

## Qualification Of Engineer

Thomas B. Jones, III declares and states that he is the proprietor of Communication Electronics Engineering in Montgomery, Alabama, and has been certified by the Society of Broadcast Engineers as a Professional Broadcast Engineer.

He also states that he has held an FCC First Class Radiotelephone license since October of 1969, and presently holds FCC license PG-6-8609, and that his qualifications have been previously given and accepted by the Federal Communications Commission.

A handwritten signature in dark ink, appearing to read 'T. B. Jones III', with a stylized flourish at the end.

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Thomas B. Jones, III

Executed on this 9th day of September, 2011.

## **Procedure**

The translator stations W263BX and W285AJ licensed to Katherine Timmerman Hagler are being combined with WQKS licensed to Bluewater Broadcasting, LLC by means of EXIR FM Combiner.

The required checks for spurious intermodulation products between WQKS operating on 96.1 MHz., W263BX operating on 100.5 MHz., and W285AJ operating on 104.9 MHz., concerns the following frequencies:

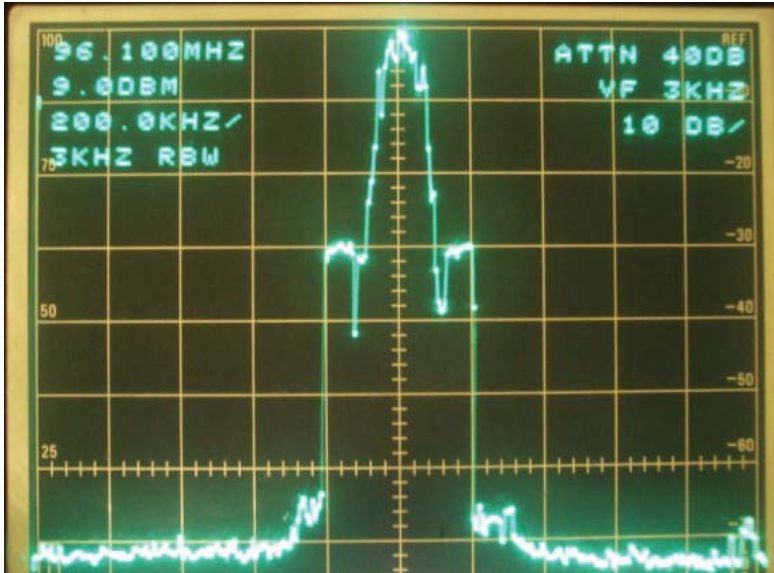
87.3 MHz  
91.7 MHz  
104.9 MHz  
113.7 MHz  
292.7 MHz  
297.1 MHz  
305.9 MHz

The required checks between the 104.9 MHz transmitter and the 100.5 MHz transmitter concerns these additional frequencies:

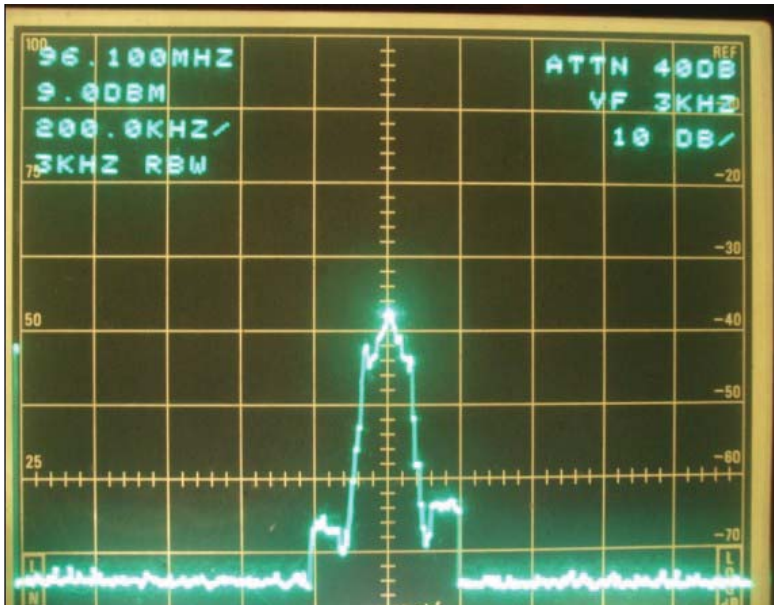
96.1 MHz  
109.3 MHz  
305.9 MHz  
310.3 MHz

The transmitters operating on 96.1 MHz., 100.5 MHz., and 104.9 MHz. Were set for normal operation; 900 Watts on 96.1 MHz., 99 Watts on 104.9 MHz. and 80 Watts on 100.5 MHz.

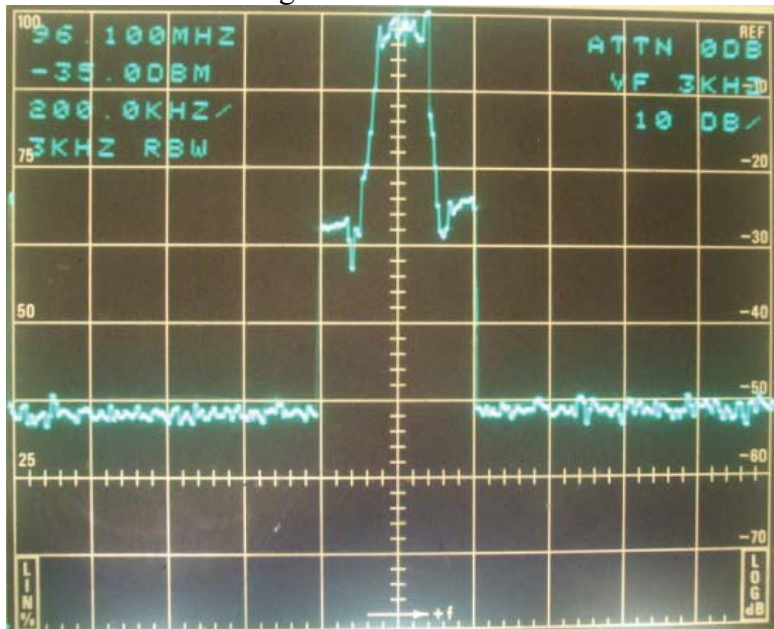
A Tektronix model 2710 spectrum analyzer was initialized and connected by means of a sample element placed into the output line section of the combiner. The gain of instrument was adjusted to give a full scale reading at 96.1 MHz. as this is the most powerful of the three transmitters. This is a photo of the result:



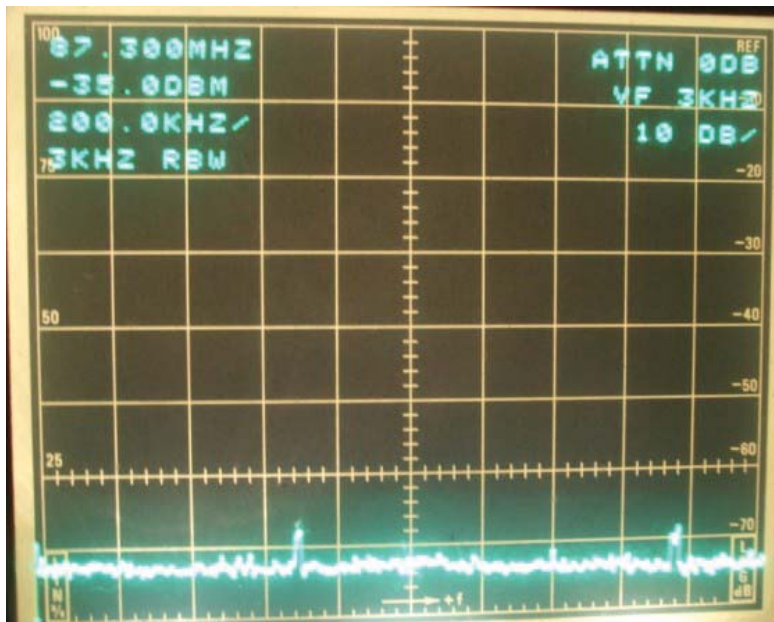
Since the resolution of the analyzer is only 70 dB, a notch filter tuned to 96.1 MHz. was placed in series with the sample element line and this photo shows there was a loss of 38 dB at 96.1 MHz.:



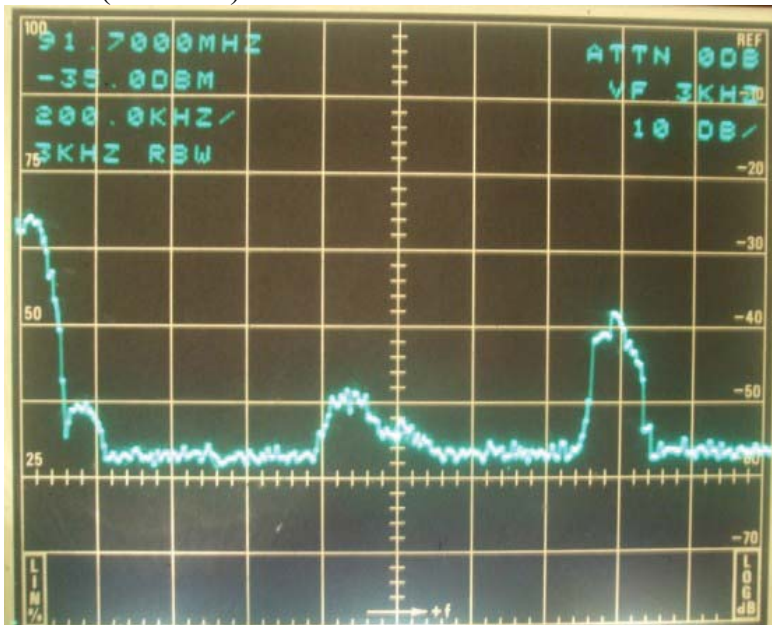
The gain of the instrument was again adjusted to bring the notched reference level to full scale and thus give a resolution of -108 dB:



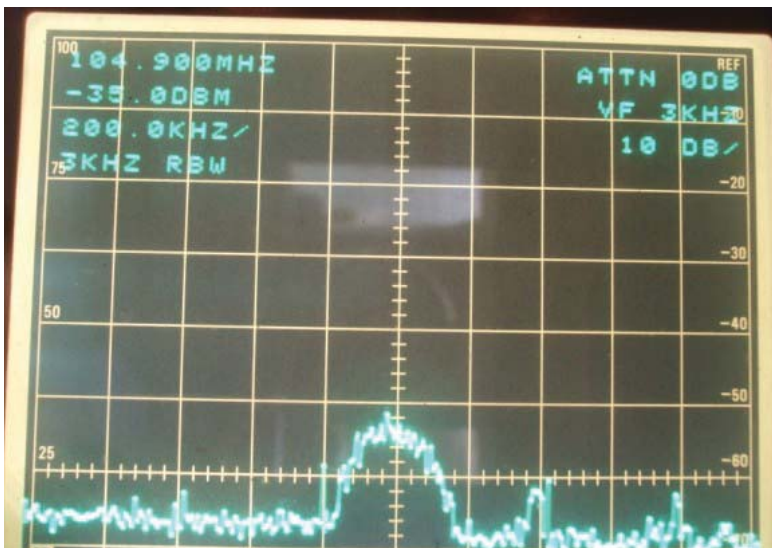
The check for emissions at 87.3 MHz shows attenuation in excess of 103 dB.:



A check for spurious emissions at 91.7 MHz. showed nothing above -90 dB (-52 + -38):



The transmitter operating on 104.9 MHz. was turned off in order to observe possible spurious signals centered at that frequency, and none were found:



The signal seen was identified as the co-channel station WOAB-FM in Ozark, Alabama and is 90 dB down from the 96.1 reference.

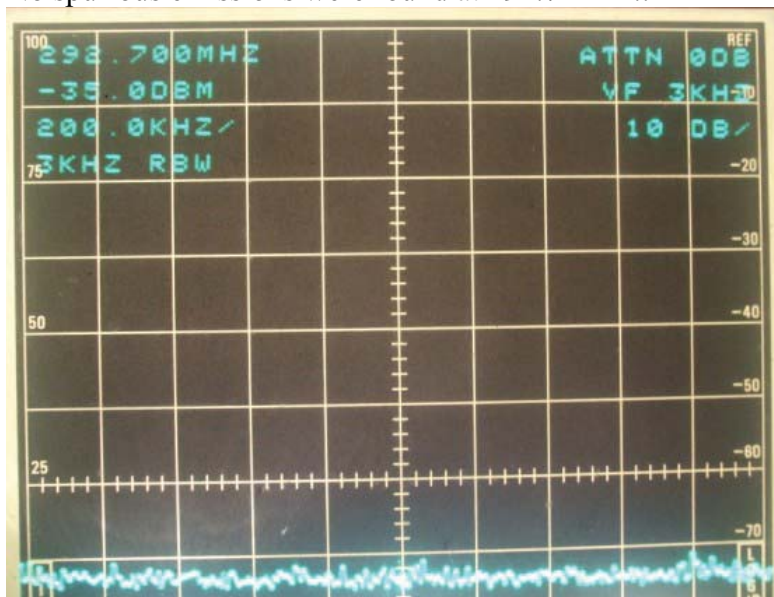


The local transmitter at 104.9 MHz. was returned to operation, and the remaining measurements of interaction between the three transmitters were made.

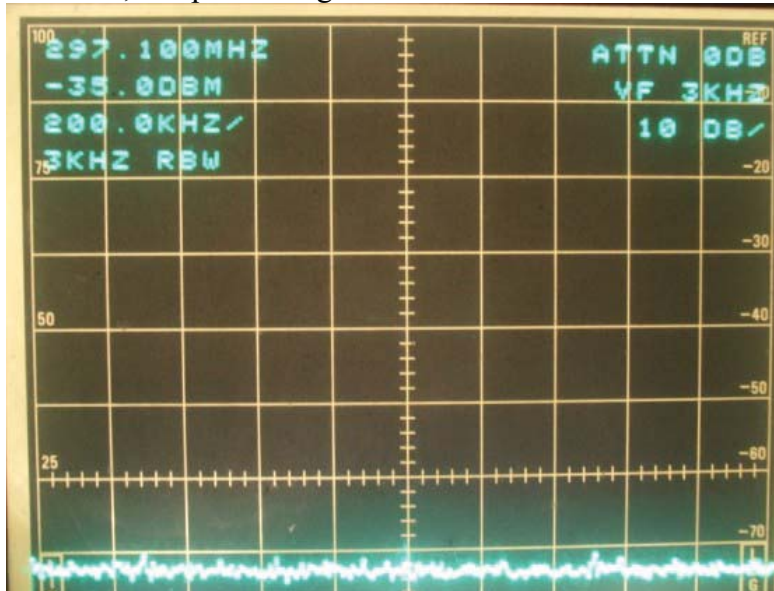
There was no spurious signal found at 113.7 MHz.:



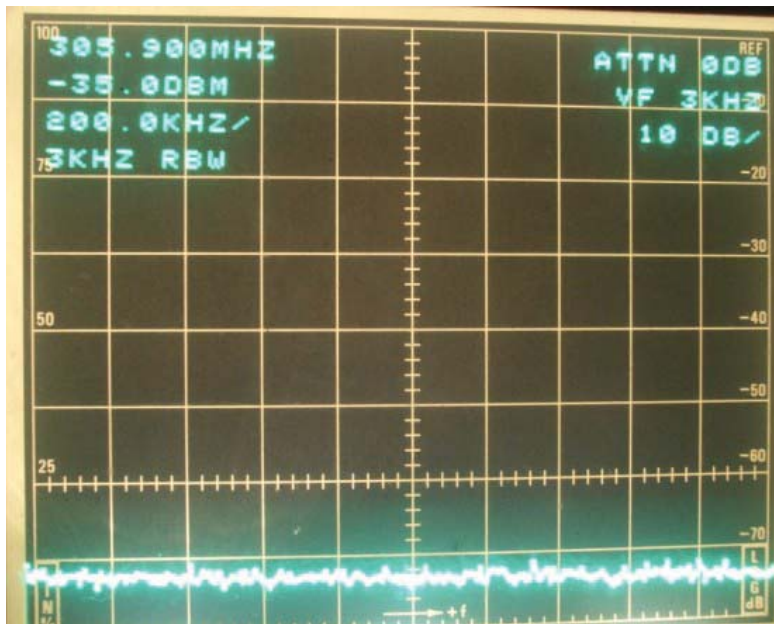
No spurious emissions were found at 292.7 MHz.:



Likewise, no spurious signals were seen at 297.1 MHz.:

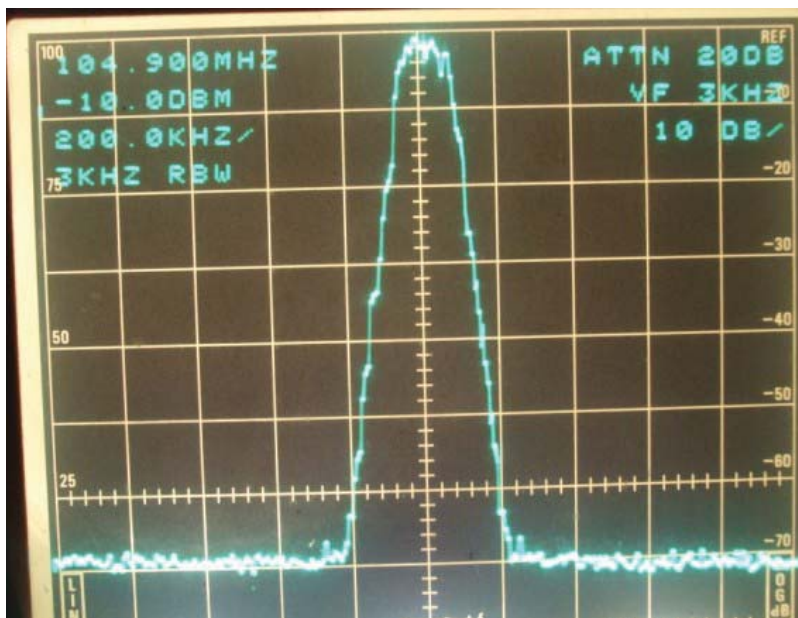


The final check with regard to 96.1 MHz plus the other two transmitters was made at 305.9 MHz.:



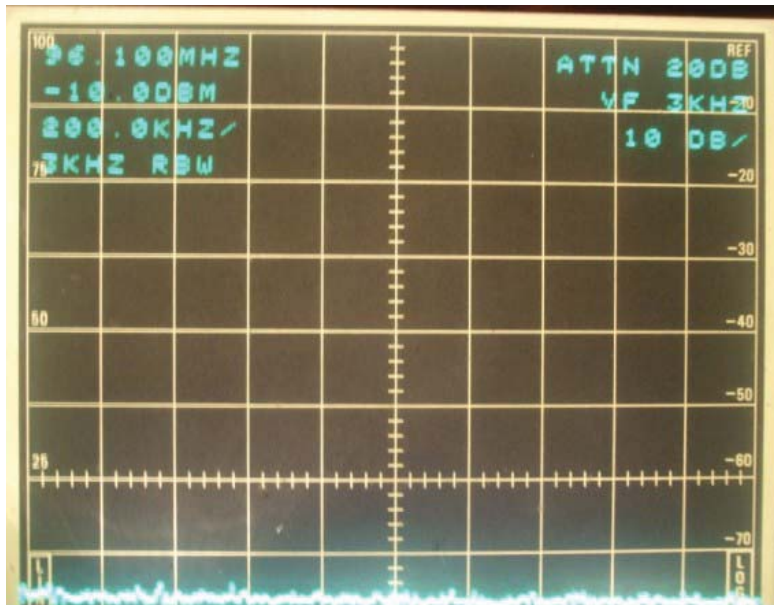
Section “D” of 73.317 stipulates that any emission appearing on a frequency removed from the carrier by more than 600 kHz must be attenuated at least  $43 + 10 \log_{10}(\text{Power in Watts})$  dB below the level of the unmodulated carrier, or 80 dB, whichever is the least attenuation. In measuring the interaction of the 104.9 MHz. transmitter and the 100.5 MHz. transmitter, the highest transmitter power level is 135 Watts on 104.9 MHz. Therefore the required attenuation is 64.3 dB which falls into the normal measurement range of the 2710 analyzer. Therefore the notch filter was removed for all subsequent measurements, and the 104.9 MHz. transmitter was used as the reference.

This photo shows the initial setup without the notch filter connected:

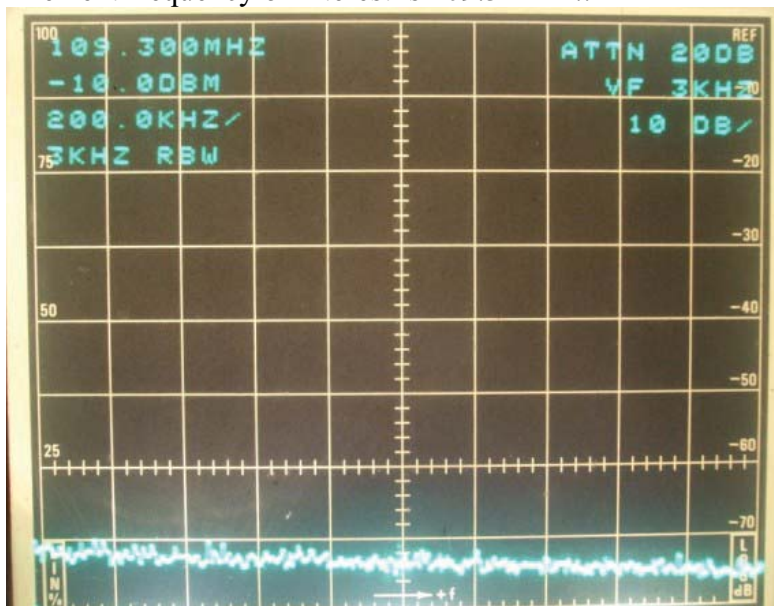




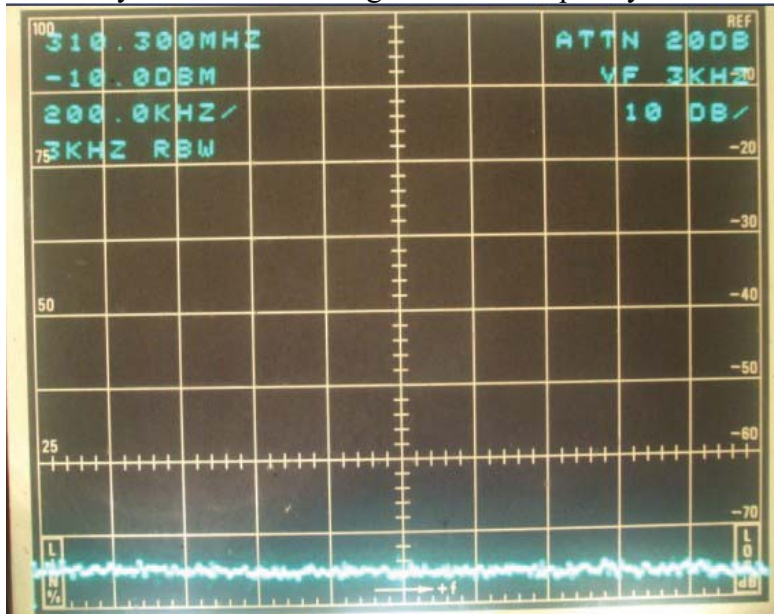
The local transmitter operating at 96.1 MHz. was turned off long enough to check for spurious signals being generated at that frequency.:



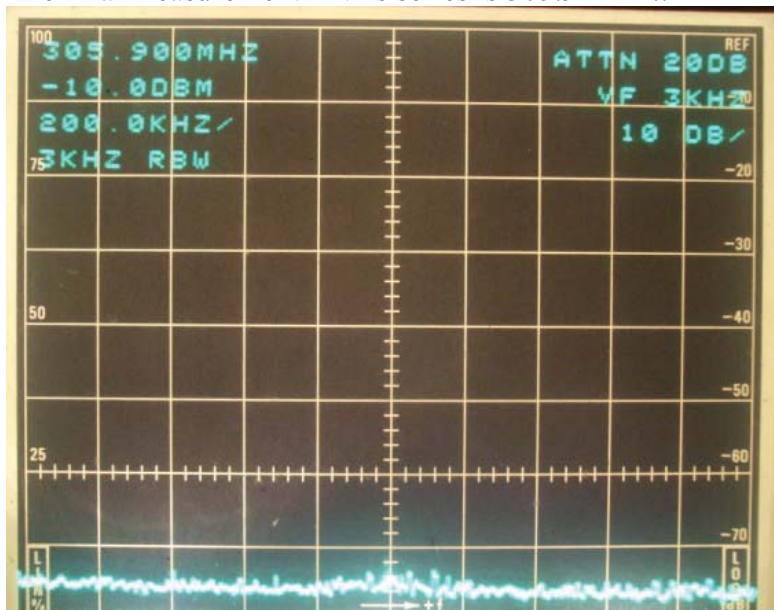
The next frequency of interest is 109.3 MHz.:



The analyzer was then configured for a frequency of 310.3 MHz.:



The final measurement in this series is 305.9 MHz.:



## Data Tabulation

Frequency:	Attenuation:
87.3 MHz	103dB
91.7 MHz	90dB
104.9 MHz	90dB
113.7 MHz	>105dB
292.7 MHz	>105dB
297.1 MHz	>105dB
305.9 MHz	>105dB

96.1 MHz	>70dB
109.3 MHz	>70dB
305.9 MHz	>70dB
310.3 MHz	>70dB

## **Conclusion**

The operation of the combined facilities of WQKS, W285AJ, and W263BX exhibit no emissions outside their licensed values.

## **Equipment List**

Tektronix Model 2710 Spectrum Analyzer s/n BO21068

Eagle Manufacturing Model TNF-200 notch filter

Bird Electronics 50 dB 25-1000MHz. sample element

RG-58 cables for interconnection