

***Specific Absorption Rate (SAR) Test Report***

for  
**Sierra Wireless Inc.**

Performed on the

**CDMA Cellular and PCS PCMCIA Card**

**Model: AIRCARD 555 with PDA**

**FCC ID: N7NACRD555**

Test Report: 20544792

Date of Report: July 28, 2001

Job #: 20054479

Date of Test: July 16 to 28, 2001

Total number of pages in report: 55.



Warnock Hersey



NVLAP Laboratory Code 200201-0  
Accredited for testing to FCC Parts 15

Tested by: <i>C. L. Yang</i>	Xi-Ming Yang	Review Date: <i>7/31/01</i>
Reviewed by: <i>David Chernomordik</i>	David Chernomordik, Ph.D., EMC Technical Manager	Review Date: <i>7/31/01</i>

All services undertaken are subject to the following general policy: Reports are submitted for exclusive use of the client to whom they are addressed. Their significance is subject to the adequacy and representative character of the samples and to the comprehensiveness of the tests, examinations or surveys made. This report shall not be reproduced except in full, without written consent of Intertek Testing Services, NA Inc. This report must not be used to claim product endorsement by NVLAP, NIST nor any other agency of the U.S. Government.



**Intertek Testing Services NA, Inc.**

1365 Adams Court, Menlo Park, CA 94025

Telephone 650-463-2900 Fax 650-463-2910 Home Page [www.etlsemko.com](http://www.etlsemko.com)





## TABLE OF CONTENTS

<b>1.0</b>	<b>JOB DESCRIPTION .....</b>	<b>2</b>
1.1	Client Information.....	2
1.2	Equipment under test (EUT) .....	2
1.3	Test plan reference.....	3
1.4	System test configuration .....	3
1.4.1	System block diagram & Support equipment.....	3
1.4.3	Test Position for Muscle .....	4
1.4.4	Test Condition .....	6
1.5	Modifications required for compliance .....	6
1.6	Additions, deviations and exclusions from standards .....	6
<b>2.0</b>	<b>SAR EVALUATION.....</b>	<b>7</b>
2.1	SAR Limits.....	7
2.2	Configuration Photographs .....	8
2.3	System Verification .....	11
2.4	Evaluation Procedures .....	11
2.5	Test Results .....	12
<b>3.0</b>	<b>EQUIPMENT.....</b>	<b>15</b>
3.1	Equipment List.....	15
3.2	Tissue Simulating Liquid .....	16
3.3	E-Field Probe Calibration.....	17
3.4	Measurement Uncertainty .....	18
3.5	Measurement Traceability .....	18
<b>4.0</b>	<b>WARNING LABEL INFORMATION - USA .....</b>	<b>19</b>
<b>5.0</b>	<b>REFERENCES .....</b>	<b>20</b>
<b>6.0</b>	<b>Document History.....</b>	<b>21</b>
	<b>APPENDIX A - SAR Evaluation Data .....</b>	<b>22</b>
	<b>APPENDIX B - E-Field Probe Calibration Data.....</b>	<b>47</b>



Sierra Wireless Inc., Model: AIRCARD 555 w/PDA  
FCC ID: N7NACRD555

Date of Test: July 16-28, 2001

## 1.0 JOB DESCRIPTION

### 1.1 Client Information

The EUT has been tested at the request of:

**Company:** Sierra Wireless, Inc.  
**Address:** 13811 Wireless Way  
Richmond, BC V6V 3A4  
Canada  
**Name of contact:** Mr. Gordon Carey  
**Telephone:** (604) 231-1145  
**Fax:** (604) 231-1109

### 1.2 Equipment under test (EUT)

#### Product Descriptions:

<b>Equipment</b>	Cell band and PCS band CDMA Radio Card installed into hand held computer (PDA)		
<b>Trade Name</b>	Sierra Wireless, Inc.	<b>Model No:</b>	AIRCARD 555
<b>FCC ID</b>	N7NACRD555	<b>S/N No.</b>	Not Labeled
<b>Category</b>	Portable	<b>RF Exposure</b>	Uncontrolled Environment
<b>Frequency Band (up link)</b>	824 - 849 MHz 1850 - 1910 MHz	<b>System</b>	CDMA
<b>Antenna Type</b>	Rotatable rod antenna, ~0 dBi		
<b>Location:</b>	Outside the card (PDA)		

**Use of Product :** Wireless Data Communications  
**Manufacturer:** Sierra Wireless, Inc.  
**Production is planned** ☒ Yes, ☐ No  
**EUT receive date:** July 16, 2001  
**EUT received condition:** Prototype in good condition.  
**Test start date:** July 16, 2001  
**Test end date:** July 28, 2001

Sierra Wireless Inc., Model: AIRCARD 555 w/PDA  
FCC ID: N7NACRD555

Date of Test: July 16-28, 2001

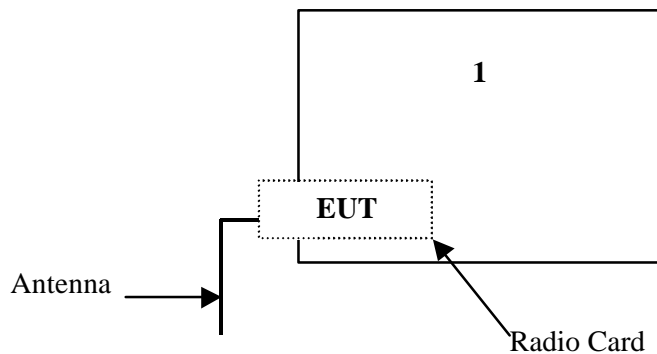
### 1.3 Test plan reference

FCC rule part 2.1093, FCC Docket 96-326 & Supplement C to OET Bulletin 65

### 1.4 System test configuration

#### 1.4.1 System block diagram & Support equipment

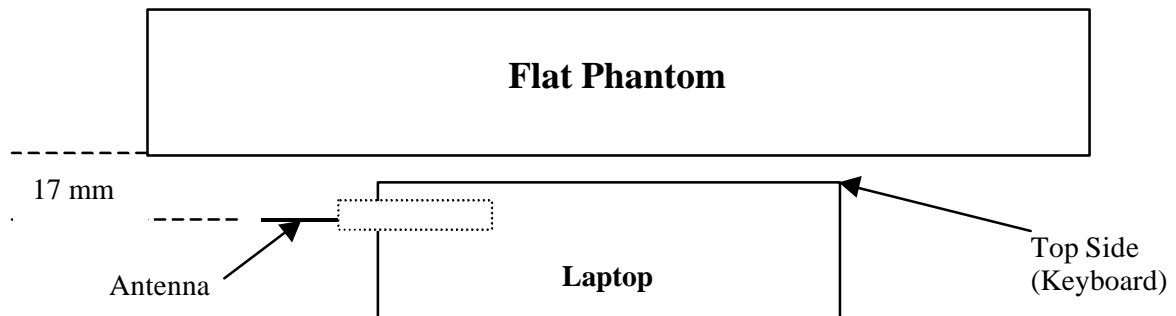
Item #	Description	Model No.	Serial No.
1	Hewlett Packard PDA	HPF1260A	SG84602056



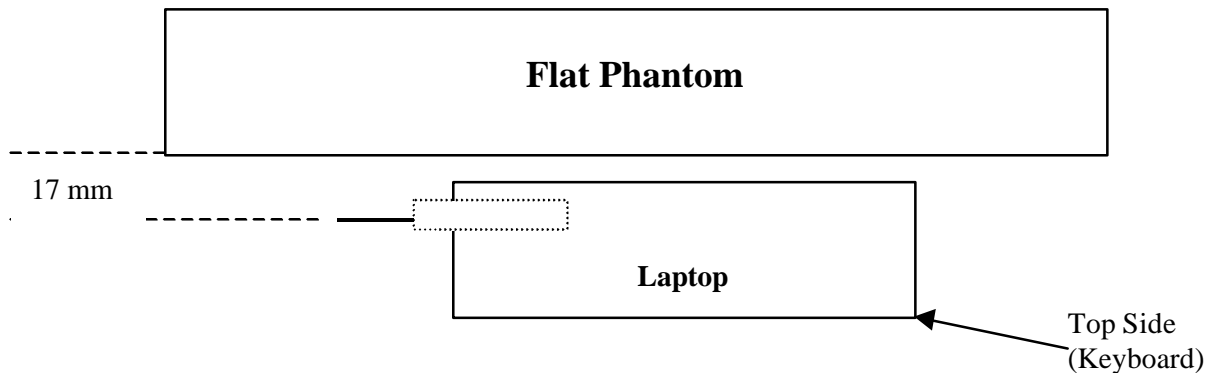
* = EUT	S = Shielded;	F = With Ferrite
** = No ferrites on video cable	U = Unshielded	M = Length in Meters

#### 1.4.3 Test Position for Muscle

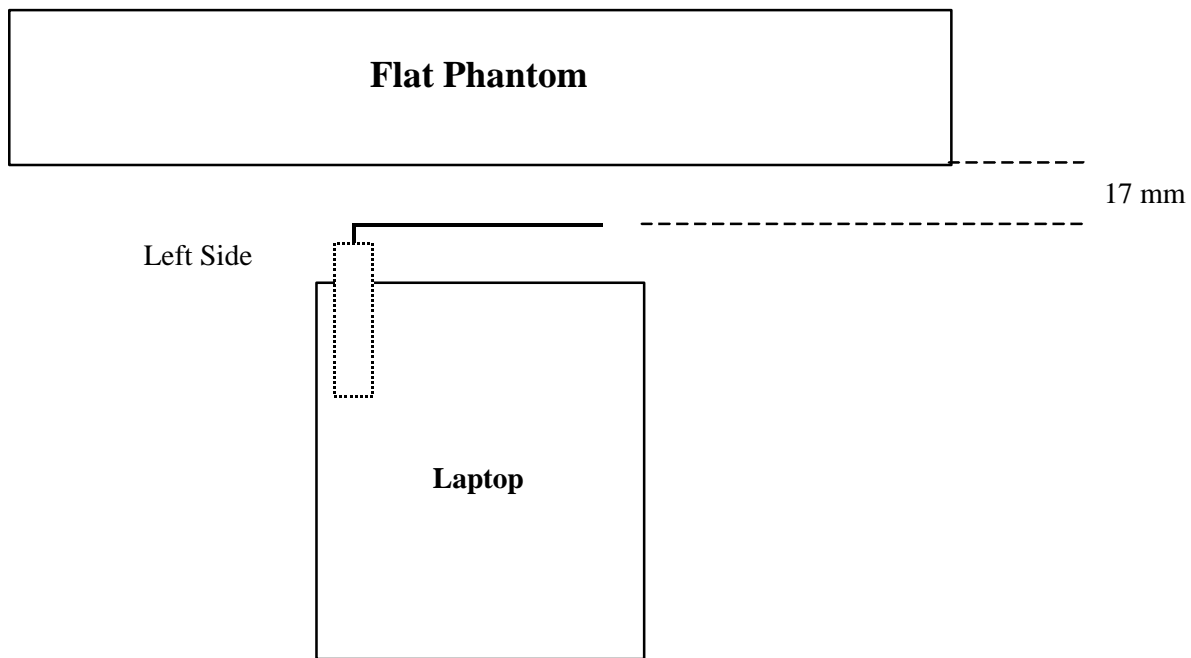
The AIRCARD 555 WITH PDA was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in C95.1 (1992) and Supplement C of OET 65 (2001). Please refer to figures 1 – 3 below for the position details:



**Figure 1: Face Up Position**



**Figure 2: Face Down Position**



**Figure 3: Vertical Position**

#### 1.4.4 Test Condition

During tests the worst case data (max RF coupling) was determined with following conditions:

EUT Antenna	Straight out position	Orientation	Flat (Muscle)
Usage	Body	Distance between antenna axis at the joint and the liquid surface:	17 mm with PDA in upside position. 17 mm with PDA in normal position. 17 mm with PDA in vertical position
Simulating human hand	Not Used	EUT Battery	EUT is powered from the PDA
Power output	23 dBm (average); 27.4 dBm (peak)		

The manufacturer accessed the spatial peak SAR values for lowest, middle and highest operating channels defined.

#### 1.5 Modifications required for compliance

No modifications were implemented by Intertek Testing Services.

#### 1.6 Additions, deviations and exclusions from standards

No additions, deviations or exclusions have been made from standard.

**2.0 SAR EVALUATION****2.1 SAR Limits**

The following FCC limits for SAR apply to devices operate in General Population/Uncontrolled Exposure environment:

<b>EXPOSURE</b> <b>(General Population/Uncontrolled Exposure environment)</b>	<b>SAR</b> <b>(W/kg)</b>
Average over the whole body	0.08
Spatial Peak (1g)	1.60
Spatial Peak for hands, wrists, feet and ankles (10g)	4.00



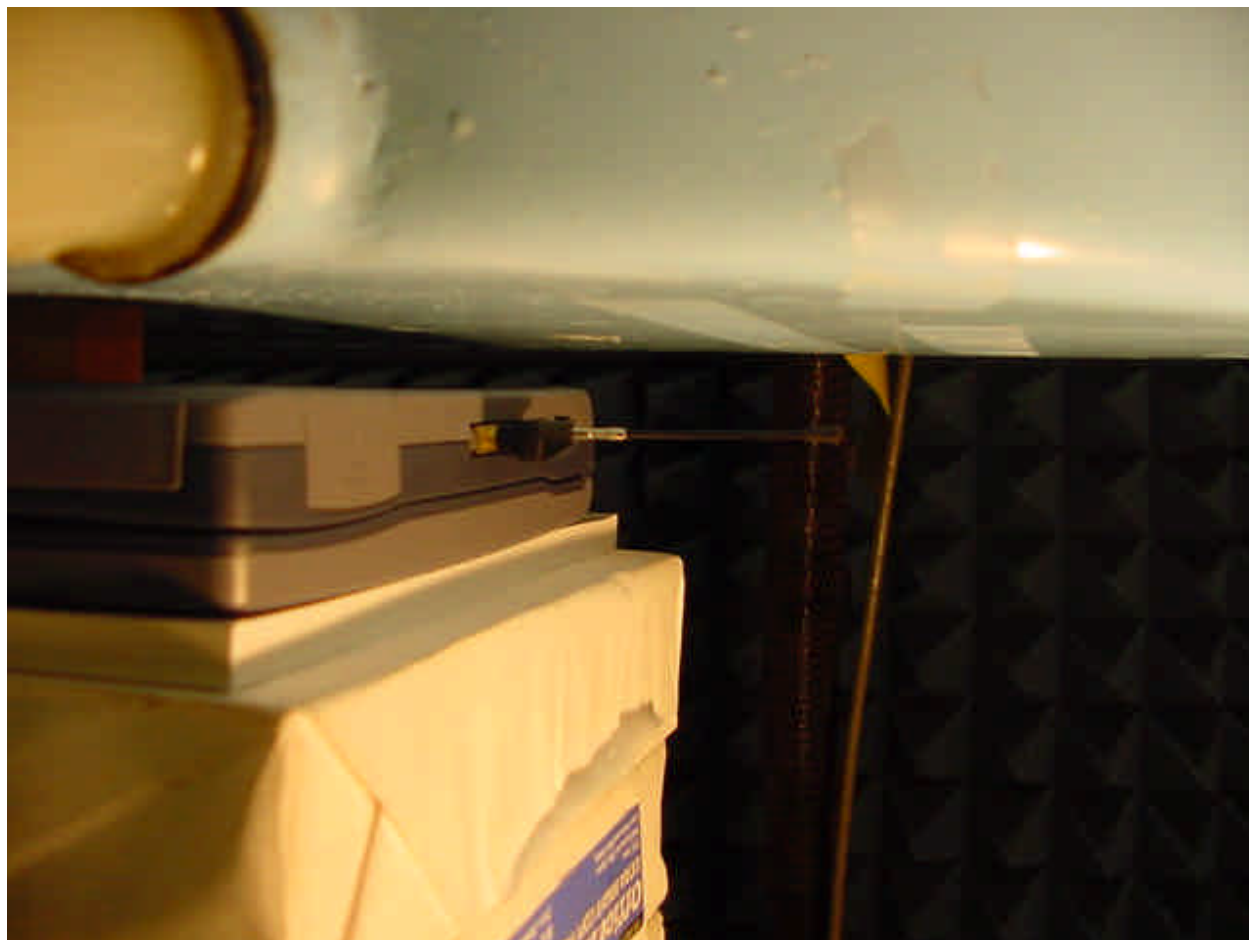
## 2.2 Configuration Photographs

### SAR Measurement Test Setup



## 2.2 Configuration Photographs Continued

### SAR Measurement Test Setup



.2 Configuration Photographs – Continued

**SAR Measurement Test Setup**



### 2.3 System Verification

Prior to the assessment, the system was verified to the  $\pm 5\%$  of the specifications by using the system validation kit. The validation was performed at 1800 MHz.

Validation kit	Targeted SAR <sub>1g</sub> (mW/g)	Measured SAR <sub>1g</sub> (mW/g)
D900V2, S/N #: 013	9.45	9.31

### 2.4 Evaluation Procedures

The SAR evaluation was performed with the following procedures:

- a. SAR was measured at a fixed location above the ear point and used as a reference value for the assessing the power drop.
- b. The SAR distribution at the exposed side of the head was measured at a distance of 4.0 mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 20 mm x 20 mm. Based on this data, the area of the maximum absorption was determined by spline interpolation.
- c. Around this point, a volume of 32 mm x 32 mm x 34 mm was assessed by measuring 5 x 5 x 7 points. Based on this data set, the spatial peak SAR value was evaluated with the following procedure:
  - i) The data at the surface were extrapolated, since the center of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measurement point is 1.6 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in Z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.
  - ii) The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3-D spline interpolation algorithm. The 3-D spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y and z directions). The volume was integrated with the trapezoidal algorithm. 1000 points (10 x 10 x 10) were interpolated to calculate the average.
  - iii) All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
- d. Re-measurements of the SAR value at the same location as in step a. above. If the value changed by more than 5 %, the evaluation was repeated.

## 2.5 Test Results

The following pages contain data tables with the test results obtained when the device was tested in the condition described in this report. Detailed measurement plots, which reveal information about the location of the maximum SAR with respect to the device, are reported in Appendix A.

<b>Trade Name:</b>	Sierra Wireless, Inc.	<b>Model No.:</b>	AIRCARD 555 WITH PDA
<b>Serial No.:</b>	Not Labeled	<b>Test Engineer:</b>	Xi-Ming Yang

TEST CONDITIONS			
Ambient Temperature	22 °C	Relative Humidity	48 %
Test Signal Source	Test Mode	Signal Modulation	CDMA
Output Power Before SAR Test	23 dBm (average)	Output Power After SAR Test	23 dBm (average)
Test Duration	23 Min.	Number of Battery Change	Not Applicable

EUT Position: Upside Down Parallel					
Channel MHz	Operating Mode	Crest Factor	Measured SAR <sub>10g</sub> (mW/g)	Limit SAR (W/kg)	Plot Number
824	CDMA	1	0.258	1.6	1
835	CDMA	1	0.318	1.6	2
849	CDMA	1	0.245	1.6	3

EUT Position: Upside Down Straight Out					
Channel MHz	Operating Mode	Duty Cycle ratio	Measured SAR <sub>1g</sub> (mW/g)	Limit SAR (W/kg)	Plot Number
824	CDMA	1	0.602	1.6	4
835	CDMA	1	0.482	1.6	5
849	CDMA	1	0.468	1.6	6



EUT Position: Vertical					
Channel MHz	Operating Mode	Crest Factor	Measured SAR <sub>1g</sub> (mW/g)	Limit SAR (W/kg)	Plot Number
824	CDMA	1	0.434	1.6	7
835	CDMA	1	0.447	1.6	8
849	CDMA	1	0.370	1.6	9

EUT Position: Keyboard Face Up Straight out					
Channel MHz	Operating Mode	Crest Factor	Measured SAR <sub>1g</sub> (mW/g)	Limit SAR (W/kg)	Plot Number
824	CDMA	1	0.537	1.6	10
835	CDMA	1	0.397	1.6	11
849	CDMA	1	0.503	1.6	12

EUT Position: Vertical On Left					
Channel MHz	Operating Mode	Crest Factor	Measured SAR <sub>1g</sub> (mW/g)	Limit SAR (W/kg)	Plot Number
1850	CDMA	1	1.04	1.6	13
1880	CDMA	1	1.06	1.6	14
1910	CDMA	1	1.23	1.6	15

EUT Position: Upside Down Parallel					
Channel MHz	Operating Mode	Crest Factor	Measured SAR <sub>1g</sub> (mW/g)	Limit SAR (W/kg)	Plot Number
1850	CDMA	1	1.32	1.6	16
1880	CDMA	1	1.00	1.6	17
1910	CDMA	1	0.851	1.6	18

EUT Position: Upside Down Straight Out					
Channel MHz	Operating Mode	Crest Factor	Measured SAR <sub>1g</sub> (mW/g)	Limit SAR (W/kg)	Plot Number
1850	CDMA	1	1.43	1.6	19
1880	CDMA	1	1.48	1.6	20
1910	CDMA	1	1.21	1.6	21

EUT Position: Keyboard Face Up					
Channel MHz	Operating Mode	Crest Factor	Measured SAR <sub>1g</sub> (mW/g)	Limit SAR (W/kg)	Plot Number
1850	CDMA	1	1.47	1.6	22
1880	CDMA	1	1.21	1.6	23
1910	CDMA	1	1.38	1.6	24

Notes: a) Worst case data reported  
b) Uncertainty of the system is not included

### 3.0 EQUIPMENT

#### 3.1 Equipment List

The Specific Absorption Rate (SAR) tests were performed with the SPEAG model DASY 3 automated near-field scanning system, which is a package, optimized for dosimetric evaluation of mobile radios [3].

The following major equipment/components were used for the SAR evaluations:

SAR Measurement System			
EQUIPMENT	SPECIFICATIONS	S/N #	LAST CAL. DATE
Robot	<b>Stäubi RX60L</b>	597412-01	N/A
	Repeatability: $\pm 0.025$ mm Accuracy: $0.806 \times 10^{-3}$ degree Number of Axes: 6		
E-Field Probe	<b>ET3DV5</b>	1333	04/23/01
	Frequency Range: 10 MHz to 6 GHz Linearity: $\pm 0.2$ dB Directivity: $\pm 0.1$ dB in brain tissue		
Data Acquisition	<b>DAE3</b>	317	N/A
	Measurement Range: $1\mu\text{V}$ to $>200\text{mV}$ Input offset Voltage: $< 1\mu\text{V}$ (with auto zero) Input Resistance: 200 M		
Phantom	<b>Generic Twin V3.0</b>	N/A	N/A
	Type: Generic Twin, Homogenous Shell Material: Fiberglass Thickness: $2 \pm 0.1$ mm Capacity: 20 liter Ear spacer: 4 mm (between EUT ear piece and tissue simulating liquid)		
Simulated Tissue	<b>Mixture</b>	N/A	07/15/01
	Please see section 6.2 for details		
Power Meter	<b>HP 8900D</b> w/ 84811A sensor	3607U00673	08/01/00
	Frequency Range: 100kHz to 18 GHz Power Range: $300\mu\text{W}$ to 3W		



### 3.2 Tissue Simulating Liquid

Muscle	
Ingredient	Frequency (800 – 900 MHz)
Water	54.05 %
Sugar	45.05 %
Salt	0.1 %
Bactericide	0.8%

Muscle	
Ingredient	Frequency (1900 MHz)
Water	55.5 %
Sugar	43.5 %
Salt	0 %
Cellulose	1.0 %

The dielectric parameters were verified prior to assessment using the HP 85070A dielectric probe kit and the HP 8753C network Analyzer. The dielectric parameters were:

Frequency (MHz)	$\epsilon_r^*$	$s^*(\text{mho/m})$	$r^{**}(\text{kg/m}^3)$
835	$56.5 \pm 5\%$	$0.95 \pm 10\%$	1000

Frequency (MHz)	$\epsilon_r^*$	$s^*(\text{mho/m})$	$r^{**}(\text{kg/m}^3)$
1900	$52.1 \pm 5\%$	$1.69 \pm 10\%$	1000

\* Worst case uncertainty of the HP 85070A dielectric probe kit

\*\* Worst case assumption

Note: The amount of each ingredient specified in the table is not the exact amount of the final test solution. The final test solution was adjusted by adding small amounts of water, sugar, and/or salt to calibrate the solution to meet the proper dielectric parameters.

### 3.3 E-Field Probe Calibration

Probes were calibrated by the manufacturer in an IFI Model 110 TEM Cell. To ensure consistency, a strict protocol was followed. The conversion factor (ConF) between this calibration and the measurement in the tissue simulation solution was performed by comparison with temperature measurement and computer simulations. Probe calibration factors are included in Appendix B.

### 3.4 Measurement Uncertainty

The uncertainty budget has been determined for the DASY3 measurement system according to the NIS81 [5] and the NIST 1297 [6] documents and is given in the following table. The extended uncertainty (K=2) was assessed to be 23.5 %

UNCERTAINTY BUDGET				
Uncertainty Description	Error	Distrib.	Weight	Std.Dev.
Probe Uncertainty				
Axial isotropy	±0.2 dB	U-shape	0.5	±2.4 %
Spherical isotropy	±0.4 dB	U-shape	0.5	±4.8 %
Isotropy from gradient	±0.5 dB	U-shape	0	
Spatial resolution	±0.5 %	Normal	1	±0.5 %
Linearity error	±0.2 dB	Rectang.	1	±2.7 %
Calibration error	±3.3 %	Normal	1	±3.3 %
SAR Evaluation Uncertainty				
Data acquisition error	±1 %	Rectang.	1	±0.6 %
ELF and RF disturbances	±0.25 %	Normal	1	±0.25 %
Conductivity assessment	±10 %	Rectang.	1	±5.8 %
Spatial Peak SAR Evaluation Uncertainty				
Extrapol boundary effect	±3 %	Normal	1	±3 %
Probe positioning error	±0.1 mm	Normal	1	±1 %
Integrat. And cube orient	±3 %	Normal	1	±3 %
Cube shape inaccuracies	±2 %	Rectang.	1	±1.2 %
Device positioning	±6 %	Normal	1	±6 %
Combined Uncertainties				<b>±11.7 %</b>

### 3.5 Measurement Traceability

All measurements described in this report are traceable to National Institute of Standards and Technology (NIST) standards or appropriate national standards.

#### **4.0 WARNING LABEL INFORMATION - USA**

See users manual.

## 5.0 REFERENCES

- [1] ANSI, ANSI/IEEE C95.1-1991: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300 GHz, The Institute of electrical and Electronics Engineers, Inc., New York, NY 10017, 1992
  
- [2] Federal Communications Commission, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", OET Bulletin 65, FCC, Washington, D.C. 20554, 1997
  
- [3] Thomas Schmid, Oliver Egger, and Niels Kuster, "Automated E-field scanning system for dosimetric assessments", *IEEE Transaction on Microwave Theory and Techniques*, vol. 44, pp. 105-113, Jan. 1996.
  
- [4] Niels Kuster, Ralph Kastle, and Thomas Schmid, "Dosimetric evaluation of mobile communications equipment with know precision", *IEICE Transactions on Communications*, vol. E80-B, no. 5, pp.645-652, May 1997.
  
- [5] NIS81, NAMAS, "The treatment of uncertainty in EMC measurement", Tech. Rep., NAMAS Executive, National Physical Laboratory, Teddinton, Middlesex, England, 1994.
  
- [6] Barry N. Taylor and Chris E. Kuyatt, "Guidelines for evaluating and expressing the uncertainty of NIST measurement results", Tech. Rep., National Institute of Standards and Technology, 1994.

Sierra Wireless Inc., Model: AIRCARD 555 w/PDA  
FCC ID: N7NACRD555

Date of Test: July 16-28, 2001

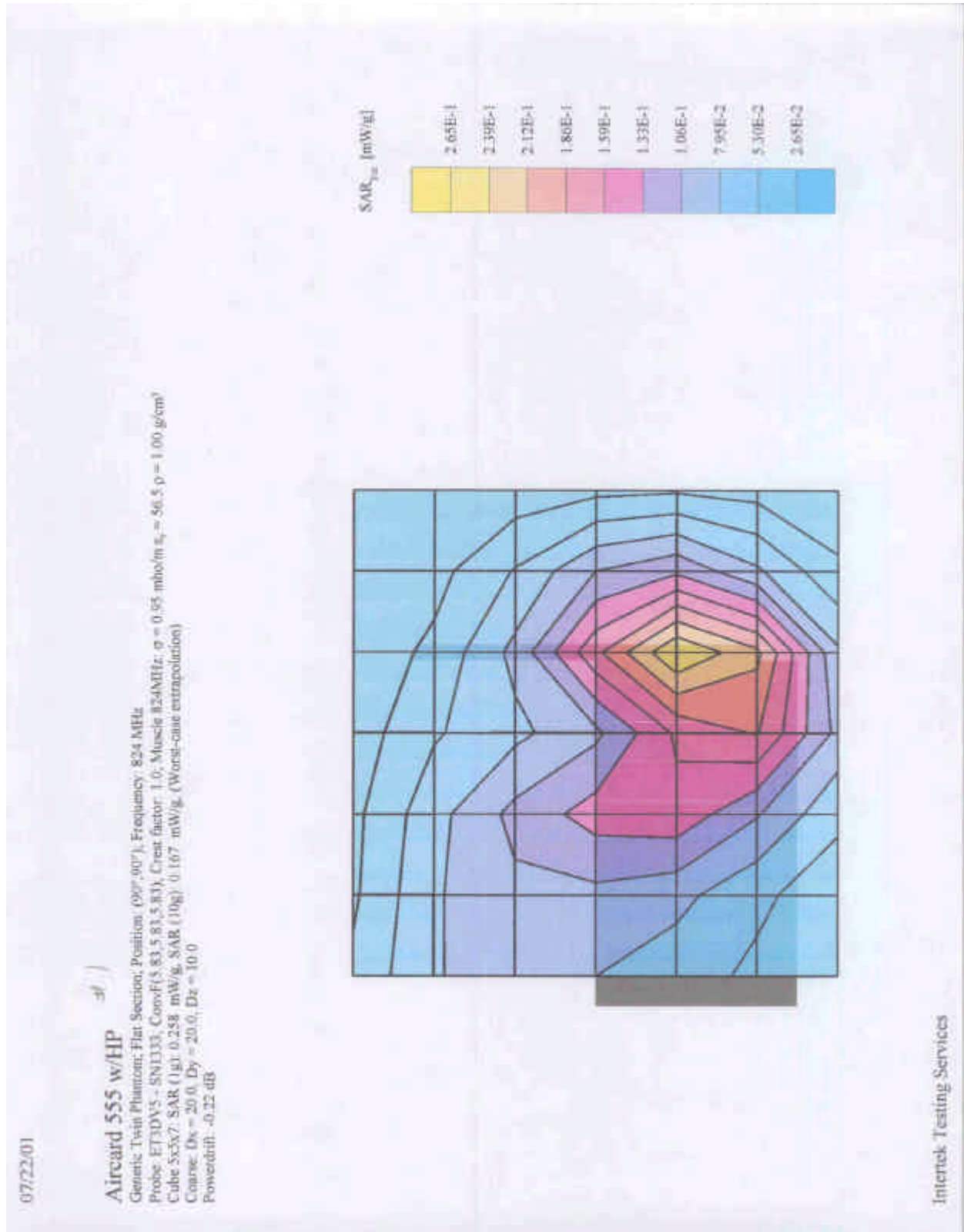
## 6.0 Document History

Revision/ Job Number	Writer Initials	Date	Change
1.0 / 20544792	SS	July 28 2001	Original document

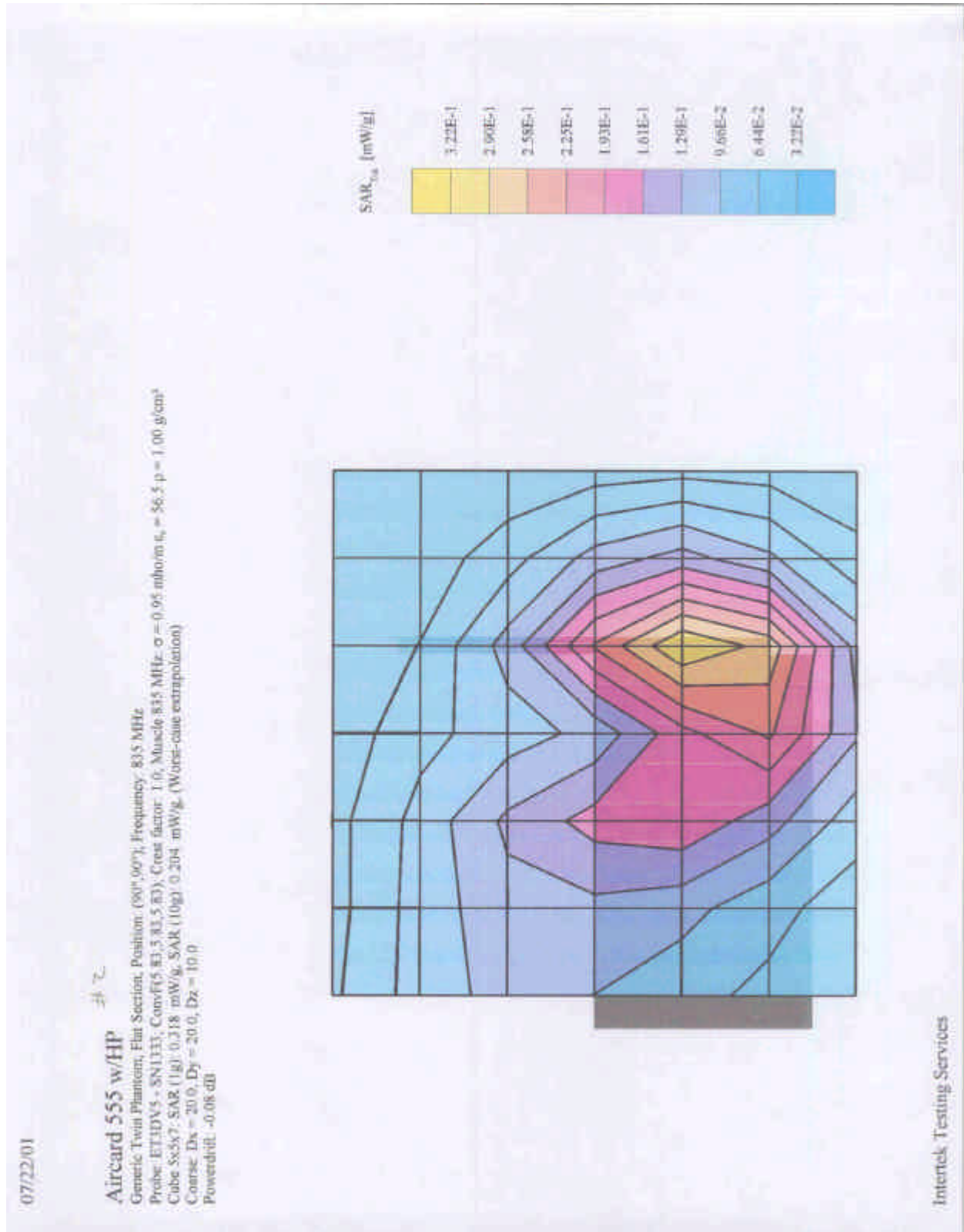
## **APPENDIX A - SAR Evaluation Data**

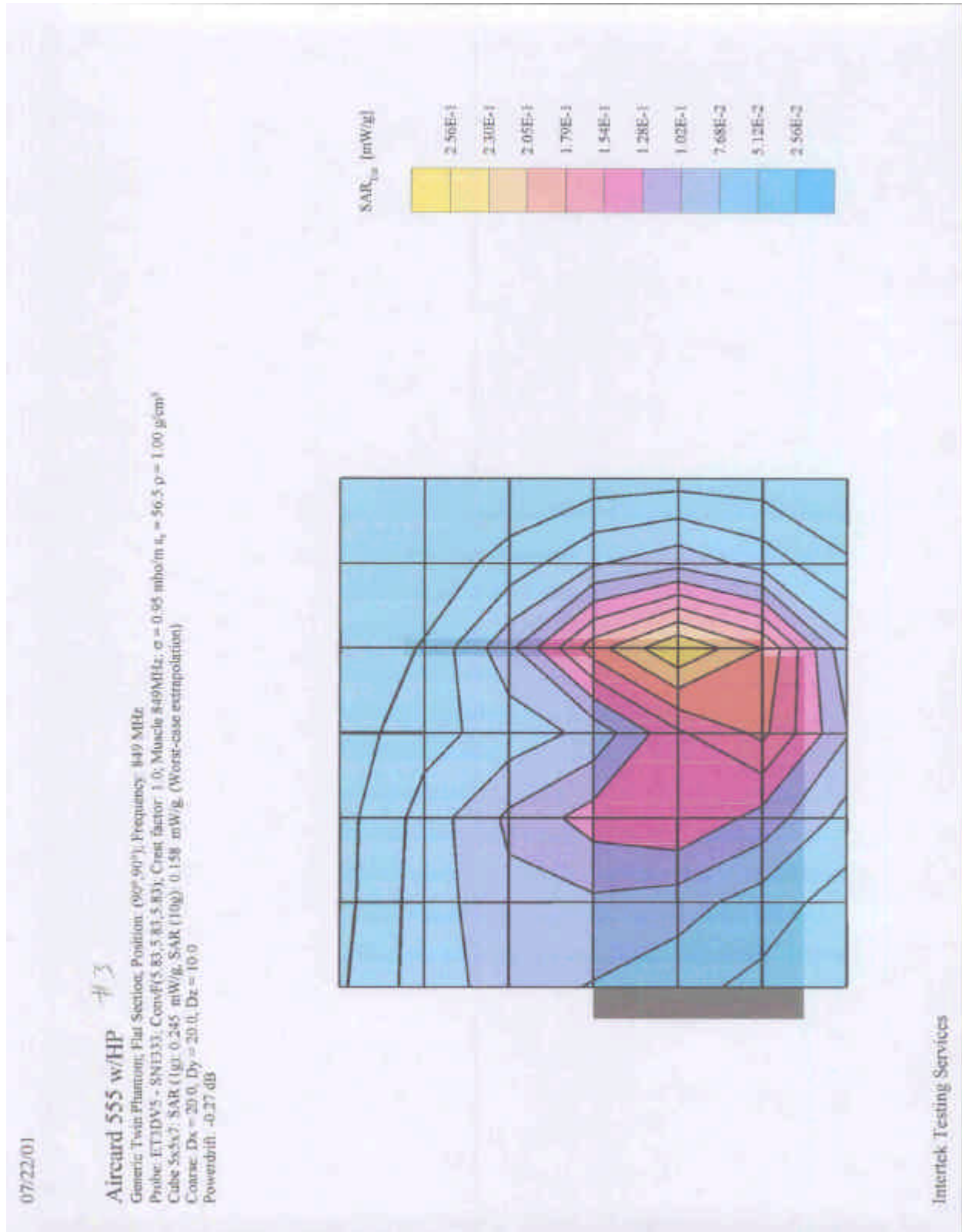
Please note that the graphical visualization of the phone position onto the SAR distribution gives only limited information on the current distribution of the device, since the curvature of the head results in graphical distortion. Full information can only be obtained either by H-field scans in free space or SAR evaluation with a flat phantom.

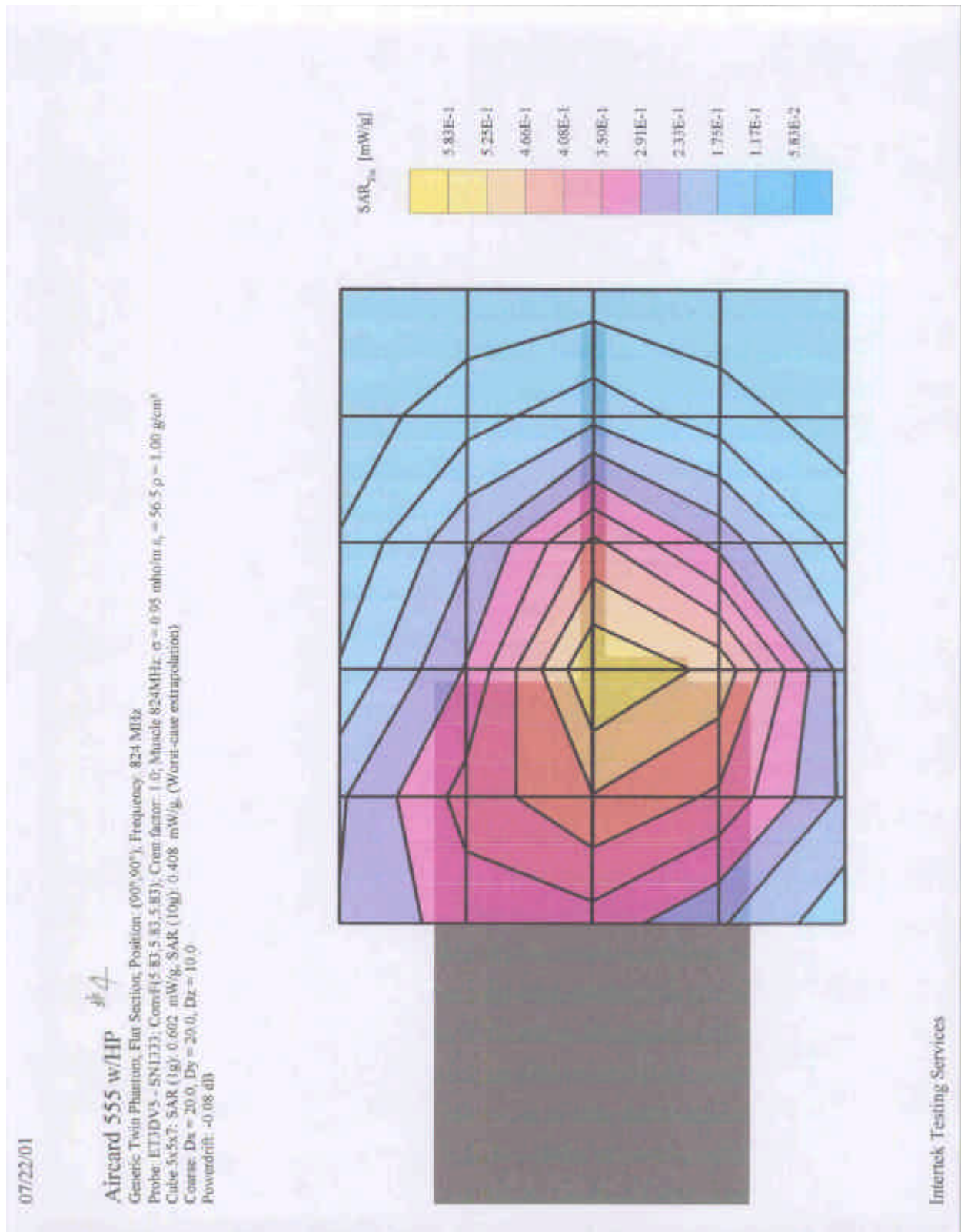
**Powerdrift** is the measurement of power drift of the device over one complete SAR scan.

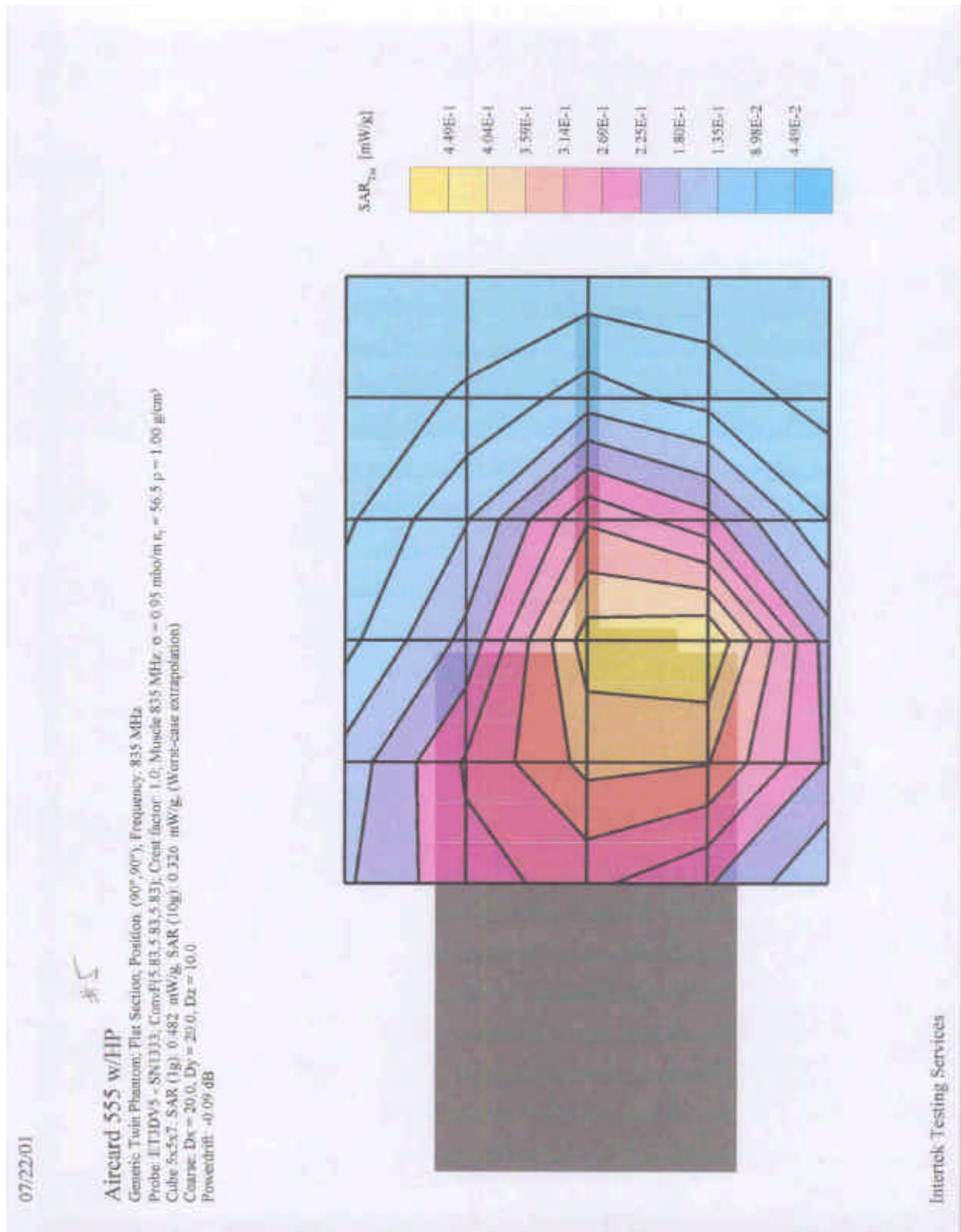




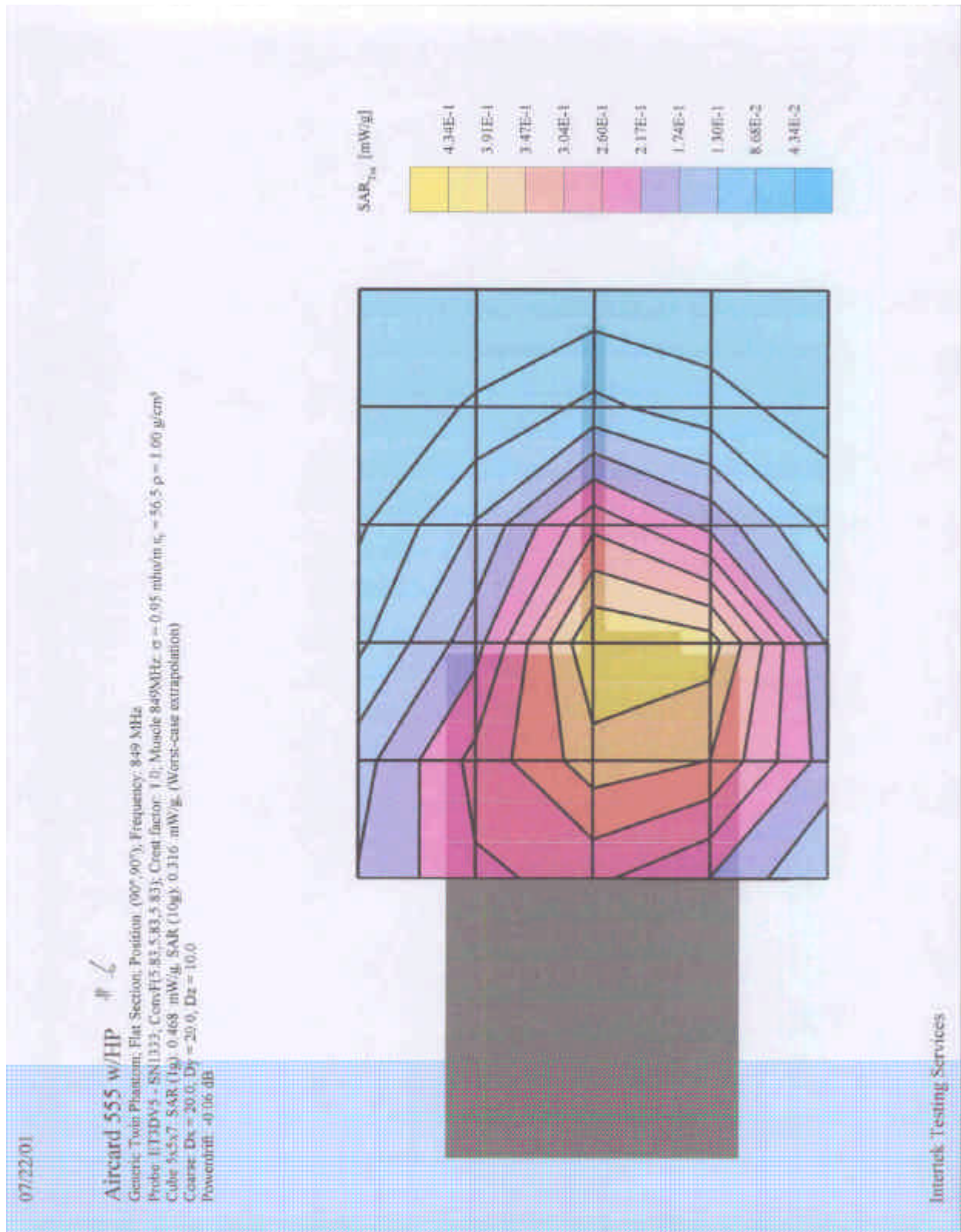


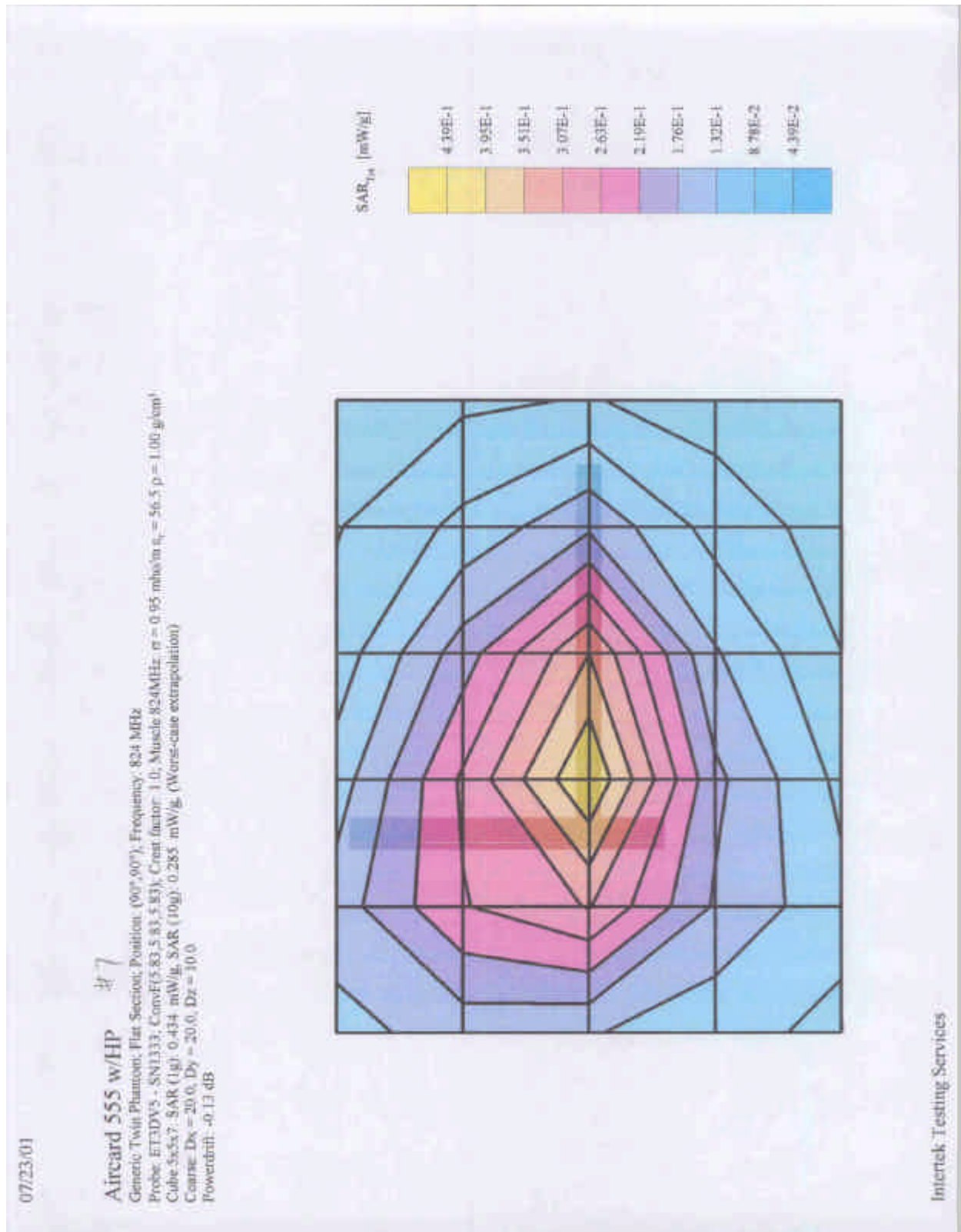


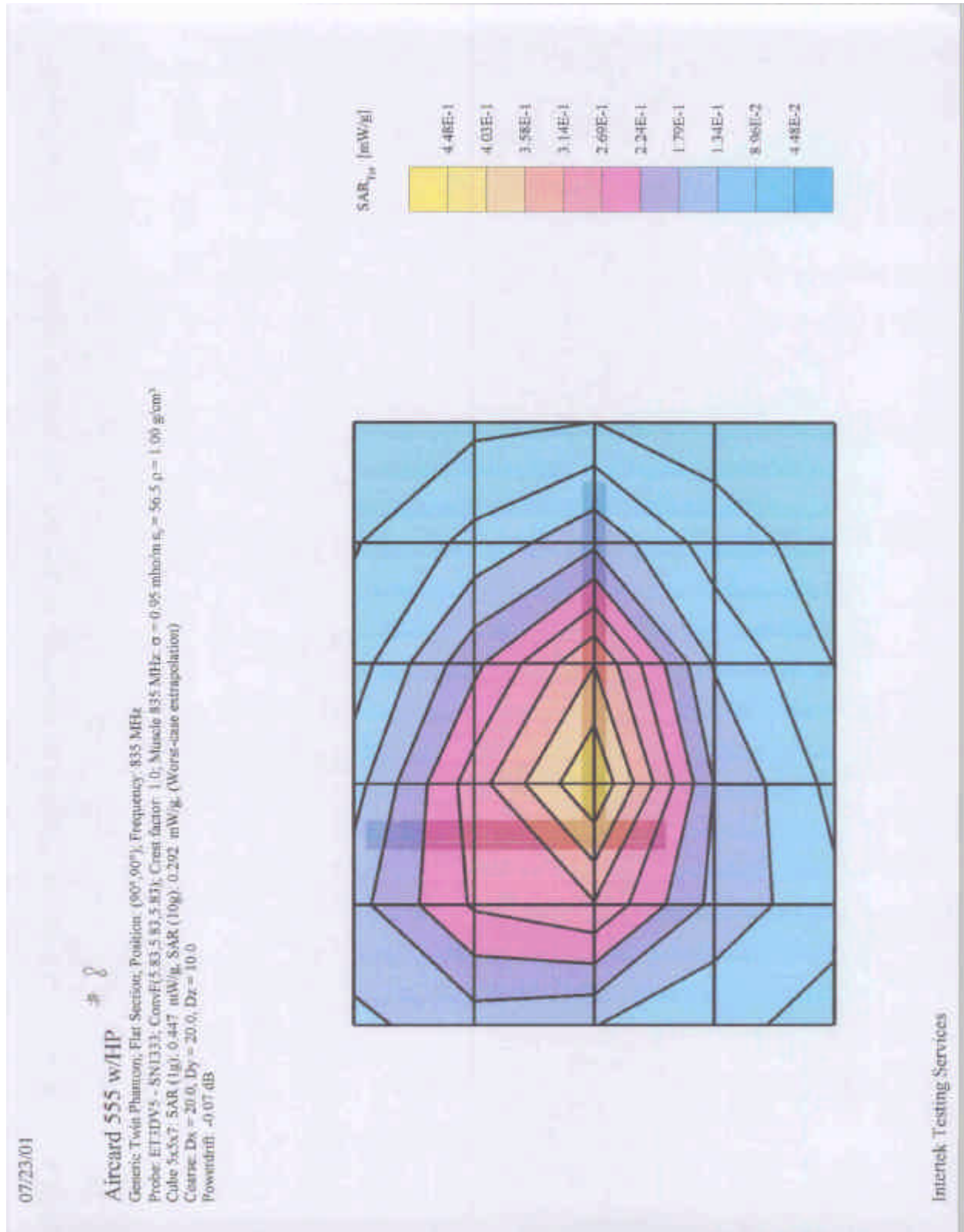




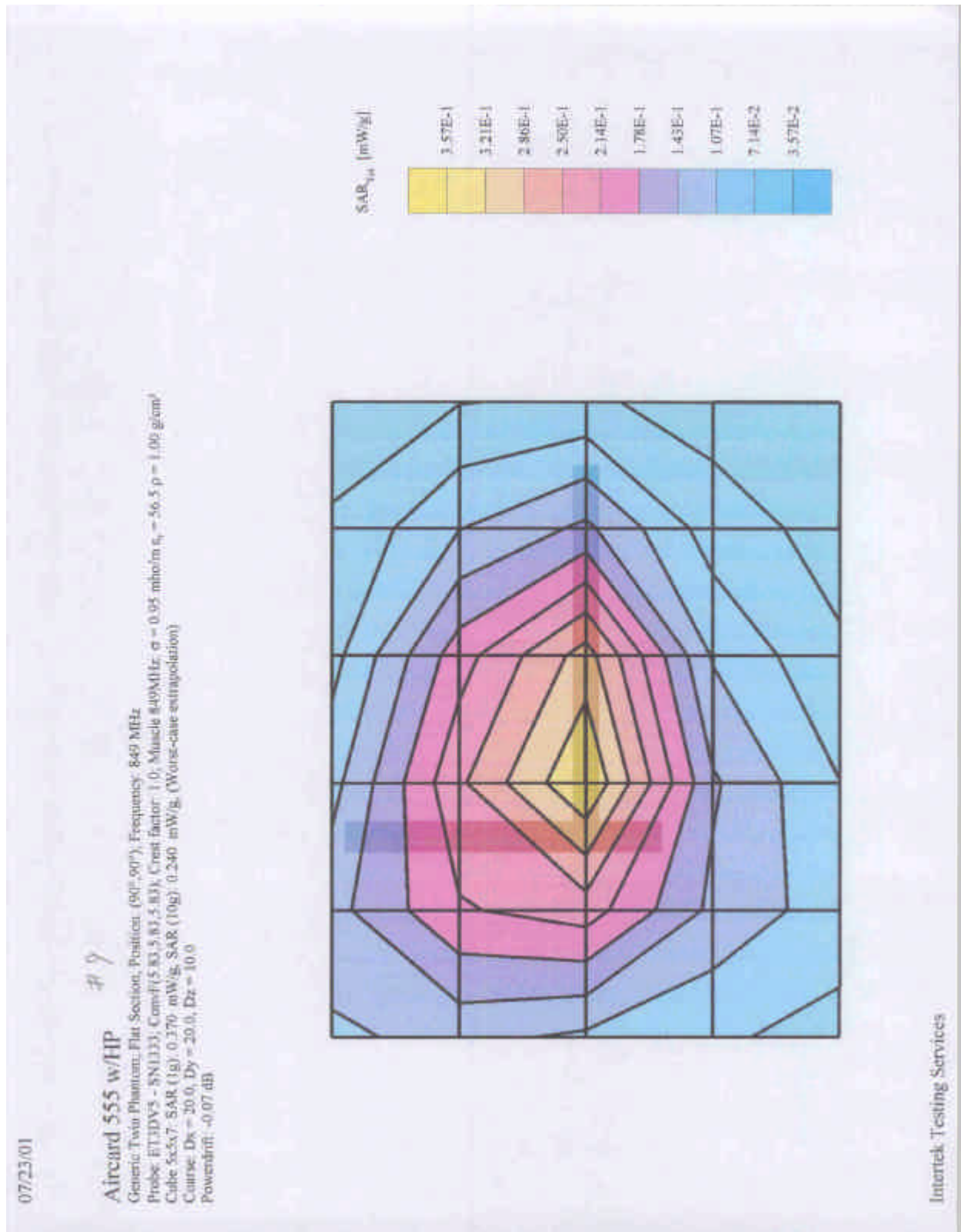




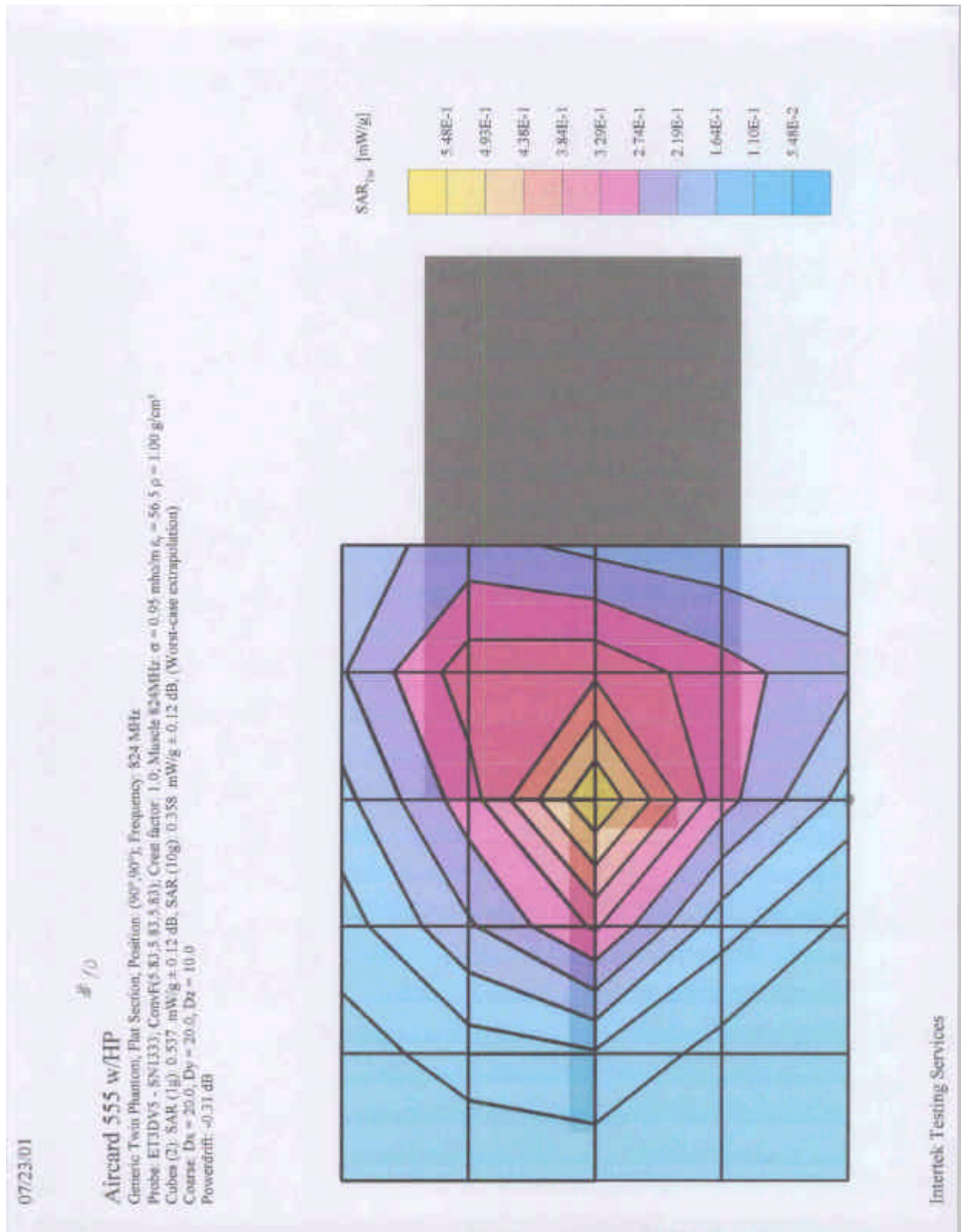


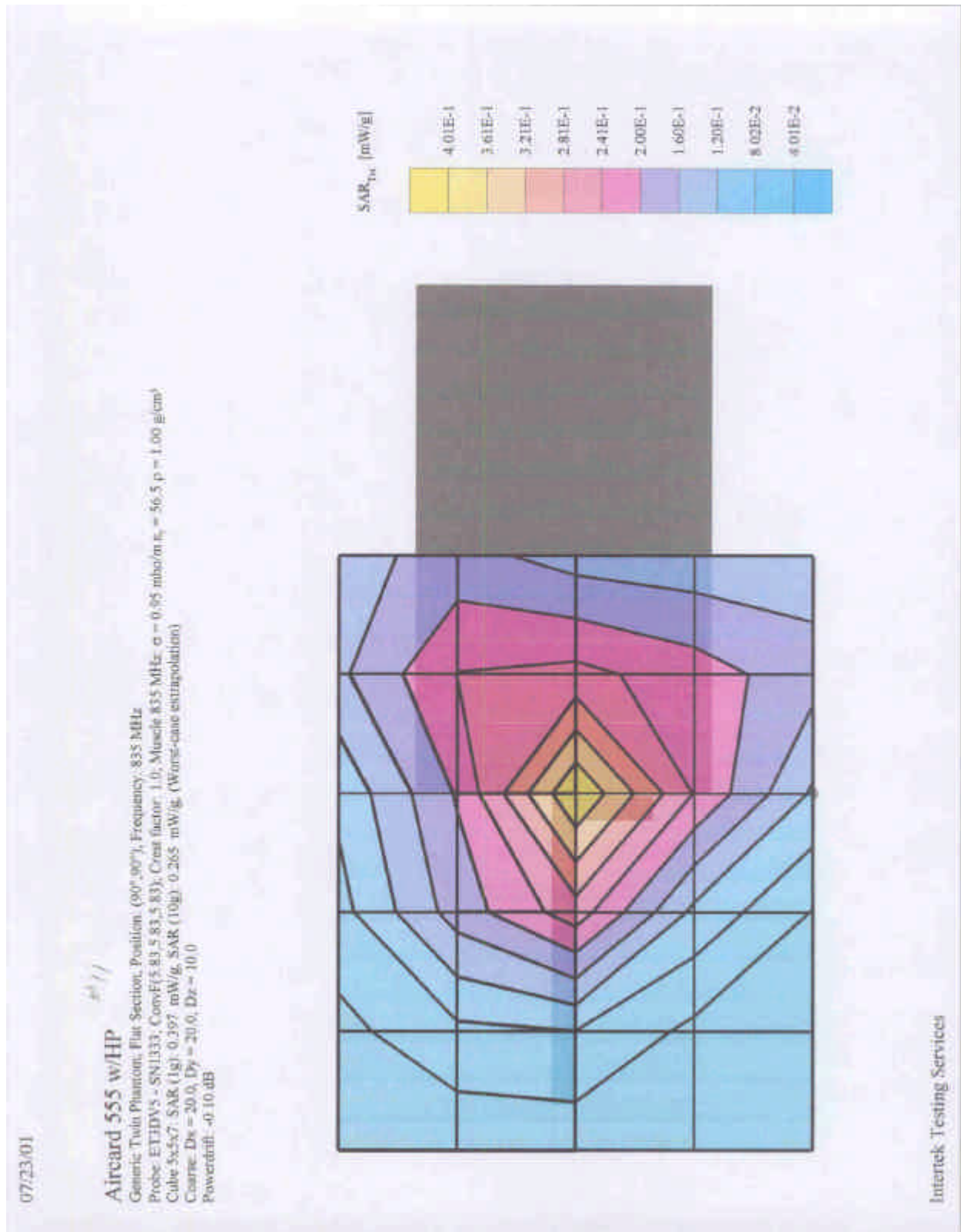




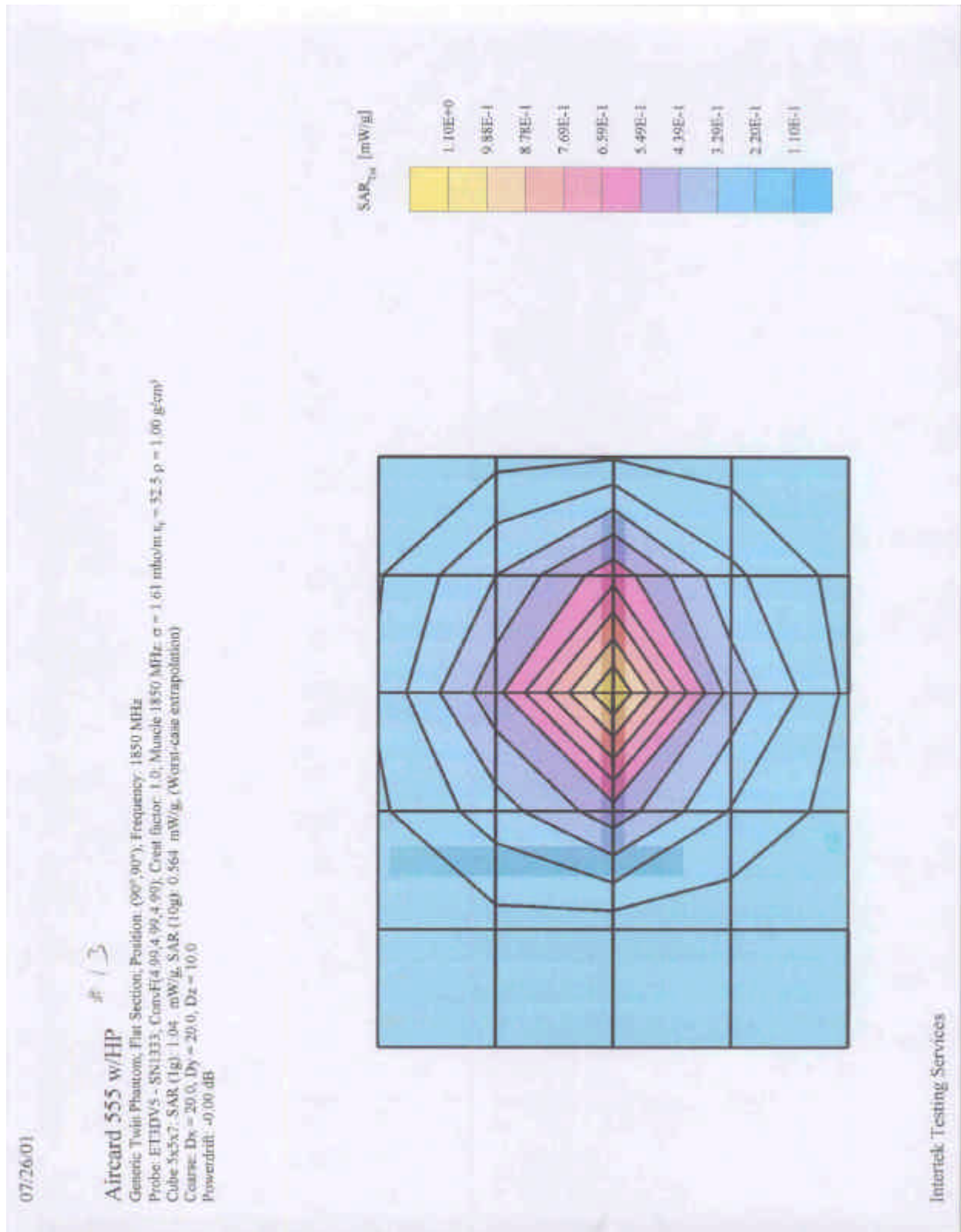




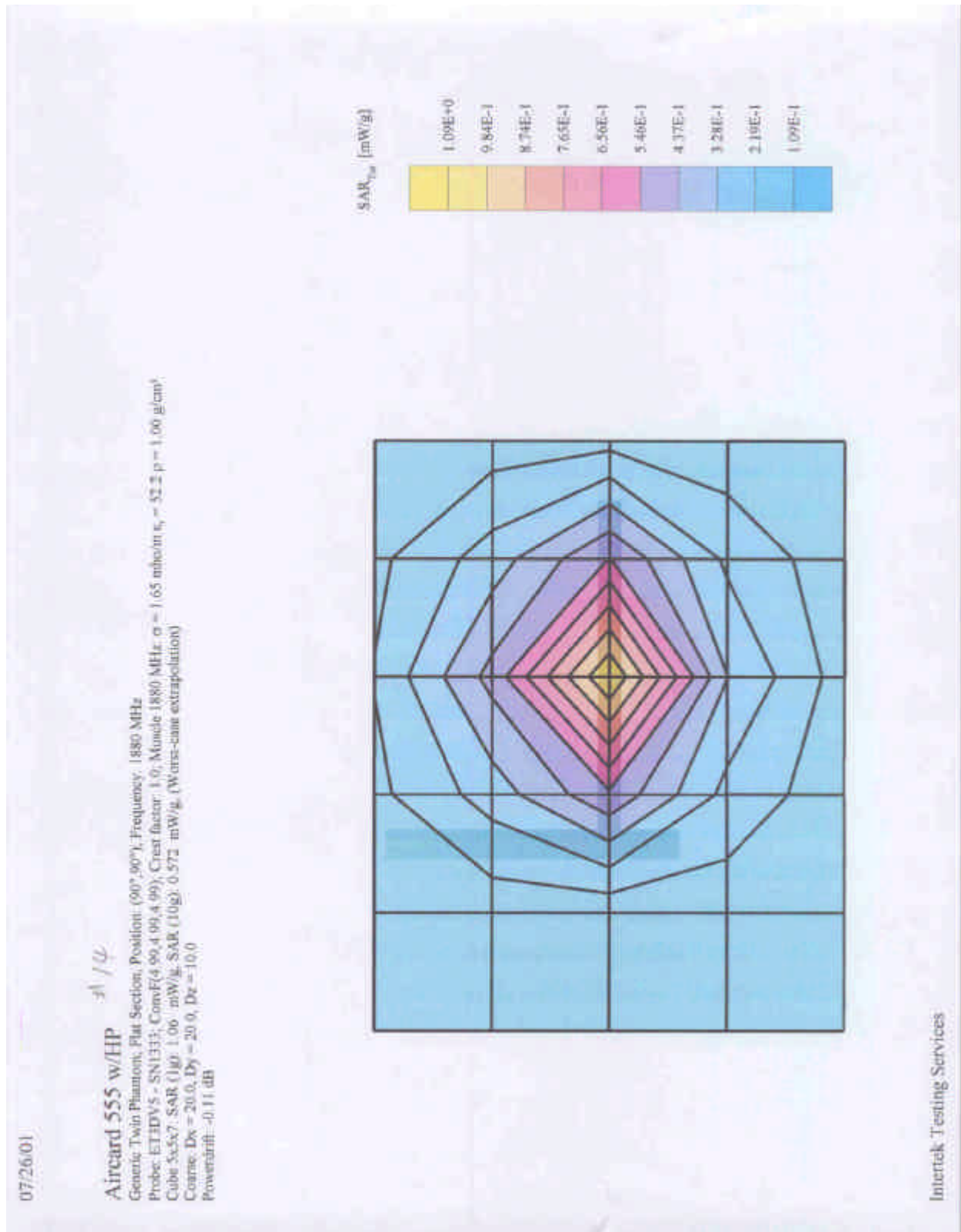


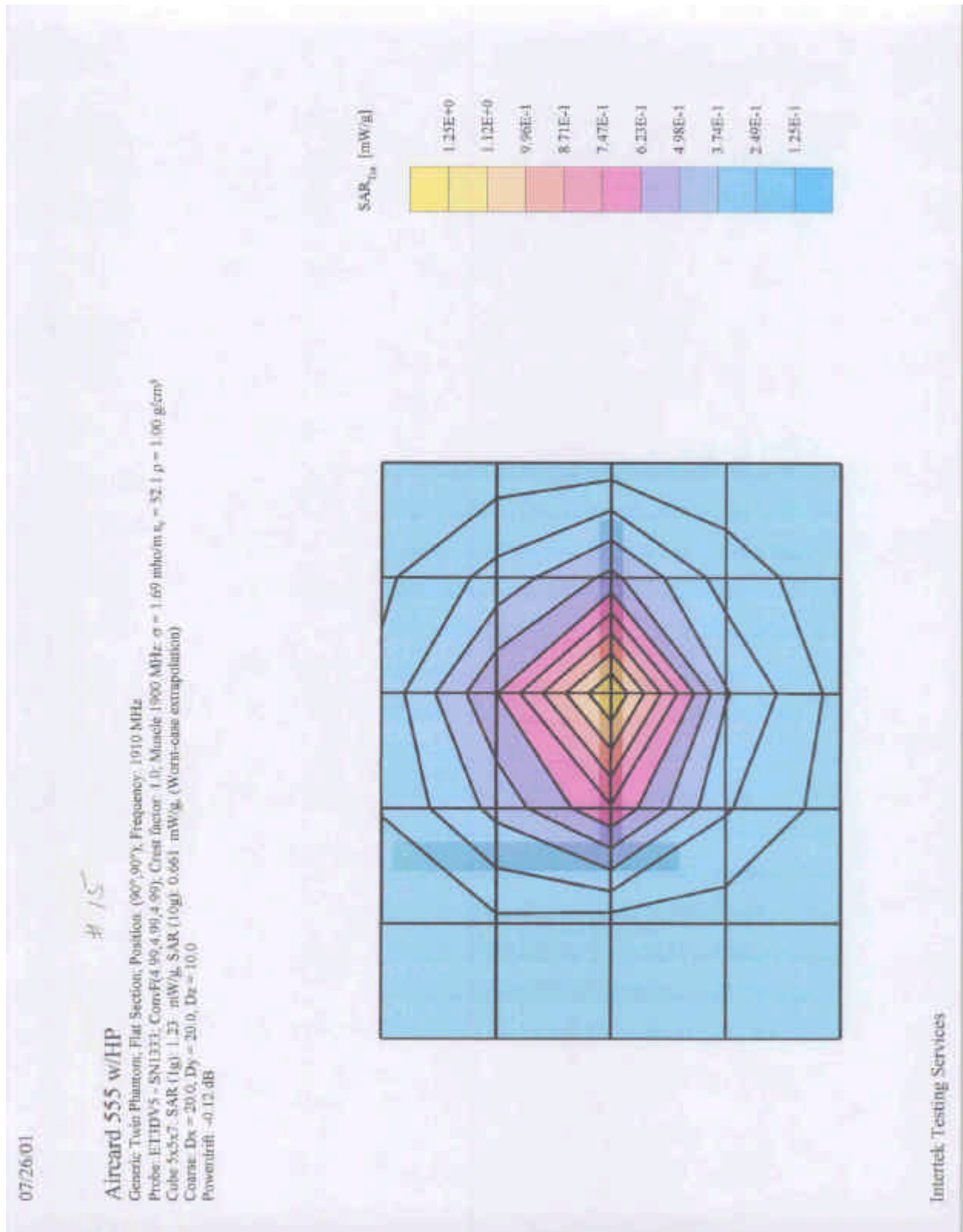


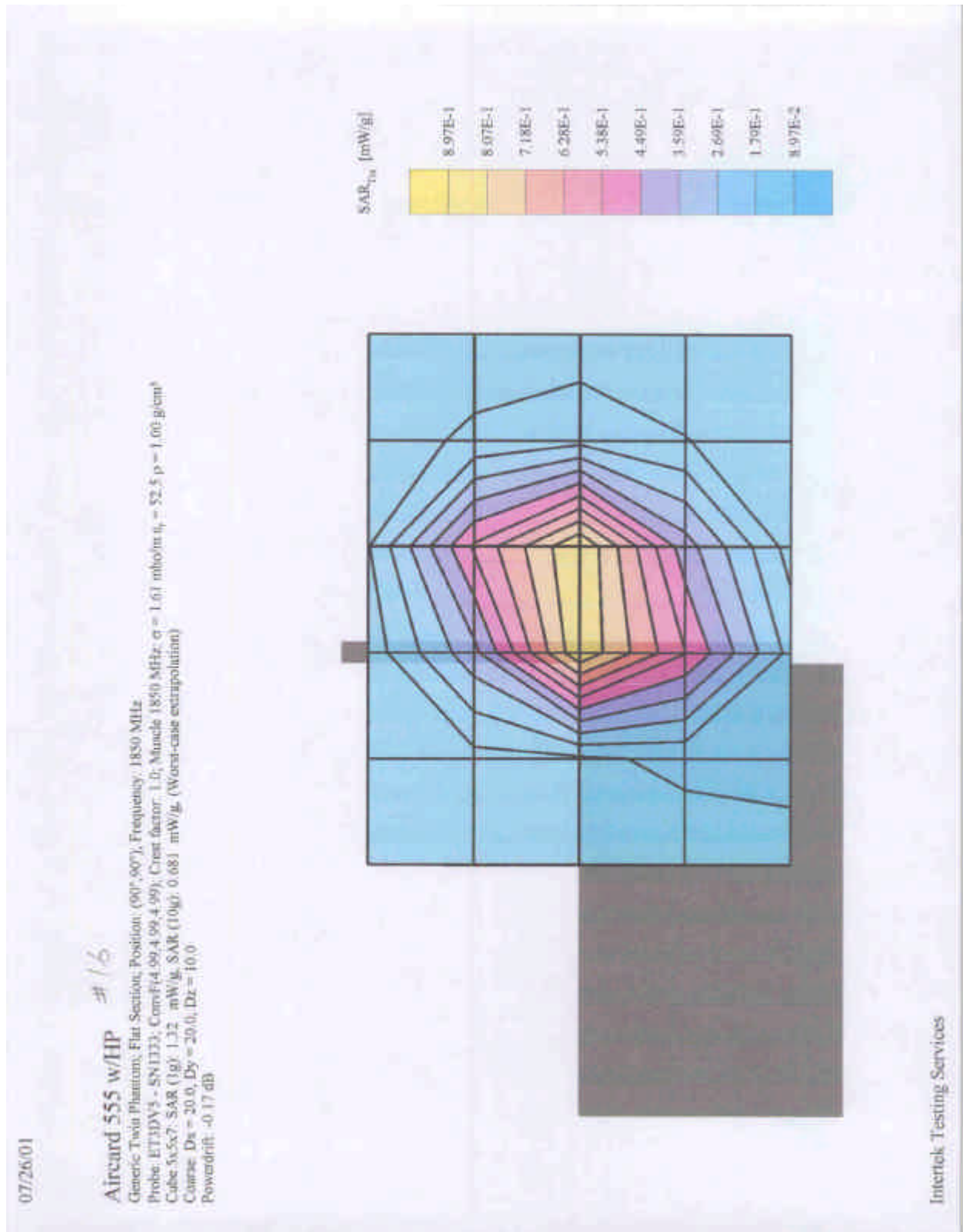


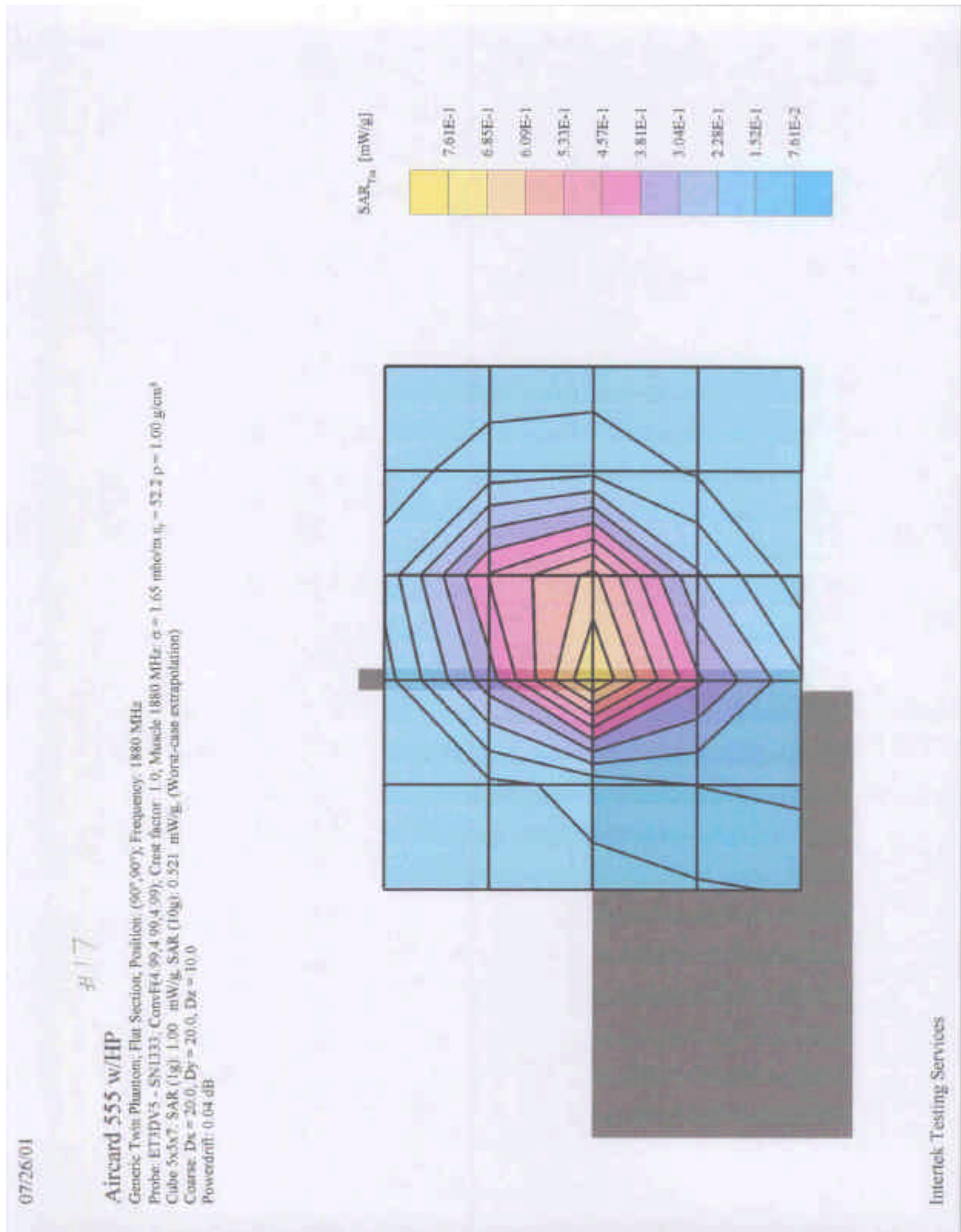




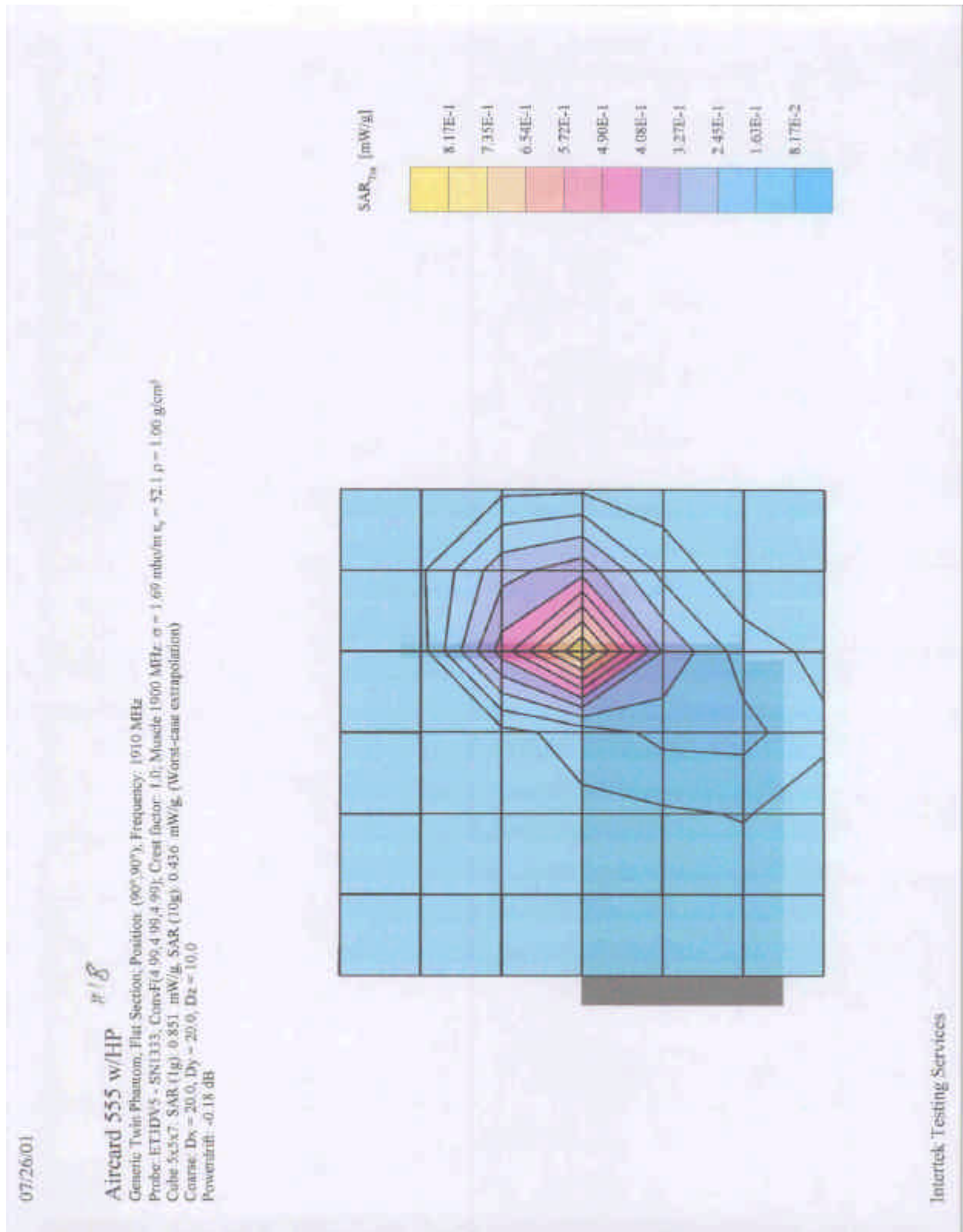


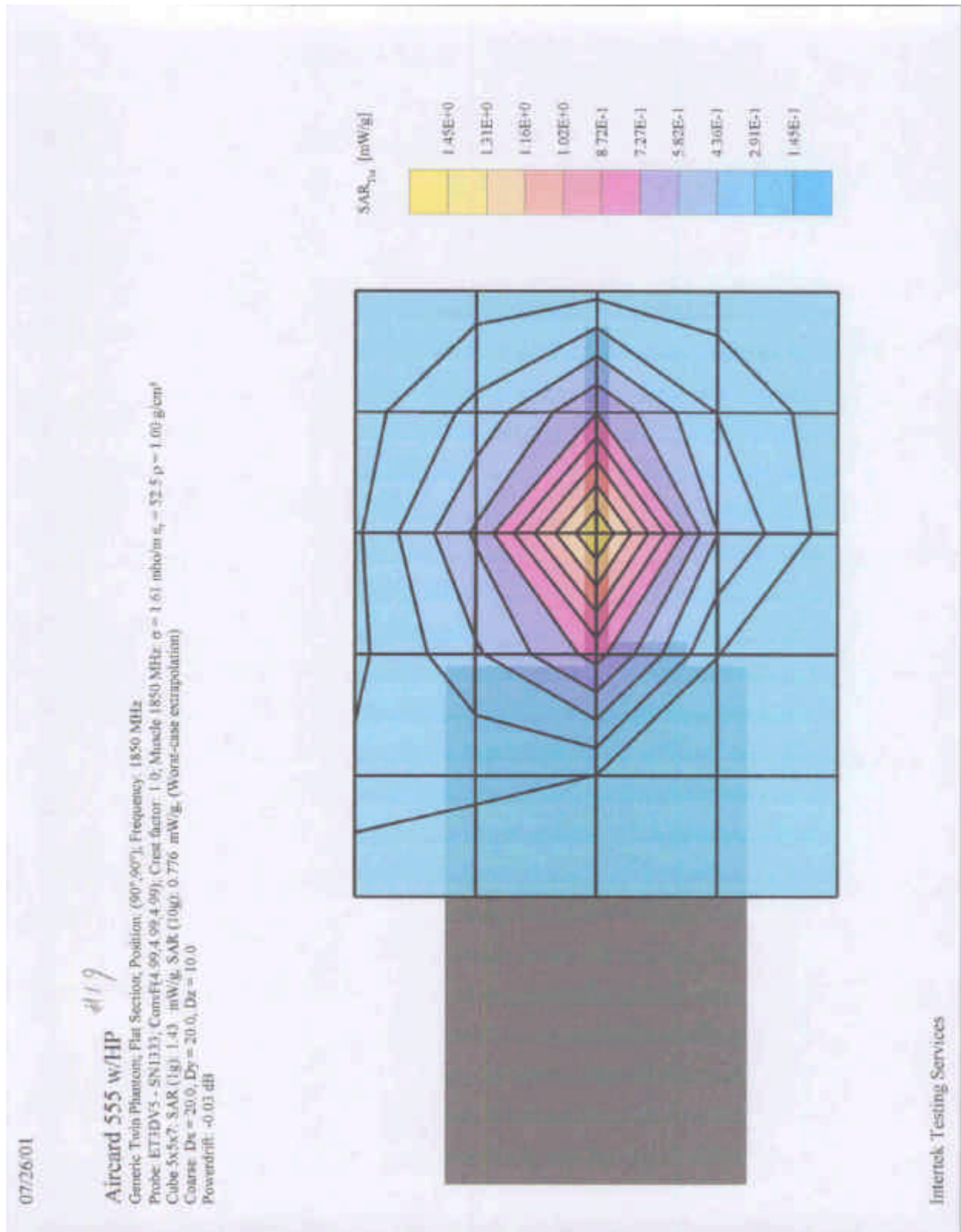


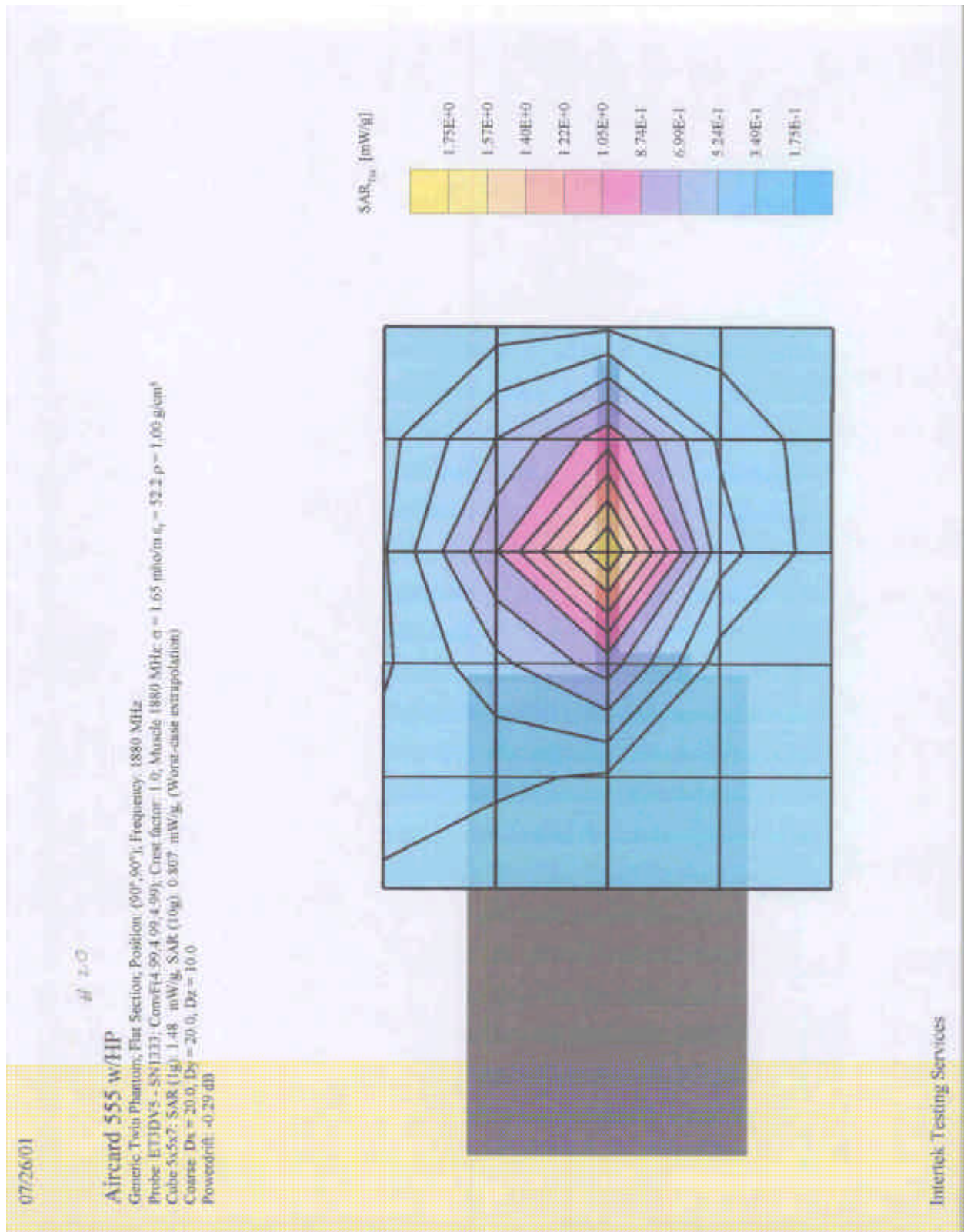


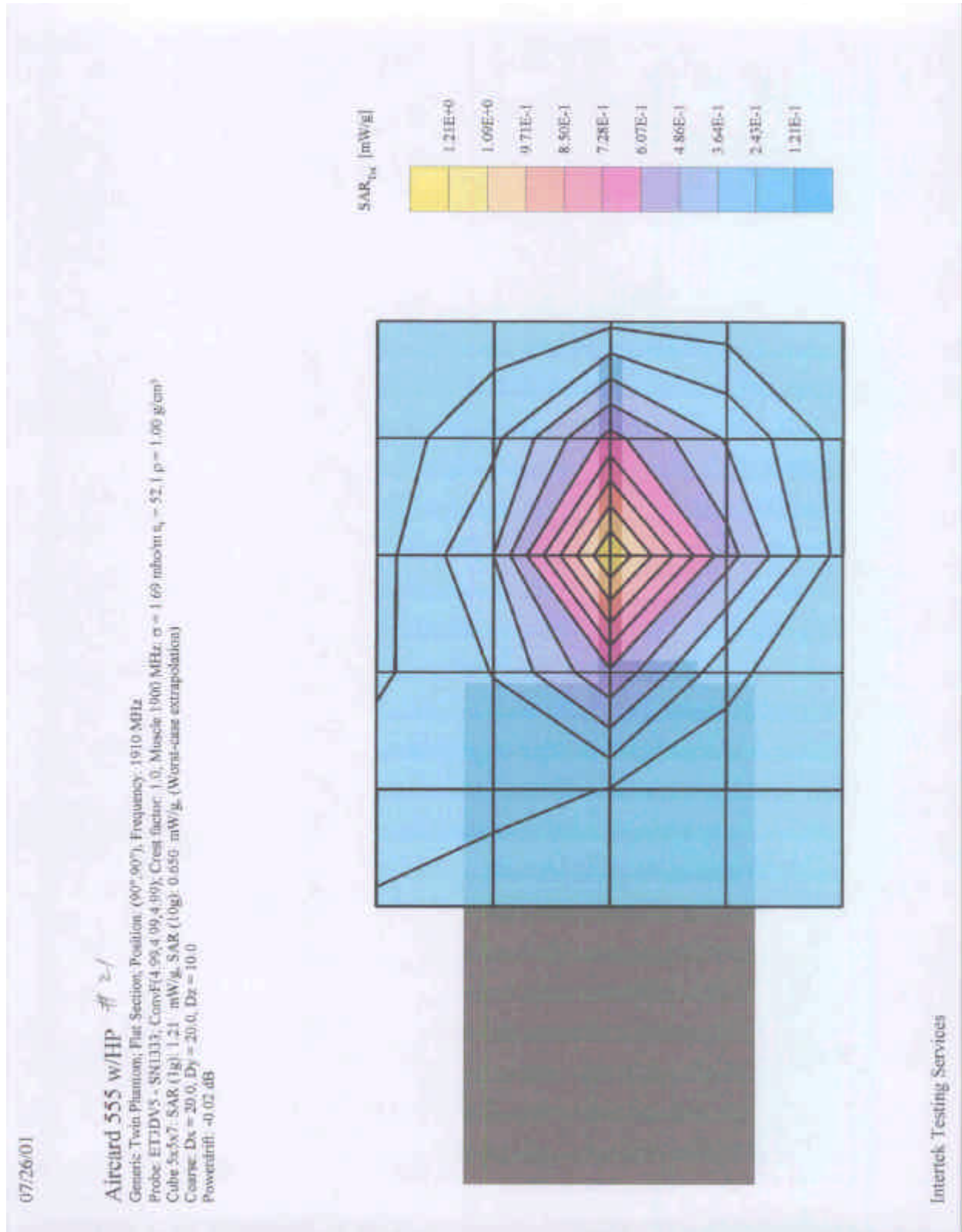




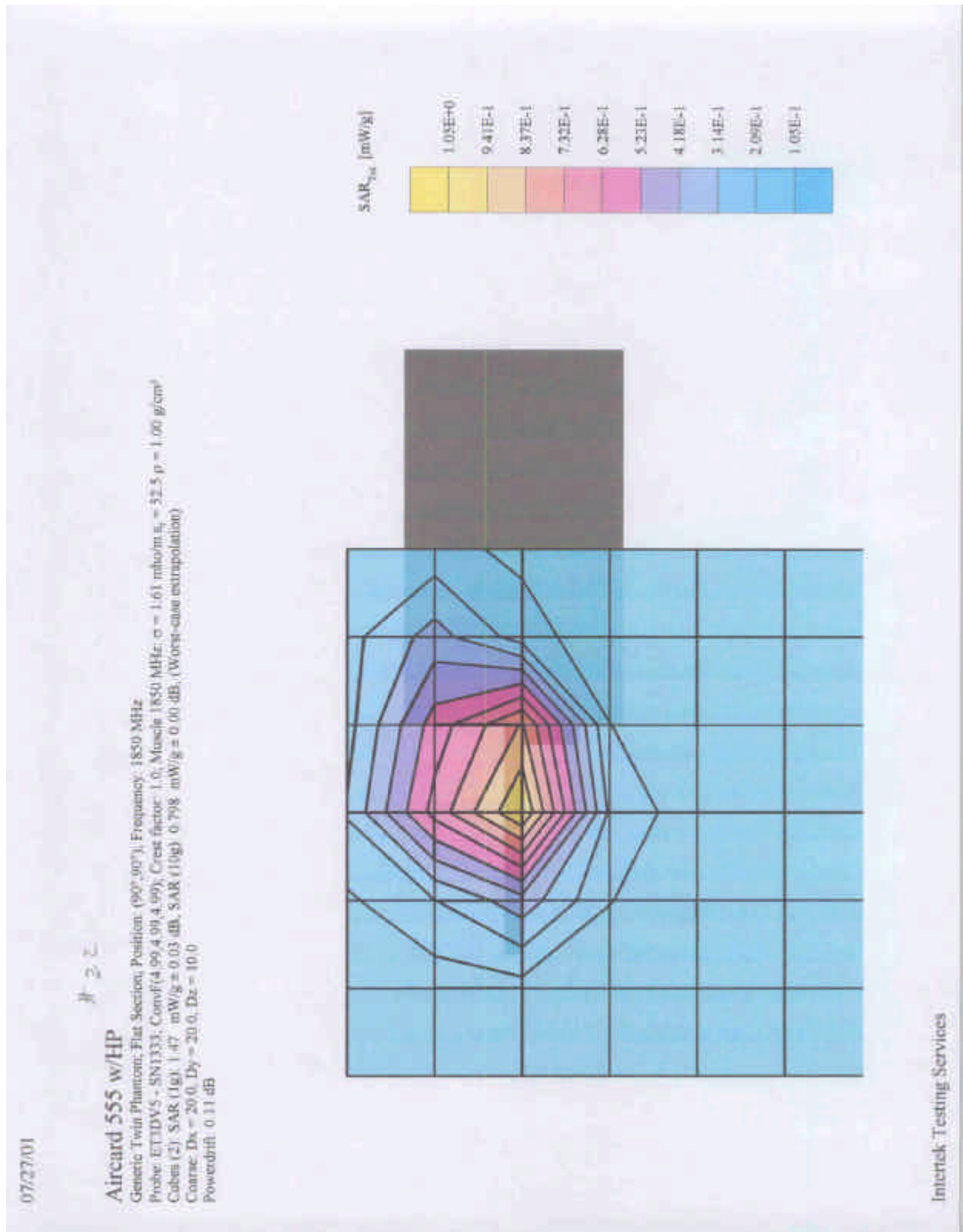


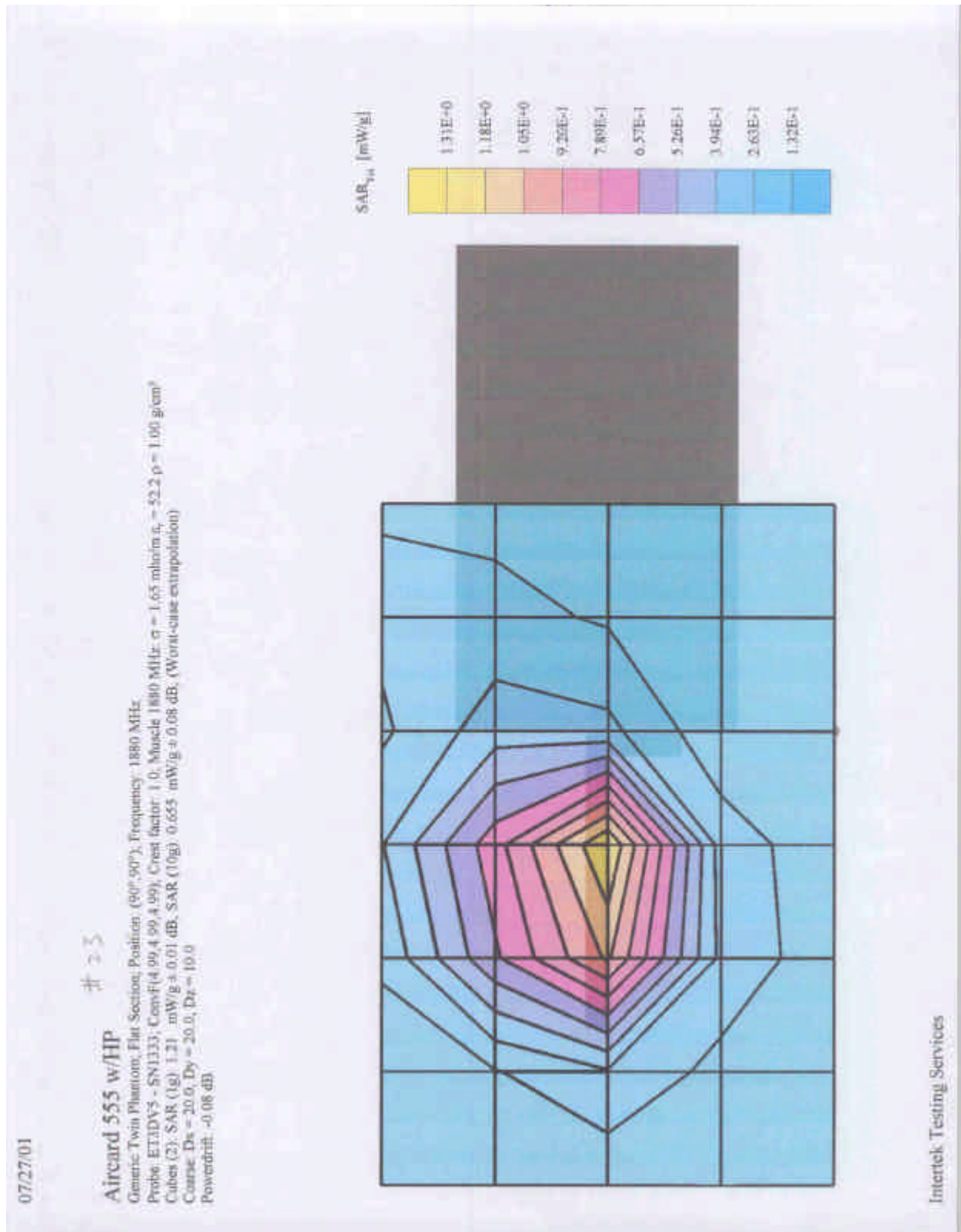


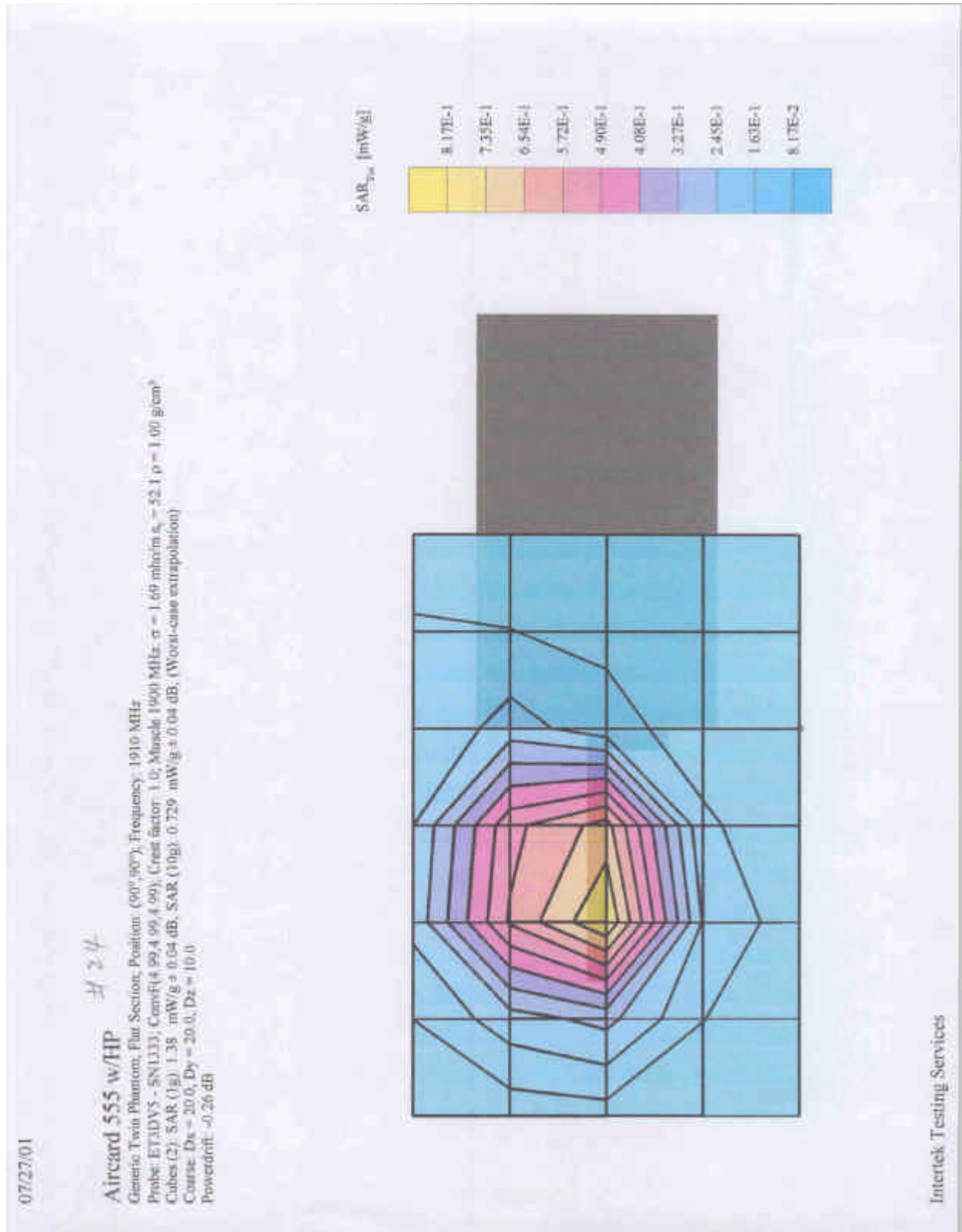












**APPENDIX B - E-Field Probe Calibration Data**

See attached pages.



**Schmid & Partner  
Engineering AG**

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

**Calibration Certificate**

**Dosimetric E-Field Probe**

Type:

**ET3DV5**

Serial Number:

**1333**

Place of Calibration:

**Zurich**

Date of Calibration:

**April 23, 2001**

Calibration Interval:

**12 months**

Schmid & Partner Engineering AG hereby certifies, that this device has been calibrated on the date indicated above. The calibration was performed in accordance with specifications and procedures of Schmid & Partner Engineering AG.

Wherever applicable, the standards used in the calibration process are traceable to international standards. In all other cases the standards of the Laboratory for EMF and Microwave Electronics at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland have been applied.

Calibrated by:

*Nicolas Knecht*

Approved by:

*Thomas Kappeler*

**Schmid & Partner  
Engineering AG**

Zeughausstrasse 43, 8004 Zurich, Switzerland, Telephone +41 1 245 97 00, Fax +41 1 245 97 79

**Probe ET3DV5**

**SN:1333**

Manufactured:	December 20, 1997
Last calibration:	April 10, 2000
Recalibrated:	April 23, 2001

Calibrated for System DASY3



ET3DV5 SN:1333

### DASY3 - Parameters of Probe: ET3DV5 SN:1333

#### Sensitivity in Free Space

NormX	2.37 $\mu\text{V}/(\text{V}/\text{m})^2$
NormY	2.38 $\mu\text{V}/(\text{V}/\text{m})^2$
NormZ	2.33 $\mu\text{V}/(\text{V}/\text{m})^2$

#### Diode Compression

DCP X	100 mV
DCP Y	100 mV
DCP Z	100 mV

#### Sensitivity in Tissue Simulating Liquid

Head                      450 MHz                       $\epsilon_r = 43.5 \pm 5\%$                        $\sigma = 0.87 \pm 10\% \text{ mho/m}$

ConvF X	6.25	extrapolated
ConvF Y	6.25	extrapolated
ConvF Z	6.25	extrapolated

Boundary effect:	
Alpha	0.19
Depth	3.06

Head                      900 MHz                       $\epsilon_r = 42 \pm 5\%$                        $\sigma = 0.97 \pm 10\% \text{ mho/m}$

ConvF X	5.83	$\pm 7\%$ (k=2)
ConvF Y	5.83	$\pm 7\%$ (k=2)
ConvF Z	5.83	$\pm 7\%$ (k=2)

Boundary effect:	
Alpha	0.38
Depth	2.70

Brain                      1500 MHz                       $\epsilon_r = 41 \pm 5\%$                        $\sigma = 1.32 \pm 10\% \text{ mho/m}$

ConvF X	5.27	interpolated
ConvF Y	5.27	interpolated
ConvF Z	5.27	interpolated

Boundary effect:	
Alpha	0.63
Depth	2.23

Brain                      1800 MHz                       $\epsilon_r = 41 \pm 5\%$                        $\sigma = 1.69 \pm 10\% \text{ mho/m}$

ConvF X	4.99	$\pm 7\%$ (k=2)
ConvF Y	4.99	$\pm 7\%$ (k=2)
ConvF Z	4.99	$\pm 7\%$ (k=2)

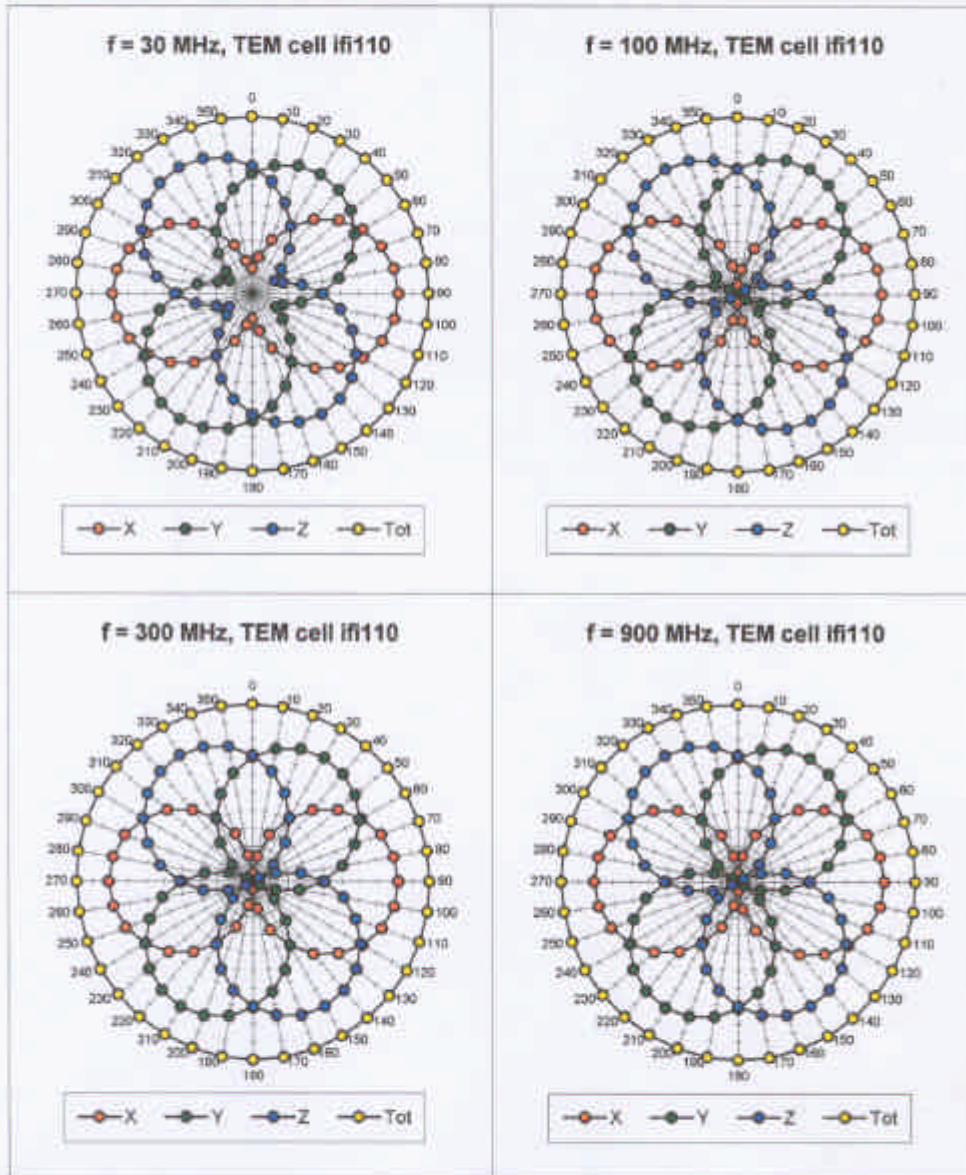
Boundary effect:	
Alpha	0.75
Depth	1.99

#### Sensor Offset

Probe Tip to Sensor Center	2.7	mm
Optical Surface Detection	1.6 $\pm$ 0.2	mm

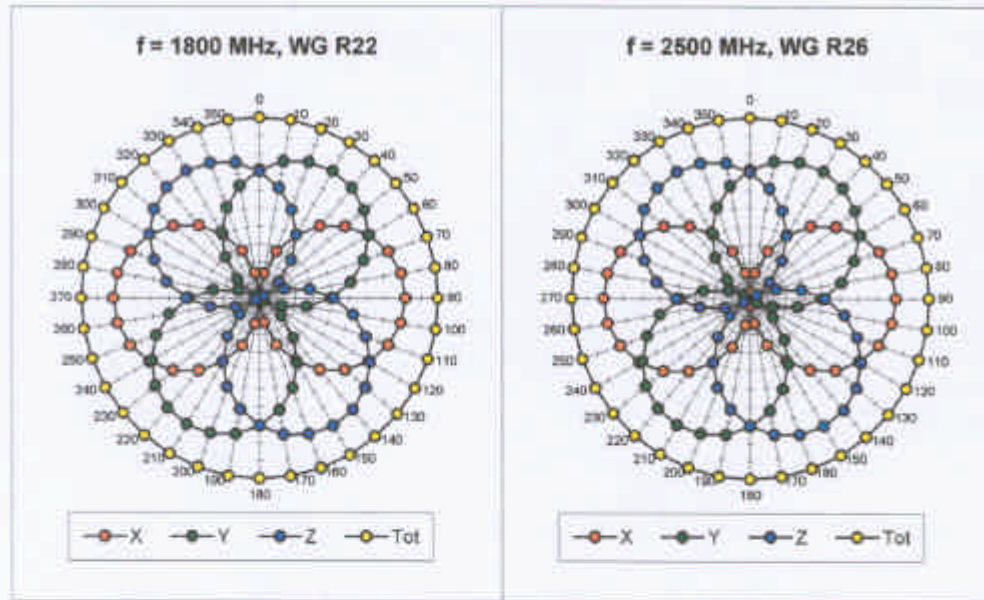
ET3DV5 SN:1333

### Receiving Pattern ( $\phi$ ), $\theta = 0^\circ$

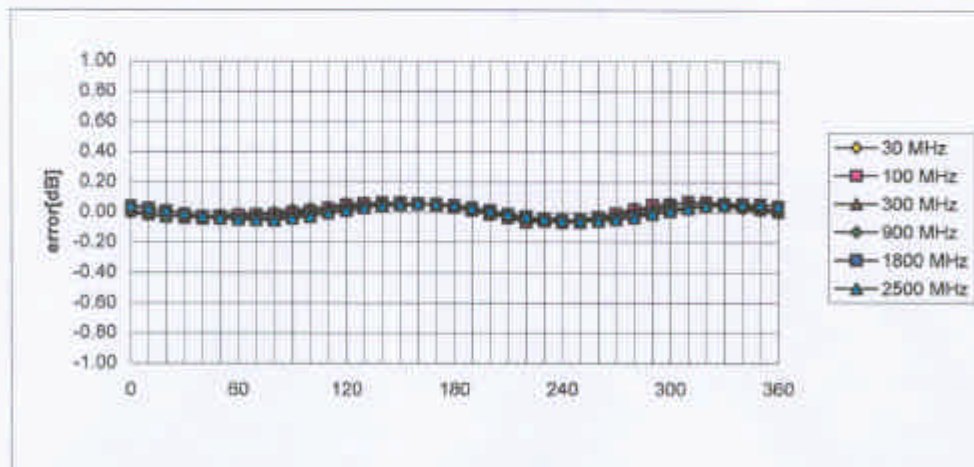




ET3DV5 SN:1333

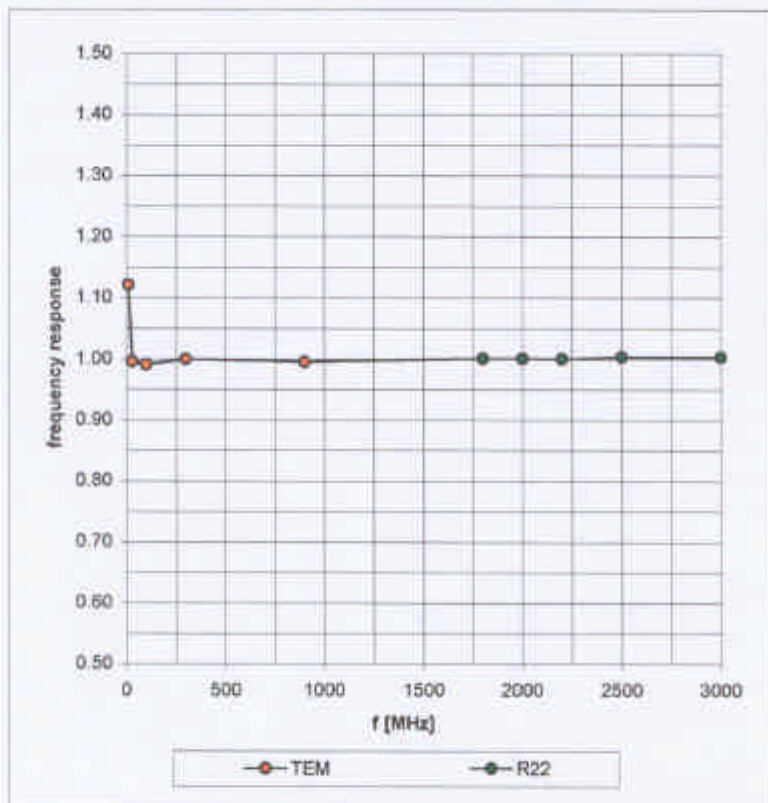


### Isotropy Error ( $\phi$ ), $\theta = 0^\circ$



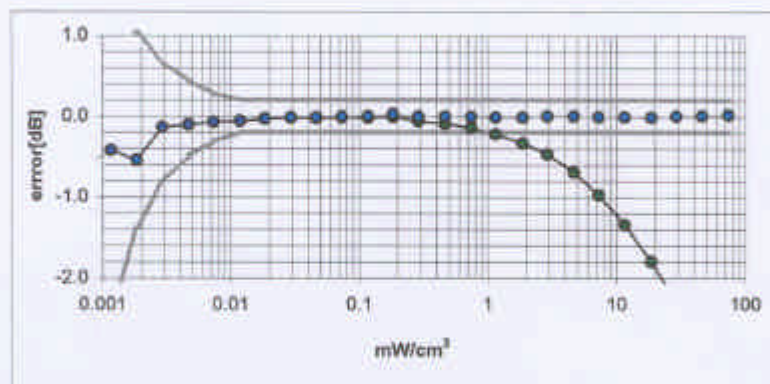
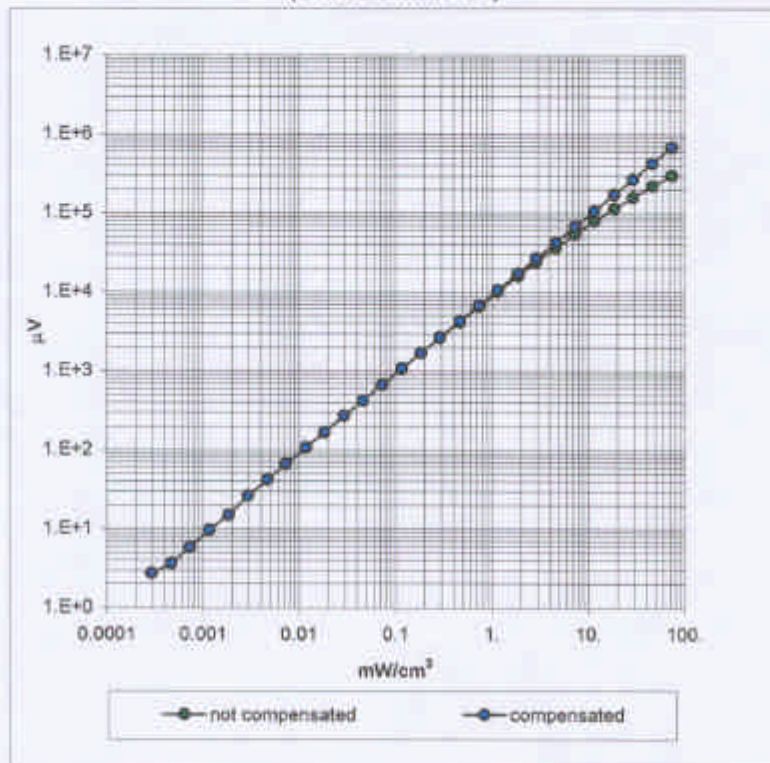
ET3DV5 SN:1333

### Frequency Response of E-Field ( TEM-Cell:ifi110, Waveguide R22)



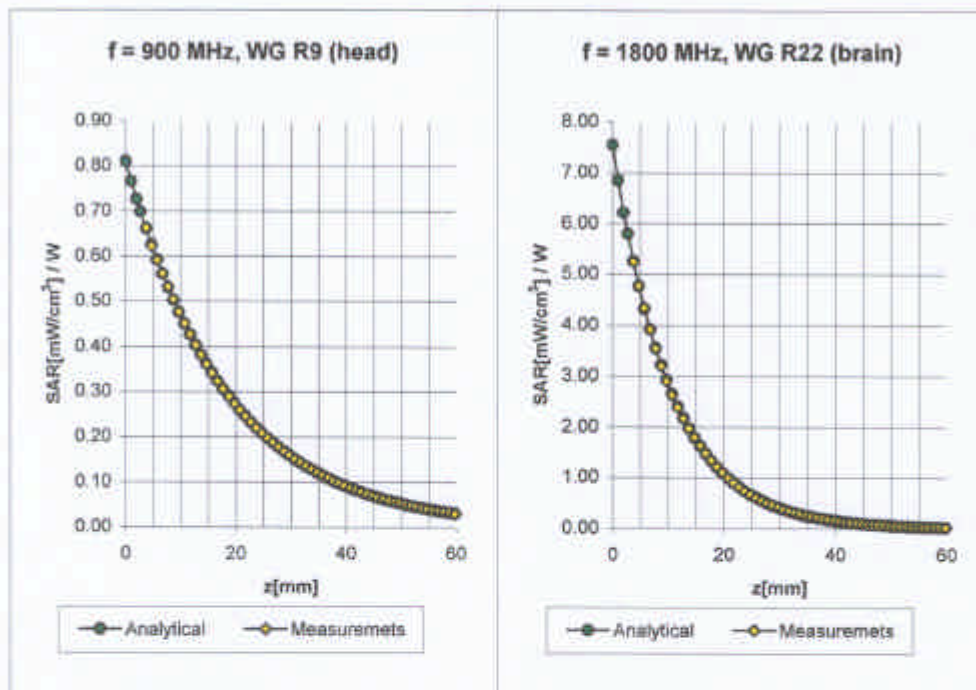
ET3DV5 SN:1333

### Dynamic Range f(SAR<sub>brain</sub>) ( TEM-Cell:ifi110 )



ET3DV5 SN:1333

## Conversion Factor Assessment



Head 900 MHz  $\epsilon_r = 42 \pm 5\%$   $\sigma = 0.97 \pm 10\%$  mho/m

ConvF X	<b>5.83</b> $\pm 7\%$ (k=2)	Boundary effect:
ConvF Y	<b>5.83</b> $\pm 7\%$ (k=2)	Alpha <b>0.38</b>
ConvF Z	<b>5.83</b> $\pm 7\%$ (k=2)	Depth <b>2.70</b>

Brain 1800 MHz  $\epsilon_r = 41 \pm 5\%$   $\sigma = 1.69 \pm 10\%$  mho/m

ConvF X	<b>4.99</b> $\pm 7\%$ (k=2)	Boundary effect:
ConvF Y	<b>4.99</b> $\pm 7\%$ (k=2)	Alpha <b>0.75</b>
ConvF Z	<b>4.99</b> $\pm 7\%$ (k=2)	Depth <b>1.99</b>