

## **Akkreditiertes Prüflaboratorium**

**DAR-Registriernummer:  
TTI-P-G 166/98-00 vom 18.09.98**

**Test report no.: 2\_1613-B/99  
FCC 47 Part 74.802  
SR 300 , AC 1**

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**1 General information**

**1.1 Notes**

The test results of this test report relate exclusively to the item tested as specified in 1.5.

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## 1.2 Testing laboratory

CETECOM ICT Services GmbH

66117 Saarbrücken

Untertürkheimer Straße 6 - 10

Deutschland

Telephone: + 49 681 598 - 9000

Telefax : + 49 681 598 - 9075

E-mail : Michael.Berg@ict.cetecom.de

Internet : www.cetecom.de

**Accredited testing laboratory**

**DAR-registration number : TTI-P-G-166/98-00 vom 18.09.98**

## 1.3 Details of applicant

Name : Sennheiser electronic GmbH & Co. KG

Street : Am Labor 1

City : D-30900 Wedemark

Country : Germany

Telephone : +49 (0) 5120 / 600-0

Telefax : +49 (0) 5120 / 600-330

Contact : Mr. Klaus Willemsen

Telephone : +49 (0) 5120 / 600-542

## 1.4 Application details

Date of receipt of application : 27.08.1999

Date of receipt of test item : 27.08.1999

Date of test : 31.08.1999

## 1.5 Test item

Type of equipment : in ear monitoring system

Type designation : SR 300 with AC 1(Antenna combiner)

Manufacturer : applicant

Street

City

Country

Serial number : 1000004, 1000008, 1000012, 1000016, 1000021

## Additional information's:

Frequency : 518 - 870 MHz

Modulation : 180KF3E

Number of channels : 1280 in 25 kHz steps

Channel bandwidth : R (200 kHz)

Antenna : BNC Socket

Power supply : 10.5 - 16V DC

Category of the alignment range : ARI

## 1.6 Test standards

CFR 47, Part 74 Subpart H

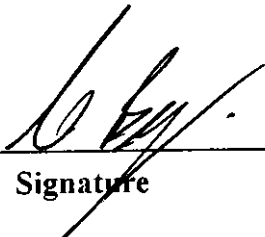
2 Technical test

2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed.

Technical responsibility for area of testing :

02.09.99            RSC8411    Berg M.  
Date                Section     Name

  
Signature

Technical responsibility for area of testing :

02.09.99            RSC8414    Ames H.  
Date                Section     Name

  
Signature

**2.2 Testreport**

**TEST REPORT**

**Testreport no.: 2\_1613-B/99**

## TEST REPORT REFERENCE

## LIST OF MEASUREMENTS

<b>PARAMETER TO BE MEASURED</b>	<b>PAGE</b>
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Equipment under test : SR 100

Ambient temperature : 23°C

Relative humidity : 62%

**OUTPUT POWER**

FCC Rule Part 74.861

Polarisation of the measurements for the larger power level .: vertical

TEST CONDITIONS		TRANSMITTER POWER (mW)				
		518.000	646.000	756.000	806.000	870.000
Frequency (MHz)						
T <sub>nom</sub> ( 23 )°C	V <sub>nom</sub> ( 230 )V	13.49	11.48	13.49	12.30	11.48
Maximum deviation from output power under extreme test conditions (dBc)		1.60	1.50	1.60	1.70	1.10
Measurement uncertainty		±3dB				

**LIMIT**

FCC Rule Part 74.861

Frequency range MHz	Power level (antenna input power) mW
54-72, 76-88, 174-216	50
470-608, 614-806	250

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**

(for reference numbers see test equipment listing)

Equipment under test : SR 100  
 Ambient temperature : 23°C  
 Relative humidity : 62%

**FREQUENCY STABILITY**

TEST CONDITIONS		FREQUENCY (MHz)				
Theoretical Frequencies (MHz)		518.000	646.000	756.000	806.000	870.000
T <sub>min</sub> (23)°C	V <sub>min</sub> ( 10.5 )V	518.00004	646.00021	755.99995	806.00009	869.99987
	V <sub>max</sub> ( 16.0 )V	518.00003	646.00027	755.99997	806.00011	869.99986
Limit (MHz)		517.9741 to 518.0259	645.96770 to 646.00323	755.96220 to 756.03780	805.95970 to 806.04030	869.95650 to 870.4350
Measurement uncertainty		$< \pm 10^{-7}$				

**LIMIT**

**FCC Rule Part 74.861**

**The frequency tolerance of the transmitter shall be 0.005 percent**



Equipment under test : SR 100  
 Ambient temperature : 23°C  
 Relative humidity : 62%

TEMPERATURE VARIATION :

TEST CONDITIONS	FREQUENCY (MHz)				
	518.000	646.000	756.000	806.000	870.000
Theoretical Frequencies (MHz)					
Temperature(°Celsius)					
-30	518.00195	645.99738	755.99693	805.99891	807.00047
-20	518.00400	646.00084	756.00113	806.00275	870.00440
-10	518.00472	646.00265	756.00367	806.00451	870.00422
0.0	518.00313	646.00225	756.00331	806.00333	870.00532
+10	518.00226	646.00159	756.00218	806.00181	870.00332
+20	518.00004	645.99979	755.99995	806.00009	869.99987
+30	517.99855	645.99838	755.99827	805.99797	869.99815
+40	517.99595	645.99619	755.99550	805.99504	869.99459
+50	517.99423	645.99463	755.99404	805.99287	869.99166
Limit (MHz)	517.9741 to 518.0259	645.96770 to 646.00323	755.96220 to 756.03780	805.95970 to 806.04030	869.95650 to 870.4350
Measurement uncertainty	$< \pm 10^{-7}$				

LIMIT

FCC Rule Part 74.861

The frequency tolerance of the transmitter shall be 0.005 percent

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

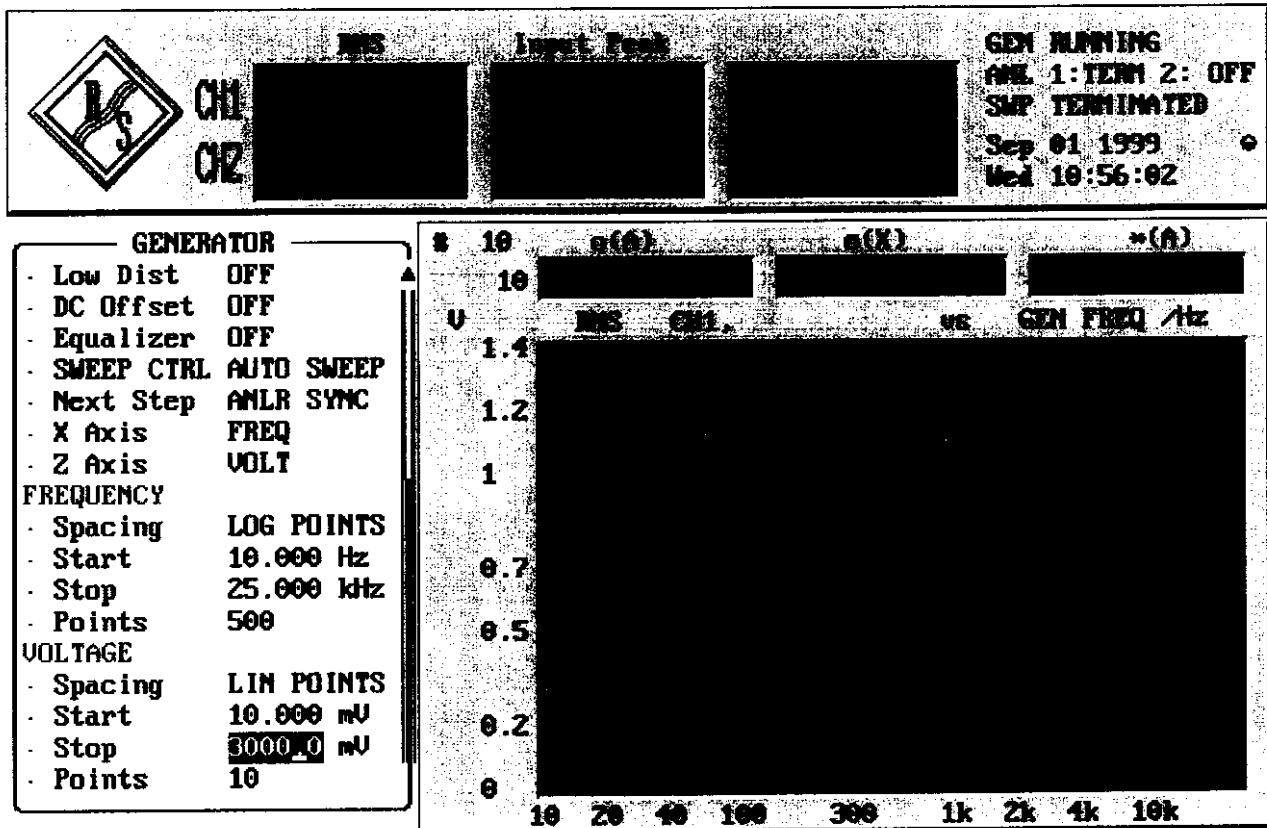
01 : 02 : 05

Equipment under test : SR 100  
 Ambient temperature : 23°C  
 Relative humidity : 62%

## CHARACTERISTICS OF THE AUDIO MODULATION CIRCUITRY

FCC Rule Part 74 Sec. 2.987

Frequency: 518.000 MHz

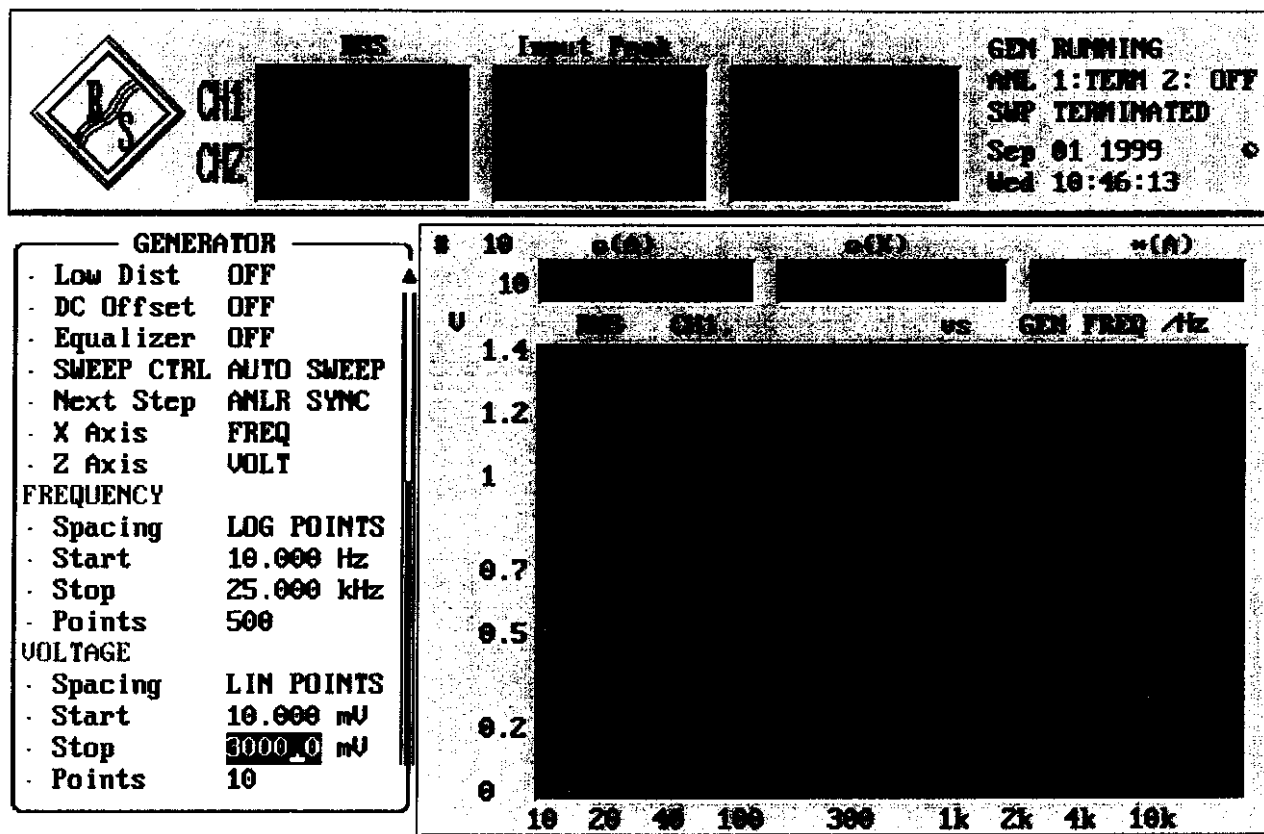


Equipment under test : SR 100  
 Ambient temperature : 23°C  
 Relative humidity : 62%

## CHARACTERISTICS OF THE AUDIO MODULATION CIRCUITRY

FCC Rule Part 74 Sec. 2.987

Frequency: 646.000 MHz



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

Equipment under test : SR 100

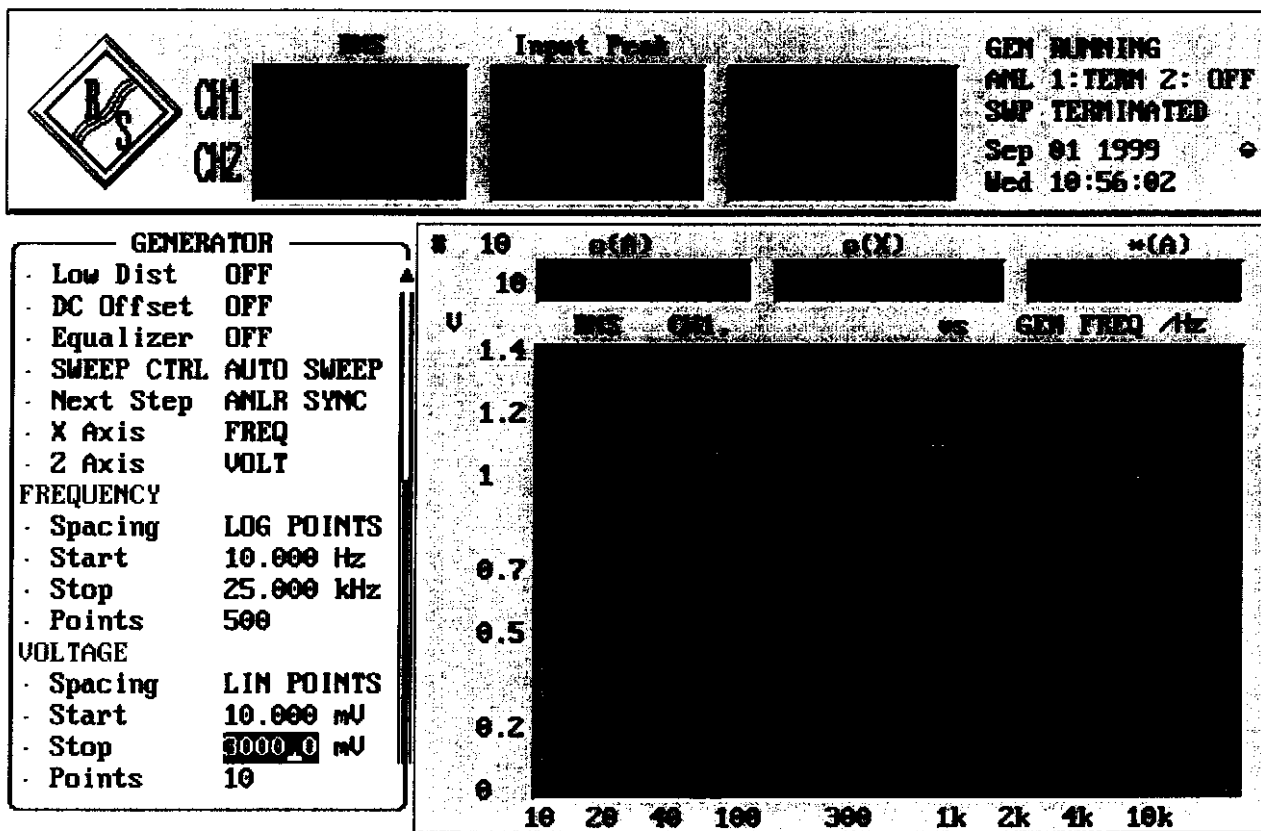
Ambient temperature : 23°C

Relative humidity : 62%

## CHARACTERISTICS OF THE AUDIO MODULATION CIRCUITRY

FCC Rule Part 74 Sec. 2.987

Frequency: 756.000 MHz

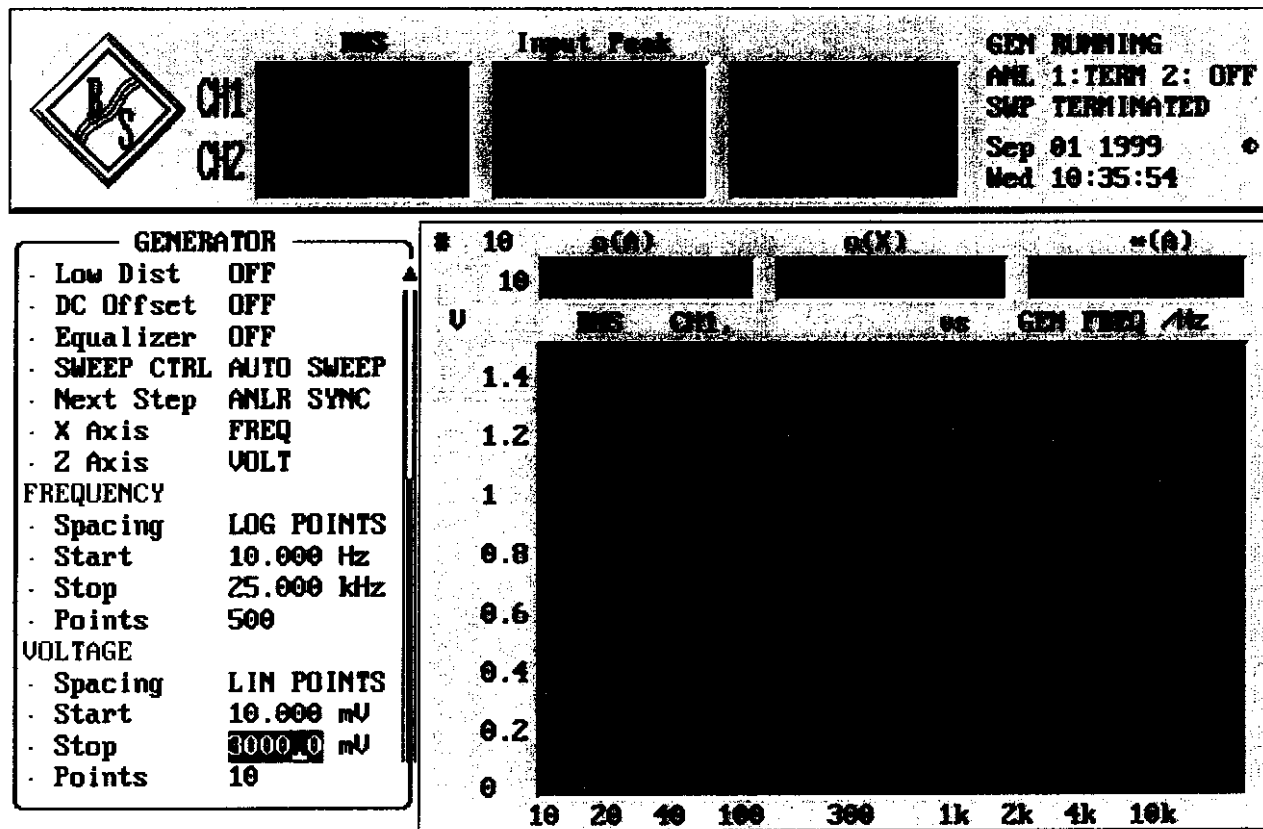


Equipment under test : SR 100  
 Ambient temperature : 23°C  
 Relative humidity : 62%

## CHARACTERISTICS OF THE AUDIO MODULATION CIRCUITRY

FCC Rule Part 74 Sec. 2.987

Frequency: 806.000 MHz



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

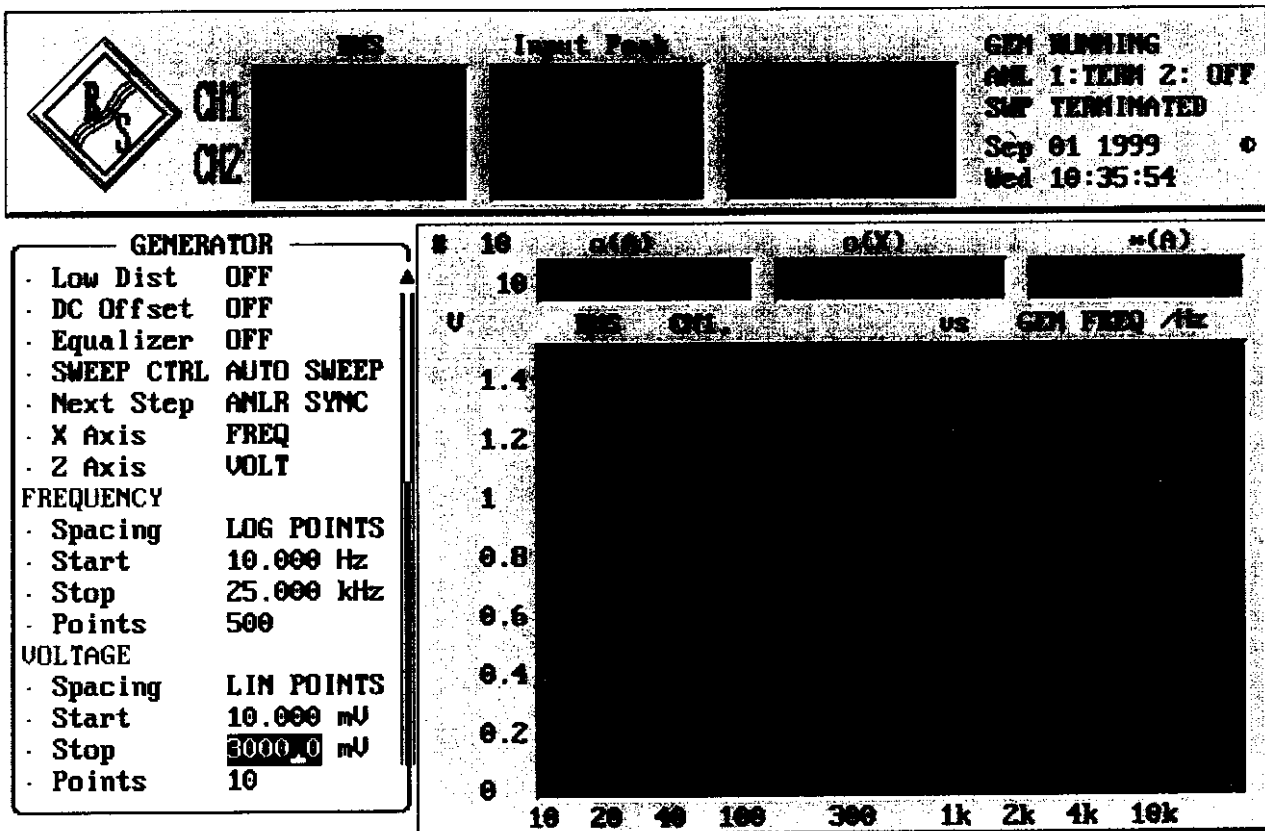
(for reference numbers see test equipment listing)

Equipment under test : SR 100  
 Ambient temperature : 23°C  
 Relative humidity : 62%

**CHARACTERISTICS OF THE AUDIO MODULATION CIRCUITRY**

FCC Rule Part 74 Sec. 2.987

Frequency: 870.000 MHz



Equipment under test : SR 100

Ambient temperature : 23°C

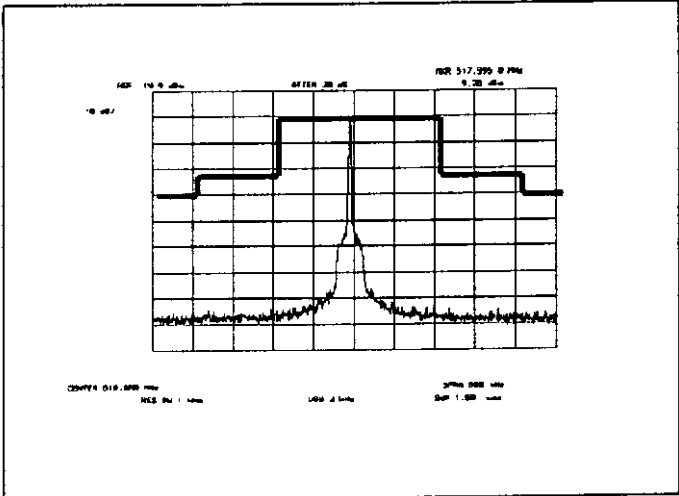
Relative humidity : 62%

**OCCUPIED BANDWIDTH**

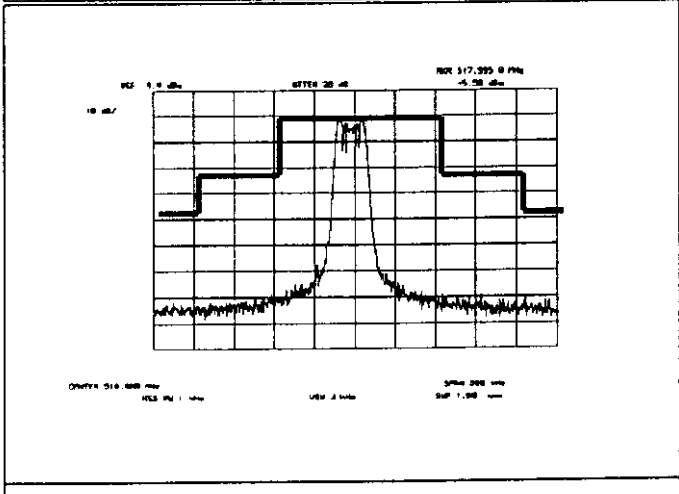
Frequency: 518.000 MHz

FCC Rule Part 74 Sec. 2.989

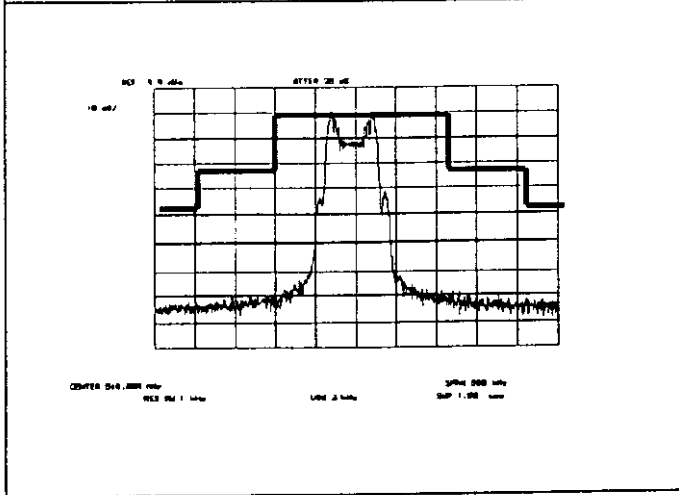
Unmodulated Carrier



50% Modulation



85% Modulation



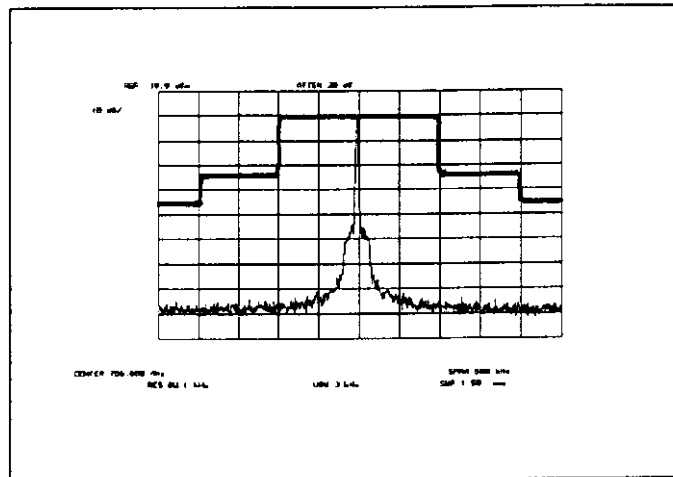
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

Equipment under test : SR 100  
Ambient temperature : 23°C  
Relative humidity : 62%

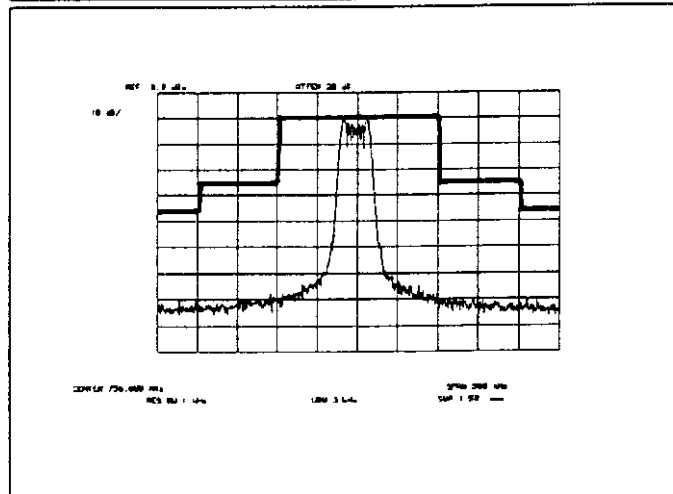
**OCCUPIED BANDWIDTH**  
Frequency: 756.000 MHz

FCC Rule Part 74 Sec. 2.989

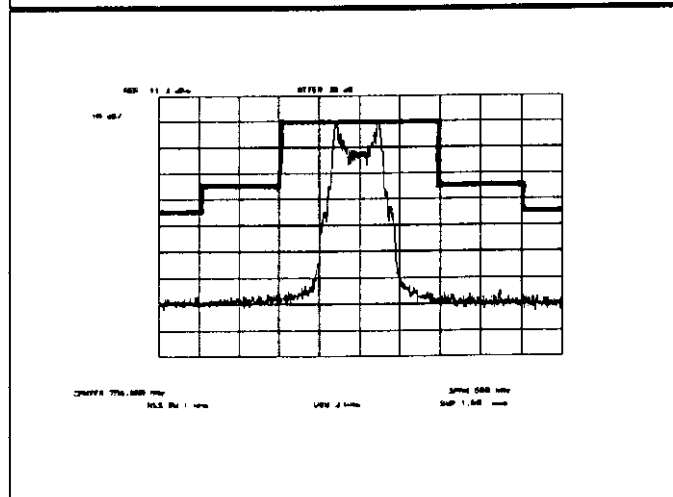
Unmodulated Carrier



50% Modulation



85% Modulation



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(For reference numbers see test equipment listing)

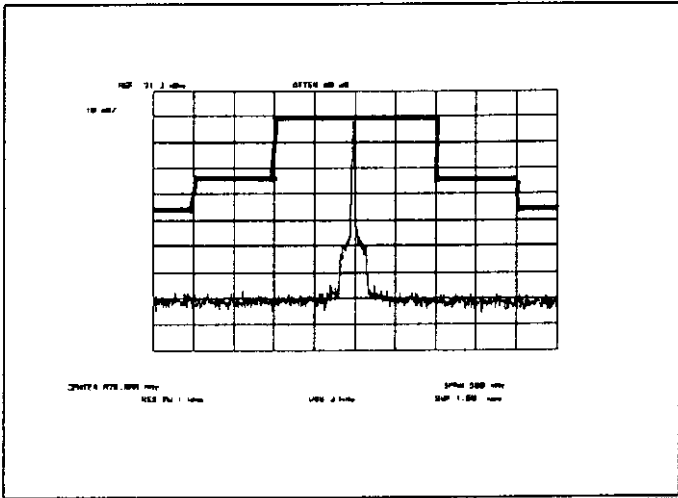


Equipment under test : SR 100  
Ambient temperature : 23°C  
Relative humidity : 62%

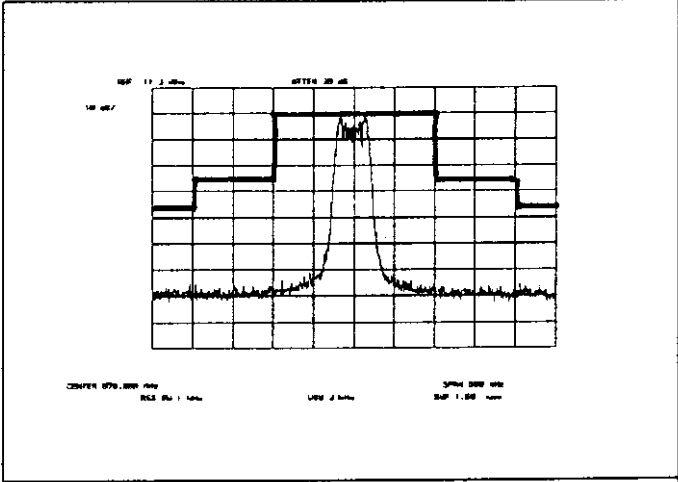
**OCCUPIED BANDWIDTH**  
Frequency: 870.000 MHz

FCC Rule Part 74 Sec. 2.989

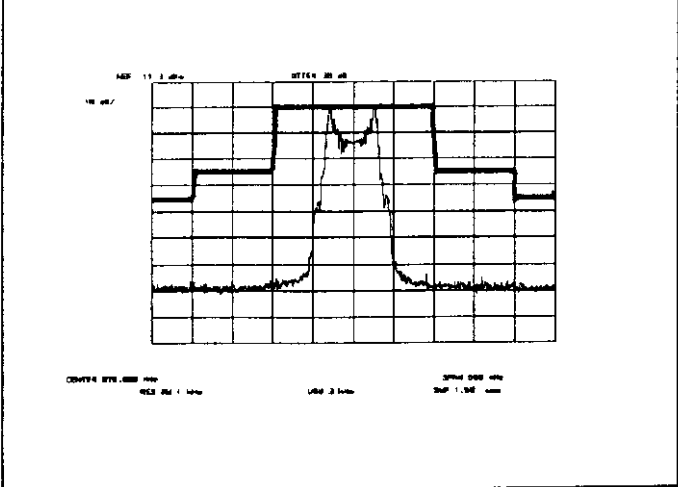
Unmodulated Carrier



50% Modulation



85% Modulation



Equipment under test : SR 100  
 Ambient temperature : 23°C  
 Relative humidity : 62%

## RADIATED EMISSIONS

FCC Rule Part 74 subpart H

Power level at which the measurement has been performed :

518.100 MHz	646.000 MHz	756.000 MHz
13.49 mW / +11.3 dBm	11.48 mW / +10.6 dBm	5.62 mW / +11.3 dBm

### Transmitter operating

SPURIOUS EMISSIONS LEVEL (dBm)								
518.000 MHz			646.000 MHz v			756.000 MHz		
f (MHz)	Band-width (kHz)	Level (dBm)	f (MHz)	Band-width (kHz)	Level (dBm)	f (MHz)	Band-width (kHz)	Level (dBm)
no	peak	found	no	peak	found	no	peak	found
Measurement uncertainty			± 3dB					

Bandwidth (kHz); this refers to the bandwidth of the measurement receiver

### Limits

FCC Rule Part 74.861(e)(6)

f ± 100 kHz to f ± 200 kHz	f ± 200 kHz to f ± 500 kHz	f ± 500 kHz
25 dBc	35 dBc	-43 +10 log <sub>10</sub> (mean output power in watts) dB below the mean output power

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
 (for reference numbers see test equipment listing)

Equipment under test : SR 100

Ambient temperature : 23°C

Relative humidity : 62%

## RADIATED EMISSIONS

FCC Rule Part 74 subpart H

Power level at which the measurement has been performed :

806.000 MHz	870.000 MHz	
12.30 mW / +10,9 dBm	11.48 mW / +10,6 dBm	

### Transmitter operating

SPURIOUS EMISSIONS LEVEL (dBm)								
806.000 MHz			870.000 MHz					
f (MHz)	Bandwidth (kHz)	Level (dBm)	f (MHz)	Bandwidth (kHz)	Level (dBm)	f (MHz)	Bandwidth (kHz)	Level (dBm)
no	peak	found	no	peak	found			
Measurement uncertainty			± 3dB					

Bandwidth (kHz); this refers to the bandwidth of the measurement receiver

### Limits

FCC Rule Part 74.861(e)(6)

f ± 100 kHz to f ± 200 kHz	f ± 200 kHz to f ± 500 kHz	f ± 500 kHz
25 dBc	35 dBc	-43 + 10 log <sub>10</sub> (mean output power in watts) dB below the mean output power

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

## TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
01	Spectrum Analyzer	8566 A	Hewlett-Packard	1925A00257
02	Analyzer Display	8566 A	Hewlett-Packard	1925A00860
03	Oscilloscope	7633	Tektronix	230054
04	Radio Analyzer	CMTA 54	Rohde & Schwarz	894 043/010
05	System Power Supply	6038 A	Hewlett-Packard	2848A07027
06	Signal Generator	8111 A	Hewlett-Packard	2215G00867
07	Signal Generator	8662 A	Hewlett-Packard	2224A01012
08	Funktionsgenerator	AFGU	Rohde & Schwarz	862 480/032
09	Regeltrenntrafo	MPL	Erfi	91350
10	Netznachbildung	NNLA 8120	Schwarzbeck	8120331
11	Relais-Matrix	PSU	Rohde & Schwarz	893 285/020
12	Power-Meter	436 A	Hewlett-Packard	2101A12378
13	Power-Sensor	8484 A	Hewlett-Packard	2237A10156
14	Power-Sensor	8482 A	Hewlett-Packard	2237A00616
15	Modulationsmeter	9008	Racal-Dana	2647
16	Frequenzzähler	5340 A	Hewlett-Packard	1532A03899
17	Absorber Schirmkabine	---	MWB	87400/002
18	Spectrum Analyzer	85660 B	Hewlett-Packard	2747A05306
19	Analyzer Display	85662 A	Hewlett-Packard	2816A16541
20	Quasi Peak Adapter	85650 A	Hewlett-Packard	2811A01131
21	RF-Preselector	85685 A	Hewlett-Packard	2833A00768
22	Biconical Antenne	3104	Emco	3758
23	Log. Per. Antenne	3146	Emco	2130
24	Double Ridge Horn	3115	Emco	3088
25	EMI-Testreceiver	ESAI	Rohde & Schwarz	863 180/013
26	EMI-Analyzer-Display	ESAI-D	Rohde & Schwarz	862 771/008
27	Biconical Antenne	HK 116	Rohde & Schwarz	888 945/013
28	Log. Per. Antenne	HL 223	Rohde & Schwarz	825 584/002
29	Relais-Switch-Unit	RSU	Rohde & Schwarz	375 339/002
30	Highpass	HM985955	FSY Microwave	001
31	Amplifier	P42-GA29	Tron-Tech	B 23602
32	Absorber Schirmkabine		Frankonia	
33	Steuerrechner	PSM 7	Rohde & Schwarz	834 621/004
34	EMI Test Reciever	ESMI	Rohde & Schwarz	827 063/010
35	EMI Test Receiver	Display	Rohde & Schwarz	829 808/010

**TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS**

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
36	Controler	HD 100	Deisel	100/322/93
37	Relais Matrix	PSN	Rohde & Schwarz	829 065/003
38	Control Unit	GB 016 A2	Rohde & Schwarz	344 122/008
39	Relais Switch Unit	RSU	Rohde & Schwarz	316 790/001
40	Power Supply	6032A	Hewlett Packard	2846A04063
41	Spektrum Monitor	EZM	Rohde & Schwarz	883 720/006
42	Meßempfänger	ESH 3	Rohde & Schwarz	890 174/002
43	Meßempfänger	ESVP	Rohde & Schwarz	891 752/005
44	Biconi Ant. 20-300MHz	HK 116	Rohde & Schwarz	833 162/011
45	Logper Ant. 0.3-1 GHz	HL 223	Rohde & Schwarz	832 914/010
46	Amplifier 0.1-4 GHz	AFS4	Miteq Inc.	206461
47	Logper Ant. 1-18 GHz	HL 024 A2	Rohde & Schwarz	342 662/002
48	Polarisationsnetzwerk	HL 024 Z1	Rohde & Schwarz	341 570/002
49	Double Ridge G Horn Antenne 1-26.5 GHz	3115	EMCO	9107-3696
50	Microw. Sys. Amplifier 0.5- 26.5 GHz	8317A	Hewlett Packard	3123A00105
51	Audio Analyzer	UPD	Rohde & Schwarz	1030.7500.04
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