



**SEP  
Privateer  
Report**

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## INTRODUCTION

Technology companies routinely strive to monetize the results of internal R&D efforts – protected through intellectual property rights – while at the same time maintaining a competitive advantage, focusing on business growth, and avoiding costly legal actions. One way of monetizing IP rights at a relatively low cost, while at the same time exposing competitors to lengthy infringement battles with no direct exposure to the company itself, is to transfer patents to an *IP privateer*. IP privateers are non-practicing entities (“NPEs”) that have acquired patents and are licensing – including litigating – in lieu of the operating companies (“OpCos”) that originated the patents.

IP privateering has been around for decades.<sup>1</sup> Over the last decade, there were more than 100 transactions where an OpCo transferred standard essential patents (“SEPs”) to a privateer. Generally, holders of patents declared essential standards [e.g., cellular standards] are required to license on a fair, reasonable, and non-discriminatory (“FRAND”) basis.<sup>2</sup> This report aims to investigate and discuss the impact of cellular SEP privateers on the aggregate royalty burden (“ARB”) of smartphones.<sup>3</sup>

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1 Tom Ewing, “Introducing the Patent Privateers,” *IAM Magazine*, Jan/Feb 2011.

2 “ETSI Intellectual Property Rights Policy,” European Telecommunication and Standardization Institute, 1 December 2021, available at: <https://www.etsi.org/images/files/IPR/etsi-ipr-policy.pdf>.

3 All citations and footnotes that include webpage links in this white paper were last accessed on August 30, 2022.

## 1

# Identification of Top 20 SEP Privateers

There are presently close to 50,000 active, declared 5G multimode (“MM”)<sup>4</sup> SEP families.<sup>5</sup> Within this large set of declared SEPs, over 1,100 cellular families are currently in the hands of privateers. Seventy-six percent of these transactions occurred in the last decade.

Stout identified a total of 64 cellular SEP privateers; the top 20 SEP privateers are listed below.

**TABLE 1: TOP 20 CELLULAR SEP PRIVATEERS**

SEP Privateer	# of Transactions (as buyer)	# of Transacted Families <sup>6</sup>	Seller(s)	Avg. Remaining Life Left at Acq. Date
Sun Patent Trust	1	173	Panasonic	15.1
PanOptis, LLC	7	169	Ericsson   LG   Panasonic   Samsung	12.0
FG Innovation Company Limited	1	114	Sharp	16.1
Conversant Intellectual Property Management Inc.	2	107	Gloucester Technologies   Nokia	11.2
Sisvel International S.A.	8	102	LG   Nokia   Orange   Provenance Asset Group LLC   Sony   Technicolor	7.4
Intellectual Ventures LLC	9	48	NextWave Wireless   Nokia   Panasonic   Quarterhill   Siemens   Telia	11.7
Acacia Research Corporation	2	44	Nokia   Swisscom	12.2
IP Bridge, Inc.	6	43	Fujitsu   Hitachi   LG   Panasonic   Sun Patent Trust	9.4
Inventergy Global, Inc.	3	31	Huawei   Nokia   Panasonic	8.3
Goldpeak Innovations Inc.	1	27	Pantech Inc.	14.8
Wi-Fi One, LLC	4	25	Ericsson   Panasonic   PanOptis   Sony	4.8
Golden Valley Holdings Limited	9	24	Hilco   Intellectual Discovery   Intellectual Ventures   Inventergy   Neocific   Sharp   SK Telecom   Telia	11.9
Innovative Sonic Limited	1	24	Asustek	15.0
Vringo Inc.	1	21	Nokia	8.7
Quarterhill Inc.	3	20	Nokia   Siemens	13.8
Provenance Asset Group LLC	2	19	BlackBerry   Nokia	8.2
Intellectual Discovery Co., Ltd.	3	18	POSCO   Samsung   SAS Technologies	12.7
G+ Communications LLC	1	14	ZTE	11.9
Redwood Technologies LLC	1	13	Wi-Fi One	3.9
WSOU Holdings, LLC	2	13	Nokia Corporation	8.7

<sup>4</sup> Multimode includes counts for 5G and all prior generations.

<sup>5</sup> Stout SEP database.

<sup>6</sup> Some SEP privateers have over time divested a portion of the acquired patents. The current number of families held by each SEP privateer may be lower due to follow-up sales as well as patent expiration.

## 2

## Identification of Top 20 Patent Sellers

Cellular SEP privateers have acquired SEPs from a broad range of patent holders across the U.S., Europe, and Asia. Table 2 summarizes the top 20 sellers of cellular SEPs to privateers.

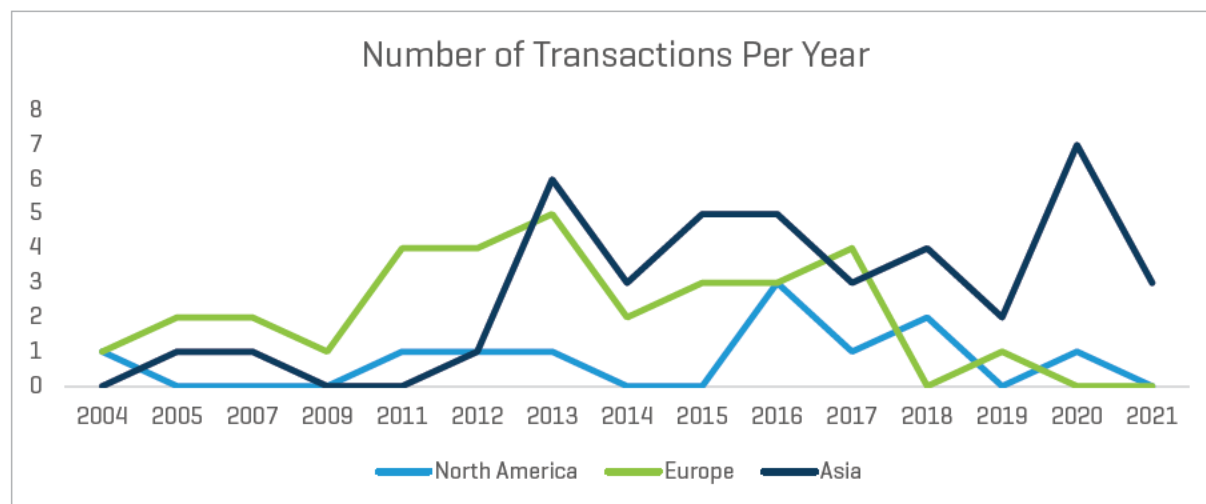
**TABLE 2: TOP 20 CELLULAR PATENT SELLERS**

Seller	# of Transactions	# of Sold Families <sup>7</sup>	Avg. Remaining Life Left at Acq. Date
Panasonic	7	270	12.3
Nokia	17	258	11.5
Ericsson	5	132	10.6
Sharp	3	117	16.1
LG	7	56	10.3
Pantech	1	27	14.8
Orange	1	27	10.1
BlackBerry	2	24	10.2
Asustek	1	24	15.0
Sony	3	22	3.6
Samsung	3	18	12.6
Siemens	3	18	4.4
Huawei	4	17	12.1
ZTE	3	17	12.0
NextWave Wireless	1	14	12.9
KT	2	12	12.9
POSCO	1	10	16.3
Telia	2	10	11.3
SAS Technologies	1	6	7.5
Qualcomm	1	5	14.4

In almost 50% of all SEP privateer transactions, the patent seller was an Asian-based company. We also see from the data in Figure 1 that Asian-based companies have in the last decade increased their divestiture activity to SEP privateers, while European and North-American-based companies have slowly decreased the number of SEP-privateer-related divestitures.

<sup>7</sup> Number of families with at least one U.S. asset

**FIGURE 1: TRANSACTIONS FROM OPCOS TO SEP PRIVATEERS ACROSS THREE KEY REGIONS**



# 3

## Patent Landscape Overview

The cellular patent landscape consists of thousands of SEPs filed by hundreds of companies worldwide. Understanding the share held by SEP privateers is critical in order to assess their impact on the ARBs of smartphones. Stout has not performed an essentiality assessment of the identified SEPs.

Within the 5G multimode landscape, there are approximately 50,000 active, declared patent families (200,000+ active assets).<sup>8</sup> Each family includes at least one family member that has been directly declared as standard essential to 5G and/or legacy generations under 3GPP standards – the standard-setting organization managing all cellular communication standards.

Combined, the top 20 cellular SEP privateers account for roughly 1.1% of the total landscape based on family counts, and 2.5% based on active asset counts. The largest cellular SEP privateer, in terms of overall patent share, is Sun Patent Trust.

**TABLE 3: PATENT SHARES OF TOP 20 CELLULAR SEP PRIVATEERS**

SEP Privateer	Active Families <sup>9</sup>	SEP Landscape Share Based on Family Count	Active Assets	SEP Landscape Share Based on Asset Count
Sun Patent Trust	165	0.3%	2,518	1.1%
PanOptis, LLC	108	0.2%	1,226	0.6%
FG Innovation Company Limited	0	0.0%	0	0.0%

<sup>8</sup> All patent landscape counts are as of April 2022.

<sup>9</sup> Counts of acquired families only; patents generated from internal R&D efforts are not included.

SEP Privateer	Active Families	SEP Landscape Share Based on Family Count	Active Assets	SEP Landscape Share Based on Asset Count
Conversant Intellectual Property Management Inc.	50	0.1%	205	0.1%
Sisvel International S.A.	81	0.2%	632	0.3%
Intellectual Ventures LLC	22	0.0%	126	0.1%
Acacia Research Corporation	3	0.0%	7	0.0%
IP Bridge, Inc.	36	0.1%	405	0.2%
Inventergy Global, Inc.	15	0.0%	51	0.0%
Goldpeak Innovations Inc.	0	0.0%	0	0.0%
Wi-Fi One, LLC	2	0.0%	4	0.0%
Golden Valley Holdings Limited	0	0.0%	0	0.0%
Innovative Sonic Limited	23	0.0%	133	0.1%
Vringo Inc.	7	0.0%	37	0.0%
Quarterhill Inc.	1	0.0%	1	0.0%
Provenance Asset Group LLC	1	0.0%	6	0.0%
Intellectual Discovery Co., Ltd.	2	0.0%	4	0.0%
G+ Communications LLC	14	0.0%	69	0.0%
Redwood Technologies LLC	7	0.0%	51	0.0%
WSOU Holdings, LLC	6 <sup>10</sup>	0.0%	8	0.0%
Total of Top 20 Privateers	542	1.1%	5,483	2.5%

## 4 Royalty Rate Analysis

Stout determined an estimate of the implied per patent family royalty rate for SEPs associated with a variety of cellular standards owned by non-privateers and privateers. We relied exclusively on the use of a market-based method to perform this analysis based on publicly available royalty rates published by a variety of SEP owners (i.e., “ask rates”).<sup>11</sup> As a result of our analysis, we have concluded the following median implied per patent family royalty rates for the SEPs owned by privateers and non-privateers for each relevant telecommunication standard are as follows:

**TABLE 4: STOUT ESTIMATE OF MEDIAN IMPLIED PER PATENT FAMILY ROYALTY RATES [% OF HANDSET ASP]**

	3G	4G	5G	Total
Non-Privateer Royalty Rates	0.00003%	0.00007%	0.00023%	0.00033%
Privateer Royalty Rates	0.00049%	0.00098%	0.00344%	0.00491%
Privateer Rate as a Multiple of Non-Privateer Rate	14.80	14.80	14.80	14.80

<sup>10</sup> SEPs held by WSOU were declared essential by WSOU after the asserts were acquired from Nokia.

<sup>11</sup> The implied per patent family royalty rate determinations estimated by Stout may not necessarily be consistent with FRAND royalty terms for the relevant SEPs. For one, the market-based method relied upon is based on published ask rates that may or may not be consistent with actual royalty rates agreed to by SEP licensors and licensees. From our experience, it is not uncommon that licensor-published ask rates are a starting point for negotiating actual rates with licensees, which may end up being lower than the published ask rates. With that said, we are aware of instances when ask rates are equal to the rates agreed to by licensees. Second, we did not implement a top-down method that has been relied upon in various instances by courts, SEP licensors and licensees, and valuation professionals to determine FRAND licensing terms for SEPs.

### Implied per Patent Family Royalty Rate Analysis

We began our analysis of the implied per patent family royalty rate for 3G, 4G, and 5G SEPs by collecting ask rates published and requested by a variety of cellular SEP licensors.

We chose to ultimately base our analysis on ask rates for SEPs associated with 5G multimode phones. Our research uncovered ten potentially relevant 5G multimode ask rates, which we divided into two groups: those published/requested by non-privateers and those published/requested by privateers. The ten ask rates are listed in Table 5 below.

**TABLE 5: PRIVATEER AND NON-PRIVATEER ASK RATES**

Non-Privateer Ask Rates		Privateer Ask Rates	
Company	5G MM Ask Rate	Company	5G MM Ask Rate
Ericsson	\$2.50 - \$5.00 <sup>12</sup>	Harfang IP [HWT]	\$0.07 <sup>13 14</sup>
Nokia	€ 3.00 <sup>15</sup>	Harfang IP [GET]	\$0.20 <sup>16 17</sup>
InterDigital	0.60% <sup>18</sup>	VoiceAge EVS	\$0.22 - \$0.44 <sup>19 20</sup>
Qualcomm	3.25% <sup>21</sup>	Crystal Clear	\$0.29 - \$0.44 <sup>22 23</sup>
Huawei	\$2.50 <sup>24</sup>		
MPEG LA	\$0.40 - \$0.70 <sup>25 26</sup>		

We then adjusted the ten published multimode ask rates to be stated as a percentage of 5G multimode handset average sales prices (“ASP”). To do this, we divided the per unit published ask rates by wholesale 5G multimode handset ASPs for the period 2019-2024 based on IDC market data (adjusting non-U.S. dollar ask rates into U.S. dollars as appropriate). We next divided the percentage of ASP ask rates by the number of 5G multimode active SEP families associated with the licensors’ ask rates to calculate a per patent family royalty rate as a percentage of ASP as shown in Table 6 below.

12 Stasik and Cohen, “Royalty Rates and Licensing Strategies for Essential Patents on 5G Telecommunication Standards”.

13 “HWT Patents and Rates,” Harfang IP. Compliant rate shown. 5G standard rate \$0.09. Available at: <https://harfangip.com/home/licensing/portfolios/hwt/hwt-patents-and-rates/>.

14 We understand that all Harfang IP [HWT] patents originate from Shanghai Langbo.

15 Stasik and Cohen, “Royalty Rates and Licensing Strategies for Essential Patents on 5G Telecommunication Standards”.

16 “GET Portfolio C Patents and Rates,” Harfang IP. Compliant rate shown. 5G standard rate \$0.266. Available at: <https://harfangip.com/home/licensing/portfolios/get/14234213421341243-2/>.

17 We understand that all Harfang IP [GET] patent originate from KT Corporation.

18 Stasik and Cohen, “Royalty Rates and Licensing Strategies for Essential Patents on 5G Telecommunication Standards.” There is an average selling price floor of \$50 and a cap of \$200, implying a minimum of \$0.30 and a maximum of \$1.20 per unit.

19 “Rate Summary”, VoiceAge EVS, Category 6 – Handsets and WiFi Devices, available at: <https://voiceageevs.com/rate.aspx>.

20 VoiceAge EVS LLC patents originate from a different entity, VoiceAge Corp, which developed the technology and then transferred the assets to a licensing entity owned by Fortress Investment Group

21 “Qualcomm 5G NR Royalty Terms Statement,” available at: <https://www.qualcomm.com/content/dam/qcomm-martech/dm-assets/documents/qualcomm-5g-nr-royalty-terms-statement.pdf>

22 “Licensing,” Crystal Clear Codec, available at: <https://www.crystalclearcodec.com/licensing>.

23 We understand that Crystal Clear Codec, LLC is licensing patents that were transferred from Huawei. See <https://www.iam-media.com/article/huawei-transfers-codec-patents-entity-linked-china-npe-campaign>. See also the Assignee in the patents listed on the Crystal Clear Codec, LLC website [<https://www.crystalclearcodec.com/patent-portfolio>]. We understand that Crystal Clear recently updated its patent list and now claims to license a total of 12 families (previously only six). As of the publication date of this article, the six new families are still assigned to Huawei; there is no recorded assignment from Huawei to Crystal Clear.

24 “Huawei to Start Demanding 5G Royalties From Apple, Samsung,” *Bloomberg News*, March 16, 2021.

25 “EVS Patent Portfolio License Briefing,” MPEG LA, available at: <https://www.mpegla.com/wp-content/uploads/EVSWeb.pdf>. Although MPEG LA offers a \$0.00 per unit royalty rate for sales of between 0 and 50,000 units in any given year, we chose to use a \$0.40 per unit royalty rate as a lower bound for our analysis given the immateriality of the \$0.00 per unit royalty for such a low volume of unit sales.

26 We understand that MPEG LA does not own any of the EVS SEPs in their pool, thus we are not considering them a privateer.

**TABLE 6: LICENSOR-SPECIFIC PER PATENT FAMILY ASK RATES FOR CELLULAR SEPS  
[% OF HANDSET ASP]**

Per Patent Family Royalty Rate			
Non-Privateer		Privateer	
Ericsson	0.00040%	Harfang IP [HWT]	0.00426% <sup>27</sup>
Nokia	0.00021%	Harfang IP [GET]	0.00443%
InterDigital	0.00027%	VoiceAge EVS	0.00539%
Qualcomm	0.00076%	Crystal Clear	0.01482%
Huawei	0.00010%		
MPEG LA	0.00115%		

We allocated these per patent family royalty rates in Table 6 to 5G, 4G, and 3G by splitting the value 70%, 20%, and 10% to each of the generations of the standards, respectively.<sup>28</sup> We then selected the median value for 3G, 4G, and 5G individually for non-privateers and privateers. This results in a median non-privateer per patent family ask rates of 0.00023% for 5G, 0.00007% for 4G, and 0.00003% for 3G. Similarly, this analysis results in privateer per patent family ask rates of 0.00344% for 5G, 0.00098% for 4G, and 0.00049% for 3G. We then compared these implied per patent family royalty rates for non-privateers and privateers as follows:

**TABLE 7: STOUT ESTIMATE OF IMPLIED PER PATENT FAMILY ROYALTY RATES  
[% OF HANDSET ASP]**

	3G	4G	5G	Total
Non-Privateer	0.00003%	0.00007%	0.00023%	0.00033%
Privateer	0.00049%	0.00098%	0.00344%	0.00491%
Privateer Rate as a Multiple of Non-Privateer Rate	14.80	14.80	14.80	14.80

As shown in Table 7 above, the median implied per patent family privateer ask rates are approximately 15 times higher than the median implied per patent family non-privateer ask rates.

<sup>27</sup> We understand that Harfang IP [HWT] licenses four families, none of which have been formally declared as SEPs. However, Harfang IP indicates that these patents “may be or may become essential to implementing industry standards, and for which commitments to be prepared to grant licenses on fair, reasonable and non-discriminatory [‘FRAND’] terms and conditions, to the extent the patents are essential, were made by the prior owners of the patents. HWT is committed to honoring these FRAND commitments.” As such, we are treating these patents as if they are standard essential. See Hedwig Wireless Technologies LLC [HWT], Harfang IP, available at: <https://harfangip.com/home/licensing/portfolios/hwt/>.

<sup>28</sup> Unwired Planet International Ltd v. Huawei Technologies Co. Ltd & Anor [2017] EWHC 711 [Pat] [05 April 2017] <http://www.bailii.org/ew/cases/EWHC/Patents/2017/711.html>. “It is common ground that one needs some weighting method in order to deal with multimode devices and both sides used the same basic approach, which for multimode LTE devices is to weight the numbers LTE/UMTS/GSM in proportions 70:20:10.”

### Analysis of Median Implied per Patent Family Royalty Rate Results

After we computed the median implied per patent family royalty rates for non-privateers and privateers, we analyzed the results to assess how they compare to the ARB indicated by the seminal cellular SEP case *TCL v. Ericsson*.<sup>29</sup> In the *TCL v. Ericsson* case, Judge James V. Selna of the Central District of California chose to utilize a range of ARBs for the 4G standard of 6%-10% of revenue for his analysis to determine a FRAND royalty rate for the 4G patents at issue in the case. While there are likely compelling arguments that the ARB for 5G multimode SEPs could be higher or lower than the ARB for 4G multimode SEPs, we also believe that an ARB for 4G multimode SEPs ranging from 6% to 10% (based on the *TCL v. Ericsson*) is likely a reasonable proxy for the ARB for SEPs used in 5G multimode handsets.

To compare the median implied per patent family royalty rate results to the 6-10% ARB range from the *TCL v. Ericsson* case, we computed implied ARBs by multiplying the median per patent family royalty rate by the total active single mode patent families for each relevant generation of the standard.

**TABLE 8: NON-PRIVATEER IMPLIED CELLULAR AGGREGATE ROYALTY BURDEN [% OF HANDSET ASP]**

	3G	4G	5G	Total
Per Patent Family Royalty Rate	0.00003%	0.00007%	0.00023%	0.00033%
Total Active Families	10,119	24,905	39,165	N/A
<b>Implied ARB</b>	<b>0.34%</b>	<b>1.65%</b>	<b>9.09%</b>	<b>11.08%</b>

**TABLE 9: PRIVATEER IMPLIED CELLULAR AGGREGATE ROYALTY BURDEN [% OF HANDSET ASP]**

	3G	4G	5G	Total
Per Patent Family Royalty Rate	0.00049%	0.00098%	0.00344%	0.00491%
Total Active Families	10,119	24,905	39,165	N/A
<b>Implied ARB</b>	<b>4.97%</b>	<b>24.46%</b>	<b>134.64%</b>	<b>164.07%</b>

Comparing the implied non-privateer ARBs shown in Table 8 to the ARB range of 6%-10% from *TCL v. Ericsson*, we find that the implied ARB falls slightly outside the 6%-10% range.

Comparing the implied privateer ARB shown in Table 9 to the ARB range of 6%-10% from *TCL v. Ericsson*, we find that the implied ARB lies far outside the range.

<sup>29</sup> *TCL Communication Technology Holdings, Ltd., et al. v. Telefonaktiebolaget LM Ericsson, et al. and Ericsson Inc., et al., v. TCL Communication Technology Holdings, Ltd., et al.*, Case No: SAVC 14-341 JVS[DFMx] Consolidated with Case No: CV 15-2370[DFMx], United States District Court, Central District of California, Memorandum of Findings of Fact and Conclusions of Law, December 17, 2017, p. 26 of 38.

Stout's research shows that there are many privateers actively purchasing and litigating cellular SEPs. However, the top 20 privateers hold only 1.1% of all declared 3G-5G patent families. In total, Stout identified 64 cellular SEP privateers.

Of the 5G SEP ask rates that are publicly available, the median implied per patent family royalty rates for privateers are approximately 15 times the median implied per patent family rates for non-privateers.

To compare the median implied per patent family royalty rates based on published ask rates to the litigated ARB from *TCL v. Ericsson*, Stout first computed implied ARBs using the median implied per patent family royalty rates for non-privateers and privateers, separately. The implied non-privateer 5G multimode cellular ARB was calculated to be 11.08% compared to the privateer 5G multimode cellular ARB of 164.07%. The implied non-privateer cellular ARB falls slightly outside the 6%-10% range from the *TCL v. Ericsson* case. The privateer cellular ARB falls far outside the range determined by *TCL v. Ericsson*. We note that our privateer analysis is based on the median of four published ask rates, as the vast majority of privateers do not publish their ask rates. Given the lack of royalty rate transparency across the vast majority of SEP privateers, we cannot rule out that some SEP privateers might have royalty ask rates that, similar to Harfang IP, VoiceAge EVS, and Crystal Clear, are not in alignment with the litigated ARB from *TCL v. Ericsson*, while others may be in alignment. The dearth of published rates may be viewed as a call for transparency by both SEP licensors and licensees to promote efficient and fair licensing of SEPs.

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