

**THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF TEXAS  
MARSHALL DIVISION**

SAINT LAWRENCE  
COMMUNICATIONS LLC,

§  
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v.

CASE NO. 2:15-CV-349-JRG  
Lead Case

ZTE CORPORATION, et al.

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§

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SAINT LAWRENCE  
COMMUNICATIONS LLC,

§  
§  
§

v.

CASE NO. 2:15-CV-351-JRG  
Consolidated with Case No. 2:15-CV-349

MOTOROLA MOBILITY LLC, et al.

§  
§

**CLAIM CONSTRUCTION**  
**MEMORANDUM AND ORDER**

On June 29, 2016, the Court held a hearing to determine the proper construction of the disputed claim terms in United States Patents No. 6,795,805, 6,807,524, 7,151,802, 7,191,123, and 7,260,521. After the June 29, 2016, the Court further permitted additional briefing regarding certain terms. *See* July 22, 2016 Order, Dkt. No. 100. After considering the arguments made by the parties at the hearing and in the parties' claim construction briefing (Dkt. Nos. 69, 70, 71, 121 & 122;<sup>1</sup> *see* Civil Action No. 2:15-CV-349, Dkt. Nos. 71, 74, 76, 206, 210 & 212), the Court issues this Claim Construction Memorandum and Order.

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<sup>1</sup> Citations to documents (such as the parties' briefs and exhibits) in this Claim Construction Memorandum and Order refer to the page numbers of the original documents rather than the page numbers assigned by the Court's electronic docket unless otherwise indicated. Shortly before the start of the June 29, 2016 hearing, the Court provided the parties with preliminary constructions with the aim of focusing the parties' arguments and facilitating discussion. The preliminary constructions were essentially the same as the constructions that are set forth below (except as to terms that were further addressed by supplemental briefing after the June 29, 2016

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hearing, *see* Dkt. Nos. 206, 210 & 212). The organization of the Court’s preliminary constructions was based on the briefing in *Saint Lawrence Communications LLC v. HTC Corporation, et al.*, Civil Action No. 2:15-CV-919 (and the related Civil Action No. 2:15-CV-1510) (collectively, “*HTC*”). At the June 29, 2016 hearing, the parties in Civil Actions No. 2:15-CV-349 and 2:15-CV-351 did not state that any additional terms required construction. In light of this, and because the parties in all of the above-captioned cases presented substantially the same arguments as to substantially the same disputed terms, and because the parties agreed to hold a single claim construction hearing as to all of the above-captioned cases (*see* Civil Action No. 2:15-CV-349, Dkt. No. 95 at 3 n.2), this Claim Construction Memorandum and Order cites only the briefing in *HTC*. The *HTC* case has been stayed upon joint motion of the *HTC* parties announcing that a settlement agreement has been reached. *See* Dkt. Nos. 123 & 124. Thus, although citations to briefing herein refer to briefing filed in the *HTC* case, the present Claim Construction Memorandum and Order applies to only the above-captioned cases. Finally, although Plaintiff argues that various terms that were at issue in *HTC* are not at issue in *ZTE* (*see* Dkt. No. 216), the coordinated claim construction proceedings in *HTC* and *ZTE* warrant addressing all of the terms that were presented in those coordinated proceedings.

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L. “means for amplifying the found codevector with said smoothing gain to thereby produce said gain-smoothed codevector” ..... 28

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N. “means for finding a codevector in a codebook in relation to said at least one first wideband signal encoding parameter” ..... 31

O. “means for computing a voicing factor  $r_v$  by means of the following relation:  $r_v = (E_v - E_c) / (E_v + E_c)$ ” ..... 32

P. “means for computing a factor  $\lambda$  using the following relation:  $\lambda = 0.5 (1 - r_v)$ ” ..... 33

Q. “means for calculating an Imittance [*sic*, Imittance] Spectral Pair distance measure between the Imittance Spectral Pairs in a present frame  $n$  of the wideband signal and the Imittance Spectral Pairs of a past frame  $n-1$  of the wideband signal . . .” ..... 35

R. “means for calculating a gain smoothing factor  $S_m$  based on both the first  $\lambda$  and second  $\theta$  factors through the following relation:  $S_m = \lambda\theta$ ” ..... 37

S. “means for calculating said pitch gain  $b^{(j)}$  using the relation:  $b^{(j)} = x^t y^{(j)} / \|y^{(j)}\|^2$ ” ..... 38

T. “means for comparing the energies of said pitch prediction errors of the different signal paths and for choosing as the signal path having the lowest calculated pitch prediction error the signal path having the lowest calculated energy of the pitch prediction error” ... 40

U. “spectral shaping unit for shaping the spectrum of the noise sequence in relation to linear prediction filter coefficients related to said down-sampled wideband signal” ..... 41

V. “gain adjustment module, responsive to said white noise sequence and a set of gain adjusting parameters, for producing a scaled white noise sequence” ..... 45

W. “convolution unit for convolving the pitch codevector with a weighted synthesis filter impulse response signal” ..... 48

X. “pitch search unit for producing pitch codebook parameters” ..... 50

Y. “signal fragmenting device for receiving an encoded wideband speech signal and extracting from said encoded wideband speech signal at least pitch codebook parameters, innovative codebook parameters, and synthesis filter coefficients” ..... 52

Z. “pitch codebook search device responsive to said perceptually weighted signal for producing pitch codebook parameters and an innovative search target vector” ..... 55

AA. “innovative codebook search device, responsive to said synthesis filter coefficients and to said innovative search target vector, for producing innovative codebook parameters” ..... 57

BB. “signal forming device for producing an encoded wideband [speech] signal” ..... 59

CC. “signal fragmenting device for receiving an encoded version of a wideband signal previously down-sampled during encoding and extracting from said encoded wideband signal version at least pitch codebook parameters, innovative codebook parameters, and linear prediction filter coefficients” ..... 61

DD. “signal synthesis device including a linear prediction filter for filtering said excitation signal in relation to said linear prediction filter coefficients to thereby produce a synthesized wideband signal” ..... 64

EE. “pitch analysis device for producing a set of pitch codebook parameters” ..... 66

FF. “pitch prediction error calculating device for calculating a pitch prediction error of said pitch codevector from said pitch codebook search device” ..... 69

GG. “pitch codebook search device responsive to the perceptually weighted signal and linear prediction synthesis filter coefficients for producing the pitch codevector and an innovative search target vector” ..... 71

HH. “pitch analysis device responsive to the pitch codevector for selecting, from said sets of pitch codebook parameters, the set of pitch codebook parameters associated to the signal path having the lowest calculated pitch prediction error” ..... 74

II. “innovative codebook search device responsive to a weighted synthesis filter impulse response signal, and the innovative search target vector, for producing innovative codebook parameters” ..... 76

JJ. “device for enhancing periodicity of an excitation signal produced in relation to a pitch codevector and an innovative codevector for supplying a signal synthesis filter in view of synthesizing a wideband speech signal” and “periodicity enhancing device” ..... 78

KK. “perceptual weighting device for producing a perceptually weighted signal in response to a wideband speech signal” ..... 81

LL. “device for producing a gain-smoothed codevector during decoding of an encoded wideband signal from a set of wideband signal encoding parameters” and “gain-smoothed codevector producing device” ..... 83

MM. “innovation filter for filtering the innovative codevector in relation to said periodicity factor to thereby reduce energy of a low frequency portion of the innovative codevector and enhance periodicity of a low frequency portion of the excitation signal” ..... 85

NN. “combiner circuit for combining said pitch codevector and said innovative codevector filtered by said innovation filter to thereby produce said periodicity enhanced excitation signal” and “combiner circuit for combining said pitch codevector and [said] innovative codevector to thereby produce an excitation signal” ..... 90

OO. “signal synthesis filter for filtering said [periodicity enhanced] excitation signal in relation to said synthesis filter coefficients to thereby produce said synthesized wideband speech signal” ..... 93

PP. “signal preemphasis filter responsive to the wideband speech signal for enhancing a high frequency content of the wideband speech signal to thereby produce a preemphasised signal” ..... 95

QQ. “signal injection circuit for injecting said spectrally-shaped noise sequence in said over-sampled synthesized signal version” ..... 97

RR. “a band-pass filter responsive to said filtered scaled white noise sequence for producing a band-pass filtered scaled white noise sequence” ..... 98

SS. “filter for filtering the pitch codevector before supplying said pitch codevector to the pitch prediction error calculating device” ..... 100

TT. “combiner circuit for combining the amplified convolved pitch codevector with the pitch search target vector to thereby produce the pitch prediction error” ..... 101

UU. “factor generator for calculating a periodicity factor related to the wideband speech signal” ..... 103

VV. “voicing factor calculator . . . delivering a first factor representative of voicing in the wideband signal in response to said at least one second wideband signal encoding parameter” ..... 104

WW. “stability factor calculator . . . delivering a second factor representative of stability of said wideband signal in response to said at least one third wideband signal encoding parameter” ..... 105

XX. “smoothing gain calculator . . . delivering a smoothing gain based on said first and second factors” ..... 106

**V. DISPUTED TERMS NOT ALLEGED TO BE MEANS-PLUS-FUNCTION ..... 107**

AAA. “[synthesized] [weighted] wideband [speech] signal” ..... 107

BBB. “signal path” and “signal paths” ..... 113

CCC. “low frequency portion” ..... 117

DDD. “[enhanced] / [enhancing a] high frequency content” ..... 121

EEE. “said full-spectrum synthesized wideband signal” ..... 123

FFF. “a frequency bandwidth generally higher than a frequency bandwidth of [the / said] over-sampled synthesized signal version” ..... 126

GGG. “weighting of said wideband speech signal in a formant region is substantially decoupled from a spectral tilt of said wideband speech signal” ..... 129

HHH. “reduce a difference between the wideband speech signal and a subsequently synthesized wideband speech signal” ..... 135

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