# Novel High-Speed QAM Receiver Architecture

Tech ID: 33909 / UC Case 2022-939-0

## BRIEF DESCRIPTION

This technology introduces a revolutionary receiver architecture capable of demodulating high-order QAM signals without the need for high-speed analog-to-digital converters (ADCs), significantly enhancing communication speed and efficiency.

## FULL DESCRIPTION

The invention presents a novel receiver architecture designed for ultra-high-speed communications, employing a carrier synchronization loop and a high-speed pipelined structure. This architecture uniquely demodulates high-order QAM signals directly into raw bit-streams, bypassing the need for ADCs in the signal path and addressing the critical bottleneck in conventional receiver designs.

## SUGGESTED USES

- Wireless front-haul/back-haul in 5G, 6G, and beyond wireless networks.
- Coherent optical communications.
- Next-generation wireline systems requiring ultra-high data rates.

## ADVANTAGES

- Eliminates the need for high-speed-resolution ADCs, reducing power consumption and cost.
- Supports demodulation of any 4N-QAM signal at arbitrary carrier frequencies.
- Improves communication speed by removing the ADC bottleneck.

## PATENT STATUS

| Country | Type | Number | Dated | Case |
|---|---|---|---|---|
| Patent Cooperation Treaty | Published Application | WO 2024/020140 | 01/25/2024 | 2022-939 |

Additional Patent Pending

## RELATED MATERIALS

- Oveisi, M., Wang, H., Heydari, P. (2023). A Study of a Millimeter-Wave Transmitter Architecture Realizing QAM Directly in RF Domain. IEEE Transactions on Circuts and Systems I: Regular Papers, 70 (6).

## CONTACT

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## OTHER INFORMATION

## CATEGORIZED AS

- **Communications**
  - Internet
  - Networking
  - Optical
  - Wireless

## RELATED CASES

2022-939-0

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