate
- E. Double check all math. Spreadsheet rounding could cause your invoice to be rejected.



USSSI for filter installations and modifications

Cbandhelp@ses.com



Update from Intelsat 2/3/2021



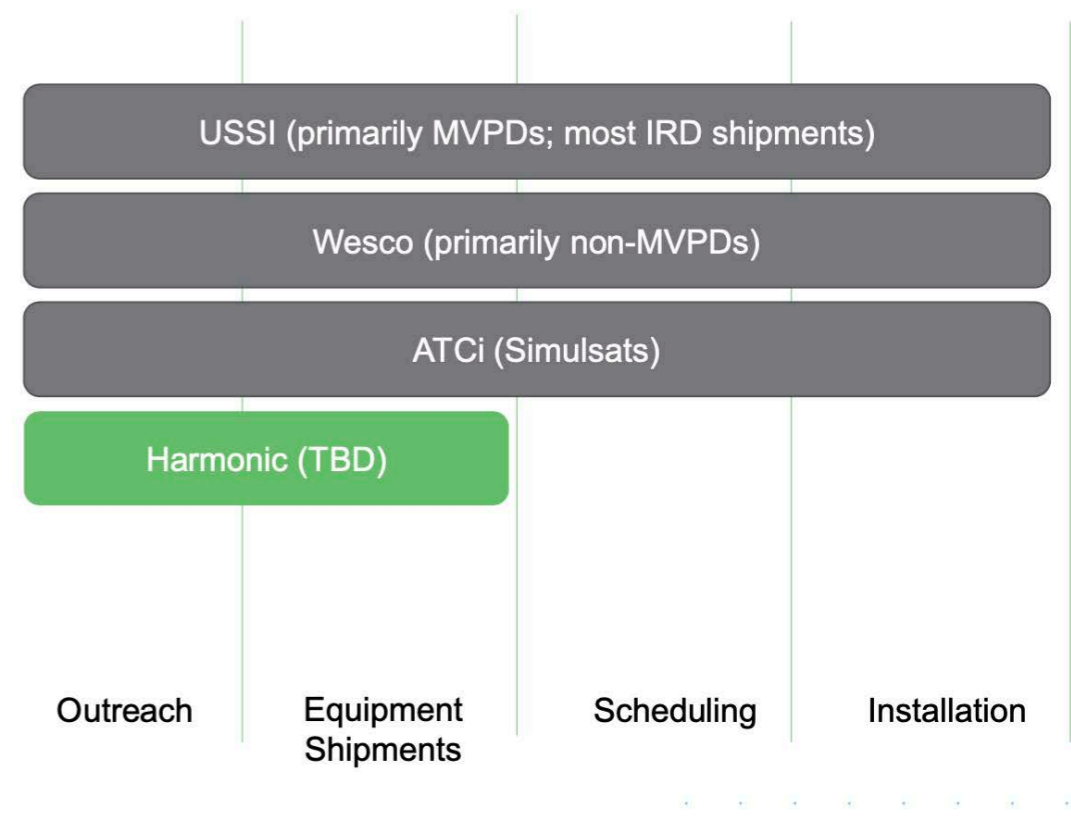
\> Most of the filtering will not start until June 1, 2021 and it will only happen in and around the top 46 markets then. Nationwide filtering will start in earnest mid-year 2023.

> The focus for the first half of 2021 is grooming services on the satellite – frequency, pol and satellite changes – and installing compression equipment.

> Your programmers and our vendors have and will be calling. The information sharing is for your benefit, to ensure you get what you need and enjoy a seamless experience. We know it's a lot, but it's necessary. Please find time to respond.

> If you have questions, please email us at cbandinfo@intelsat.com and we will be happy to answer them.

Who's who in the zoo – Intelsat's vendors





**C-BAND / 5G ISSUE
QUESTIONS, FILTERS AND INSTALLATION
THANK YOU FOR YOUR TIME!**

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