

T Z SAWYER TECHNICAL CONSULTANTS

2130 HUTCHISON GROVE COURT, SUITE 100
FALLS CHURCH, VA 22043 USA
Tel: (703) 848-2130 / (202) 642-2130

BASIN BROADCASTING COMPANY, INC.

**K278DD CHANNEL 278D (103.5 MHZ)
(Previously K265FJ)**

**FARMINGTON, NEW MEXICO
FCC FACILITY ID: 200659**

FCC LMS FILE: 0000140751

LICENSE TO COVER - ENGINEERING STATEMENT

All operating specifications and conditions set forth in the K278DD Construction Permit have been fully met and the facility is ready for licensing.

No changes or deviations from the operating parameters authorized in the underlying construction permit have occurred.

Delivery Method:

The applicant wishes to notify the Commission of a change in the delivery method of the signal of the primary station from “Wired” to “Microwave.” No change in the primary station is sought, only the method upon which the primary station’s signal is delivered to the translator. As this is a “fill-in” translator, the change reported has no impact on the station license and is administrative in nature. No other changes are reported.

Automatic Program Test Authority:

The facility is operating under the terms of the construction permit, which authorized “Automatic program test authority” upon filing of this application for station license.

Special Operating Conditions:

Basin Broadcasting Company, Inc., accepts and affirms that it is in compliance with the special operating conditions as listed on the construction permit.

Transmitter Power Output (TPO):

The transmitter power output has been calculated at 0.217 kilowatts to achieve the required effective radiated power (ERP) of 0.250-kilowatts (H & V) as authorized. A TPO worksheet of the calculations is attached.

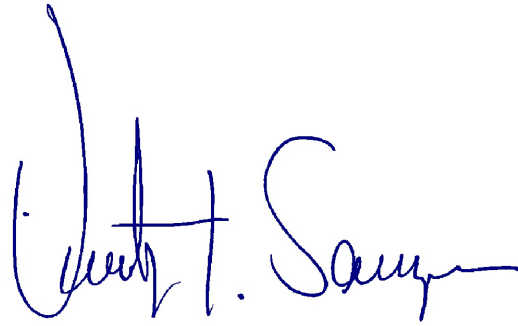
Diplexed Operation with K261FB

Co-owned K261FB’s construction permit (LMS 0000140811) authorized diplex operation with K278DD. The proof of performance and spurious emissions report required in the K261FB construction permit is being included herein for

completeness of the record. No adverse interaction results in the diplexed operation with K261FB.

Respectfully submitted,

June 28, 2021

A handwritten signature in blue ink, reading "Timothy Z. Sawyer". The signature is written in a cursive style with a large initial "T" and "S".

Timothy Z. Sawyer, Consulting Engineer
Writers Direct Number: 703-848-2130
e-Mail to: tzsawyer@tzsawyer.com

STATION	K278DD	FM TRANSLATOR
LOCATION	FARMINGTON, NM	
CHANNEL	FM TRANSLATOR	278

CALCULATED FOR
ERP OF 250 WATTS (0.250 KW) H & V

K278DD
 FARMINGTON, NM
 FM TRANSLATOR

COMPUTED LINE LOSSES - BASED ON MANUFACTURES TABLES AT OPERATING FREQUENCY

DESCRIPTION AND LENGTH NEAREST FOOT	SIZE/TYPE	LENGTH	EXTRA LOSS (dB) (IF ANY)	SECTION LOSS (dB)	TOTAL (dB)
JUMPER ANT	TRANSMISSION LINE		0	0.000	0.000
VERTICAL RUN	TRANSMISSION LINE	7/8" FOAM FEET 49.00	0	0.174	0.174
BLD TO TOWER	TRANSMISSION LINE	7/8" FOAM FEET 20.00	0	0.071	0.071
JUMPER TRANS	TRANSMISSION LINE		0	0.000	0.000
MISC ANT/LINE/TERMINATION CONNECTOR LOSSES	QYN	4.00	0	0.064	0.064

FM	278	CH
FREQ:	103.5	MHz

FREQUENCY SENSITIVE COMPONENTS		
	DB PER 100 FT	SYSTEM JUMPER AT ANTENNA
0.3552	DB PER 100 FT	VERTICAL RUN ON TOWER
0.3552	DB PER 100 FT	HORIZONTAL RUN TO TX BLD
	DB PER 100 FT	SYSTEM JUMPER AT TRANSMITTER
0.0161	DB PER PAIR	TERMINATING CONNECTOR LOSSES

Insertion Loss = 0.05 X sqrt (freq GHz)

TOTAL FEET (MIXED) **69.00**

COMPUTED SYSTEM LOSSES

SUBTOTAL	0.309	dB Line Loss (with jumpers, line, and connector losses) from above
	1.006	dB additional losses (diplexer)
CLIENT PROVIDED LOSSES (IF ANY)	0.000	dB additional losses
TOTAL	1.315	Total System Loss in dB

73.87% Transmission System Efficiency Factor = Eff (%)

COMPUTED TPO NEAREST WATT

217

0.250 kW	-6.021 dBk	STATION MAXIMUM ERP
1.559 X (Gain)	1.928 dBd	ANTENNA GAIN PER ANT SPEC SHEET
0.160 kW	-7.949 dBk	ANTENNA INPUT
0.057 KW	1.315 dB	SYSTEM TOTAL LOSSES
0.217 kW	-6.634 dBk	TRANSMITTER POWER

ANTENNA SPECIFIED

MAKE	AAT
MODEL	IV-CP-BB
BAYS	3
SPACING	1.00
MODE	ND
POLARIZATION	H & V
ANT GAIN	1.559

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 www.tzsawyer.com
 June 28, 2021



105%	0.228	TPO HIGH LIMIT
100%	0.217	NOMINAL
90%	0.195	TPO LOW LIMIT

Math Proof Check					
TPO	X	EFF	X	ANT G	= ERP
0.217		73.87%		1.559	0.250



BTA, INC.

P.O. Box 297
Durango, CO. 81302
Phone: (970) 749-1302
Fax: (970) 385-9490



*Broadcast Technology
Associates, Inc.*

Proof of Performance Measurement

FOR

K261FB, Farmington, New Mexico

And

K278DD, Farmington, New Mexico

Station Information

Station	Frequency	C.P. File Number	License File Number	Facility ID No.
K261FB	100.1 MHz	BNPFT-20180418AGG	To Be Assigned	203279
K278DD	103.5 MHz	BNPFT-20171201AHO	To Be Assigned	200659

Introduction. The two translator stations mentioned above operate into a combined antenna system at a common facility utilizing an American Amplifier Technologies, LLC model ANT-FM-IV-CP-BB3 antenna, fed by a FM Branch Combiner also manufactured by American Amplifier Technologies, LLC and designed and engineered specifically for the two frequencies.

To assure the proper operation and insure that any intermodulation products produced due to inadequate port to port filtering are at or below the required level of -73 dBc. The measurements contained herein were made to verify compliance with Federal Communications Commission Rules and Regulations section 73.317,b,c,d.

Process. For measurement purposes, a coaxial sample port line section was installed in the output port of the Combiner system, this sample port was utilized to sample the signals being applied to the feedline and antenna system. Using a recently calibrated properly operating spectrum analyzer, the total signals from the sample port were connected through a series of step attenuators to establish the correct carrier level, taking care not to overload the input of the analyzer.

After the gain of the measurement system was established, a Trilithic adjustable VHF band pass filter was utilized to sweep the band of frequencies from 90 MHz to 600 KHz, with the output feeding the spectrum analyzer to reduce the undesired signals by at least 30 dB, assuring that there was no unwanted mixing in the input stages of the analyzer, and to allow examination of the band area where calculated and expected second order products might exist.

Station	Carrier Frequency	Calculated TPO	Operating ERP	Notes
K261FB	100.1 mHz	0.225 KW	0.250 KW	
K278DD	103.5 mHz	0.217 KW	0.250 KW	

The span of frequencies between 50 MHz and 600 MHz were checked for any evidence of intermod products resulting from the 2 stations transmitters being combined into one output, there were no spurious signals detected.


In addition to the expected frequencies shown above, a scan of frequencies from 50 MHz to 600 MHz was made, the results showed no abnormal spurious signals, and those signals that did show up were not attributable to the subject stations.

Based on the above measurements made at the time, it can be concluded that the above described transmission system is operating in accordance with Federal Communications Rules and Regulations.

Technical Certification. I, James R. Burt, Principal Engineer for BTA, Inc., a Company providing technical service to the Broadcast Industry, and having been involved in the field of radio engineering for more than 25 years, and hold FCC General Radio Telephone License number PG-15-6264, am familiar with the requirements and procedures for making RF Intermodulation Product measurements.

I hereby certify that the measurements discussed above were made by myself or under my supervision on June 26, 2021, and that all representations contained herein are true and accurate to the best of my knowledge.

DATE: 6/26/2021

BY: 
James R. Burt

K261FB & K278DD Intermod Measurements

June 26, 2021

Harmonic	Frequency	Measured	Reference	Actual	Pt 73.317d	Pass/Fail	Notes
Carrier	100.1	-12.00 DBM	-12				Carrier Reference calibration
Carrier	103.5	-12.00 DBM	-12				Carrier Reference calibration
2nd Order	200.2	-98.28 DBM	-12	-86.28 DBC	-73.00	Pass	
	203.6	-99.01 DBM	-12	-87.01 DBC	-73.00	Pass	
	207.0	-98.27 DBM	-12	-86.27 DBC	-73.00	Pass	
3rd Order	300.3	-98.88 DBM	-12	-86.88 DBC	-73.00	Pass	
	303.7	-98.69 DBM	-12	-86.69 DBC	-73.00	Pass	
	307.1	-96.24 DBM	-12	-84.24 DBC	-73.00	Pass	
	310.5	-98.87 DBM	-12	-86.87 DBC	-73.00	Pass	
4th Order	400.4	-99.79 DBM	-12	-87.79 DBC	-73.00	Pass	
	403.8	-99.80 DBM	-12	-87.80 DBC	-73.00	Pass	
	407.2	-97.21 DBM	-12	-85.21 DBC	-73.00	Pass	
	410.6	-97.25 DBM	-12	-85.25 DBC	-73.00	Pass	
	414.0	-98.69 DBM	-12	-86.69 DBC	-73.00	Pass	
5th Order	500.5	-99.33 DBM	-12	-87.33 DBC	-73.00	Pass	
	503.9	-98.21 DBM	-12	-86.21 DBC	-73.00	Pass	
	507.3	-96.30 DBM	-12	-84.30 DBC	-73.00	Pass	
	510.7	-99.10 DBM	-12	-87.10 DBC	-73.00	Pass	
	514.1	-98.80 DBM	-12	-86.80 DBC	-73.00	Pass	
	517.5	-96.11 DBM	-12	-84.11 DBC	-73.00	Pass	

The above frequencies were identified using intermodulation product calculating software and the it indicated possible combining frequencies. These frequencies were checked for any existence of out of band energy as produced by the two transmitted frequencies.

Based on the measured results I can conclude that the FM Translators, and diplexer system was operating in compliance with FCC Rule Part 73.317d at the time of measurements were made.

Sincerely,

