

FM Combiner Measurements

W242CB & W298BI
Community Broadcasters, LLC
Florence, SC

8/22/2021

Albert Broadcast Services, Inc.

Overview

Community Broadcasters, LLC has filed an application to modify the antenna height of W298BI (107.5 MHz), co-located with, and operating into the same antenna as station W242CB (96.3 MHz). As such, sufficient measurements to ensure compliance with 47 C.F.R. 73.317 rules regarding spurious signal transmission was required. The report contained herein certifies compliance with the applicable rules for combining two transmitters into a common antenna.

The two stations seek to operate into a combiner/filter arrangement feeding a common antenna on a tower located West of the junction of I-20 and I-95 in Florence County, SC.

This report certifies that the as-built operation, depicted in Figure 1 was measured for compliance with FCC rule section 47 C.F.R. Sections 73.317(b) through 73.317(d) including standards for occupied bandwidth emissions, as well as for certifying that the Shively Labs - provided combiner/filter arrangement was installed correctly and performing per the manufacturer's specifications.

In summary, both stations, W242CB and W298BI were found to be in compliance with all applicable FCC rules and NRSC recommended practices when simultaneously operated through the combiner/filter system.

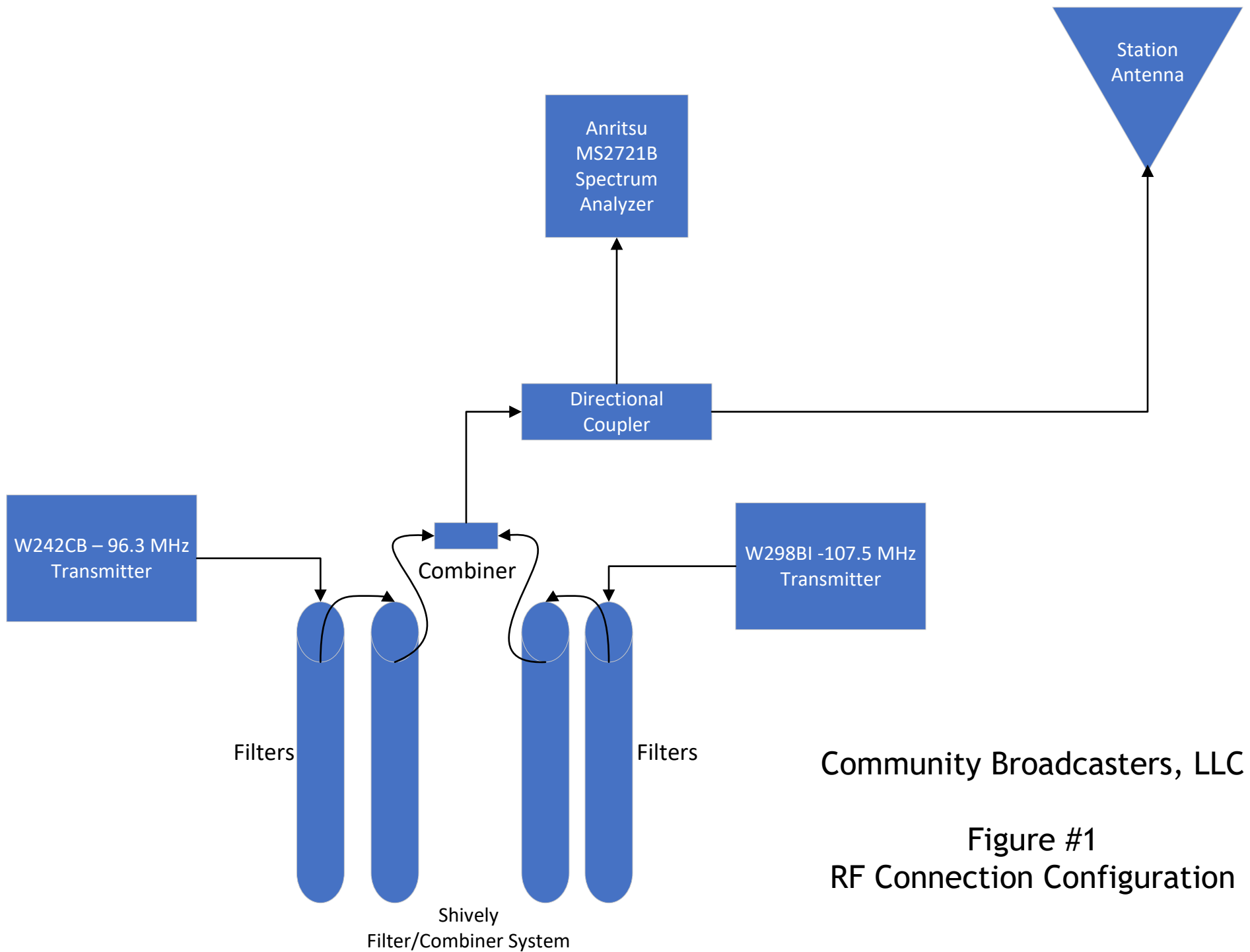


Figure #1
RF Connection Configuration

W242CB - 96.3 MHz
Occupied Bandwidth Measurements
8/22/2021

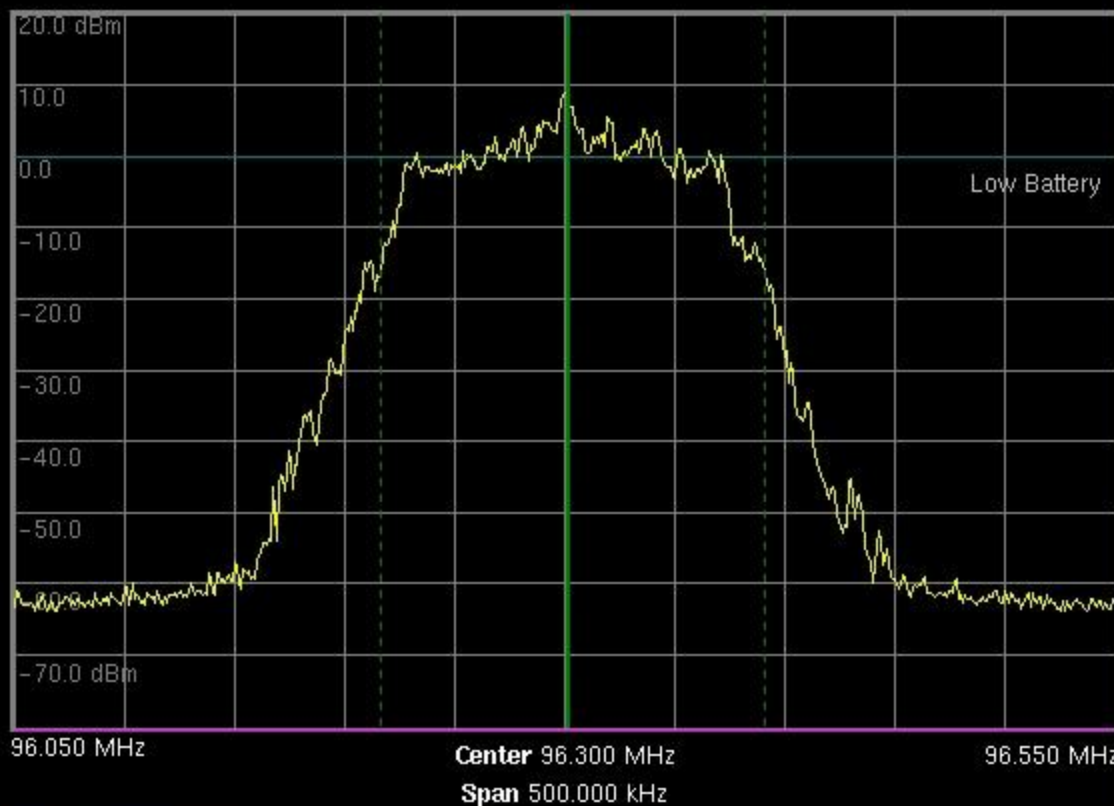
The measurements contained in this report were obtained with the use of an Anritsu Spectrum Analyzer, Model MS2721B serial number 0720137 by Albert Broadcast Services, Inc., Charlotte, NC on August 22, 2021.

The measurements were taken at the output terminal of the W242CB/W298BI transmission line combiner, through a suitable directional coupler.

All measurements were taken with a 1 KHz resolution bandwidth at 3 MHz video bandwidth with a measurement span to allow for accurate averaging of modulation peaks filling the occupied bandwidth, except where noted.

The requirements for FM transmission system occupied bandwidth limitations are outlined in FCC Rules and Regulations, paragraph 73.317. Station W242CB met the requirements of these rules at the time of this measurement.

Emissions between 120 kHz and 240 kHz were found to be below 25 dB. The Occupied Bandwidth emission products within this range totaled no more than 175.136 KHz. Emissions between 240 kHz and 600 kHz were measured under 35 dB and emissions greater than 600 kHz removed from the un-modulated carrier were greater than 67 dB down from the carrier reference ($43 + 10 \log^{10} (250 \text{ Watts})$ dB).

**Ref Lvl**
20.0 dBm**Input Atten**
40.0 dB**Detection**
Peak**#RBW**
1 kHz**VBW**
300 Hz**Sweep Time**
199 ms**Traces**
A: Max Hold
B: Trace Hold
C: Trace Hold**Sweep**
Continuous**Freq Ref**
Int Std Accy

Occ BW dB Down

> dBc 25

Occ BW: 175.136 kHz

Measured : 99.84 %

Freq

Amplitude

Span

BW

Marker



Save

a b c

d e f

g h i

j k l

m n o

p q r

s t u

v w x

y z - _ +

Back Space

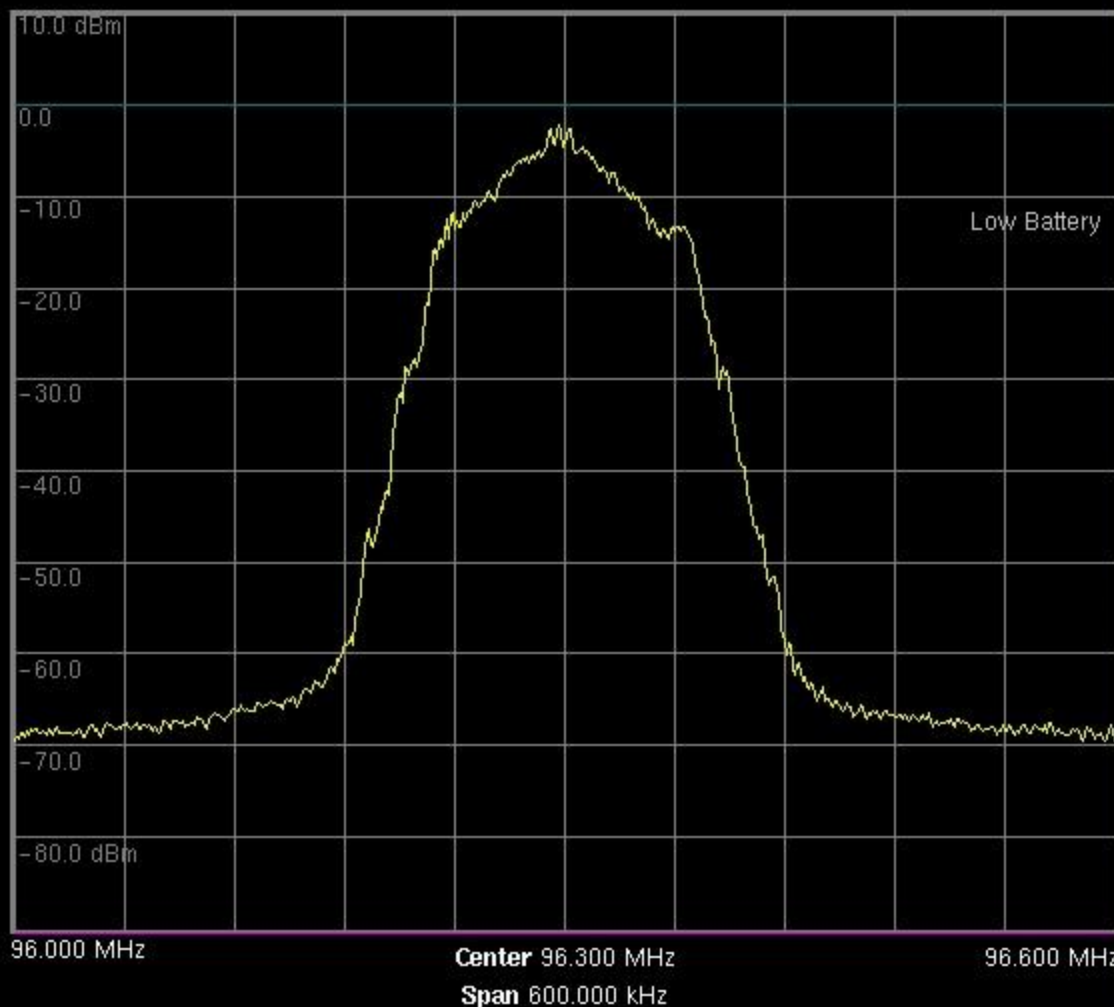
Change

Save

Location

Change Type

Setup/JPEG/...

Ref Lvl
10.0 dBm**Input Atten**
30.0 dB**Detection**
Peak**#RBW**
1 kHz**#VBW**
3 MHz**Sweep Time**
207 ms**Traces**
A: Average
B: Trace Hold
C: Trace Hold**Trace Count**
50/50**Sweep**
Continuous**Freq Ref**
Int Std Accy

Freq

Amplitude

Span

BW

Marker



Save

a b c

d e f

g h i

j k l

m n o

p q r

s t u

v w x

y z - _ +

Back Space

Change

Save

Location

Change Type

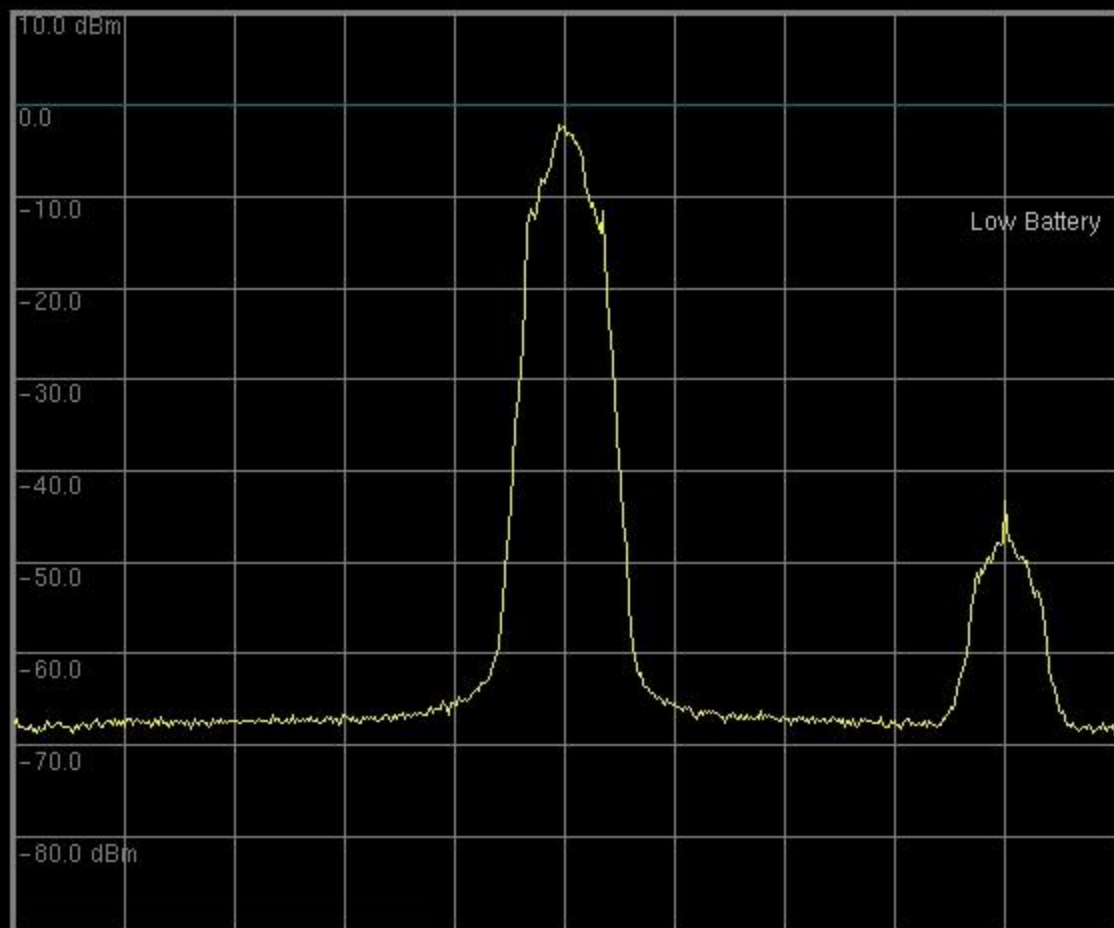
Setup/JPEG/...

Ref Lvl
10.0 dBm**Input Atten**
30.0 dB**Detection**
Peak**#RBW**
1 kHz**#VBW**
3 MHz**Sweep Time**
516 ms**Traces**

A: Average

B: Trace Hold

C: Trace Hold

Trace Count
50/50**Sweep**
Continuous**Freq Ref**
Int Std Accy

95.300 MHz

Center 96.300 MHz

97.300 MHz

Span 2.000 MHz

Freq

Amplitude

Span

BW

Marker



Save

a b c

d e f

g h i

j k l

m n o

p q r

s t u

v w x

y z - _ +

Back Space

Change

Save

Location

Change Type

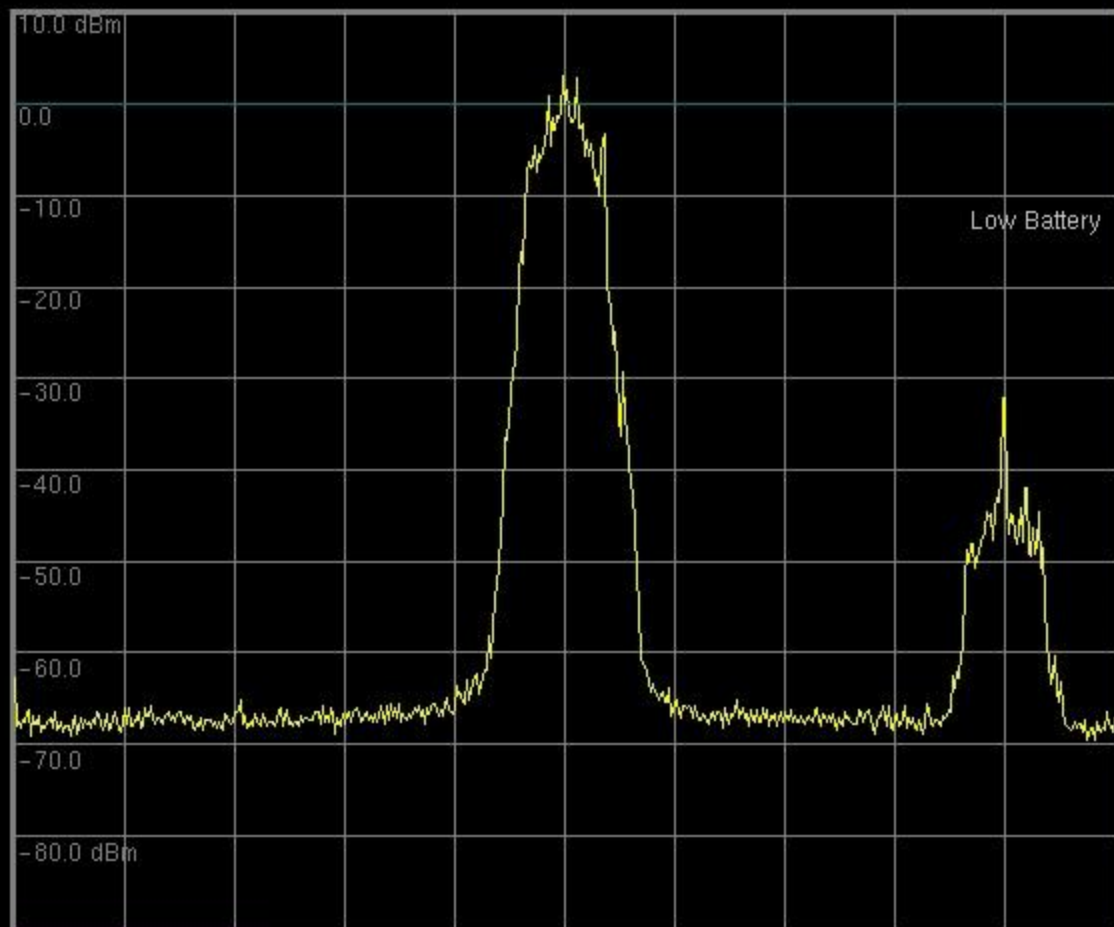
Setup/JPEG/...

Ref Lvl
10.0 dBm**Input Atten**
30.0 dB**Detection**
Peak**#RBW**
300 Hz**#VBW**
3 MHz**Sweep Time**
1.449 s**Traces**

A: Max Hold

B: Trace Hold

C: Trace Hold

Sweep
Continuous**Freq Ref**
Int Std Accy

95.300 MHz

Center 96.300 MHz

97.300 MHz

Span 2.000 MHz

Freq

Amplitude

Span

BW

Marker

W298BI – 107.5 MHz
Occupied Bandwidth Measurements
8/22/2021

The measurements contained in this report were obtained with the use of an Anritsu Spectrum Analyzer, Model MS2721B serial number 0720137 by Albert Broadcast Services, Inc., Charlotte, NC on August 22, 2021.

The measurements were taken at the output terminal of the W242CB/W298BI transmission line combiner, through a suitable directional coupler.

All measurements were taken with a 1 KHz resolution bandwidth at 3 MHz video bandwidth with a measurement span to allow for accurate averaging of modulation peaks filling the occupied bandwidth, except where noted.

The requirements for FM transmission system occupied bandwidth limitations are outlined in FCC Rules and Regulations, paragraph 73.317. Station W298BI met the requirements of these rules at the time of this measurement.

Emissions between 120 kHz and 240 kHz were found to be below 25 dB. The Occupied Bandwidth emission products within this range totaled no more than 155.172 KHz. Emissions between 240 kHz and 600 kHz were measured under 35 dB and emissions greater than 600 kHz removed from the un-modulated carrier were greater than 67 dB down from the carrier reference ($43 + 10 \log^{10} (250 \text{ Watts})$ dB).



Spectrum Analyzer

Save

a b c

d e f

g h i

j k l

m n o

p q r

s t u

v w x

y z - _ +

Back Space

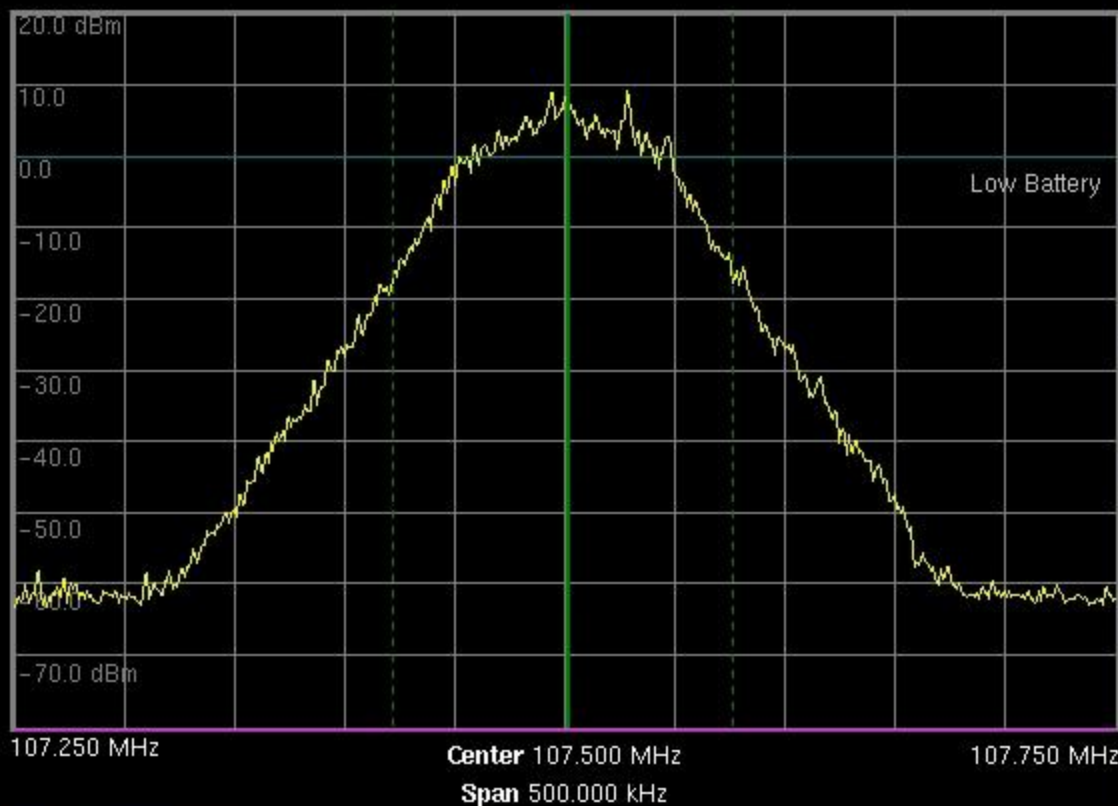
Change

Save

Location

Change Type

Setup/JPEG/...

Ref Lvl
20.0 dBm**Input Atten**
40.0 dB**Detection**
Peak**#RBW**
1 kHz**#VBW**
300 Hz**Sweep Time**
199 ms**Traces**
A: Max Hold
B: Trace Hold
C: Trace Hold**Sweep**
Continuous**Freq Ref**
Int Std Accy

Occ BW dB Down

> dBc 25

Occ BW: 155.172 kHz

Measured : 99.83 %

Freq

Amplitude

Span

BW

Marker



Save

a b c

d e f

g h i

j k l

m n o

p q r

s t u

v w x

y z - _ +

Back Space

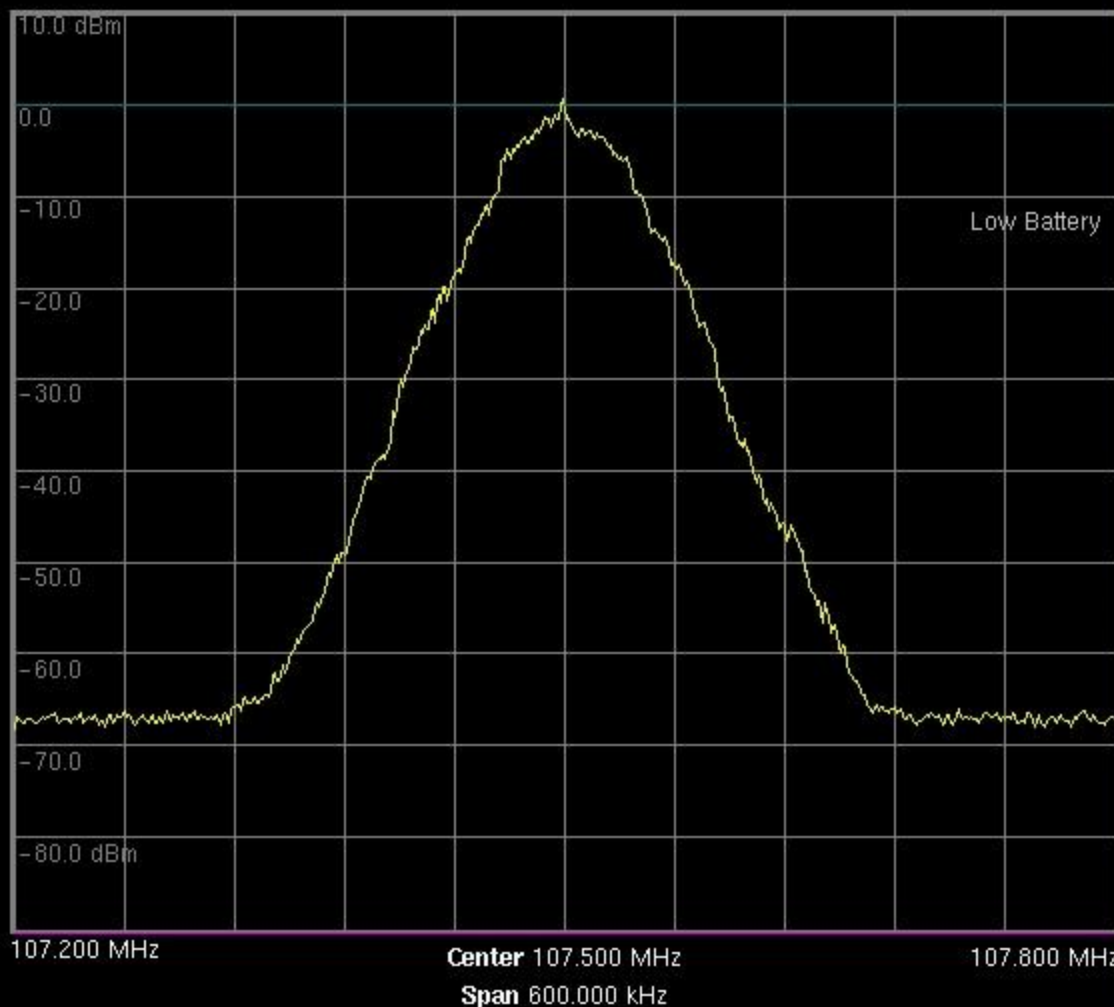
Change

Save

Location

Change Type

Setup/JPEG/...

Ref Lvl
10.0 dBm**Input Atten**
30.0 dB**Detection**
Peak**#RBW**
1 kHz**#VBW**
3 MHz**Sweep Time**
207 ms**Traces**
A: Average
B: Trace Hold
C: Trace Hold**Trace Count**
50/50**Sweep**
Continuous**Freq Ref**
Int Std Accy

Freq

Amplitude

Span

BW

Marker



Save

a b c

d e f

g h i

j k l

m n o

p q r

s t u

v w x

y z - _ +

Back Space

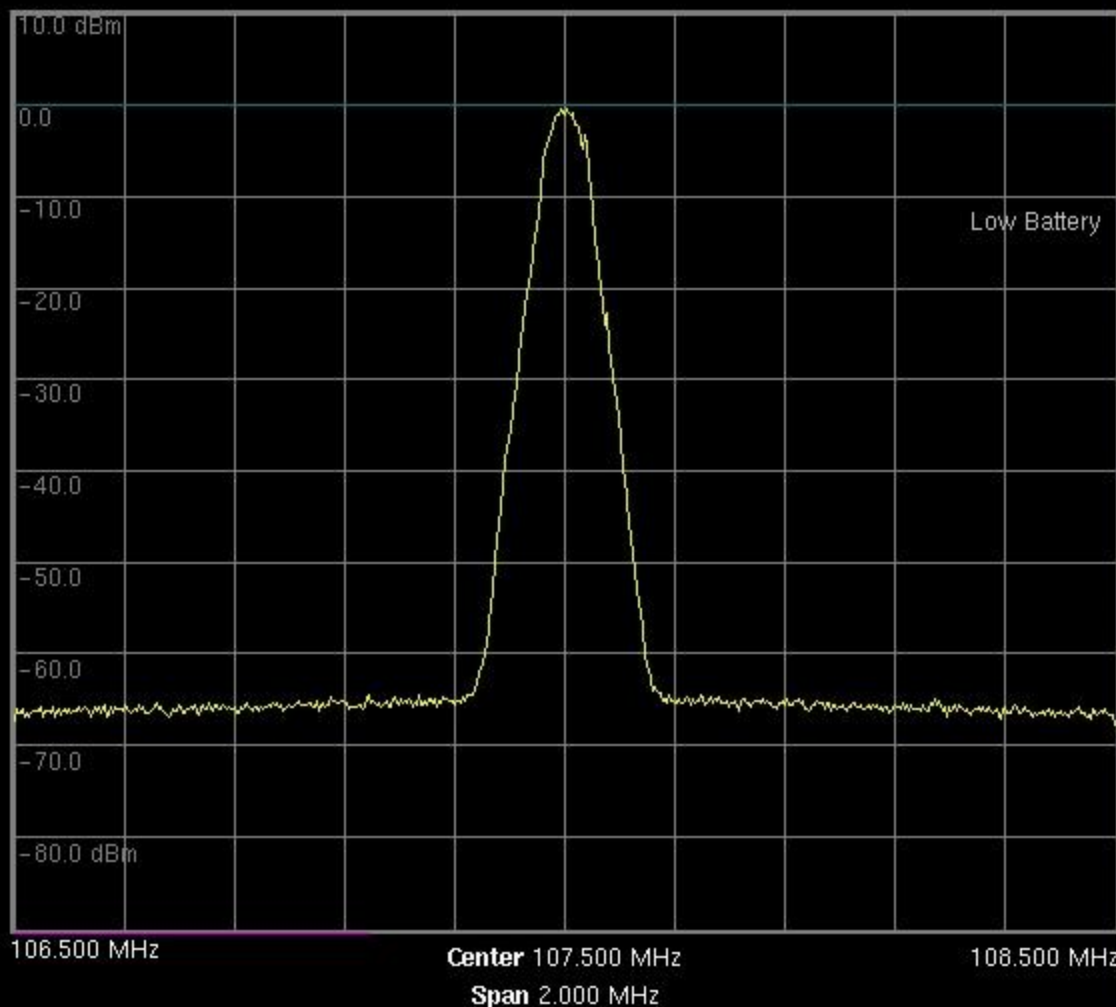
Change

Save

Location

Change Type

Setup/JPEG/...

Ref Lvl
10.0 dBm**Input Atten**
30.0 dB**Detection**
Peak**#RBW**
1 kHz**#VBW**
3 MHz**Sweep Time**
516 ms**Traces**
A: Average
B: Trace Hold
C: Trace Hold**Trace Count**
50/50**Sweep**
Continuous**Freq Ref**
Int Std Accy

Freq

Amplitude

Span

BW

Marker



Save

a b c

d e f

g h i

j k l

m n o

p q r

s t u

v w x

y z - _ +

Back Space

Change

Save

Location

Change Type

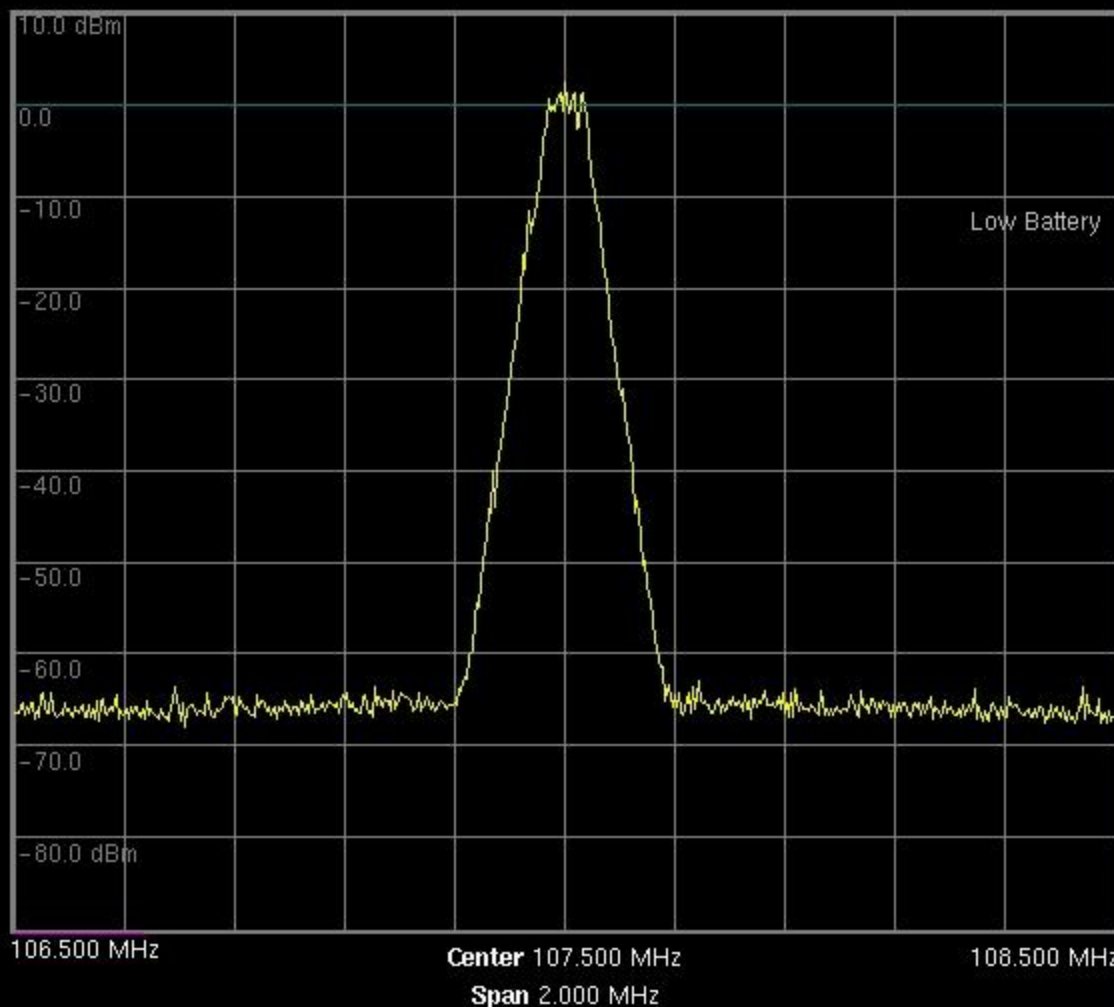
Setup/JPEG/...

Ref Lvl
10.0 dBm**Input Atten**
30.0 dB**Detection**
Peak**#RBW**
300 Hz**#VBW**
3 MHz**Sweep Time**
1.449 s**Traces**

A: Max Hold

B: Trace Hold

C: Trace Hold

Sweep
Continuous**Freq Ref**
Int Std Accy

Freq

Amplitude

Span

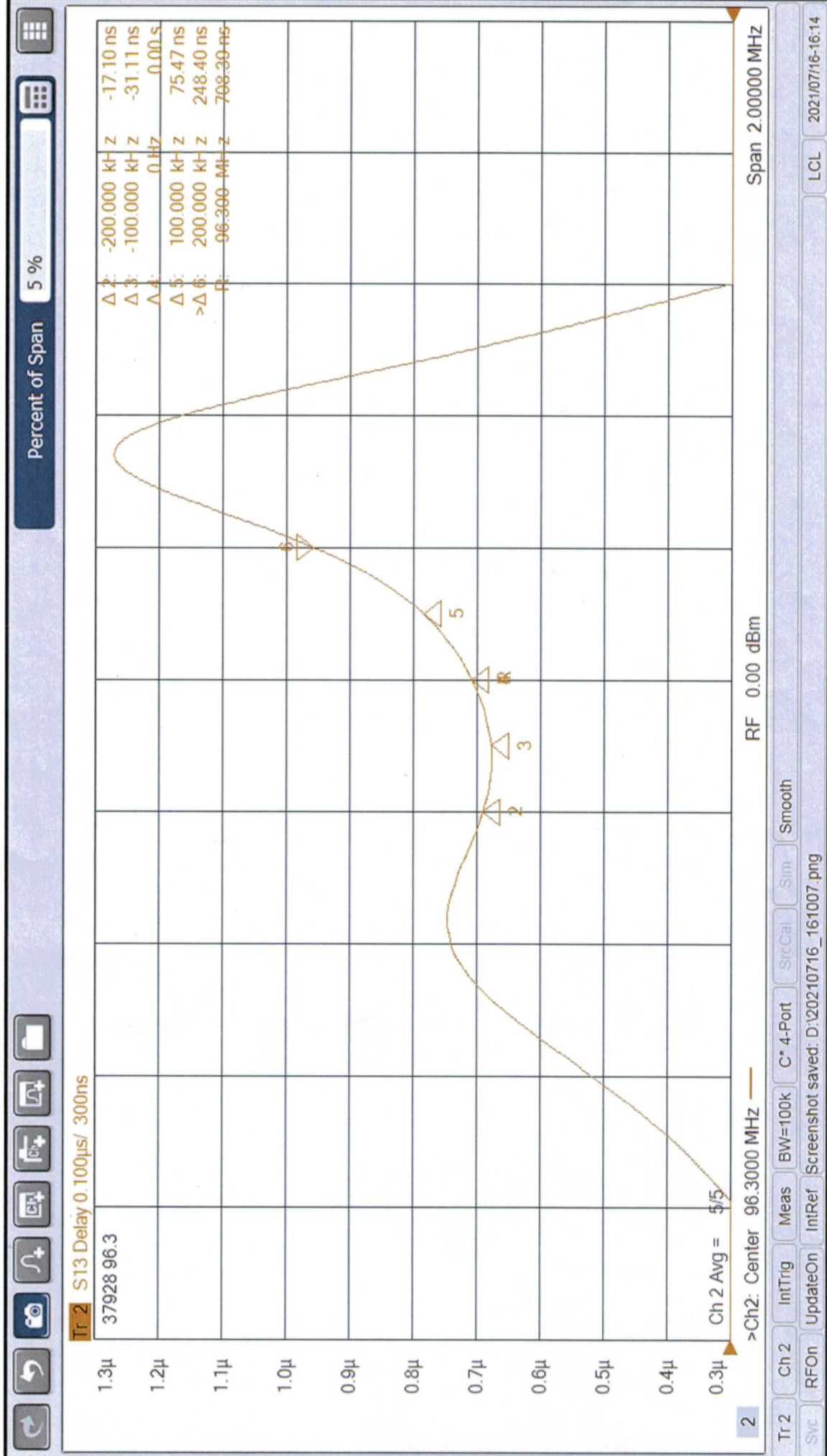
BW

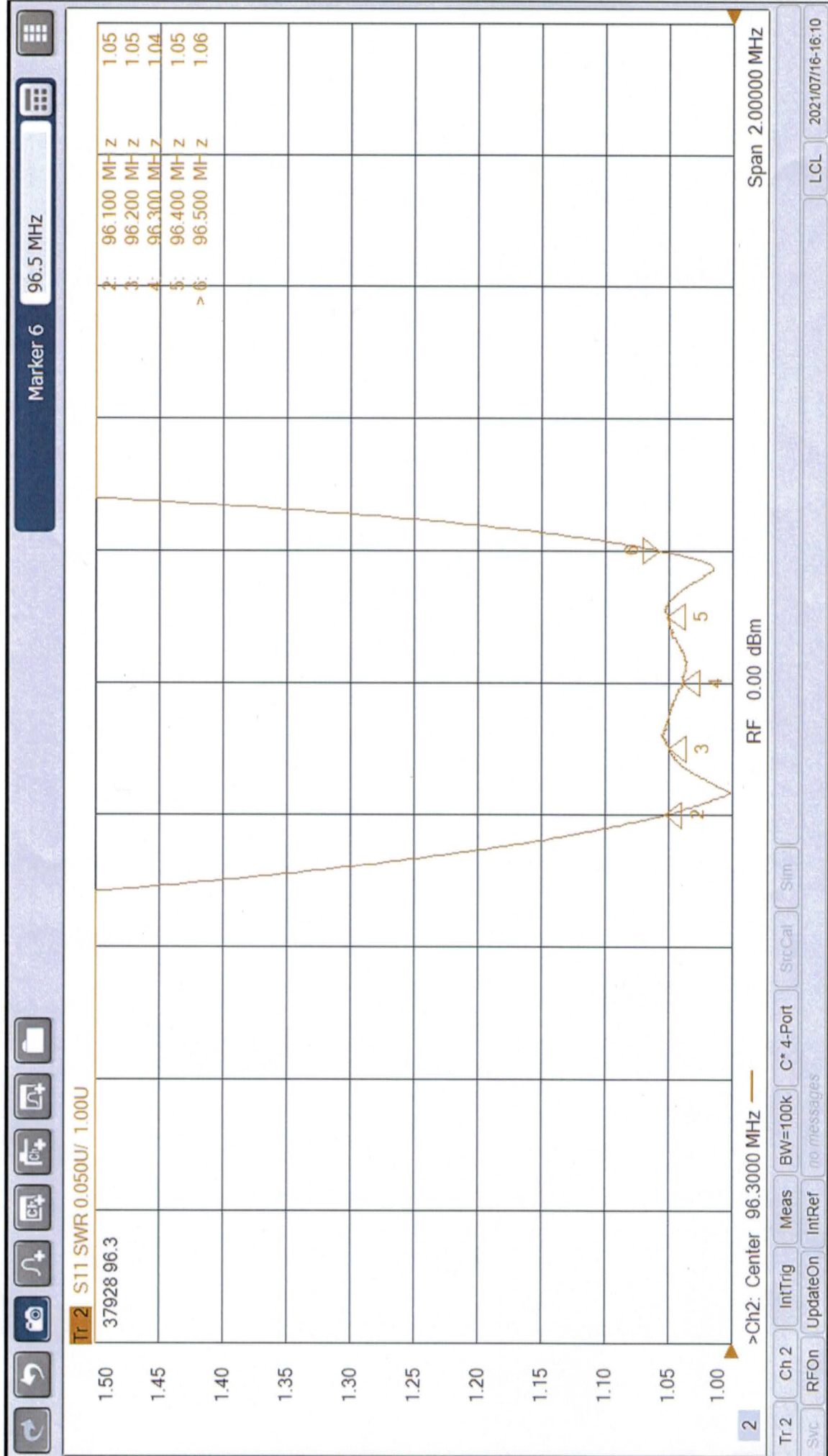
Marker

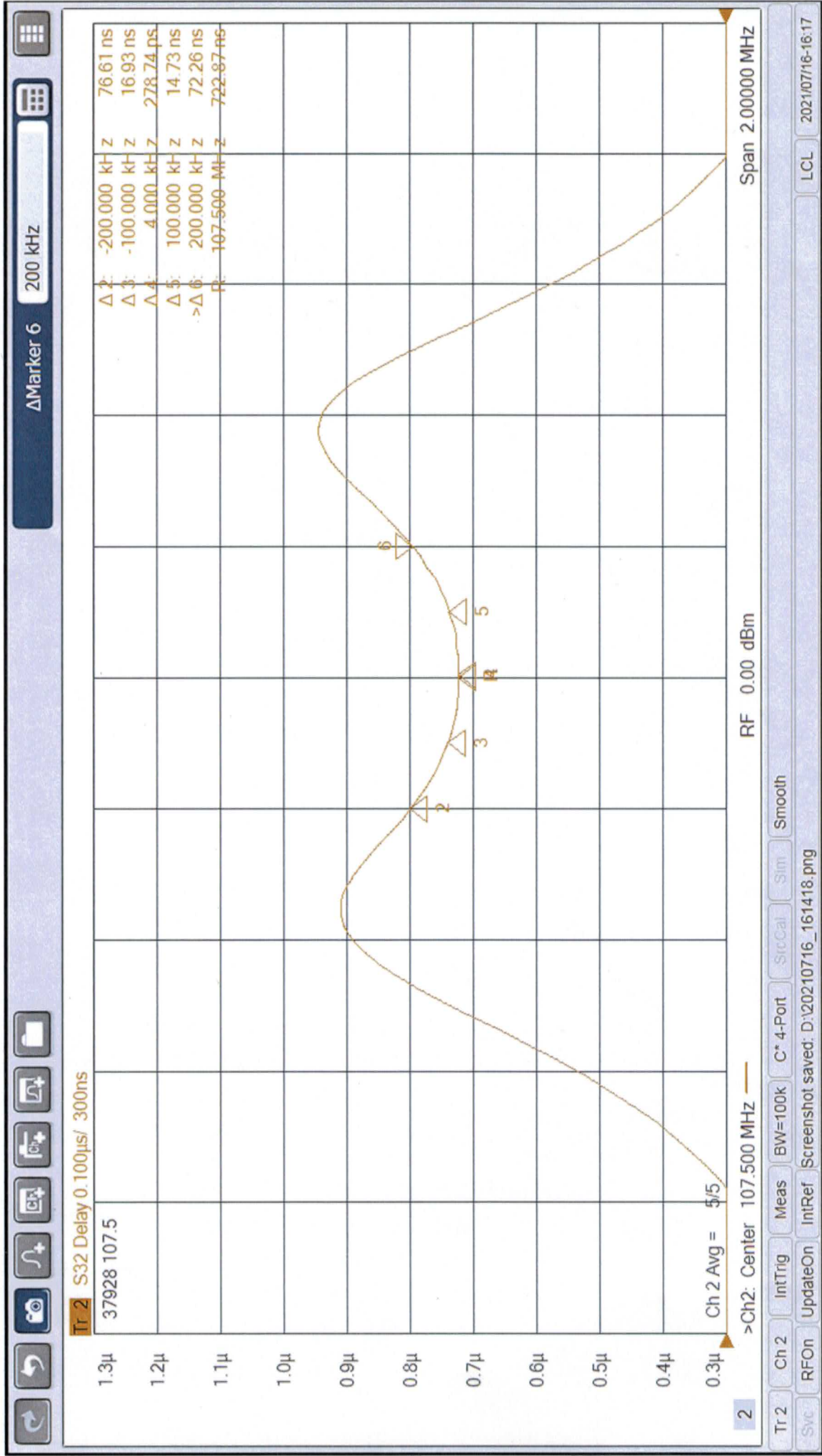
Combined Filter Measurements

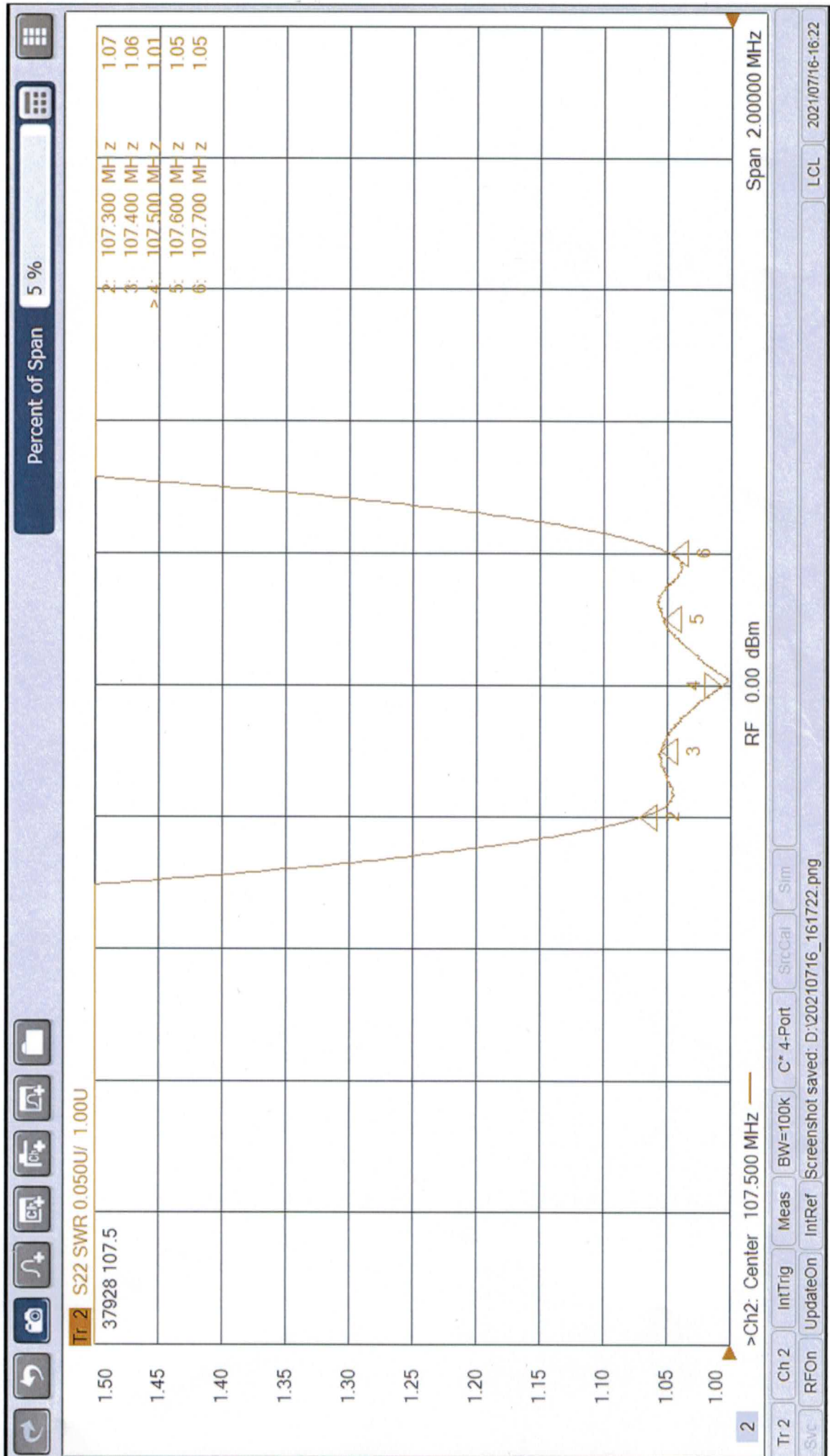
8/22/2021

The swept response measurements of the combiner/filter arrangement were completed and supplied by the manufacturer, Shively Labs, and are made a part of this report. Additionally, an RF sweep of the spectrum sufficient to show the sum and difference frequencies for W242CB and W298BI was made with both stations operating at their permitted RF amplitudes. The spectrum analyzer was connected via a suitable directional coupler at the output terminals of the diplexer filter, with the station antenna connected as the normal load. No out-of-tolerance spurious emissions were noted in the entire RF spectrum, indicating that the stations operate satisfactorily with this diplexer arrangement.











Spectrum Analyzer

Save

a b c

d e f

g h i

j k l

m n o

p q r

s t u

v w x

y z - _ +

Back Space

Change

Save

Location

Change Type

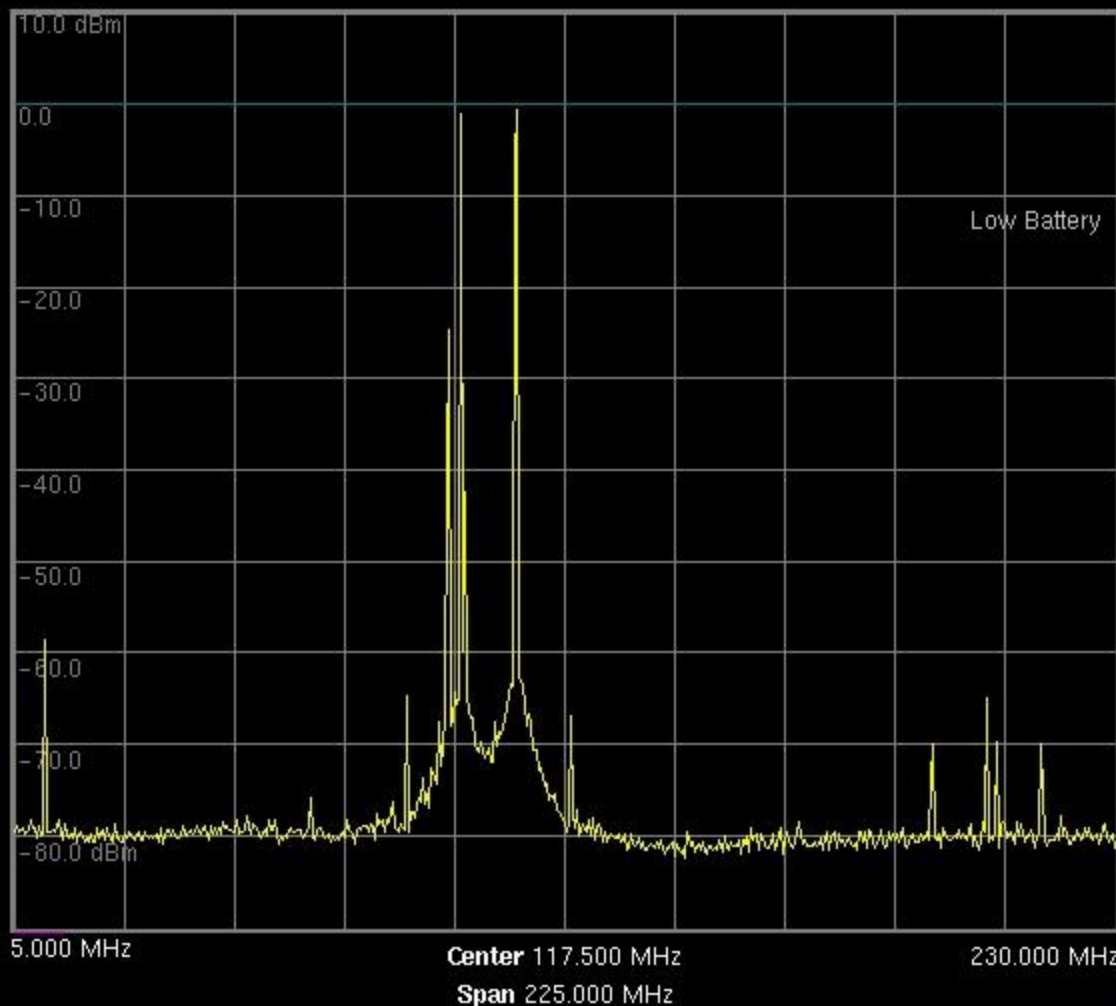
Setup/JPEG/...

Ref Lvl
10.0 dBm**Input Atten**
30.0 dB**Detection**
Peak**#RBW**
1 kHz**#VBW**
300 Hz**Sweep Time**
1.1242 min**Traces**

A: Max Hold

B: Trace Hold

C: Trace Hold

Sweep
Continuous**Freq Ref**
Int Std Accy

Freq

Amplitude

Span

BW

Marker

Certification

I hereby certify that I am a technical consultant to radio and television stations throughout the United States of America, with over 45 years of experience in broadcast engineering.

My qualifications are a matter of record with the Federal Communications Commission.

I have prepared the report herein and certify that all facts herein are true and accurate to the best of my knowledge and belief.

A handwritten signature in black ink, appearing to read 'Steward R. Albert', with a large, stylized initial 'S' and 'A'.

Steward R. Albert, President
Albert Broadcast Services, Inc.
PO Box 11836
Charlotte, NC 28220-1836
(704) 507-4987