

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

WILUS INSTITUTE OF STANDARDS AND TECHNOLOGY INC.,
Patent Owner.

Case No. IPR2025-01069
U.S. Patent No. 10,313,077

**PATENT OWNER'S SUR-REPLY TO PATENT OWNER
PRELIMINARY RESPONSE**

Samsung’s Reply seems to agree that Bharadwaj-Prov59’s formula is not what the invention discloses. Notably, L_{LENGTH} as disclosed in Baradwaj-Prov59 includes “+m” as shown below, whereas the ’077 Patent’s L_Length is calculated using “-m.” POPR at pp. 16-17. The calculation of $RXTIME$, and N_{sym} , which uses L_Length is also different.

Bharadwaj-Prov59, ¶ [0051]	’077 Patent, FIG. 30
$L_{LENGTH} = \left\lceil \frac{TXTime-20}{4} \right\rceil \times 3 - 3 + m$ where $m = 1, 2$	$L_Length = \left\lceil \frac{TXTime-20}{4} \right\rceil \times 3 - 3 - m$ where $m = 1$ or 2

As the POPR pointed out, this difference is significant for Wi-Fi 6 (802.11ax) communications because the old technique, i.e., the one disclosed in Bharadwaj-Prov59, unfairly prejudices legacy devices because N_{sym} (which is calculated using L_Length) for legacy devices is one symbol longer than N_{sym} for the non-legacy devices (calculated using the same L_Length formula), due to ceiling operations. See POPR at 14, 18.

In the Petition, Samsung attempted to modify the formula of Bharadwaj-Prov59 with hindsight, despite contemporaneous IEEE documents, including submissions to IEEE with Bharadwaj’s blessing, demonstrating that the ’077 Patent is not obvious. POPR at 11-15, 18-19.

Samsung’s Reply is problematic in several ways. First, Samsung’s compare and contrast between Bharadwaj-Prov59’s formula with 802.11ac’s formula is irrelevant. Reply at 1-2. Bharadwaj-Prov059 provides no

explanation of any relationship between “m” signaling and legacy compatibility. Moreover, what is at issue in the POPR is the 802.11ax standard, and in particular, how Bharadwaj-Prov59’s old approach differs from the ’077 Patent’s new approach. It is irrelevant that there is a more ancient formula (i.e., RXTIME in 802.11ac) than Bharadwaj-Prov59. Nor does Samsung’s misleading label that Bharadwaj-Prov59 is “non-legacy formula” in comparison to 802.11ac’s “legacy formula” save Bharadwaj-Prov59’s failure to disclose the ’077 Patent.

Second, Samsung improperly modified Bharadwaj-Prov59’s formula as POPR pointed out. Bharadwaj-Prov59 unequivocally states that its RXTIME is calculated using $L_{LENGTH} - m$ as part of a ceiling operation. Yet, in Petition, when applying Bharadwaj-Prov59’s formula, Petitioner applied $L_{LENGTH} + m$.

$RXTIME = \left\lceil \frac{L_{LENGTH} - m}{3} + 3 \right\rceil \times 4 + 20$	$RXTIME = \left\lceil \frac{(240 + m)}{3} + 3 \right\rceil \times 4 + 20 = 348$
Bharadwaj-Prov-59, ¶ [0055], eq. 5	Petition at 22.

The Reply does not help Samsung on this issue. Samsung improperly equates the L_{LENGTH} in Bharadwaj-Prov59 with LENGTH in 11ac’s RXTIME formula. Reply at 2 (“the Petition addresses how the use of Bharadwaj-Prov59’s L_{LENGTH} (i.e., LENGTH + m) value as the LENGTH value...”). But Bharadwaj-Prov59 does not disclose a variable “LENGTH” or suggest that L_{LENGTH} and LENGTH are equivalent. This distinction is

significant because, as Bharadwaj-Prov59 itself states, 11ac does not use m in its calculation since m was first added in 11ax, but Bharadwaj-Prov59 does use m . Bharadwaj-Prov59 at ¶ [0051]. In other words, the L_{LENGTH} which uses m is not the equivalent of LENGTH which doesn't use m . Furthermore, the Board must reject Samsung's attempt in the Reply to modify Bharadwaj-Prov59 with 11ac's formula because 11ac is not one of the asserted grounds of invalidity in the Petition.

Third, for reasons explained in the POPR, there is no basis for a POSITA to borrow the “- m ” from Yu's equation¹ which is for a different purpose. POPR at 21-23. It is not self-evident or obvious to borrow merely the subtraction operator from an equation designed to signal last symbol structure (Yu-Prov428) and apply it to an equation designed for auto-detection (Bharadwaj-Prov059). Furthermore, Yu's equation for length does not have a ceiling operation. It therefore does not have or solve the issue arising from the ceiling operation in Bharadwaj-Prov59. Coupled with the un rebutted facts that right before the '077 Patent, industry-wide experts all adopted Bharadwaj-Prov59's technique (POPR at 11-15), there is no teaching or motivation to modify Bharadwaj-Prov59, much less to modify it with Yu.

¹ Reply also mentioned a Lee reference (Reply at 3) which is not relevant here since Lee was not asserted as a ground of invalidity in the Petition.

Patent Owner's Sur-Reply to POPR
IPR2025-01069 (U.S. Patent No. 10,313,077)

Dated: November 19, 2025

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CERTIFICATE OF SERVICE

I hereby certify that "Patent Owner's Sur-Reply to Patent Owner Preliminary Response" was served on November 19, 2025 by email sent to:

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