



April 4, 2023

Mr. Alan Jurison  
Chair, IBOC Standards Development Working Group

Mr. Glynn Walden  
Mr. Jackson Wang  
Co-Chairmen, DRB Subcommittee

National Radio Systems Committee c/o National Association of Broadcasters  
1771 N Street, N.W.  
Washington, D.C. 20036

Dear Sir or Madam:

On behalf of iBiquity Digital Corporation (“iBiquity”) and its corporate parent Xperi Inc. (“Xperi”) and in accordance with the Section 7.2.5.1 of the National Radio Systems Committee (“NRSC”) Procedures Manual (rev. 1.4), which requires participants in the NRSC standard to identify their relevant patents, we are pleased to provide an updated list of patents owned by iBiquity that we believe are relevant to the latest NRSC-5 standard.

Attachment A contains the updated patent listings for iBiquity's currently in-force United States patents related to Transmission, while Attachment B contains the updated patent listings for iBiquity's currently in-force United States patents related to Receivers. We have removed all of iBiquity's expired or lapsed patents from these Attachments. These Attachments supersede Attachments A and B of iBiquity's August 5, 2011 and April 13, 2005 letters. All other aspects of those two previous letters remain valid.

iBiquity and Xperi confirm that, in accordance with NRSC policy, a license to the patents listed in Attachments A and B to this letter shall be made available, with charge, to applicants under reasonable terms and conditions that are demonstrably free of any unfair discrimination.

iBiquity and Xperi appreciate the NRSC's ongoing effort to improve the NRSC-5 standard and welcome the opportunity to be a continuing part of this effort. Please feel free to contact me if you have any questions.

Very truly yours,

Michael Spillner  
Authorized Signatory, Xperi Inc.

**Attachment A  
Transmission Patent Portfolio for NRSC-5**

Patent #	Title
6,898,249	METHOD AND APPARATUS FOR DIGITAL AUDIO BROADCASTING WITH AMPLITUDE SCALED SUB-CARRIERS
7,043,681	METHOD FOR ENCODING A DIGITAL SIGNAL USING COMPLEMENTARY PATTERN-MAPPED CONVOLUTIONAL CODES
7,191,136	EFFICIENT CODING OF HIGH FREQUENCY SIGNAL INFORMATION IN A SIGNAL USING A LINEAR/NON-LINEAR PREDICTION MODEL BASED ON A LOW PASS BASEBAND
7,305,043	METHOD AND APPARATUS FOR FORMATTING SIGNALS FOR DIGITAL AUDIO BROADCASTING TRANSMISSION AND RECEPTION
7,340,010	FORWARD ERROR CORRECTION CODING FOR HYBRID AM IN-BAND ON-CHANNEL DIGITAL AUDIO BROADCASTING SYSTEMS
7,352,817	METHOD AND APPARATUS FOR INTERLEAVING SIGNAL BITS IN A DIGITAL AUDIO BROADCASTING SYSTEM
7,474,707	BANDWIDTH REDUCTION OF AN FM BROADCAST SIGNAL USING A BASEBAND PRECOMPENSATION TECHNIQUE
7,512,175	METHOD FOR SYNCHRONIZING EXPORTER AND EXCITER CLOCKS
7,542,517	PEAK-TO-AVERAGE POWER REDUCTION FOR FM OFDM TRANSMISSION
7,706,468	TRANSMITTER WITH FORWARD ERROR CORRECTION CODING FOR HYBRID AM IN-BAND ON-CHANNEL DIGITAL AUDIO BROADCASTING SYSTEMS
7,873,120	FORWARD ERROR CORRECTION CODING FOR AM 9KHZ AND 10KHZ IN-BAND ON-CHANNEL DIGITAL AUDIO BROADCASTING SYSTEMS
7,908,172	SYSTEM AND METHOD FOR GENERATING MULTIMEDIA ACCOMPANIMENTS TO BROADCAST DATA
7,933,368	METHOD AND APPARATUS FOR IMPLEMENTING A DIGITAL SIGNAL QUALITY METRIC
8,027,419	METHOD FOR ALIGNMENT OF ANALOG AND DIGITAL AUDIO IN A HYBRID RADIO WAVEFORM
8,111,716	METHOD AND APPARATUS FOR FORMATTING DATA SIGNALS IN A DIGITAL AUDIO BROADCASTING SYSTEM
8,144,612	SYSTEMS AND METHODS FOR TRANSMITTING MEDIA CONTENT VIA DIGITAL RADIO BROADCAST TRANSMISSION FOR SYNCHRONIZED RENDERING BY A RECEIVER
8,279,908	SYNCHRONIZATION OF SEPARATED PLATFORMS IN AN HD RADIO BROADCAST SINGLE FREQUENCY NETWORK
8,396,100	SYSTEM AND METHOD FOR TRANSMITTING DIGITAL MULTIMEDIA DATA WITH ANALOG BROADCAST DATA
8,451,868	SYSTEMS AND METHODS FOR TRANSMITTING MEDIA CONTENT VIA DIGITAL RADIO BROADCAST TRANSMISSION FOR SYNCHRONIZED RENDERING BY A RECEIVER
8,521,079	RADIO SERVICE REGISTRY
8,595,748	SYSTEMS AND METHODS FOR TRANSMITTING AND RECEIVING LARGE OBJECTS VIA DIGITAL RADIO BROADCAST



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Patent #	Title
8,660,128	SYSTEMS AND METHODS FOR A MULTIPOINT SYNCHRONOUS-ASYNCHRONOUS CLIENT FOR SCHEDULING AND DELIVERING CONTENT FOR DIGITAL RADIO BROADCAST TRANSMISSION
8,660,479	DIGITAL RADIO BROADCAST RECEIVER, BROADCASTING METHODS AND METHODS FOR TAGGING CONTENT OF INTEREST
8,676,114	DIGITAL RADIO BROADCAST RECEIVER, BROADCASTING METHODS AND METHODS FOR TAGGING CONTENT OF INTEREST
8,798,196	PEAK-TO-AVERAGE POWER RATIO REDUCTION FOR HYBRID FM HD RADIO TRANSMISSION
9,118,430	BROADCAST EQUIPMENT COMMUNICATION PROTOCOL
9,178,740	PEAK-TO-AVERAGE POWER RATIO REDUCTION FOR QAM MODULATION WITH HD RADIO SIGNALS
9,337,791	SYSTEM AND METHOD FOR GENERATING MULTIMEDIA ACCOMPANIMENTS TO BROADCAST DATA
9,350,471	SYSTEMS AND METHODS FOR TRANSMITTING AND RECEIVING LARGE OBJECTS VIA DIGITAL RADIO BROADCAST
9,379,918	SYSTEM AND METHOD FOR INCREASING THROUGHPUT IN DIGITAL RADIO BROADCAST RECEIVER
9,407,383	APPARATUS AND METHOD FOR DISTRIBUTING CONTENT FROM AN HD RADIO SYSTEM
9,467,255	SYSTEMS AND METHODS FOR DIGITAL RADIO BROADCAST WITH CROSS PLATFORM RECEPTION
9,872,066	METHOD FOR STREAMING THROUGH A DATA SERVICE OVER A RADIO LINK SUBSYSTEM
10,044,333	SYSTEM AND METHOD FOR GENERATING MULTIMEDIA ACCOMPANIMENTS TO BROADCAST DATA
10,484,115	AUDIO ALIGNMENT IN HD RADIO EXCITER ENGINE
10,727,980	LUMBER SERVICE MODES FOR HD RADIO BROADCASTS
10,819,298	SYSTEM AND METHOD FOR GENERATING MULTIMEDIA ACCOMPANIMENTS TO BROADCAST DATA
11,038,622	NEW FM SYSTEM MODES FOR HD RADIO

**Attachment B  
Receiver (Non-Transmission) Patent Portfolio for NRSC-5**

Patent #	Title
6,898,249	METHOD AND APPARATUS FOR DIGITAL AUDIO BROADCASTING WITH AMPLITUDE SCALED SUB-CARRIERS
6,970,685	DYNAMIC FILTER SELECTION IN IBOC DAB RECEIVERS
7,043,681	METHOD FOR ENCODING A DIGITAL SIGNAL USING COMPLEMENTARY PATTERN-MAPPED CONVOLUTIONAL CODES
7,127,008	COHERENT AM DEMODULATOR USING A WEIGHTED LSB/USB SUM FOR INTERFERENCE MITIGATION
7,221,688	METHOD AND APPARATUS FOR RECEIVING A DIGITAL AUDIO BROADCASTING SIGNAL
7,221,917	METHOD FOR MITIGATING ADJACENT CHANNEL INTERFERENCE IN FM DIGITAL BROADCASTING RECEIVERS
7,305,043	METHOD AND APPARATUS FOR FORMATTING SIGNALS FOR DIGITAL AUDIO BROADCASTING TRANSMISSION AND RECEPTION
7,305,056	COHERENT TRACKING FOR FM IN-BAND ON-CHANNEL RECEIVERS
7,340,010	FORWARD ERROR CORRECTION CODING FOR HYBRID AM IN-BAND ON-CHANNEL DIGITAL AUDIO BROADCASTING SYSTEMS
7,352,817	METHOD AND APPARATUS FOR INTERLEAVING SIGNAL BITS IN A DIGITAL AUDIO BROADCASTING SYSTEM
7,546,088	METHOD AND APPARATUS FOR BLENDING AN AUDIO SIGNAL IN AN IN-BAND ON-CHANNEL RADIO SYSTEM
7,551,675	METHOD AND APPARATUS FOR SYNCHRONIZED TRANSMISSION AND RECEPTION OF DATA IN A DIGITAL AUDIO BROADCASTING SYSTEM
7,680,201	FORWARD ERROR CORRECTION CODING FOR AM 9KHZ AND 10KHZ IN-BAND ON-CHANNEL DIGITAL AUDIO BROADCASTING SYSTEMS
7,697,620	EQUALIZER FOR AM IN-BAND ON-CHANNEL RADIO RECEIVERS
7,706,474	CARRIER TRACKING FOR AM IN-BAND ON-CHANNEL RADIO RECEIVERS
7,724,850	COHERENT TRACKING FOR FM IBOC RECEIVER USING A SWITCH DIVERSITY ANTENNA SYSTEM
7,982,683	ANTENNA DESIGN FOR FM RADIO RECEIVERS
8,019,311	SYSTEMS AND METHODS FOR DC COMPONENT RECOVERY IN A ZERO-IF RADIO RECEIVER
8,027,419	METHOD FOR ALIGNMENT OF ANALOG AND DIGITAL AUDIO IN A HYBRID RADIO WAVEFORM
8,040,989	SYSTEM AND METHOD FOR SAMPLING RATE ADJUSTMENT OF DIGITAL RADIO RECEIVER
8,068,563	SYSTEMS AND METHODS FOR FREQUENCY OFFSET CORRECTION IN A DIGITAL RADIO BROADCAST RECEIVER
8,111,716	METHOD AND APPARATUS FOR FORMATTING DATA SIGNALS IN A DIGITAL AUDIO BROADCASTING SYSTEM
8,138,915	SYSTEMS AND METHODS FOR RENDERING ALERT INFORMATION FOR DIGITAL RADIO BROADCAST, AND ACTIVE DIGITAL RADIO BROADCAST RECEIVER

Patent #	Title
8,144,612	SYSTEMS AND METHODS FOR TRANSMITTING MEDIA CONTENT VIA DIGITAL RADIO BROADCAST TRANSMISSION FOR SYNCHRONIZED RENDERING BY A RECEIVER
8,180,470	SYSTEMS AND METHODS FOR FINE ALIGNMENT OF ANALOG AND DIGITAL SIGNAL PATHWAYS
8,351,843	DIGITAL RADIO BROADCAST RECEIVER, BROADCASTING METHODS AND METHODS FOR TAGGING CONTENT OF INTEREST
8,396,100	SYSTEM AND METHOD FOR TRANSMITTING DIGITAL MULTIMEDIA DATA WITH ANALOG BROADCAST DATA
8,442,170	EQUALIZER FOR AM IN-BAND ON-CHANNEL RADIO RECEIVERS
8,451,868	SYSTEMS AND METHODS FOR TRANSMITTING MEDIA CONTENT VIA DIGITAL RADIO BROADCAST TRANSMISSION FOR SYNCHRONIZED RENDERING BY A RECEIVER
8,595,748	SYSTEMS AND METHODS FOR TRANSMITTING AND RECEIVING LARGE OBJECTS VIA DIGITAL RADIO BROADCAST
8,660,128	SYSTEMS AND METHODS FOR A MULTIPOINT SYNCHRONOUS-ASYNCHRONOUS CLIENT FOR SCHEDULING AND DELIVERING CONTENT FOR DIGITAL RADIO BROADCAST TRANSMISSION
8,660,479	DIGITAL RADIO BROADCAST RECEIVER, BROADCASTING METHODS AND METHODS FOR TAGGING CONTENT OF INTEREST
8,676,114	DIGITAL RADIO BROADCAST RECEIVER, BROADCASTING METHODS AND METHODS FOR TAGGING CONTENT OF INTEREST
8,804,037	SYSTEMS AND METHODS FOR TRANSMITTING MEDIA CONTENT VIA DIGITAL RADIO BROADCAST TRANSMISSION FOR SYNCHRONIZED RENDERING BY A RECEIVER
8,817,917	METHOD AND APPARATUS FOR IMPLEMENTING SIGNAL QUALITY METRICS AND ANTENNA DIVERSITY SWITCHING CONTROL
8,831,546	MRC ANTENNA DIVERSITY FOR FM IBOC DIGITAL SIGNALS
8,923,378	EQUALIZER FOR AM IN-BAND ON-CHANNEL RECEIVERS THAT DOES NOT REQUIRE ANALOG SIGNAL BANDWIDTH INFORMATION
9,037,103	MRC ANTENNA DIVERSITY FOR FM IBOC DIGITAL SIGNALS
9,094,139	LOOK AHEAD METRICS TO IMPROVE BLENDING DECISION
9,106,472	CHANNEL STATE INFORMATION (CSI) ESTIMATION AND APPLICATIONS FOR IN-BAND ON-CHANNEL RADIO RECEIVERS
9,118,427	METHOD AND APPARATUS FOR STORE AND REPLAY FUNCTIONS IN A DIGITAL RADIO BROADCASTING RECEIVER
9,129,592	SIGNAL ARTIFACT DETECTION AND ELIMINATION FOR AUDIO OUTPUT
9,178,548	FIRST ADJACENT CANCELLER (FAC) WITH IMPROVED BLENDING USING A PARAMETRIC FILTER
9,178,740	PEAK-TO-AVERAGE POWER RATIO REDUCTION FOR QAM MODULATION WITH HD RADIO SIGNALS
9,184,804	METHOD AND APPARATUS FOR IMPLEMENTING SIGNAL QUALITY METRICS AND ANTENNA DIVERSITY SWITCHING CONTROL
9,203,668	SYSTEMS, METHODS AND COMPUTER READABLE MEDIA FOR DIGITAL RADIO BROADCAST RECEIVER MEMORY AND POWER REDUCTION
9,219,573	SYSTEM AND METHOD FOR RECOVERING AUDIO PDU TRANSPORT ELEMENTS IN DIGITAL RADIO BROADCAST RECEIVER

Patent #	Title
9,252,899	ADAPTIVE BANDWIDTH MANAGEMENT OF IBOC AUDIO SIGNALS DURING BLENDING
9,379,918	SYSTEM AND METHOD FOR INCREASING THROUGHPUT IN DIGITAL RADIO BROADCAST RECEIVER
9,467,255	SYSTEMS AND METHODS FOR DIGITAL RADIO BROADCAST WITH CROSS PLATFORM RECEPTION
9,544,039	METHOD AND APPARATUS FOR IMPLEMENTING SIGNAL QUALITY METRICS AND ANTENNA DIVERSITY SWITCHING CONTROL
9,596,044	METHOD AND APPARATUS FOR ANALOG AND DIGITAL AUDIO BLEND FOR HD RADIO RECEIVERS
9,768,853	METHOD AND APPARATUS FOR BLENDING AN AUDIO SIGNAL IN AN IN-BAND ON-CHANNEL RADIO SYSTEM
9,819,480	SYSTEM AND METHOD FOR SYNCHRONOUS PROCESSING OF ANALOG AND DIGITAL PATHWAYS IN A DIGITAL RADIO RECEIVER
9,842,048	SYSTEMS, METHODS AND COMPUTER READABLE MEDIA FOR DIGITAL RADIO BROADCAST RECEIVER MEMORY AND POWER REDUCTION
9,876,592	SYSTEMS AND METHODS FOR DETECTION OF SIGNAL QUALITY IN DIGITAL RADIO BROADCAST SIGNALS
9,947,332	METHOD AND APPARATUS FOR AUTOMATIC AUDIO ALIGNMENT IN A HYBRID RADIO SYSTEM
10,177,729	AUTO LEVEL IN DIGITAL HD RADIO SYSTEMS
10,225,070	TIME-ALIGNMENT MEASUREMENT FOR HYBRID HD RADIO TECHNOLOGY
10,255,926	METHOD AND APPARATUS FOR AUTOMATIC AUDIO ALIGNMENT IN A HYBRID RADIO SYSTEM
10,256,931	SYSTEMS AND METHODS FOR DETECTION OF SIGNAL QUALITY IN DIGITAL RADIO BROADCAST SIGNALS
10,355,908	CSI ESTIMATION AND LLR APPROXIMATION FOR QAM DEMODULATION IN FM HD RADIO RECEIVERS
10,581,539	SYSTEMS AND METHODS FOR DETECTION OF SIGNAL QUALITY IN DIGITAL RADIO BROADCAST SIGNALS
10,638,188	METHOD OF ESTIMATING DIGITAL AUDIO AVAILABILITY FOR SUPPLEMENTAL AUDIO PROGRAMS IN HD RADIO BROADCAST
10,666,416	TIME-ALIGNMENT MEASUREMENT FOR HYBRID HD RADIO TECHNOLOGY
11,190,334	TIME-ALIGNMENT MEASUREMENT FOR HYBRID HD RADIO (TM) TECHNOLOGY
RE48,966	TIME-ALIGNMENT MEASUREMENT FOR HYBRID HD RADIO (TM) TECHNOLOGY
RE48655	METHOD AND APPARATUS FOR TIME ALIGNMENT OF ANALOG AND DIGITAL PATHWAYS IN A DIGITAL RADIO RECEIVER
RE49,210	METHOD AND APPARATUS FOR LEVEL CONTROL IN BLENDING AN AUDIO SIGNAL IN AN IN-BAND ON-CHANNEL RADIO SYSTEM