



SUPER SLO-MO ANYWHERE

The Democratization of Elite Sports Production
via TVU's Bonded RPS REMI Ecosystem

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1. Executive Summary

In the 2026 sports production landscape, fans no longer distinguish between “major” and “regional” broadcasts, they expect Super Slow Motion (SSMo) at 3x, 6x, and 10x frame rates regardless of venue or sport tier. Until now, delivering that expectation required a dedicated 10 Gbps+ fiber circuit or expensive on-site mobile units: infrastructure that is impractical for the hundreds of collegiate and tier-2/3 events that air every week.

TVU Networks has solved this through the “Anywhere-REMI” architecture of the RPS and RPS Link. By cracking the multi-phase synchronization problem over non-deterministic networks, TVU enables broadcasters to deploy SSMo at any venue, from a remote collegiate soccer pitch to a high-density urban marathon, over 5G, Starlink, or standard broadband, without the traditional infrastructure tax.

Big Ten Network (BTN) has validated this in production, extending SSMo replay to baseball, soccer, volleyball, and other programs that historically went without it, while keeping the platform complementary to its existing fiber-based workflows rather than displacing them. BTN has also established bonded IP as a critical hot backup to fiber and as an early-access connectivity layer for production trucks.

2. Breaking the “Infrastructure Barrier” to Super Slow-Motion Replay

The primary hurdle for remote SSMo is Phase Coherence. A 3x SSMo camera outputs three distinct SDI “phases” that must be interleaved perfectly at the replay server.

In a traditional REMI setup, the public internet's 'jitter', variable packet arrival times caused by congestion and routing changes across IP hops, destroys this alignment. This is precisely why broadcasters have defaulted to dedicated fiber for SSMo REMI: fiber circuits are deterministic by nature and immune to jitter. But fiber is also expensive, requires advance coordination, and simply does not exist at the majority of venues where sports are played.

This has created three structural constraints for every broadcaster operating outside a fiber-connected venue:

The “Fiber Lock”: REMI SSMo workflow has traditionally been restricted to “connected” stadiums with 10 Gbps+ dedicated lines. Any venue without that infrastructure is excluded from elite replay production.

The “Dead Asset” Problem: Replay servers and CCU controllers physically shipped to venues are unusable during transit, cannot be re-patched between simultaneous games, and accumulate hardware fatigue. A DreamCatcher unit traveling 600 miles is a stranded capital asset.

Control Latency: Attempting to shade high-speed cameras remotely over standard IP introduces perceptible “joystick lag”, a delay between control input and camera response that makes the precision required for live sports impractical.

3. The Solution: Synchronized “Anywhere” Contribution

The TVU RPS (Remote Production System) platform provides the architecture to treat any internet connection — 5G, Starlink, or public Wi-Fi — as a frame-accurate broadcast pipe when aggregated together using TVU's field proven ISX protocol. It does this through two core engineering innovations working in tandem.

A. Precision TimeLock Synchronization

Unlike standard encoders that timestamp at the software layer, the TVU RPS Link applies a hardware-level timestamp to each incoming SDI phase at the point of ingestion. At the receiving hub, the TVU RPS One decoder reconstructs these phases with sub-frame accuracy, compensating for jitter, packet reordering, and path-level delays introduced by bonded transport.

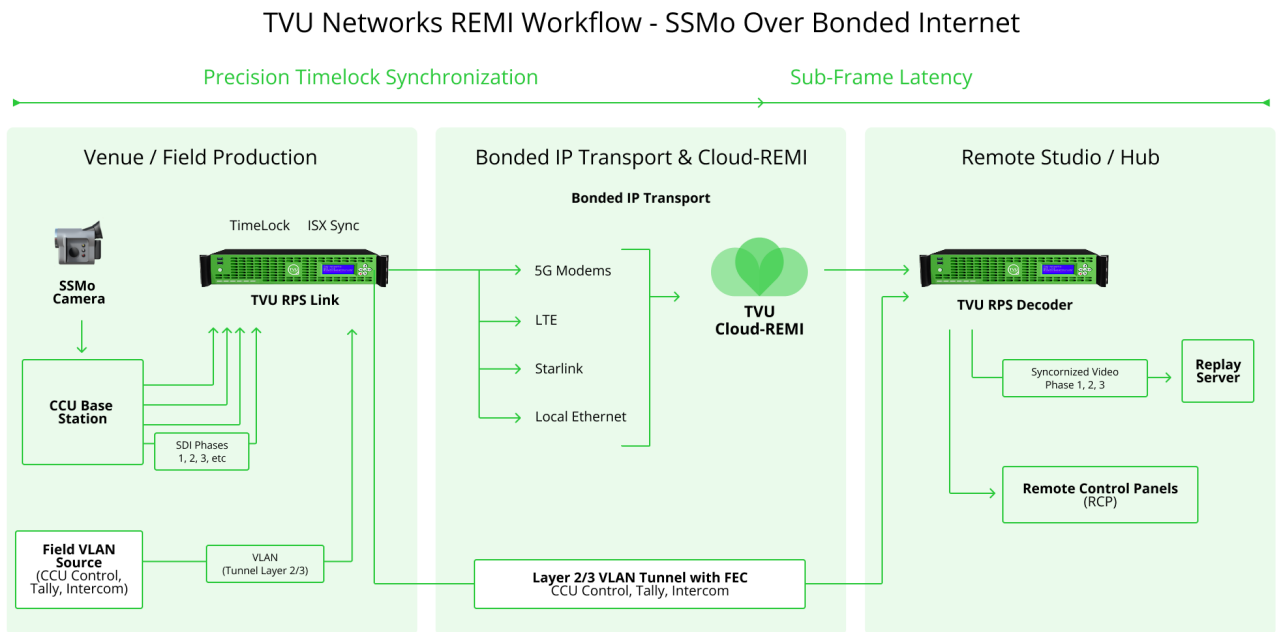
The result: the replay server, whether an Evertz, EVS, Grass Valley or equivalent, receives a perfectly synchronized signal. The 1,000-mile transit is transparent to the operator. TimeLock operates continuously across network path changes without intervention. In BTN's production testing, synchronization held for several days with zero phase drift events as the bonded network actively shifted between Ethernet and 5G paths.

B. The Bidirectional VLAN Tunnel

TVU's unique VLAN Tunnel (supporting Layer 2 and Layer 3 traffic) allows the CCU Base Station to remain in the field while the Remote Control Panel (RCP) stays in the studio. This dedicated, FEC-protected bidirectional channel carries iris and shading control, tally, intercom, and CCU telemetry — giving the full production team remote command of every camera in the field.

- **Tactile Response:** Control signals for iris and shading are protected by Forward Error Correction (FEC), surviving packet loss without re-transmission delay and providing the shader with the “live feel” necessary to paint cameras in rapidly changing lighting conditions.

- **Seamless Discovery:** The studio RCP “sees” the field CCU via the Layer 2 bridge as if they were on the same local switch — no VPN configuration, no complex routing. From the shader’s perspective, the camera is local.



4. In Practice: Solid-State Reliability for Collegiate Sports

BTN integrated a fleet of TVU RPS Link encoders into its regional fly-pack operation to cover HFR requirements across a broad range of collegiate sports: baseball, soccer, volleyball, wrestling, and other programs that had historically aired without SSMo. The replay systems stay permanently at BTN's central production hub, re-patched between events on demand.

The result is a single hub asset serving multiple concurrent productions that previously would each have required dedicated hardware or fiber connectivity at the venue.

During rigorous soak tests and live game conditions, the TVU-DreamCatcher integration held its synchronization lock as the bonded network shifted between local Ethernet and 5G paths, exactly the scenario that has defeated competing transport solutions. Hub-based operators performed complex multi-angle scrubs and Super Slow-Mo zooms with the same fluidity as a local workflow, with zero interruption to coverage.

The VLAN tunnel delivers the production control to match. From the central studio, operators shade cameras, manage tally and intercom, and run shows across multiple venues simultaneously, without a single crew member traveling to a venue that would previously have required an on-site presence.

BTN has also embedded RPS Link units in its regional field trucks as a hot backup for major fiber-based productions. If the primary fiber connection fails, the TVU system assumes the synchronized SSMo feeds without manual intervention. Those same units run TVU Router, giving production crews live IP connectivity from the moment the truck parks, before venue fiber is ever activated.

"The primary hurdle for moving our super slo-mo workflows to a remote model has always been the synchronization drift over the open internet," said Nick Smith, VP of Engineering, Big Ten Network. "TVU has allowed us to take super slo-mo replay where it wasn't previously possible."

— Nick Smith, VP of Engineering, Big Ten Network

5. Why "Anywhere" Matters, The Economic Shift

Moving the "Super Slo-Mo Center of Gravity" from the venue to the hub is not just a technical shift, it is a capital and operational restructuring. For CTOs and engineering directors, three consequences define the new model:

1. **Asset Elasticity:** A single SSMo at the hub re-patches between games across the country in minutes. One server. One operator. Five simultaneous productions. Capital concentrates where it is most efficiently used, rather than depreciating in transit between venues.
2. **Resource Density:** A Lead Shader at the hub paints cameras across back-to-back games at distant venues without travel. Expert operators are more available, less fatigued, and deployable across more productions per week — a direct improvement in both output quality and resource utilization.
3. **Venue Independence:** SSMo is no longer a stadium luxury gated by fiber infrastructure. Any sport, at any venue, can now receive the same replay production quality as a marquee broadcast, whether that's a regional soccer match, a collegiate wrestling meet, or a baseball game. The production bar rises uniformly across the entire rights portfolio, not just at the top of it.

6. The Conclusion

The TVU RPS / RPS Link have closed the infrastructure gap that has defined, and limited live sports production for a decade. Tier-1 Super Slo-Mo no longer belongs exclusively to the venues that can afford a fiber contract. It belongs to any event with an internet connection and an operator willing to rethink where the hardware lives.

The implications extend beyond collegiate sports. As rights portfolios grow, production budgets tighten, and viewer expectations continue to rise uniformly across tiers, the economics of shipping replay hardware to every venue become harder to justify. The Anywhere-REMI model, hub-centric, network-agnostic, and resilient, is not a workaround for broadcasters without fiber. It is the logical architecture for any organization producing at scale.

For engineering teams still evaluating whether bonded IP can be trusted for SSMo: BTN has run the test, under live conditions, at scale, over multi-day continuous operation. The synchronization held. The question now is not technical feasibility, it is how quickly your organization restructures around it. While the camera is in the field, the control, and the quality, remain firmly in the studio.

[See It in Your Workflow](#)

If your production still depends on fiber or on-site hardware to deliver Super Slo-Mo, TVU RPS can change that equation without disrupting what already works. Whether you're looking to extend SSMo to more sports in your portfolio, add resilience to your marquee fiber productions, or reduce the operational cost of traveling replay hardware, the Anywhere-REMI model is ready to deploy.