

Engineering Report
Spurious Emissions Analysis
47 CFR 73.317(b) and (d) Compliance

K273DJ-FM 102.5 MHz
and
KFNW-FM 97.9 MHz
Fargo, ND

November 15, 2023

Northwestern Media
3003 Snelling Ave N
Saint Paul, MN 55113

Station A Data:

Call Sign: K273DJ-FM

City of License: Fargo, ND

Frequency: 102.5 MHz

TPO: 364 watts

Station B Data:

Call Sign: KFNW-FM

City of License: Fargo, ND

Frequency: 97.9 MHz

TPO: 3369 watts

Combiner: Kintronic Laboratories FMC-2X1kW3.5kW

Line Section: Bird RF 4230-018 with 4724 sample port

Spectrum Analyzer: Keysight FieldFox N9914A

Measurement Date: November 9, 2023

The measurement data obtained for this report indicates the operation of the combiner with stations K273DJ-FM and KFNW-FM to be IN COMPLIANCE with the provisions of 47 CFR 73.317(b) and (d) of the FCC rules. Spectrum Measurements were taken with both stations operating at above mentioned TPO, with zero modulation into the Kintronic Laboratories combiner. On the output of the combiner, the Bird Line section with sample port was used to obtain the RF sample which was injected into the FieldFox RF Analyzer using an external 30dB attenuator so as to not overload the metering circuitry within the analyzer. Measurements were performed by Nathaniel Becker – Media Engineer, and Gregory Schmitke – Chief Engineer for KFNW in Fargo, North Dakota.

According to the provisions of 47 CFR 73.317(d), all spurious emissions removed from the carrier by more than 600kHz must be attenuated at least $43 + 10 \log_{10} (\text{Power in Watts})$ dB or 80dB below the level of the unmodulated carrier, whichever is the lesser attenuation.

With the above in mind, and considering the combined TPO of both stations to be 3733 Watts, the spurious emissions removed from the carrier by more than 600kHz must be attenuated at least $43 + 10 \log_{10} (3733)$ dB, which calculates to 79dB. As this is the lesser of the two attenuations, it is the one we will use to demonstrate our compliance.

The table below shows the frequencies that were measured in reference to the unmodulated carriers of main stations K273DJ-FM and KFNW-FM. Note that the unmodulated carrier level of K273DJ-FM and KFNW-FM were slightly lower than the baseline set point of the FieldFox RF Analyzer. All measurements are referenced to the higher of the two main carrier levels, which is KFNW-FM at -14.51dBm from the set point of the FieldFox.

Intermods		Station A : K273DJ-FM			
		Frequency (Mhz)	Measured Values (dBm)	Attenuation From Max Carrier (dB)	
Fundamentals	f	102.5	-22.46	-7.95	
1st harmonic	fx2	205.0	-118.7	-104.19	
2nd harmonic	fx3	307.5	-108.1	-93.59	
3rd harmonic	fx4	410.0	-120.6	-106.09	
4th harmonic	fx5	512.5	-119.9	-105.39	
		Station B : KFNW-FM			
Fundamentals	f	97.9	-14.51	0.00	
1st harmonic	fx2	195.8	-121.6	-107.09	
2nd harmonic	fx3	293.7	-118.5	-103.99	
3rd harmonic	fx4	391.6	-120.3	-105.79	
4th harmonic	fx5	489.5	-117.80	-103.29	
2nd order intermod	A1+B1	200.4	-120.1	-105.59	
	A1-B1	4.6	-117.3	-102.79	
3rd order intermod	2A+B	302.9	-121.2	-106.69	
	2A-B	107.1	-109.8	-95.29	
	2B+A	298.3	-116.7	-102.19	
	2B-A	93.3	-97.74	-83.23	
5th order intermod	3B-2A	88.7	-97.95	-83.44	
	3A-2B	111.7	-111	-96.89	
7th order intermod	4A-3B	116.3	-111.8	-97.29	
	4B-3A	84.1	-112.6	-98.09	