

## 5. Measurement Data For Transmitter

### 5.1 Measurement Data For Transmitter {2.983(e)}

Section Number	Item	Measurement Results	Procedure Exhibit #
2.985(a)	1 Radio Frequency Power Output measurement Time Masks	Table 5.2.2 Table 5.2.3	6.1
2.987(d)	2 Modulation Char.	Figure 5.3.1	
2.989(h)(1)	3 Occupied Bandwidth	Table 5.4.1	6.2
2.991	4 Spurious Emissions at Antenna Terminal	Table 5.6.1 ~ 5.6.12	6.3
2.993	5 Field Strength of Spurious Radiation	Table 5.7.1 ~ 5.7.6	6.4
2.995	6 Frequency Stability	Table 5.8.1	6.5
24.238(b)(c)	7 Conducted Emissions at the Band Edges of PCS Frequency Blocks	Figure 5.5.1 ~ 5.5.6	6.6

### 5.2 Radio Frequency Power Output Measurement Data {2.985(a)}

#### 5.2.1 Conducted Power Output Measurement

Power Control Level	Nominal Peak Output Power (dBm)	Tolerance (dB)
0	30	±2
7	16	±3
15	0	±5

**Table 5.2.1 Radio Frequency Power Output Measurement Limits**

Frequency (MHz)	Channel #	Power Control Level	Peak Output Power (dBm)
1850.2	512	0	29.48
		7	15.88
		15	2.28
1880.0	661	0	29.48
		7	15.89
		15	1.90
1909.8	810	0	29.65
		7	15.76
		15	1.07

**Table 5.2.2 Conducted Power Measurement Results**

## 5.2.2 Radiated Output Power Measurement

### Radiated Emissions / Interference

Notes: EIRP Measurements

Distance: 3

Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB
EUT, retractable antenna(fully Retracted)									
V	1850.200	96.7	28.6	1.9	0.0	0.0	127.1	n/a	n/a
V	1880.000	96.8	28.8	1.9	0.0	0.0	127.5	n/a	n/a
V	1909.900	96.1	29.0	1.9	0.0	0.0	127.0	n/a	n/a
EUT, retractable antenna(fully Extended)									
V	1850.200	96.3	28.6	1.9	0.0	0.0	126.7	n/a	n/a
V	1880.000	98.0	28.8	1.9	0.0	0.0	128.6	n/a	n/a
V	1909.800	96.9	29.0	1.9	0.0	0.0	127.8	n/a	n/a

### Substitution Method

Ant. Pol. (V/H)	Frequency MHz	EUT Measured Reading dB(uV)	Sig Generator Level dBm	Pwr meter Reading dBm	Atten	Tx. Ant Gain dBi	Subs Meth Radiated Power dBm	Radiated Power in Watts	Calc. EUT Radiated Power	Delta EUT vs. Subs. dB
EUT, retractable antenna(fully Retracted)										
V	1850.200	127.1	-26.3	-9.7	29.8	6.6	26.7	0.472		
V	1880.000	127.5	-24.6	-8.1	29.8	6.6	28.3	0.675		
V	1909.800	127.0	-23.7	-8.0	29.8	6.6	28.4	0.693		
EUT, retractable antenna(fully Extended)										
V	1850.200	126.7	-26.6	-10.0	29.8	6.6	26.5	0.442		
V	1880.000	128.6	-23.0	-6.5	29.8	6.6	29.9	0.971		
V	1909.800	127.8	-23.0	-7.3	29.8	6.6	29.1	0.809		

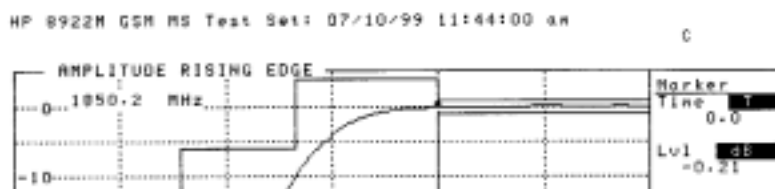
### Comments

- 1) Sig Generator Level(dBm) refers to raw signal level seen on the signal generator.  
This is recorded for our reference purpose only.
- 2) Pwr meter reading(dBm) refers to signal level measured on the power meter at the input of transmitting antenna and it includes 30 dB nominal attenuator
- 3) Atten refers to 30 dB nominal attenuator used at the input of the power meter.
- 4) Tx. Ant Gain(dBi) refers to transmitting antenna gain in dBi.
- 5) The corrected signal generator level that is fed into the antenna can be calculated by combining the signal level measured on the power meter and 30 dB nominal attenuator. For example, if the power meter reading was -6.5 dBm then the corrected signal generator level = -6.5 + 29.8 = 23.3 dBm
- 6) Simple radiated power calculation  
Radiated Power(dBm) = Corrected signal generator level(dBm) + Transmitting antenna gain(dBi)

if the corrected signal generator level(dBm) = 23.3 dBm and  
the transmitting antenna gain = 6.6 dBi, then

Radiated Power(dBm) = 23.3 dBm + 6.6 dBi = 29.9 dBm or approximately 1 Watt

**Table 5.2.3 Radiated Power Measurement Results**



HP 8922M GSM MS Test Set: 07/10/99 11:47:00 am

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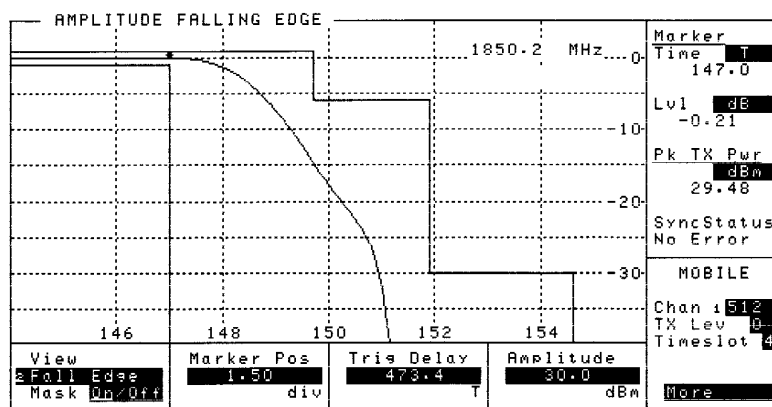
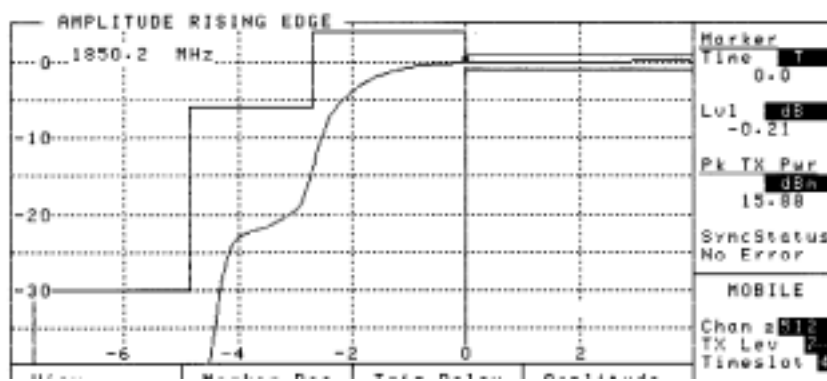


Figure 5.2.1 Carrier 1850.2 MHz (Ch 512) Power Level 0

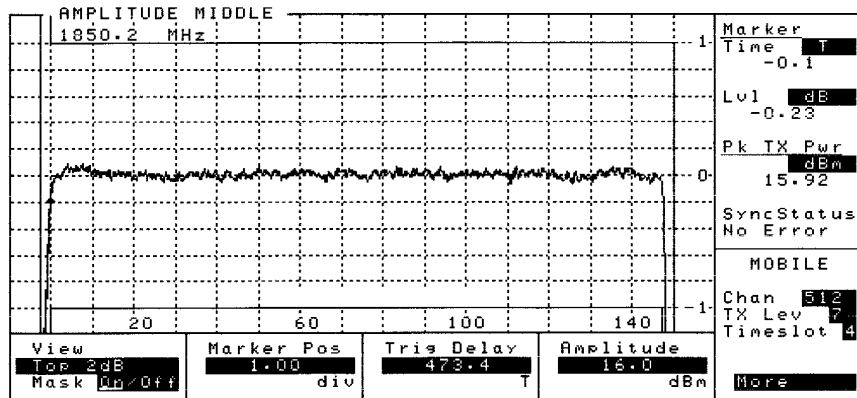
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HP 8922M GSM MS Test Set: 07/10/99 11:52:00 am

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HP 8922M GSM MS Test Set: 07/10/99 11:52:00 am

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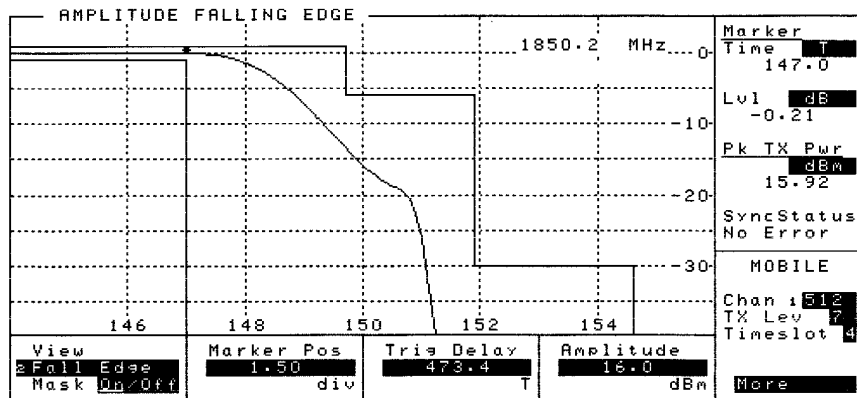
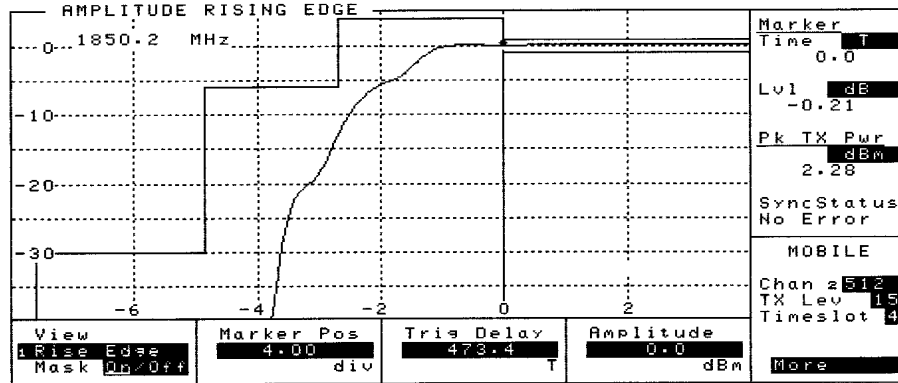


Figure 5.2.2 Carrier 1850.2 MHz (Ch 512) Power Level 7

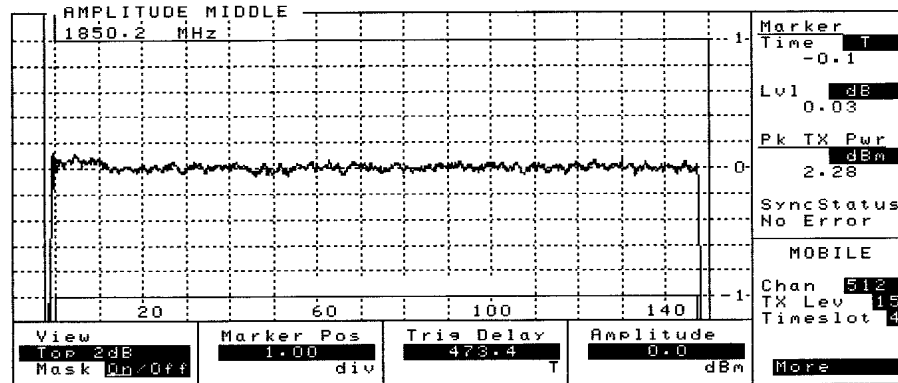
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HP 8922M GSM MS Test Set: 07/10/99 01:50:00 PM

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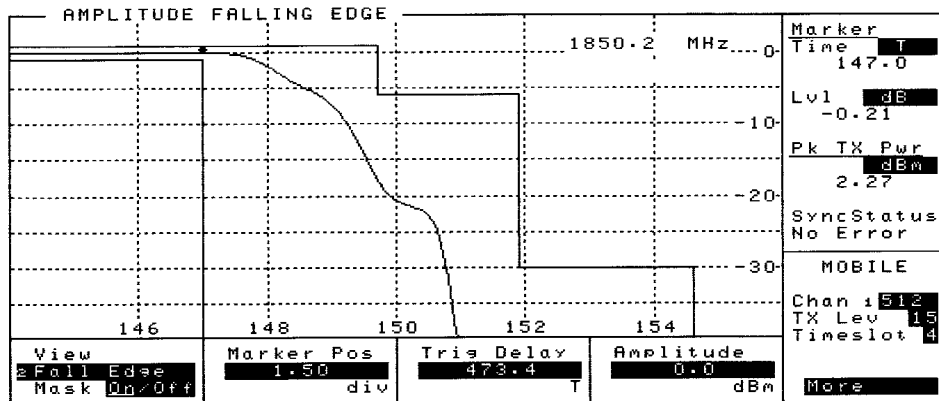
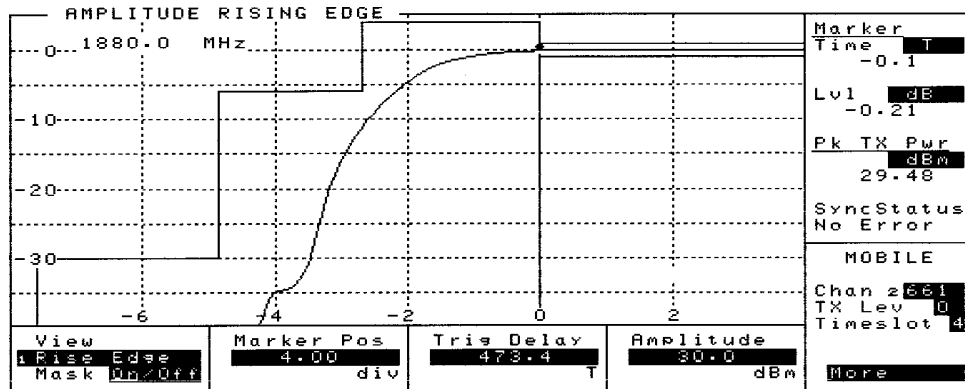


Figure 5.2.3 Carrier 1850.2 MHz (Ch 512) Power Level 15

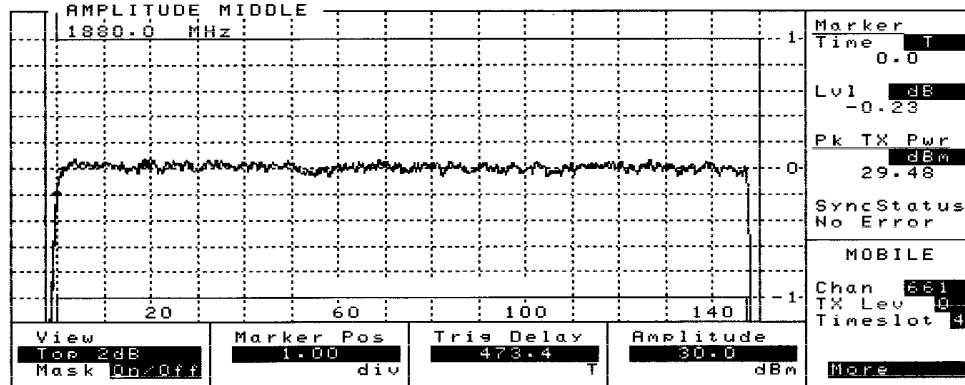
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HP 8922M GSM MS Test Set: 07/10/99 11:56:00 am

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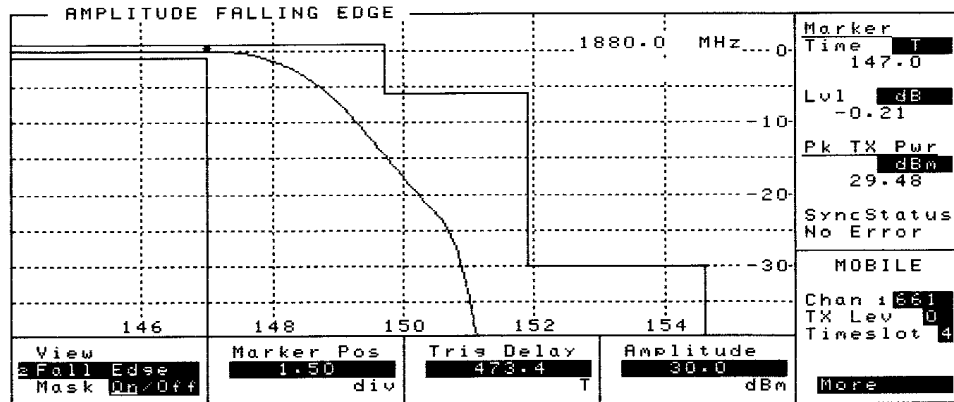
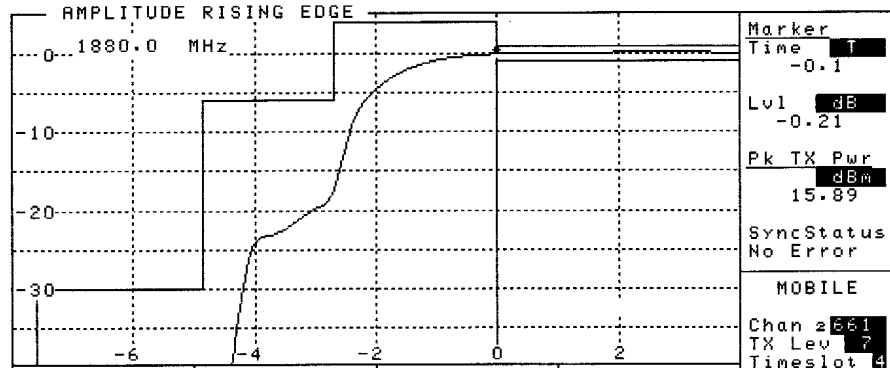


Figure 5.2.4 Carrier 1880.0 MHz (Ch 661) Power Level 0

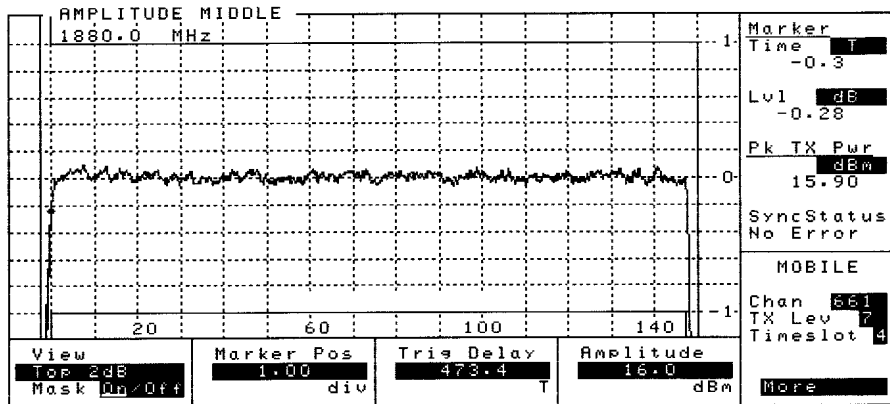
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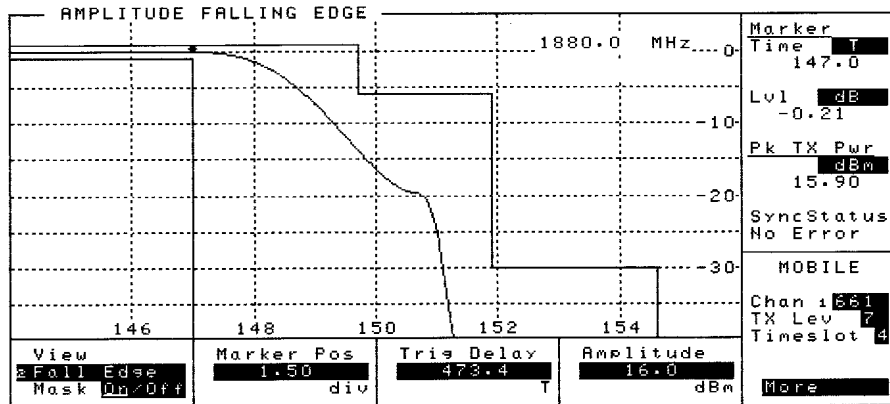


Figure 5.2.5 Carrier 1880.0 MHz (Ch 661) Power Level 7

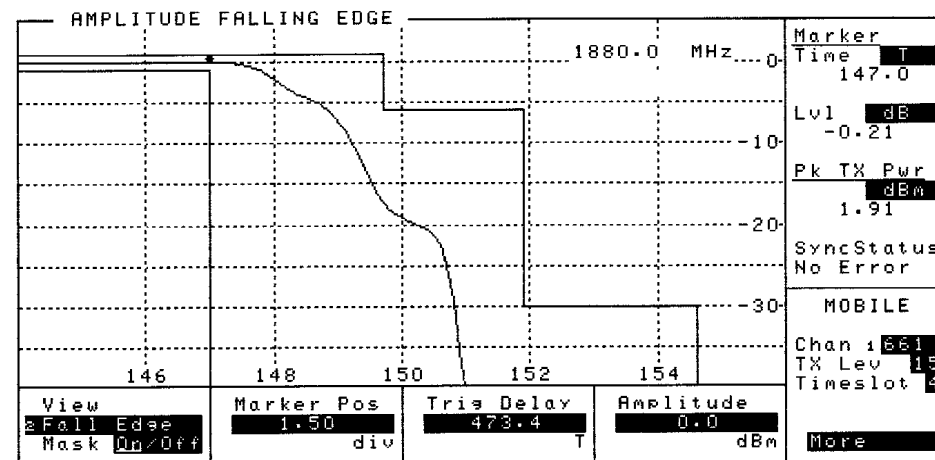
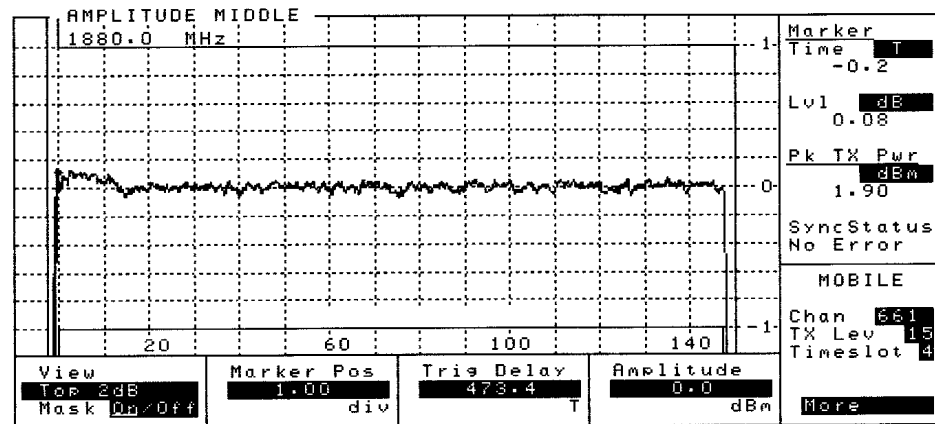
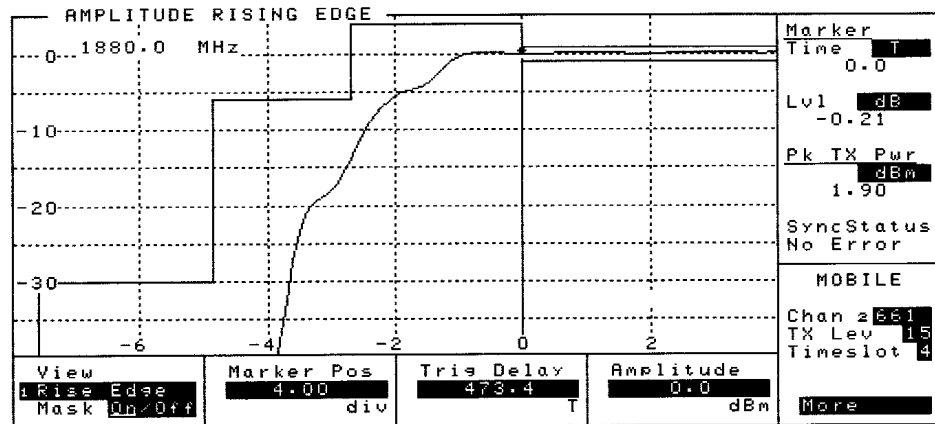
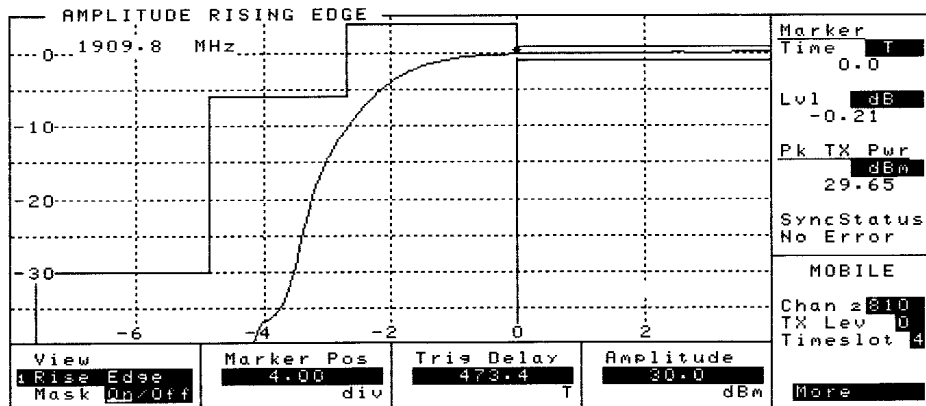


Figure 5.2.6 Carrier 1880.0 MHz (Ch 661) Power Level 15



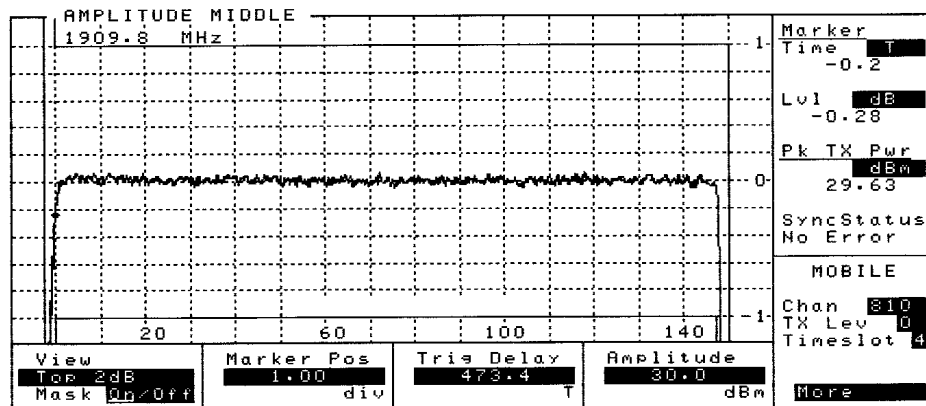
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HP 8922M GSM MS Test Set: 07/10/99 12:03:00 PM

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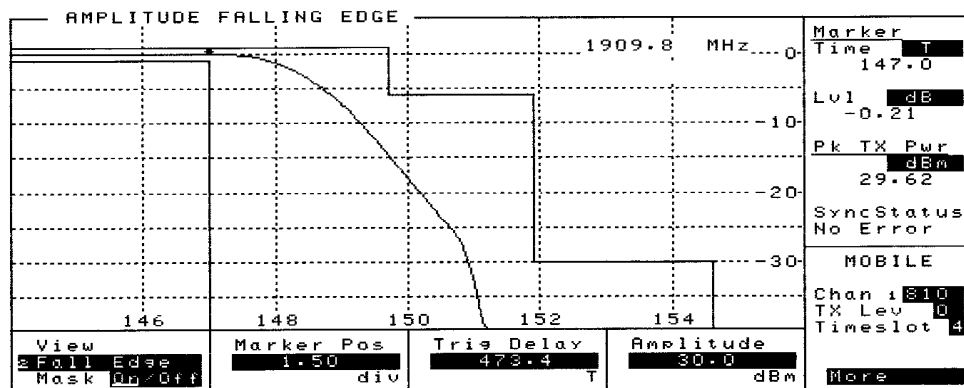


Figure 5.2.7 Carrier 1909.8 MHz (Ch 810) Power Level 0