1.0 Environmental Evaluation for Occupational RF Exposure -- Pursuant 47 CR2.1093 (d)(2)

1.1 **General Information**

FCC ID: AZ489FT5792

Device category: Portable Radio

RF exposure environment: uncontrolled

Test method: Measurement

The test results included herein demonstrates that the highest level SAR measurements are well within the FCC limit of 1.6 W/kg, per the requirements of 47 CFR 2.1093(d)(2).

1.2 **Antenna Description**

Antenna type: monople (x) dipole ( ) Helix (x) Patch ( ) Other ( )
1/2 wave whip when extended and 1/4 wave helix when retracted

Antenna Location on Device: Left ( ) Right (x) Top (x) Bottom ( ) Front ( ) Back ( )

Antenna Dimensions:		
	Length (extended)	13.0 cm
	Diameter (at tip of antenna)	0.58 cm
	Diameter (at middle of antenna)	0.16 cm
	Diameter (at base of antenna)	0.36 cm

Antenna configuration: Fixed ( ) Retractable (x) External ( ) Other ( )

Antenna Gain: 2.11 (dBi) Extended Antenna Gain: 0.42 (dBi) Retracted

1.3 **Test Signal**

Test signal source: Test mode (x) Base Station ( ) Simulator ( ) Other ( )

Signal Modulation: C.W. ( ) TDMA (x) Other ( )

1.4 **Output Power**

Output power measurement conditions: Free Space radiated ( )
SAR test configuration ( )
Conducted (x)

Output power measured with: Power meter (x)
Base Station Simulator ( )
Spectrum Analyzer ( )

Measured Output Power before and after SAR runs

Measurements made with the radio operating with 1/6 multiplexing (16.67% duty cycle)

Output Power Measured at Frequency (MHz)	Max. Output Power Measured Before SAR with Fully Charged Battery (mWatts)	Max. Output Power Measured After SAR (mWatts)
806.0125	670	670 after 16 mins
813.5625	640	640 after 19 mins
820.9875	620	620 after 15 mins

No battery changes made during SAR runs.

1.5 **Test Position**

The following describes the three test positions used to perform SAR measurements on the portable radio:

1. Head - The portable radio is positioned in a normal telephone operating position by aligning the axis of the radio with a line from the center of the ear to the corner of the lips, center the listening area of the test radio over the ear canal. Next, position the radio as close as possible to the phantom, preferably with three points of contact with the phantom to allow for best coupling to the simulated tissue.
   SAR measurements were performed with the radio antenna extended and retracted.

2. Face - The portable radio is positioned in the right hand of a full body phantom in a normal two-way radio operating position and the radio's normal speaking area is aligned with the center of the phantom's mouth.
   SAR measurements were performed with the radio antenna extended and retracted.

3. Abdomen - The portable radio is positioned in a leather carry case with belt clip as well as a plastic carry holder accessory beneath the abdomen of the full body phantom with the back of the radio facing the abdomen, the keypad/display facing the floor. An interface cable between the radio connector and an earpiece/microphone is connected to the radio to allow telephone or two-way radio operation and the antenna is made to be as parallel as possible to the phantom.
   SAR measurements were performed with the radio antenna extended and retracted.

Reference figures: 1, 2, and 3 for portable radio antenna orientation and distances relative to phantoms.

1.6 **Measurement Uncertainty**

The table below list an estimate of the possible errors that are associated with the measurement system.

	ERROR (%)
a) Measurement of the conductivity of tissue simulant	+/- 3
b) Temperature rise calibration of probe	+/- 5
c) Measurement of thermal capacity of tissue simulant	+/- 5
d) Accuracy of a repeatable radio position	+/- 1
e) Probe isotropic response	+/- 12

Statistically it's unlikely that any of the errors are correlated thus, it's reasonable to use a Root -Sum - Squared calculation to estimate the total system error of +/- 14.3%.

1.7 **Measurement System and Phantom Description**

Description of Measurement System and Performance:

The measurement system used to evaluate the portable radio SAR consist of a small diameter Isotropic electric field probe, multiple axis probe positioning system, differential amplifiers, high impedance cables connecting the probes to the differential amplifiers and the amplifier output to a computer, IDX FLEXWARE software version 3.56, robotics arm with its extension, a custom probe holder, and supporting equipment to calibrate the probe and characterize the simulated tissue material. The measurement system has sensitivity of 10 micro-Watt/g. Linear response up to 20 mW/g. The system is calibrated using thermal measurements of SAR in muscle and brain simulated tissue at the frequency band of interest.

Description of Positioning System and Performance:

The Intelledex Microsmooth Model 660 six-axis robotics arm is used to position a small diameter Isotropic electric field probe inside a human shaped phantom with a solution that mimics the Electrical characteristics of human brain or muscle tissue. Communication with the robot is by a hand held controller and over an RS-232 link. Reference Intelledex MicroSmooth 660 Operation Manual. The positioning system performance is based on a 1 mm positioning repeatability.

Overall System Performance Verification Procedure:

Established procedures within the Motorola Worldwide CGISS (formerly LMPS) EME Lab are Routinely followed to verify the overall system performance. They consist of calibrating the electric field probe together with the system instrumentation for each frequency band of interest and measuring the simulated tissue conductivity and dielectric constant to ensure that they are within established specs.

RF Susceptibility Verification Results:

No change is produced in the voltage offsets of the measurement system instrumentation amplifiers as a result of positioning a transmitting radio around the amplifiers and cables or when the transmitting radio is moved around the lab. The radio used to cause RF interference to the measurement system is made to transmit in the same band and with comparable output power as the radio to be tested by the measurement system. The measurement system immunity to unwanted RF exposure is accomplished by providing the probe leads that connect to the

instrumentation amplifiers with shielded EMI cables, enclosing the instrumentation amplifiers in a shielded housing, connecting the instrumentation amplifiers to the computer equipment with high impedance cables, using RF absorbing cones throughout the lab to minimize reflections, providing enough distance between the computer equipment, positioning system and probe to eliminate unwanted coupling.

System Verification Results:
Overall system results are verified by performing SAR measurements with a reference radio, at the frequency band of interest, and then comparing the results to previously measured data using the same reference radio.

Description of phantom:
Human shaped, solid shell device made of Fiberglas and mounted on a non metallic base or stand. The phantoms used in the Motorola CGISSS EME Lab are the half body or torso (left and right ear version, no arms) and a lay down full body (6 feet tall).

Phantom Types: Full body (x)

Abdomen Thickness: 0.15 cm

Face Thickness: 0.15 cm

Torso (x)

Torso's Head: Left Ear (x) Right Ear (x)

Left Ear Thickness: 0.5 cm

Cheek Thickness: 0.15 cm

1.8 **Simulated Tissue Properties**

Type of simulated tissue used: Muscle (x) [Full Body] Brain (x) [Torso]

Simulated tissue composition (% by weight) for : Muscle (x) Brain (x)

Di-Water:	53.50%	Di-Water:	43.75%
Sugar:	44.25%	Sugar:	54.00%
Salt:	1.15%	Salt:	1.15%
HEC:	1.00%	HEC:	1.00%
Dowicil 75:	0.10%	Dowicil 75:	0.10%

Note: HEC (HYDROXYETHYL CELLULOSE) is a gelling agent and Dowicil 75 is anti-bacterial compound.

Characterization of Simulated tissue materials and ambient conditions:
Simulated tissue prepared for SAR measurements are measured at room temperature and verified to be in spec prior to actual SAR measurements by filling a coaxial slotted line with the tissue and probing the amplitude and phase changes versus distance in the simulated tissue. A HP8753D Network Analyzer is used to perform the measurements.

Measured simulated tissue dielectric constant and conductivity used in SAR runs as of 5/17/99

Simulated tissue dielectric constant:	Muscle: 52.7	Brain: 43.3
Simulated tissue conductivity:	Muscle: 1.10 S/m	Brain: 0.9 S/m
Simulated tissue density:	1.25 g/cubic-cm	

Note: Simulated tissue dielectric constant and conductivity have been rounded off to one and two significant digits after the decimal point respectively, to take into account the tissue's measurement uncertainty.

1.9 **Electric Field Probe Descriptions and Calibration**

Electric Field Probe Description and Performance:
The electric field probe is a three channel device used to measure RF electric fields. The probe Sensors consist of three mutually orthogonal dipoles, each 2.5 mm in length. Located at the center of each of the three dipoles is a Schottky diode detector. For each channel of the probe, the dipole and two high impedance lines are vapor deposited on a quartz substrate. The three substrates are mounted on a non conductive RF transparent support which has a I-beam cross section. Along the support are three pairs of high impedance lines which connect the substrate to a single output connector. The probe is enclosed in a protective sleeve to avoid contact with the corrosive elements
of the simulated tissue. The total length of the probe is approximately 25 cm. The electric field probe is isotropic and its performance is such that no significant field perturbation from the probe occurs during measurements.

Probe type: Electric Field (x) Magnetic ( ) Other ( )
Probe S/N: P040

Electric Field Probe Calibration Procedures:

The SAR measurement system is calibrated as a single unit and is performed in two steps.

1) Correlation of the measured free space electric field and the measured electric field in the medium to temperature rise in a dielectric medium.

   a. A RF transparent thermistor based temperature probe (Vitek Electrothermia Monitor #101) and an isotropic electric field probe are placed side by side in a planar phantom while both are exposed to RF energy from a half wave dipole antenna located below the phantom.

   b. The location (hot spot) of maximum electric field concentration on the phantom's surface is determined. Then the electric field probe is moved sideways so that the temperature probe, while affixed to the electric field probe, is placed at the previous location of the electric field probe. Temperature changes for 30 second exposures at the same RF power levels used for the electric field measurements are recorded.

   c. The conversion factor, which scales the electric field in terms of the thermally derived SAR, is determined.

2) Determination of free space electric field from amplified probe outputs in a test RF (TEM cell) field.

   a. A RF signal generator is connected to the input of a TEM cell manufactured by IFI (Instruments For Industries) and the output of the cell to a RF HP 437B power meter. The RF signal generator is adjusted so that the power density inside the cell is 1 mW/sq-cm. For the IFI model CC-110, the corresponding power level is 271 mW.

   b. The probe is inserted through the side aperture of the TEM cell with the positioning system and the tip of the probe, where the probe detectors are located, is lowered 3.5 inches inside the volumetric center of the cell. Once the prescribed probe position inside the cell is achieved, it must be maintained during the measurements.

c. The probe is rotated 360 degrees on its axis while the RF power level from the signal generator is maintained constant throughout the calibration.

d. Software indicators will show the maximum measured value on each of the three channels While the probe is being rotated through 360 degrees. The maximum measured values are referred to as amplifier settings and they are the factors necessary to adjust each channel of the measurement system so its indicated output can then be equated to the RF field.

Media and Frequency for E-Field Probe Calibration

Media: Air Frequency: 835 MHz
Media: Simulated Muscle and Brain tissue Frequency: 835 MHz

Probe Offset: 3 mm

Probe Isotropic Response: +/- 12% deviation from isotropy in tissue located in flat phantom.

E-Field Probe Calibration Factor Muscle: 0.928 mW/g Brain: 0.644 mW/g

Probe Initial Thermal Derived SAR Calibration Date: 1/6/99; Next Due Date: 1/5/2000
Probe Free Space Calibration Date Prior to SAR Measurements: 5/18/99.

1.10 **SAR Measurement Parameters, Procedures and Results:**

SAR test frequencies: 806.0125 MHz, 813.5625 MHz, 820.9875 MHz.

The radio is marketed as a handheld transceiver capable of operating as a telephone, traditional two-way (dispatch) radio, or modem. An associated base station allocates a number of 15 msec. time division multiplex (TDM) time slots in which the transceiver transmits depending on the user requested transmission mode. The trunking system protocol for voice transmission uses a 90 msec. frame divided into six 15 msec. time slots. PSTN (phone mode) interconnect calls utilize 2 time slots (2/6 multiplexing) with a 33.33% duty cycle. Two-way radio dispatch transmissions are accomplished using one time slot (1/6 multiplexing) with a 16.67% duty cycle.
Circuit data mode is one in which the transceiver functions as a wireless RF modem which utilizes two time slots. In the packet data mode, the protocol uses a multiple of voice/circuit data mode frames with a duty cycle that varies with the RF environment. The worst case duty cycle of 67.5% occurring with 20 frames (120 time slots).

The operating position when the radio is used as a telephone with a 33.33% duty cycle is to position
it adjacent to the head as described in Fig 1.

The standard operating position when the radio is used as a traditional two-way radio (dispatch) with a 16.67% duty cycle is to position the radio with a separation distance of 1-2 inches (2.5cm – 5cm) between the radio microphone and the user's lips. Reference the safety section of the User Manual provided with the radio.
The phantom's palm in which the radio is positioned to perform the test is fixed. Refer to Fig 2, which shows the dispatch test set up configuration. When the radio was tested in the phantom's palm, the separation distance between the tip of the phantom's nose and the radio case was actually 2 mm and thus, constitutes the smallest distance for the device. In the standard operating position, the body of the radio does not touch the user's nose.

Several accessories marketed as separate items are available which influence possible operating conditions of this handheld transceiver. These include some body-worn items such as a leather carry case with belt clip which is intended to be attached to a user's belt, and an interconnecting cable to peripheral devices such as a body-worn ear-piece with microphone. The combination of carrying case and audio accessory devices when worn on the body permits the handheld transceiver to be operated as a telephone with a 33.33% duty cycle or as two-way radio with a 16.67% duty cycle as described in Fig 3.

All SAR measurements performed with the radio positioned in the described test positions and user modes were done while the radio was operating with a 16.67% duty cycle.

Description of coarse scan region (for highest measured SAR values obtained per test position):

A coarse scan of the radio was performed to determine the hot spot location with the radio positioned in the head, face and abdominal test position, described in the coarse scan region plot for runs 99052613_AREA.VLT, 99052522_AREA.VLT, and 99052109_AREA.VLT, respectively.

Coarse Scan Area (Head Position): x = 12 cm, y = 7 cm, z = 0 cm Scan resolution: 1 cm
Coarse Scan Area (Face Position): x = 11 cm, y = 7 cm, z = 0 cm Scan resolution: 1 cm
Coarse Scan Area (Abdomen Position): x = 15 cm, y = 5 cm, z = 0 cm Scan resolution: 1 cm

Description of fine scan region (for highest measured SAR values obtained per test position):

Subsequent to and based on the above coarse scan regions, a finer scan region centered around each of the peak SAR locations were scanned, to determine the one gram average SAR. Reference the plots for runs 99052613_ZOOM.VLT, 99052522_ZOOM.VLT, and 99052109_ZOOM.VLT.

Fine Scan Area (Head Position): x = 2 cm, y = 2 cm, z = 0 cm Scan resolution: 0.25cm
Fine Scan Area (Face Position): x = 2 cm, y = 2 cm, z = 0 cm Scan resolution: 0.25cm
Fine Scan Area (Abdomen Position): x = 2 cm, y = 2 cm, z = 0 cm Scan resolution: 0.25cm

Note: The 0,0 location of the scan area is chosen to be at the radio antenna interface.

Identification of peak SAR location:
Reference the contour plot (run # 99052109_ZOOM.VLT) for the highest measured peak SAR

location on the radio.

Highest peak SAR (W/kg) and its test configuration:

1) Highest measured peak SAR = 1.0 mW/g and it occurred at the surface of the phantom when the radio is in the abdominal position with the antenna retracted and operating in telephone mode. Reference the field attenuation SAR curve for run 99052109_ZOOM.VLT.

2) Highest measured one-gram averaged peak SAR (W/kg):
The measured 1-gram averaged peak SAR = 0.5996 mW/g but, will be rounded to 0.6 mW/g. The1-gram averaged peak SAR was measured at the low end of the band (806.0125 MHz). Reference run # 99052109_ZOOM.VLT.

Generally, radios are measured at the middle of the operating band in the CGISS EME Lab at Motorola and the calculated maximum 1 gram averaged SAR value is determined by scaling up the SAR by the same ratio as the maximum power delivered to the radio antenna connector under any conditions of permissible tuning, frequency, voltage and temperature. For this reason, the radio Maximum Calculated 1 gram averaged peak SAR becomes:

Maximum Calculated 1 gram Averaged Peak SAR = [(A / B) x (C x D)]

A = Maximum pulse average power delivered to the antenna connector under any conditions of permissible tuning, frequency, voltage and temperature.

B = Lowest pulse average power measured (low end of the band 806.0125 MHz) at end of SAR.

C = Measured 1 gram averaged peak SAR at a duty cycle equal 16.67%.

D = D1 x D2

D1 is the transmission mode duty cycle, i.e., the ratio of the user requested transmission and the tested mode.

D2 is the Push To Talk duty cycle. For two-way radio (dispatch) = 0.5, data and telephony =1

Max. Calc. 1-gram Avg Peak SAR = (0.72W/0.67W x 0.5996 mW/g x 33.33%/16.67% x 1)=1.29 mW/g

Refer to table 1on the following page for other SAR test positions and measured 1-gram averaged SAR values.

SAR Distribution of Worse Case Test Results:

Based on the description for scaling up the measured SAR 1-gram averaged peak value, refer to table 1 for variation of test frequency and antenna position relative to the phantom; and to table 2 for the highest calculated SAR values by expected operating conditions.

TABLE 1

MEASURED SAR MATRIX

(Measurements made with radio operating with 1/6 multiplexing 16.67% duty cycle)

RADIO SERIAL NO.	ANTENNA POSITION	TRANSMIT FREQENCY	SAR (mW/g)		
			ABDOMEN	FACE	HEAD
Separation distance from antenna to closest body part:			2.0 cm	5.3cm	2.6 cm
831AZKE547	RETRACTED	HIGH	0.54 (Batt. #1)	0.10 (Batt. #2)	0.27 (Batt. #2)
831AZKE547	EXTENDED	HIGH	*<=0.33	*<=0.10	*<= 0.16
831AZKE547	RETRACTED	MID	0.56 (Batt. #1)	0.10 (Batt. #2)	0.27 (Batt. #1 or 2)
831AZKE547	EXTENDED	MID	*<=0.33	0.04 (Batt. #2)	0.16 (Batt. #1 or 2)
831AZKE547	RETRACTED	LOW	0.60 (Batt. #1)	0.11 (Batt. #2)	0.27 (Batt. #2)
831AZKE547	EXTENDED	LOW	0.33 (Batt. #2)- NOTE 4	*<=0.11	*<=0.16

NOTES: 1) * Other measurements indicated that the higher SAR depositions were with the antenna retracted.

2) Measured 1-gram averaged peak SAR values in the table have been rounded off to two significant digits after the decimal point, to take into account the probe's measurement uncertainty.

3) Battery (thin) #1 (NTN8970A, AAA NiMH), Battery (thick) #2 (NTN8971A, AA NiMH)

4) At a distance of 3.5cm, the radio with Swivel Belt Clip Holster measured SAR is 0.06 mW/g.

SAR Compliance for the Hand:

It was determined during a radiated test with the radio clutched in the hand of a test subject that 134 mW of RF energy was uniformly distributed in the hand. Since the mass of the test subject's hand was about 220 grams, this represents a SAR of 0.69 W/Kg. This is substantially below the limit of 4 W/Kg and thus, the radio is compliant with 47CFR 2.1093(d)(2).

The measurement method employed to determine the power deposited was to first observe the power radiated in an anechoic chamber while the radio was transmitting in free-space condition. Then the radio was clutched in the hand of a subject, and the decreased in radiated power was observed.

TABLE-2

Maximum Calculated SAR by Expected Operating Position and Conditions

MEASUREMENT POSITION	HIGHEST MEASURED SAR DEPOSITION	MAXIMUM OPERATIONAL DUTY CYCLE AND MODE	OPERATIONAL MAXIMUM CALCULATED SAR
Abdomen (with leather carry case & audio accy.)	0.60 mW/g	33.33% - with attached accessory cable for remote ear-piece/microphone	1.29 mW/g
Abdomen (with plastic carry holder)	0.06 mW/g	67.5% - for data mode operation	0.26 mW/g
Face	0.11 mW/g	16.67% - 2-way dispatch	0.06 mW/g
Head	0.27 mW/g	33.33% - Telephone	0.58 mW/g
Hand	0.61 mW/g	33.33% - Telephone	0.69 mW/g

Description of procedures used to extrapolate SAR to phantom surface:

The highest local SAR occur at the surface of the phantom. There is a 3 mm probe offset from the physical end of the probe to the probe detectors. The probe offset make it necessary to extrapolate to the peak surface SAR from the SAR measured at a short distance from the surface.

At the measurement point on the phantom surface where the highest probe voltage is recorded (a.k.a. hot-spot), 11 probe voltage measurements are performed starting as close as possible to the phantom surface and every 0.5 cm thereafter along a path normal to the probe axis (+z - axis) for a distance of 5 cm. An exponential decay of the energy density with depth is calculated using the first three probe voltage measurements nearest the surface. The extrapolated peak surface voltage is calculated from the following relation:

Peak Surface Voltage = (V1) x (Exponential Decay)

where: V1 is the first voltage measurements along a path normal to the probe axis.

Exponential Decay = e{Ln (Slope) x (Offset / Spacing)}

Slope = [(V1/V2) + (V2/V3)] / 2

where: V1, V2 and V3 are the first, second and third voltage measurements along a path normal to probe axis, respectively. Reference the first three measured voltage values from run # 99052109_ZOOM.VLT.

Offset = Distance from center of probe dipoles to outside of probe case

Spacing = Distance between measurement points (in +z-axis)

The peak SAR, at the surface, is calculated as follows:

Peak SAR (at surface) = Peak Surface Voltage x (Probe Calibration Factor / Sensor Factor)

where: Sensor Factor = 10.8 mV/mW/sq-cm

Description of 1-gram average procedures, highest SAR gradient at peak location (W/kg/mm):

1-gram avg SAR = (Peak Surface Voltage + 1 cm Voltage)/2 x Probe Calibration Factor/Sensor Factor

Peak Surface Voltage is described above and the 1cm Voltage is an interpolated voltage, representative of the voltage 1 cm above the surface of the phantom.

The derivative of the peak SAR is the gradient at the peak location.

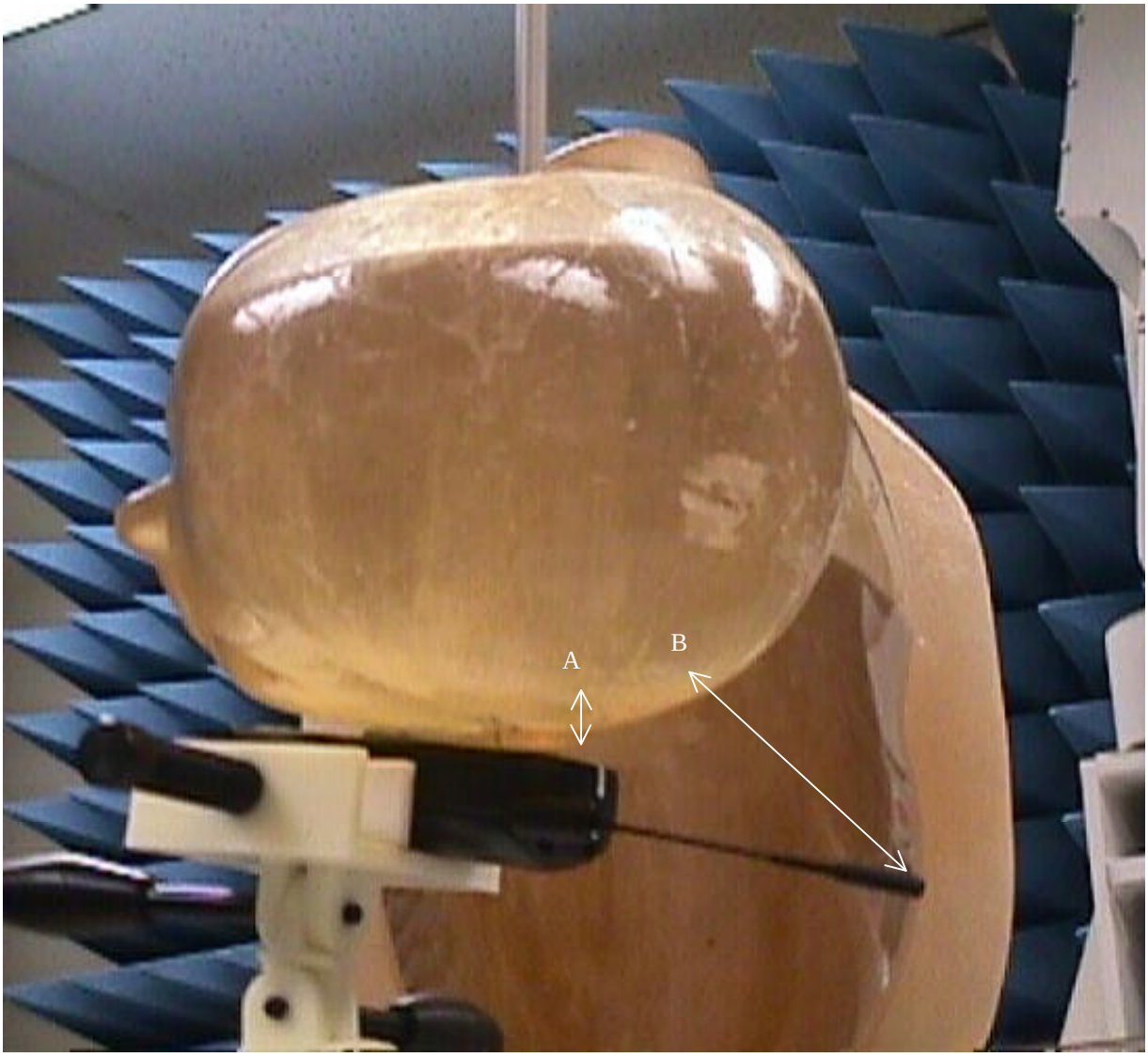
Gradient (at peak SAR location) = [Ln (slope) x Peak SAR] / Spacing

Gradient (at peak SAR location) is 0.16 W/Kg/mm. The calculation was determined using the Measured values from run # 99052109_ZOOM.VLT.

FIG. 1A HEAD POSITION - LEFT EAR

<====
(+x Axis)

====>
(-x Axis)



Radio with antenna extended & thin battery (NTN8970A)

DIM A = Distance from surface of antenna base to phantom head = 20 mm

DIM B = Distance from surface of antenna tip to phantom head = 65 mm

Legend: Torso filled with simulated brain tissue on non RF support fixture and radio affixed to head.

(+y) Axis is out of the page, toward viewer and (-y) Axis is into the page, away from viewer.

FIG. 1B HEAD POSITION - RIGHT EAR

<====
(+x Axis)

====>
(-x Axis)

Radio with antenna retracted & thick battery (NTN8971A)

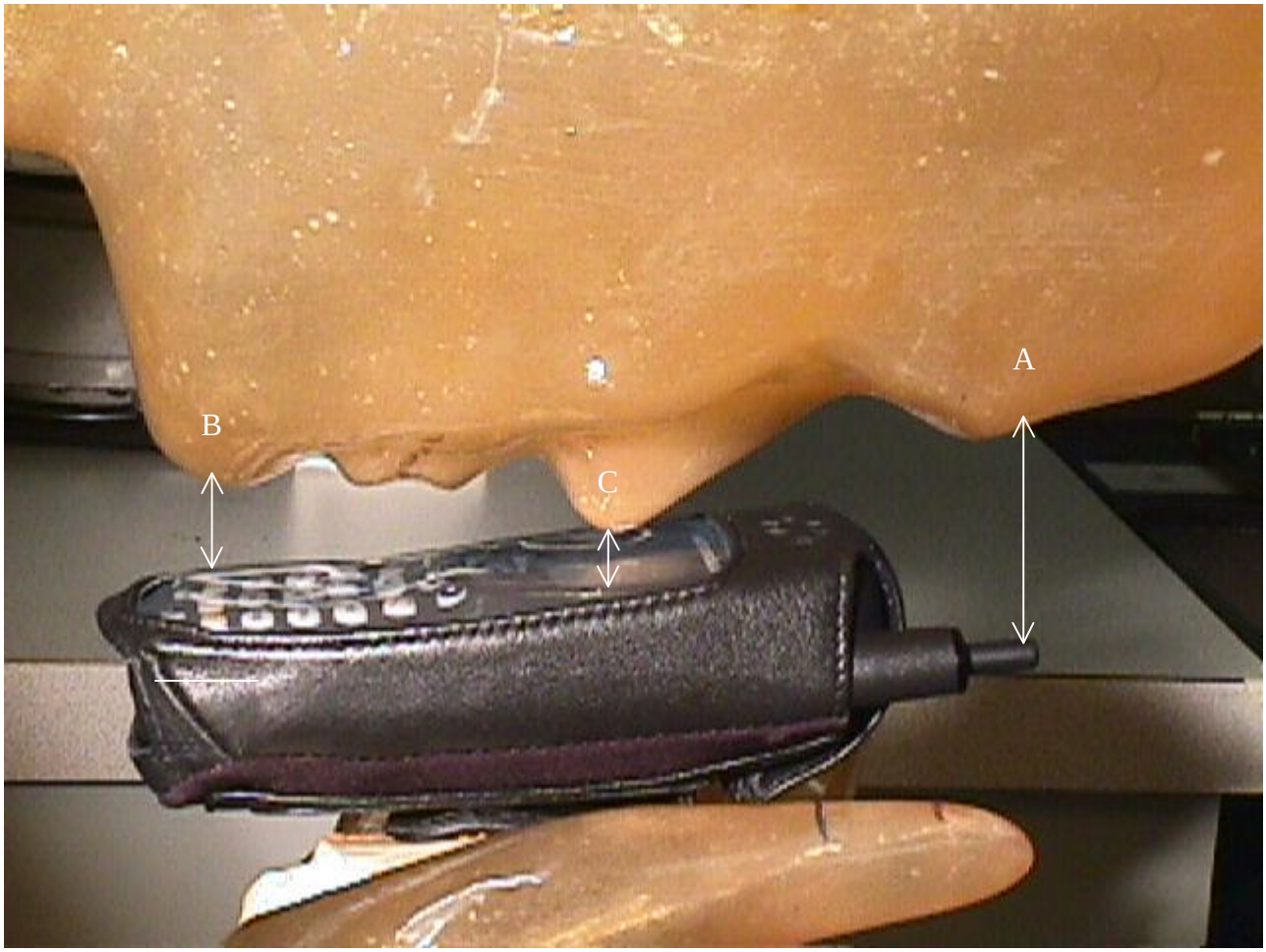
DIM A = Distance from surface of antenna base to phantom head = 26 mm

Legend: Torso filled with simulated brain tissue on non RF support fixture and radio affixed to head.

(+y) Axis is out of the page, toward viewer and (-y) Axis is into the page, away from viewer.

FIG. 2 FACIAL POSITION

<===== =====>
(+x Axis) Towards phantom's feet (-x Axis)



Radio in phantom's palm with leather case and thick battery (NTN8971A)
DIM A = Distance from center of phantom's forehead to antenna surface when the antenna is in the retracted position = 53 mm

DIM B = Closest distance between phantom's chin and radio surface = 14 mm

DIM C = Closest distance between phantom's nose tip and radio surface = 2 mm

Legend: Lay down full body phantom filled with simulated muscle tissue on non RF support fixture and radio in phantom's palm.
(+y) direction is out of the page, toward viewer and (-y) direction is into the page, away from viewer.

FIG. 3 ABDOMINAL POSITION

<== Toward Phantom's feet (+ x axis) Toward phantom's head (-x axis) ==>

Radio with antenna retracted in leather carry case/belt clip accessory, ear-piece with microphone audio accessory connected to bottom of radio and thin battery (NTN8790A)

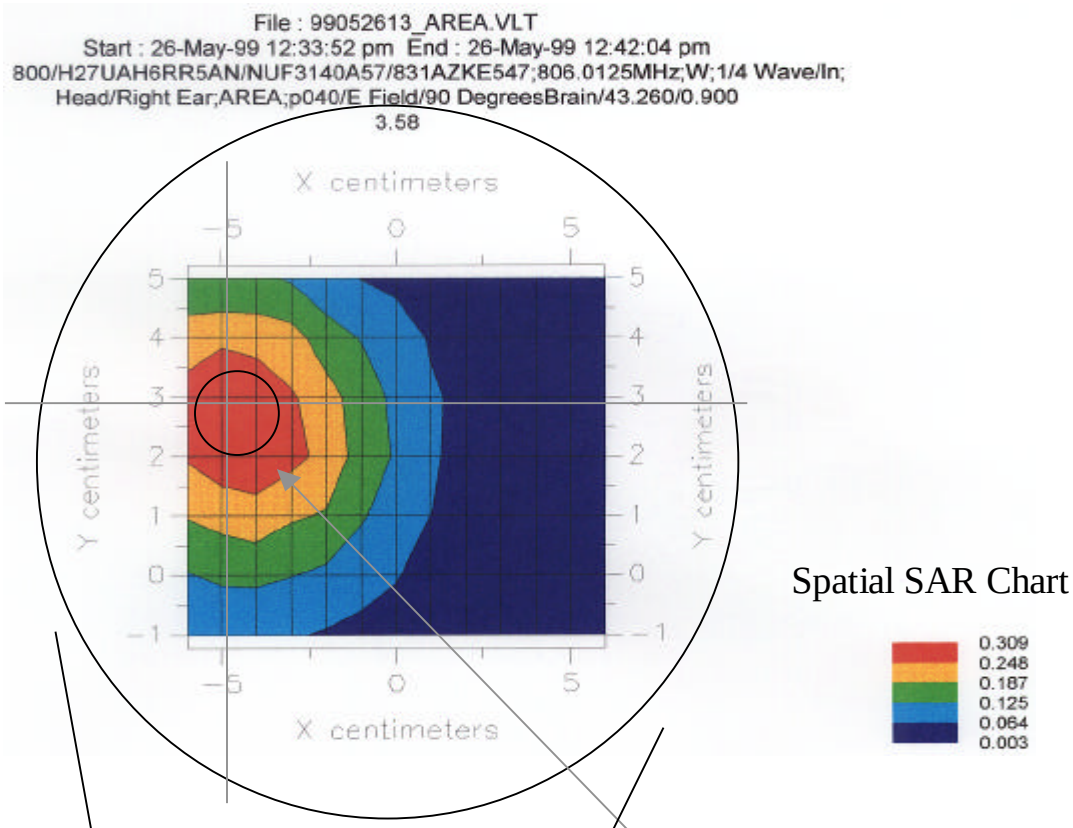
Dim A = Distance from surface of antenna base to phantom surface = 20 mm

Dim B= Distance from antenna surface tip to phantom = 21 mm

Legend: Lay down full body phantom filled with simulated muscle tissue on Non-RF support fixture and radio affixed to phantom's abdomen.

(+ y) axis is out of the page, toward viewer and (-y) axis is into the page, away from viewer.

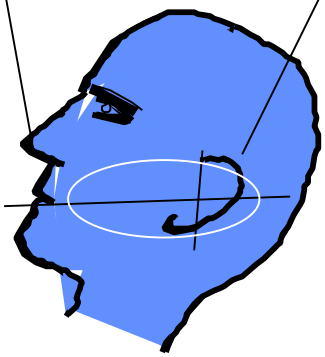
Head Position Coarse Scan Region



Spatial SAR Chart

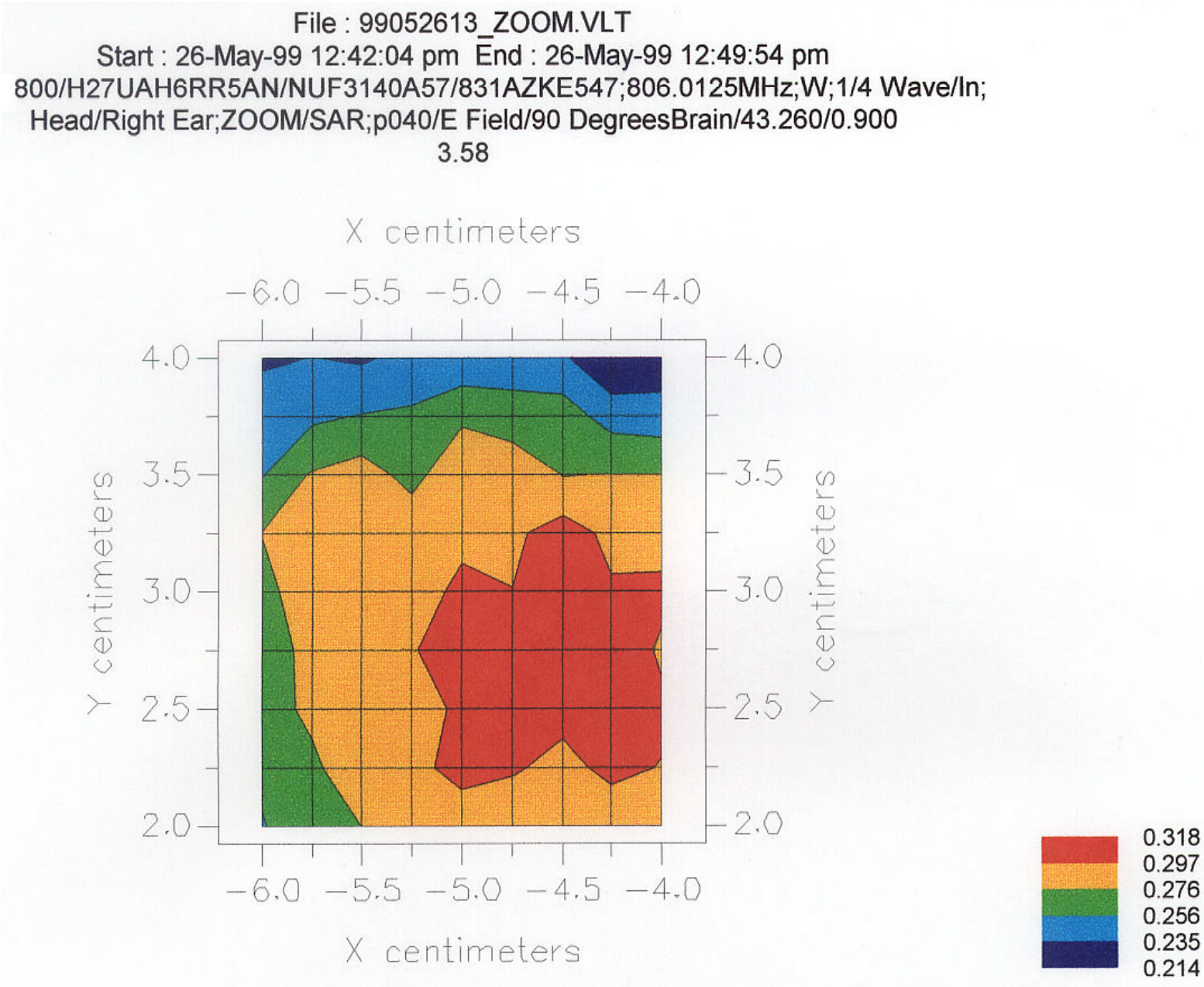
Radio

Antenna/Radio Interface



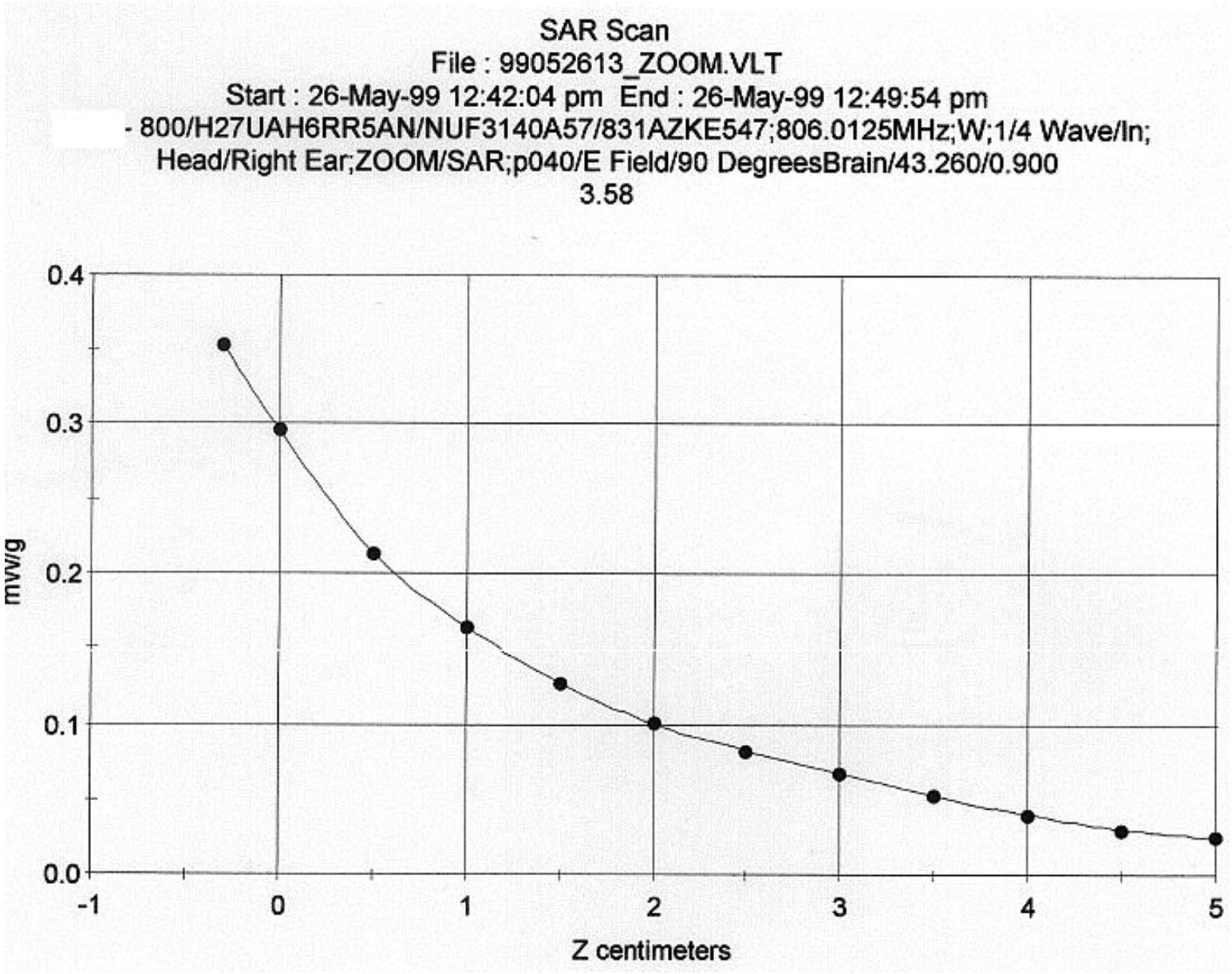
Partial View of Torso Phantom
As Viewed From Tissue Side

Head Position Fine Scan Region

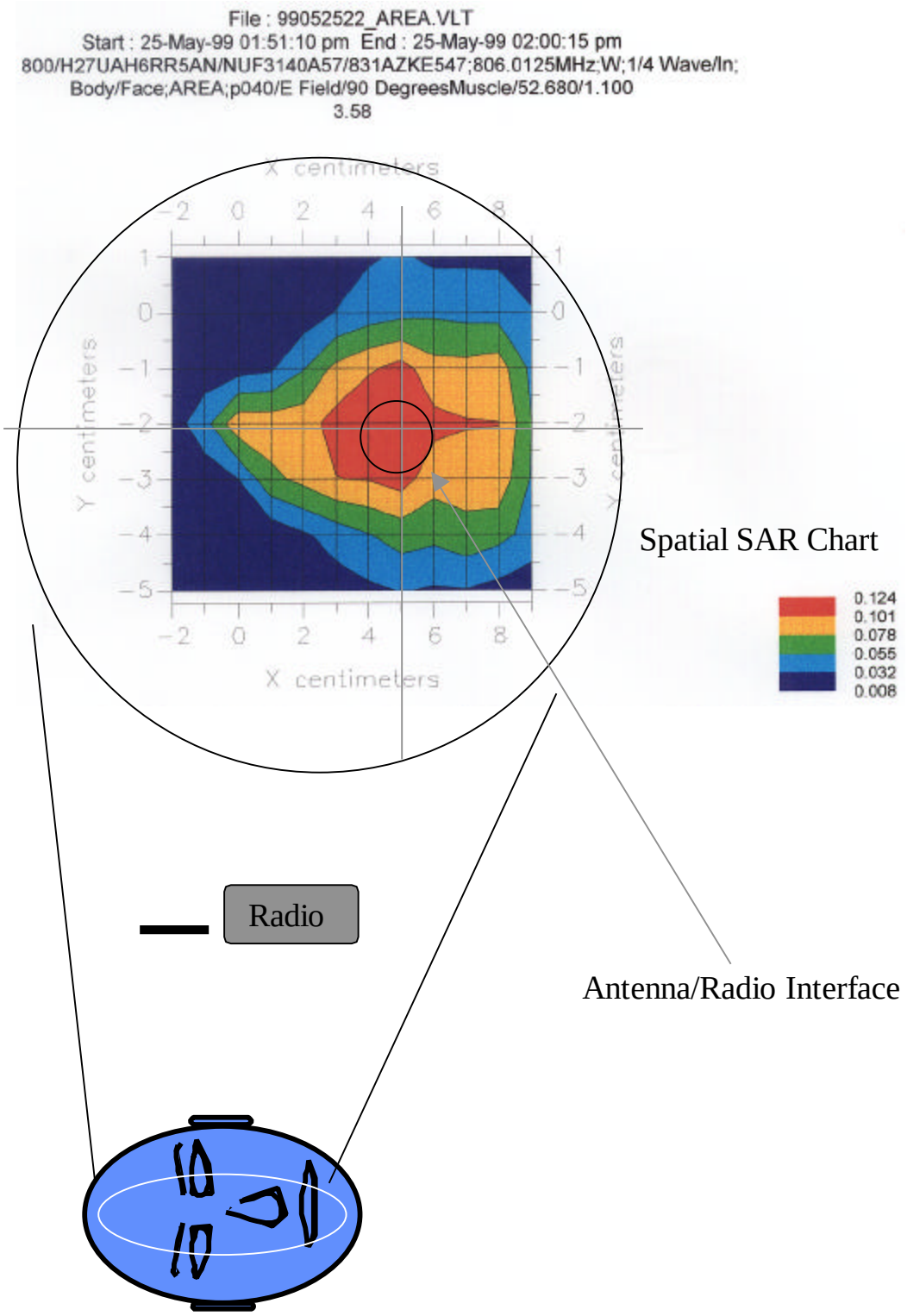


Head Position SAR Data

```
File  : c:/idx3/SYSTEM/SARMEAS3/data/Normal/99052613_ZOOM.VLT
Start : 26-May-99 12:42:04 pm  End : 26-May-99 12:49:54 pm
Ver   : 3.58

Radio Type       :      - 800
Model Number     : H27UAH6RR5AN/NUF3140A57
Serial Number    : 831AZKE547
Frequency        : 806.0125 MHz
Peak Trans. Pwr  : 0.720 W
Start Trans. Pwr: 0.670 W
Antenna Type     : 1/4 Wave
Antenna Posn.    : In
Phantom Type     : Head
Phantom Posn.    : Right Ear
Scan Type        : ZOOM/SAR
Probe Name       : p040
Field Type       : E Field
Orientation      : 90 Degrees

Mixture Type                  = Brain
Mixture Dielectric Constant = 43.260
Mixture Conductivity          =  0.900


Comment :
    Comment Line 1: Gain=10, Batt:NTN8971A, Ant:858136C01(Fix)
    Comment Line 2:Sample/Rate:5460/993. Ant => +X direction.
    Comment Line 3: Measurement taken w/ ROBOT36.ASC LOADED.


Robot   : CGISS Robot


Probe Offset         = 0.30 cm
Sensor Factor        = 0.0108
Conversion Factor    =  0.644


p040   Amplifier Channel Settings :  0.144   0.156   0.112


Max Location : X =  -5.000,  Y =   2.750,  Z =   0.000   (cm)  Value =   5.335


Measured Values (volts) =
  4.969E-003  3.572E-003  2.749E-003  2.141E-003  1.677E-003  1.383E-003
  1.128E-003  8.752E-004  6.684E-004  5.015E-004  4.126E-004


Calc. Voltage @ Surface (Vs) = 0.0059


Voltage @ 1.00 cm (Vt)       = 0.0032


Ave. Voltage (Vs+Vt)/2       = 0.0046


Ave. SAR over 1 g (mW/g)    = 0.2737
```


SAR Scan
File : 99052613_ZOOM.VLT
Start : 26-May-99 12:42:04 pm End : 26-May-99 12:49:54 pm
- 800/H27UAH6RR5AN/NUF3140A57/831AZKE547;806.0125MHz;W;1/4 Wave/In;
Head/Right Ear;ZOOM/SAR;p040/E Field/90 DegreesBrain/43.260/0.900
3.58
mW/g
0.4
0.3
0.2
0.1
0.0
-1
0
1
2
3
4
5
Z centimeters

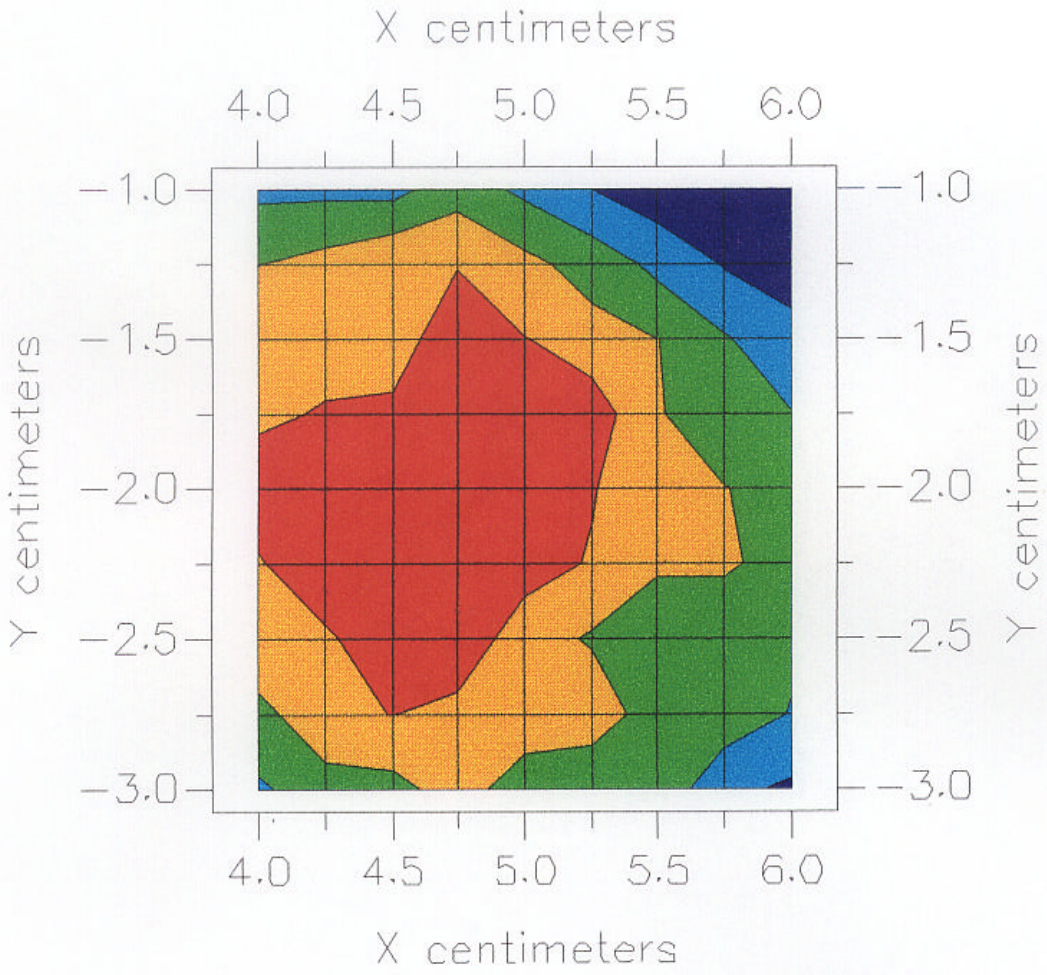
Facial Position Coarse Scan Region



Partial View of Full Body Phantom
As Viewed From Tissue Side

Facial Position Fine Scan Region

File : 99052522_ZOOM.VLT
Start : 25-May-99 02:00:15 pm End : 25-May-99 02:09:44 pm
800/H27UAH6RR5AN/NUF3140A57/831AZKE547;806.0125MHz;W;1/4 Wave/In;
Body/Face;ZOOM/SAR;p040/E Field/90 DegreesMuscle/52.680/1.100
3.58

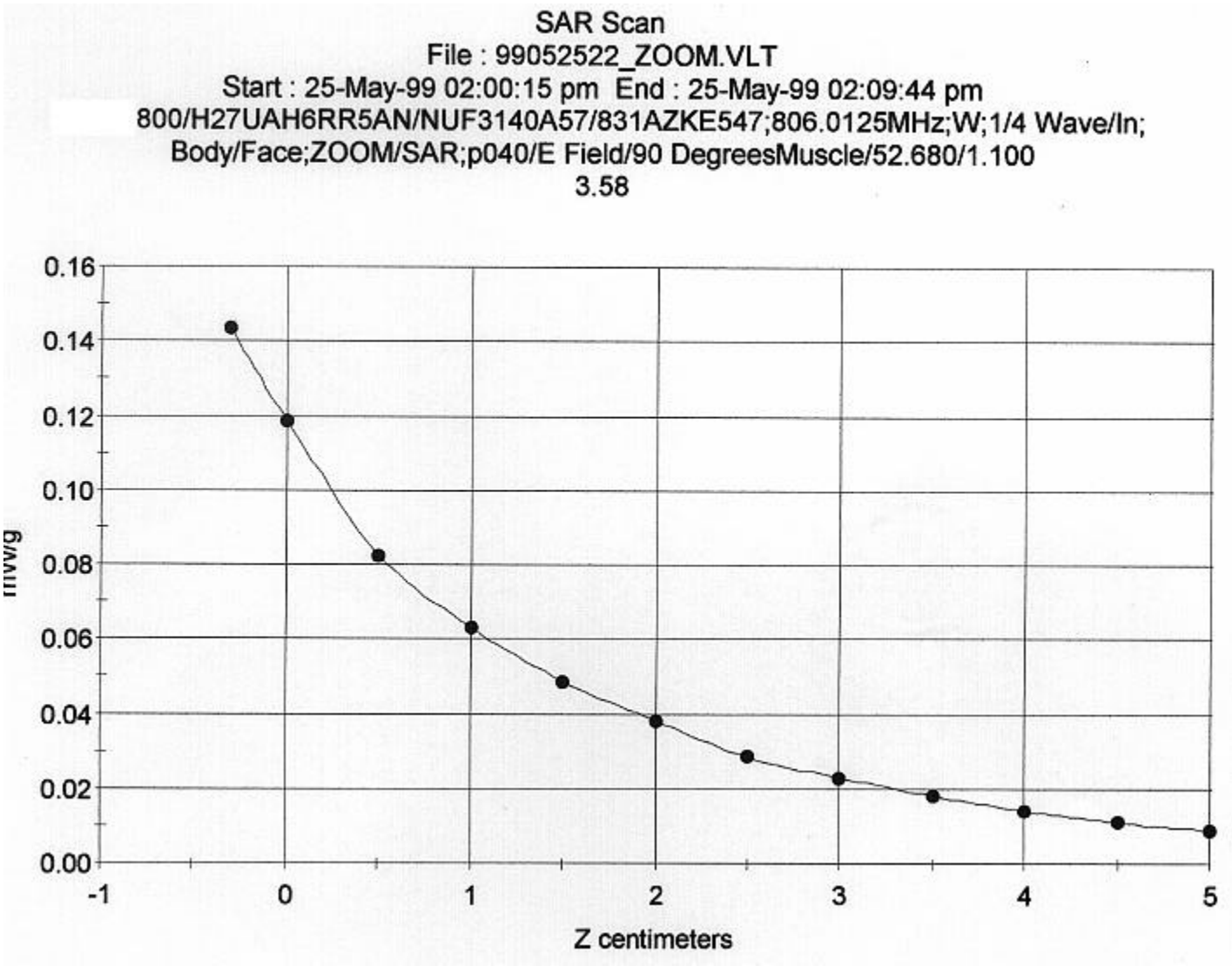


Spatial SAR Chart

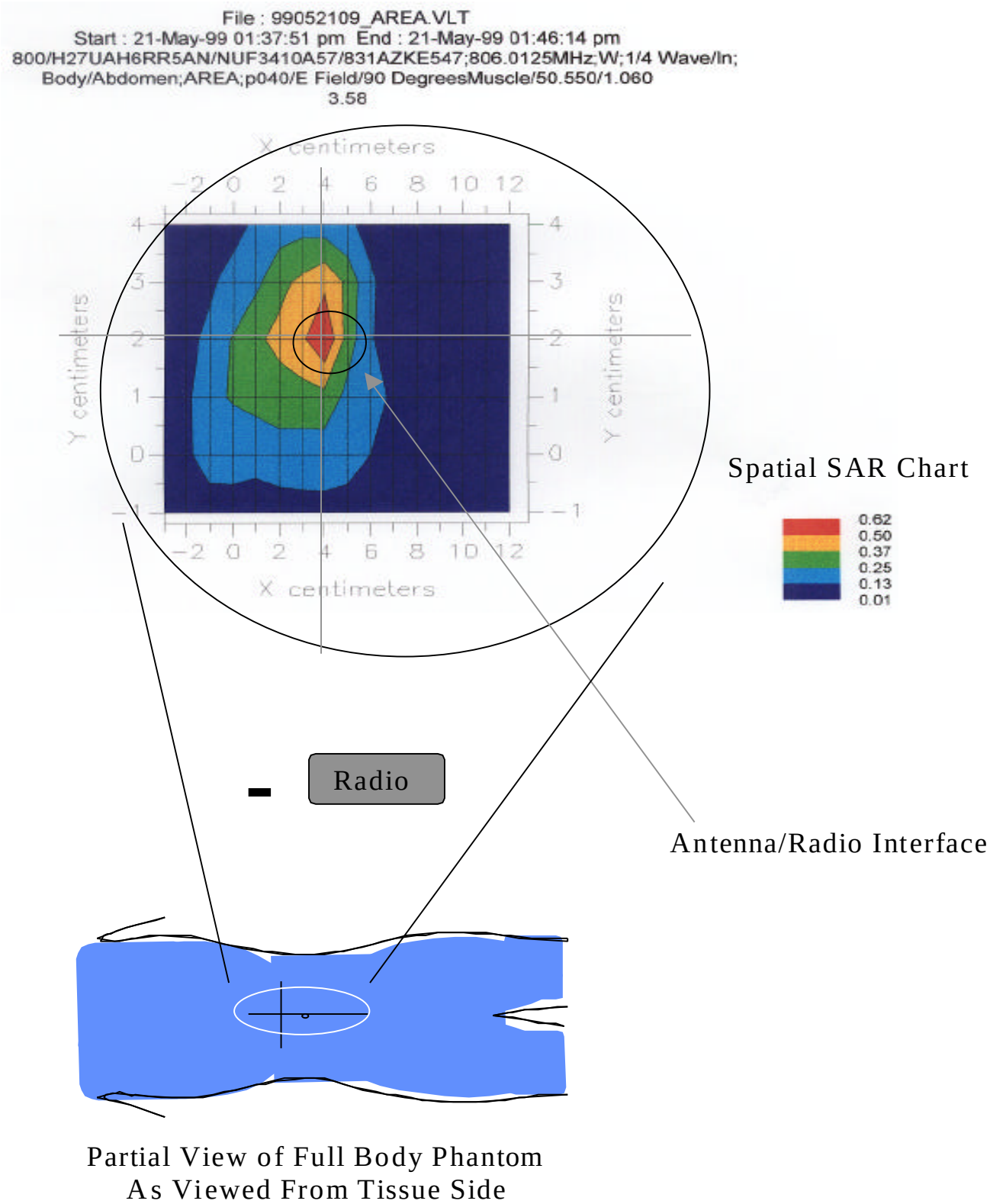
Facial Position SAR Data

```
File  : c:/idx3/SYSTEM/SARMEAS3/data/Normal/99052522_ZOOM.VLT
Start : 25-May-99 02:00:15 pm  End : 25-May-99 02:09:44 pm
Ver   : 3.58

Radio Type       :        800
Model Number     : H27UAH6RR5AN/NUF3140A57
Serial Number    : 831AZKE547
Frequency        : 806.0125 MHz
Peak Trans. Pwr  : 0.720 W
Start Trans. Pwr: 0.670 W
Antenna Type     : 1/4 Wave
Antenna Posn.    : In
Phantom Type     : Body
Phantom Posn.    : Face
Scan Type        : ZOOM/SAR
Probe Name       : p040
Field Type       : E Field
Orientation      : 90 Degrees

Mixture Type                  = Muscle
Mixture Dielectric Constant = 52.680
Mixture Conductivity          =  1.100


Comment :
    Comment Line 1: Gain=10, Batt:NTN8971A, Ant:858136C01(Fix)
    Comment Line 2:Sample/Rate:5460/993. Acc: NTN8981
    Comment Line 3: Measurement taken w/ ROBOT36.ASC LOADED.


Robot   : CGISS Robot


Probe Offset         = 0.30 cm
Sensor Factor        = 0.0108
Conversion Factor    =  0.928


p040   Amplifier Channel Settings :  0.144   0.156   0.112


Max Location : X =   4.750,  Y =  -2.000,  Z =   0.000   (cm)  Value =   1.476


Measured Values (volts) =
  1.382E-003  9.606E-004  7.343E-004  5.654E-004  4.434E-004  3.303E-004
  2.657E-004  2.104E-004  1.632E-004  1.261E-004  1.017E-004


Calc. Voltage @ Surface (Vs) = 0.0017


Voltage @ 1.00 cm (Vt)       = 0.0009


Ave. Voltage (Vs+Vt)/2       = 0.0013


Ave. SAR over 1 g (mW/g)     = 0.1092
```

Facial Position SAR Curve



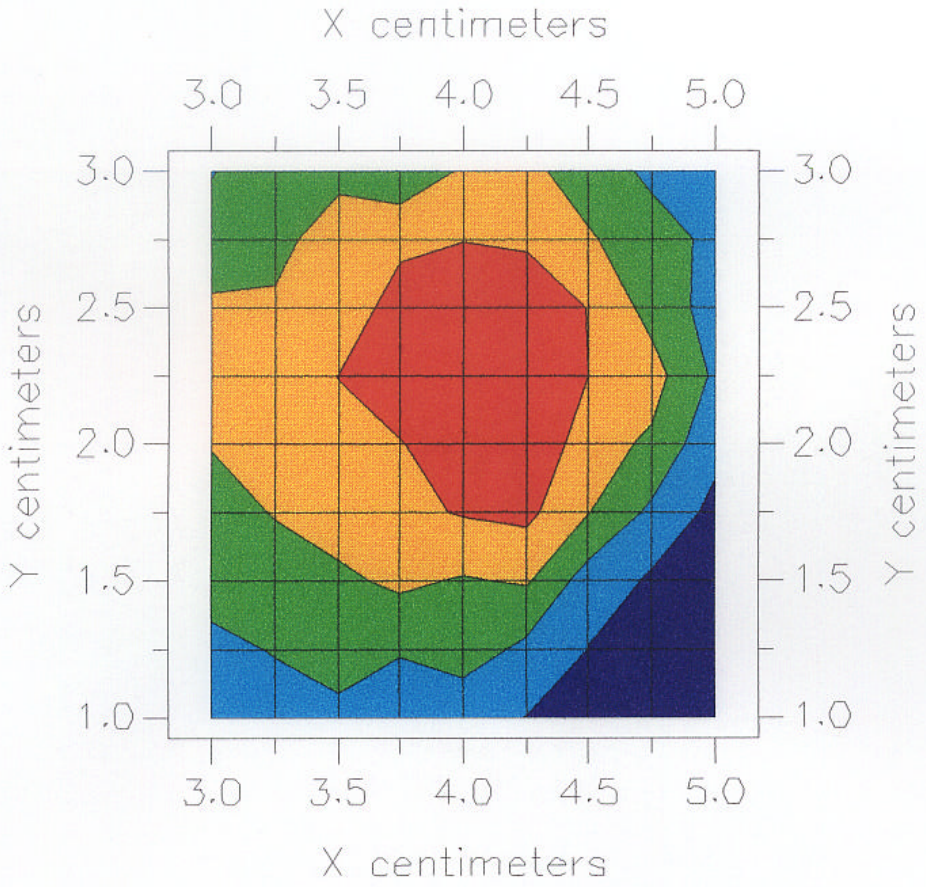
Abdominal Position Coarse Scan Region



Partial View of Full Body Phantom
As Viewed From Tissue Side

Abdominal Position Fine Scan Region

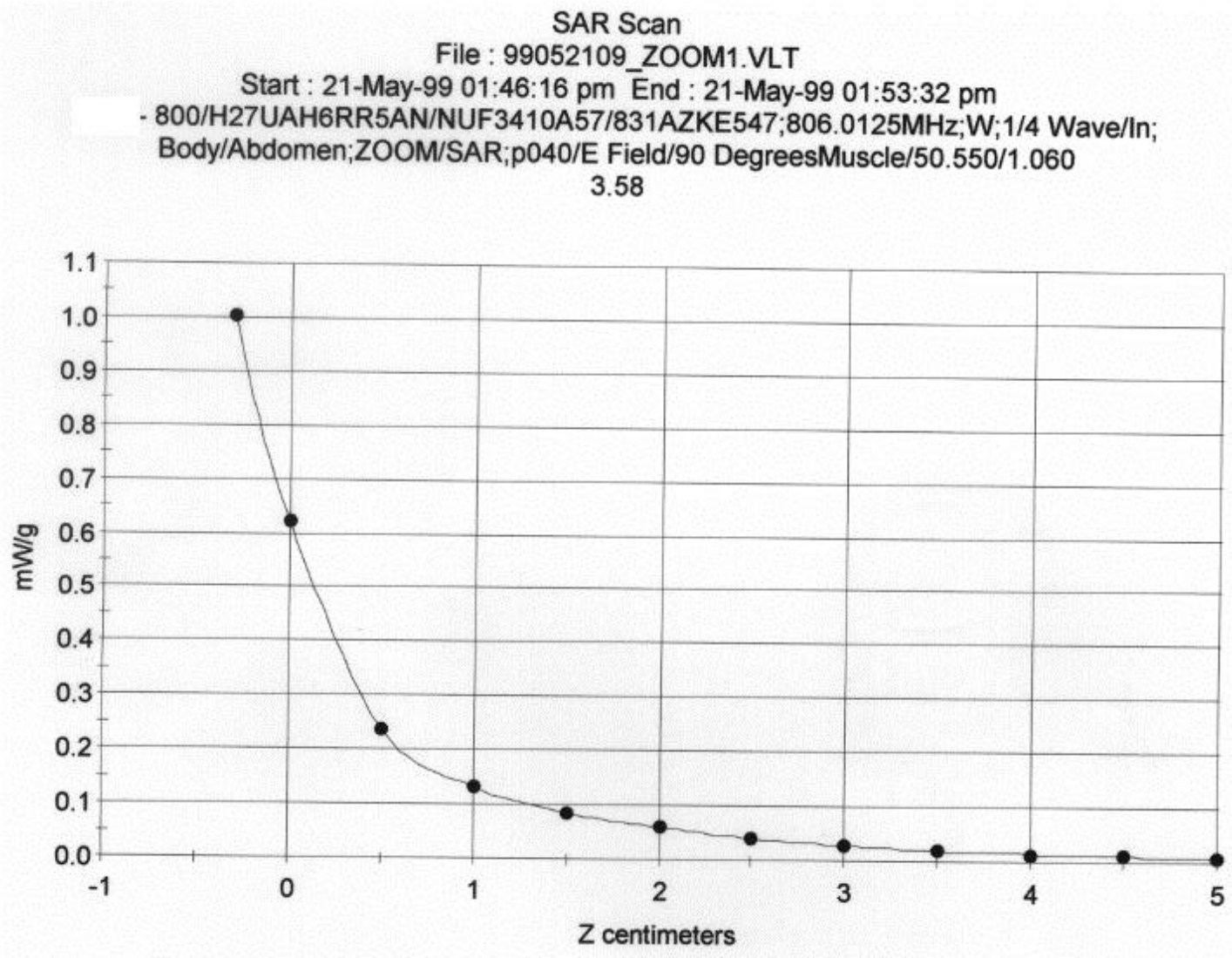
File : 99052109_ZOOM.VLT
Start : 21-May-99 01:46:16 pm End : 21-May-99 01:53:32 pm
800/H27UAH6RR5AN/NUF3410A57/831AZKE547;806.0125MHz;W;1/4 Wave/In;
Body/Abdomen;ZOOM/SAR;p040/E Field/90 DegreesMuscle/50.550/1.060
3.58



Spatial SAR Chart

Abdominal Position SAR Data

```
File  : c:/idx3/SYSTEM/SARMEAS3/data/Normal/99052109_ZOOM.VLT
Start : 21-May-99 01:46:16 pm  End : 21-May-99 01:53:32 pm
Ver   : 3.58

Radio Type       :      - 800
Model Number     : H27UAH6RR5AN/NUF3410A57
Serial Number    : 831AZKE547
Frequency        : 806.0125 MHz
Peak Trans. Pwr  : 0.720 W
Start Trans. Pwr: 0.670 W
Antenna Type     : 1/4 Wave
Antenna Posn.    : In
Phantom Type     : Body
Phantom Posn.    : Abdomen
Scan Type        : ZOOM/SAR
Probe Name       : p040
Field Type       : E Field
Orientation      : 90 Degrees

Mixture Type                  = Muscle
Mixture Dielectric Constant = 50.550
Mixture Conductivity          =  1.060


Comment :
    Comment Line 1: Gain=10, Batt:NTN8970A, Ant:8585136C01(Fix)
    Comment Line 2: Sample/Rate: 5460/993. Acc: NTN8981A, NTN8367A
    Comment Line 3: Measurement taken w/ ROBOT36.ASC LOADED.


Robot   : CGISS Robot


Probe Offset         = 0.30 cm
Sensor Factor        = 0.0108
Conversion Factor    =  0.928


p040   Amplifier Channel Settings :  0.144   0.156   0.112


Max Location : X =   4.250,  Y =   2.250,  Z =   0.000   (cm)  Value =   7.431


Measured Values (volts) =
  7.256E-003  2.763E-003  1.536E-003  9.777E-004  6.873E-004  4.527E-004
  3.208E-004  2.147E-004  1.603E-004  1.216E-004  8.389E-005


Calc. Voltage @ Surface (Vs) = 0.0117


Voltage @ 1.00 cm (Vt)       = 0.0023


Ave. Voltage (Vs+Vt)/2       = 0.0070


Ave. SAR over 1 g (mW/g)    = 0.5996
```


SAR Scan
File : 99052109_ZOOM1.VLT
Start : 21-May-99 01:46:16 pm End : 21-May-99 01:53:32 pm
- 800/H27UAH6RR5AN/NUF3410A57/831AZKE547;806.0125MHz;W;1/4 Wave/In;
Body/Abdomen;ZOOM/SAR;p040/E Field/90 DegreesMuscle/50.550/1.060
3.58
mW/g
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-1
0
1
2
3
4
5
Z centimeters