



**TEST REPORT OF A 433.92 MHZ REMOTE ALARM  
NOTIFICATION ALARM DEVICE, BRAND NEDAP,  
TYPE PAGSLS, IN CONFORMITY WITH CFR 47 PART  
15 (2003-12-08).**

FCC listed : 90828  
Industry Canada : IC3501

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FCC ID: CGDPAGSLS  
 Test specification(s): Title 47 Ch. I Part 15.231 (2003-12-08)  
 Description of EUT: 433.92 MHz Remote Alarm Notification Device  
 Manufacturer: N.V. NEDAP  
 Brand mark: NEDAP  
 Type: PAGSLS

## MEASUREMENT/TECHNICAL REPORT

**N.V. NEDAP**

**TYPE: PAGSLS**

**FCC ID: CGDPAGSLS**

May 26, 2004

This report concerns:      Original grant/certification <del>Class 2 change</del> <del>Verification</del>			
Equipment type: Remote Alarm Notification device			
Deferred grant requested per 47 CFR 0.457(d)(1)(ii) ?	<del>Yes</del>	<del>No</del>	n.a.
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The data taken for this test and report herein was done in accordance with CFR 47 Part 15 and the measurement procedures of ANSI C63.4-1992. TNO Electronic Products & Services (EPS) B.V., Niekerk, The Netherlands, certifies that the data is accurate and contains a true representation of the emission profile of the Equipment Under Test (EUT) on the date of the test as noted in the test report. I have reviewed the test report and find it to be an accurate description of the test(s) performed and the EUT so tested.

Date: May 26, 2004

Signature:

P. de Beer  
 TNO Electronic Products & Services (EPS) B.V.



FCC ID: CGDPAGSLS  
Test specification(s): Title 47 Ch. I Part 15.231 (2003-12-08)  
Description of EUT: 433.92 MHz Remote Alarm Notification Device  
Manufacturer: N.V. NEDAP  
Brand mark: NEDAP  
Type: PAGSLS

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### Description of test item


Test item : Remote Alarm Notification device  
Manufacturer : N.V. Nederlandsche Apparatenfabriek NEDAP  
Brand : NEDAP  
Model : PAGSLS  
Serial number : PN11 021  
Revision : n.a.  
Receipt number : n.a.  
Receipt date : January 4, 2004

### Applicant information


Applicant's representative : Mr. J. Hulshof  
Company : N.V. Nederlandsche Apparatenfabriek "NEDAP"  
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Telephone number : +31 544 47 11 11  
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### Test(s) performed

Location : Niekerk  
Test(s) started : January 4, 2004  
Test(s) completed : May 26, 2004  
Purpose of test(s) : Type approval / certification  
Test specification(s) : CFR 47 Part 15.231 (2003-12-08)

Test engineer : J. Schuurmans, B.Sc.E.E. 

Project leader : H.J. Pieters, 

Report written by : J. Schuurmans, B.Sc.E.E. 

Report approved by : P. de Beer 

Report date : May 26, 2004

**This report is in conformity with EN 45001.**

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The test results relate only to the item(s) tested.**



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# 1 General information

## 1.1 Product description

### 1.1.1 Introduction.

The PAGSLS is a Remote Alarm Notification Device, intended to be part of an anti pilferage system. It contains a 433.92 MHz transmitter which is automatically activated upon detection of tags in the detection fields of the system. Personnel in shops may carry a receiver to receive the notification.

### 1.1.2 Choice of operating frequency.

The operating frequency of the Remote Alarm Notification device, brand NEDAP, type PAGSLS, is 433.9 MHz.

### 1.1.3 Operating principles.

The PAGSLS is triggered when a detection of a tag occurs. It transmits a 433.92 MHz carrier, FM modulated, for approximately 4.8 seconds. After this period the transmitter stops automatically.

## 1.2 Related submittal(s) and/or Grant(s)

The device with FCC ID CGDIQ-MD4 is, at the date of this test report, in the process of being filed at the commission.

## 1.3 Tested system details

Details and an overview of the system and all of its components, as it has been tested, may be found in table 1 below. FCC ID's are stated in this overview where applicable. The EUT is listed in the first row of table 1.

Description	Manufacturer	Type number	Serial number	FCC ID	Cable descriptions
Remote Alarm Notificaton Device	N.V. NEDAP	PAG SLS	PN211 021	CGDPAGSLS	Shielded 4-conductor cable
Central Control Unit	N.V. NEDAP	NCC1/NT2/NR2/IO MD4	R929 B 002	CGDIQ-MD4	RG59U coaxial cables with factory ferrite beads.
Antenna pairs	N.V. NEDAP	See overview	n.a.	CGDIQ-MD4	Coaxial cables with factory fitted ferrite beads
Slave Unit	N.V. NEDAP	/NR2/NT2/IO	R925 014	CGDIQ-MD4	Coaxial cable for supply and frequency synchronisation
Switched Mode Power Supply	N.V. NEDAP	PS NCC	P 926 001	n.a.	Unshielded DC power cable
Multiplex filter	NEDAP	MD-PG45	R 909003	CGDIQ-MD4	Coaxial cables with factory fitted ferrite beads

Table 1 - Tested system details overview.



FCC ID: CGDPAGSLs  
Test specification(s): Title 47 Ch. I Part 15.231 (2003-12-08)  
Description of EUT: 433.92 MHz Remote Alarm Notification Device  
Manufacturer: N.V. NEDAP  
Brand mark: NEDAP  
Type: PAGSLs

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## 1.4 Test methodology

The test methodology used is based on the requirements of CFR 47 Part 15, issue of December 18, 2003, section 15.231. Tests in accordance with CFR 47 Part 15.231 (a)(2), 15.231 (b) and 15.231 (c) have been carried out. Other tests as listed in CFR 47 Part 15.231 have been deemed to be not applicable.

The test methods, which have been used, are based on ANSI C63.4: 1992.

Radiated emission tests above 30 MHz were performed at a measurement distance of 3 meters. Below 30 MHz the radiated emission tests were carried out at measurement distances of 3 and 10 meters. The test results regarding the radiated emission tests on frequencies below 30 MHz have been extrapolated in order to determine the field strength of the measured values at measurement distances of 30 and 300 meters (as required by CFR 47 Part 15).

The bandwidth of the receiver is switching automatically to the right bandwidth in accordance with CISPR 16. This is implemented in the receiver. The antenna factors are programmed in the test receiver. The receiver automatically calculates the appropriate correction factor for the utilized antenna and also the appropriate antenna factor for the cable loss. The total correction is automatically added to the measured value.

## 1.5 Test facility

The Federal Communications Commission has reviewed the technical characteristics of the test facilities at TNO Electronic Products & Services (EPS) B.V., located in Niekerk, 9822 TL Smidshornerweg 18, The Netherlands, and has found these test facilities to be in compliance with the requirements of CFR 47 Part 15, section 2.948, per October 23, 2000, with reference 90828.

The description of the test facilities has been filed at the Office of the Federal Communications Commission. The facility has been added to the list of those laboratories performing these test services for the public on a fee basis.

The list of all public test facilities is available on the Internet at <http://www.fcc.gov>.

## 1.6 Product labeling

In accordance with CFR 47 Part 15.19 (a)(3) the following text shall be placed on a label, which shall be attached to the EUT:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The FCC ID of the EUT must be placed on a label, which shall be attached to the EUT.

For further details about the labeling requirements (size, legibility, etc.) as set by the Federal Communications Commission see CFR 47 Part 15.19 (a)(3), CFR 47 Part 15.19 (b)(2), CFR 47 Part 15.19 (b)(4), CFR 47 Part 2.925 and CFR 47 Part 2.926.



## 2 System test configuration

### 2.1 Justification

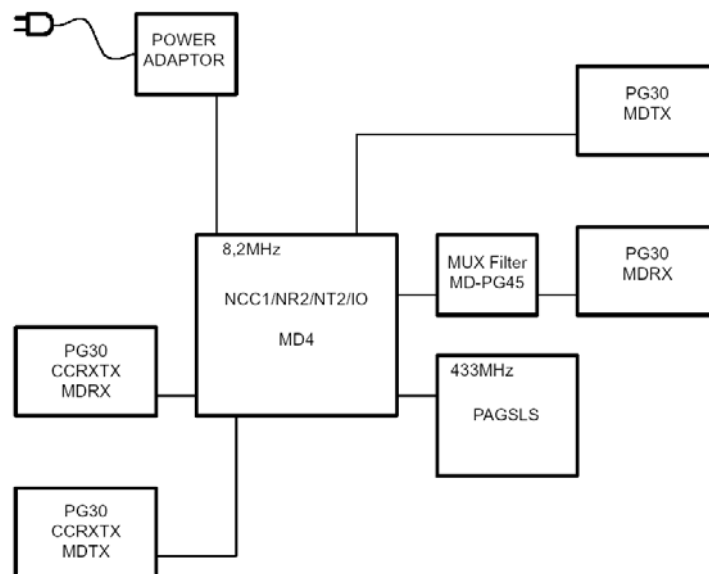
The system was configured for testing in a typical fashion (as a customer would normally use it). During all tests the EUT was set up to function in accordance with the manufacturer's instructions.

The justification and manipulation of cables and equipment in order to simulate a worst-case behavior of the test setup has been carried out as prescribed in ANSI C63.4: 1992.

Tests were performed with the EUT operating at a frequency of 433.92 MHz.

### 2.2 EUT mode of operation

The EUT only functions when integrated in the NEDAP anti pilferage system. Emission tests are performed as part of that system. A block diagram of the tested configuration of this system can be found in the figure below.



The NCC1/NR2/NT2/IO is the system unit. PG30 are the antennas, pairwise forming the entrance or exit ports. The MUX filter is a passive device concerned with the metal detection of the system. When the ports detect a tag, the alarm is triggered and PAGSLS executes the notification transmission.

During the radiated emission measurements, the EUT was configured to transmit continuously in order to simulate a worst-case behavior. During all other tests, the EUT was configured for normal operation.



### 2.3 Special accessories

No special accessories are used and/or needed to achieve compliance with the appropriate sections of CFR 47 Part 15.

### 2.4 Equipment modifications

None.

### 2.5 Configuration of the tested system

Unit title	:	Remote Alarm Notification Device
Model number	:	PAGSLS
Part number	:	n.a.
FCC ID	:	CGDPAGSLS
Frequency range	:	433.92 MHz
Description/details	:	see section 1.1 of this test report
Power supply	:	24 V DC, supplied by the system unit.
Clock Oscillator(s)	:	3.84 MHz
Cabinet & Screening	:	Plastic
Interface Cable(s)	:	shielded 4 conductor (2 supply, 2 trigger cables)
Method of screening	:	Not applicable
Method of grounding	:	Not applicable
Operating configuration	:	see section 1.3 of this test report

### 2.6 Block diagram of the EUT

The block diagram is available in the technical documentation package as an addendum to this test report.

### 2.7 Schematics of the EUT

The schematics are available in the technical documentation package as an addendum to this test report.

### 2.8 Part list of the EUT

The part list is available in the technical documentation package as an addendum to this test report.





### 3 Test results

#### 3.1 Field strength of emissions above 30 and below 4.5 GHz

Frequency (MHz)	Measurement results dB(μV)/m @ 3 meters Quasi-peak		Limits dB(μV)/m @ 3 meters Quasi-peak	Margin (dB) Quasi-peak		Result
	Vertical	Horizontal		Vertical	Horizontal	
90.00	29.8	27.3	43.5	-13.7	-16.2	PASS
193.58	25.0	28.5	43.5	-18.5	-15.0	PASS
196.61	26.3	31.2	43.5	-17.2	-12.3	PASS
180.00	20.3	33.6	43.5	-23.2	-9.9	PASS
210.00	23.3	31.5	43.5	-20.2	-12.0	PASS
229.38	23.3	28.6	46.0	-22.7	-17.4	PASS
330.00	30.0	33.2	46.0	-16.0	-12.8	PASS
360.00	29.0	37.1	46.0	-17.0	-8.9	PASS
390.00	34.0	39.2	46.0	-12.0	-6.8	PASS
425.98	22.1	34.1	46.0	-23.9	-11.9	PASS
433.98	65.4	64.9	80.8	-15.4	-15.9	PASS
450.00	33.5	32.2	46.0	-12.5	-13.8	PASS
458.73	33.1	33.1	46.0	-12.9	-12.9	PASS
867.82	44.7	44.7	61.6	-16.9	-16.9	PASS
1301.8	26.6	28.9	61.9	-35.3	-33	PASS
1735.72	37.8	33.7	61.9	-24.1	-28.2	PASS
2169.65	56.5	60.9	61.9	-5.4	-1	PASS
2603.6	56.5	60.4	61.9	-5.4	-1.5	PASS
3037.5	56.0	58.4	61.9	-5.9	-3.5	PASS
3471.4	38.4	40.2	61.9	-23.5	-21.7	PASS
3905.4	41.6	42.1	54.0	-12.4	-11.9	PASS
4339.3	38.9	39.1	54.0	-15.1	-14.9	PASS

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15, sections 15.205, 15.209 and 15.223 (a) and 15.231 (b), with the EUT operating in continuous transmit mode on 433.92 MHz, are depicted in the table above.

**Note:** - Field strength values of radiated emissions at frequencies not listed in table 2 are more than 20 dB below the applicable limit.

Test engineer

Signature : 

Name : J. Schuurmans, B.Sc.E.E.

Date : February 8, 2004



### 3.2 Field strength of emissions below 30 MHz

Frequency (MHz)	Measurement results dB $\mu$ V Quasi-peak		Antenna factor dB	Cable loss dB	Measurement results dB( $\mu$ V)/m Quasi-peak (calculated)	Limits Part 15.209 dB( $\mu$ V)/m (calculated)
	3 meters	10 meters				
0.06277	101.9	74.9	16.70	1	15.33	31.68
0.12554	<<	<<	16.50	1	n.a.	25.6
0.18831	<<	<<	16.00	1	n.a.	22.1
0.009 - 0.490	<<	<<	16.0	1	<10.0	48.5 – 13.8 (300 m)
0.490 - 1.705	<<	<<	16.0	1	<10.0	33.8 – 22.9 (30 m)
1.705 – 7.4	<<	<<	15.9	1	<10.0	30.0 (30 m)
7.57	49.20	23.20	15.9	1	15.4 (30 m)	40 (30 m)
8.70	50.7	27.4	15.9	1	22.0 (30 m)	40 (30 m)
8.7 – 10	<<	<<	15.9	1	<10.0	40 (30 m)
10-30	<<	<<	15.9	1	<10.0	30 (30 m)

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15, sections 15.205 and 15.209 and 15.223, with the EUT operating in continuous transmit mode on 433.92 MHz, are depicted in the table above.

- 1) The emissions on 62.77, 125 and 188 kHz, as well as the sweeping signal around 8.2 MHz are emerging from the anti pilferage system.
- 2) Frequency range: 9-90 kHz Average detector used during measurements
- 3) Frequency range: 110-490 kHz Average detector used during measurements
- 4) The radiated field strengths were measured at a distance of 3 and 10 meters.
- 5) <<. indicates that no field strength values could be measured on the listed frequencies or in the listed frequency range
- 6) Field strength values of radiated emissions at frequencies not listed in table 43 are more than 20 dB below the applicable limit

Signature: 

Test engineer: J. Schuurmans

Date January 14, 2004




## 4 Conducted emission data

### 4.1 Conducted emission

Frequency (MHz)	Measurement results dB( $\mu$ V) Neutral		Measurement results dB( $\mu$ V) Line 1		Limits dB( $\mu$ V)		Margin (dB) Neutral		Margin (dB) Line 1		Result
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV	
0.15	38.1	26.2	36.4	23.7	66.0	56.0	-27.9	-29.8	-29.6	-32.3	PASS
0.24	37.0	36.8	36.9	36.4	62.0	52.0	-25.0	-15.2	-25.1	-15.6	PASS
0.34	32.4	30.1	31.7	29.1	59.2	49.2	-26.8	-19.1	-27.5	-20.1	PASS
0.53	29.3	21.7	28.6	4.0	56.0	46.0	-26.7	-24.3	-27.4	-42.0	PASS
1.06	30.4	17.3	28.4	17.4	56.0	46.0	-25.6	-28.7	-27.6	-28.6	PASS
2.08	32.4	16.5	33.0	16.0	56.0	46.0	-23.6	-29.5	-23.0	-30.0	PASS
2.64	36.0	18.7	33.4	17.6	56.0	46.0	-20.0	-27.3	-22.6	-28.4	PASS
3.33	34.9	21.6	34.1	18.2	56.0	46.0	-21.1	-24.4	-21.9	-27.8	PASS
4.12	39.4	24.2	37.4	23.5	56.0	46.0	-16.6	-21.8	-18.6	-22.5	PASS
5.14	35.7	25.0	36.4	23.7	60.0	50.0	-24.3	-25.0	-23.6	-26.3	PASS
7.57	44.1	25.3	43.7	22.5	60.0	50.0	-15.9	-24.7	-16.3	-27.5	PASS
8.10	44.7	21.9	44.1	23.1	60.0	50.0	-15.3	-28.1	-15.9	-26.9	PASS
8.70	42.3	19.2	45.1	20.3	60.0	50.0	-17.7	-30.8	-14.9	-29.7	PASS
15.14	22.6	15.6	21.9	14.7	60.0	50.0	-37.4	-34.4	-38.1	-35.3	PASS
16.20	23.7	15.1	21.7	13.9	60.0	50.0	-36.3	-34.9	-38.3	-36.1	PASS
17.40	21.0	13.6	20.1	12.4	60.0	50.0	-39.0	-36.4	-39.9	-37.6	PASS
22.64	18.1	10.7	17.4	10.2	60.0	50.0	-41.9	-39.3	-42.6	-39.8	PASS
24.30	23.0	15.2	21.6	14.0	60.0	50.0	-37.0	-34.8	-38.4	-36.0	PASS
26.10	25.9	18.6	24.6	17.6	60.0	50.0	-34.1	-31.4	-35.4	-32.4	PASS
29.99	23.3	15.9	22.2	15.0	60.0	50.0	-36.7	-34.1	-37.8	-35.0	PASS

The results of the conducted emission tests, carried out in accordance with 47 CFR Part 15, section 15.207, at the 110 Volts AC mains connection terminals of the AC/DC power supply connected to the EUT and with the EUT operating in continuous transmit mode on 433.92 MHz, are depicted in table above

Signature: 

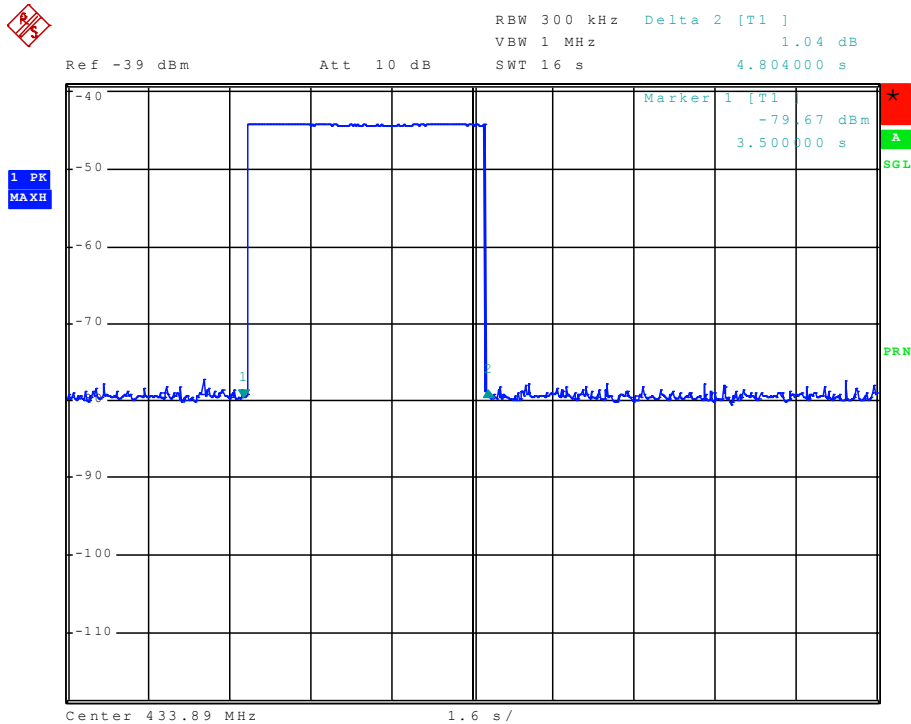
Test engineer: J. Schuurmans

Date January 16, 2004



## 5 Deactivation of automatically activated transmitter

As per 47 CFR 15.231 (a)(2), the transmitter shall cease transmission within 5 seconds after activation. The plot below shows the time of the transmission.



Plot 2 – Automatic deactivation of automatically activated transmitter

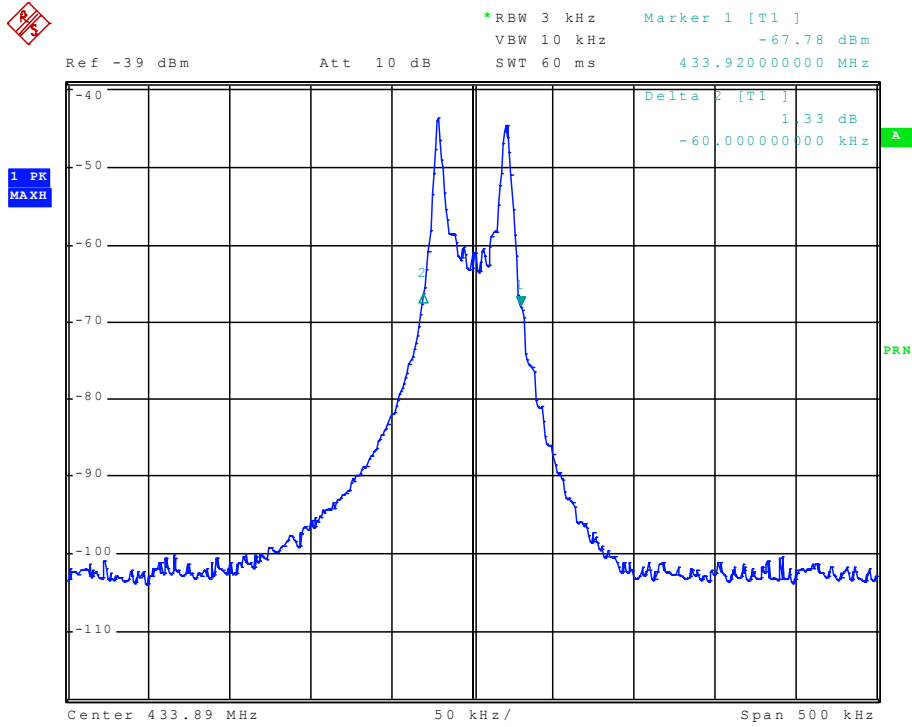
Test engineer

Signature :

Name : J. Schuurmans, B.Sc.E.E.  
Date : May 25, 2004



## 6 Bandwidth of emission



Plot 3 – Bandwidth of emission

Tests have been carried out in order to determine compliance with CFR 47 Part 15, section 15.231 (c). The test results are depicted by means of the plot above. It was determined that the bandwidth of emission is 0.14% of the carrier frequency.

### Test engineer

Signature :

Name : J. Schuurmans, B.Sc.E.E.  
Date : May 25, 2002



FCC ID: CGDPAGSLs  
 Test specification(s): Title 47 Ch. I Part 15.231 (2003-12-08)  
 Description of EUT: 433.92 MHz Remote Alarm Notification Device  
 Manufacturer: N.V. NEDAP  
 Brand mark: NEDAP  
 Type: PAGSLs

## 7 List of utilized test equipment

Inventory number	Description	Brand	Type
12471	Biconical antenna 20MHz-200MHz	EATON	94455-1
12473	Log-per antenna 200-1000MHz	EATON	96005
12476	Antenna mast	EMCO	TR3
12477	Antenna mast 1-4 mtr	Poelstra	--
12482	Loop antenna	EMCO	6507
12483	Guidehorn	EMCO	3115
12484	Guidehorn	EMCO	3115
12488	Guidehorn 18 - 26.5 GHz	EMCO	RA42-K-F-4B-C
12533	Signalgenerator	MARCONI	2032
12561	DC Power Supply 20A/70V	DELTA	SM7020D
12605	calibrated dipole 28MHz-1GHz	Emco	3121c
12608	HF milliwattmeter	Hewlett Packard	HP435a
12609	Power sensor 10MHz-18GHz	Hewlett Packard	HP8481A
12636	Polyester chamber	Polyforce	--
12640	Temperature chamber	Heraeus	VEM03/500
99538	Spectrum analyzer	R&S	FSP
13078	Preamplifier 0.1 GHz - 12 GHz	Miteq	AMF-3D-001120-35-14p
13452	Digital multi meter	HP	34401A
13526	Signalgenerator 20 GHz	Hewlett & Packard	83620A
13886	Open Area testsite	Comtest	--
14051	Anechoic room	Comtest	--
14450	2.4 GHz bandrejectfilter	BSC	XN-1783
15633	Biconilog Testantenna	Chase	CBL 6111B
15667	Measuring receiver	R&S	ESCS 30
99045	DC Power Supply 3A/30V	DELTA	E030/3
99055	Non-conducting support	NMi	--
99061	Non-conducting support 150cm	NMi	--
99068	Detector N-F/BNC-F	Radiall	R451576000
99069	Cable 5m RG214	NMi	--
99071	Cable 10m RG214	NMi	--
99076	Bandpassfilter 4 - 10 GHz	Reactel	7AS-7G-6G-511
99077	Regulating trafo	RFT	LTS006
99112	Tripod	Chase	--
99136	Bandpassfilter 10 - 26.5 GHz	Reactel	9HS-10G/26.5G-S11