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

EXHIBIT 15

Section 2.1049 Measurements Required: Occupied Bandwidth

The test results in this exhibit demonstrate that the radiated signal (carrier) can not be over modulated by any analog signal type used as a modulator input. Occupied bandwidth measurements were made for three carriers representing the cellular band end frequencies and approximately mid-band: Channels 991 (869.04 MHz), 400 (882.00 MHz) and 799 (893.97 MHz). The modulating signals applied to each carrier are **1)** Audio alone and **2)** Audio + SAT for both A-Law and Mu-Law audio basebands. Additional measurements were made with each carrier modulated by **3)** SAT alone and by **4)** Wideband Data (WBD).

1) In compliance with Part 2.1049(c)(1), the audio modulating signal utilized was a 2500 Hz tone set at a level 16 dB greater than that necessary to produce 50% modulation. The exact procedure followed was in accordance with IS-138-A, Section 3.4.1.1.2. The audio input power level was first set by a 1004 Hz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation. The audio input frequency was then set to 2500 Hz for the occupied bandwidth measurement.

2) Audio + SAT modulation was accomplished by first setting the SAT tone to 6030 Hz, and then adjusting it's power level to provide ± 2 kHz peak frequency deviation (PFD) at the transceiver output terminal. The 2500 Hz audio signal from the preceding test was then added to the SAT and the resulting occupied bandwidth was then measured and recorded.

3) SAT alone, at 6030 Hz, was first input to the transceiver and the level adjusted to provide ± 2 kHz PFD at the transceiver output terminal; then the resulting occupied bandwidth was measured and recorded. The SAT signal was generated within the transceiver and did not utilize the baseband as did the externally input Audio signals.

4) Wideband data (WBD) is generated within the transceiver, at a 10 kb/second pseudo-random bit stream, with the power level set to provide ± 8 kHz PFD at the transmitter output terminal. The resulting occupied bandwidth was then measured and recorded for each of the 3 carriers. Since the WBD signal was generated within the transceiver, it did not utilize the baseband as did the externally input Audio signals.

MINIMUM STANDARD:

Part 22.917(h) specifies that the spectrum analyzer resolution bandwidth (RBW) be set to 300 Hz. The video bandwidth is typically set to 10 x RBW and the measurement detector set to max hold. The emission limitations are based on attenuation below the unmodulated carrier. Using a variable attenuator, the peak of the unmodulated carrier is first positioned to the top of the spectrum analyzer reticle which is set at 0 dBm as reference, and then modulation is applied. Attenuation below the carrier is then read directly off the 0 dBm to -110 dBm scale.

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

EXHIBIT 15

1,2,3) Emission Limitation Mask for Cellular: Audio alone, Audio + SAT, and SAT alone

In accordance with Part 22.917(b), the emission mask for Audio alone, Audio + SAT, and SAT alone modulation over a 120 kHz frequency span, centered on the 30 kHz carrier is:

Occupied Bandwidth Emission Mask for **Audio, Audio + SAT, SAT**	Displacement from the Carrier Center Frequency in a **120 kHz Span**	Attenuation below the Unmodulated Carrier in a **120 kHz Span**
Part 22.917(b)(1)	20 kHz to 45 kHz	26 dBc
Part 22.917(b)(2)	45 kHz to 60 kHz	60 dBc or 43 + 10 log P(in Watts), whichever is the lesser attenuation
For P = 36 mW	45 kHz to 60 kHz	28.6 dBc

4) Emission Limitation Mask for Cellular: Wideband Data (WBD)

In accordance with Part 22.917(d), the emission mask for **Wideband Data (WBD)** modulation over a 120 kHz frequency span, centered on the 30 kHz carrier is:

Occupied Bandwidth Emission Mask for **Wideband Data**	Displacement from the Carrier Center Frequency in a **120 kHz Span**	Attenuation below the Unmodulated Carrier in a **120 kHz Span**
Part 22.917(d)(1)	20 kHz to 45 kHz	26 dBc
Part 22.917(d)(2)	45 kHz to 60 kHz	45 dBc

RESULTS:

The attached occupied bandwidth plots demonstrate full compliance with the requirements of Part 22.917 for each modulation type. At each test frequency, the carrier was well within the required emission mask; the Cellular TDMA/Analog Dual Radio Module (CDRM), 44WR54, demonstrated full compliance with Part 22.917 for occupied bandwidth. The measurements performed are:

Plot No.	**Baseband**	**Carrier**
1	A-Law	Ch 991 + Audio at 2500 Hz
2	A-Law	Ch 400 + Audio at 2500 Hz
3	A-Law	Ch 799 + Audio at 2500 Hz
4	A-Law	Ch 991 + Audio at 2500 Hz + SAT at 6030 Hz
5	A-Law	Ch 400 + Audio at 2500 Hz + SAT at 6030 Hz
6	A-Law	Ch 799 + Audio at 2500 Hz + SAT at 6030 Hz
7	Mu-Law	Ch 991 + Audio at 2500 Hz
8	Mu-Law	Ch 400 + Audio at 2500 Hz
9	Mu-Law	Ch 799 + Audio at 2500 Hz
10	Mu-Law	Ch 991 + Audio at 2500 Hz + SAT at 6030 Hz
11	Mu-Law	Ch 400 + Audio at 2500 Hz + SAT at 6030 Hz
12	Mu-Law	Ch 799 + Audio at 2500 Hz + SAT at 6030 Hz
13	NA	Ch 991 + SAT at 6030 Hz
14	NA	Ch 400 + SAT at 6030 Hz
15	NA	Ch 799 + SAT at 6030 Hz
16	NA	Ch 991 + WBD at 10 kb/s pseudo-random
17	NA	Ch 400 + WBD at 10 kb/s pseudo-random
18	NA	Ch 799 + WBD at 10 kb/s pseudo-random

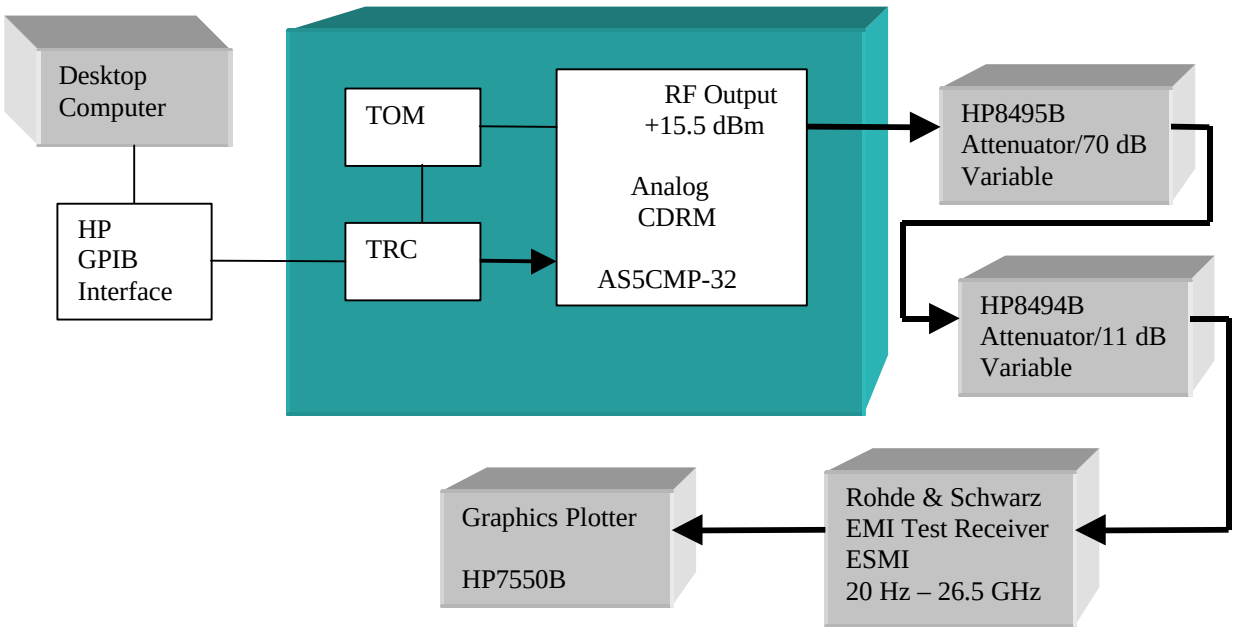
APPLICANT: Lucent Technologies **FCC ID: AS5CMP-32**

EXHIBIT 15

Test set-up for measuring the occupied bandwidth output from the Analog Cellular Dual Radio Module transceiver using a FLEXENT Development Cell (D-Cell).

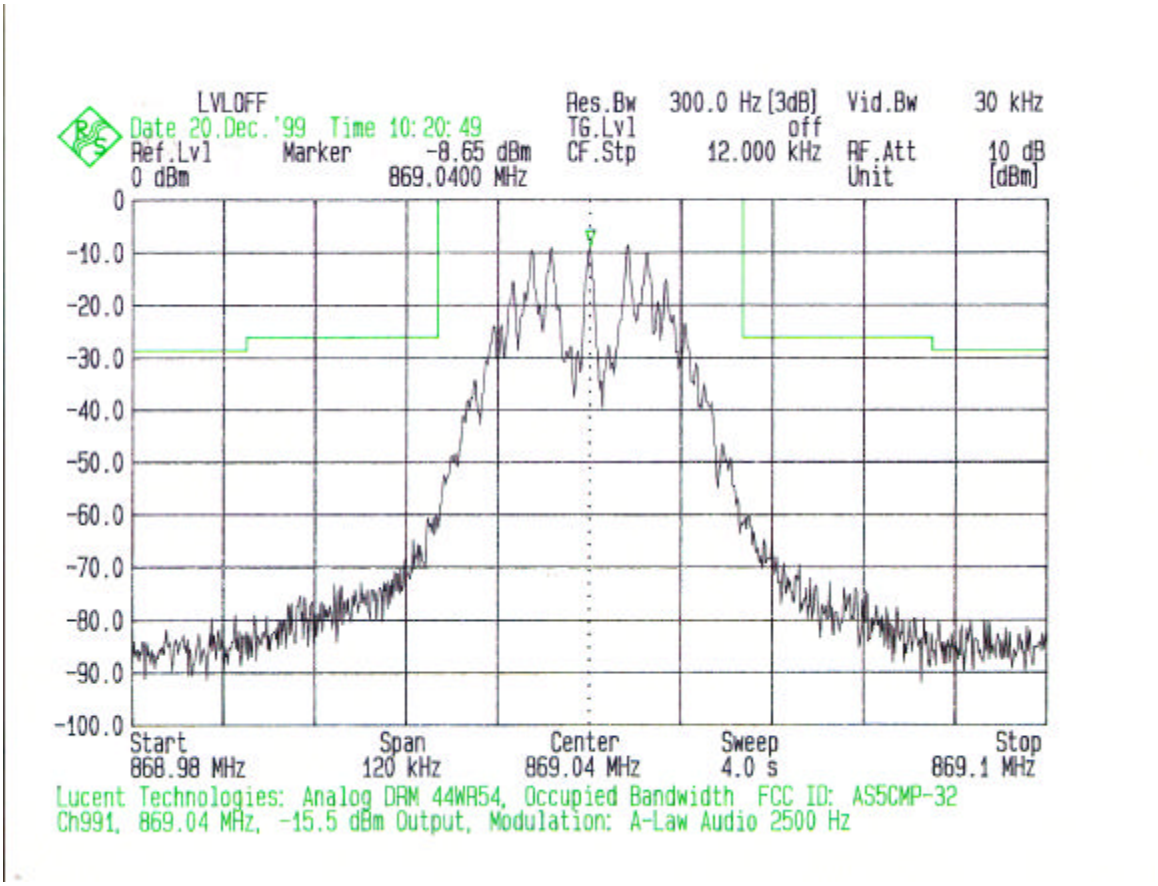
TOM: TDMA Oscillator Module [15 MHz Reference Frequency]
TRC: TDMA Radio Controller
CDRM: TDMA/Analog Cellular Dual Radio Module

D-Cell



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

EXHIBIT 15

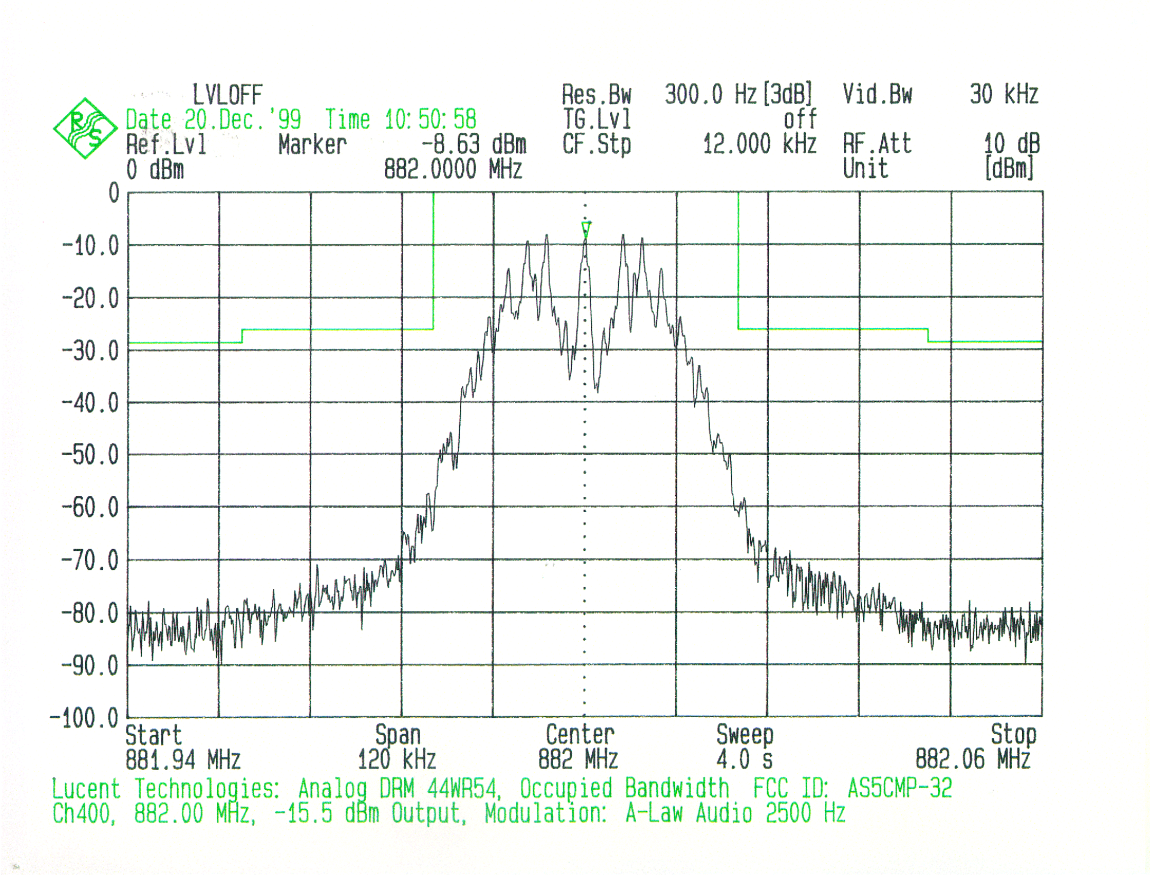


Cellular A-Band: Lower Edge Channel
Channel 991, 869.04 MHz + Audio 2500 Hz
A-Law Baseband

PLOT #1

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

EXHIBIT 15



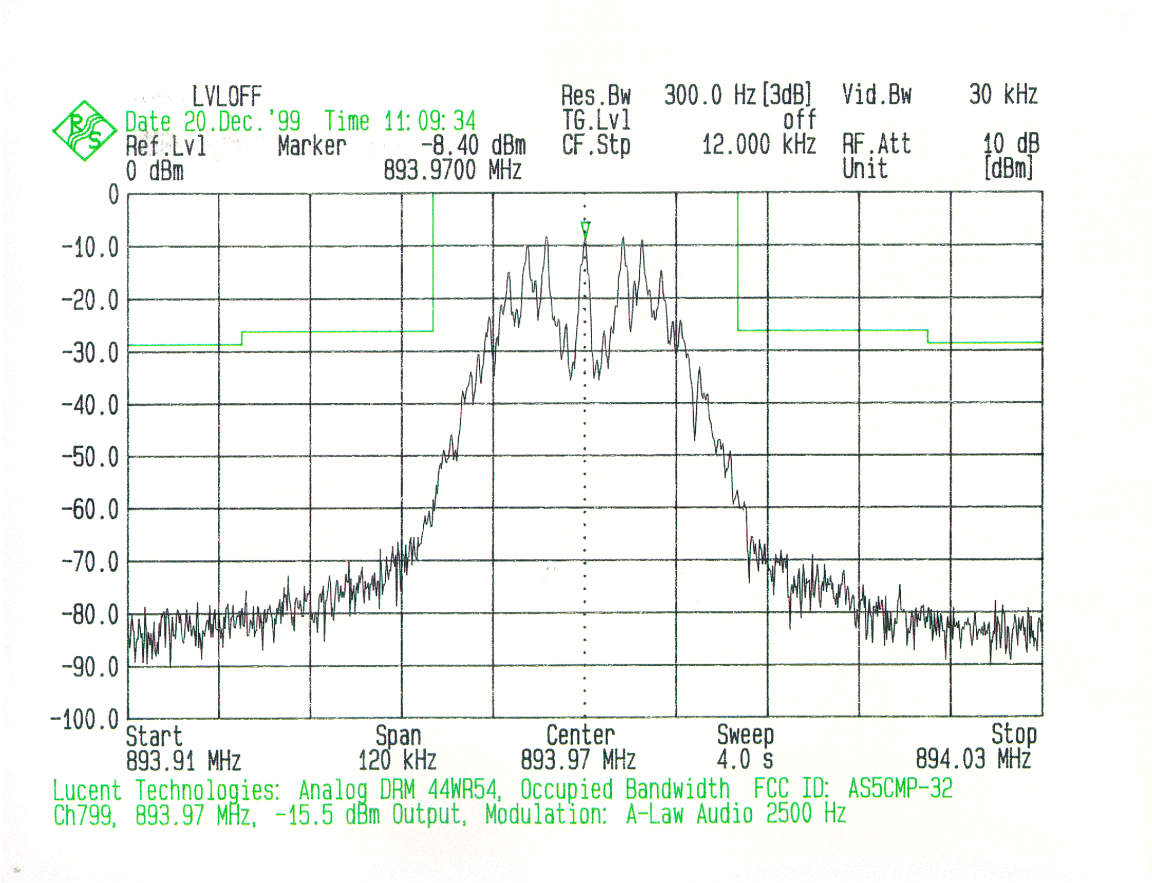
Mid Cellular Frequency Band:

Channel 400, 882.00 MHz + Audio 2500 Hz
A-Law Baseband

PLOT #2

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

EXHIBIT 15

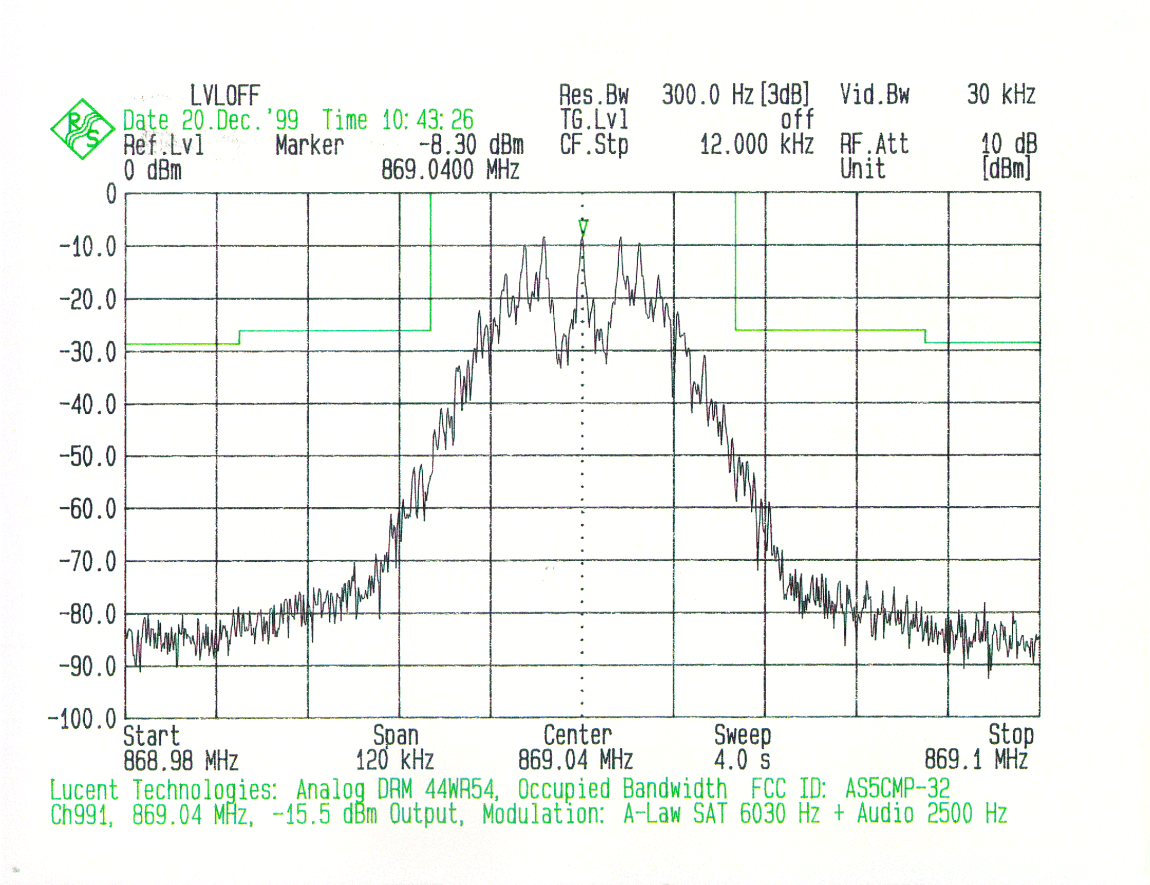


Cellular B-Band: Upper Edge Channel
Channel 799, 893.970 MHz + Audio 2500 Hz
A-Law Baseband

PLOT #3

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

EXHIBIT 15

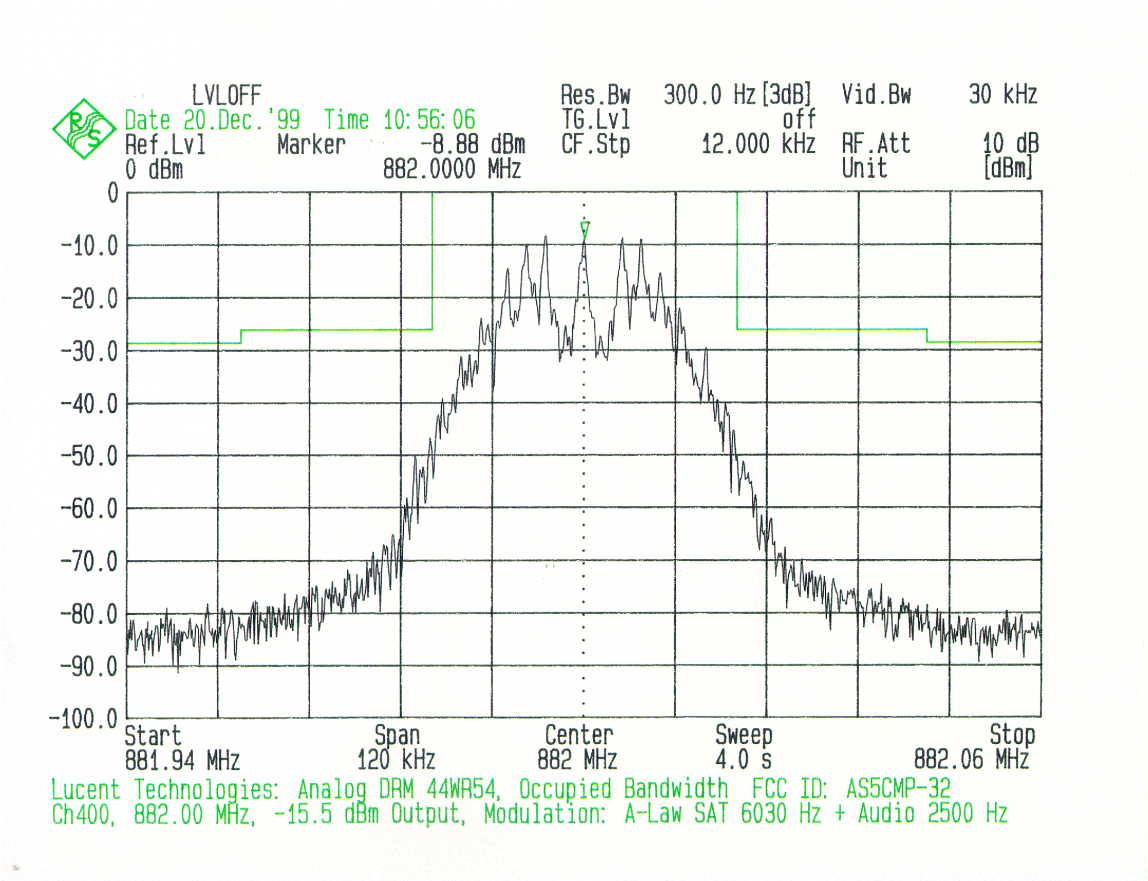


Cellular A-Band: Lower Edge Channel
Channel 991, 869.04 MHz + Audio 2500 Hz + SAT 6030 Hz
A-Law Baseband

PLOT #4

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

EXHIBIT 15



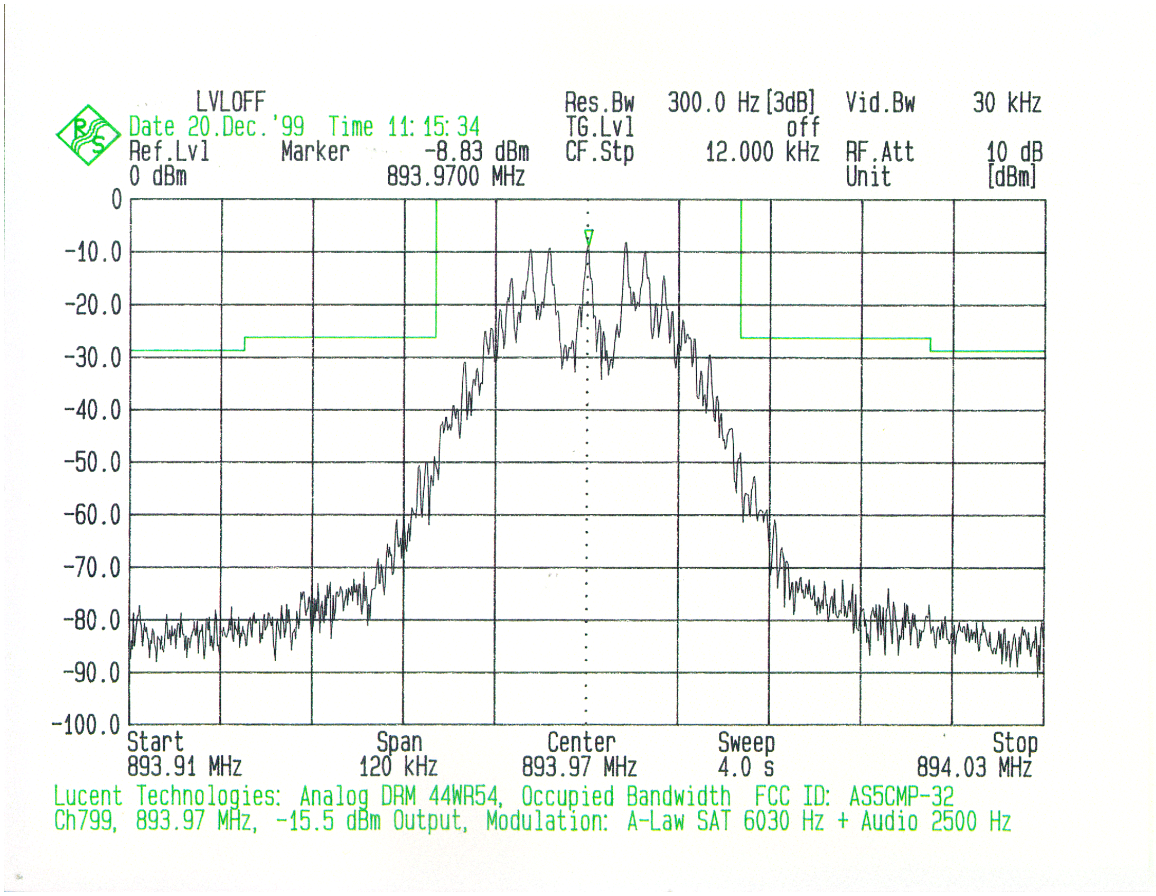
Mid Cellular Frequency Band:

Channel 400, 882.00 MHz + Audio 2500 Hz + SAT 6030 Hz
A-Law Baseband

PLOT #5

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

EXHIBIT 15

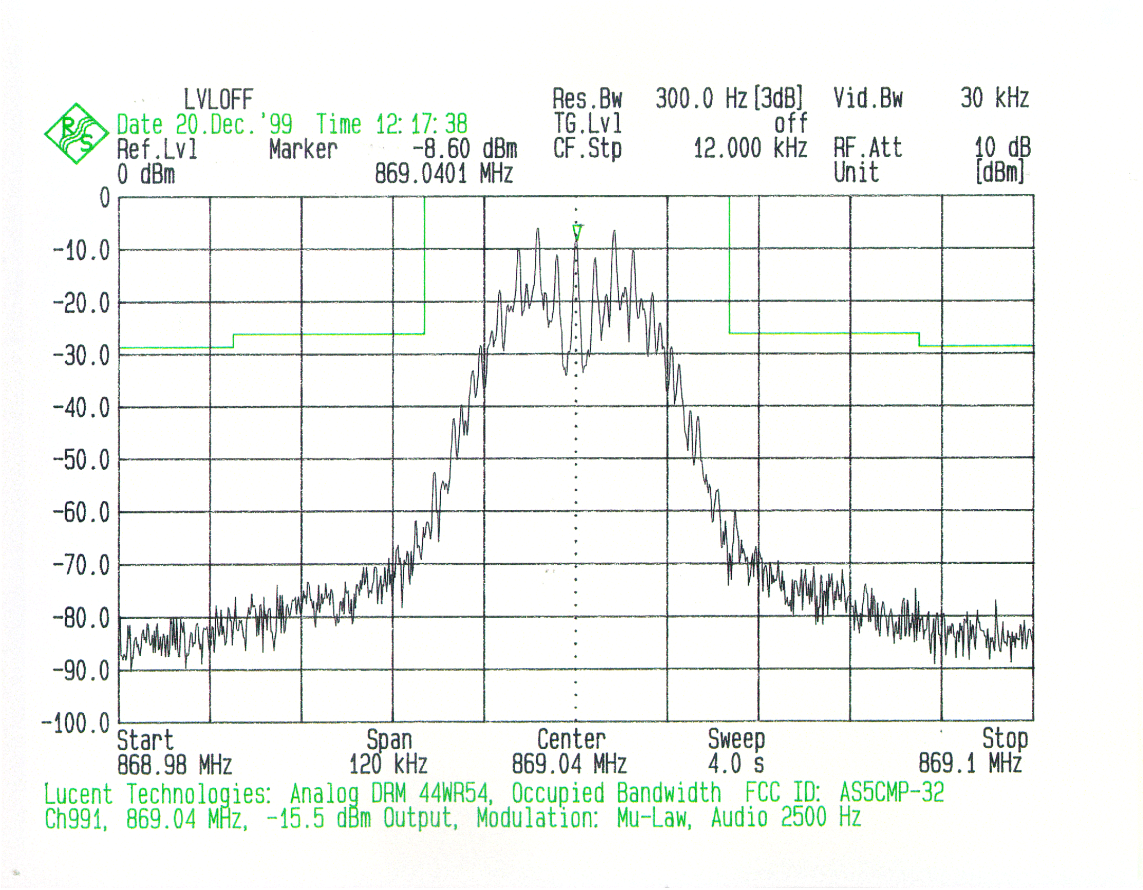


Cellular B-Band: Upper Edge Channel
Channel 799, 893.970 MHz + Audio 2500 Hz + SAT 6030 Hz
A-Law Baseband

PLOT #6

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

EXHIBIT 15

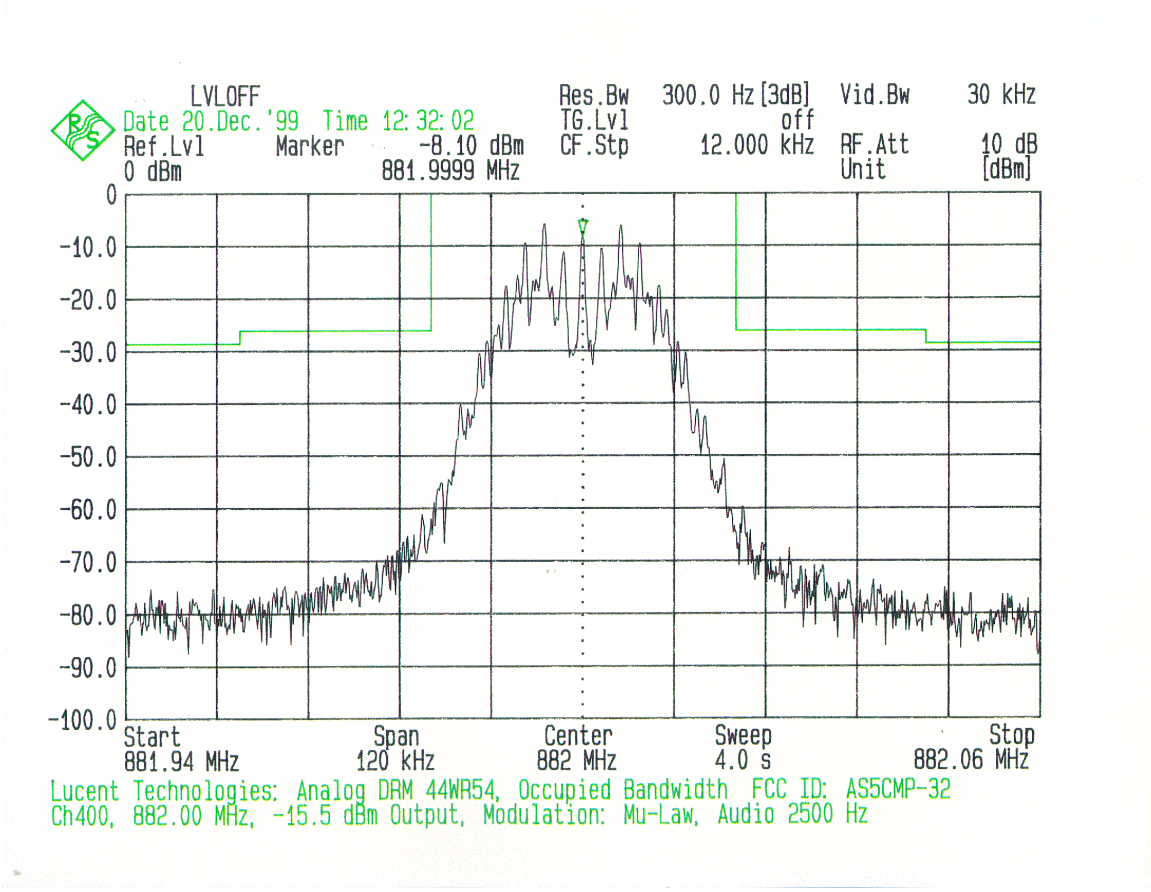


Cellular A-Band: Lower Edge Channel
Channel 991, 869.04 MHz + Audio 2500 Hz
Mu-Law Baseband

PLOT #7

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

EXHIBIT 15



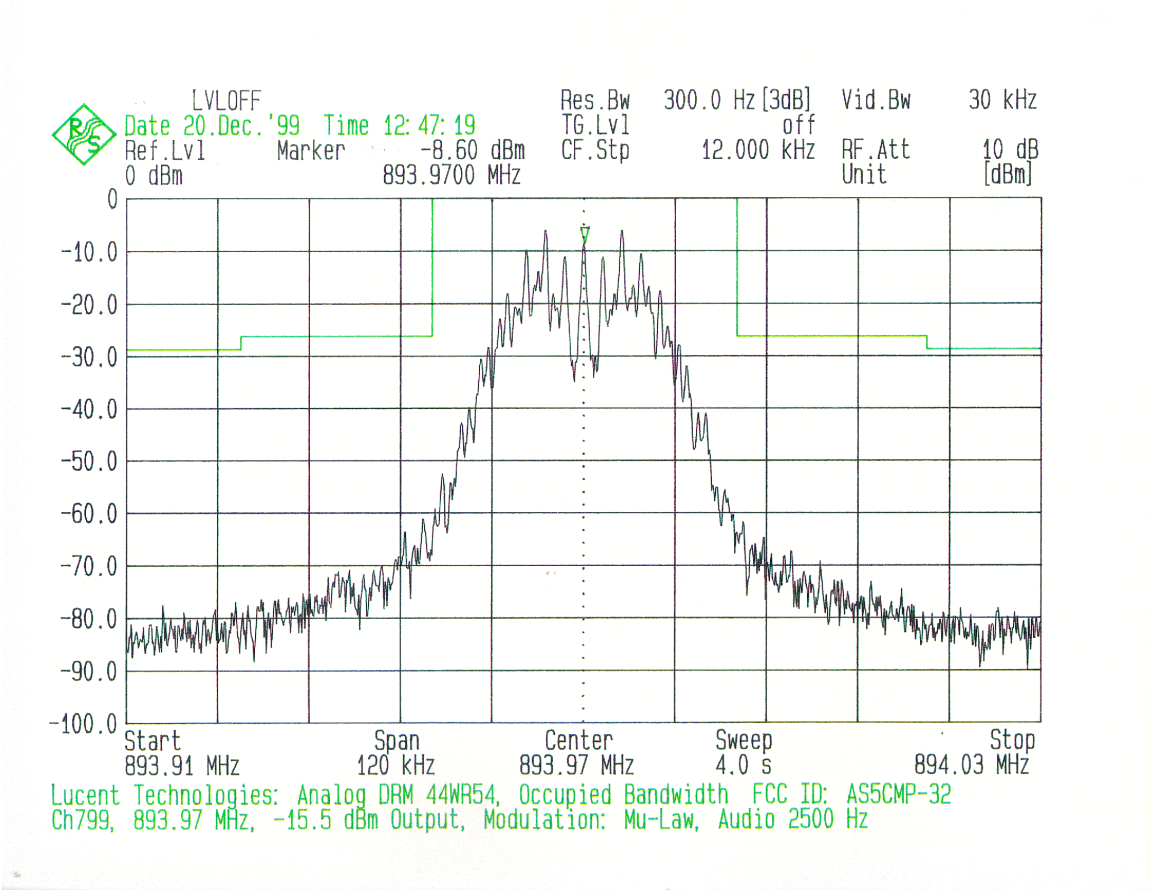
Mid Cellular Frequency Band:

Channel 400, 882.00 MHz + Audio 2500 Hz
Mu-Law Baseband

PLOT #8

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

EXHIBIT 15

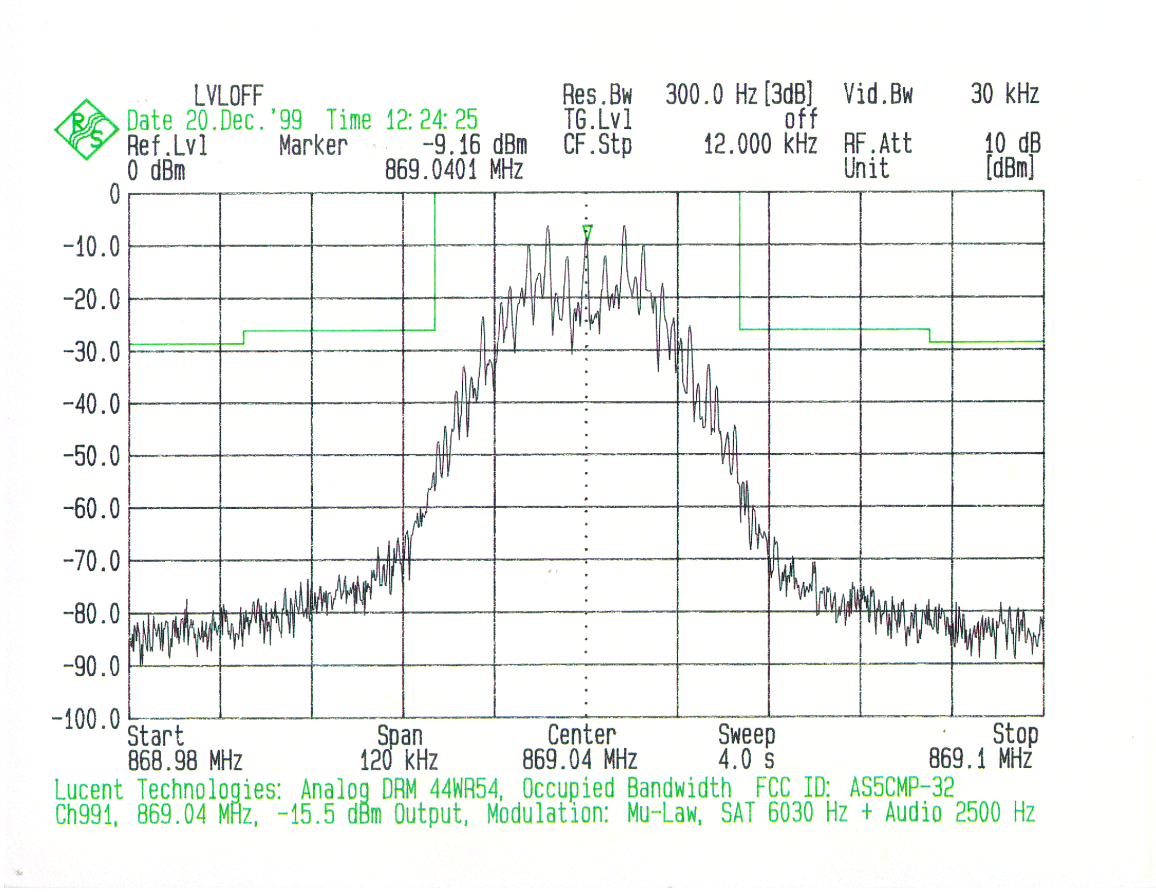


Cellular B-Band: Upper Edge Channel
Channel 799, 893.970 MHz + Audio 2500 Hz
Mu-Law Baseband

PLOT #9

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

EXHIBIT 15

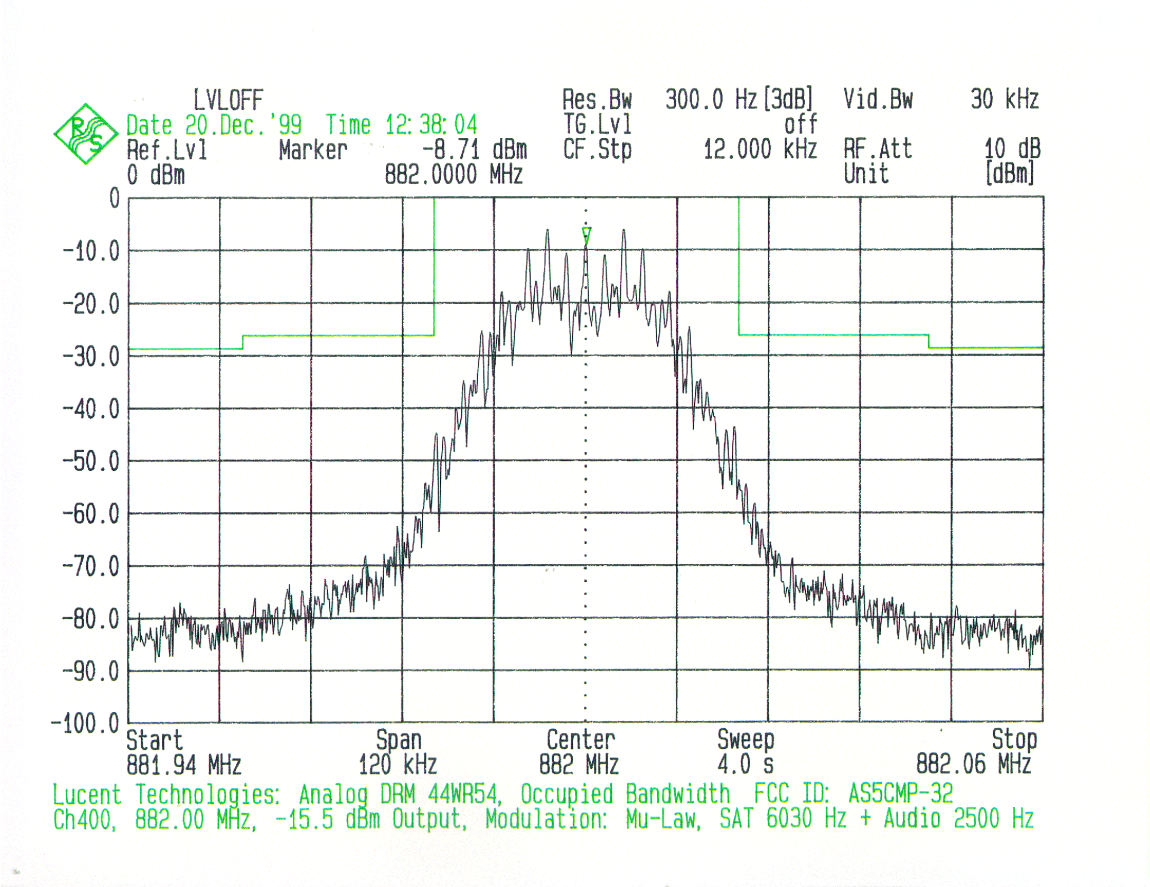


Cellular A-Band: Lower Edge Channel
Channel 991, 869.04 MHz + Audio 2500 Hz + SAT 6030 Hz
Mu-Law Baseband

PLOT #10

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

EXHIBIT 15



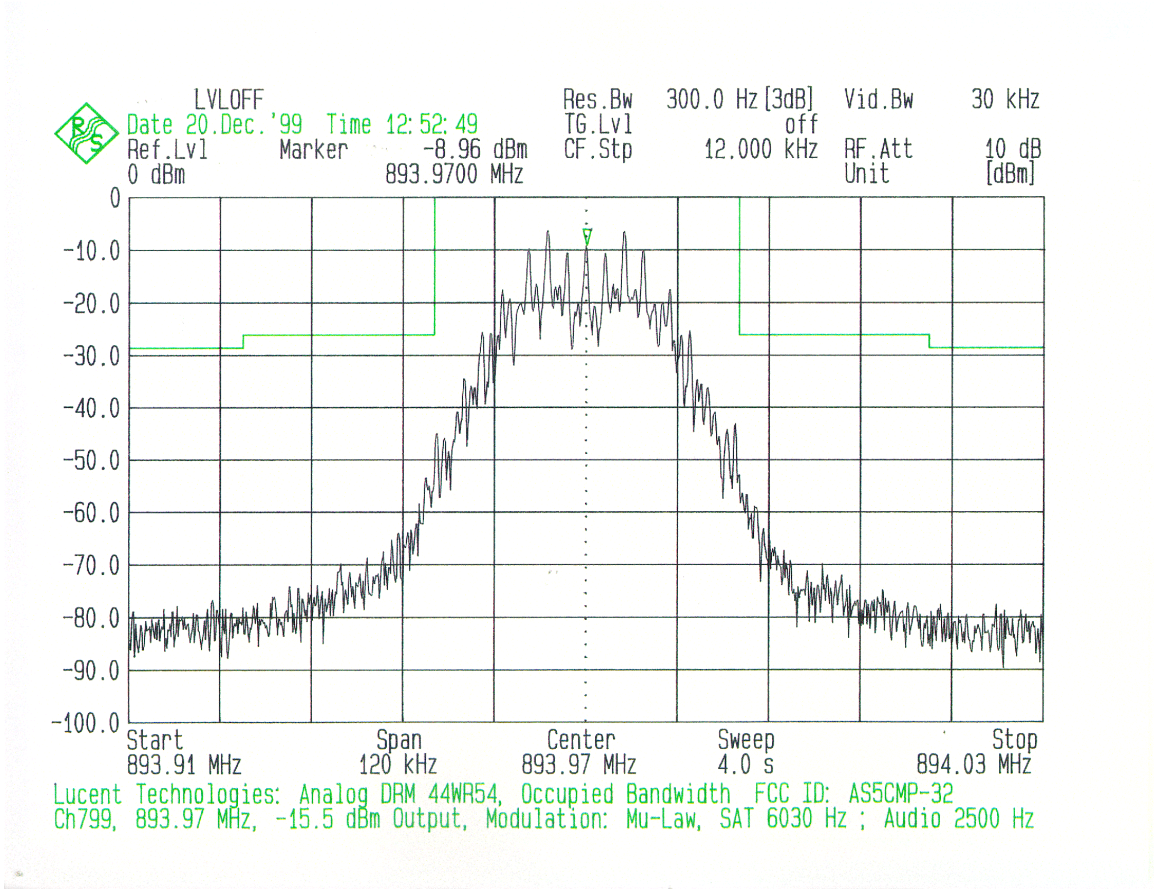
Mid Cellular Frequency Band:

Channel 400, 882.00 MHz + Audio 2500 Hz + SAT 6030 Hz
Mu-Law Baseband

PLOT #11

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

EXHIBIT 15

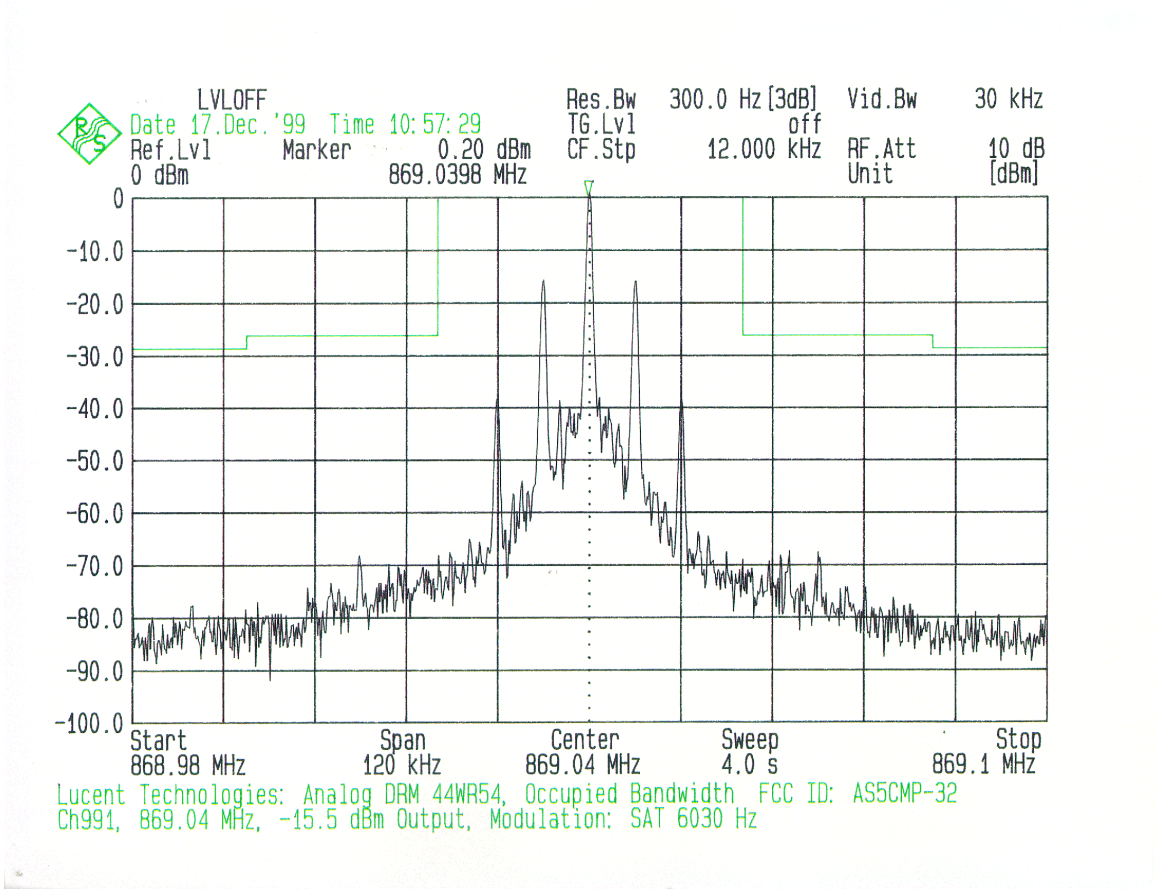


Cellular B-Band: Upper Edge Channel
Channel 799, 893.970 MHz + Audio 2500 Hz + SAT 6030 Hz
Mu-Law Baseband

PLOT #12

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

EXHIBIT 15

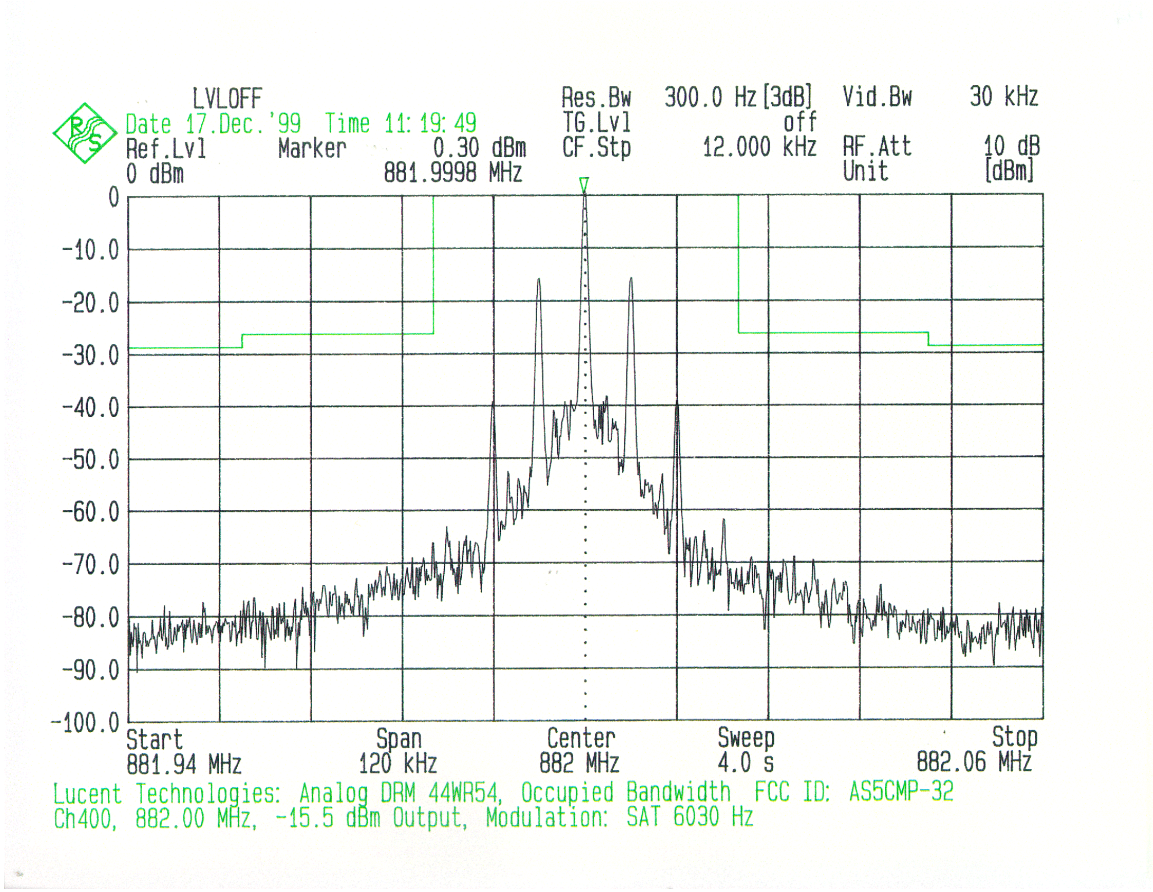


Cellular A-Band: Lower Edge Channel
Channel 991, 869.04 MHz + SAT 6030 Hz

PLOT #13

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

EXHIBIT 15

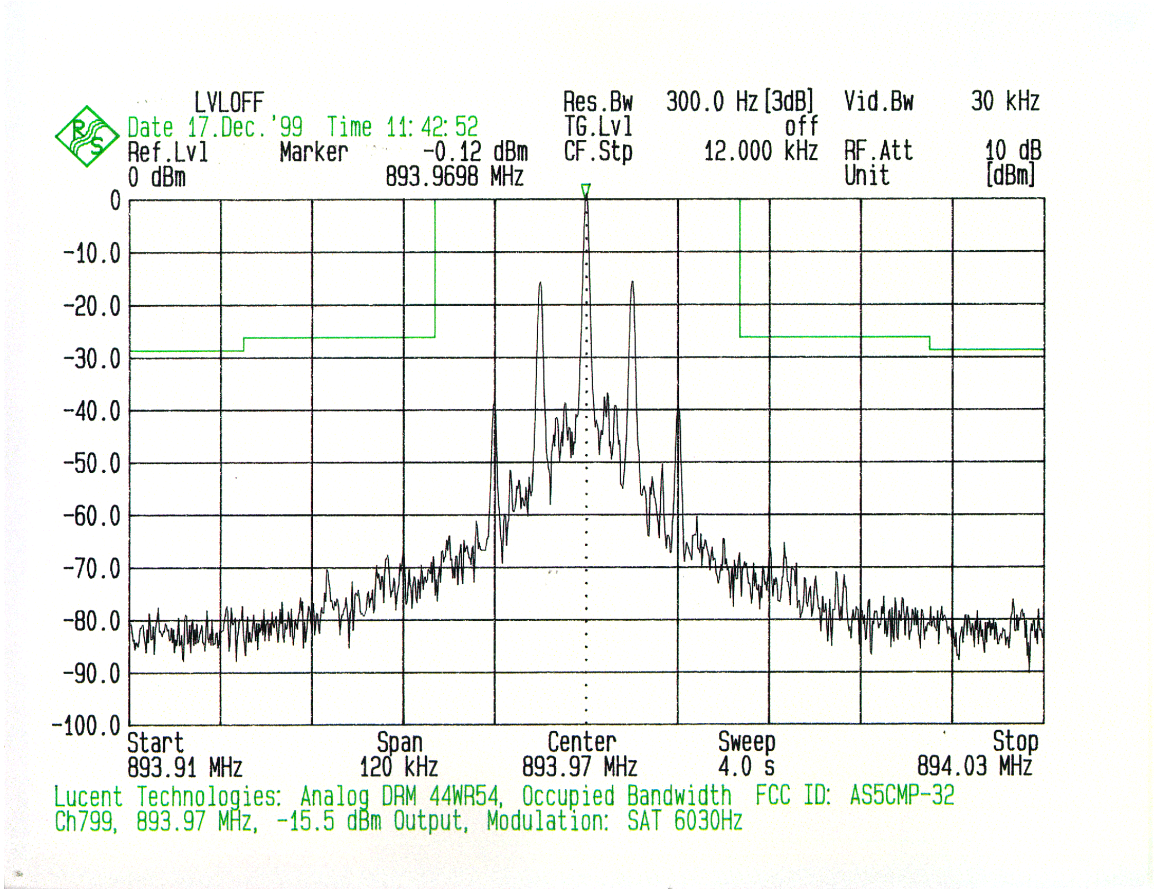


Mid Cellular Frequency Band:
Channel 400, 882.00 MHz + SAT 6030 Hz

PLOT #14

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

EXHIBIT 15

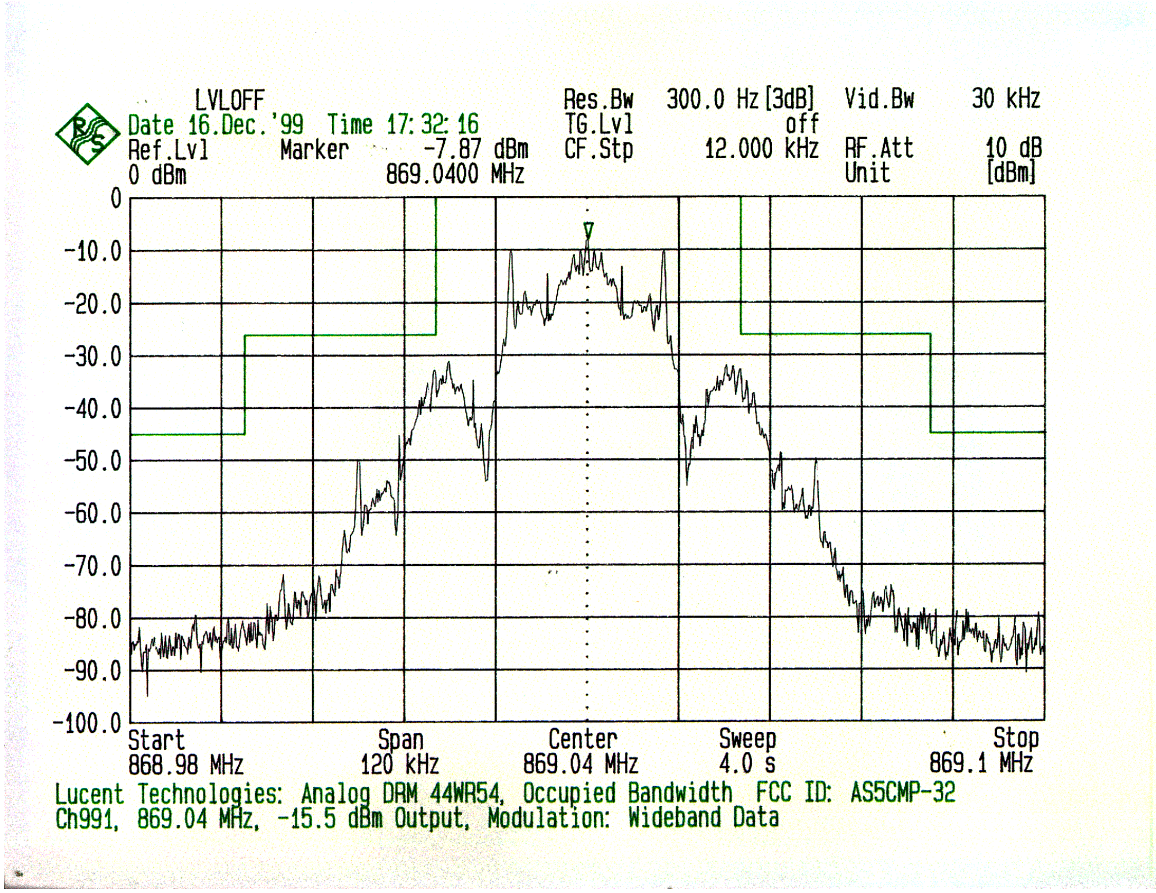


Cellular B-Band: Upper Edge Channel
Channel 799, 893.970 MHz + SAT 6030 Hz

PLOT #15

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

EXHIBIT 15

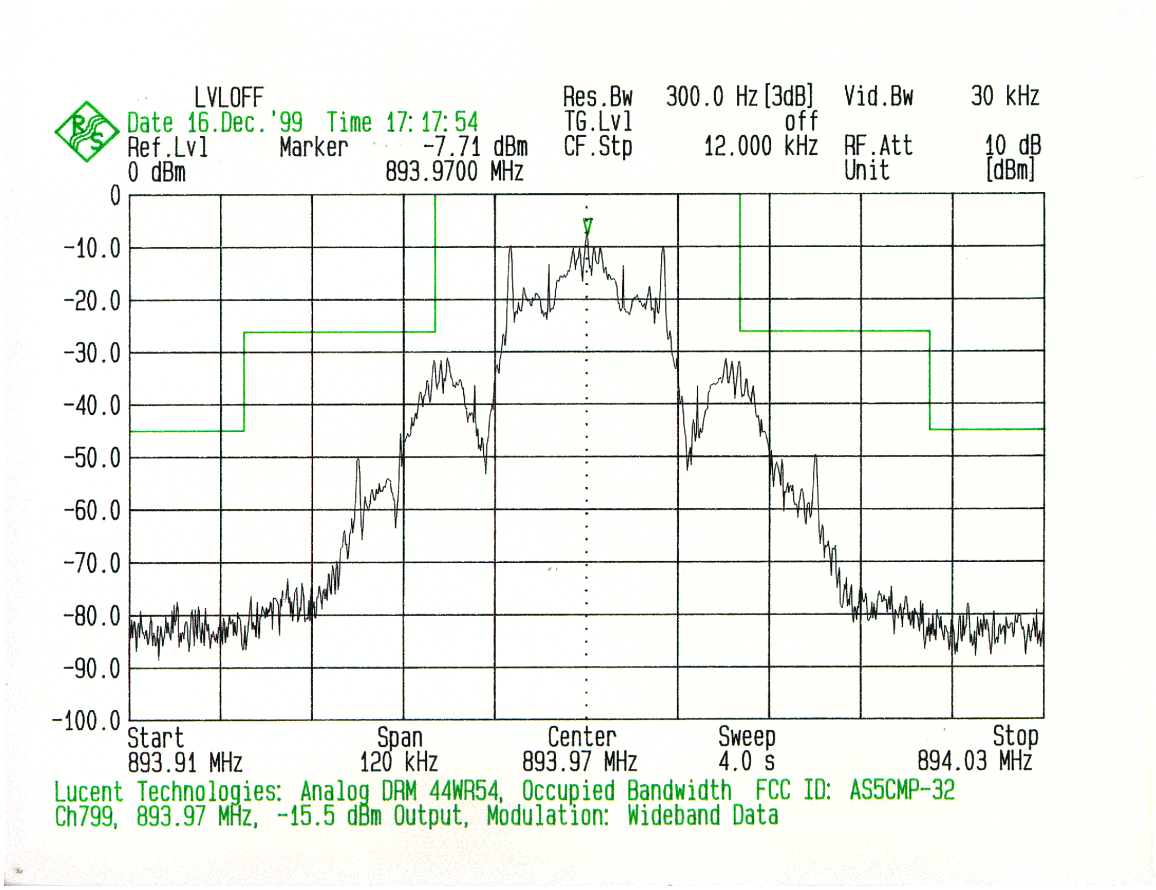


Cellular A-Band: Lower Edge Channel
Channel 991, 869.04 MHz + WBD at 10 kB/s pseudo-random

PLOT #16

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

EXHIBIT 15



Cellular B-Band: Upper Edge Channel
Channel 799, 893.970 MHz + WBD at 10 kB/s pseudo-random

PLOT #18