

FOR  
FCC  
USE  
ONLY

**FCC 302-AM**  
**APPLICATION FOR AM**  
**BROADCAST STATION LICENSE**

(Please read instructions before filling out form.)

**FOR COMMISSION USE ONLY**

**FILE NO.**

**SECTION I - APPLICANT FEE INFORMATION**

1. PAYOR NAME (Last, First, Middle Initial)

Hickory Radio, LLC

MAILING ADDRESS (Line 1) (Maximum 35 characters)

111 S. 108th Ave

MAILING ADDRESS (Line 2) (Maximum 35 characters)

CITY

Omaha

STATE OR COUNTRY (if foreign address)

Nebraska

ZIP CODE

68154

TELEPHONE NUMBER (include area code)

402 991 2201

CALL LETTERS

KIBM

OTHER FCC IDENTIFIER (If applicable)

74104

2. A. Is a fee submitted with this application?

☒

Yes

☐

No

B. If No, indicate reason for fee exemption (see 47 C.F.R. Section

☐

Governmental Entity

☐

Noncommercial educational licensee

☐

Other (Please explain):

C. If Yes, provide the following information:

Enter in Column (A) the correct Fee Type Code for the service you are applying for. Fee Type Codes may be found in the "Mass Media Services Fee Filing Guide." Column (B) lists the Fee Multiple applicable for this application. Enter fee amount due in Column (C).

(A)

FEE TYPE CODE		
M	M	R

(B)

FEE MULTIPLE			
0	0	0	1

(C)

FEE DUE FOR FEE TYPE CODE IN COLUMN (A)
\$ 645

FOR FCC USE ONLY

To be used only when you are requesting concurrent actions which result in a requirement to list more than one Fee Type Code.

(A)

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(B)

0	0	0	1
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(C)

\$
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ADD ALL AMOUNTS SHOWN IN COLUMN C,  
AND ENTER THE TOTAL HERE.  
THIS AMOUNT SHOULD EQUAL YOUR ENCLOSED  
REMITTANCE.

TOTAL AMOUNT  
REMITTED WITH THIS  
APPLICATION

\$ 645

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SECTION II - APPLICANT INFORMATION		
1. NAME OF APPLICANT Hickory Radio, LLC		
MAILING ADDRESS 111 S. 108th Ave		
CITY Omaha	STATE Nebraska	ZIP CODE 68154

2. This application is for:

☒ Commercial
 ☐ Noncommercial  
☐ AM Directional
 ☒ AM Non-Directional

Call letters KIBM	Community of License Omaha	Construction Permit File No. BP-20211221AAC	Modification of Construction Permit File No(s).	Expiration Date of Last Construction Permit July 26, 2025
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3. Is the station now operating pursuant to automatic program test authority in accordance with 47 C.F.R. Section 73.1620?

☐ Yes ☒ No

Exhibit No.

If No, explain in an Exhibit. Condition #4 of construction permit PTA is requested

4. Have all the terms, conditions, and obligations set forth in the above described construction permit been fully met?

☒ Yes ☐ No

Exhibit No.

If No, state exceptions in an Exhibit.

5. Apart from the changes already reported, has any cause or circumstance arisen since the grant of the underlying construction permit which would result in any statement or representation contained in the construction permit application to be now incorrect?

☐ Yes ☒ No

Exhibit No.

If Yes, explain in an Exhibit.

6. Has the permittee filed its Ownership Report (FCC Form 323) or ownership certification in accordance with 47 C.F.R. Section 73.3615(b)?

☐ Yes ☐ No

☒ Does not apply

If No, explain in an Exhibit.

Exhibit No.

7. Has an adverse finding been made or an adverse final action been taken by any court or administrative body with respect to the applicant or parties to the application in a civil or criminal proceeding, brought under the provisions of any law relating to the following: any felony; mass media related antitrust or unfair competition; fraudulent statements to another governmental unit; or discrimination?

☐ Yes ☒ No

If the answer is Yes, attach as an Exhibit a full disclosure of the persons and matters involved, including an identification of the court or administrative body and the proceeding (by dates and file numbers), and the disposition of the litigation. Where the requisite information has been earlier disclosed in connection with another application or as required by 47 U.S.C. Section 1.65(c), the applicant need only provide: (i) an identification of that previous submission by reference to the file number in the case of an application, the call letters of the station regarding which the application or Section 1.65 information was filed, and the date of filing; and (ii) the disposition of the previously reported matter.

Exhibit No.

8. Does the applicant, or any party to the application, have a petition on file to migrate to the expanded band (1605-1705 kHz) or a permit or license either in the existing band or expanded band that is held in combination (pursuant to the 5 year holding period allowed) with the AM facility proposed to be modified herein?

☐ Yes ☒ No

If Yes, provide particulars as an Exhibit.

Exhibit No.

The APPLICANT hereby waives any claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because use of the same, whether by license or otherwise, and requests and authorization in accordance with this application. (See Section 304 of the Communications Act of 1934, as amended).


The APPLICANT acknowledges that all the statements made in this application and attached exhibits are considered material representations and that all the exhibits are a material part hereof and are incorporated herein as set out in full in

### CERTIFICATION

1. By checking Yes, the applicant certifies, that, in the case of an individual applicant, he or she is not subject to a denial of federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. Section 862, or, in the case of a non-individual applicant (e.g., corporation, partnership or other unincorporated association), no party to the application is subject to a denial of federal benefits that includes FCC benefits pursuant to that section. For the definition of a "party" for these purposes, see 47 C.F.R. Section 1.2002(b).

☒ Yes ☐ No

2. I certify that the statements in this application are true, complete, and correct to the best of my knowledge and belief, and are made in good faith.

Name James A. Leedham	Signature 	
Title Chief Engineer, Hickory Radio, LLC	Date August 9, 2022	Telephone Number 402-680-2424

### **WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001), AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION**

#### FCC NOTICE TO INDIVIDUALS REQUIRED BY THE PRIVACY ACT AND THE PAPERWORK REDUCTION ACT

The solicitation of personal information requested in this application is authorized by the Communications Act of 1934, as amended. The Commission will use the information provided in this form to determine whether grant of the application is in the public interest. In reaching that determination, or for law enforcement purposes, it may become necessary to refer personal information contained in this form to another government agency. In addition, all information provided in this form will be available for public inspection. If information requested on the form is not provided, the application may be returned without action having been taken upon it or its processing may be delayed while a request is made to provide the missing information. Your response is required to obtain the requested authorization.

Public reporting burden for this collection of information is estimated to average 639 hours and 53 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, can be sent to the Federal Communications Commission, Records Management Branch, Paperwork Reduction Project (3060-0627), Washington, D. C. 20554. Do NOT send completed forms to this address.

THE FOREGOING NOTICE IS REQUIRED BY THE PRIVACY ACT OF 1974, P.L. 93-579, DECEMBER 31, 1974, 5 U.S.C. 552a(e)(3), AND THE PAPERWORK REDUCTION ACT OF 1980, P.L. 96-511, DECEMBER 11, 1980, 44 U.S.C. 3507.

**SECTION III - LICENSE APPLICATION ENGINEERING DATA**

Name of Applicant

Hickory Radio, LLC

PURPOSE OF AUTHORIZATION APPLIED FOR: (check one)



Station License



Direct Measurement of Power

**1. Facilities authorized in construction permit**

Call Sign	File No. of Construction Permit (if applicable)	Frequency (kHz)	Hours of Operation	Power in kilowatts	
				Night	Day
KIBM	BP-20211221AAC	1490	Unlimited	0.90	0.97

**2. Station location**

State Nebraska	City or Town Omaha
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**3. Transmitter location**

State NE	County Douglas	City or Town Omaha	Street address (or other identification) 6424 Hartman Ave
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**4. Main studio location**

State NE	County Douglas	City or Town Omaha	Street address (or other identification) 11717 Burt St Suite 201
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**5. Remote control point location (specify only if authorized directional antenna)**

State	County	City or Town	Street address (or other identification)
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6. Has type-approved stereo generating equipment been installed?



Yes



No

7. Does the sampling system meet the requirements of 47 C.F.R. Section 73.68?



Yes



No



Not Applicable

Attach as an Exhibit a detailed description of the sampling system as installed.

Exhibit No.

**8. Operating constants:**

RF common point or antenna current (in amperes) without modulation for night system 2.85	RF common point or antenna current (in amperes) without modulation for day system 2.96
Measured antenna or common point resistance (in ohms) at operating frequency Night 111 Day 111	Measured antenna or common point reactance (in ohms) at operating frequency Night +j167 Day +j167

**Antenna indications for directional operation**

Towers	Antenna monitor Phase reading(s) in degrees		Antenna monitor sample current ratio(s)		Antenna base currents	
	Night	Day	Night	Day	Night	Day

Manufacturer and type of antenna monitor:

# SECTION III - Page 2

9. Description of antenna system ((f directional antenna is used, the information requested below should be given for each element of the array. Use separate sheets if necessary.)

Type Radiator Skirt detuned uniform cross section steel tower	Overall height in meters of radiator above base insulator, or above base, if grounded.  150.9	Overall height in meters above ground (without obstruction lighting)  153.0	Overall height in meters above ground (include obstruction lighting)  153.9	If antenna is either top loaded or sectionalized, describe fully in an Exhibit.  <div>Exhibit No.</div>
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Excitation

☒

Series

☐

Shunt

Geographic coordinates to nearest second. For directional antenna give coordinates of center of array. For single vertical radiator give tower location.

North Latitude	41 °	18 '	47 "	West Longitude	96 °	00 '	36 "
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If not fully described above, attach as an Exhibit further details and dimensions including any other antenna mounted on tower and associated isolation circuits.

Exhibit No.  
On File

Also, if necessary for a complete description, attach as an Exhibit a sketch of the details and dimensions of ground system.

Exhibit No.

As specified in BP-20211221AAC

10. In what respect, if any, does the apparatus constructed differ from that described in the application for construction permit or in the permit?

None

11. Give reasons for the change in antenna or common point resistance.

New installation

I certify that I represent the applicant in the capacity indicated below and that I have examined the foregoing statement of technical information and that it is true to the best of my knowledge and belief.

Name (Please Print or Type) Thomas S. Gorton P.E.	Signature (check appropriate box below) 
Address (include ZIP Code) Hatfield & Dawson Consulting Engineers 9500 Greenwood Ave N Seattle, WA 98103-3012	Date August 5, 2022
	Telephone No. (Include Area Code) (206) 783-9151

☐

Technical Director

☒

Registered Professional Engineer

☐

Chief Operator

☐

Technical Consultant

☐

Other (specify)

## Engineering Report

### **On-Site Tuning of New Diplexing System**

KCRO – 660 kHz, 1 kW NDA  
KIBM – 1490 kHz, 1 kW NDA

Omaha, NE

Robert A. Elder

Sr. Field Engineer  
Kintronic Labs, Inc.

President,  
Compliance Matters, Inc.

16 November 2021



## Executive Summary

A new diplexing antenna system was recently installed at the KCRO / KIBM AM transmitter site in Omaha, NE, using equipment supplied by Kintronic Labs, Inc.

The diplexing system, installed earlier in the year, had been tuned by local engineering support. The series-fed tower in use is 151 meters in height, which is roughly 120° in electrical height at 660 kHz, but is a “very tall” 270° at 1490 kHz. For this reason, a “partial detuning” skirt, designed and provided by Kintronic Labs was installed on the tower in order to lower the effective electrical height of the tower at the higher frequency. This change to the tower configuration then required a retuning of the diplexing system.

An engineering site visit was made to the station during the week of November 8-12, 2021, to provide support for final installation details, provide on-site final tuning of the networks, and to collect measurement data required for each station to file an updated 302-AM form with the FCC. The present report documents the results and collected data from this site visit.

The filter networks were assessed as to their pass/reject characteristics, and adjusted as needed to provide the required isolation between stations. Besides the standard series filters used to protect each side from the other, each side also has a shunt filter to reject 590 kHz, due to the close proximity of AM station KXSP, located ~1 km to the east of the KCRO/KIBM transmitter site.

After the 6-wire skirt was installed, with the detuning network set to the factory pre-set adjustment, the diplexing system was provisionally tuned to provide 50-Ohm matches to the respective transmitters. Field measurements of signal strength were made, demonstrating the need to make tuning adjustments to the detune network, mounted on the tower. With an engineer (Mr. Val Lane, providing contract engineering support for the station) monitoring the signal strength at a measurement point 1.0 km from the tower, adjustments to the detune network were made (by a member of the tower crew), until the monitored signal strength on 1490 kHz reached a maximum value.

A final sweep of tower impedances at the respective carrier and +/- 15 kHz sideband frequencies was measured for each station. An impedance sweep was made at the output side of each matching network, corresponding to the base current measurement point for each station. Calculations were also made, and presented in the present report, as to the base current for each station, corresponding to full nominal power, and the FCC tolerance levels of +5% and -10% of nominal full power.

After all other adjustments were made to the system, an input impedance sweep was measured for each station at carrier and +/- 15 kHz sideband frequencies, at 5 kHz intervals, after all adjustments were completed.

Measurements of possible spurious emissions were made at the intermodulation frequencies calculated from the combinations of the carrier and harmonic frequencies from the two stations.

The present report summarizes all of the findings and measurements taken on the system.

## Measurements

All impedance measurements were made with an HP 8751A Network Analyzer in conjunction with a Tunwall Radio directional coupler and an ENI 300L RF amplifier in a calibrated measurement set up. Signal strength measurements within the AM band were made with a Potomac Instruments Field Strength Meter model FIM-41. Further measurements between the AM band and 5 MHz were made using an Anritsu Spectrum Analyzer model MT8222A, S/N 0802149, owned by Mr. Val Lane, who also made these measurements.

## General Outline of material:

1. Tower Impedance Measurement Sweeps
2. Filter Characteristics and Isolation Measurements
3. KCRO (660 kHz) Characterization After Tuning
4. KIBM (1490 kHz) Characterization After Tuning
5. Signal Strength Measurements at Intermodulation Frequencies
6. (For reference) copy of RF schematics for system



## Tower Impedance Measurement Sweeps

A final set of tower impedance measurements were made at the two carrier frequencies and their respective +/- 15 kHz sideband frequencies in 5 kHz intervals, after the adjustments to the detune network mounted on the tower, and after all final adjustments to the system were completed. These measurements were made at the final output J-plug for each side of the system (J-plugs J4 and J104), and are presented below. The modeled tower impedance (on carrier) used in the design of the system, as shown in the final RF schematic, is presented for comparison.

<u>Station</u>	<u>Freq. (kHz)</u>	<u>Impedance (<math>\Omega</math>)</u>	<u>Modeled impedance</u>
KCRO	645	260 + j275	
	650	274 + j282	
	655	294 + j289	
	<b>660</b>	<b>316 + j295</b>	<b>238 + j313</b>
	665	340 + j299	
	670	364 + j301	
	675	390 + j300	
KIBM	1475	448 + j100	
	1480	441 + j39.5	
	1485	415 – j10.1	
	<b>1490</b>	<b>379 – j41.4</b>	<b>362 + j72</b>
	1495	345 – j55.8	
	1500	317 – j59.2	
	1505	296 – j57.2	

### Filter Characteristics and Isolation Measurements

Each side of the diplexing system employs a series (notch) filter to provide isolation from the other station. There is also, for each station, a shunt filter designed to reject signals at 590 kHz, due to the close proximity of the KXSP – AM transmitter site. The isolation (in dB) provided by each filter in isolation was measured, and the filter adjusted, if needed. Isolation as reported below is after all adjustments to filters have been made.

After all adjustments were made to the overall system (including the matching networks), the total isolation between stations was measured between J-plugs J2 and J102. (This is essentially the input points for each station, while bypassing the 590 kHz shunt filter for each side.) Results of all the above measurements are presented below.

#### KCRO (660 kHz) System

Pass 660 / Reject 1490:	- 63.0 dB
Pass 660 / Reject 590:	- 29.9 dB

#### KIBM (1490 kHz) System

Pass 1490 / Reject 660:	- 55.4 dB
Pass 1490 / Reject 590:	- 31.4 dB

#### Overall Isolation between system input points

660 kHz:	-63.0 dB
1490 kHz:	-57.8 dB

### KCRO Station (660 kHz) Characterization After Tuning

After all adjustments were made to the matching network for the KCRO (660 kHz) station, the impedance was measured both at the ATU input, at the transmission line (disconnected from the cable clamp), and at the matching network output J-plug (J3). The measurements were made on carrier and the +/- 15 kHz sidebands, at 5 kHz intervals. The “output” impedance is at the base current monitoring point for the system, and the impedance on the carrier frequency is the value to be reported to the FCC on Form 302-AM. The impedance here (on carrier) assumed in the system design (as shown on the final RF schematic) is also provided for comparison.

Calculations of expected current at nominal full power, and at the +5% and -10% tolerance values, corresponding to the “output” impedance measurement, have been provided below.

<u>Freq. (kHz)</u>	<u>Input Z</u>	<u>SWR</u>	<u>“Output” Z</u>	<u>Per design:</u>
645	41.0 – j2.2	1.227	109 + j198	
650	44.1 + j0.2	1.135	114 + j209	
655	47.4 + j1.1	1.060	121 + j220	
<b>660</b>	<b>49.7 + j0.05</b>	<b>1.007</b>	<b>128 + j232</b>	<b>126 + j268</b>
665	49.5 – j2.2	1.046	137 + j244	
670	46.7 – j3.5	1.105	147 + j255	
675	42.2 – j2.9	1.197	159 + j266	

### Calculated Base Currents with FCC Tolerances

<u>Operating Mode</u>	<u>Tolerance</u>	<u>Power (W)</u>	<u>Current (A)</u>	<u>Report on 302-AM</u>
Day	- 10%	900	2.65	<b>2.8</b>
	Nominal	1000	2.80	
	+ 5%	1050	2.86	
Critical Hours	-10%	450	1.88	<b>2.0</b>
	Nominal	500	1.98	
	+ 5%	525	2.03	
Night	- 10%	48.6	0.62	<b>0.7</b>
	Nominal	54	0.65	
	+ 5%	56.7	0.67	

### KIBM Station (1490 kHz) Characterization After Tuning

After all adjustments were made to the matching network for the KIBM (1490 kHz) station, the impedance was measured both at the ATU input, at the transmission line (disconnected from the cable clamp), and at the matching network output J-plug (J103). The measurements were made on carrier and the +/- 15 kHz sidebands, at 5 kHz intervals. The “output” impedance is at the base current monitoring point for the system, and the impedance on the carrier frequency is the value to be reported to the FCC on Form 302-AM. The impedance here (on carrier) assumed in the system design is also provided for comparison.

Calculations of expected current at nominal full power, and at the +5% and -10% tolerance values, corresponding to the “output” impedance measurement, have been provided below.

<u>Freq. (kHz)</u>	<u>Input Z</u>	<u>SWR</u>	<u>“Output” Z</u>	<u>Per design:</u>
1475	50.5 + j15.0	1.345	74.5 + j164	
1480	53.3 + j8.9	1.202	85.4 + j168	
1485	52.8 + j3.0	1.083	97.9 + j169	
<b>1490</b>	<b>50.0 – j0.9</b>	<b>1.019</b>	<b>111 + j167</b>	<b>121 + j185</b>
1495	46.5 – j2.3	1.091	122 + j161	
1500	43.5 – j2.0	1.158	130 + j153	
1505	41.2 – j0.7	1.213	134 + j144	

### Calculated Base Currents with FCC Tolerances

<u>Operating Mode</u>	<u>Tolerance</u>	<u>Power (W)</u>	<u>Current (A)</u>	<u>Report on 302-AM</u>
Day	- 10%	900	2.85	<b>3.0</b>
	Nominal	1000	3.00	
	+ 5%	1050	3.08	
Night	- 10%	216	1.40	<b>1.5</b>
	Nominal	240	1.47	
	+ 5%	252	1.51	

## Field Strength Measurements at Intermodulation Product Frequencies

Field strength measurements were first attempted at the same measurement location that was used for monitoring field strength while adjusting the detune network. This proved to be too far away to accurately measure the possible spur emissions, particularly for those relative to the 1490 kHz unmodulated carrier reference level. An alternative measurement location was therefore selected, in closer proximity to the tower site, to produce valid measurements.

Measurements at intermodulation frequencies falling within the AM band were made using an FIM-41. For intermodulation frequencies between 1600 kHz and 5.0 MHz, a spectrum analyzer in conjunction with an AM loop antenna was used.

Field strength measurements of the unmodulated signal at full licensed power were made at the carrier frequencies of each station to be used as reference values, and then at each of the various intermodulation frequencies falling between 500 kHz and 5 MHz (as shown in the data table following).

Each station was operating at its full authorized daytime power level, with normal audio modulation. Signal strength measurements were made using a Potomac Instruments field strength meter, model FIM-41, S/N 1956 last calibrated 13 June 2018. The measurement location was in the field adjacent to the site entrance on Hartman Ave., at the corner of the field furthest away from the tower. The GPS coordinates of the measurement location (NAD 83) are: 41 18 37.8 N, 96 00 45.9 W. This measurement location is at a distance of 0.33 km from the tower, at a bearing of 213°. There were no overhead wires or possible reradiating objects observed in the immediate vicinity of the measurement location.

At each of the intermodulation frequencies noted, observations were made of the signal strength and the nature of any audio modulation detected, and were analyzed relative to the field strengths of the unmodulated carrier frequency signals of each station. There were no frequencies at which the measured signal strength exceeded the FCC limits, other than those for which (as noted in the data) the signal was clearly attributable to another source. The field observations therefore indicate that all potential spurious emissions exist stemming from intermodulation products generated by the two stations fall within FCC limits.

Measurements at frequencies within the AM band were made using the FIM-41 field strength meter. Intermodulation products up to 5<sup>th</sup> order were selected for the possible spurious emissions falling within the AM band. For these measurements, the measured signal strength at each frequency must be 73 dB below that of the unmodulated carrier frequency for each station.

Measurements and calculated results are presented below:

“A” 660 kHz: 910 mV/m  
 “B” 1490 kHz: 310 mV/m

<u>Freq. (kHz)</u>	<u>Product</u>	<u>Meas. (mV/m)</u>	<u>Relative to 660 kHz</u>	<u>Relative to 1490 kHz</u>
830	B – A	0.0120	- 98.3 dB	- 88.2 dB
1000	2B – 3A	0.0320	- 89.8 dB	- 79.7 dB
1150	4A – B	0.250	- 72.0 dB	- 61.9 dB (see note)
1320	2A	0.0620	- 84.1 dB	- 74.0 dB
1660	2B – 2A	0.180	- 74.8 dB	- 64.67 dB (see note)

Note: For the measurements at 1150 kHz and 1660 kHz, it was clear that the audio was distinctly different from the audio being broadcast by either station (660 / 1490 kHz).

Measurements at frequencies above the AM band were made using the spectrum analyzer. Intermodulation products within this band were limited to 4<sup>th</sup> order products and below. The measurements were made relative to signal strength of the unmodulated carrier frequency for each station, using the respective carrier frequency measurement as the “reference” signal strength. Data are presented below:

“A” 660 kHz reference level: -41.79 dB  
 “B” 1390 kHz reference level: -41.10 dB

The target level for the intermodulation frequencies is 73 dB below these reference values. The target is thus -114.79 relative to 660 kHz, and -114.1 dB relative to 1490 kHz, and the data presented below demonstrate that each measurement falls within the required limit.

<u>Freq. (kHz)</u>	<u>Product</u>	<u>Measurement (dB)</u>
1980	3A	- 118.52
2150	A + B	- 115.17
2320	2B – A	- 123.14
2640	4A	- 123.01
2810	2A + B	- 121.58
2980	2B	- 117.74
3470	3A + B	- 124.07
3640	A + 2B	- 121.92
3810	3B – A	- 126.44
4300	2A + 2B	- 124.95
4470	3B	- 118.26

