TEST REPORT
FROM
RADIO FREQUENCY
INVESTIGATION LTD.

Test of: Danger Inc.
Hiptop Mobile Telephone Handset with Colour Display

To: OET Bulletin 65 Supplement C: (2001-01)

Test Report Serial No:
RFI/SARB2/RP44198JD02A
Supersedes Test Report Serial No:
RFI/SARB1/RP44198JD01A

This Test Report Is Issued Under The Authority Of Richard Jacklin, Operations Director: 	**Checked By:** 
Tested By: 	**Release Version No:** **PDF01**
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It should be noted that the standard, OET Bulletin 65 Supplement C: (2001-01) is not listed on RFIs current UKAS schedule and is therefore "not UKAS accredited".

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1. Client Information

1.1. Client Details

Company Name:	Danger Inc
Address:	124 University Avenue Palo Alto Ca 94301 USA
Contact Name:	Mr M Wallgren

1.2. Test Laboratory

Company Name:	Radio Frequency Investigation Ltd.
Address:	Ewhurst Park Ramsdell Basingstoke Hampshire RG26 5RQ.
Contact Name:	Mr J Lomako

2. Equipment Under Test (EUT)

The following information (with the exception of the Date of Receipt) has been supplied by the client:

The client has stated that the unit under test is a production unit.

2.1. Identification Of Equipment Under Test (EUT)

Brand Name	Danger Inc.
Model Name or Number	GEM3501
Unique Type Identification	None Stated by Client
IMEI Number	001028000035010
Battery Serial Number	8471106442
FCC ID:	P5J-SKCA
Country Of Manufacture	Malaysia
Date Of Receipt	09 December 2002

Brand Name	Personal Hands Free Kit
Model Name or Number	None Stated by Client
Unique Type Identification	None Stated by Client
IMEI Number	None Stated by Client
Battery Serial Number	Not applicable
Country Of Manufacture	None Stated by Client
Date Of Receipt	09 December 2002

Brand Name	Case
Model Name or Number	None Stated by Client
Unique Type Identification	None Stated by Client
IMEI Number	None Stated by Client
Battery Serial Number	Not applicable
Country Of Manufacture	None Stated by Client
Date Of Receipt	09 December 2002

2.2. Modifications Incorporated In EUT

The client has stated that the EUT has not been modified from what is described by the Model Name and Unique Type Identification stated above.

2.3. Additional Information Related to the EUT

Equipment Category:	Portable
FCC Rule Part(s):	2.1093 as per OET Bulletin 65 Supplement C
Application Type:	Certification
Transmitter Frequency Range (MHz):	1850 – 1910
Receiver Frequency Range (MHz):	1930 – 1990
Transmit Frequency Allocation Of EUT When Under Test (Channels):	512;1850.2 MHz (Bottom Channel) 660;1879.8 MHz (Middle Channel) 810;1909.8 MHz (Top Channel)
Modulation(s):	GSM 1900
Modulation Scheme (Crest Factor)	GSM (Crest Factor 8)
Maximum RF Output Power:	1900 MHz – 30dBm
Measured Radiated Output Power (Max):	Bottom Channel (512): 30.57 dBm Middle Channel (660): 29.80 dBm Top Channel (810): 29.42 dBm
Battery Type(s):	Internal (non-removable)
Antenna Length and Type:	Internal
Number Of Antenna Positions	1 (Fixed Antenna)
Intended Operating Environment:	Domestic, Commercial
Weight:	Approx. 184 g
Dimensions (without Antenna) mm:	Approx. 115 x 65 x 30
Power Supply Requirement:	
DC Supply (Volts/Amps)	Not applicable
AC Supply (Volts/Amps)	Not applicable
Internal Battery (Volts/Amps)	4.2 V
Port(s):	Enclosure Personal Hands Free Connector

2.4. Support Equipment

Brand Name:	Will'tek
Model Name or Number:	4202S
Unique Type Identification	RFI Asset No: M1093
Serial Number:	0513018
FCC ID Number:	Not applicable
Cable Length And Type:	Not applicable (Air Link)
Connected to Port:	Antenna

3. Test Specification, Methods And Procedures

3.1. Test Specification

Reference:	OET Bulletin 65 Supplement C: (2001-01)
Title:	Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields.
Purpose of Test:	To determine whether the equipment complied with the requirements of the specification.

3.2. Methods And Procedures

The methods and procedures used were as detailed in:

EN 50361: 2001
Title: Basic standard for the measurement of specific absorption rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz).

ANSI/IEEE C95.1: 1999
IEEE standard for safety levels with respect to human exposure to radio frequency electromagnetic fields, 3 kHz to 300 GHz.

Federal Communications Commission, “Evaluating compliance with FCC Guidelines for human exposure to radio frequency electromagnetic fields”, OET Bulletin 65 Supplement C, FCC, Washington, D.C, 20554, 1997.

Thomas Schmid, Oliver Egger and Neils Kuster, “Automated E-field scanning system for dosimetric assessments”, IEEE Transaction on microwave theory and techniques, Vol. 44, pp. 105-113, January 1996.

Neils Kuster, Ralph Kastle and Thomas Schmid, “Dosimetric evaluation of mobile communications equipment with know precision”, IEICE Transactions of communications, Vol. E80-B, No.5, pp. 645-652, May 1997.

3.3. Definition Of Measurement Equipment

The measurement equipment used complied with the requirements as detailed in OET Bulletin 65 Supplement C, Appendix D.

4. Deviations From The Test Specification

Due to the EUT not having a direct connection it was not possible to measure the EUT conducted power.

The SAR at a reference point was measured before and after each test case. The SAR at the reference point did not change by more than 8.6% for any test case.

5. Operation Of The EUT During Testing

The equipment under test is a standard production model.

5.1. Operating Modes

The EUT was tested in the following operating configurations:

1) Operating Mode (including maximum device rating):

   The EUT was tested in GSM Allocated Mode. The EUT was tested at full transmit power, at the maximum duty factor (1/8). In GPRS mode the EUT can only operate one transmit (uplink) timeslot, therefore the maximum EUT duty cycle is 1/8. As a result of this the EUT was tested in normal GSM mode only.

2) Operating Frequency Range (including maximum device rating):

   The EUT was tested at the Centre, Top and Bottom channels (refer to Section 2.3, Transmitter/Receiver Frequency Range).

3) Operating Tolerances:

   Not applicable.

4) Antenna Type and Operating Position(s):

   The EUT has a fixed internal antenna.

5) Applicable Body-Worn Configuration:

   The EUT was tested in a case for body worn configuration and with a personal hands free kit. The case is the item specified in the user manual.

6) Battery Options that could affect the results:

   The EUT has an internal battery that is not removable by the user.

7) The EUT was exercised during the test with a 4202S Will'tek. The maximum radiated power from the EUT was measured as 29.8 dBm at the centre channel prior to the test. The GSM test set was then set to operate the EUT at power control level 0 (maximum power) at all times.

The EUT has no external antenna connection, therefore the maximum power was measured before the test and the SAR drift was recorded before and after each test case to check for any drift.

6. Summary Of Test Results

6.1. Summary Of Tests

Test Name	Specification Reference	Compliancy Status
Specific Absorption Rate (SAR)	OET Bulletin 65 Supplement C	Complied

6.2. Test Results For Specific Absorption Rate - 1900 MHz

6.2.1. Specific Absorption Rate - 1900 MHz Band

Environmental Conditions

Temperature Variation in Lab (°C):	20.5 to 21.5
Temperature Variation in Liquid (°C):	18.4 to 18.5

Conducted Power before Test:	Not applicable (Refer to section 4)
Conducted Power after Test:	Not applicable (Refer to section 4)

Position	Side of Head	Frequency Channel No	Distance from antenna to phantom (mm)	SAR Level (W/kg) 1g	SAR Limit (W/kg) 1g	Margin (W/kg) 1g	Result
Cheek	Left	660	26	0.077	1.6	1.523	Complied
Tilted	Left	660	17	0.054	1.6	1.546	Complied
Cheek	Right	660	26	0.059	1.6	1.541	Complied
Tilted	Right	660	17	0.063	1.6	1.537	Complied
Cheek	Left	512	26	0.108	1.6	1.492	Complied
Cheek	Left	810	26	0.081	1.6	1.519	Complied

6.3. Test Results For Specific Absorption Rate - 1900 MHz

6.3.1. Specific Absorption Rate - 1900 MHz Band – Body Worn Position

Environmental Conditions

Temperature Variation in Lab (^{o}C):	20.5 to 21.5
Temperature Variation in Liquid (°C):	18.4 to 18.5

Conducted Power before Test:	Not applicable (Refer to section 4)
Conducted Power after Test:	Not applicable (Refer to section 4)

Position	Side of Head	Frequency Channel No	Distance from antenna to phantom (mm)	SAR Level (W/kg) 1g	SAR Limit (W/kg) 1g	Margin (W/kg) 1g	Result
Hiptop in case in body worn position	Flat	660	15	1.270	1.6	0.330	Complied
Hiptop in case with personal hands free kit	Flat	660	15	0.688	1.6	0.912	Complied
Hiptop in case in body worn position	Flat	512	15	1.260	1.6	0.340	Complied
Hiptop in case in body worn position	Flat	810	15	0.749	1.6	0.851	Complied

7. SAR Measurement System

7.1. Radio Frequency Investigation SAR measurement facility utilises the Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY system is comprised of the robot controller, computer, near-field probe, probe alignment sensor, and the SAM phantom containing brain or muscle equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF). A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The Staubli robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card. The DAE3 utilises a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching mulitplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe-mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.

8. SAR Safety Limits

Exposure Limits (General populations/Uncontrolled Exposure Environment)	**SAR** (W/Kg)
Spatial Peak (averaged over any 1 g of tissue)	1.60

Notes:

1. The FCC SAR safety limits specified in the table above apply to devices operated in the General Population / Uncontrolled Exposure Environment.

2. Uncontrolled environments are defined as locations where there is exposure of individuals who have no knowledge or control of their exposure.

9. Details of SAR Evaluation

9.1. The equipment under test was found to be compliant for localised specific absorption rate (SAR) based on the following provisions and conditions:

a) The handset was placed in a normal operating position with the centre of the ear-piece aligned with the ear canal on the phantom.

b) With the ear-piece touching the phantom the centre line of the handset was aligned with an imaginary plane (X and Y axis) consisting of three lines connecting both ears and the mouth.

c) For the cheek position the handset was gradually moved towards the cheek until any point of the mouth-piece or keypad touched the cheek.

d) For the tilted position the EUT was positioned as for the cheek position, then the horizontal angle was increased by fifteen degrees (the phone keypad was moved away from the cheek by fifteen degrees).

e) The EUT was tested in a body-worn configuration with the handset placed in the belt holster which was placed on the device holder with the back of the phone facing parallel to, and the belt-clip touching, the outer surface of the phantom flat section. The belt holster provided a spacing between the back of the phone and the outer surface of the phantom flat section.

f) SAR measurements were evaluated at maximum power and the unit was operated for an appropriate period prior to the evaluation in order to minimise the drift.

g) The device was keyed to operate continuously in the transmit mode for the duration of the test.

h) The location of the maximum spatial SAR distribution (Hot Spot) was determined relative to the handset and its antenna.

i) The EUT was tested with a fully charged battery.

10. Evaluation Procedures

10.1. The Specific Absorption Rate (SAR) evaluation was performed in the following manner:

a) (i) The evaluation was performed in an applicable area of the phantom depending on the type of device being tested. For devices worn about the ear during normal operation, both the left and right ear positions were evaluated at the centre frequency of the band at maximum power. The side, which produced the greatest SAR, determined which side of the phantom would be used for the entire evaluation. The positioning of the head worn device relative to the phantom was dictated by FCC OET bulletin 65 Supplement C.

(ii) For body worn devices or devices which can be operated within 20 cm of the body, the flat section of the phantom was used. The type of device being evaluated dictated the distance of the EUT to the outer surface of the phantom flat section.

b) The SAR was determined by a pre-defined procedure within the DASY3 software. The exposed region of the phantom was scanned near the inner surface with a grid spacing of 20mm x 20mm.

c) A 7x7x7 matrix was performed around the greatest spatial SAR distribution found during the area scan of the applicable exposed region. SAR values were then calculated using a 3-D spline interpolation algorithm and averaged over spatial volumes of 1 and 10 grams.

d) If the EUT had any appreciable drift over the course of the evaluation, then the EUT was re-evaluated. Any unusual anomalies over the course of the test also warranted a re-evaluation.

11. System Validation

11.1. Prior to the assessment, the system was verified in the flat region of the phantom. A 1900 MHz dipole was used. A forward power of 250 mW was applied to the dipole and system was verified to a tolerance of ±5 for the 1900 MHz dipole. The applicable verification (normalised to 1 Watt) is as follows:

Dipole Validation Kit	Target SAR 1g (w/kg)	Measured SAR 1g (w/kg)
D1900V2	42.4	44.0

12. Simulated Tissues

12.1. The brain and muscle mixtures consist of water and glycol. Visual inspection is made to ensure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the tissue.

Ingredient	Frequency	
	1900 MHz Brain	1900 MHz Muscle
Water	10.96 Litres	14.01 Litres
D.G.B.E. (Glycol)	8.97 Litres	6.0 Litres
Salt	0.064 grams	42 grams

13. Tissue Parameters

13.1. The dielectric parameters of the fluids were verified prior to the SAR evaluation using an 58070C Dielectric Probe Kit and an 8753E Network Analyser. The dielectric parameters of the fluid are as follows:

Frequency (MHz)	Equivalent Tissue	Dielectric Constant εr	Conductivity ó (mho/m)
1850-1910	Brain	39.53 ± 5%	1.45 ± 5%
1850-1910	Muscle	50.67 ± 5%	1.54 ± 5%

14. DASY3 Systems Specifications

Robot System

Positioner:	Stäubli Unimation Corp. Robot Model: RX90L
Repeatability:	0.025 mm
No. of axis:	6
Serial Number:	F00/SD89A1/A/01
Reach:	1185 mm
Payload:	3.5 kg
Control Unit:	CS7
Programming Language:	V+

Data Acquisition Electronic (DAE) System

Cell Controller

PC:	Dell Optiplex GX110
Operating System:	Windows NT
Data Card:	DASY3 PC-Board
Serial Number:	220

Data Converter

Features:	Signal Amplifier, multiplexer, A/D converter and control logic.
Software:	DASY3 Software
Connecting Lines:	Optical downlink for data and status info. Optical uplink for commands and clock.

PC Interface Card

Function:	24 bit (64 MHz) DSP for real time processing Link to DAE3 16 nit A/D converter for surface detection system serial link to robot direct emergency stop output for robot.

E-Field Probe

Model:	ET3DV6
Serial No:	1529
Construction:	Triangular core fibre optic detection system
Frequency:	10 MHz to 3 GHz
Linearity:	±0.2 dB (30 MHz to 3 GHz)
Probe Length (mm):	337
Probe Diameter (mm):	12
Tip Length (mm):	10
Tip Diameter (mm):	6.8
Sensor X Offset (mm):	2.7
Sensor Y Offset (mm):	2.7
Sensor Z Offset (mm):	2.7

Phantom

Phantom:	SAM Phantom
Shell Material:	Fibreglass
Thickness:	2.0 ±0.1 mm

15. Validation results – 1900 MHz

15.1. System Validation

15.1.1. Validation of the system test configuration was carried out prior to testing.

Validation Dipole Type and Serial No.	Calibrated Value of SAR in 1/10g volume (W/kg) at 1900 MHz	Measured Value of SAR in 1g volume (W/kg) at 1900 MHz	Percentage Difference (≤5%)
D1900V2 / 540	42.4	44.0	Yes

15.2. Liquid Properties - Brain

15.2.1. Properties of the tissue simulating liquid were measured prior to testing.

Property	Target Value (1900 MHz)	Measured/Calculated Value (1900 MHz)	Percentage Difference (≤5%)
Relative Permittivity	40.0	39.53	Yes
Conductivity	1.40	1.45	Yes

15.3. Liquid Properties - Body

15.3.1. Properties of the tissue simulating liquid were measured prior to testing.

Property	Target Value (1900 MHz)	Measured/Calculated Value (1900 MHz)	Percentage Difference (≤5%)
Relative Permittivity	53.3	50.67	Yes
Conductivity	1.52	1.54	Yes

15.4. Temperature Variation

15.4.1. The temperature of the laboratory and within the tissue simulating liquid for this test shall not exceed the range +15ºC to +25ºC.

15.4.2. The actual temperature measured at the beginning and end of each test was recorded and the maximum range is shown below:

Measurement	Maximum Temperature	Minimum Temperature
Laboratory	21.5	20.5
Tissue Simulating Liquid	18.5	18.4

16. Measurement Uncertainty

16.1. No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently, the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

16.2. The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

16.3. The uncertainty of the result may need to be taken into account when interpreting the measurement results.

16.4. The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor, such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

Measurement Type	Range	Confidence Level	Calculated Uncertainty
Specific Absorption Rate	1900MHz	95%	± 18.02%

16.5. The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty, the published guidance of the appropriate accreditation body is followed.

16.6. Measurement uncertainties in SAR measurements are difficult to quantify due to several variables including biological, physiological, and environment. However, the estimated measurement uncertainties in SAR are less than 30%.

16.7. According to ANSI/IEEE C95.3, the overall uncertainties are difficult to assess and will vary with the type of meter and usage situation. However, accuracy’s of ±1 to 3 dB can be expected in practice, with greater uncertainties in near-field situations and at higher frequencies (shorter wavelengths), or areas where large reflecting objects are present. Under optimum measurement conditions, SAR measurement uncertainties of at least ±2 dB can be expected.

16.8. According to CENELEC, typical worst-case uncertainty of field measurements is ±5 dB. For well-defined modulation characteristics the uncertainty can be reduced to ±3 dB.

Test Of: **Danger Inc.**
Hiptop Mobile Telephone Handset with Colour Display
To: **OET Bulletin 65 Supplement C: (2001-01)**

Specific Absorption Rate Uncertainty at 1900 MHz, GSM Modulation Scheme calculated in accordance with IEEE 1528-200X

Type of Uncertainty	Source of uncertainty	Value ±%	Probability distribution	Divisor	C_i	$u_i(\ )$ ±	ν_i or ν_{eff}
B	Probe Calibration	9.5000	Normal	2.0000	1.0000	4.7500	∞
B	Axial Isotropy	2.3000	Rectangular	1.7321	0.7000	0.9295	∞
B	Hemisphrical Isotropy	4.7000	Rectangular	1.7321	0.7000	1.8995	∞
B	Spatial Resolution	0.5000	Rectangular	1.7321	1.0000	0.2887	∞
B	Boundary Effect	0.7390	Rectangular	1.7321	1.0000	0.4267	∞
B	Linearity	2.3300	Rectangular	1.7321	1.0000	1.3452	∞
B	Detecton Limits	0.2000	Rectangular	1.7321	1.0000	0.1155	∞
B	Readout Electronics	0.6500	Normal	2.0000	1.0000	0.3250	∞
B	Response time	0.0000	Rectangular	1.7321	1.0000	0.0000	∞
B	Integration Time	0.0040	Rectangular	1.7321	1.0000	0.0023	∞
B	RF Ambient Conditions	3.0000	Rectangular	1.7321	1.0000	1.7321	∞
B	Probe Positioner Mech. Restrictions	6.6700	Rectangular	1.7321	1.0000	3.8509	∞
B	Probe Positioning with regard to Phantom Shell	2.8500	Rectangular	1.7321	1.0000	1.6454	∞
B	Extrapolation and Integration/Max SAR Evaluation	5.0800	Rectangular	1.7321	1.0000	2.9329	∞
A	Test Sample Positioning	0.5840	Normal	1.0000	1.0000	0.5840	10
A	Device Holder Uncertainty	0.1540	Rectangular	1.7321	1.0000	0.0889	10
B	Drift of output power	5.0000	Rectangular	1.7321	1.0000	2.8868	∞
B	Phantom Uncertainty	4.0000	Rectangular	1.7321	1.0000	2.3094	∞
B	Liquid conductivity (target value)	5.0000	Rectangular	1.7321	0.7000	2.0207	∞
B	Liquid conductivity (measured value)	2.4400	Rectangular	1.7321	0.7000	0.9861	∞
B	Liquid Permittivity (target value)	5.0000	Rectangular	1.7321	0.6000	1.7321	∞
B	Liquid Permittivity (measured value)	2.4400	Rectangular	1.7321	0.6000	0.8452	∞
	Combined standard uncertainty		normal			9.01	>500
	Expanded uncertainty		normal k=2			18.02	>500

Statement of Confidence:-

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k = 2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Appendix 1. Test Equipment Used

Instrument	Manufacturer	Serial No.	RFI No.
Probe	Schmid & Partners	ET3 DV6	A1186
Data Acquisition Electronics	Schmid & Partners	DAE	A1184
RF Power Meter	Rohde & Schwarz	URY	M037
Diode Power Sensor	Rohde & Schwarz	NRV-Z2	M1069
Signal Generator	Gigatronics	7100/.01-20	G046
Low noise Amplifier	Mini Circuits	ZHL-42	A1225
SAM Phantom	Schmid & Partners	001	A1238
1900MHz Validation Dipole	Schmid & Partners	D1900V2	A1237
Robot Power Supply	Schmid & Partner	Dasy3	G0528
Thermometer	Testo	110	M509
RF Insertion Unit	Rohde & Schwarz	URY-Z2	M033
PSU	Thurlby Thandar	CPX200	G088
Narda 20W Termination	Narda	374BNM	A034
Baro/Hygro/Thermo meter	Oregon Scientific	BA888	M292
20 dB Attenuator	Narda	766-20	A215
Will tek	Will tek	4202S	M1093
Cable	Rosenberger	UFA210A-1-1181-70x70	C344
Rosenberger Cable	Rosenberger	FA210A-1-020m	C1024
Cable	Utiflex	FA210A0030M3030	C1052
Cable	Utiflex	FA210A0003M3030	C1053
Cable	Utiflex	FA210A0001M3050A	C1054
blank	RFI	N/A	S256
Handset Positioner	Schmid & Partners	V3.0	A1182
Robot Arm	Staubli	RX908 L	M1047
Network Analyser	Agilent Technologies	8753ES	M1015
Dielectric Probe Kit	Agilent Technologies	85070C	A1174
Data Acquisition Electronics	Schmid & Partners	DAE	A1184
Data Acquisition Electronics	Schmid & Partners	DAE	A1184

Appendix 2. Measurement Methods

Test Dates: 12 December 2002

FCC Part 24.232: Effective Isotropic Radiated Power (EIRP)

EIRP measurements were performed in accordance with the standard, against appropriate limits.

The EIRP was measured with the EUT arranged on a non-conducting table on an open area test site using an antenna height of 1.5 m and a measurement distance of 3 m

The level of the EIRP was maximised by rotating the non-conducting table.

Once the final amplitude (maximised) had been ascertained, the EIRP was measured using a substitution method whereby the EUT was replaced by a broadband horn antenna and a signal generator. The level of the signal generator is increased or decreased until the amplitude indicated on the measurement receiver matches that from the EUT. Once this has been achieved the final EIRP is calculated as being the signal generator output level minus the interconnecting cable loss plus the substitution antenna gain.

This procedure is repeated for all three channels of the EUT.

The test equipment settings for EIRP measurements were as follows:

Receiver Function	**Final Measurements**
Detector Type:	Peak
Mode:	Not applicable
Bandwidth:	1 MHz
Amplitude Range:	20 dB
Measurement Time:	> 1 s
Observation Time:	> 15 s
Sweep Time:	Coupled

Carrier Output Power: Call Mode: (EIRP): Section 24.232

Tests were performed to identify the maximum transmit power in accordance with FCC Part 24.232 for EIRP.

Results are shown for the EUT set to Bottom, Middle and Top channels using a fully charged battery. The battery nominally charged voltage is declared at 4.2 Volts:

Results

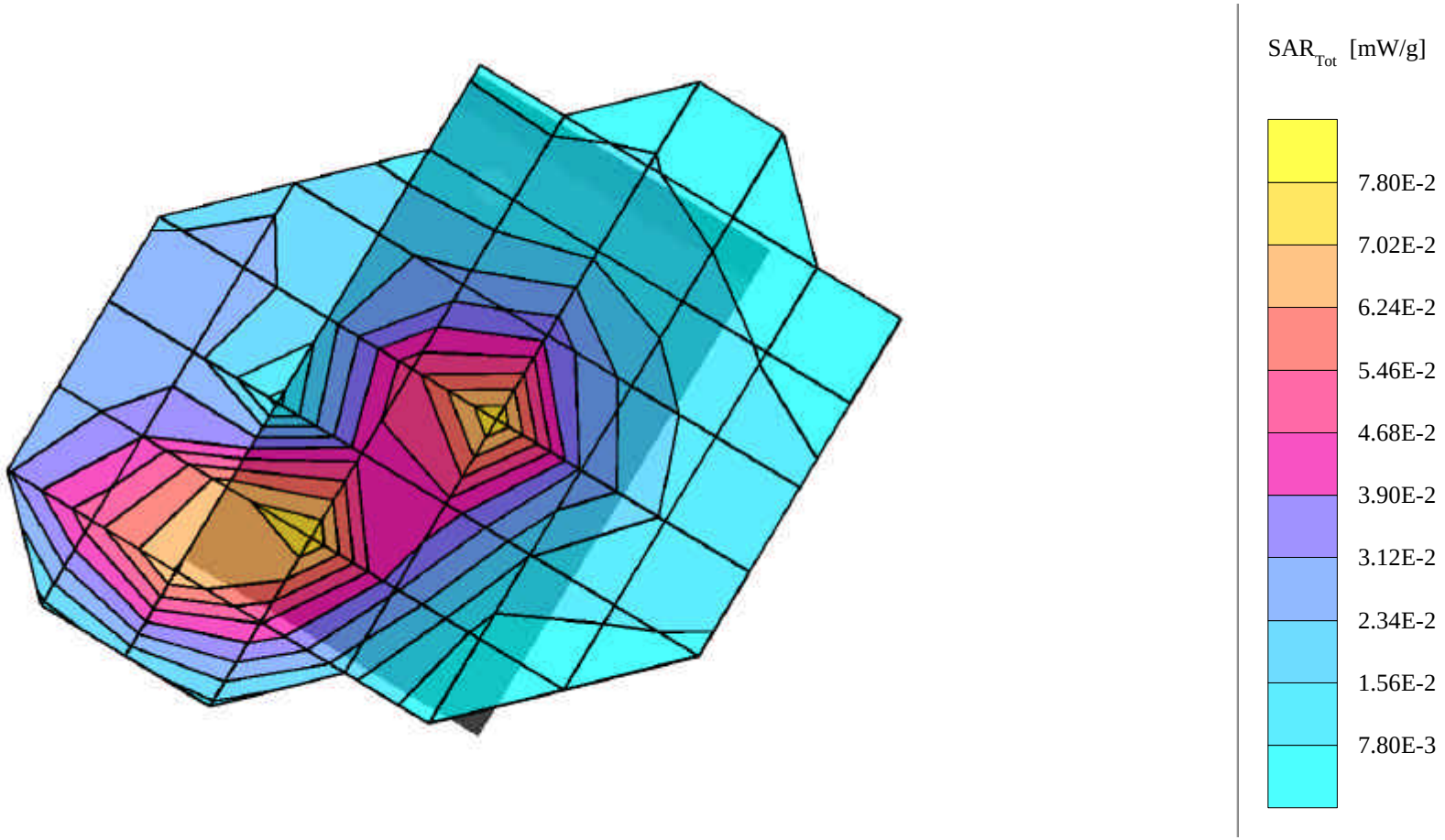
Channel	Antenna Polarity (H/V)	Maximum Transmitter EIRP (dBm)
Bottom (512)	Horiz	30.57
Middle (660)	Horiz	29.80
Top (810)	Horiz	29.42

Appendix 3. SAR Distribution Scans

This appendix contains SAR Distribution Scans.

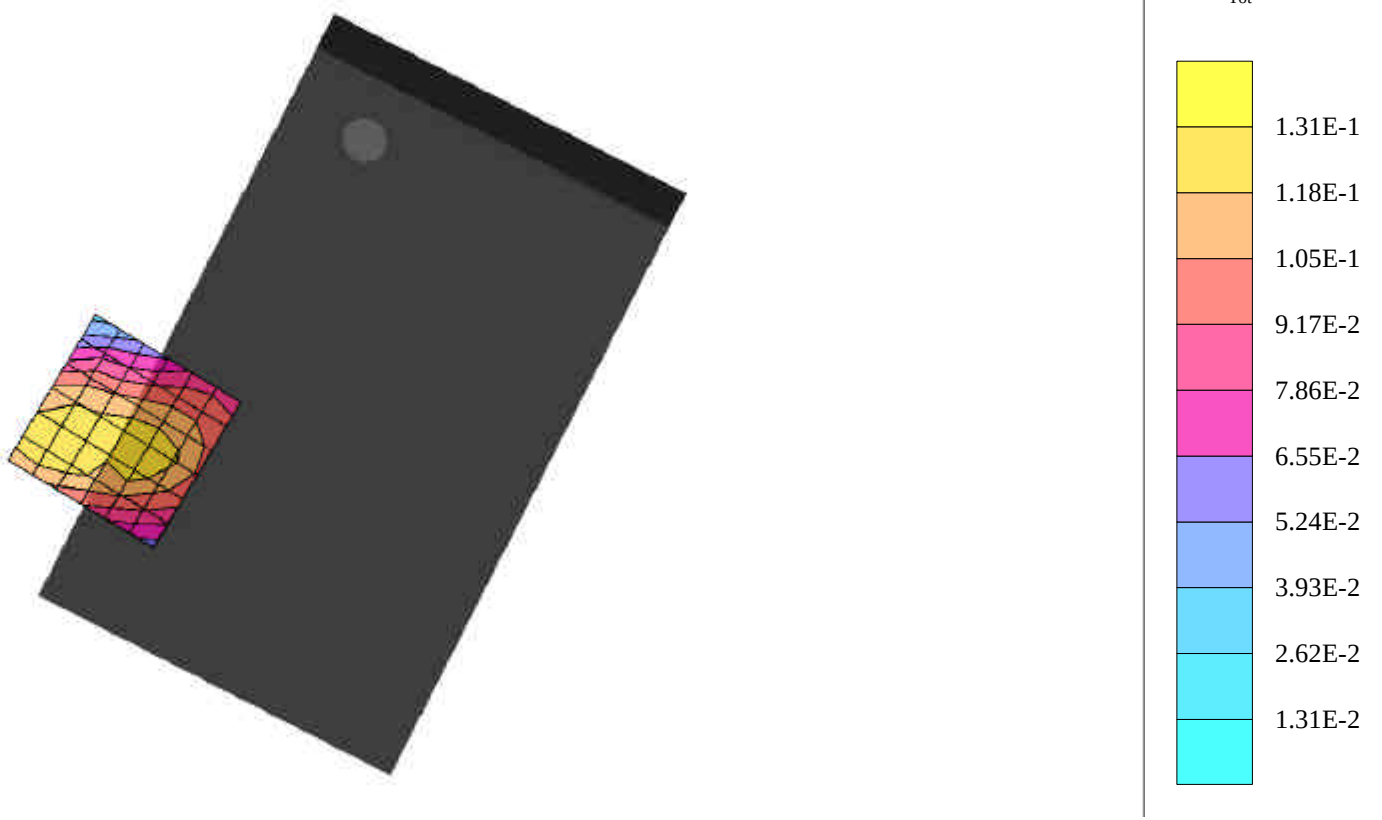
Danger Hiptop with Colour Display

Cheek Left Centre Channel (660)
SAM Phantom; Left Hand
Probe: ET3DV6 - SN1529; ConvF(5.20,5.20,5.20)
Crest factor: 8.0; Brain 1900MHz: σ = 1.49 mho/m ε_r = 37.5 ρ = 1.00 g/cm^3
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 5.0%
12/10/02



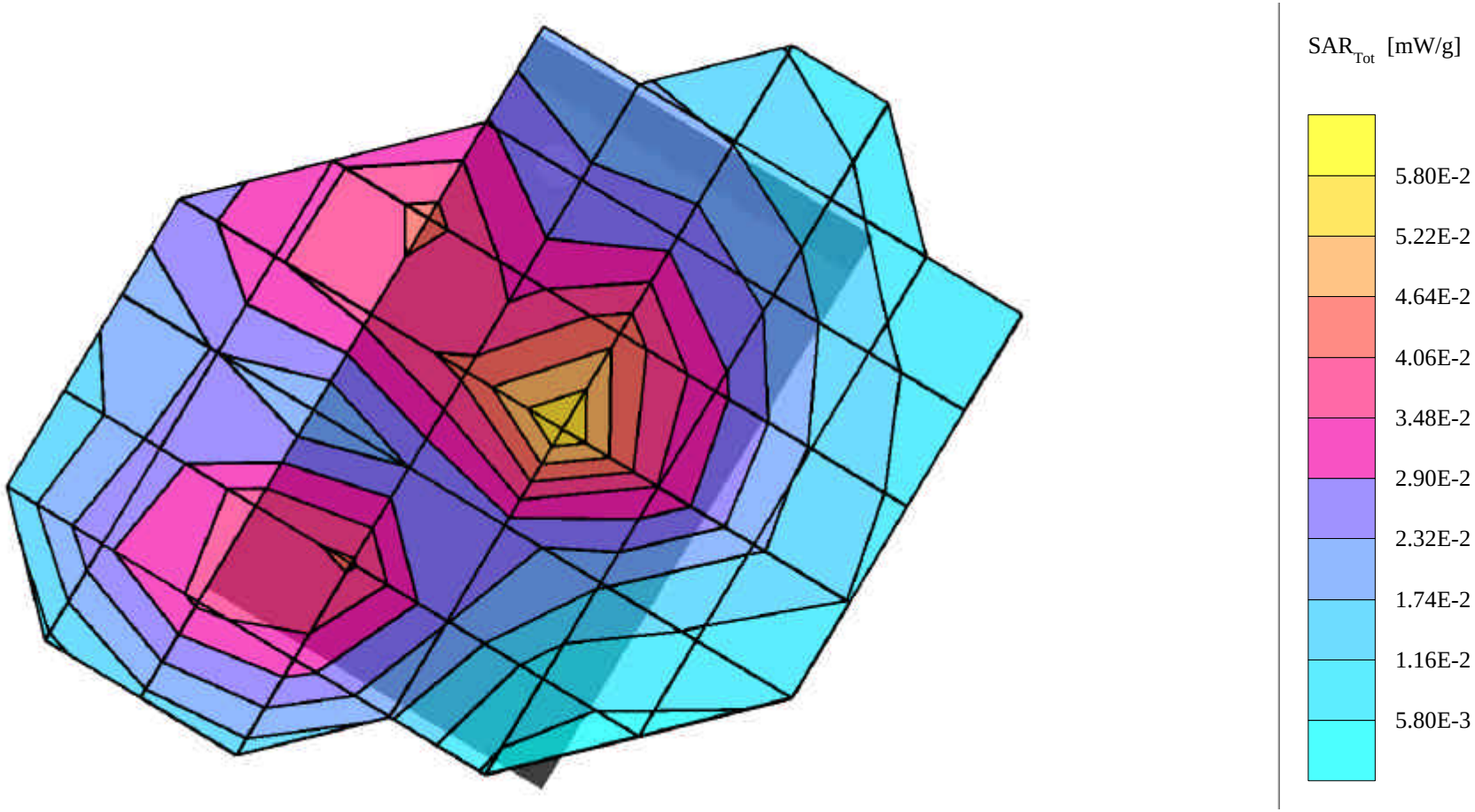
Danger Hiptop with Colour Display

Cheek Left Centre Channel (660)
SAM Phantom; Left Hand
Probe: ET3DV6 - SN1529; ConvF(5.20,5.20,5.20)
Crest factor: 8.0; Brain 1900MHz: σ = 1.49 mho/m ε_r = 37.5 ρ = 1.00 g/cm^3
Peak: 0.133 mW/g, SAR (1g): 0.0774 mW/g
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 5.0%
12/10/02



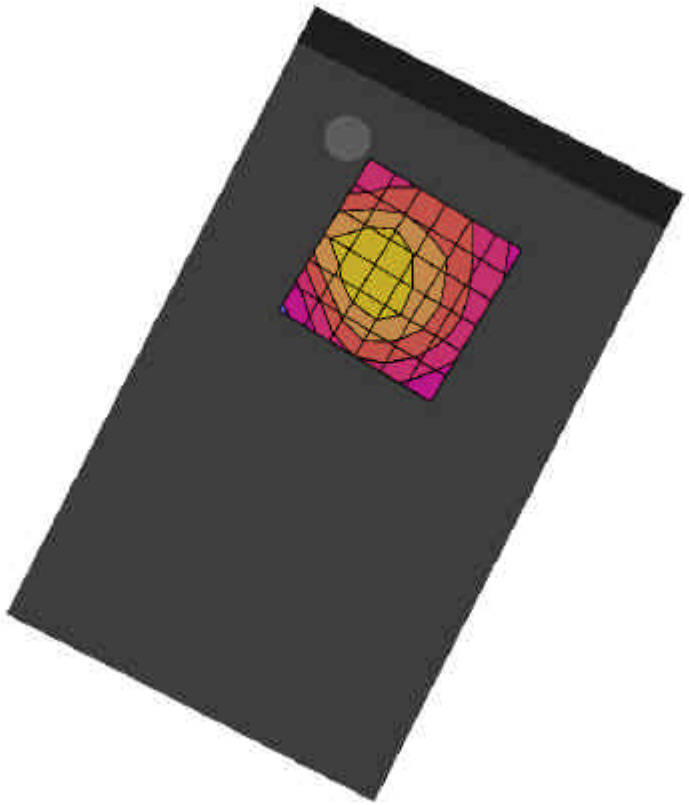
Danger Hiptop with Colour Display

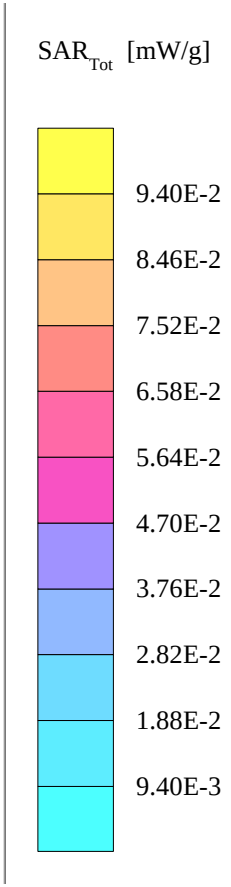
Tilted Left Centre Channel (660)
SAM Phantom; Left Hand
Probe: ET3DV6 - SN1529; ConvF(5.20,5.20,5.20)
Crest factor: 8.0; Brain 1900MHz: σ = 1.49 mho/m ε_r = 37.5 ρ = 1.00 g/cm^3
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 2.7%
12/10/02



Danger Hiptop with Colour Display

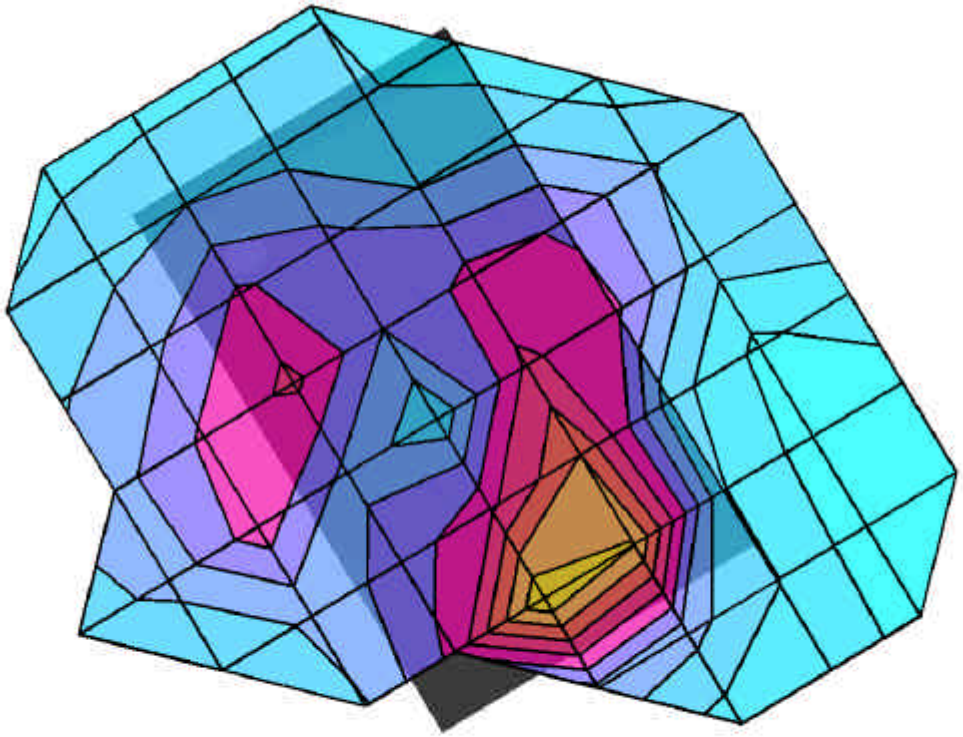
Tilted Left Centre Channel (660)
SAM Phantom; Left Hand
Probe: ET3DV6 - SN1529; ConvF(5.20,5.20,5.20)
Crest factor: 8.0; Brain 1900MHz: σ = 1.49 mho/m ε_r = 37.5 ρ = 1.00 g/cm^3
Peak: 0.0940 mW/g, SAR (1g): 0.0536 mW/g
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 2.7%
12/10/02

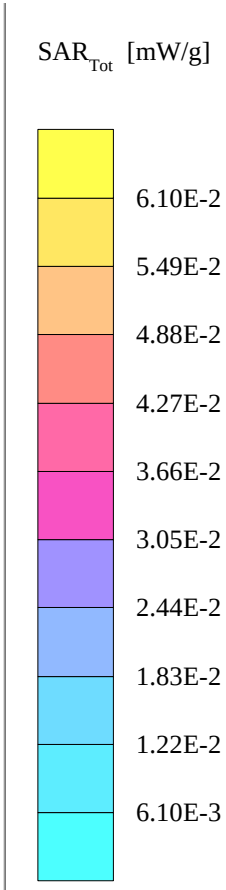




Danger Hiptop with Colour Display

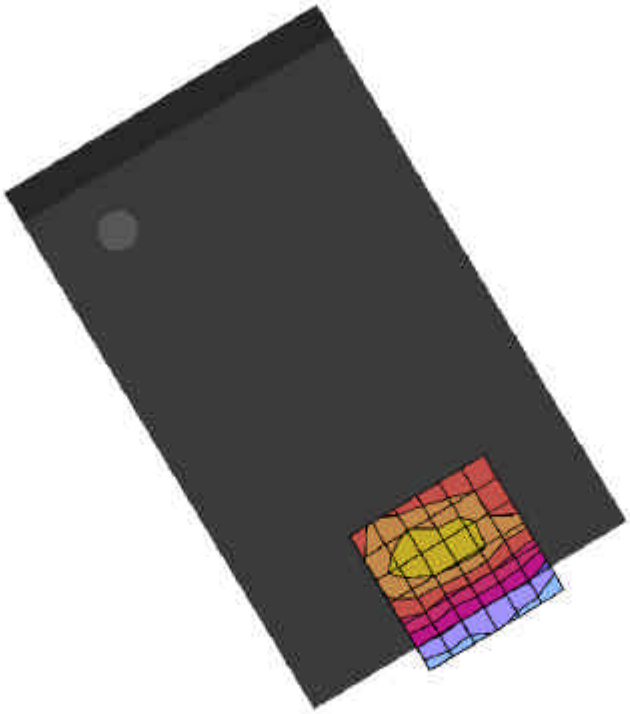
Cheek Right Centre Channel (660)
SAM Phantom; Righ Hand
Probe: ET3DV6 - SN1529; ConvF(5.20,5.20,5.20)
Crest factor: 8.0; Brain 1900MHz: σ = 1.49 mho/m ε_r = 37.5 ρ = 1.00 g/cm^3
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 8.4%
12/10/02

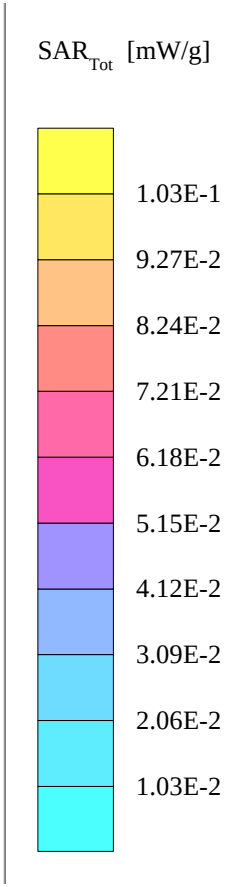




Danger Hiptop with Colour Display

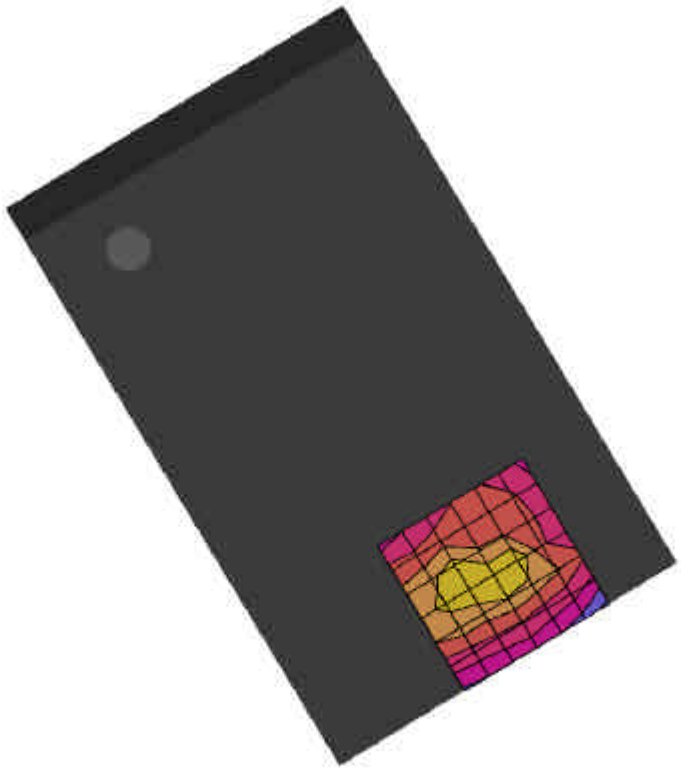
Cheek Right Centre Channel (660)
SAM Phantom; Righ Hand
Probe: ET3DV6 - SN1529; ConvF(5.20,5.20,5.20)
Crest factor: 8.0; Brain 1900MHz: σ = 1.49 mho/m ε_r = 37.5 ρ = 1.00 g/cm^3
Peak: 0.102 mW/g, SAR (1g): 0.0584 mW/g
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 8.4%
12/10/02

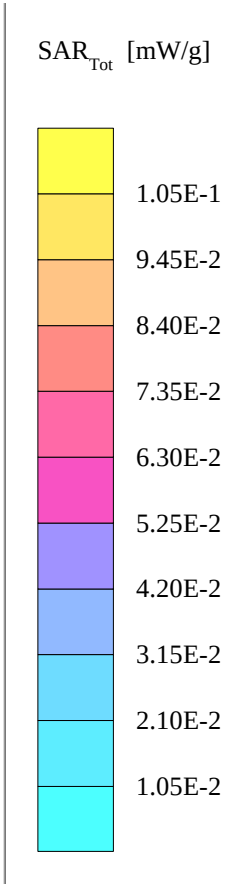




Danger Hiptop with Colour Display

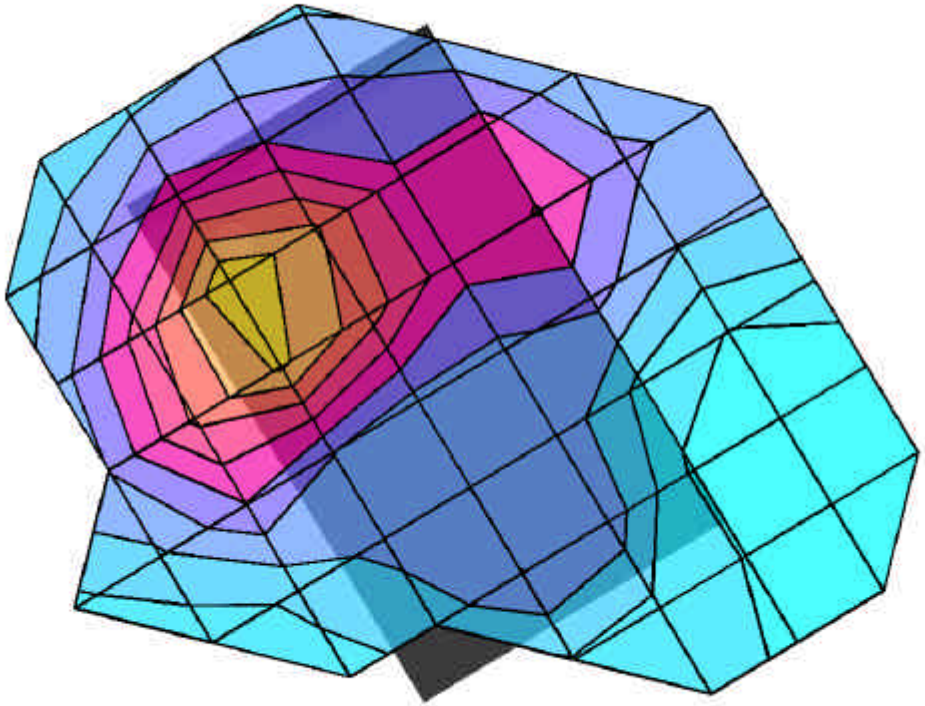
Cheek Right Centre Channel (660)
SAM Phantom; SAR Right Ref
Probe: ET3DV6 - SN1529; ConvF(5.20,5.20,5.20)
Crest factor: 8.0; Brain 1900MHz: σ = 1.49 mho/m ε_r = 37.5 ρ = 1.00 g/cm^3
Peak: 0.107 mW/g, SAR (1g): 0.0586 mW/g
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 8.4%
12/10/02

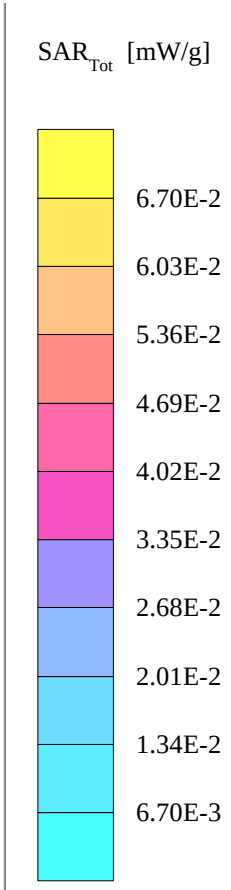




Danger Hiptop with Colour Display

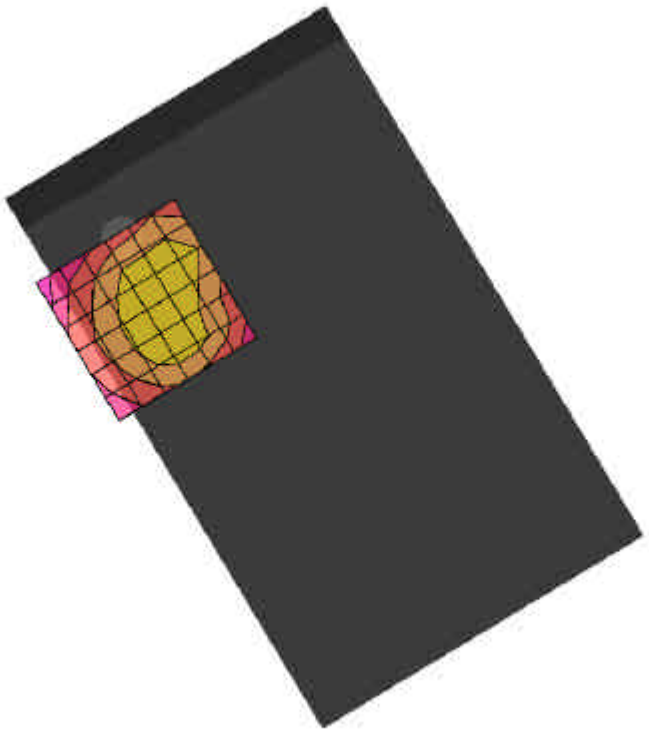
Tilted Right Centre Channel (660)
SAM Phantom; Righ Hand
Probe: ET3DV6 - SN1529; ConvF(5.20,5.20,5.20)
Crest factor: 8.0; Brain 1900MHz: σ = 1.49 mho/m ε_r = 37.5 ρ = 1.00 g/cm^3
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 3.6%
12/11/02

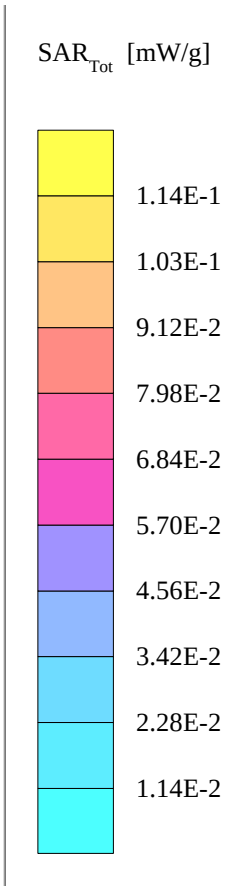




Danger Hiptop with Colour Display

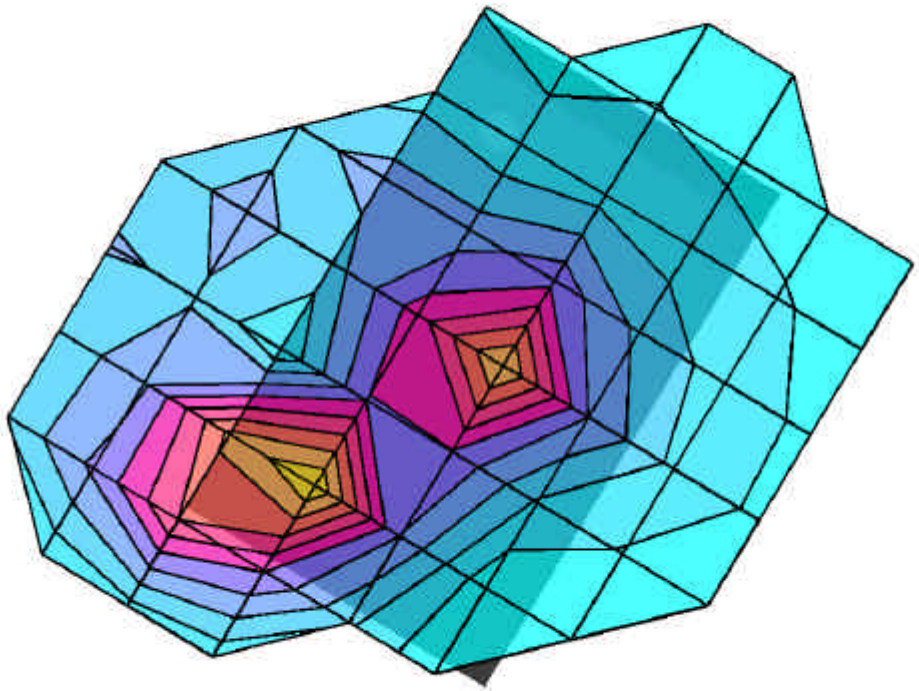
Tilted Right Centre Channel (660)
SAM Phantom; Righ Hand
Probe: ET3DV6 - SN1529; ConvF(5.20,5.20,5.20)
Crest factor: 8.0; Brain 1900MHz: σ = 1.49 mho/m ε_r = 37.5 ρ = 1.00 g/cm^3
Peak: 0.115 mW/g, SAR (1g): 0.0631 mW/g
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 3.6%
12/11/02

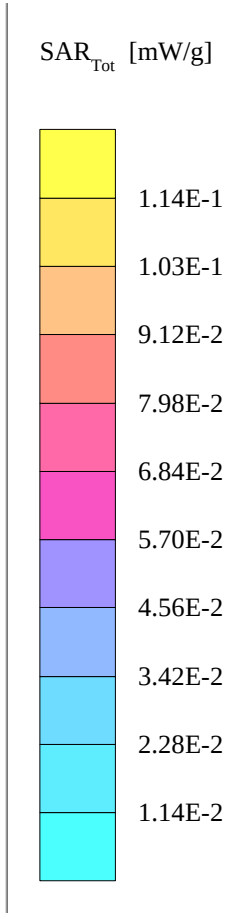




Danger Hiptop with Colour Display

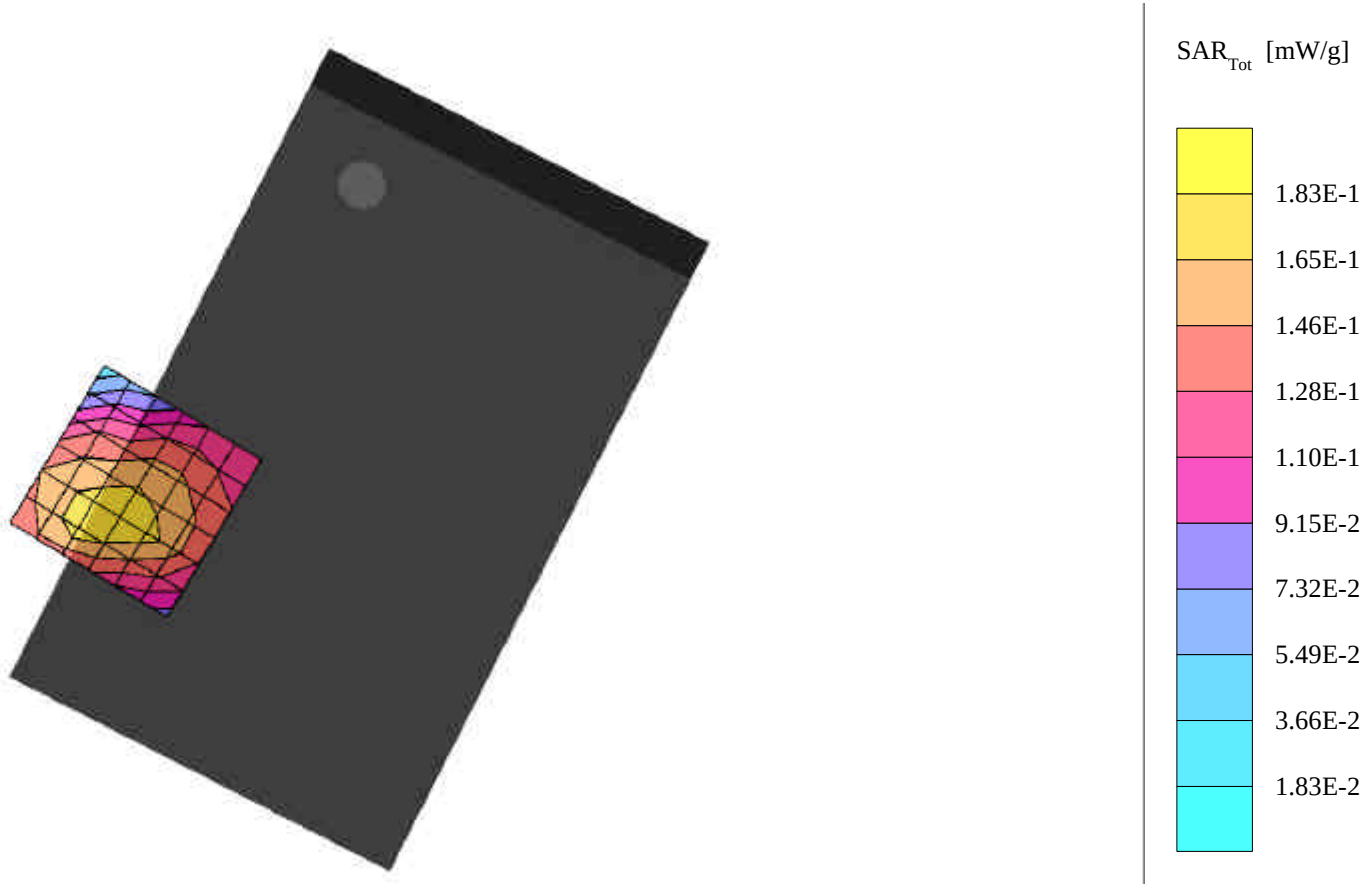
Cheek Left Bottom Channel (512)
SAM Phantom; Left Hand
Probe: ET3DV6 - SN1529; ConvF(5.20,5.20,5.20)
Crest factor: 8.0; Brain 1900MHz: σ = 1.49 mho/m ε_r = 37.5 ρ = 1.00 g/cm^3
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 8.6%
12/11/02





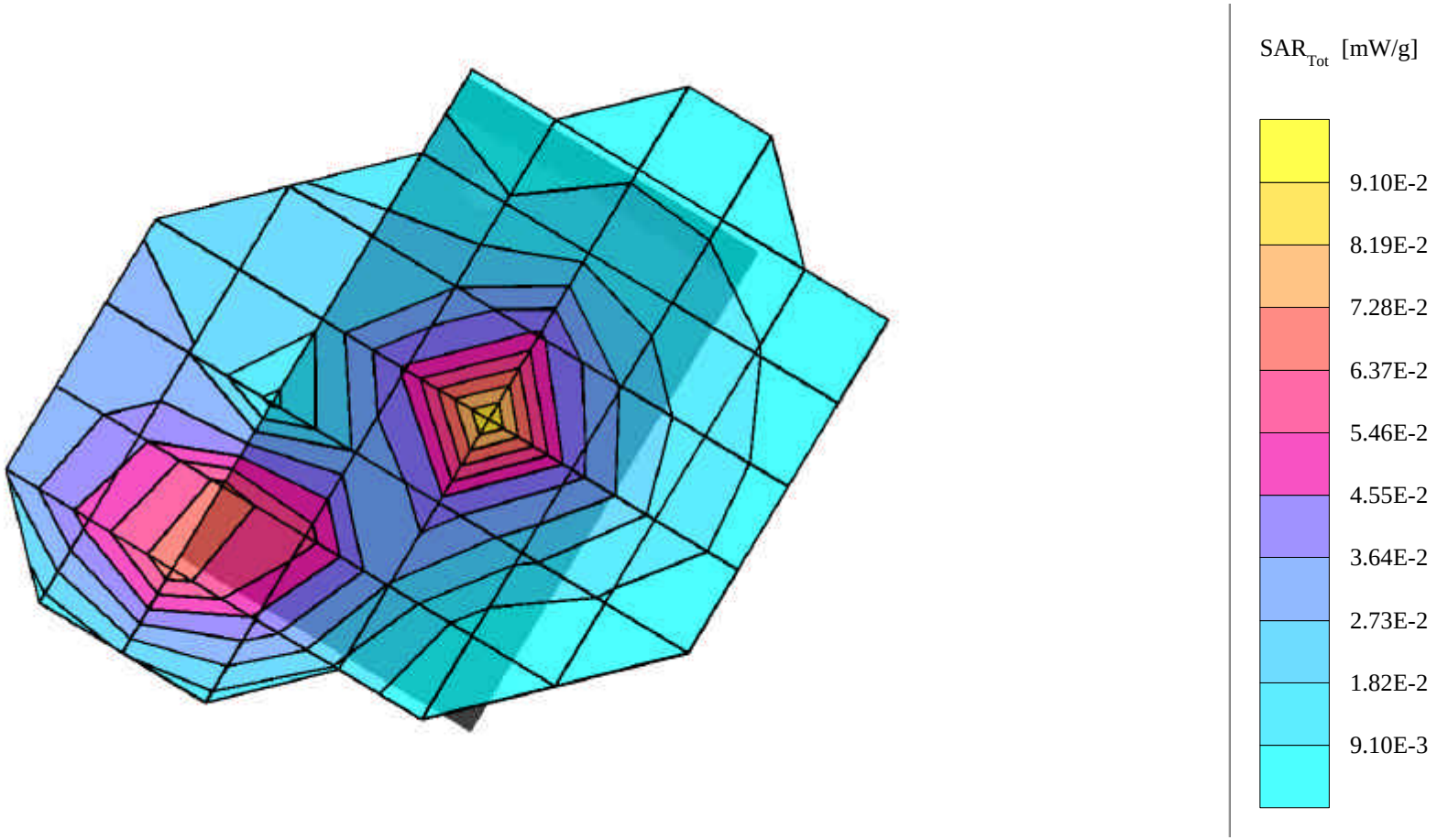
Danger Hiptop with Colour Display

Cheek Left Bottom Channel (512)
SAM Phantom; Left Hand
Probe: ET3DV6 - SN1529; ConvF(5.20,5.20,5.20)
Crest factor: 8.0; Brain 1900MHz: σ = 1.49 mho/m ε_r = 37.5 ρ = 1.00 g/cm^3
Peak: 0.183 mW/g, SAR (1g): 0.108 mW/g
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 8.6%
12/11/02



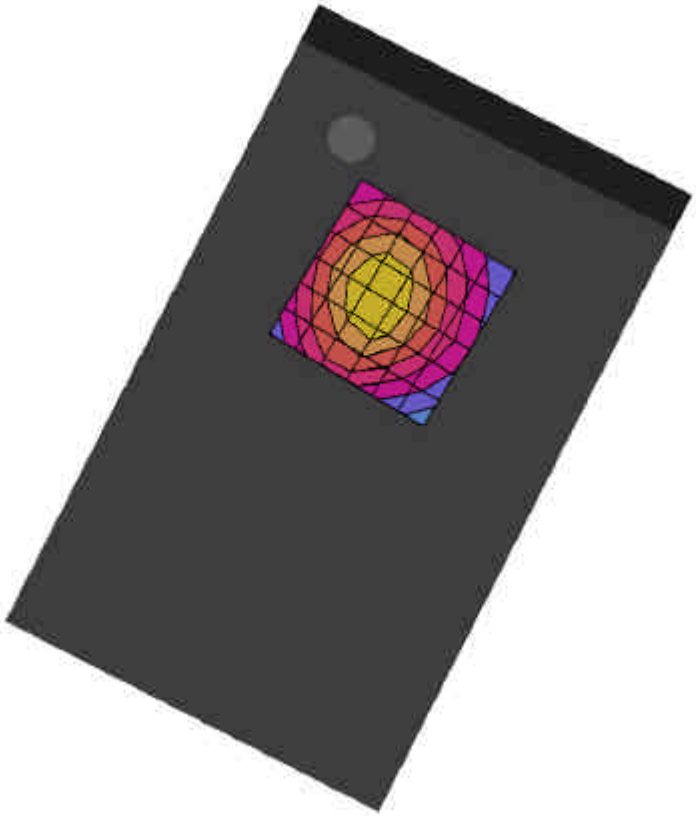
Danger Hiptop with Colour Display

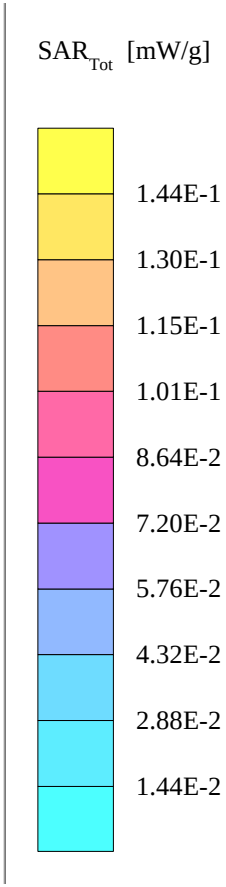
Cheek Left Top Channel (810)
SAM Phantom; Left Hand
Probe: ET3DV6 - SN1529; ConvF(5.20,5.20,5.20)
Crest factor: 8.0; Brain 1900MHz: σ = 1.49 mho/m ε_r = 37.5 ρ = 1.00 g/cm^3
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 2.0%
12/11/02



Danger Hiptop with Colour Display

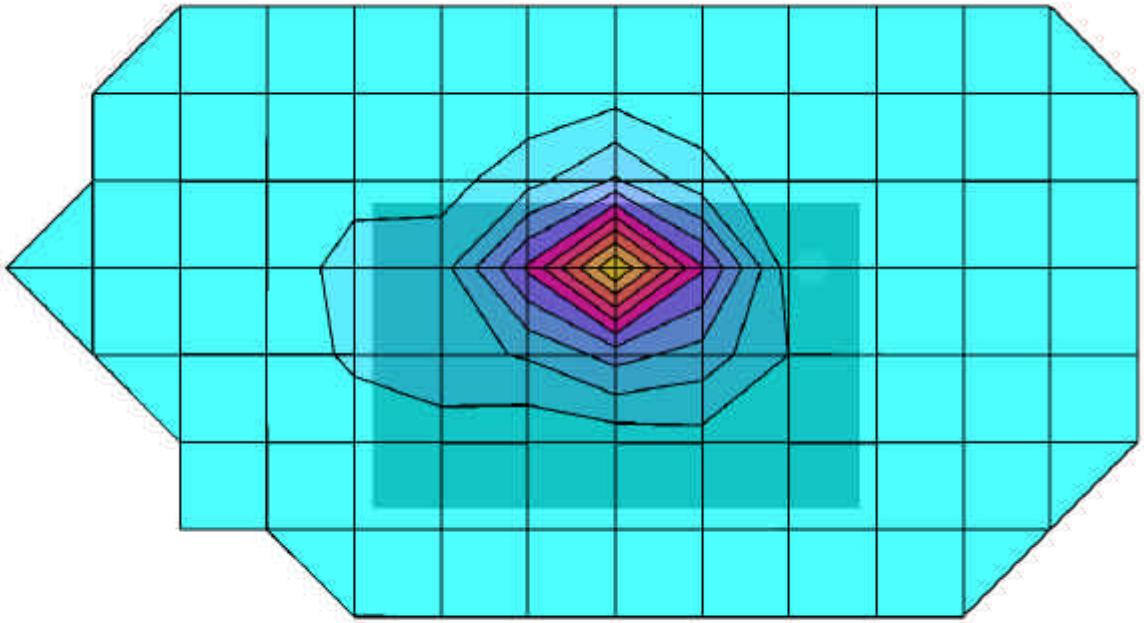
Cheek Left Top Channel (810)
SAM Phantom; Left Hand
Probe: ET3DV6 - SN1529; ConvF(5.20,5.20,5.20)
Crest factor: 8.0; Brain 1900MHz: σ = 1.49 mho/m ε_r = 37.5 ρ = 1.00 g/cm^3
Peak: 0.144 mW/g, SAR (1g): 0.0811 mW/g
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 2.0%
12/11/02

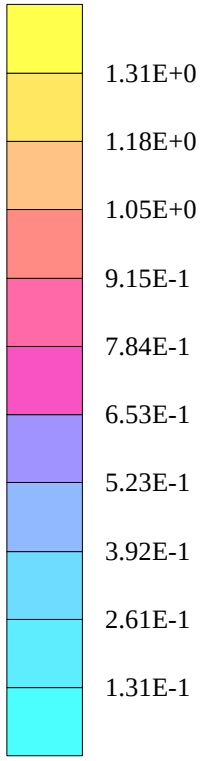




Danger Hiptop with Colour Display

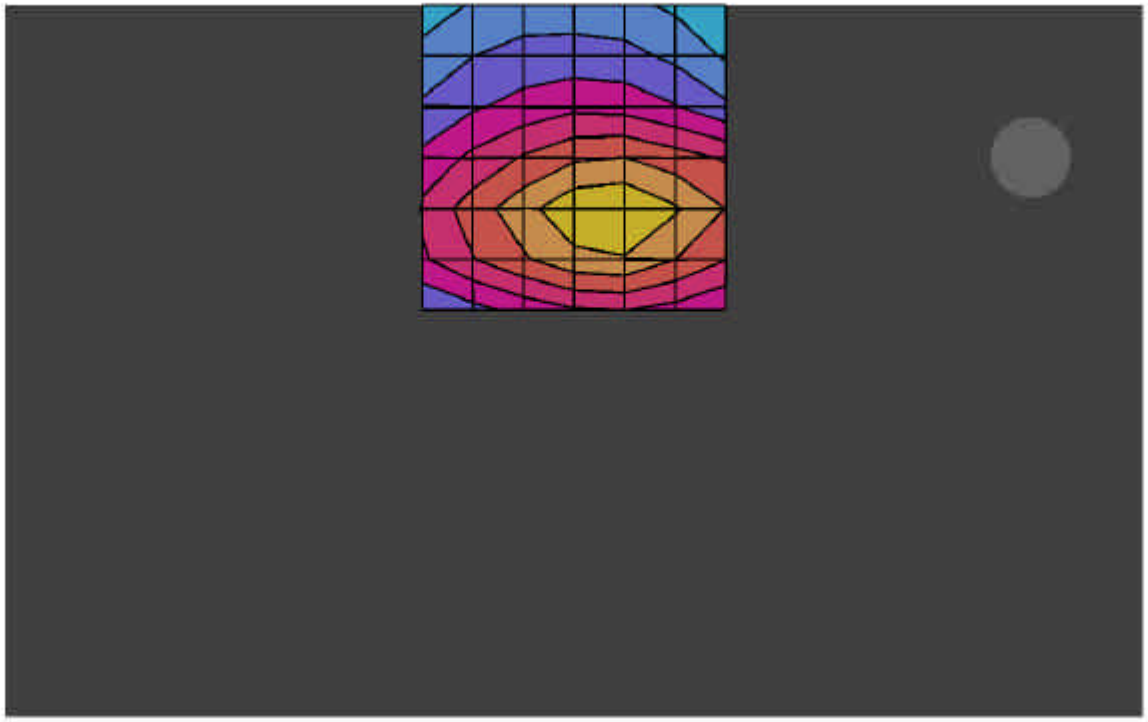
Hiptop in Case in Body Worn Position Flat Centre Channel (660)
SAM Phantom; Flat
Probe: ET3DV6 - SN1529; ConvF(4.70,4.70,4.70)
Crest factor: 8.0; Body 1900MHz FCC: σ = 1.63 mho/m ε_r = 50.9 ρ = 1.00 g/cm^3
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 0.9%
12/11/02





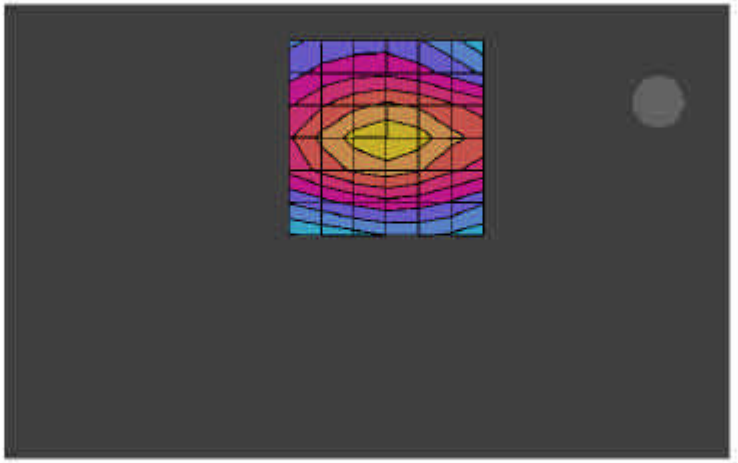
Danger Hiptop with Colour Display

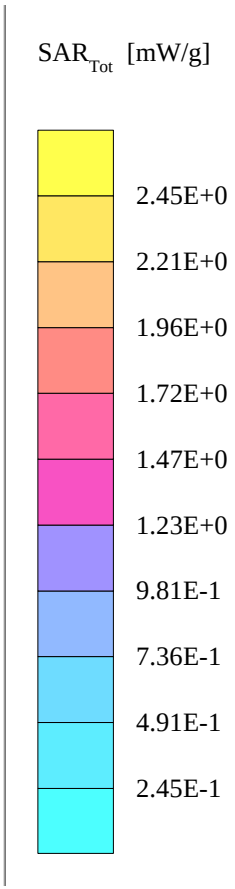
Hiptop in Case in Body Worn Position Flat Centre Channel (660)
SAM Phantom; Flat
Probe: ET3DV6 - SN1529; ConvF(4.70,4.70,4.70)
Crest factor: 8.0; Body 1900MHz FCC: σ = 1.63 mho/m ε_r = 50.9 ρ = 1.00 g/cm^3
Peak: 2.44 mW/g, SAR (1g): 1.26 mW/g
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 0.9%
12/11/02



Danger Hiptop with Colour Display

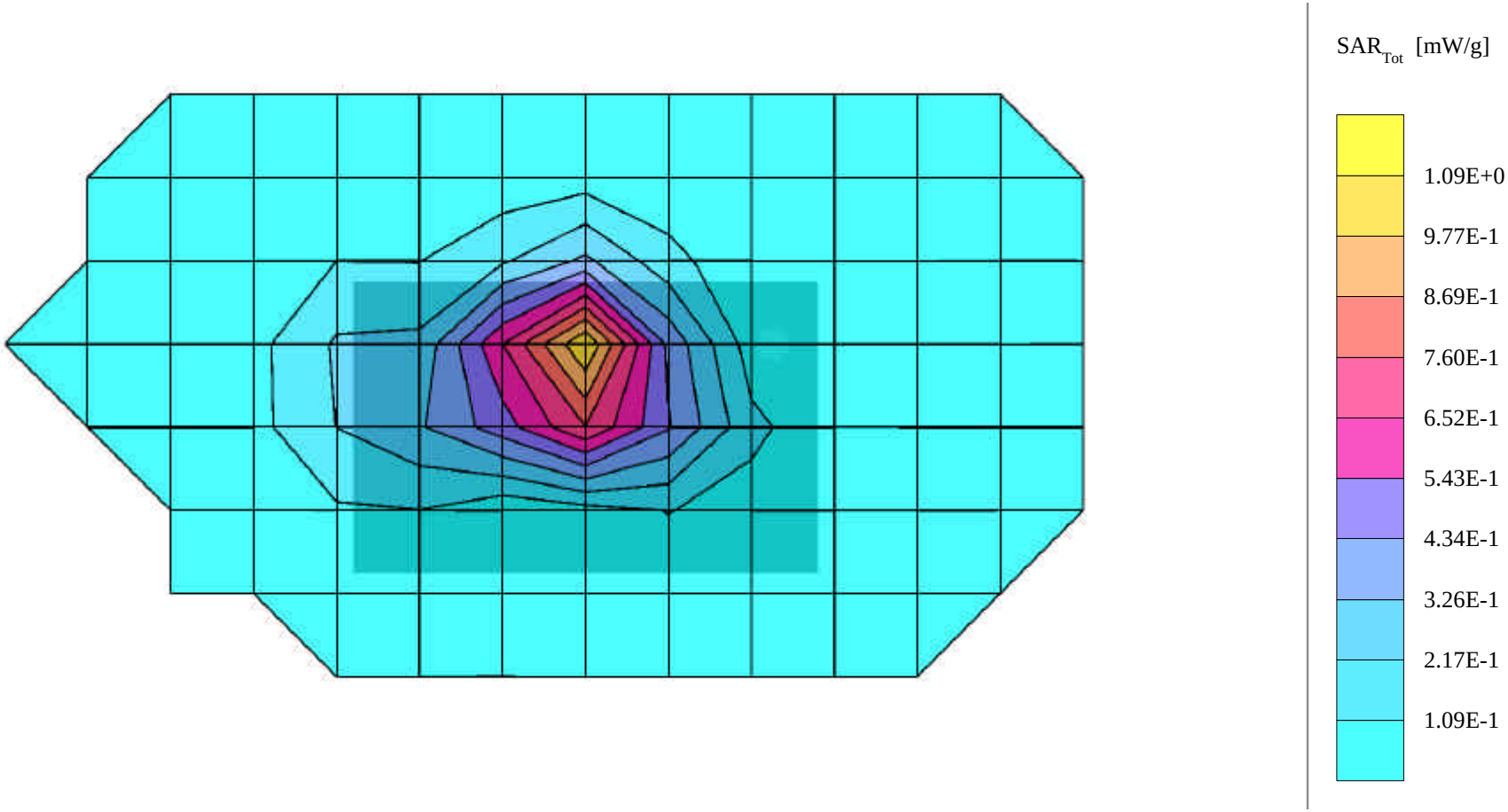
Hiptop in Case in Body Worn Position Flat Centre Channel (660)
SAM Phantom; Flat
Probe: ET3DV6 - SN1529; ConvF(4.70,4.70,4.70)
Crest factor: 8.0; Body 1900MHz FCC: σ = 1.63 mho/m ε_r = 50.9 ρ = 1.00 g/cm^3
Peak: 2.45 mW/g, SAR (1g): 1.27 mW/g
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 0.9%
12/11/02





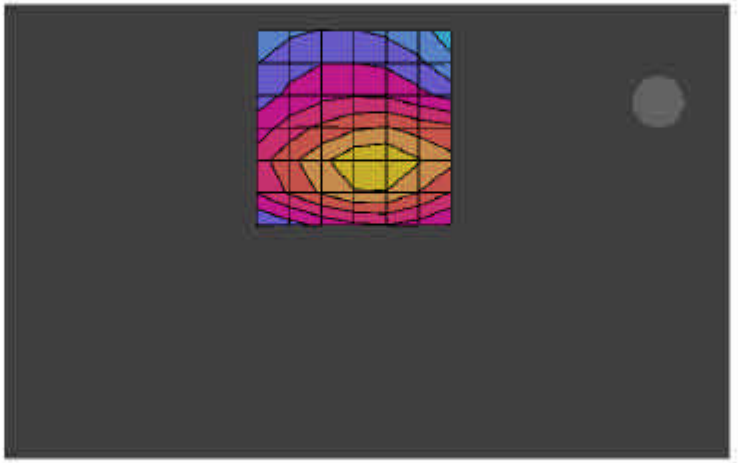
Danger Hiptop with Colour Display

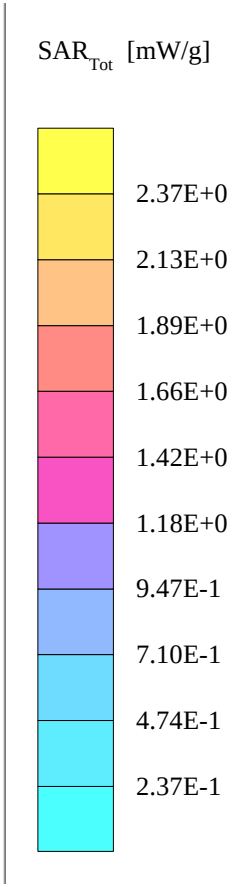
Hiptop in Case in Body Worn Position Flat Bottom Channel (512)
SAM Phantom; Flat
Probe: ET3DV6 - SN1529; ConvF(4.70,4.70,4.70)
Crest factor: 8.0; Body 1900MHz FCC: σ = 1.63 mho/m ε_r = 50.9 ρ = 1.00 g/cm^3
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 2.1%
12/11/02



Danger Hiptop with Colour Display

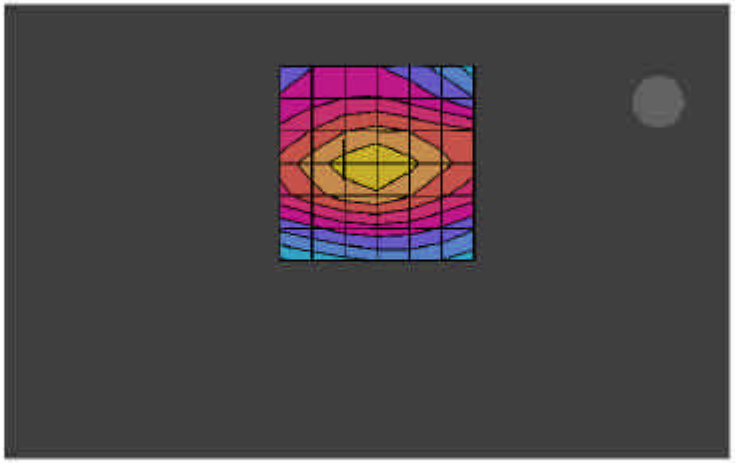
Hiptop in Case in Body Worn Position Flat Centre Channel (512)
SAM Phantom; Flat
Probe: ET3DV6 - SN1529; ConvF(4.70,4.70,4.70)
Crest factor: 8.0; Body 1900MHz FCC: σ = 1.63 mho/m ε_r = 50.9 ρ = 1.00 g/cm^3
Peak: 2.40 mW/g, SAR (1g): 1.26 mW/g
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 2.1%
12/11/02

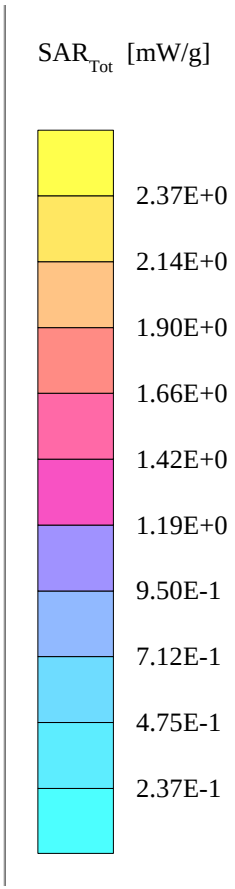




Danger Hiptop with Colour Display

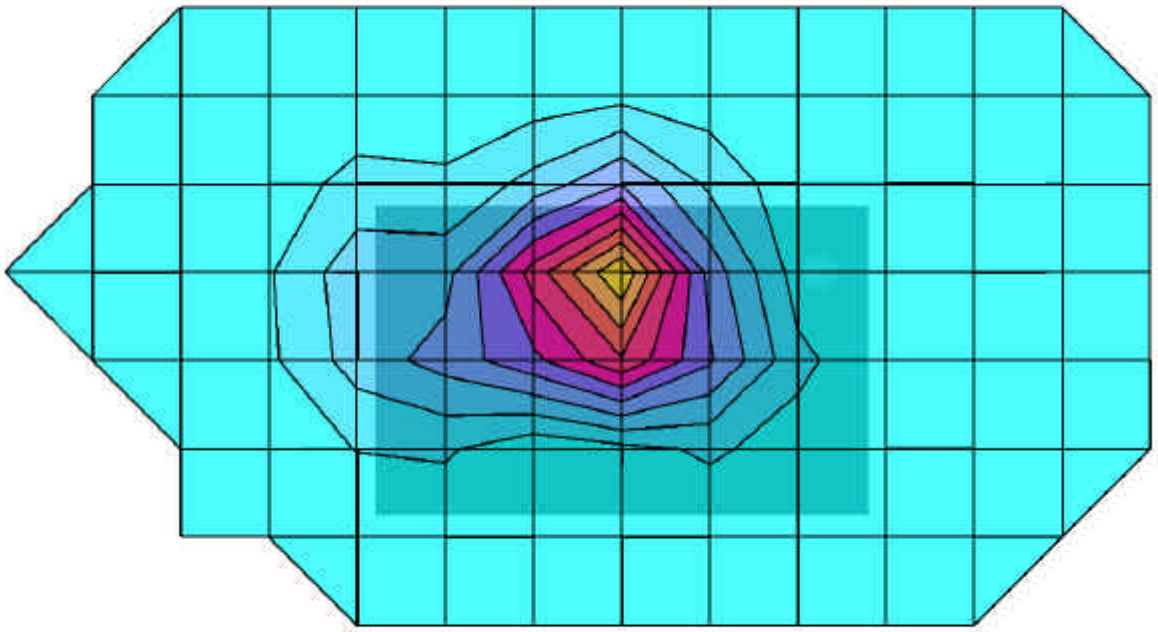
Hiptop in Case in Body Worn Position Flat Bottom Channel (512)
SAM Phantom; Flat
Probe: ET3DV6 - SN1529; ConvF(4.70,4.70,4.70)
Crest factor: 8.0; Body 1900MHz FCC: σ = 1.63 mho/m ε_r = 50.9 ρ = 1.00 g/cm^3
Peak: 2.38 mW/g, SAR (1g): 1.26 mW/g
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 2.1%
12/11/02





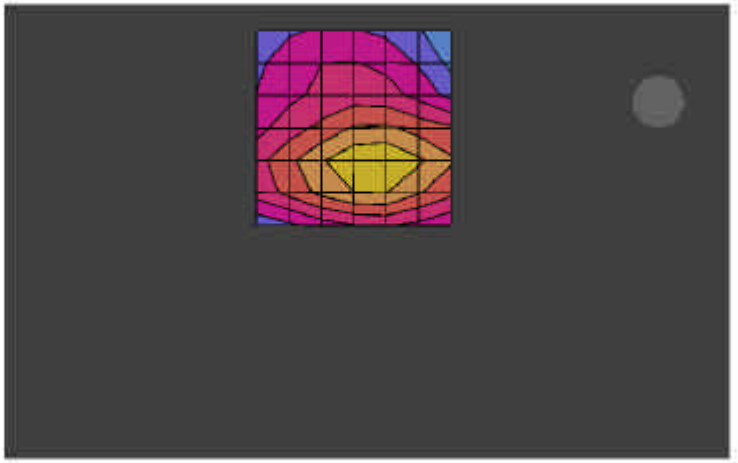
Danger Hiptop with Colour Display

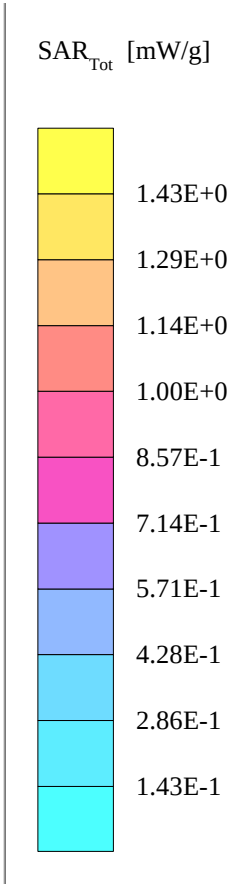
Hiptop in Case in Body Worn Position Flat Top Channel (810)
SAM Phantom; Flat
Probe: ET3DV6 - SN1529; ConvF(4.70,4.70,4.70)
Crest factor: 8.0; Body 1900MHz FCC: σ = 1.63 mho/m ε_r = 50.9 ρ = 1.00 g/cm^3
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 0.9%
12/11/02



Danger Hiptop with Colour Display

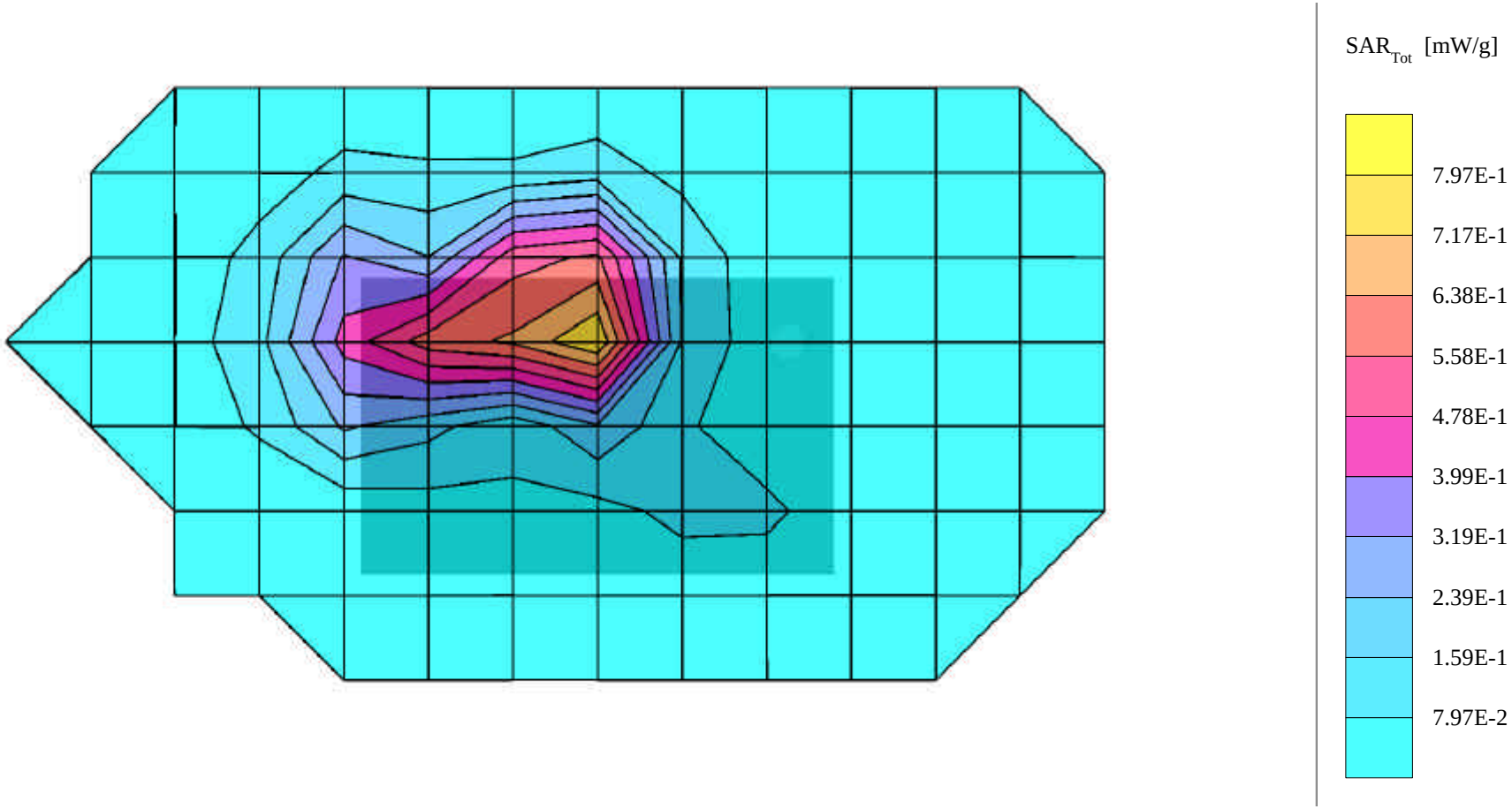
Hiptop in Case in Body Worn Position Flat Top Channel (810)
SAM Phantom; Flat
Probe: ET3DV6 - SN1529; ConvF(4.70,4.70,4.70)
Crest factor: 8.0; Body 1900MHz FCC: σ = 1.63 mho/m ε_r = 50.9 ρ = 1.00 g/cm^3
Peak: 1.44 mW/g, SAR (1g): 0.749 mW/g
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 0.9%
12/11/02





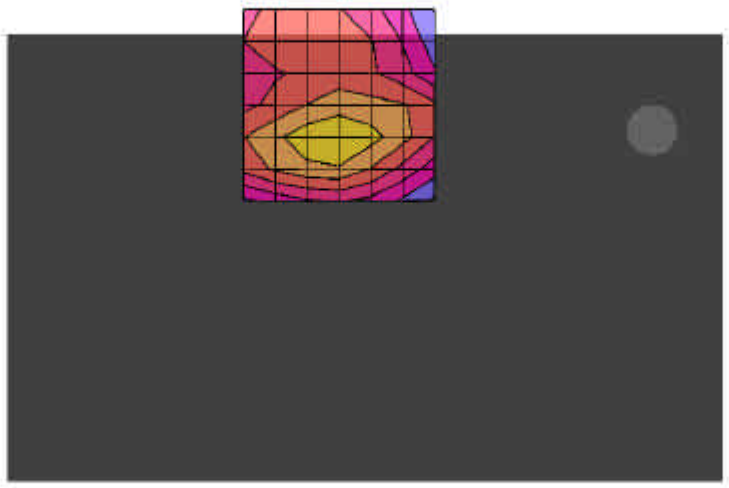
Danger Hiptop with Colour Display

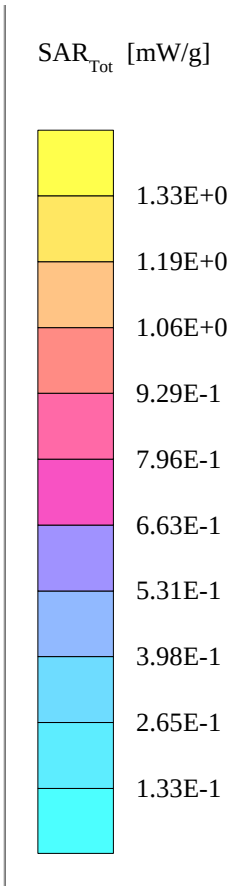
Hiptop in Case with Personal Hands Free Kit Flat Centre Channel (660)
SAM Phantom; Flat
Probe: ET3DV6 - SN1529; ConvF(4.70,4.70,4.70)
Crest factor: 8.0; Body 1900MHz FCC: σ = 1.63 mho/m ε_r = 50.9 ρ = 1.00 g/cm^3
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 4.5%
12/12/02



Danger Hiptop with Colour Display

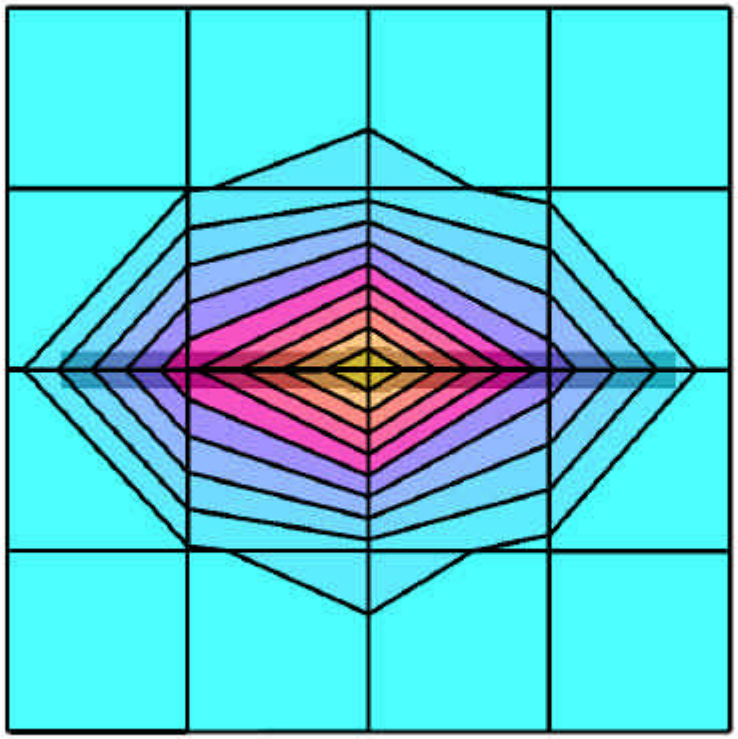
Hiptop in Case with Personal Hands Free Kit Flat Centre Channel (660)
SAM Phantom; Flat
Probe: ET3DV6 - SN1529; ConvF(4.70,4.70,4.70)
Crest factor: 8.0; Body 1900MHz FCC: σ = 1.63 mho/m ε_r = 50.9 ρ = 1.00 g/cm^3
Peak: 1.33 mW/g, SAR (1g): 0.688 mW/g
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
SAR Drift 4.5%
12/12/02

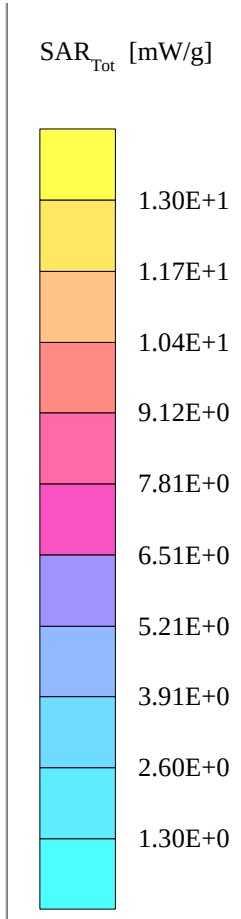




Dipole 1900 MHz

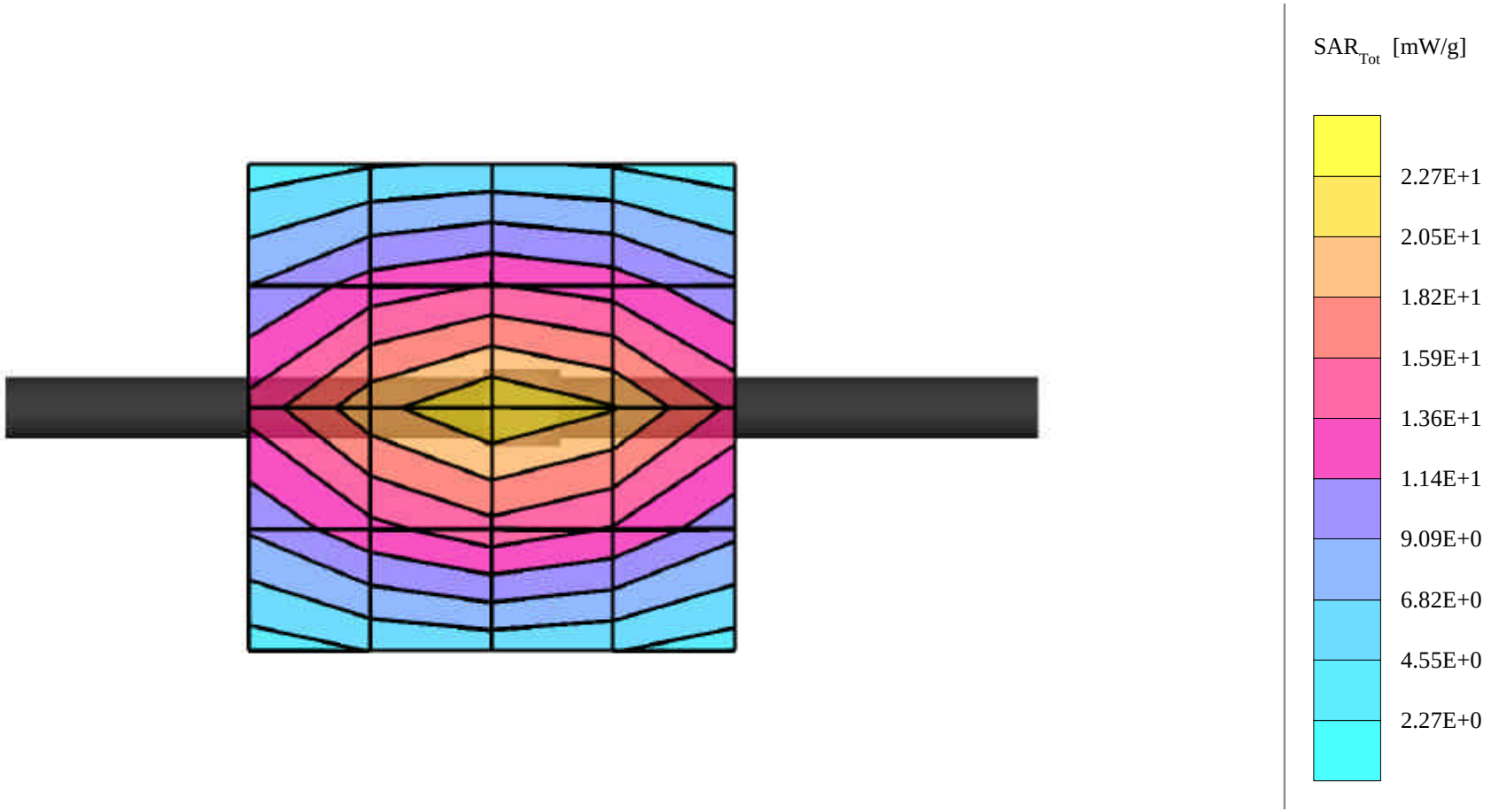
Validation
SAM Phantom; Flat
Probe: ET3DV6 - SN1529; ConvF(5.20,5.20,5.20)
Crest factor: 1.0; Brain 1900MHz: σ = 1.49 mho/m ε_r = 37.5 ρ = 1.00 g/cm^3
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
12/10/02





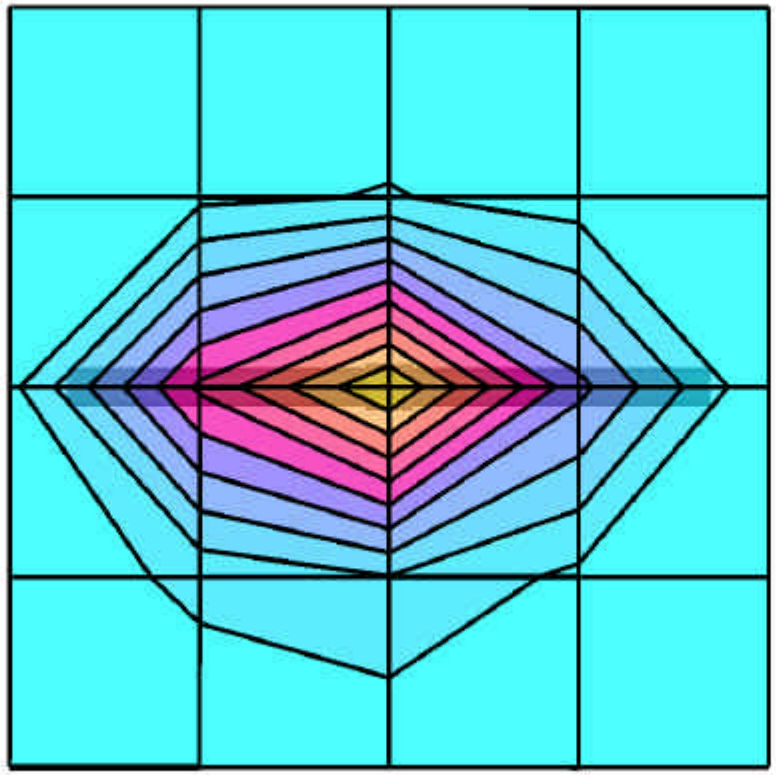
Dipole 1900 MHz

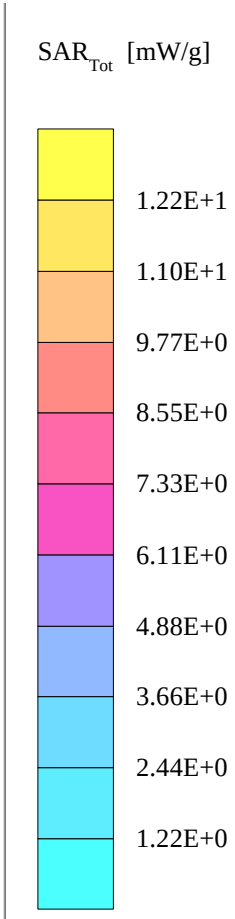
Validation
SAM Phantom; Flat
Probe: ET3DV6 - SN1529; ConvF(5.20,5.20,5.20)
Crest factor: 1.0; Brain 1900MHz: σ = 1.49 mho/m ε_r = 37.5 ρ = 1.00 g/cm^3
Peak: 22.5 mW/g ± 0.04 dB, SAR (1g): 10.9 mW/g ± 0.03 dB, SAR (10g): 5.25 mW/g ± 0.01 dB
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
12/10/02



Dipole 1900 MHz

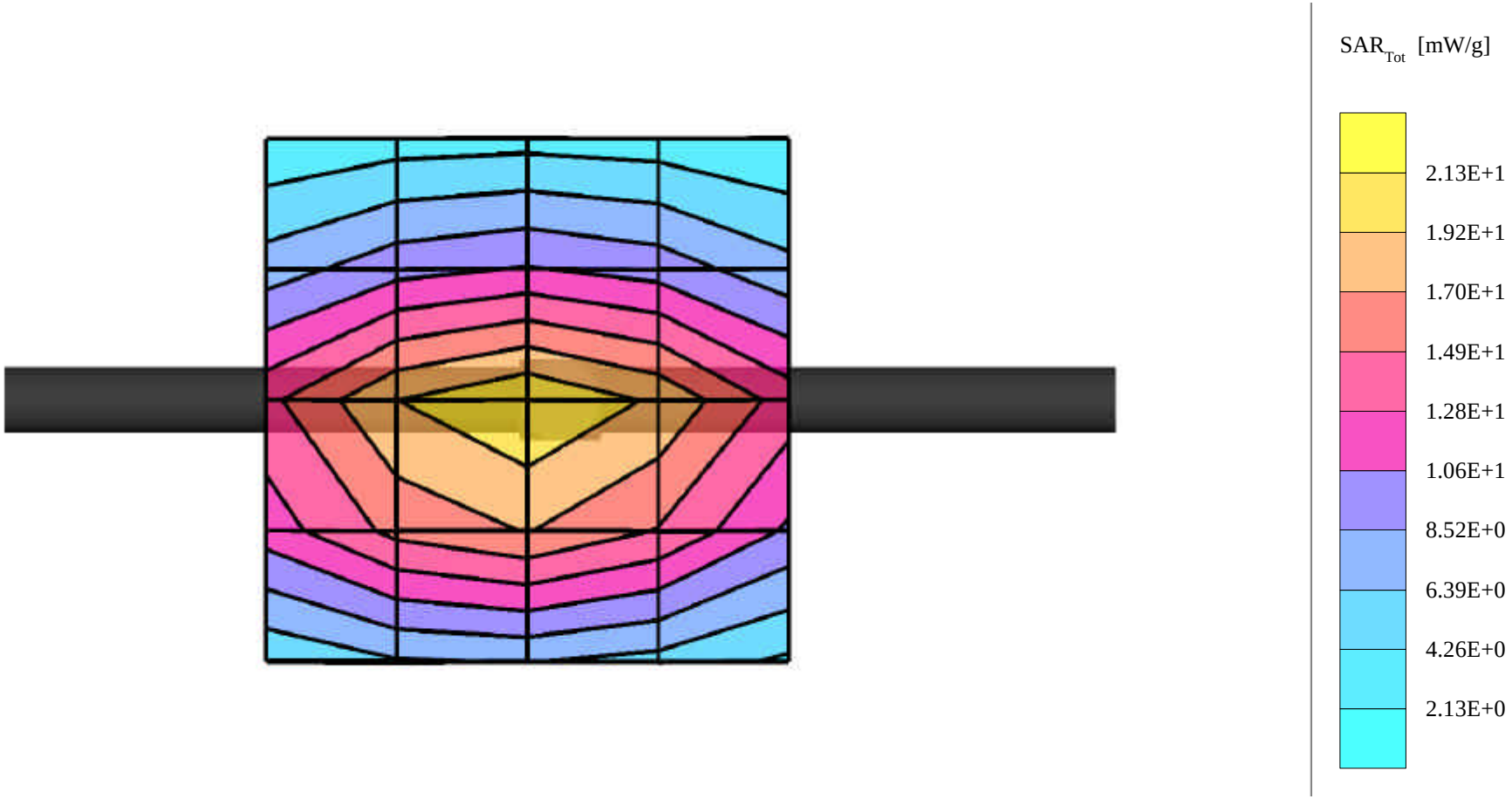
Validation
SAM Phantom; Flat
Probe: ET3DV6 - SN1529; ConvF(5.20,5.20,5.20)
Crest factor: 1.0; Brain 1900MHz: σ = 1.49 mho/m ε_r = 37.5 ρ = 1.00 g/cm^3
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
12/11/02





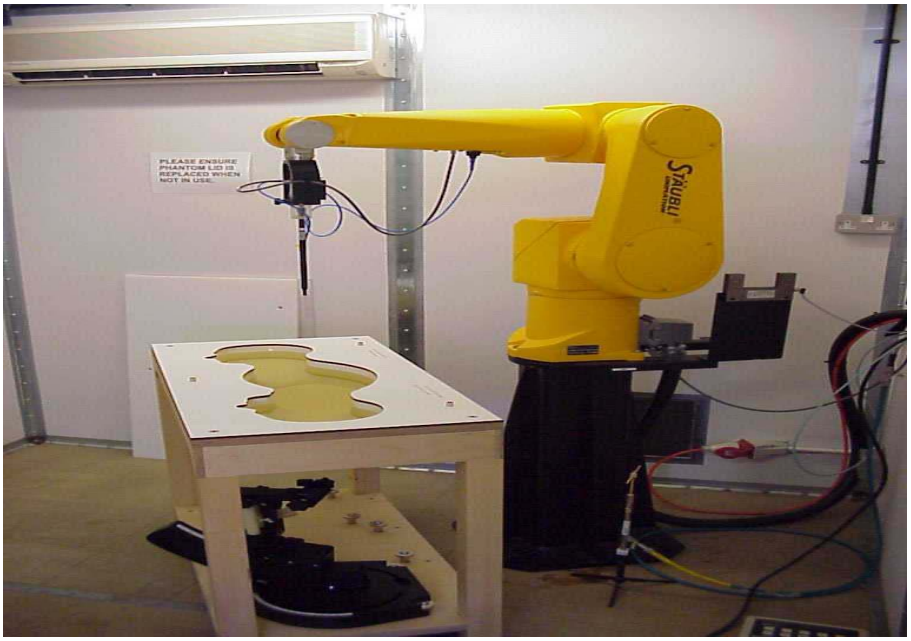
Dipole 1900 MHz

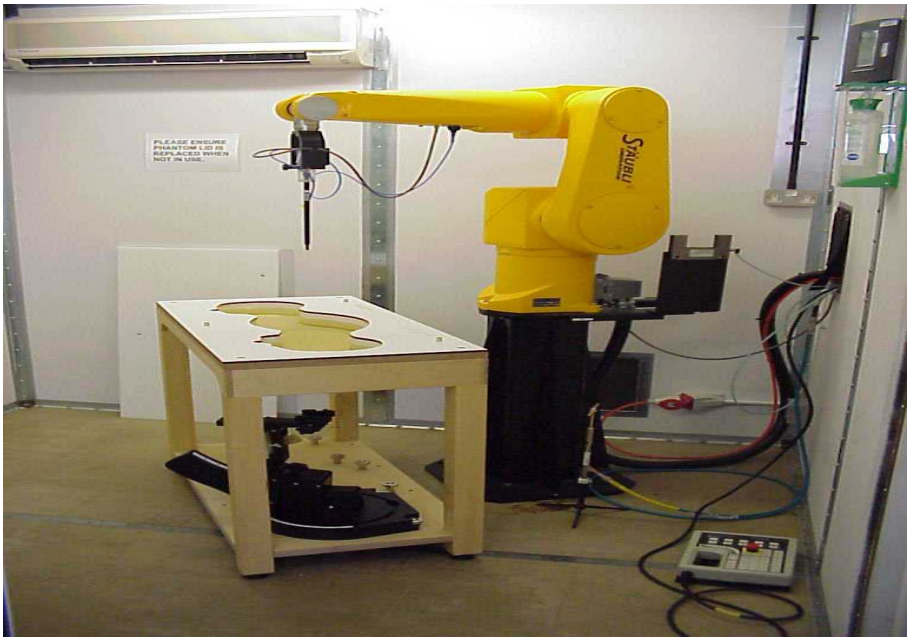
Validation
SAM Phantom; Flat
Probe: ET3DV6 - SN1529; ConvF(5.20,5.20,5.20)
Crest factor: 1.0; Brain 1900MHz: σ = 1.49 mho/m ε_r = 37.5 ρ = 1.00 g/cm^3
Peak: 21.9 mW/g ± 0.03 dB, SAR (1g): 10.6 mW/g ± 0.00 dB, SAR (10g): 5.13 mW/g ± 0.02 dB
Lab Temperature 21.5 deg C, Fluid Temperature 18.5 deg C
12/11/02



Appendix 4. Test Configuration Photograph

This appendix contains photographs showing the test configuration for the measurement of Specific Absorption Rate (SAR)





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Hiptop Mobile Telephone Handset with Colour Display
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Appendix 5. Calibration Data

This appendix contains the calibration data and certificates.

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Appendix 6. Photographs of EUT

This appendix contains the following photographs:

Photo Reference Number	Title
PHT/44198JD02/001	Hiptop in case with personal hands free 2.
PHT/44198JD02/002	Hiptop in case with personal hands free 3.
PHT/44198JD02/003	Hiptop in case with personal hands free.
PHT/44198JD02/004	Hiptop in case.
PHT/44198JD02/005	Cheek left position.
PHT/44198JD02/006	Cheek right position.
PHT/44198JD02/007	Tilted left position.
PHT/44198JD02/008	Tilted right position.

These pages are not included in the total number of pages for this report.

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Test Of: **Danger Inc.**
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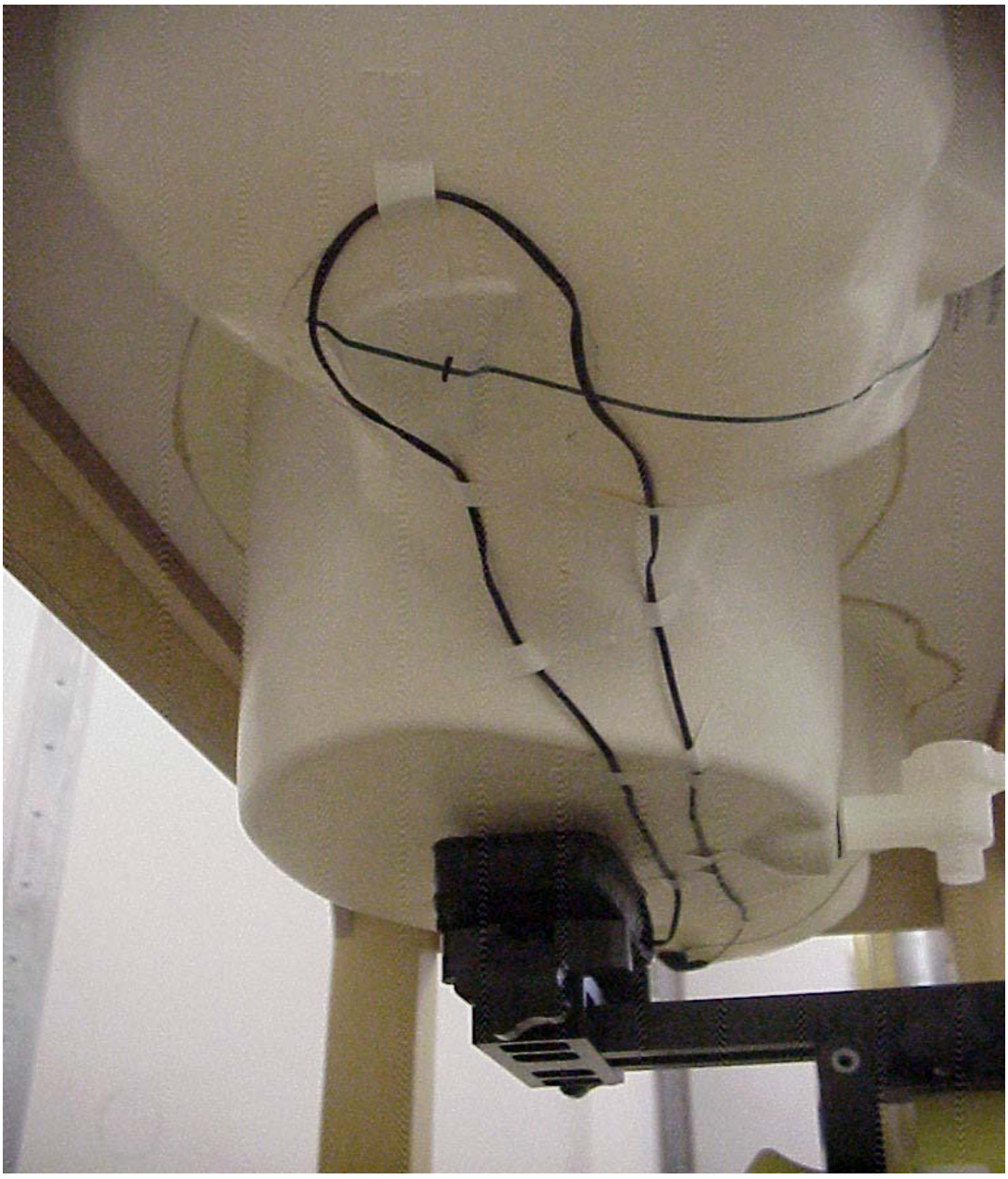
To: **OET Bulletin 65 Supplement C: (2001-01)**

PHT/44198JD02/001 Hiptop in case with personal hands free 2.



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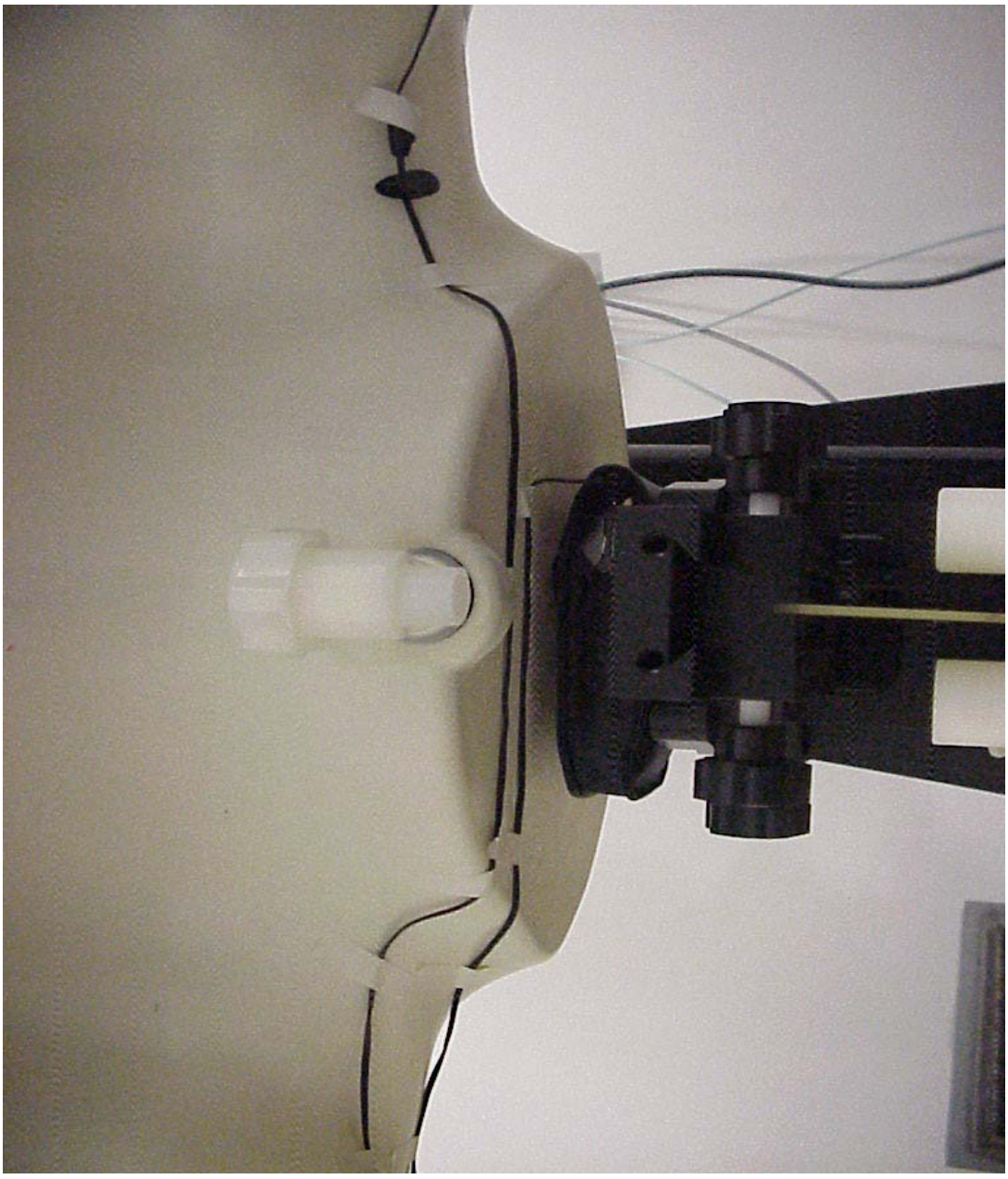
PHT/44198JD02/002 Hiptop in case with personal hands free 3.



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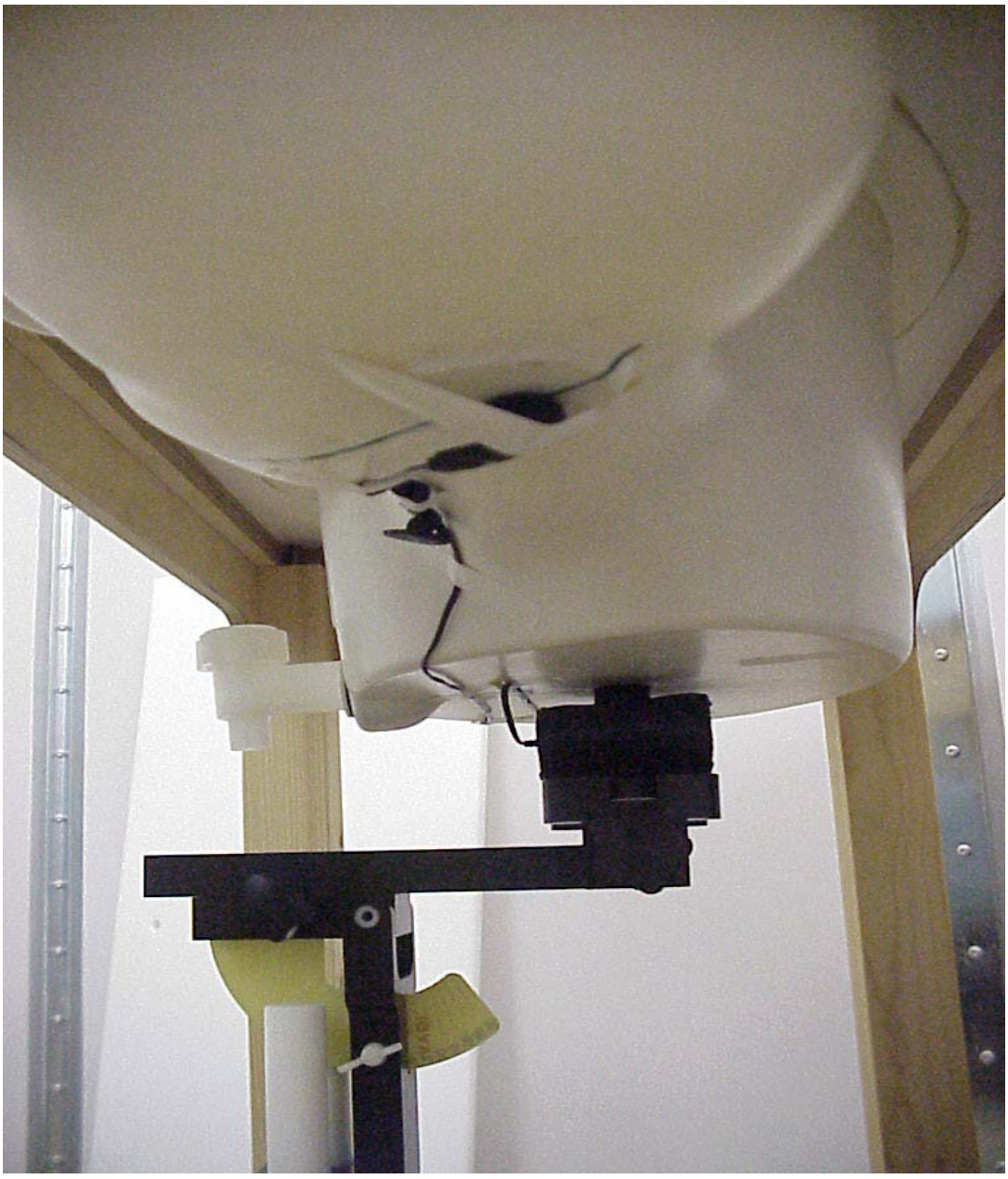
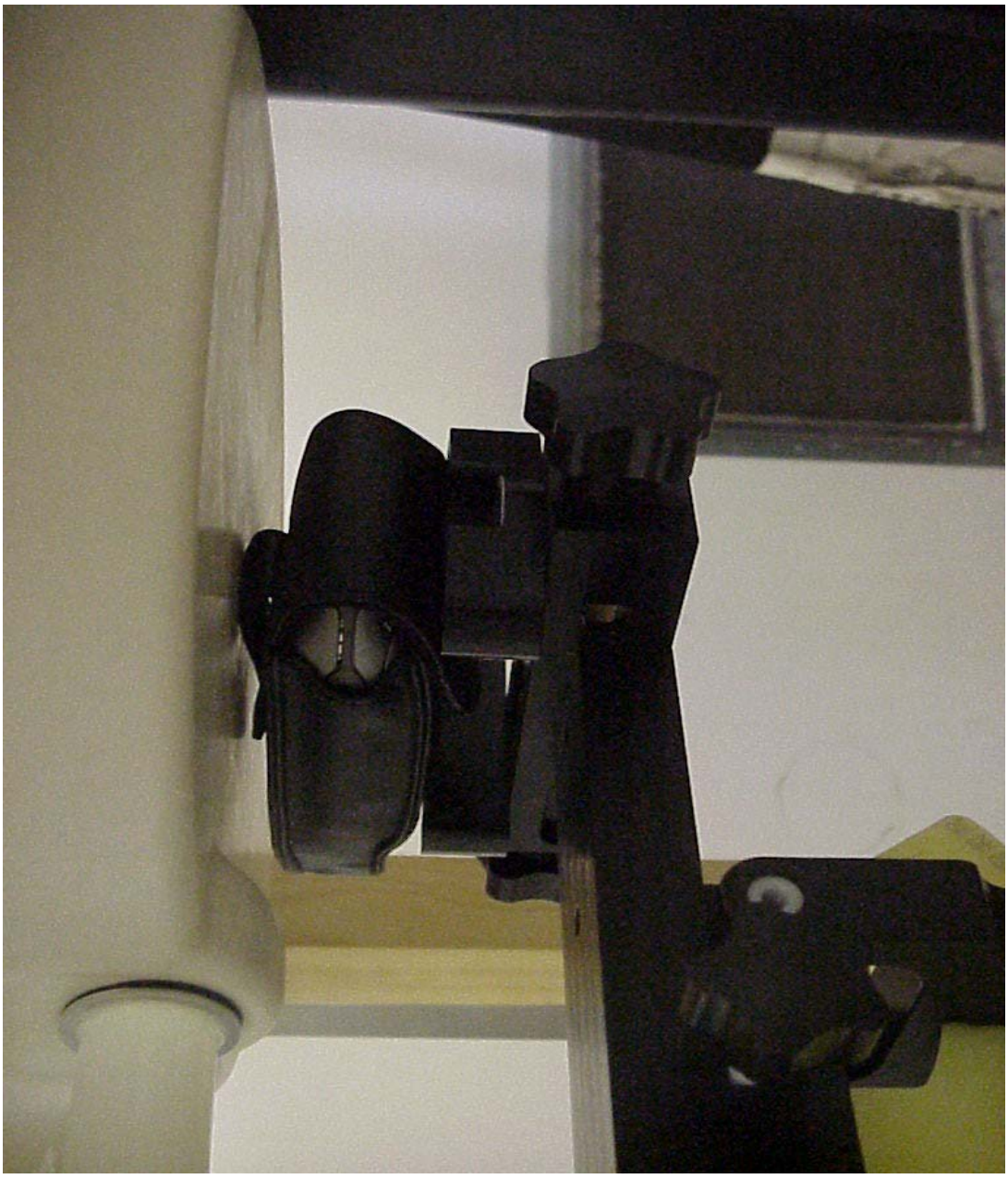
Hiptop Mobile Telephone Handset with Colour Display
To: **OET Bulletin 65 Supplement C: (2001-01)**

PHT/44198JD02/003 Hiptop in case with personal hands free.



Test Of: **Danger Inc.**
Hiptop Mobile Telephone Handset with Colour Display
To: **OET Bulletin 65 Supplement C: (2001-01)**

PHT/44198JD02/004 Hiptop in case.



Test Of: **Danger Inc.**
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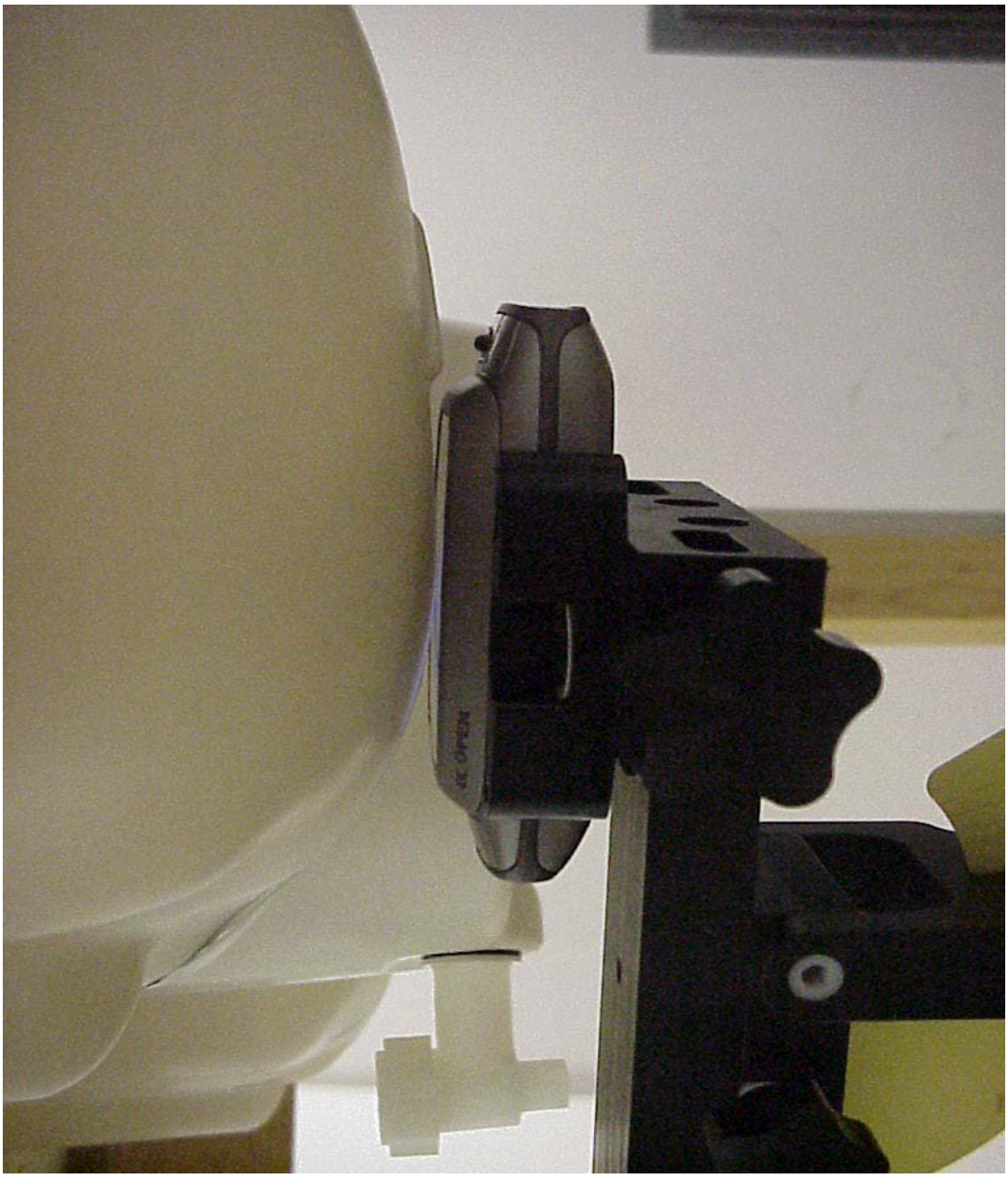
PHT/44198JD02/005 Cheek left position.



Test Of: **Danger Inc.**
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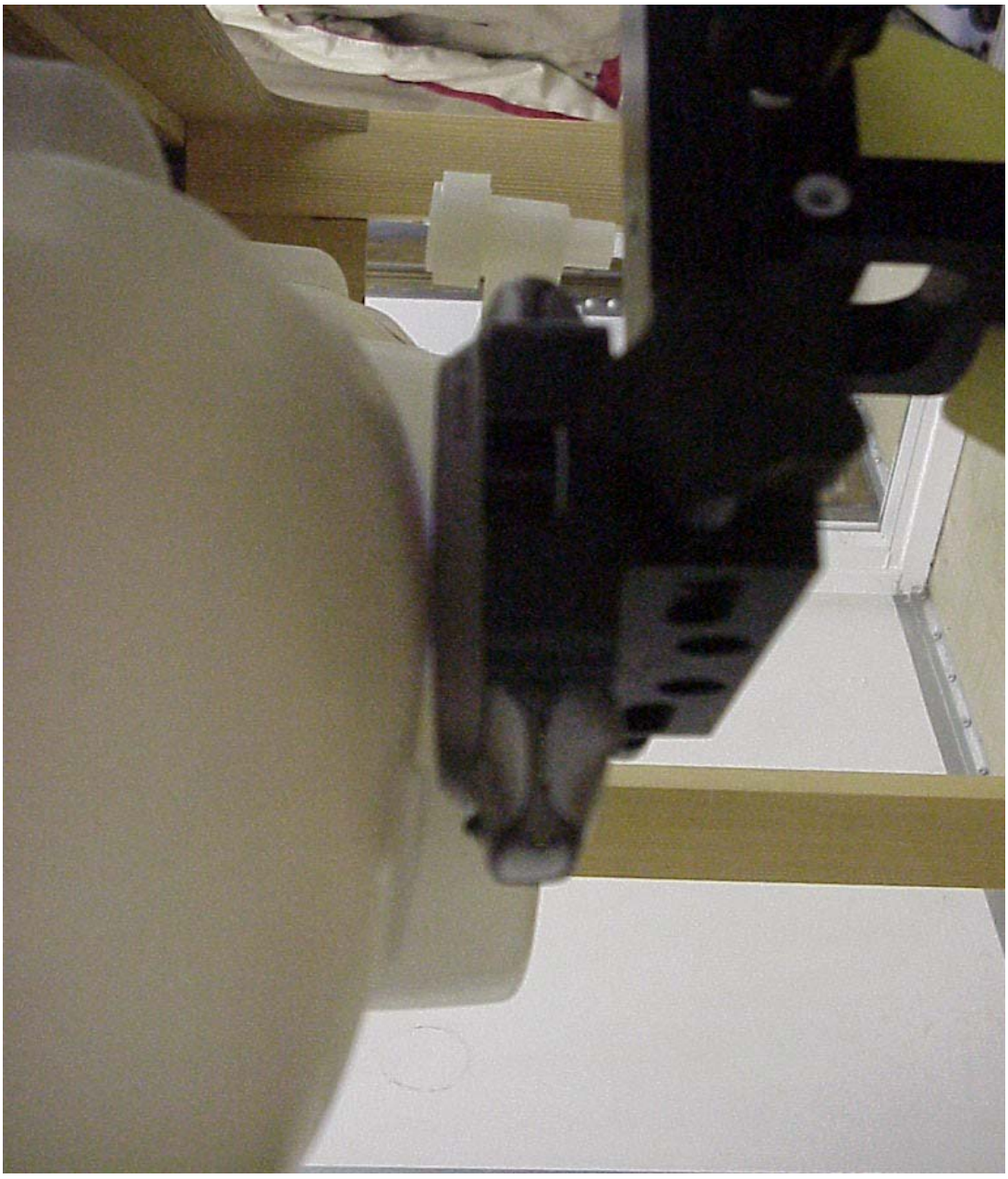
PHT/44198JD02/006 Cheek right position.



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PHT/44198JD02/007 Tilted left position.

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Hiptop Mobile Telephone Handset with Colour Display
To: **OET Bulletin 65 Supplement C: (2001-01)**

PHT/44198JD02/008 Tilted right position.