MOTOROLA

Exhibit 11: SAR Test Report: IHDT6BK1

Date of test: 10/30/01-11/01/01

Laboratory:
Motorola Personal Communications Sector Product Safety Laboratory
2001 N. Division
Room: AS228
Harvard, Illinois 60033

Test Responsible:
Firass Badaruzzaman
SAR RF Engineer

Accreditation:

This laboratory is accredited to ISO/IEC 17025-1999 to perform the following electromagnetic exposure tests:
System Validation & Interlaboratory Comparison
Simulated Tissue Specifications and Procedure
EME Cellular Phone Testing Procedure

On the following types of products:
Wireless Communications Devices (Examples): Two Way Radios; Portable Phones (including Cellular, Licensed Non-Broadcast and PCS); Low Frequency Readers; and Pagers

A2LA certificate #1651-01

Statement of Compliance:
Motorola declares under its sole responsibility that portable cellular telephone FCC ID IHDT6BK1 to which this declaration relates, is in conformity with the appropriate RF exposure standards, recommendations and guidelines (FCC 47 CFR §2.1093). It also declares that the product was tested in accordance with the appropriate measurement standards, guidelines and recommended practices. Any deviations from these standards, guidelines and recommended practices are noted below:

(none)

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Reference Notes

1. Introduction

The Motorola Personal Communications Sector Product Safety Laboratory has performed measurements of the maximum potential exposure to the user of portable cellular phone FCC ID IHDT6BK1. The Specific Absorption Rate (SAR) of this product was measured. The portable cellular phone was tested in accordance with the latest available test guidelines. The SAR values found for the portable cellular phone (FCC ID IHDT6BK1) are below the maximum recommended levels of 1.6 W/kg. Detailed procedures of the test are described in the *Motorola Exhibit 11 Reference SAR Test Report*.

2. Description of the Device Under Test

Antenna description

Type	Fixed Stub	
Location	Right Side	
Dimensions	Length	24 mm
	Width Base	9 mm
Configuration	Helix	

Device description

FCC ID Number	IHDT6BK1
Serial number	350652800000300
Mode(s) of Operation	GSM 1900
Modulation Mode(s)	GSM
Maximum Output Power Setting	29.50 dBm
Duty Cycle	1:8
Transmitting Frequency Rang(s)	1850.2-1909.8 MHz

3. Test Results

The test sample was operated in a test mode that allows control of the transmitter without the need to place actual phone calls. For the purposes of this test the unit is commanded to test mode and manually set to the proper channel, transmitter power level and transmit mode of operation. The phone was then placed in the SAR measurement system with a fully charged battery.

3.1 Head Adjacent Test Results

The SAR results shown in tables 1 and 2 are maximum SAR values averaged over 1 gram of phantom tissue. Also shown are the measured conducted output powers during the test. The SAR measurements were performed using the Motorola phantoms listed in section 3.1. The device holder used was the supplied Motorola device holder.

A full data set output of the test conditions with the highest SAR values from the Dasy™ measurement system is included as appendix 2. The test conditions included are indicated as bold numbers in the following table. All other test conditions measured lower SAR values than those included.

			Cheek/Touch Position SAR, 1g		
			Left Head		
f		Conducted Output Power (dBm)	*Ant Fixed*		
(MHz)	Description		Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)
Digital 1900MHz	**Channel 512**	29.47	**0.737**	**0.08**	**0.74**
	Channel 660	29.44	0.684	0.03	0.68
	Channel 810	29.45	0.673	0.03	0.67

Table 1: SAR measurement results for the portable cellular telephone FCC ID IHDT6BK1 at highest possible output power. Measured against the left head.

			Cheek/Touch Position SAR, 1g		
			Right Head		
f		Conducted Output Power (dBm)	*Ant Fixed*		
(MHz)	Description		Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)
Digital 1900MHz	**Channel 512**	29.47	0.63	-0.03	0.63
	Channel 660	29.44	0.62	-0.08	0.63
	Channel 810	29.45	0.63	-0.06	0.64

Table 2: SAR measurement results for the portable cellular telephone FCC ID IHDT6BK1 at highest possible output power. Measured against the right head.

3.2 Body-Worn Test Results

The SAR results shown in table 3 are maximum SAR values averaged over 1 gram of phantom tissue. Also shown are the measured conducted output powers during the test. The same "flat" phantom used for the system accuracy verification in section 5 was used for the body-worn tests. The same device holder described in section 6 was used for positioning the phone.

A full data set output of the test condition with the highest SAR values from the Dasy™ measurement system is included as appendix 3 . The test conditions included are indicated as bold numbers in the following table. All other test conditions measured lower SAR values than those included.

			Body-Worn SAR, 1g		
			Leather Carry Case with Belt Clip		
f		Conducted Output Power (dBm)	*Ant Fixed*		
(MHz)	Description		Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)
Digital 1900MHz	**Channel 512**	29.47	**0.58**	**0.09**	**0.58**
	Channel 661	29.44	0.50	0.08	0.50
	Channel 810	29.45	0.43	0.09	0.43

Table 3: SAR measurement results for the portable cellular telephone FCC ID IHDT6BK1 at highest possible output power. Measured against the body.

4. Test Equipment Used

4.1 Dosimetric System

The Motorola Personal Communications Sector Product Safety Laboratory utilizes a Dosimetric Assessment System (Dasy3™) SAR measurement system manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. The overall RSS uncertainty of the measurement system is ±12.0% (K=1).

Description	Serial Number	Cal Due Date
DASY3 DAE V1	SN378	07/28/2002
E-Field Probe ETDV6	SN1522	05/01/2002
Dipole Validation Kit, DV1800V2	SN279	01/04/2003

4.2 Additional Equipment

Description	Serial Number	Cal Due Date
Signal Generator HP8648C	3847A04832	01/18/2003
Power Meter E4419B	GB3951088	01/19/2002
Power Sensor E9301A	US39210917	01/24/2002

5. Electrical parameters of the tissue simulating liquid

Prior to conducting SAR measurements, the relative permittivity, ε_r, and the conductivity, σ, of the tissue simulating liquids were measured with HP85070 Dielectric Probe Kit These values are shown in the table below. The mass density, ρ, used by the dosimetric system is also given. Recommended limits for maximum permittivity, minimum conductivity and maximum mass density are also shown. It is seen that the measured parameters are satisfactory for compliance testing.

f (MHz)	Tissue type	Limits / Measured	Dielectric Parameters		
			e_r	s (S/m)	r (g/cm^3)
1880	**Head**	**Measured,** 10/30/01	39.3	1.44	1.00
		Recommended Limits	40.0	1.40	N/A
	Body	**Measured,** 11/01/01	47.8	1.65	1.00
		Recommended Limits	53.3	1.52	N/A

6. System Accuracy Verification

A system accuracy verification of the DASY3 was performed using the measurement equipment listed in Section 3. The dipole was placed below a "flat" phantom. This "flat" phantom is made out of 1" thick natural High Density Polyethylene with a thickness at the bottom equal to 2.0mm. It measures 52.7cm(long) x 26.7cm(wide) x 21.2cm(tall). The measured dielectric constant of the material used is less than 2.3 and the loss tangent is less than 0.0046 all the way up to 2.184GHz.

A SAR measurement was performed to see if the measured SAR was within +/- 8% from the target SAR indicated on the dipole certification sheet. The test was conducted on the same days as the measurement of the DUT. Recommended limits for maximum permittivity, minimum conductivity are shown in the table below. The obtained results from the system accuracy verification are displayed in the table below. The distributions of SAR compare well with those of the reference measurements (see Appendix 1). SAR values are normalized to 1W forward power delivered to the dipole.

f (MHz)	Description	SAR (W/kg), 1gram	Dielectric Parameters		Temp (°C)
			e_r	s (S/m)	
1900	**Measured,** 10/30/01	43.65	40.80	1.72	23.80
	Recommended Limits	44.40	40.00	1.71	N/A
1900	**Measured,** 11/01/01	42.80	42.30	1.71	23.90
	Recommended Limits	44.40	40.00	1.71	N/A

Appendix 1

SAR distribution comparison for the system accuracy verification

Dipole 1800 MHz

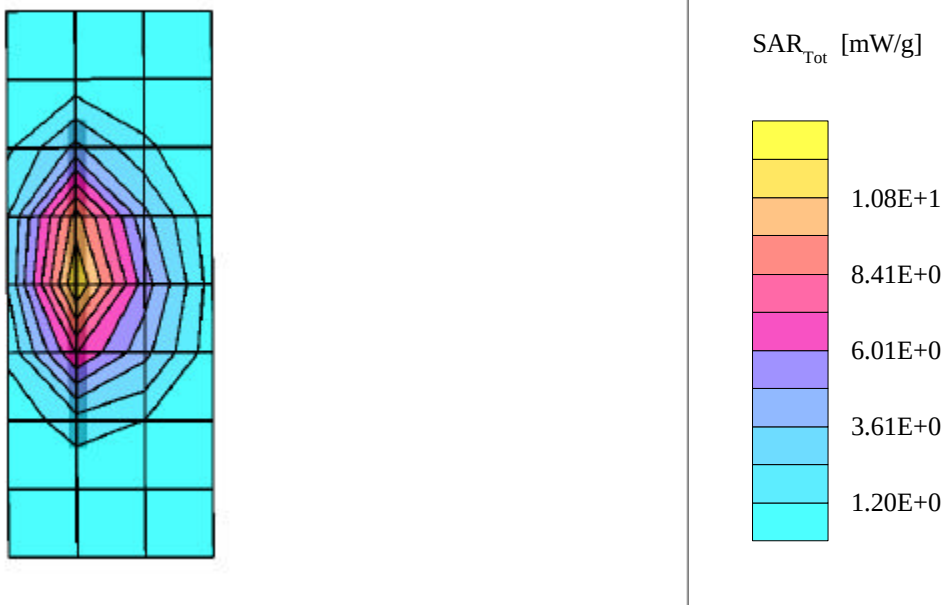
Robot 1 Amy Twin Phantom 2.3; Section 1

Probe: ET3DV6 - SN1522 Validation; ConvF(5.40,5.40,5.40); Crest factor: 1.0; Validation 1800 MHz: σ = 1.72 mho/m ε_r = 40.8 ρ = 1.00 g/cm^3

Cubes (2): Peak: 22.1 mW/g ± 0.14 dB, SAR (1g): 11.2 mW/g ± 0.09 dB, SAR (10g): 5.61 mW/g ± 0.05 dB, (Worst-case extrapolation)

Penetration depth: 7.5 (7.2, 8.3) [mm]

Powerdrift: 0.02 dB



Dipole 1800 MHz

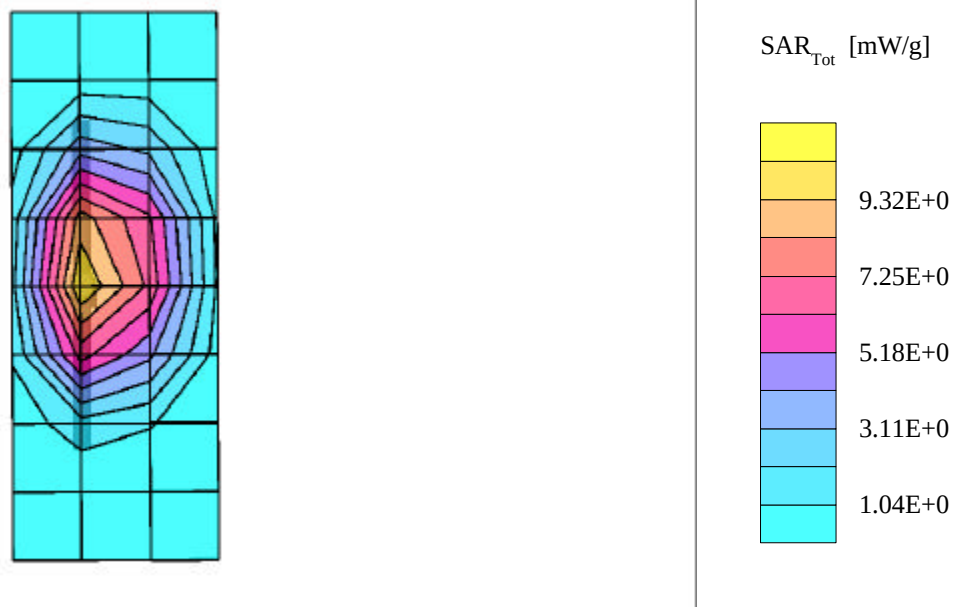
Robot 1 Amy Twin Phantom 2.3; Section 1

Probe: ET3DV6 - SN1522 Validation; ConvF(5.40,5.40,5.40); Crest factor: 1.0; Validation 1800 MHz: σ = 1.71 mho/m ε_r = 42.3 ρ = 1.00 g/cm^3

Cubes (2): Peak: 21.8 mW/g ± 0.17 dB, SAR (1g): 11.0 mW/g ± 0.13 dB, SAR (10g): 5.52 mW/g ± 0.10 dB, (Worst-case extrapolation)

Penetration depth: 7.2 (6.9, 8.0) [mm]

Powerdrift: -0.06 dB

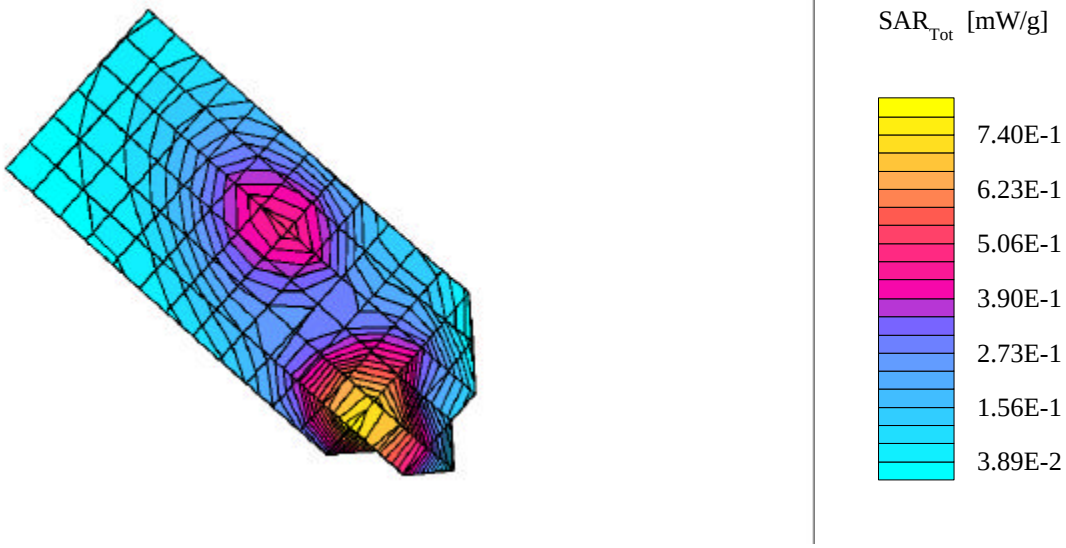


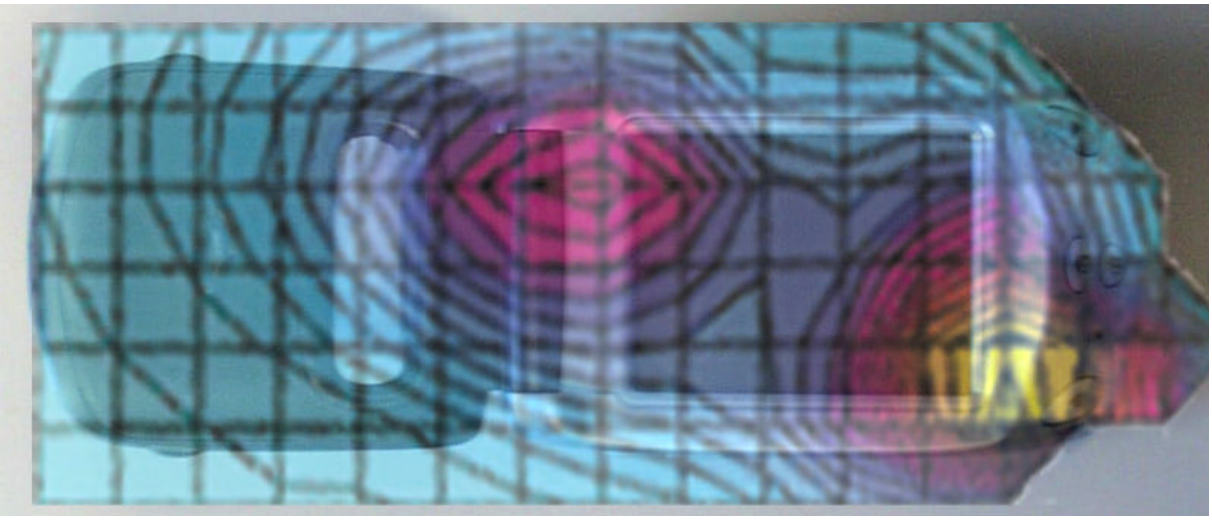
Appendix 2

SAR distribution plots for Phantom Head Adjacent Use

SN# 350652800000300

Ch# 512 / Pwr Step:0 / Antenna Position: Fixed
Robot 1 Left Head (George) Phantom; Left Head Section; Position: (80°,180°); Frequency: 1851 MHz
Probe: ET3DV6 - SN1522 Brain (Glycol); ConvF(5.16,5.16,5.16); Crest factor: 8.0; Head Glycol 1900 MHz: σ = 1.44 mho/m ε_r = 39.3 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.737 mW/g, SAR (10g): 0.430 mW/g, (Worst-case extrapolation)
Coarse: Dx = 10.0, Dy = 10.0, Dz = 10.0
Penetration depth: 13.3 (12.1, 14.4) [mm]
Powerdrift: 0.08 dB



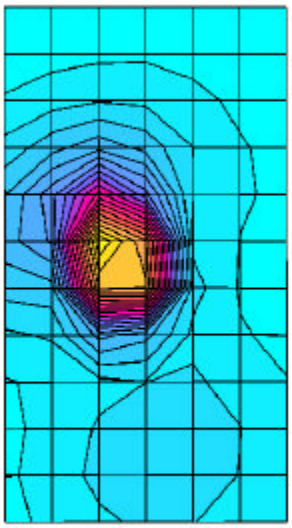


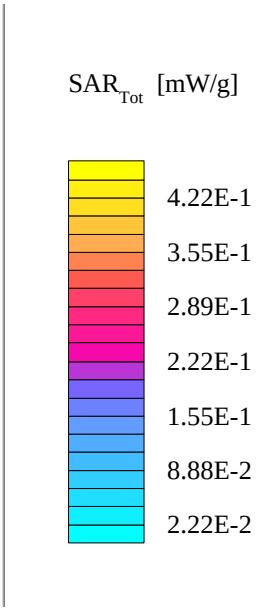
Appendix 3

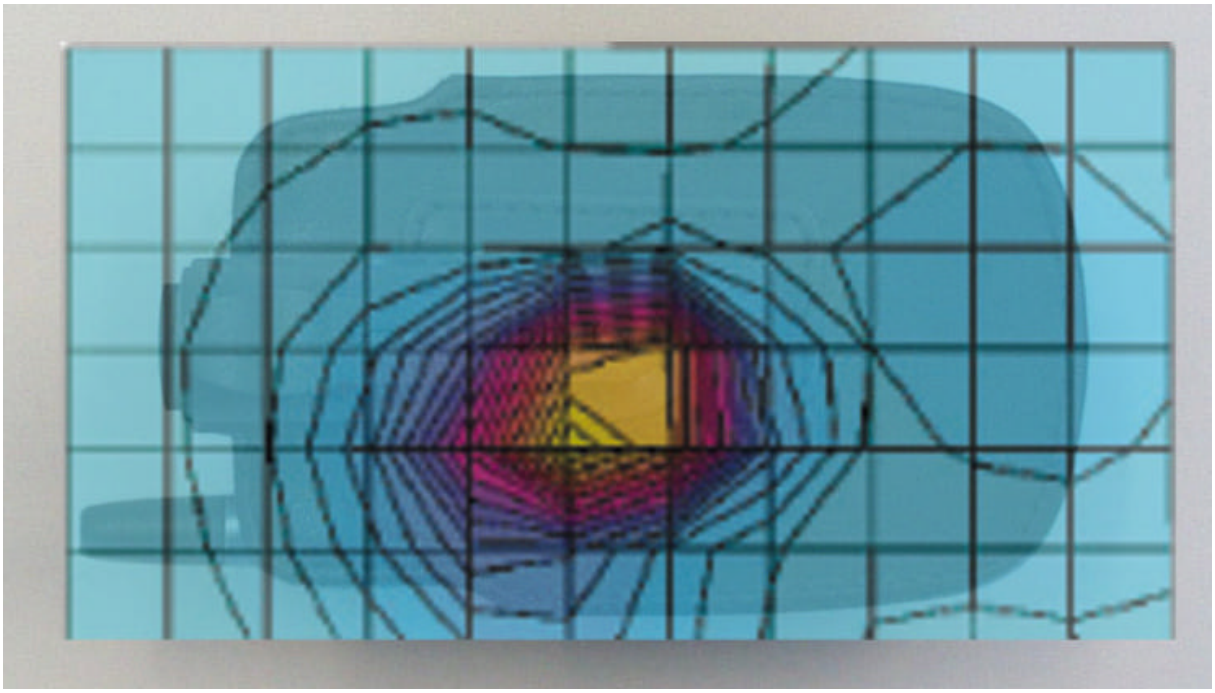
SAR distribution plots for Body Worn Configuration

SN# 350652800000300

Ch#512 / Pwr Step: 0 / Antenna Position:Fixed
Robot 1 Amy Twin Phantom 2.3 Phantom; Section2 Section; Position: (0°,0°); Frequency: 1851 MHz
Probe: ET3DV6 - SN1522 Muscle (Glycol); ConvF(4.91,4.91,4.91); Crest factor: 8.0; Muscle Glycol 1900 MHz: σ = 1.65 mho/m ε_r = 47.8 ρ = 1.00 g/cm^3
Cube 5x5x7: SAR (1g): 0.578 mW/g, SAR (10g): 0.284 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 8.3 (7.8, 9.4) [mm]
Powerdrift: 0.09 dB







Appendix 4

Photographs of the device under test

Figure A. Front of the Phone with Flip Closed

Figure B. Front of the Phone with Flip Open

Figure C. Front of the Phone inside the Pouch

Figure D. Side of the Phone inside the Pouch

Figure E. Distance of the Antenna from the Flat Phantom

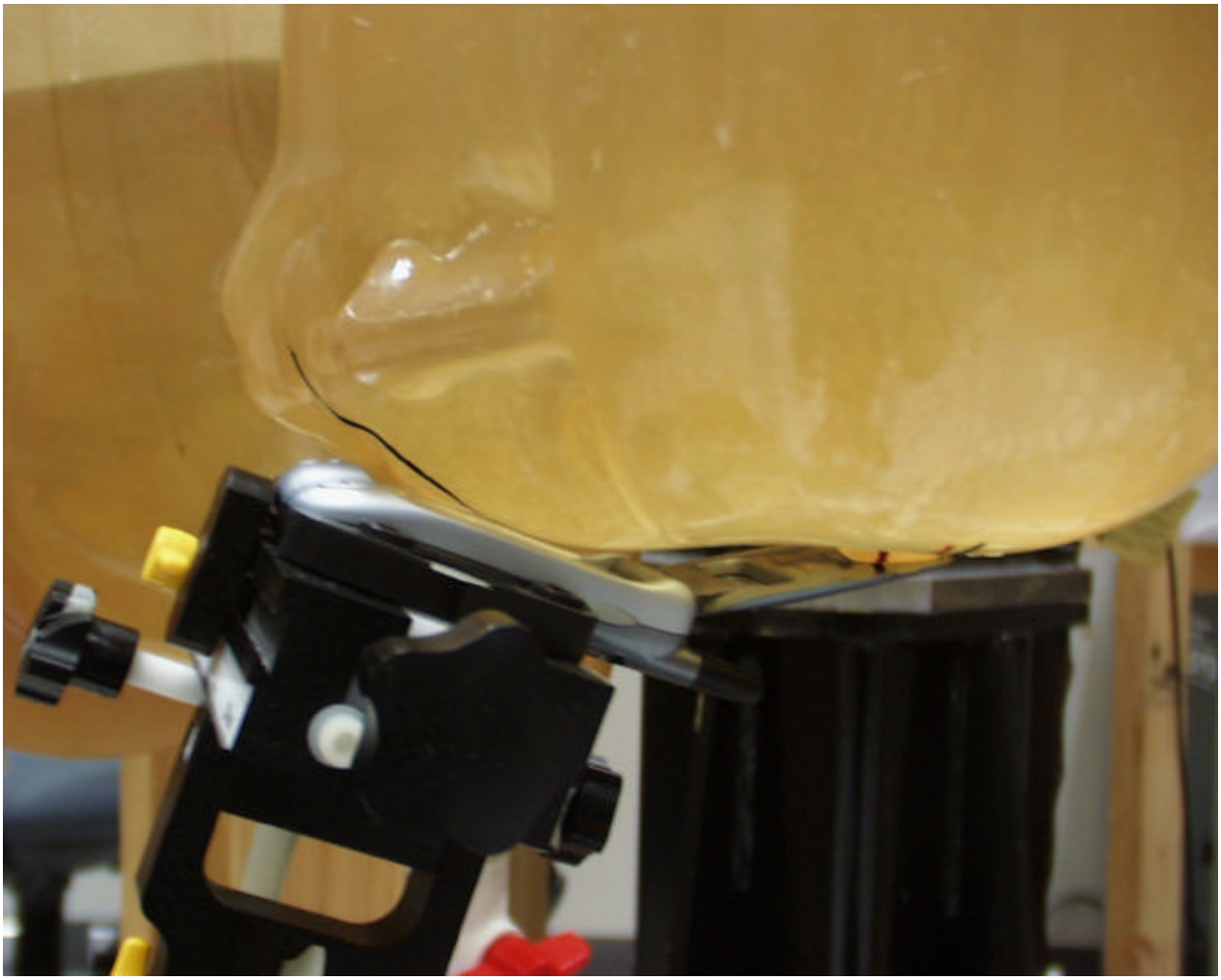


Figure F. Phone Against The Head

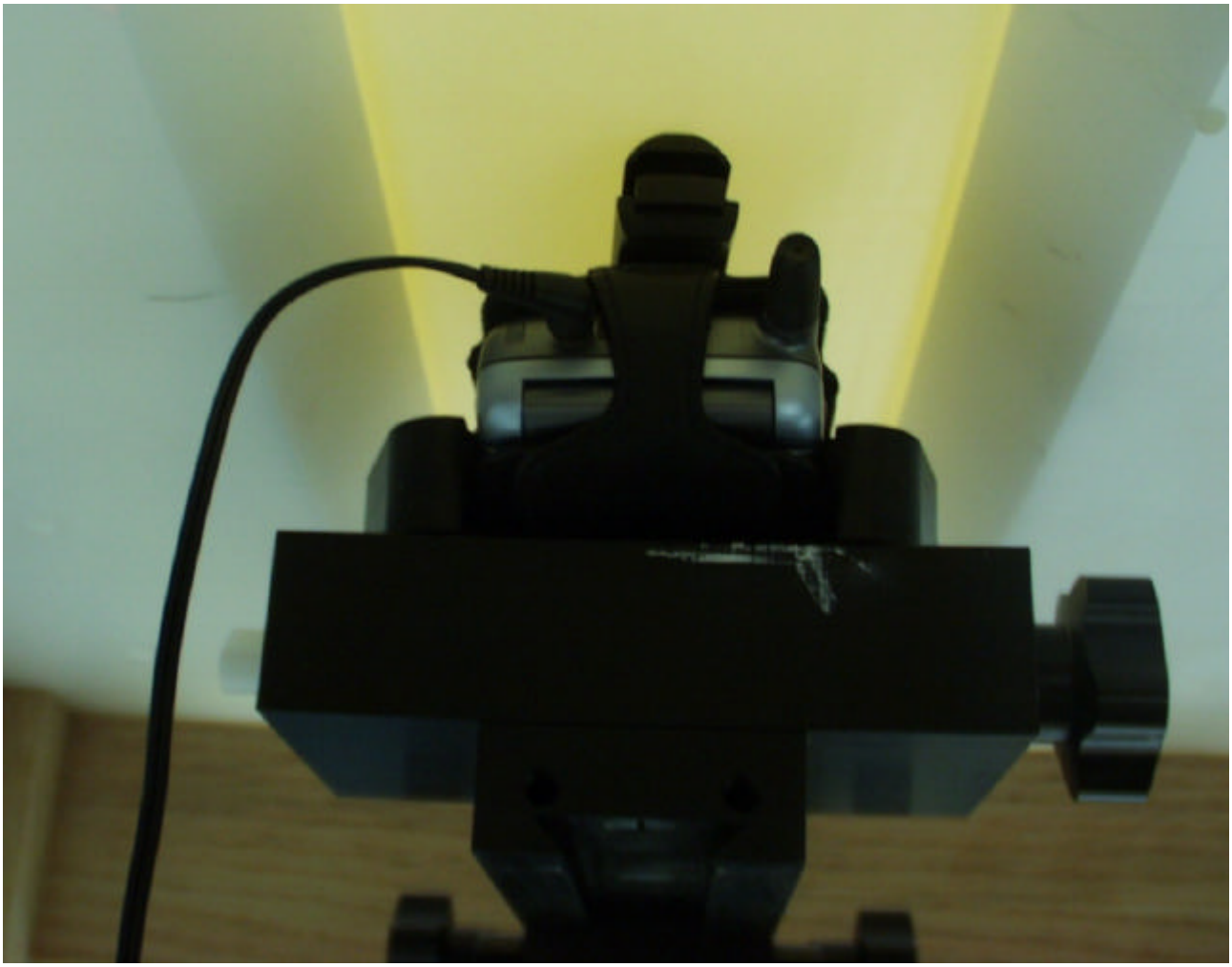


Figure G. Phone in the Body Worn Configuration with Head Set