RADIO STATION KFMK

PROOF OF PERFORMANCE MEASUREMENTS

October 1978

Ronald D. Haney
Chief Engineer
The following equipment performance measurements for Radio Station KFMK were conducted on the nights of October 21 and October 29, 1978 between 12 midnight and 6am. All measurements were made by, or directly under the supervision of Ronald D. Haney (license # P1-9-11388) chief engineer of KFMK. Kevin R. Wyne and Michael D. Eggebrecht both third class operators regularly employed by KFMK as announcer/operators assisted in the tests. The test equipment specified in the attached equipment list was used for all of the measurements and was connected as shown in the accompanying equipment connection diagram.

Prior to its use, the test equipment frequency response was checked and found to be within 0.1 dB from 30 hertz to 30,000 hertz. The residual hum and noise and distortion contained in the audio generator and harmonic distortion analyzer combined was measured at 0.05%.

All station equipment was adjusted for normal operation and all equipment used in the system between the microphone input and the transmitting antenna was included in the tests. The compression of the Collins 26U-2 was disabled by removing the tubes producing the control voltage. The Tapco reverberation unit and the UREI equalizer were disabled by switching them "out". The CBS 4110 was put in the test position. Measurements were made for each of the stereo channels with the transmitter in the stereo mode. The right channel was selected on the exciter for all mono tests.

The frequency response of the system was measured by adjusting the audio generator to produce the modulation level indicated with the modulating frequencies indicated (1000 hertz reference) and varying the frequency while recording the generator output required to produce the same modulation level.

The harmonic distortion was measured by adjusting the audio generator to produce the modulation indicated with the modulating frequencies indicated, and measuring the distortion at the modulation monitor instrument output terminals.

The FM s/n ratio is given relative to 400 hertz at 100% modulation. The AM noise and crosstalk were measured with the modulation monitor located at the transmitter site.

Stereo separation was measured by modulating each channel (1 or r) with modulating frequencies indicated while measuring leakage into the unmodulated channel.

ALL DATE CONTAINED HEREIN IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE.

RONALD D. HANEY
Chief Engineer KFMK RADIO

November 2, 1978
* The 26U-2 was patched out for measurements.
** The equalizer and reverb were switched out for measurements.
*** The volumax was placed in the test position for measurements.
FREQUENCY RESPONSE MEASUREMENTS

100% Modulation

<table>
<thead>
<tr>
<th>FREQUENCY</th>
<th>MONO</th>
<th>LEFT</th>
<th>RIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 Hertz</td>
<td>+2.7</td>
<td>+3.5</td>
<td>+1.0</td>
</tr>
<tr>
<td>100 Hertz</td>
<td>+2.2</td>
<td>+2.8</td>
<td>+2.2</td>
</tr>
<tr>
<td>250 Hertz</td>
<td>+2.0</td>
<td>+2.0</td>
<td>+2.1</td>
</tr>
<tr>
<td>400 Hertz</td>
<td>+1.5</td>
<td>+2.0</td>
<td>+2.0</td>
</tr>
<tr>
<td>750 Hertz</td>
<td>+0.7</td>
<td>+0.8</td>
<td>+1.1</td>
</tr>
<tr>
<td>1000 Hertz</td>
<td>± 0</td>
<td>± 0</td>
<td>± 0</td>
</tr>
<tr>
<td>3000 Hertz</td>
<td>-3.3</td>
<td>-3.6</td>
<td>-4.2</td>
</tr>
<tr>
<td>5000 Hertz</td>
<td>-6.2</td>
<td>-8.0</td>
<td>-8.0</td>
</tr>
<tr>
<td>10,000 Hertz</td>
<td>-11.5</td>
<td>-13.6</td>
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<tr>
<td>15,000 Hertz</td>
<td>-17.0</td>
<td>-16.5</td>
<td>-15.5</td>
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</table>

50% Modulation

<table>
<thead>
<tr>
<th>FREQUENCY</th>
<th>MONO</th>
<th>LEFT</th>
<th>RIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 Hertz</td>
<td>+2.5</td>
<td>+3.0</td>
<td>+2.8</td>
</tr>
<tr>
<td>100 Hertz</td>
<td>+2.1</td>
<td>+2.5</td>
<td>+2.2</td>
</tr>
<tr>
<td>250 Hertz</td>
<td>+1.8</td>
<td>+2.0</td>
<td>+1.8</td>
</tr>
<tr>
<td>400 Hertz</td>
<td>+1.3</td>
<td>+1.5</td>
<td>+1.5</td>
</tr>
<tr>
<td>750 Hertz</td>
<td>+0.4</td>
<td>+0.8</td>
<td>+0.8</td>
</tr>
<tr>
<td>1000 Hertz</td>
<td>± 0</td>
<td>± 0</td>
<td>± 0</td>
</tr>
<tr>
<td>3000 Hertz</td>
<td>-3.7</td>
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<td>-4.2</td>
</tr>
<tr>
<td>5000 Hertz</td>
<td>-6.5</td>
<td>-7.5</td>
<td>-7.8</td>
</tr>
<tr>
<td>10,000 Hertz</td>
<td>-11.6</td>
<td>-12.2</td>
<td>-13.2</td>
</tr>
<tr>
<td>15,000 Hertz</td>
<td>-16.8</td>
<td>-14.8</td>
<td>-16.0</td>
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</tbody>
</table>

READINGS INDICATED ARE THOSE OF THE OSCILLATOR AND MUST BE INVERTED FOR THE 75usec CURVE.

ALL READINGS TAKEN BY Ronald D. Haney
FREQUENCY RESPONSE MEASUREMENTS

25% Modulation

<table>
<thead>
<tr>
<th>FREQUENCY</th>
<th>MONO</th>
<th>LEFT</th>
<th>RIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 Hertz</td>
<td>+2.5</td>
<td>+3.2</td>
<td>+3.0</td>
</tr>
<tr>
<td>100 Hertz</td>
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<tr>
<td>400 Hertz</td>
<td>+1.3</td>
<td>+1.5</td>
<td>+1.5</td>
</tr>
<tr>
<td>750 Hertz</td>
<td>+0.6</td>
<td>+0.2</td>
<td>+1.0</td>
</tr>
<tr>
<td>1000 Hertz</td>
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<td>± 0</td>
<td>± 0</td>
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<td>15,000 Hertz</td>
<td>-17.0</td>
<td>-14.5</td>
<td>-15.0</td>
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Readings indicated are those of the oscillator and must be inverted for the 75usec curve.

All tests performed by Ronald O. Knapp

Date October 21, 1978
STANDARD
PRE-EMPHASIS CURVE
TIME CONSTANT
75 MICROSECONDS
LINE A

UPPER AND LOWER LIMITS
LINES A AND B

AUDI/O FREQUENCY RESPONSE—25% MODULATION

RADIO STATION KFMK
HOUSTON TEXAS
OCTOBER 1973

MONO CHANNEL
STANDARD PRE-EMPHASIS CURVE
TIME CONSTANT
75 MICROSECONDS
LINE A

UPPER AND LOWER LIMITS
LINES A AND B

FREQUENCY -- CYCLES PER SECOND

AUDIO FREQUENCY RESPONSE--- 50% MODULATION

RADIO STATION KFMK
HOUSTON TEXAS
OCTOBER 1977

MONO CHANNEL
STANDARD PRE-EMPHASIS CURVE
TIME CONSTANT
75 MICROSECONDS
LINE A

UPPER AND LOWER LIMITS
LINES A AND B

FREQUENCY -- CYCLES PER SECOND

AUDIO FREQUENCY RESPONSE--100% MODULATION

RADIO STATION KFMK
HOUSTON, TEXAS
OCTOBER 1978

MONO CHANNEL
STANDARD PRE-EMPHASIS CURVE
TIME CONSTANT
75 MICROSECONDS
LINE A

UPPER AND LOWER LIMITS
LINES A AND B

FREQUENCY -- CYCLES PER SECOND

AUDIO FREQUENCY RESPONSE--- 25% MODULATION

RADIO STATION KFMK
HOUSTON TEXAS
OCTOBER 1978

LEFT CHANNEL
STANDARD PRE-EMPHASIS CURVE
TIME CONSTANT
75 MICROSECONDS
LINE A

UPPER AND LOWER LIMITS
LINES A AND B

FREQUENCY -- CYCLES PER SECOND

AUDIO FREQUENCY RESPONSE --- 50% MODULATION

RADIO STATION KFMK
HOUSTON TEXAS
OCTOBER 1978

LEFT CHANNEL
STANDARD PRE-EMPHASIS CURVE
TIME CONSTANT 75 MICROSECONDS
LINE A
UPPER AND LOWER LIMITS
LINES A AND B

FREQUENCY -- CYCLES PER SECOND

AUDIO FREQUENCY RESPONSE -- 100% MODULATION

RADIO STATION KIMK
HOUSTON TEXAS
OCTOBER 1978

LEFT CHANNEL
STANDARD
PRE-EMPHASIS CURVE
TIME CONSTANT
75 MICROSECONDS
LINE A

UPPER AND LOWER LIMITS
LINES A AND B

DECIBELS

FREQUENCY -- CYCLES PER SECOND

AUDIO FREQUENCY RESPONSE---25% MODULATION

RADIO STATION KFMK
HOUSTON TEXAS
OCTOBER 1978

RIGHT CHANNEL
STANDARD PRE-EMPHASIS CURVE
TIME CONSTANT
75 MICROSECONDS
LINE A

UPPER AND LOWER LIMITS
LINES A AND B

FREQUENCY -- CYCLES PER SECOND

AUDIO FREQUENCY RESPONSE---50% MODULATION
RADIO STATION KFMK
HOUSTON, TEXAS
OCTOBER 1978
RIGHT CHANNEL
STANDARD
PRE-EMPHASIS CURVE
TIME CONSTANT
75 MICROSECONDS
LINE A

UPPER AND LOWER LIMITS
LINES A AND B

A

B

50 100 400 1000 5000 15000
FREQUENCY -- CYCLES PER SECOND

DECIBELS

AUDI0 FREQUENCY RESPONSE--100% MODULATION

RADIO STATION KFMK
HOUSTON TEXAS
OCTOBER 1978

RIGHT CHANNEL
HARMONIC FREQUENCY CONTENT

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<tr>
<th>Modulation</th>
<th>50 CPS</th>
<th>100 CPS</th>
<th>400 CPS</th>
<th>1000 CPS</th>
<th>5000 CPS</th>
<th>10 kc</th>
<th>15 kc</th>
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<tbody>
<tr>
<td>25%</td>
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<td>1.50</td>
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<td>0.88</td>
<td>0.80</td>
<td>0.85</td>
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25% MODULATION

50% MODULATION

100% MODULATION

MODULATION
### HARMONIC FREQUENCY CONTENT

<table>
<thead>
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<th>Modulation</th>
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<tbody>
<tr>
<td>25%</td>
</tr>
<tr>
<td>50%</td>
</tr>
<tr>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Modulation</th>
<th>50 CPS</th>
<th>100 CPS</th>
<th>400 CPS</th>
<th>1000 CPS</th>
<th>5000 CPS</th>
<th>10 kc</th>
<th>15 kc</th>
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<tbody>
<tr>
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<td>0.86</td>
<td>0.90</td>
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<td>1.60</td>
<td>**</td>
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<tr>
<td>100%</td>
<td>1.30</td>
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<td>1.20</td>
<td>0.78</td>
<td>0.76</td>
<td>1.50</td>
<td>2.50</td>
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</table>

#### 25% MODULATION

![Graph for 25% Modulation](image)

#### 50% MODULATION

![Graph for 50% Modulation](image)

#### 100% MODULATION

![Graph for 100% Modulation](image)
### HARMONIC FREQUENCY CONTENT

<table>
<thead>
<tr>
<th>Modulation</th>
<th>50 CPS</th>
<th>100 CPS</th>
<th>400 CPS</th>
<th>1000 CPS</th>
<th>5000 CPS</th>
<th>10 kHz</th>
<th>15 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.20</td>
<td>1.70</td>
<td>***</td>
<td>**</td>
</tr>
<tr>
<td>50%</td>
<td>0.77</td>
<td>0.45</td>
<td>0.60</td>
<td>0.52</td>
<td>1.00</td>
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<tr>
<td>100%</td>
<td>0.68</td>
<td>0.36</td>
<td>0.40</td>
<td>0.32</td>
<td>0.73</td>
<td>0.46</td>
<td>0.66</td>
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### MODULATION

- **25% MODULATION**
- **50% MODULATION**
- **100% MODULATION**

**Date:** October 1978

**Engineer:** Ronald D. Haney

**License No.:** PL-9-11388
RADIO STATION KFMK  
PROOF OF PERFORMANCE  
OCTOBER 1978

<table>
<thead>
<tr>
<th>FREQUENCY IN HERTZ</th>
<th>LEFT INTO RIGHT</th>
<th>RIGHT INTO LEFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>38.5</td>
<td>32.0</td>
</tr>
<tr>
<td>100</td>
<td>40.4</td>
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</tr>
<tr>
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<td>42.2</td>
<td>35.0</td>
</tr>
<tr>
<td>1000</td>
<td>42.0</td>
<td>35.0</td>
</tr>
<tr>
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<td>40.5</td>
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<tr>
<td>10000</td>
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<td>36.8</td>
</tr>
<tr>
<td>15000</td>
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<td>36.5</td>
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ALL MEASUREMENTS TAKEN BY [Signature]