PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT7169364

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	SECURITY INTEREST

CONVEYING PARTY DATA

Name	Execution Date
HUGHES NETWORK SYSTEMS, LLC	02/02/2022

RECEIVING PARTY DATA

Name:	U.S. BANK GLOBAL CORPORATE TRUST WEST SIDE FLATS, ST. PAUL
Street Address:	60 LIVINGSTON AVENUE
City:	SAINT PAUL
State/Country:	MINNESOTA
Postal Code:	55107

PROPERTY NUMBERS Total: 42

Property Type	Number
Patent Number:	11165491
Patent Number:	11165622
Patent Number:	11159263
Patent Number:	11211999
Application Number:	17566544
Application Number:	17566501
Application Number:	17566214
Application Number:	17566358
Application Number:	17646359
Application Number:	17566551
Application Number:	17564469
Application Number:	17563755
Application Number:	17563801
Application Number:	17562559
Application Number:	17562594
Application Number:	17562581
Application Number:	17562204
Application Number:	17645969
Application Number:	17562353
Application Number:	17565574

Property Type	Number
Application Number:	17561455
Application Number:	17557832
Application Number:	17555055
Application Number:	17555940
Application Number:	17555156
Application Number:	17553413
Application Number:	17552785
Application Number:	17546802
Application Number:	17548319
Application Number:	17548309
Application Number:	17542292
Application Number:	17537860
Application Number:	17537879
Application Number:	17535823
Application Number:	17522152
Application Number:	17522805
Application Number:	17521690
Application Number:	17455059
Application Number:	17453258
Application Number:	17452547
Application Number:	17510607
Application Number:	17450210

CORRESPONDENCE DATA

Fax Number:

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Email: cory.myers@hughes.com
Correspondent Name: HUGHES NETWORK SYSTEMS, LLC
Address Line 1: 11717 EXPLORATION LANE
Address Line 4: GERMANTOWN, MARYLAND 20876

NAME OF SUBMITTER:	CORY L MYERS
SIGNATURE:	/Cory L. Myers/
DATE SIGNED:	02/10/2022

Total Attachments: 6
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Patent Security Agreement

Patent Security Agreement, dated as of February 2, 2022, by Hughes Network Systems, LLC, a Delaware limited liability company (the "Pledgor"), in favor of U.S. Bank National Association, in its capacity as collateral agent (the "Collateral Agent") pursuant to that certain Secured Indenture dated as of July 27, 2016, by and among Hughes Satellite Systems Corporation, the guarantors party thereto, and the Collateral Agent as collateral agent and trustee (as supplemented, the "2016 Indenture").

WITNESSETH:

WHEREAS, the Pledgor is a party to a Security Agreement dated as of June 8, 2011 as supplemented by the Joinder Agreement, dated as of March 28, 2014, the Additional Secured Party Joinder, dated as of July 27, 2016 and the Joinder Agreements dated as of March 23, 2017, August 10, 2017 and June 12, 2019 (as amended, amended and restated, supplemented or otherwise modified from time to time, the "Security Agreement") in favor of the Collateral Agent pursuant to which the Pledgor is required to execute and deliver this Patent Security Agreement;

NOW, THEREFORE, in consideration of the premises and to induce the Collateral Agent, for the benefit of the Secured Parties, to enter into each Indenture, the Pledgor hereby agrees with the Collateral Agent as follows:

SECTION 1. Defined Terms. Unless otherwise defined herein, terms defined in the Security Agreement and used herein have the meaning given to them in the Security Agreement.

SECTION 2. Grant of Security Interest in Patent Collateral. The Pledgor hereby pledges and grants to the Collateral Agent for the benefit of the Secured Parties a lien on and security interest in and to all of its right, title and interest in, to and under all the following Pledged Collateral of the Pledgor:

(a) Patents of the Pledgor listed on Schedule I attached hereto; and

(b) all Proceeds of any and all of the foregoing (other than Excluded Property).

SECTION 3. Security Agreement. The security interest granted pursuant to this Patent Security Agreement is granted pursuant to the security interest granted to the Collateral Agent under the Security Agreement and the Pledgor hereby acknowledges and affirms that the rights and remedies of the Collateral Agent with respect to the security interest in the Patents made and granted hereby are more fully set forth in the Security Agreement, the terms and provisions of which are incorporated by reference herein as if fully set forth herein. In the event that any provision of this Patent Security Agreement is deemed to conflict with the Security Agreement, the provisions of the Security Agreement shall control unless the Collateral Agent shall otherwise determine.

SECTION 4. Termination. Upon the payment in full of the Secured Obligations and termination of the Security Agreement, the Collateral Agent shall execute, acknowledge, and deliver to the Pledgor an instrument in writing in recordable form releasing the collateral pledge, grant, assignment, lien and security interest in the Patents under this Patent Security Agreement.

SECTION 5. Counterparts. This Patent Security Agreement may be executed in any number of counterparts, all of which shall constitute one and the same instrument, and any party hereto may execute this Patent Security Agreement by signing and delivering one or more counterparts.

SECTION 6. Governing Law. This Patent Security Agreement and the transactions contemplated hereby, and all disputes between the parties under or relating to this Patent Security Agreement or the facts or circumstances leading to its execution, whether in contract, tort or otherwise, shall be construed in accordance with and governed by the laws (including statutes of limitation) of the State of New York, without regard to conflicts of law principles that would require the application of the laws of another jurisdiction.

[signature page follows]

IN WITNESS WHEREOF, the Pledgor and the Collateral Agent have caused this Patent Security Agreement to be duly executed and delivered by their duly authorized officer as of the date first set forth above.

HUGHES NETWORK SYSTEMS, LLC,
as Pledgor

By: _____
Name: Dean A. Manson
Title: Executive Vice President, General Counsel and Secretary

U.S. BANK NATIONAL ASSOCIATION,
as Collateral Agent

By: _____
Name: Benjamin J. Krueger
Title: Vice President

SCHEDULE I
to
PATENT SECURITY AGREEMENT
PATENT REGISTRATIONS AND PATENT APPLICATIONS

United States Patent Registrations:

Company	Patent No.	Patent Name
Hughes Network Systems, LLC	11,165,491	LOCATION MANAGEMENT IN SATELLITE SYSTEMS
Hughes Network Systems, LLC	11,165,622	SYSTEM AND METHOD FOR LOW-RATE HIGH-RATE COUPLED ACQUSITION AND TRACKING OF HIGH SYMBOL RATE INROUTES
Hughes Network Systems, LLC	11,159,263	OVERLAPPED TDM/TDMA SATELLITE RETURN COMMUNICATIONS
Hughes Network Systems, LLC	11,211,999	SATELLITE NETWORK VIRTUAL LAN USAGE

Applications:[1]

Company	Application No.	Application Name
Hughes Network Systems, LLC	17/566,544	DEMODULATOR IMPLEMENTATION THAT SUPPORTS BOTH NON-VLSNR AND VLSNR DOWNLINK RAMES PRESENT IN A SINGLE STREAM
Hughes Network Systems, LLC	17/566,501	CHANNEL STATE INFORMATION (CSI) ACQUISITION FOR LINE-OF-SIGHT MIMO FEEDER LINK IN MULTIBEAM SATELLITE SYSTEMS
Hughes Network Systems, LLC	17/566,214	DYNAMIC INROUTE RECONFIGURATION OF SATELLITE COMMUNICATIONS SYSTEMS
Hughes Network Systems, LLC	17/566,358	SECURE SATELLITE BASED CONTENT PRELOADING
Hughes Network Systems, LLC	17/646,359	SATELLITE RECEIVER INCLUDING PRE-EQUALIZER TO COMPENSATE FOR LINEAR IMPAIRMENTS

[1] List excludes unpublished applications.

Company	Application No.	Application Name
Hughes Network Systems, LLC	17/566,551	MOCA FREQUENCY HOPPING VSAT
Hughes Network Systems, LLC	17/564,469	SYSTEM AND METHOD TO MINIMIZE HANDOVER INTERRUPTION TIME IN NGSO SYSTEMS WITH SINGLE PARABOLIC ANTENNA
Hughes Network Systems, LLC	17/563,755	SATELLITE SYSTEM OPTIMIZATION BY DIFFERENTIATING APPLICATION OF ADAPTIVE CODING AND MODULATION
Hughes Network Systems, LLC	17/563,801	APPARATUS AND METHOD FOR REDUCTION OF HANDOVERS IN NGSO SATELLITE SYSTEMS
Hughes Network Systems, LLC	17/562,559	INCREASED FEEDER LINK CAPACITY FOR GEOSYNCHRONOUS SATELLITE COMMUNICATIONS
Hughes Network Systems, LLC	17/562,594	USE OF CARBON FIBER IN ANTENNA REFLECTOR/BACK-STRUCTURE FOR A 10M DIAMETER APERTURE USED IN V/Q BAND COMMERCIAL SATELLITE GROUND NETWORK.
Hughes Network Systems, LLC	17/562,581	SATELLITE-COMMUNICATIONS GATEWAY
Hughes Network Systems, LLC	17/562,204	ADAPTIVE RECEIVER PLATFORM FOR INTERFERENCE MITIGATION
Hughes Network Systems, LLC	17/645,969	MOBILITY MULTI-TRANSPORT SOFTWARE DEFINED WIDE AREA NETWORK
Hughes Network Systems, LLC	17/562,353	METHODS AND SYSTEMS FOR AMPLITUDE AND PHASE CORRECTION
Hughes Network Systems, LLC	17/565,574	A SATELLITE COMMUNICATION SYSTEM WITH SOFTWARE DEFINED NETWORK ORCHESTRATION
Hughes Network Systems, LLC	17/561,455	VSAT OR AERONAUTICAL MODEM WITH CONFIGURABLE TX/RX REFERENCE FREQUENCIES
Hughes Network Systems, LLC	17/557,832	SIMULTANEOUS MULTI-POLARIZATION RECEIVING WITH CROSS-POLARIZATION INTERFERENCE CANCELLATION
Hughes Network Systems, LLC	17/555,055	DEPLOYING AND UPDATING MACHINE LEARNING MODELS OVER A COMMUNICAT ION NETWORK
Hughes Network Systems, LLC	17/555,940	MOBILE TERMINAL AND METHODS OF USE
Hughes Network Systems, LLC	17/555156	IMPROVED SIGNALING TECHNIQUES IN THE PRESENCE OF PHASE NOISE AND FREQUECY OFFSET
Hughes Network Systems, LLC	17/553,413	QUANTUM COMMUNICAT ION TRANSCEIVER BASED ON QUANTUM ENANGLED ATOMIC STATES
Hughes Network Systems, LLC	17/552,785	PROVISIONING ENCRYPTED DOMAIN NAME SERVICE AND SECURE VALUEADDED SERVICE

Company	Application No.	Application Name
		WITH CERTIFICATES AT A CUSTOMER PREMISE EQUIPMENT IN A BROADBAND SATELLITE SYSTEM
Hughes Network Systems, LLC	17/546,802	WIDE-BAND AUTOMATED GAIN CONTROL FOR BURSTY FRAMES
Hughes Network Systems, LLC	17/548,319	WEATHER IMPACT MODELING OF SATELLITE BASED SERVICES
Hughes Network Systems, LLC	17/548,309	WIFI DEVICE COMPATIBILITY ANALYZER FOR SATELLITE NETWORKS
Hughes Network Systems, LLC	17/542,292	NON-GEOSTATIONARY ORBIT (NGSO) AND GEOSTAIONARY ORBIT (GEO) HYBRID NETWORK FOR UNINTERRUPED COMMUNICATIONS
Hughes Network Systems, LLC	17/537,860	CARRIER ACQUISITION IN SATELLITE COMMUNICAT IONS
Hughes Network Systems, LLC	17/537,879	CARRIER ACQUISITION IN SATELLITE COMMUNICATIONS
Hughes Network Systems, LLC	17/535,823	MOBILE TACTICAL RADIO OVER THE HORIZON SYSTEM
Hughes Network Systems, LLC	17/522,152	SATELLITE COMMUNICAT ION SYSTEM, COMMUNICAT ION TERMINAL, AND METHOD OF OPERATION
Hughes Network Systems, LLC	17/522,805	TECHNIQUES FOR CALIBRATION AND MEASUREMEN TS OF AN EBAND SATELLITE COMMUNICAT ION (SATCOM) SYSTEM
Hughes Network Systems, LLC	17/521,690	REDUCING REFLECTOR ANTENNA SPILLOVER LOBES AND BACK LOBES IN SATELLITE COMMUNICAT ION SYSTEMS
Hughes Network Systems, LLC	17/455,059	USE OF POLYGONS TO SPECIFY BEAM BOUNDARIES FOR DIFFERENT REGIONS OF COVERAGE AREA IN A SATELLITE COMMUNICATION SYSTEM
Hughes Network Systems, LLC	17/453,258	DEEP LEARNING FOR RAIN FADE PREDICTION IN SATELLITE COMMUNICATIONS
Hughes Network Systems, LLC	17/452,547	RESILIENT COUNTERMEASURES FOR LINE-OFSIGHT MIMO FEEDER LINKS IN MULTIBEAM SATELLITE SYSTEMS
Hughes Network Systems, LLC	17/510,607	HIGH-RATE DECIMATION FILTER WITH LOW HARDWARE COMPLEXITY
Hughes Network Systems, LLC	17/450,210	POWER SPECTRAL DENSITY LIMITS FOR REGIONS OF A COVERAGE AREA IN A LIMIT SATELLITE COMMUNICATION SYSTEM