



ELETTRONICA TELECOMUNICAZIONI S.p.A.

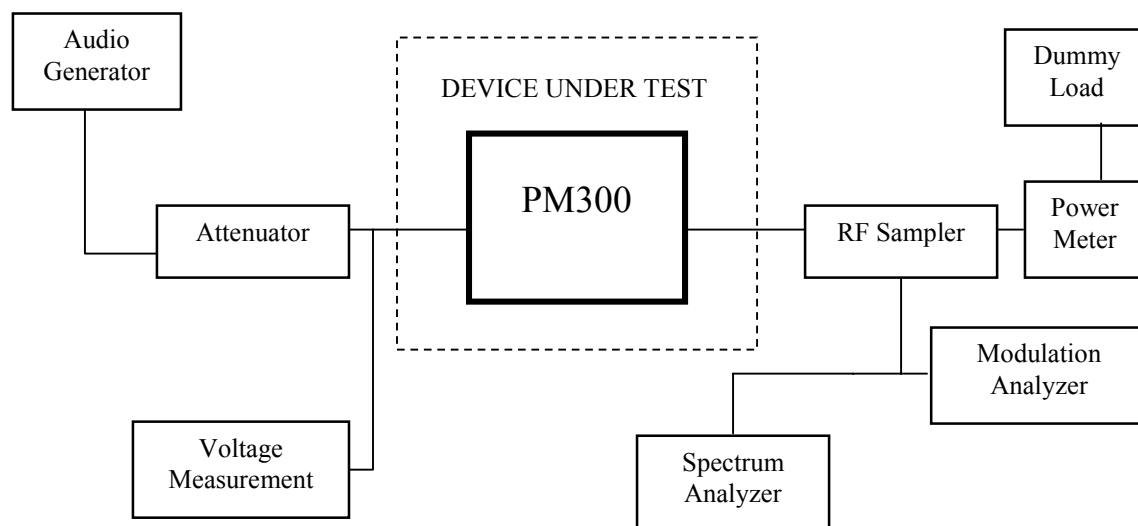
# **PM300**

## **300W FM Low Power Transmitter**

### **TEST REPORT**

The following document shows the technical performance of the PM300 FM transmitter. According to the FCC rules and regulations (applicable portion of Part 2 and Part 73).

## MEASUREMENT EQUIPMENT



### • Conducted Emissions

Stereophonic and Monophonic configurations have been tested.

#### • STEREOPHONIC MODE

PILOT: set to 9% (6.75kHz deviation)

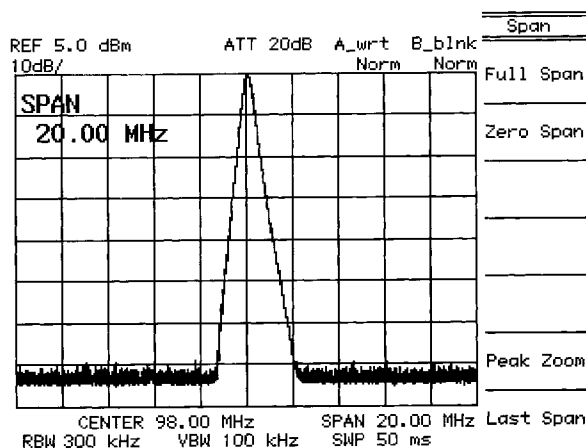
LEFT (or RIGHT) input: 15kHz

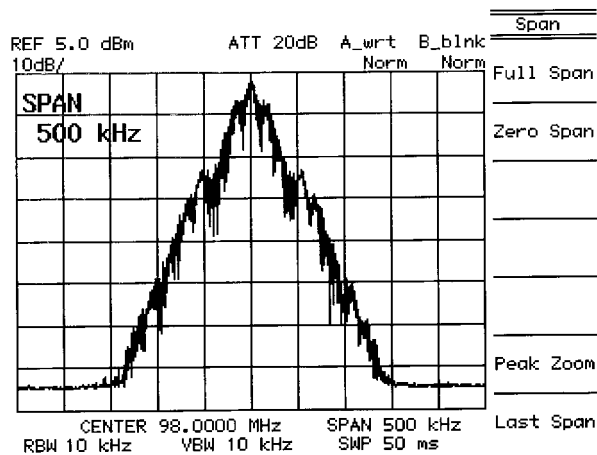
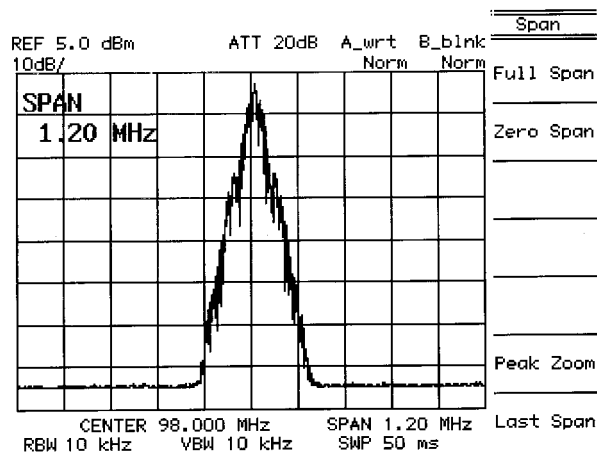
MAIN CHANNEL: 28.5kHz deviation

STEREO CHANNEL: 28.5kHz deviation

The transmitter was set at 300W RF output power

Emission levels recorded on the ADVANTEST R3131 Spectrum Analyzer





The FCC rule 73.317 limits the emission between 120kHz and 240kHz from the carrier frequency to  $-25\text{dB}$ , between 240kHz and 600kHz to  $-35\text{dB}$  and for higher frequency than 600kHz the emission may be at least  $43+10 \log P_o$ , or  $-67\text{dB}$  referenced to the unmodulated carrier. In the stereophonic mode the emissions are below the limits.

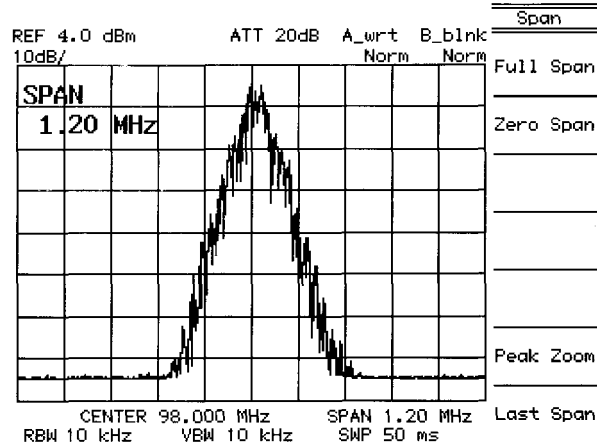
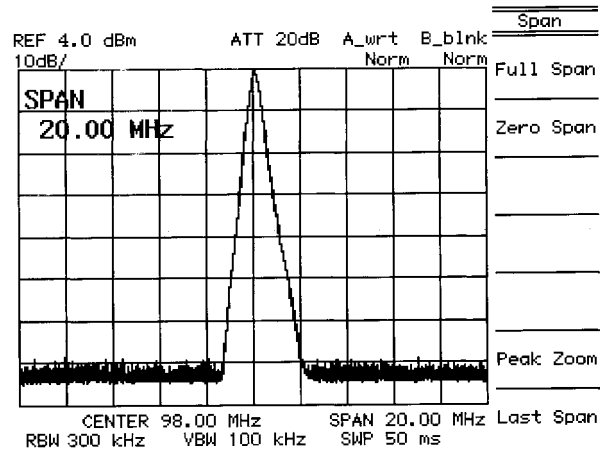
- STEREOPHONIC MODE PLUS SCA

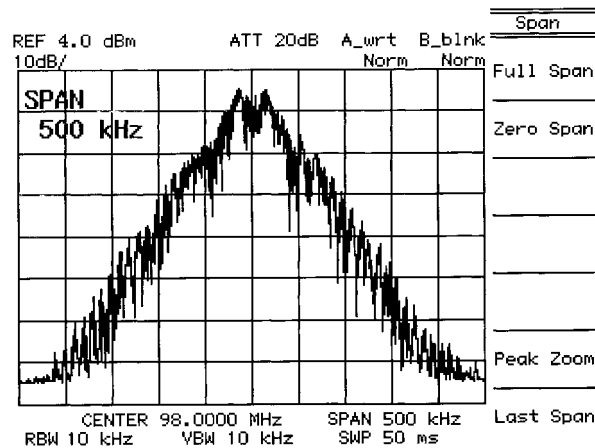
An SCA channel has been added to the stereo channel.

SCA input: 67kHz

SCA input sub-carrier: modulated at 15% (11.15kHz)

LEFT (or RIGHT) input: 15kHz adjusted to obtain 70% modulation (52.5kHz)

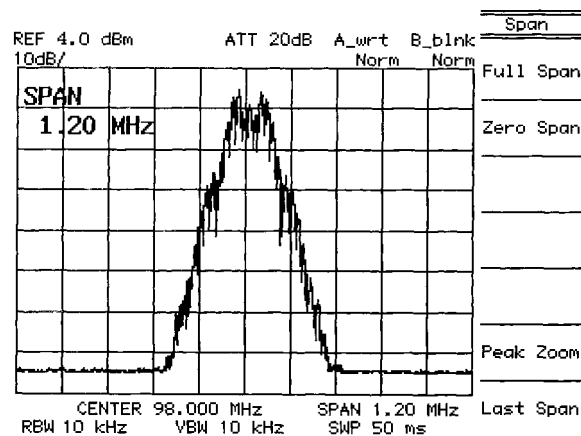
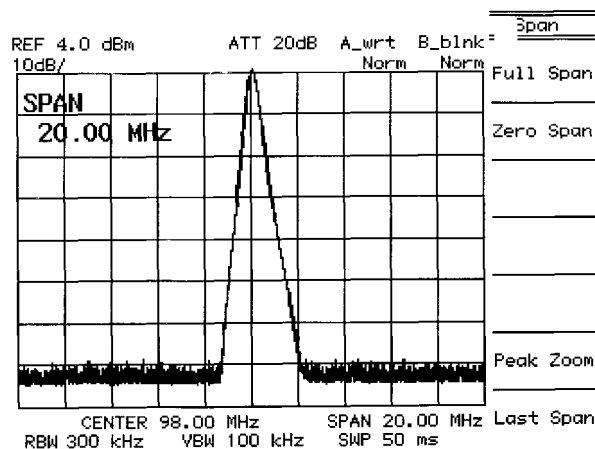


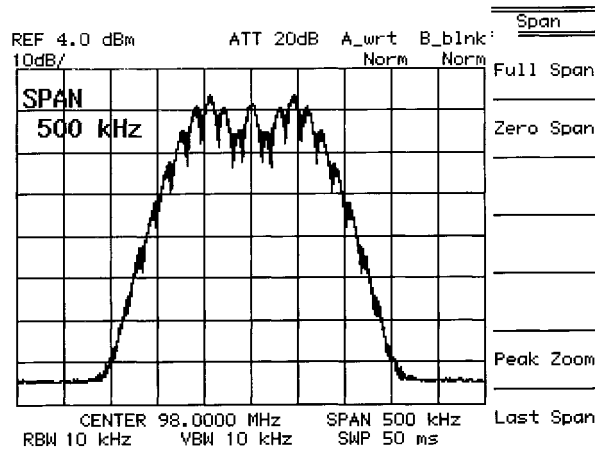


In the stereophonic mode plus SCA the emissions are below the limits.

- MONOPHONIC MODE

MONO input: 15kHz with 80% modulation (63.75kHz deviation)





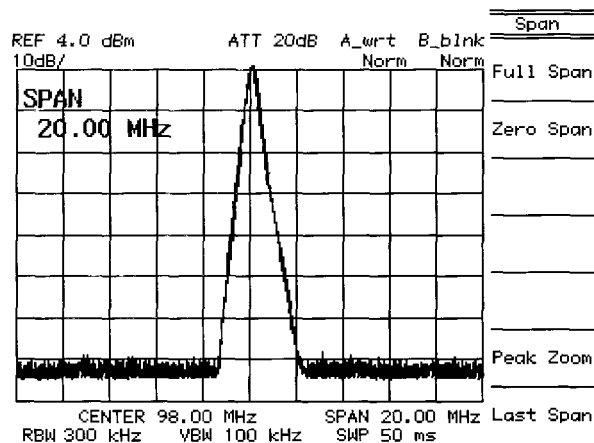
As can be seen, the monophonic mode emissions meet the requirement.

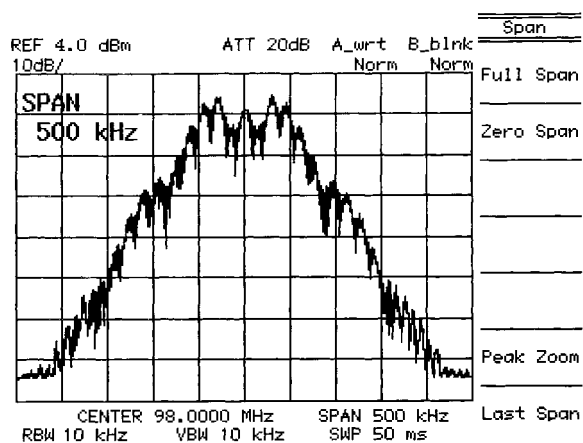
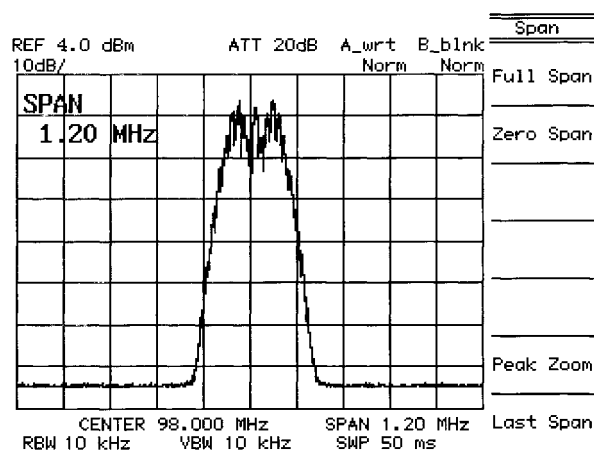
- MONOPHONIC MODE PLUS SCA

SCA input: 67kHz

SCA input sub-carrier: modulated at 15% (11.15kHz)

LEFT (or RIGHT) input: 15kHz adjusted to obtain 70% modulation (52.5kHz)





In the monophonic mode plus SCA the emissions are below the limits.

- CONDUCTED HARMONICS

Conducted harmonics are sampled in the output transmission line.

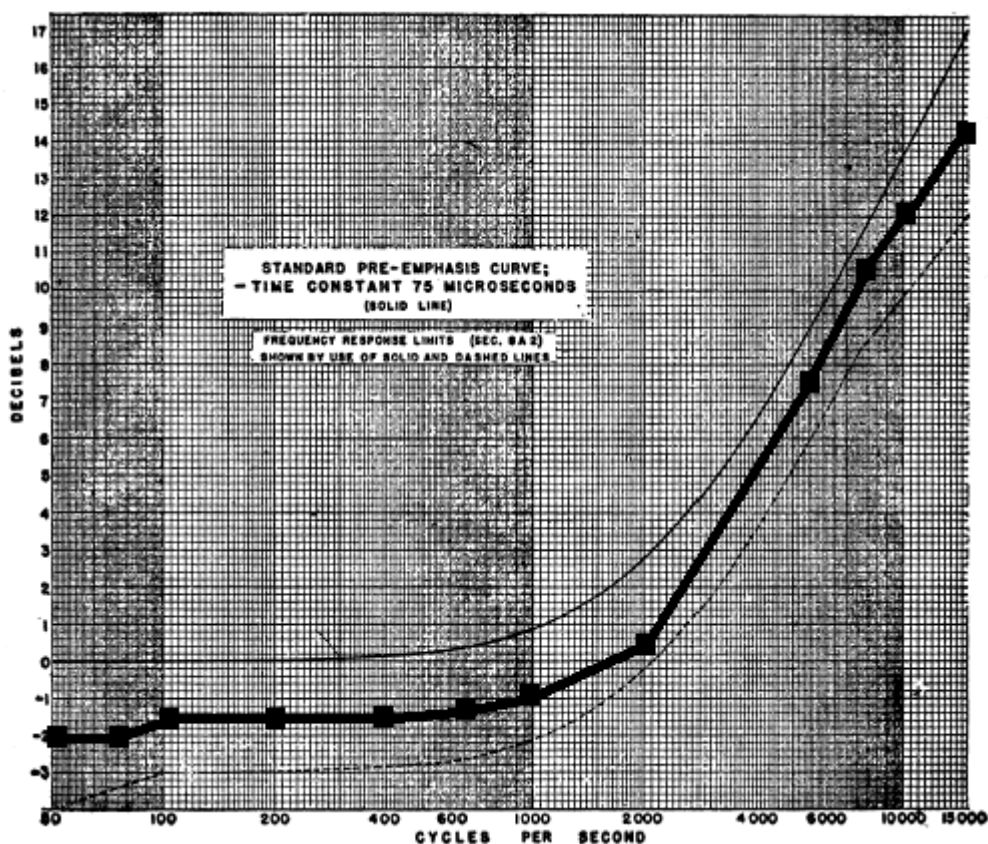
The measured value must be adjusted using the directional coupler coupling value and cable loss.

HARMONIC N°	HARMONIC LEVEL
2 <sup>th</sup> 196MHz	-79.9dBc
3 <sup>th</sup> 294MHz	-77.2dBc
4 <sup>th</sup> 392MHz	-95.4dBc
5 <sup>th</sup> 490MHz	-90.2dBc
6 <sup>th</sup> 588MHz	-99.5dBc
7 <sup>th</sup> 686MHz	< -100dBc
8 <sup>th</sup> 784MHz	< -100dBc
9 <sup>th</sup> 882MHz	< -100dBc
10 <sup>th</sup> 980MHz	< -100dBc

All the measures are at least  $43 + 10 \log P_o$  (or 67dB) or better.

- Audio Frequency Response and Pre-emphasis curve

The characteristics were measured from the Modulation Analyzer



- **RF Power Output Stability**

With the audio generator not energized, the loss through the RF output cable , directional coupler and attenuator was calibrated. The carrier frequency was 98MHz.

- VARIABLE TEMPERATURE

The transmitter was turned on at a power output of 350W (at room temperature).  
Next the temperature was varied from 0C to +50C.  
Then the output power was reduced to 58W.

Temperature	RF Power
0°C	351W
25°C	350W
50°C	352W
0°C	58W
25°C	58W
50°C	57W

- VARIABLE LINE VOLTAGE

The transmitter was turned on at a power output of 300W (at room temperature).  
The line voltage was varied from 94Vac to 126Vac.  
Then the power output was reduced to 45WW.

Line Voltage	RF Power
94V <sub>AC</sub>	300W
110V <sub>AC</sub>	300W
126V <sub>AC</sub>	300W
94V <sub>AC</sub>	45W
110V <sub>AC</sub>	45W
126V <sub>AC</sub>	45W

- **Frequency Stability**

With the audio generator not energized, the loss through the RF output cable , directional coupler and attenuator was calibrated. The carrier frequency was 98MHz.

The transmitter was turned on at a power output of 300W (at room temperature).  
The line voltage was varied from 94V<sub>AC</sub> to 126V<sub>AC</sub>.

Line Voltage	RF Frequency
94V <sub>AC</sub>	98.0000007MHz
110V <sub>AC</sub>	98.0000007MHz
126V <sub>AC</sub>	98.0000007MHz

- **Cabinet Radiation**

The transmitter was set at 300W and the carrier frequency was 98MHz.

The measured value must be adjusted using cable loss, antenna gain characteristics.

Then the radiated power was calculated and compared to 300W.

Frequency MHz	Field Strength DBuV/m	Field Strength V/m	Equivalent Radiated Power W	Relative to P <sub>OUT</sub> dBc
98	56	0.000631	119.4483E-9	-93.9
196	39	0.000089	2.3763E-9	-111.0
294	38	0.000079	1.8723E-9	-112.0
392	36	0.000063	1.1907E-9	-114.0
490	34	0.000050	0.7500E-9	-116.0
588	36	0.000063	1.1907E-9	-114.0
686	35	0.000056	0.9408E-9	-115.0
784	34	0.000050	0.7500E-9	-116.0
882	32	0.000039	0.4563E-9	-118.2
980	34	0.000050	0.7500E-9	-116.0

- **FCC rules and regulations (applicable portion of Part 2 and Part 73)**

- Part 2.1046
- Part 2.1053
- Part 2.1057
- Part 2.1033
- Part 73.1545
- Part 73.333
- Part 73.297
- Part 73.317
- Part 73.319
- Part 73.322
- Part 73.1570

- **Equipment**

	MODEL
Spectrum Analyzer	ADVANTEST R3131
Modulation Analyzer	RHODE & SCHWARZ FMAB
RF Power Meter	BIRD MODEL 43
Humidifier	ETT S.R.L.
Thermal Detector	AZ 8703
Humidity Detector	ETT S.R.L.
Thermal Room	ANGELANTONI TY 175 IU S
Test Load	BIRD 8431
Directional Coupler	BIRD 4275

