

Form PTO-1595 (Rev. 03-09)  
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U.S. DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office

## RECORDATION FORM COVER SHEET PATENTS ONLY

To the Director of the U.S. Patent and Trademark Office: Please record the attached documents or the new address(es) below.

<b>1. Name of conveying party(ies)</b>  HE Holdings Inc., dba Hughes Electronics, formerly known as Hughes Aircraft Company  Additional name(s) of conveying party(ies) attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<b>2. Name and address of receiving party(ies)</b> Name: <u>Hughes Electronics Corporation</u> Internal Address: <u>Bldg 001 MS A109</u> <u>PO Box 956</u>  Street Address: <u>200 North Sepulveda Blvd.</u> <u>PO Box 956</u>  City: <u>El Segundo</u> State: <u>CA</u> Country: <u>USA</u> Zip: <u>90245</u>  Additional name(s) & address(es) attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>3. Nature of conveyance/Execution Date(s):</b> Execution Date(s) <u>December 16, 1997</u> <input checked="" type="checkbox"/> Assignment <input type="checkbox"/> Merger <input type="checkbox"/> Security Agreement <input type="checkbox"/> Change of Name <input type="checkbox"/> Joint Research Agreement <input type="checkbox"/> Government Interest Assignment <input type="checkbox"/> Executive Order 9424, Confirmatory License <input type="checkbox"/> Other _____	<b>4. Application or patent number(s):</b> <input type="checkbox"/> This document is being filed together with a new application. A. Patent Application No.(s)  <u>08/950,718</u>  B. Patent No.(s)  Additional numbers attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>5. Name and address to whom correspondence concerning document should be mailed:</b> Name: <u>Stacy Cline</u> Internal Address: <u>The Boeing Company</u>  Street Address: <u>2201 Seal Beach Blvd, MC 110-SD54</u>  City: <u>Seal Beach</u> State: <u>CA</u> Zip: <u>90740</u> Phone Number: <u>562/797-9025</u> Fax Number: <u>562/797-9051</u> Email Address: <u>patentadmin@boeing.com</u>	<b>6. Total number of applications and patents involved:</b> <u>1</u>  <b>7. Total fee (37 CFR 1.21(h) &amp; 3.41)</b> \$ <u>40.00</u>  <input checked="" type="checkbox"/> Authorized to be charged to deposit account <input type="checkbox"/> Enclosed <input type="checkbox"/> None required (government interest not affecting title)
<b>8. Payment Information</b>  Deposit Account Number <u>181730</u> Authorized User Name <u>Stacy Cline</u>	
<b>9. Signature:</b> <u>Stacy Cline</u> Signature <u>March 9, 2011</u> Date  <u>Stacy Cline</u> Name of Person Signing	
Total number of pages including cover sheet, attachments, and documents: <span style="border: 1px solid black; padding: 2px 10px;">9</span>	

Documents to be recorded (including cover sheet) should be faxed to (571) 273-0140, or mailed to:  
Mail Stop Assignment Recordation Services, Director of the USPTO, P.O.Box 1450, Alexandria, V.A. 22313-1450

**ASSIGNMENT OF PATENTS**  
**AND**  
**RELATED INTELLECTUAL PROPERTY RIGHTS**  
**FROM**  
**HE HOLDINGS, INC. dba HUGHES ELECTRONICS**  
**TO**  
**HUGHES ELECTRONICS CORPORATION**

This Assignment is effective the 15th day of December, 1997.

WHEREAS, HE Holdings, Inc., dba Hughes Electronics and formerly known as Hughes Aircraft Company (see Exhibit A), a corporation of the State of Delaware, United States of America ("Assignor"), having a principal place of business in Los Angeles, California, is the owner of the rights, title and interests in and to the invention disclosures, patent applications and United States patents, listed on Schedule A attached hereto; and

WHEREAS, Hughes Electronics Corporation, a corporation organized and existing under the laws of the State of Delaware, United States ("Assignee"), having a principal place of business at Los Angeles, California, in connection with a corporate reorganization involving Assignor and referred to as "Triple Play", is desirous of acquiring title and any existing rights which Assignor has or may have in the invention disclosures, patent applications, and issued patents which are a) listed on Schedule A or b) which originated in any business units of Assignee listed on Exhibit B during the period when such business units were or are business units of Assignor or which are owned by such business units, (all such invention disclosures, patent applications, and patents herein collectively referred to as "the Patents"), and any applications for patent, letters patent, reissues, reexaminations, divisions, parents, continuations, continuations-in-part, or extensions thereof which may have been or shall be granted thereon in the United States, and any foreign country throughout the world, as well as title and any existing rights to all trade secrets, copyrights, license agreements and other intellectual property rights relating to the technology described in the Patents ("Related Intellectual Property Rights");

NOW, THEREFORE, to whom it may concern, be it known that pursuant to the obligations herein and good and valuable consideration, the sufficiency and receipt of which is hereby acknowledged, Assignor hereby assigns and transfers to Assignee all right, title and interest that it has and may have in said Patents and the inventions claimed therein, and the Related Intellectual Property Rights, to be held and enjoyed by the Assignee, its successors and assigns, as fully and as entirely as the same would have been held and enjoyed by Assignor had this assignment not been made, together with all present or future claims for profits, royalties, fees and/or damages by reason of past infringement or use of the Patents or Related Intellectual Property Rights by any party or parties, with the right to sue for and collect the same as Assignee sees fit.

Assignor, for itself and its assigns, successors in interest and legal representatives does hereby: authorize and request the Commissioner of Patents and Trademarks of the United States and all foreign countries to issue all letters patents to Assignee, its successors, assigns or other legal representatives for the Patents; covenant that no assignment, sale, agreement, transfer or encumbrance will be made or entered into which would conflict with this Assignment; agree to communicate to Assignee its successors, assigns or other legal representatives, upon request, any facts known to Assignor respecting the Patents and Related Intellectual Property Rights; appoint Assignee its attorney in fact with respect to all matters, including claims and proceedings, relating to the Patents and Related Intellectual Property Rights; agree to do all lawful acts, including the execution and delivery of all papers and proper oaths and giving of testimony that are deemed necessary or desirable by Assignee, its successors, assigns or representatives for protecting, obtaining, maintaining and enforcing any and all of said Patents and the Related Intellectual Property Rights in the United States and throughout the world and for perfecting, affirming, recording and maintaining the title in Assignee, its successors, assigns or other legal representatives, and generally cooperate to the fullest extent in all matters pertaining to the Patents and the Related Intellectual Property Rights.

ASSIGNOR:  
HE HOLDINGS, INC., dba Hughes Electronics

By: *[Signature]*  
Name: Wanda K. Denson-Low  
Title: Vice President and Assistant Secretary

STATE OF California )  
COUNTY OF Los Angeles )

SS:

On December 16, 1997 before  
me, T. MONTGOMERY

a Notary Public in and for said State, personally appeared  
Wanda K. Denson-Low

personally known to me or  proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.

Notary Public *[Signature]*

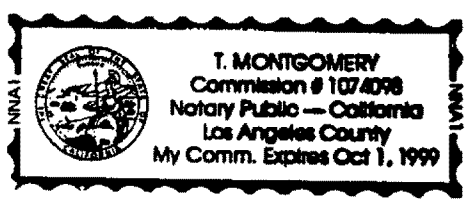


EXHIBIT A

PAGE 1

*State of Delaware*  
*Office of the Secretary of State*

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I, EDWARD J. FREEL, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF AMENDMENT OF "HUGHES AIRCRAFT COMPANY", CHANGING ITS NAME FROM "HUGHES AIRCRAFT COMPANY" TO "HE HOLDINGS, INC.", FILED IN THIS OFFICE ON THE SECOND DAY OF JANUARY, A.D. 1996, AT 9 O'CLOCK A.M.

A CERTIFIED COPY OF THIS CERTIFICATE HAS BEEN FORWARDED TO THE NEW CASTLE COUNTY RECORDER OF DEEDS FOR RECORDING.



*Edward J. Freel*  
\_\_\_\_\_  
Edward J. Freel, Secretary of State

AUTHENTICATION:

**PATENT**  
**REEL: 025950 FRAME: 0198**

**CERTIFICATE OF AMENDMENT  
OF  
CERTIFICATE OF INCORPORATION  
OF  
HUGHES AIRCRAFT COMPANY**

Hughes Aircraft Company, a corporation organized and existing under and by virtue of the General Corporation Law of the State of Delaware, does hereby certify:

FIRST: That the sole stockholder of the Corporation did consent to and adopt the following resolution setting forth a proposed amendment to the Certificate of Incorporation of the Corporation:

RESOLVED, That Article 1 of the Certificate of Incorporation of this corporation is hereby amended to read as follows:

"1. The name of the corporation is HE Holdings, Inc."

SECOND: That this amendment was duly adopted in accordance with the provisions of Section 242 of the General Corporation Law of the State of Delaware.

IN WITNESS WHEREOF, said corporation has caused this certificate to be signed by its Chairman of the Board and attested by its Secretary this 8<sup>th</sup> day of December, 1995.

**HUGHES AIRCRAFT COMPANY**

By: *M. T. Smith*  
M. T. Smith  
Chairman of the Board

Attest:

By: *R. M. Hall*  
R. M. Hall  
Secretary

SCHEDULE A  
OF  
ASSIGNMENT OF PATENTS AND RELATED INTELLECTUAL  
PROPERTY RIGHTS  
FROM  
HE HOLDINGS, INC. dba HUGHES ELECTRONICS  
TO  
HUGHES ELECTRONICS CORPORATION

PATENT APPLICATIONS

PD NO.	FILING DATE	SERIAL NO.	TITLE
096184	8/26/97	08/920,103	DUAL MODE CAVITY RESONATOR WITH COUPLING GROOVES
096200	9/2/97	08/922,687	DYNAMIC POWER ALLOCATION SYSTEM AND METHOD FOR MULTI-BEAM SATELLITE AMPLIFIERS
096205	9/27/96	08/721,882	CONTROL MOTION GYRO WITH VIBRATION ISOLATION
096224	11/08/96	08/745,590	METHOD FOR REDUCING ALPHA PLANE BIT MASK SIZE
096226	10/6/97	08/944,875	COLLISION DETECTION FOR PACKET-SWITCHED MULTIPLE-PATH COMMUNICATION SYSTEM
096227	7/17/97	08/896,103	LIGHTWEIGHT, LOW THERMAL EXPANSION MICROWAVE STRUCTURES AND METHOD OF MAKING THE SAME
096230	10/14/97	MLD	NICKEL/GOLD PLATING OF A COPPER-REFRACTORY METAL MATERIAL
096250	4/30/97	08/846,908	METHOD AND APPARATUS FOR ANNEALING ETCH RESISTORS
096254	2/21/97	08/803,936	METHOD AND SYSTEM FOR DETERMINING A POSITION OF A TARGET VEHICLE UTILIZING TWO-WAY RANGING
096274	11/08/96	08/745,585	EFFICIENT REPRESENTATION OF TEXTURE FOR GRAY SCALE ALPHA MAPS
096276	9/2/97	08/922,983	INTEGRATED INTERDIGITATED CAPACITOR AND METHOD
096279	11/08/96	08/745,568	HEIRACHICAL LOW LATENCY VIDEO COMPRESSION
096284	11/08/96	08/745,588	HIGH QUALITY REDUCED LATENCY TRANSMISSION OF VIDEO OBJECTS
096288	10/3/97	08/943,360	NOISE REDUCTION SYSTEMS AND METHODS
096308	6/20/97	08/879,456	BIPOLAR 6/CTION TRANSISTOR (BJT)- RESONANT TUNNELING DIODE (RTD) OSCILLATOR CIRCUIT AND METHOD
096310	2/21/97	08/803,934	GROUND BASED BEAM FORMING UTILIZING SYNCHRONIZED CODE DIVISION MULTIPLEXING
→ 096313	10/15/97	MLD	CERAMIC-POLYMER COMPOSITE MATERIAL AND ITS USE IN MICROELECTRONICS PACKAGING
096315	10/14/97	MLD	METHOD AND SYSTEM FOR MAXIMIZING SATELLITE CONSTELLATION COVERAGE
096317	8/7/97	08/907,386	A WAVEGUIDE END LAUNCHER HAVING A MICROSTRIP PATCH FEED
096323	3/18/97	08/819,747	RADIATOR USING THERMAL CONTROL COATING
096324	6/23/97	08/880,283	TRACKING ANALOG-TO-DIGITAL CONVERTER
096330	2/21/97	08/803,937	METHOD AND SYSTEM FOR DETERMINING A POSITION OF A TRANSCEIVER UNIT UTILIZING TWO-WAY RANGING IN A POLYSTATIC SATELLITE CONFIGURATION
096345	12/18/96	08/768,736	SATELLITE CONTROL METHOD USING SINGLE SPECIES OF BIROPELLANT
096351	7/9/97	08/891,418	METHOD AND APPARATUS FOR ESTIMATING ATTITUDE SENSOR BIAS IN A SATELLITE

dated as of 11/14/07

WHOLLY OWNED SUBSIDIARIES, AFFILIATES, PARTNERSHIPS, INVESTMENTS (See Legend Below)

AFTER INTERNAL SPIN OF TELECOM BUSINESS ("HNS")

HUGHES ELECTRONICS CORPORATION  
Hughes Network Systems (a business unit)

\*\* designates first tier  
\*\* designates second tier  
\*\* designates third and fourth tier

DIRECTV ENTERPRISES, INC.

- DIRECTV, Inc.
- DIRECTV Merchandising, Inc.
- DIRECTV Operations, Inc.

HUGHES TELECOMMUNICATIONS & SPACE COMPANY

- Hughes do Brasil - Eletronica e Comunicacoes Ltda.
- Hughes International de Mexico, S.A. de C.V.
- Hughes Space and Communications Company
- + Hughes Space and Communications International Service Company
- + Hughes Global Services, Inc.
- + Hughes Space and Commun. International, Inc.
- + PT. Pasifik Satellite Nusantara (a)
- Spectrolab, Inc.
- Hughes Communications, Inc.
- + DIRECTV International, Inc.
- California Broadcast Center LLC
- DTV1 One, Inc.
- DTV1 Two, Inc.
- DIRECTV Japan Kabushiki Kaisha(a)
- DIRECTV Latin America, Inc.
- Galaxy Entertainment de Venezuela, C.A. (a)
- Galaxy Latin America (p)
- Servicios Galaxy Sat III R, C.S. (a)
- Hughes Electronics Japan Kabushiki Kaisha
- Hughes Japan Broadcasting KK
- Kabushiki Kaisha DIRECTV
- SurfIn, Ltd. (a)
- + Hughes Communications Galaxy, Inc.
- + Hughes Communications Satellite Services, Inc.
- American Mobile Satellite Corporation (a)
- + PanAmSat Corporation (a)
- ICO Global Communications (Holdings) Ltd (f)
- Lifestar Digital Television, Inc. (p)
- Medical Science Partners III (p)
- Technologies for Info. & Entertainment III, L.P. (p)

HUGHES NETWORK SYSTEMS

- First HNS Mauritius Ltd
- + Hughes Ispat Limited (a)
- HNS-Chartel GP, Inc.
- HNS-India, Inc.
- HNS-India VSAT, Inc.
- HNS-Italia S.r.l.
- HNS-Shanghai, Inc.
- Hughes Electronics Foreign Sales Corporation
- Hughes Electronics International Corporation
- Hughes Electronics Systems International
- Hughes Escorts Communications Limited (a)
- Hughes-Kenwood RDSS Inc. (a)
- Hughes Network Systems France
- Hughes Network Systems International Service Company
- + Hughes Network Systems Limited
- Hughes Olivetti Telekom GmbH
- Hughes Olivetti Telecom, N.V.
- Hughes Software Systems Private Ltd
- NetSat Express, Inc.
- Shanghai Hughes Network Systems (a)
- Verinet (p)
- Hughes International de Mexico, S.A. de C.V. - OWNED BY AND REPORTS TO HTS]
- + HNS de Mexico, S.A. de C.V.
- + Satellitron S.A. de CV (a)

OTHER SUBSIDIARIES

- First Portland Technology Corp (f)
- FLIR Systems, Inc. (a)
- Hughes Aircraft Holdings Canada Ltd.
- Hughes-Avicom International, Inc.
- + Hughes Electronics Manufacturing Co. Avicom International S.A.
- Hughes Electronics Realty, Inc.
- Hughes Foreign Sales Corporation
- Hughes International Sales Corporation
- Hughes International Sales Corporation
- Hughes Investment Management Corp
- Hughes Research Laboratories LLC (f)
- + Hughes-Parolo Research Partners
- L-T Ranches, Inc.
- MDP, Ltd.
- + XMC Holdings, Ltd.
- Nippon Avionics Co., Ltd (a)

LEGEND

- (a) Affiliate (less than wholly owned)
- (p) Joint Venture Partnerships
- (f) Investment (no direct management involvement & less than 10% ownership)

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PATENT