APPLICANT: Lucent Technologies   **FCC ID: AS5CMP-32**

EXHIBIT 14

Section 2.1047   Measurements Required: Modulation Characteristics

The analog modulation capability is based solely on internal firmware and external software control. Part 2.1047 requires that compliance be demonstrated by (a) a curve showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz, and (b) a curve or family of curves showing the percentage of modulation versus the modulation input voltage, i.e., modulation limiting as a function of the audio input signal power level.

The transmit-audio response, in compliance with Part 2.1047(a), was measured over a frequency range of 100 to 4000 Hz ; since the controlling software did not permit exceeding 4000 Hz. The frequency response was measured and plotted for three carriers corresponding to the cellular band end frequencies and to approximately mid-band: Ch 991 (869.04 Hz), Ch 400 (882.00 MHz), and Ch 799 (893.97 MHz). The test was first run using an A-Law baseband and then with a Mu-Law baseband.   For each carrier frequency and for each baseband, the audio input frequency was first set to 1004 Hz and the power level set to maintain a constant ± 2.9 kHz peak frequency deviation (PFD). This was then the reference frequency and level. The audio input modulating signal was then varied from 100 to 4000 Hz and the corresponding transmitter output PFD was measured and recorded. The minimum standard recommends that the audio frequency response, from 300 to 3000 Hz, shall not vary more than +1 to –3 dB from a true 6 dB/octave characteristic as referenced to the 1004 Hz level.

The modulation limiting characteristics, in compliance with Part 2.1047(b), is demonstrated by a family of curves showing the percentage of modulation, expressed as peak frequency deviation (PFD) in Hz, versus the modulation input voltage, expressed as the audio signal input power level form –12 dBm to +15 dBm. This test will be performed for each of three carriers: channels 991, 400 and 799; first using an A-Law baseband and then a Mu-Law baseband. For each carrier and baseband, testing was performed with audio alone at 304, 1004 and 2904 Hz; and then with each audio plus SAT at 6000 Hz. The required modulation limiting is ±12 kHz for audio alone and ±14 kHz for audio + SAT
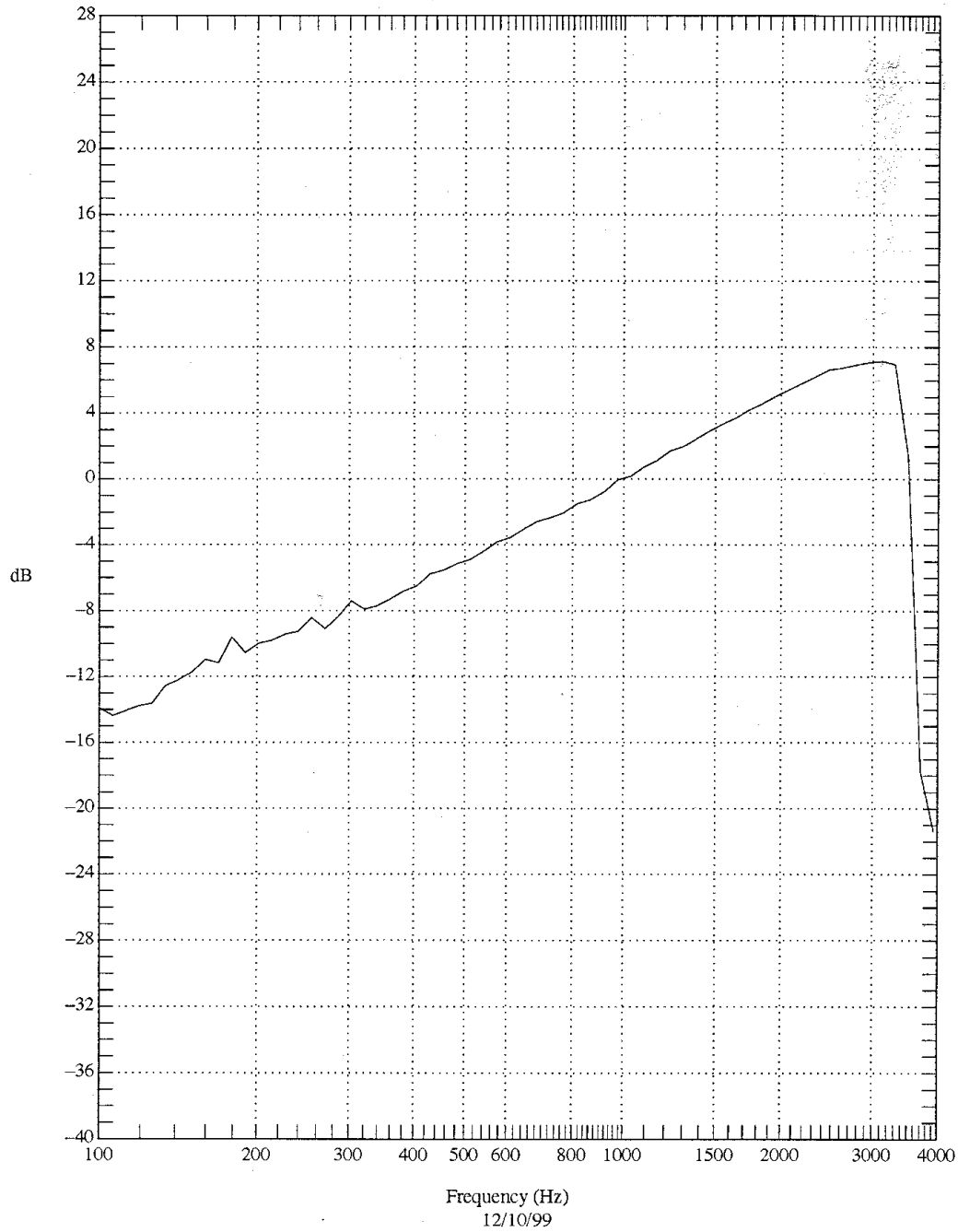
RESULTS:

Then 10 following data plots demonstrate full compliance with Part 2.1047.   The first 6 show the transmit-audio response for A-Law and Mu-Law basebands over the audio frequency range of 100-4000 Hz.   The last 4 data plots show modulation limiting for A-Law with audio alone and then with audio + SAT; this is then repeated with Mu-Law baseband. All data curves demonstrate full compliance with the recommended minimum standards for each modulation test type.

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EXHIBIT 14

Transmit Audio Response from 100-4000 Hz.
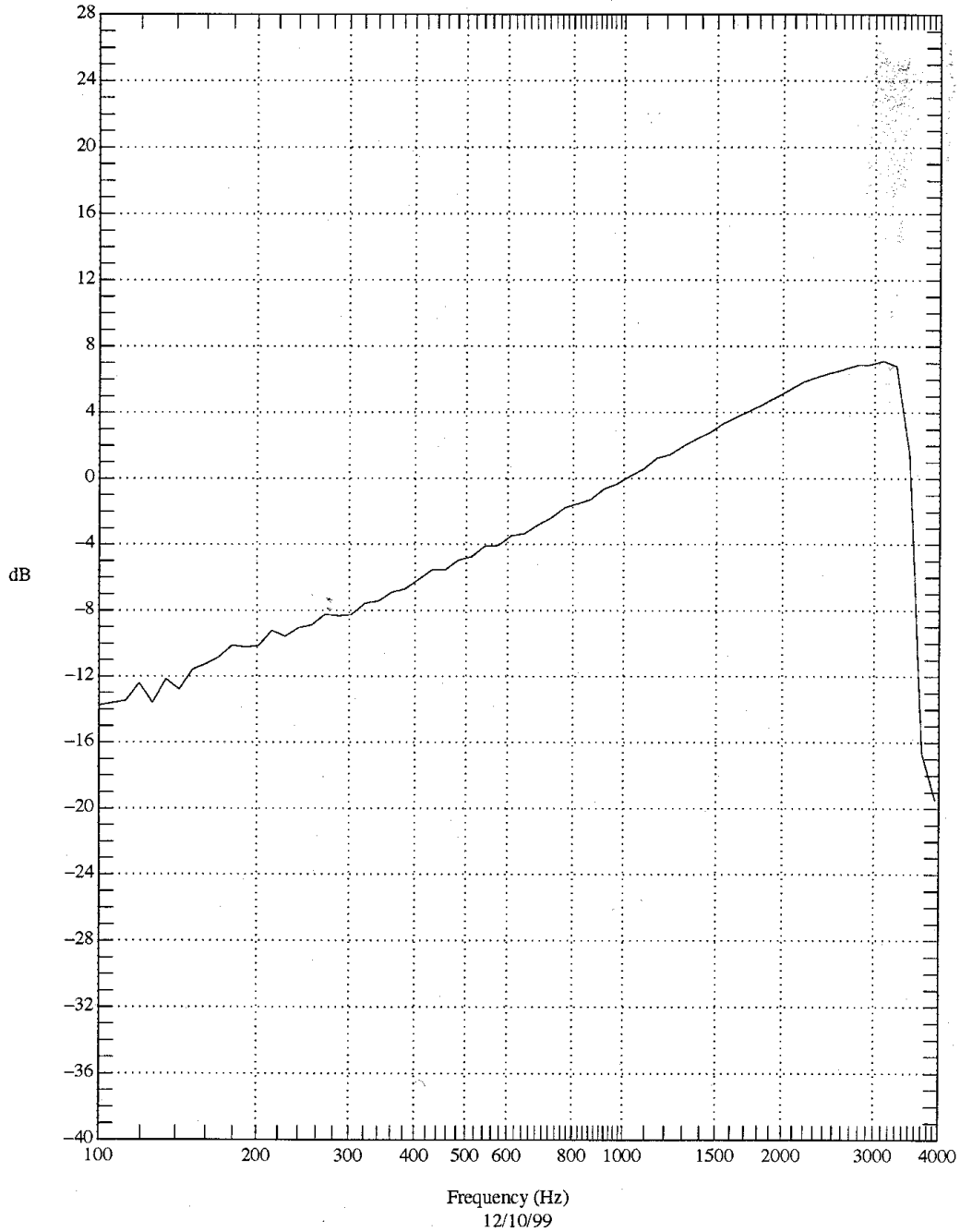DRM, alaw mode, Channel 991.
Reference = 2.9 +- .03 kHz PFD at 1004 Hz

Frequency (Hz)
12/10/99

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EXHIBIT 14

Transmit Audio Response from 100-4000 Hz.
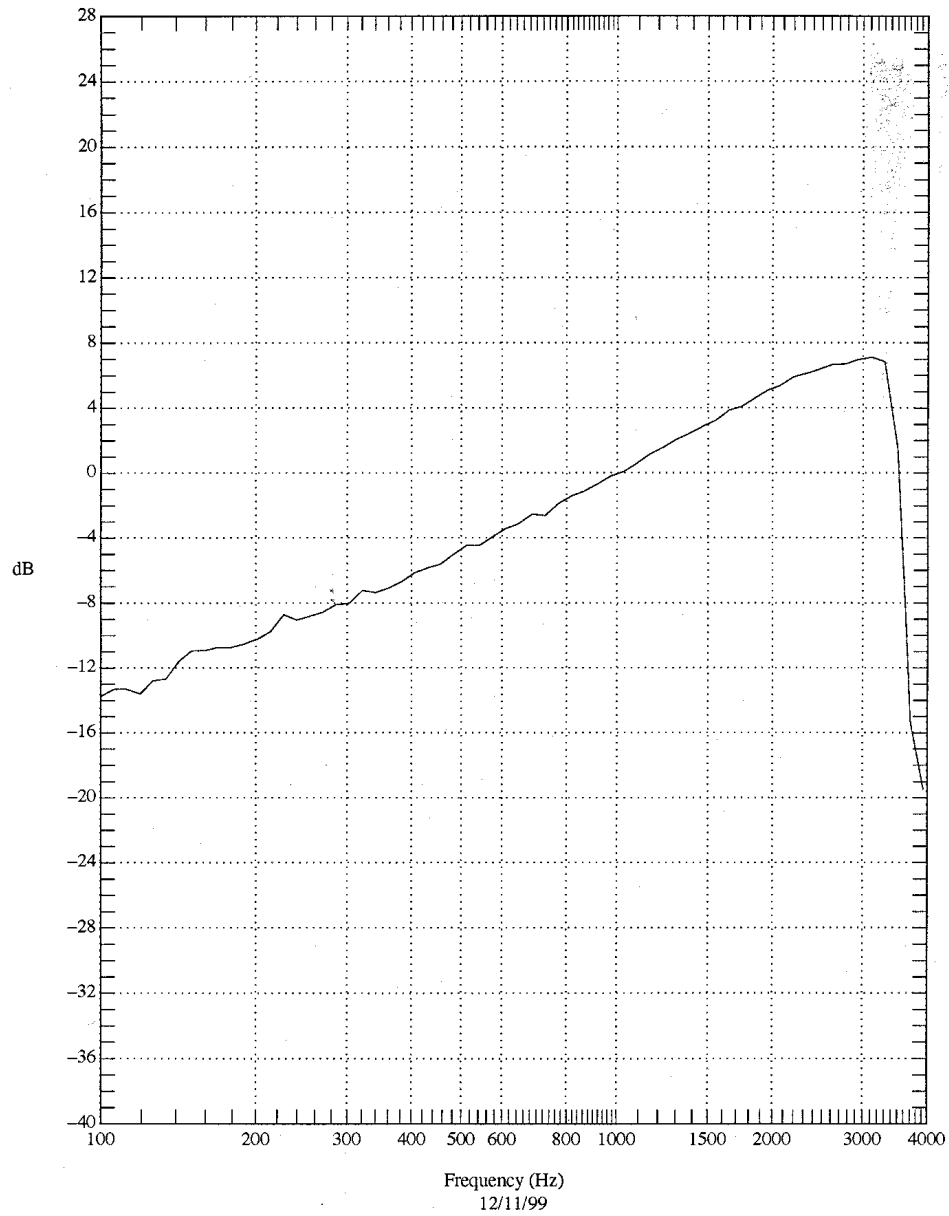DRM, alaw mode, Channel 400.
Reference = 2.9 +- .03 kHz PFD at 1004 Hz

Frequency (Hz)
12/10/99

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EXHIBIT 14

Transmit Audio Response from 100-4000 Hz.
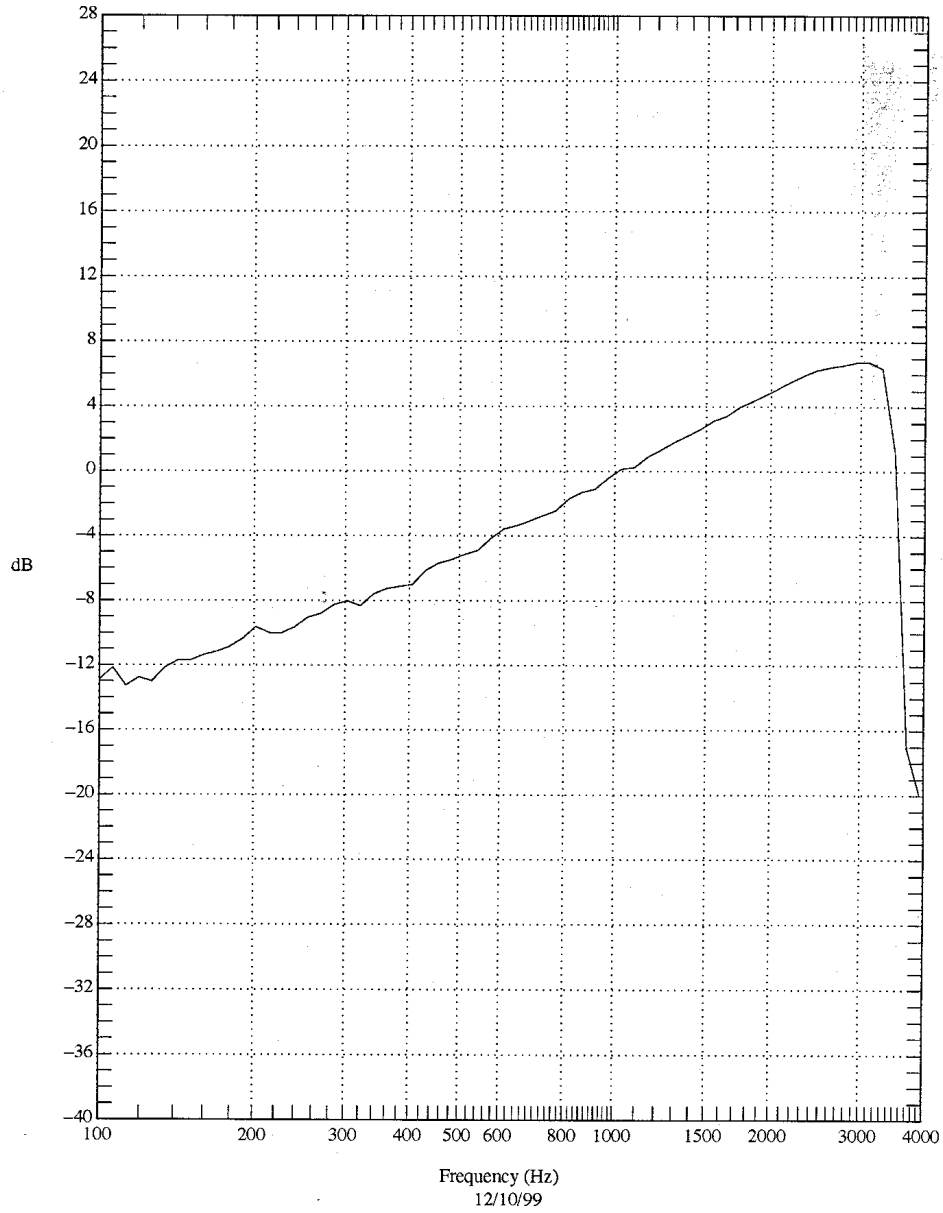DRM, alaw mode, Channel 799.
Reference = 2.9 +- .03 kHz PFD at 1004 Hz

Frequency (Hz)
12/11/99

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EXHIBIT 14

Transmit Audio Response from 100-4000 Hz.
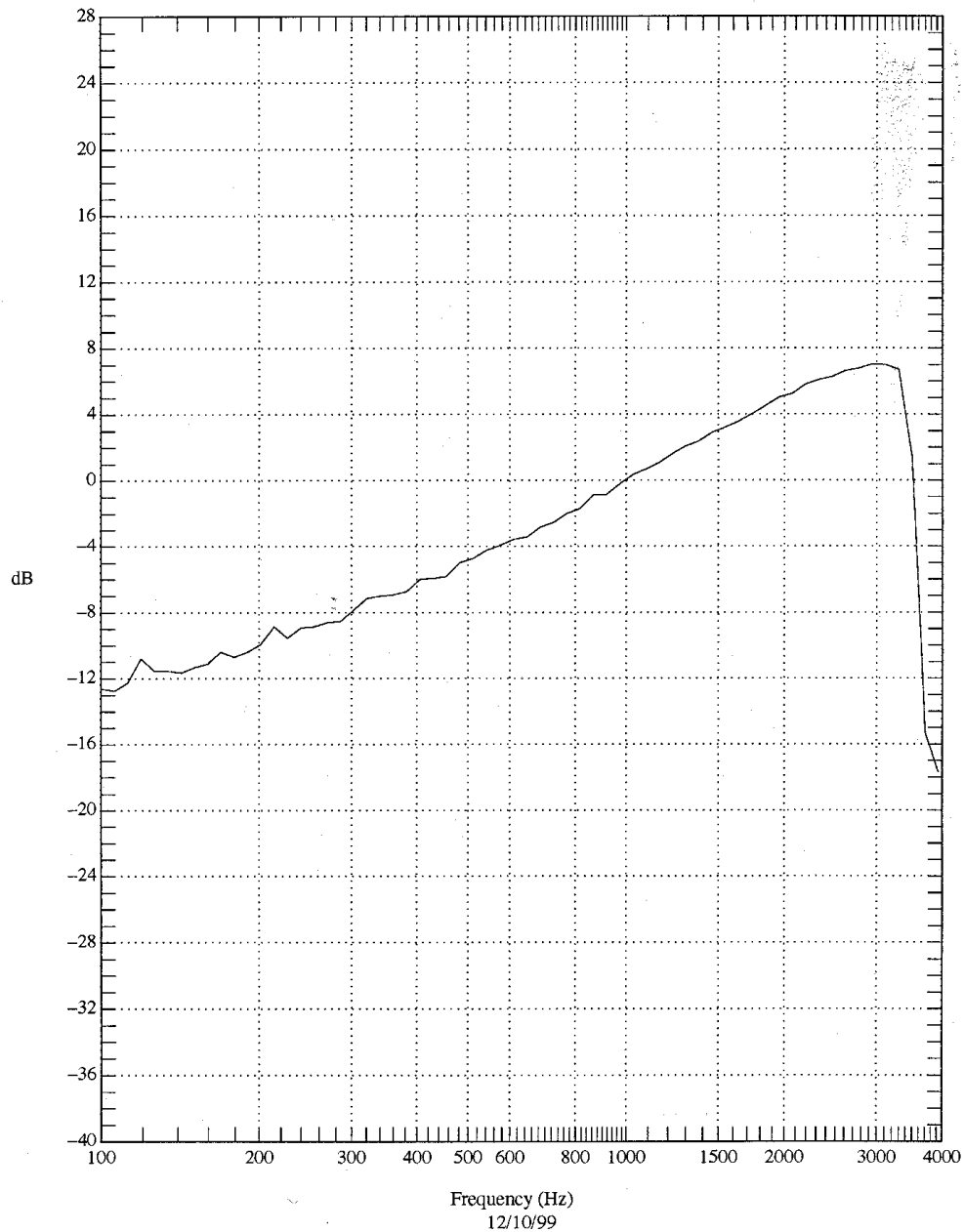DRM, mlaw mode, Channel 991.
Reference = 2.9 +- .03 kHz PFD at 1004 Hz

Frequency (Hz)
12/10/99

APPLICANT: Lucent Technologies   **FCC ID: AS5CMP-32**

EXHIBIT 14

Transmit Audio Response from 100-4000 Hz.
DRM, mlaw mode, Channel 400.
Reference = 2.9 +- .03 kHz PFD at 1004 Hz
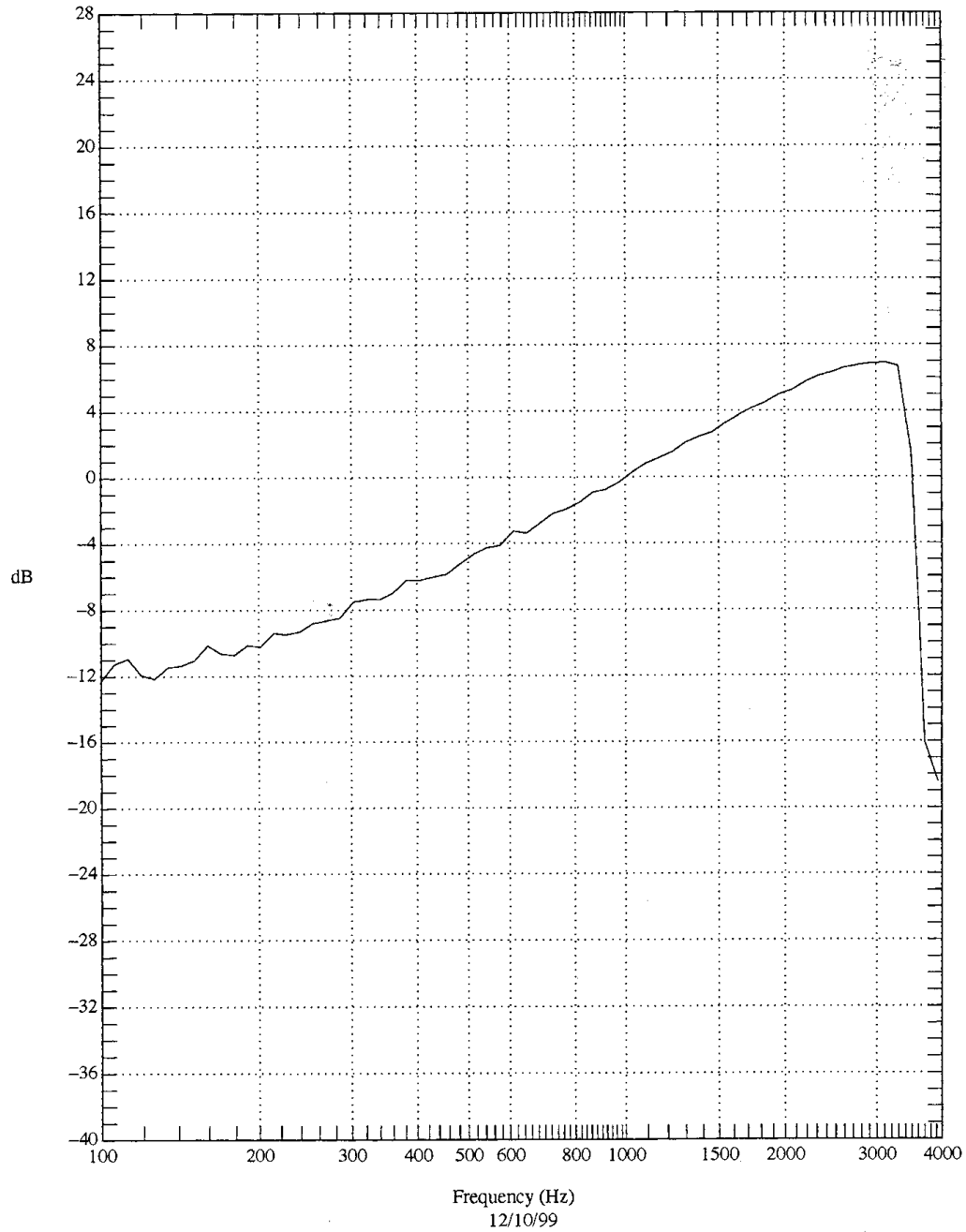

Frequency (Hz)
12/10/99

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EXHIBIT 14

Transmit Audio Response from 100-4000 Hz.
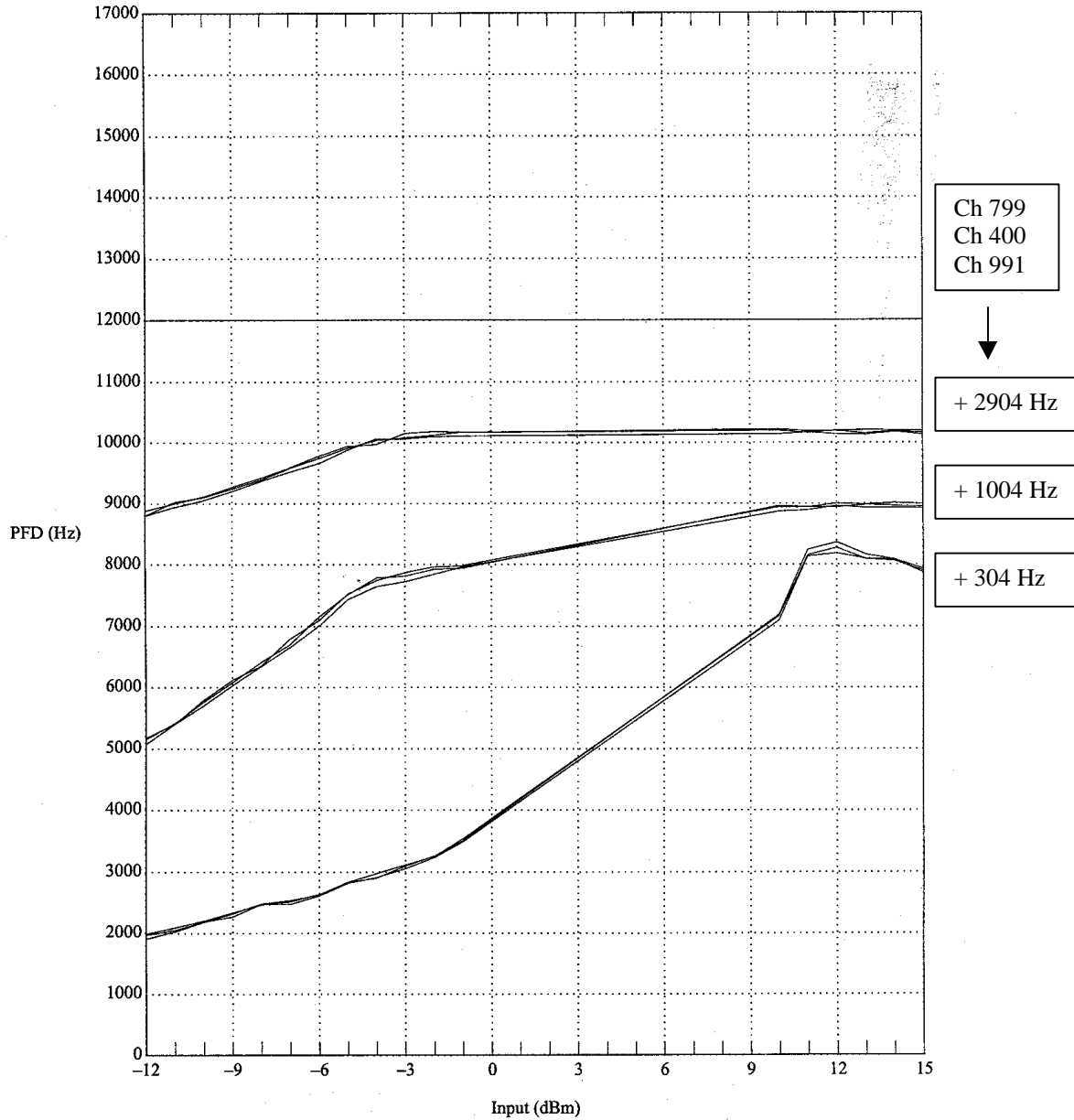DRM, mlaw mode, Channel 799.
Reference = 2.9 +- .03 kHz PFD at 1004 Hz

Frequency (Hz)
12/10/99

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EXHIBIT 14

A-Law with Audio alone

Transmit Audio Deviation Limiting (No SAT)
DRM, FCC Limiter, alaw mode

Ch 799
Ch 400
Ch 991

↓

+ 2904 Hz

+ 1004 Hz

+ 304 Hz

PFD (Hz)

Input (dBm)

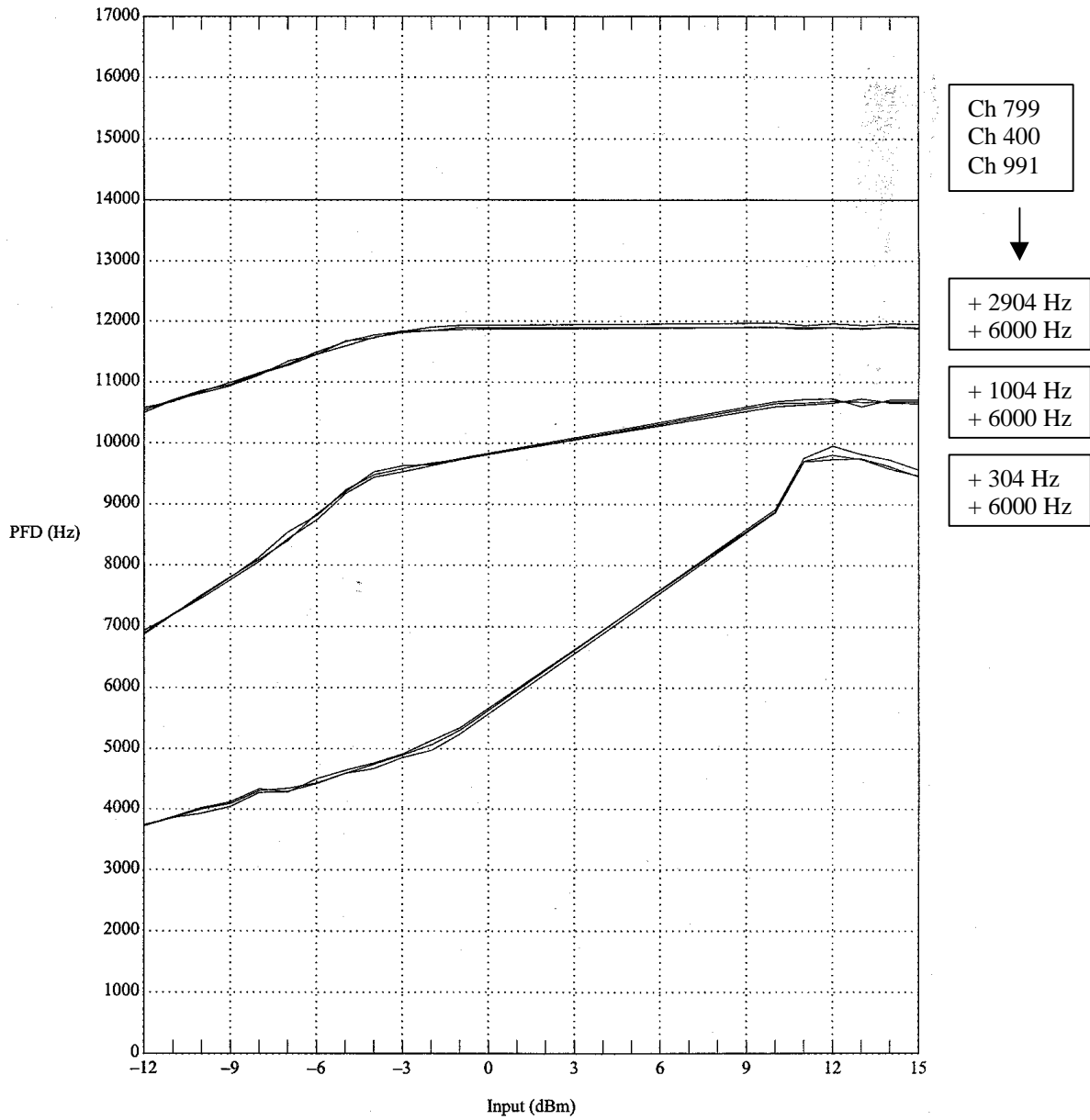12/01/99

APPLICANT: Lucent Technologies   **FCC ID: AS5CMP-32**

EXHIBIT 14

A-Law with Audio + SAT

Transmit Audio Deviation Limiting (With 6 kHz SAT)
DRM, FCC Limiter, alaw mode

Input (dBm)

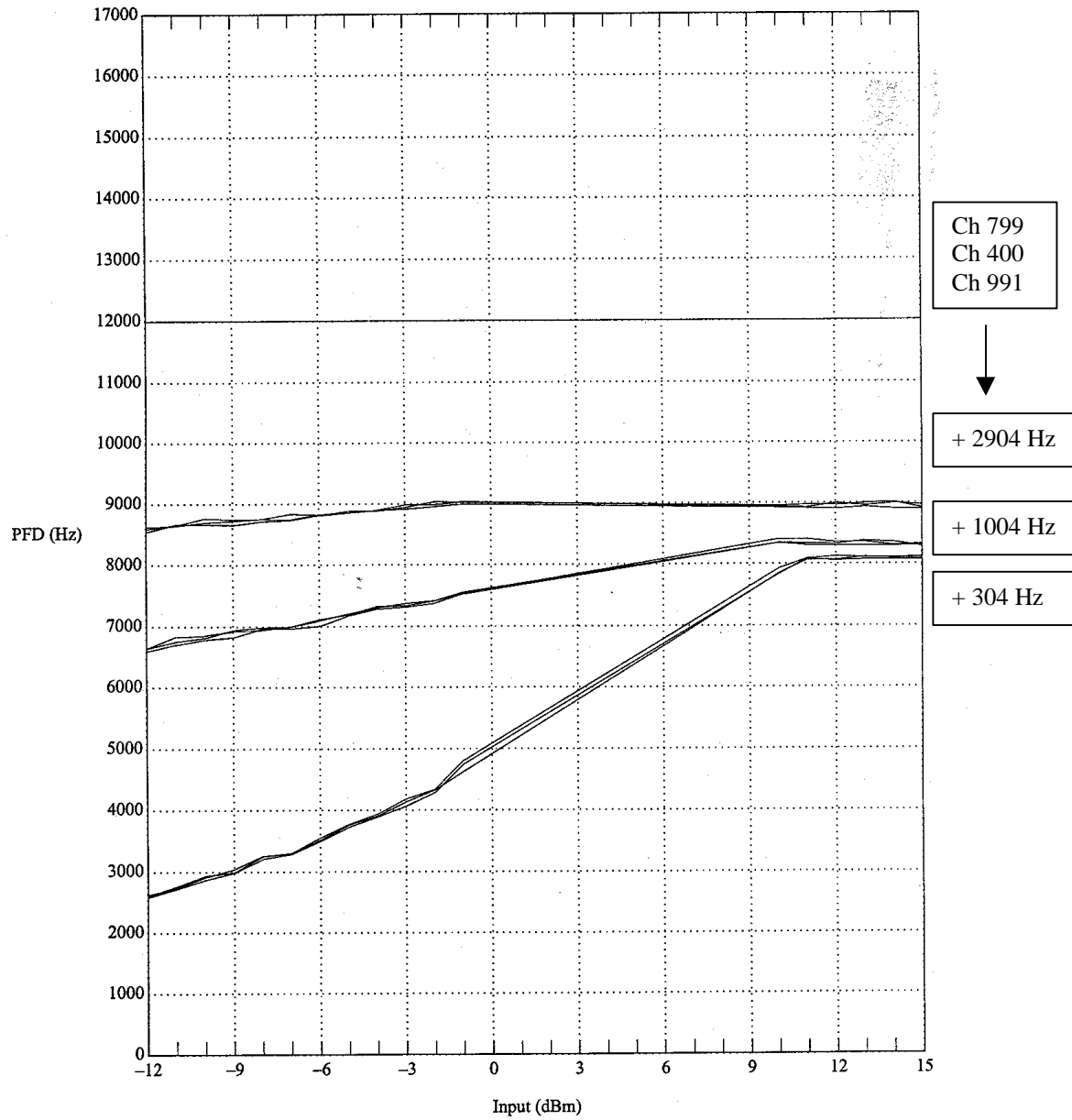12/01/99

APPLICANT: Lucent Technologies   **FCC ID: AS5CMP-32**

EXHIBIT 14

Mu-Law with Audio alone

Transmit Audio Deviation Limiting (No SAT)
DRM, FCC Limiter, mlaw mode

PFD (Hz)

Input (dBm)

Ch 799
Ch 400
Ch 991

+ 2904 Hz

+ 1004 Hz

+ 304 Hz

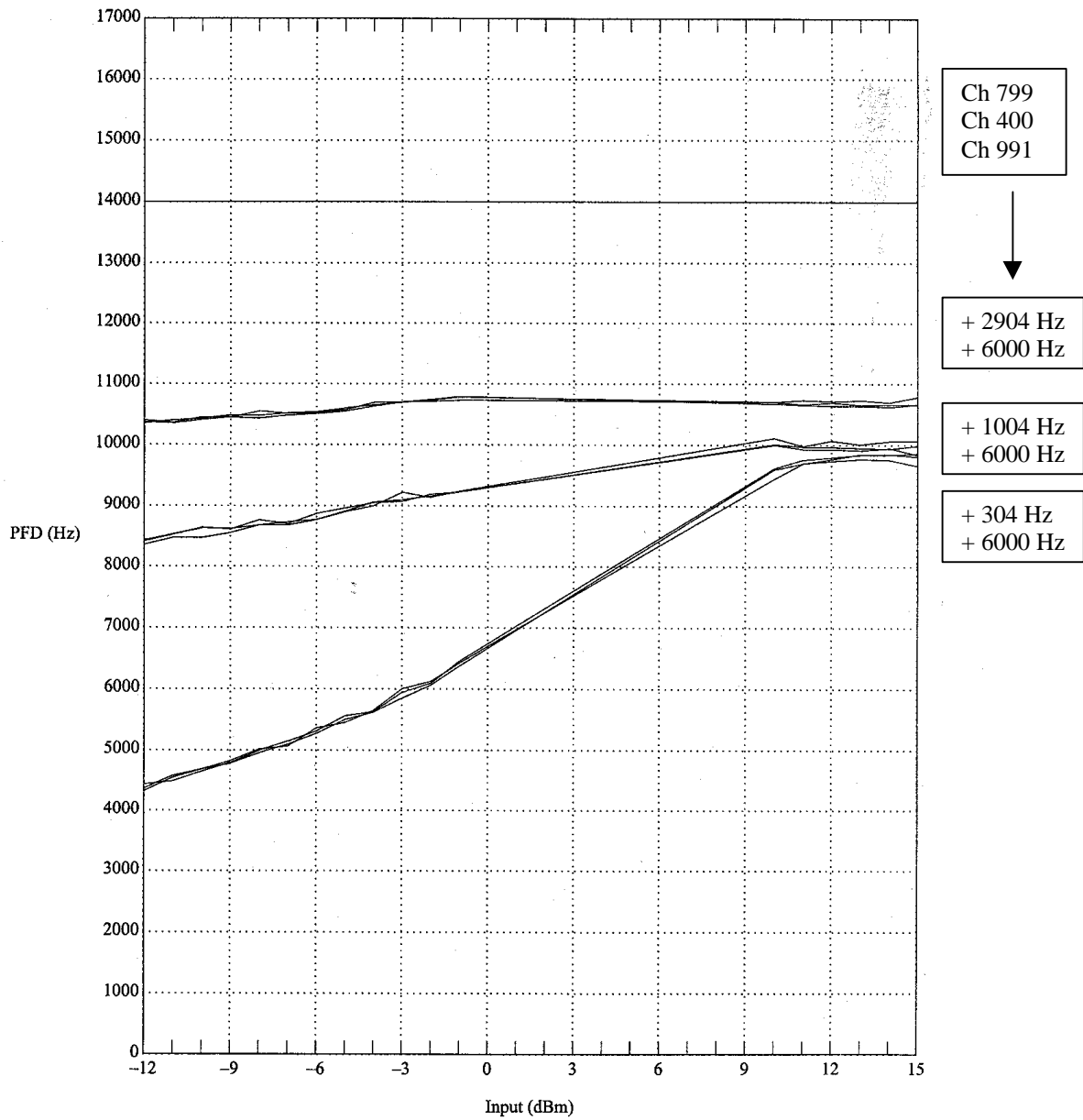12/02/99

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EXHIBIT 14

Mu-Law with Audio + SAT

Transmit Audio Deviation Limiting (With 6 kHz SAT)
DRM, FCC Limiter, mlaw mode

Ch 799
Ch 400
Ch 991

↓

+ 2904 Hz
+ 6000 Hz

+ 1004 Hz
+ 6000 Hz

+ 304 Hz
+ 6000 Hz

PFD (Hz)

Input (dBm)

12/02/99

APPLICANT: Lucent Technologies   **FCC ID: AS5CMP-32**

EXHIBIT 14

Test set-up for measuring the analog modulation characteristics for the Analog Cellular Dual Radio Module transceiver using a FLEXENT Development Cell (D-Cell).

TOM: TDMA Oscillator Module [15 MHz Reference Frequency]
TRC: TDMA Radio Controller
CDRM: TDMA/Analog Cellular Dual Radio Module

D-Cell