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APPARATUS FOR STUDYING THE PROPERTIES OF ANTENNAS IN AN EFFECTIVELY INFINITE DISSIPATIVE MEDIUM

Scientific Report No. 6

By

Larry D. Scott

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ABSTRACT

Experimental equipment is designed and techniques are developed which allow relatively thin ($h/a \approx 20$ to 200) linear antennas to be studied in effectively infinite, homogeneous, isotropic media. The drive point admittance for ten antennas of $\beta h \approx 0.3$ to 3.3 is measured in six media for which $\alpha/\beta \approx 0$ to 1. Measured current and charge distributions are also presented. Special techniques are developed to more accurately measure the electrical properties of the dissipative media. Finally, drive point junction effects are considered.

1. Dissipative Media

In order to obtain significant comparisons between theory and experiment, it was initially decided to devise an experimental situation that would approximate an antenna in an infinite, isotropic, homogeneous, dissipative medium for each value of α/β in the study. The ratio α/β is the plane wave attenuation constant divided by the phase constant.

A saline solution (salt water) was selected as the dissipative medium because of its availability. Iizuka [1] used wooden tanks for his investigations of antennas in dissipative media, and he found some resonances which affected his results, particularly in the less dissipative media. To construct sufficiently larger tanks to contain the saline solutions would be prohibitively expensive.

An obvious alternative is to use a natural body of water having the desired dissipation and large enough in extent to approximate an infinite medium. The difficulty with this is that for the bodies of water readily accessible, only two cases of interest may be studied. These are the highest and lowest dissipation cases (sea water and fresh water). It was finally decided to construct an equipment float of sufficient size and buoyancy to accommodate the experimental apparatus and two researchers (see Fig. 1). Submerged below and attached to this float is a large thin walled polyethylene tank. The entire apparatus is then placed in a deep fresh water lake. Lake Megunticook (near Camden, Maine) was selected because of its depth

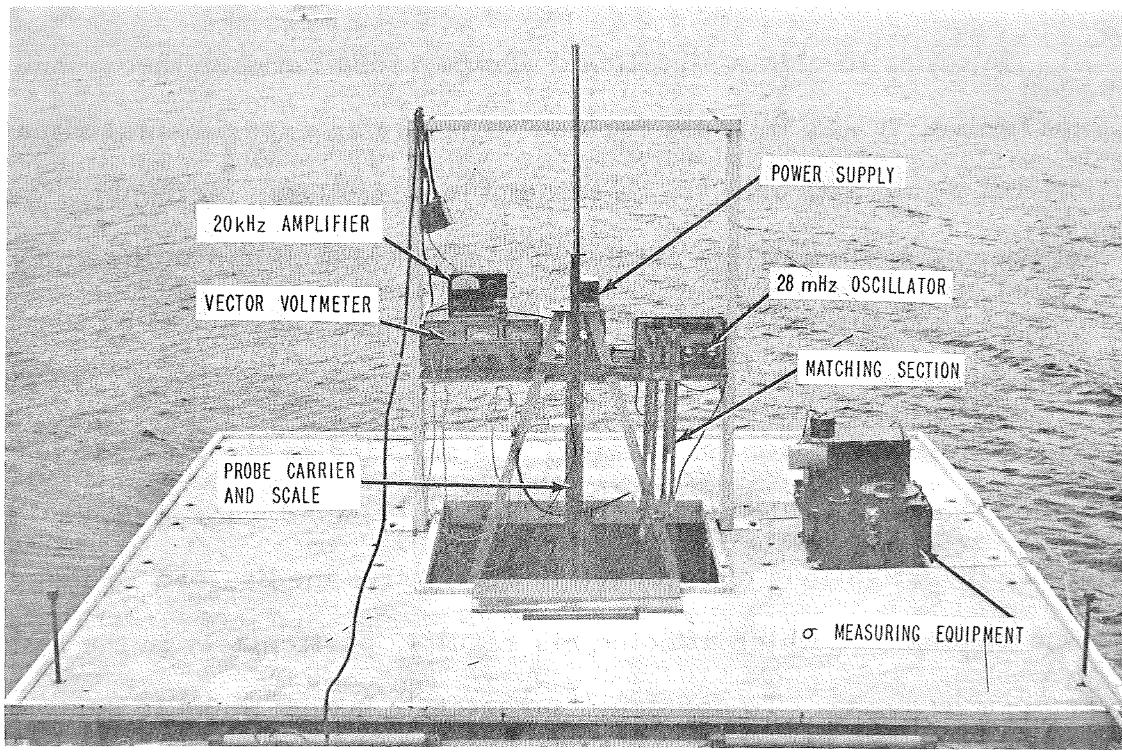


FIG. .-1 EQUIPMENT FLOAT ON LAKE MEGUNTICOOK

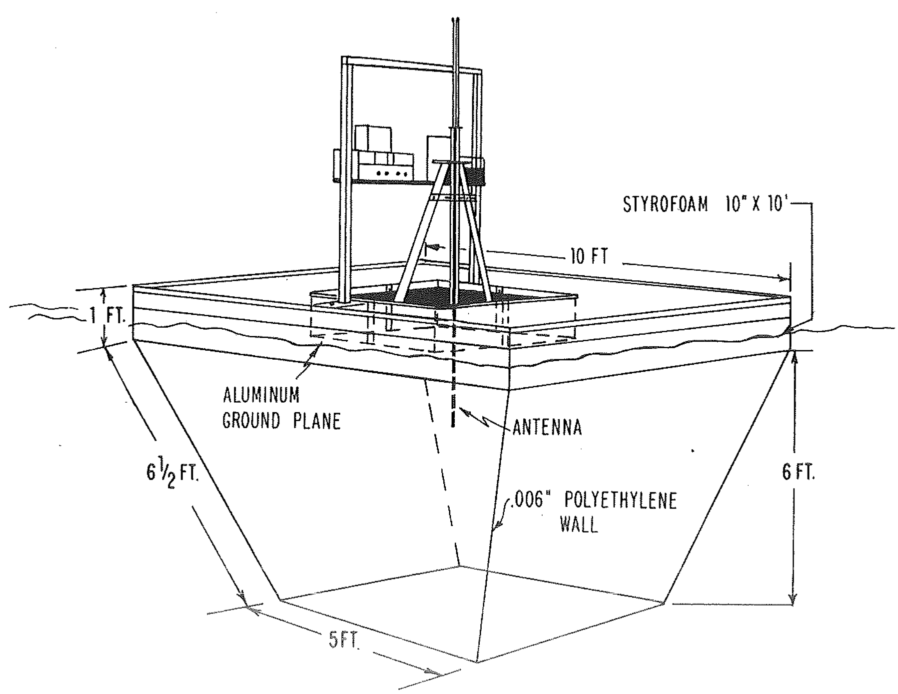


FIG. 2 EQUIPMENT FLOAT WITH POLYETHYLENE TANK.

and low conductivity. At the signal frequency used in the study, this lake's α/β was 0.016.

The polyethylene tank beneath the equipment float is designed to minimize reflections and hence perturbations of the measured electrical properties of the antennas due to the finite size of the tank. As seen in Fig. 2, a polyethylene bag is suspended beneath the equipment float and is kept in position by an oak skeletal frame. This frame consists of a 5 foot square at the bottom with its four corners attached to the corners of the equipment float by 1" x 2" oak stock. With the polyethylene bag secured to the sides of the float, the saline solution is confined to the bag while the bag walls are held in place by the oak frame. This configuration holds 2500 gal. of solution and has a volume of 337.5 cu ft.

The polyethylene bag wall thickness is 0.006 inches. Since the wavelength in the saline solution was in all cases about 1 meter, this thickness of polyethylene causes virtually no reflection in itself. It is sufficient then to consider only reflections due to the different wave impedances of the salt solutions within the tank and the lake water outside the tank.

The worst case for reflection from the tank walls is that of normal incidence by a plane wave. Consider the ratio of reflected power to forward power at the antenna due to reflection from the nearest wall, as illustrated in Fig. 3. The reflection coefficient and hence this ratio at a distance ℓ from the wall may be calculated by using equations analogous to those for lossy transmission lines [2].

TABLE 1-1 REFLECTED POWER AT ANTENNA

α	β	ℓ	η_1		η_2		$\lvert\rho\rvert^2$
.086	5.400	∞	40.947	j0.652	40.947	j0.652	0
.369	5.254	1.17	41.891	j2.941	"	"	1.6×10^{-4}
.557	5.273	1.17	41.478	j4.378	"	"	1.5×10^{-4}
1.692	5.618	1.17	36.089	j0.871	"	"	7.7×10^{-6}
4.355	7.356	1.17	22.262	j3.181	"	"	$< 1 \times 10^{-8}$
13.815	14.245	.16	4.002	j3.881	377	j0	1.4×10^{-4} *

* *This case is for sea water in a small plywood tank surrounded by air.*

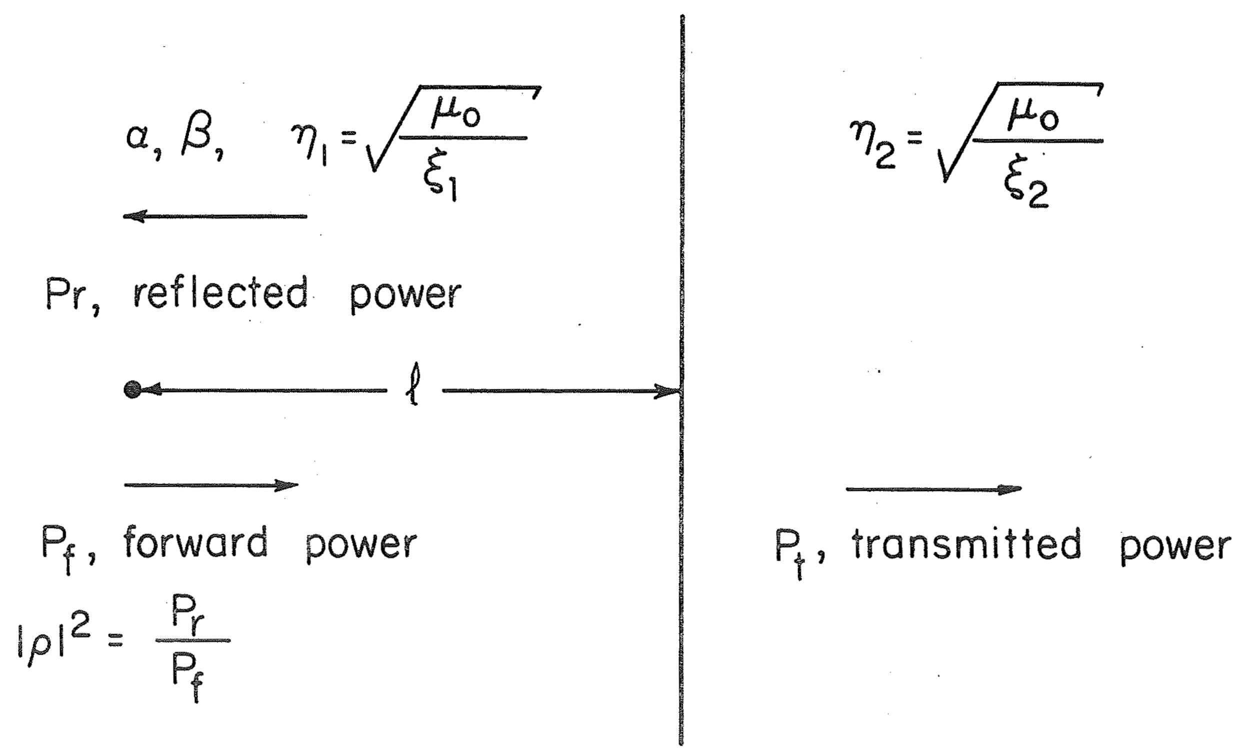


FIG. 3 REFLECTION FROM TANK WALL

The reflection coefficient is

$$\rho = (Z_i/\eta_1 - 1)/(Z_i/\eta_1 + 1) \tag{1-1}$$

where

$$\frac{Z_i}{\eta_1} = \left[\frac{\eta_2 \cosh \gamma_1 \ell + \eta_1 \sinh \gamma_1 \ell}{\eta_1 \cosh \gamma_1 \ell + \eta_2 \sinh \gamma_1 \ell}\right] \tag{1-2}$$

$$\gamma = \alpha + j\beta = j\omega\sqrt{\mu_o \xi}$$

$$\alpha = \omega\sqrt{\mu_o \epsilon}\,\sqrt{\tfrac{1}{2}(\sqrt{1 + p^2} - 1)}$$

$$\beta = \omega\sqrt{\mu_o \epsilon}\,\sqrt{\tfrac{1}{2}(\sqrt{1 + p^2} + 1)}$$

$$p = \sigma/\omega\epsilon$$

The wave impedance $\eta = \sqrt{\mu_o/\xi} = \omega\mu_o/(\beta - j\alpha)$ for the medium. The complex dielectric constant $\xi = \epsilon(1 + j\sigma/(\omega\epsilon))$. Substituting (1-2) into (1-1) we have

$$\rho = [(\eta_2 - \eta_1)\cosh \gamma\ell + (\eta_1 - \eta_2)\sinh \gamma\ell]/$$
$$[(\eta_2 + \eta_1)\cosh \gamma\ell + (\eta_1 + \eta_2)\sinh \gamma\ell] \tag{1-3}$$

Then the power ratio

$$\frac{P_r}{P_f} = |\rho|^2 \tag{1-4}$$

is the quantity of interest. Table 1 results from calculation of (1-4) using values from the various experimental cases studied. From these values of $|\rho|^2$ it is evident that for this design, it is quite reasonable to assume that the resulting measurements are virtually the same as those that would be obtained in an infinite medium.

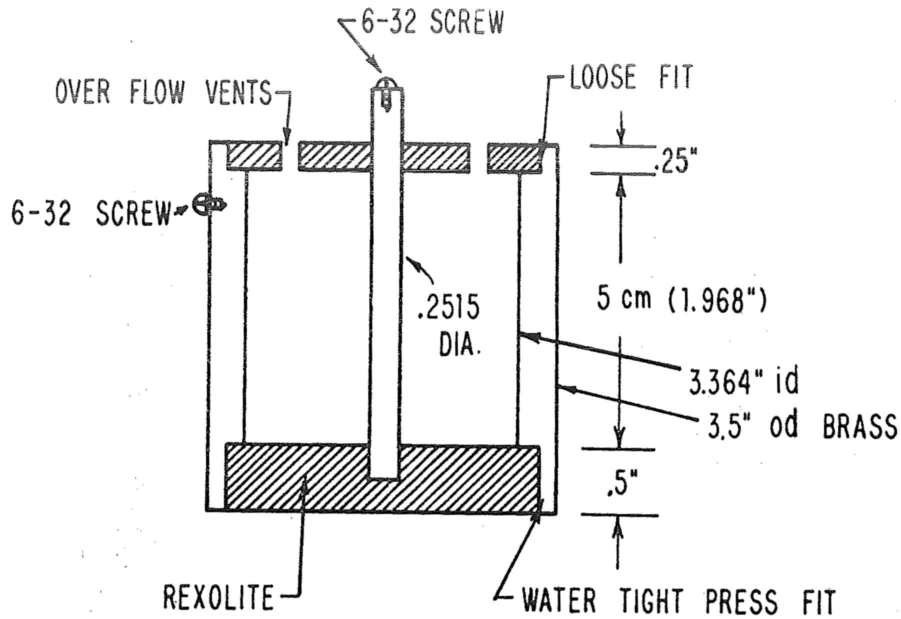
The effect of reflections from the lake floor was investigated experimentally by measuring the admittance of the longest antenna

($\approx$ full wave) with the polyethylene tank removed for various floor depths. It was determined that any depth greater than about 10 feet caused no change in the measured admittance. It was then concluded that reflections for floor depths greater than 10 feet were negligible. All measurements for the study were then obtained with the equipment float over water at least 15 feet deep. It should also be noted that the float was situated over a part of the lake floor that sloped quite steeply into depths of at least 40 feet. This steep angle of descent further ensured the absence of perturbing reflections.

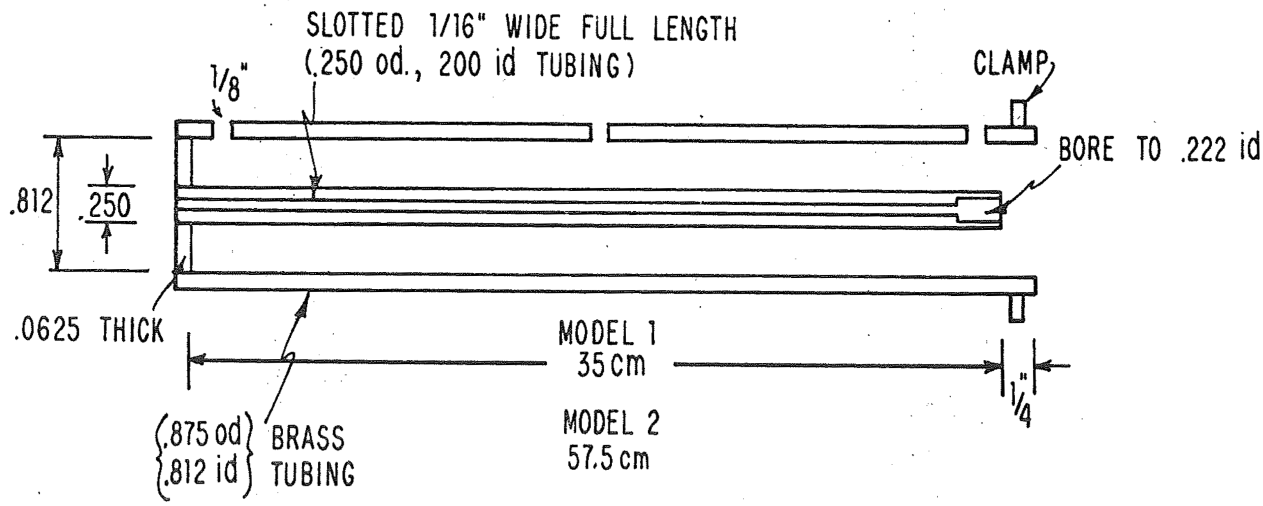
2. Measuring the Electrical Properties of the Dissipative Medium

In any experimental investigation of an antenna in a dissipative medium it is vital that the medium be accurately characterized. The essential properties are the conductivity σ and the dielectric constant ϵ. Since the highest operating frequency used in this study was 28.01 MHz, a method of accurately measuring σ and ϵ was devised using what will be referred to as the Hi-Lo method. The measurement technique involves the precision measurement of a coaxial, cylindrical test cell resistance at a very low frequency (100 KHz) together with a high frequency (28 MHz) determination of the propagation constant β on a short-circuited transmission-line test cell. From these two measurements, σ and ϵ may be determined by solving the appropriate equations.

In deriving the impedance expression for the low-frequency test cell (Fig. 4a, 5a) it is assumed that fringing fields contribute negligibly to the filled test cell low frequency impedance. This is reasonable, since the relative dielectric constant of the medium in the



(a) CYLINDRICAL CAPACITOR FOR σ MEASUREMENT



(b) SHORTED TRANSMISSION LINE FOR β MEASUREMENT

FIG. 5 DETAIL DRAWINGS OF HI-LO TEST CELLS

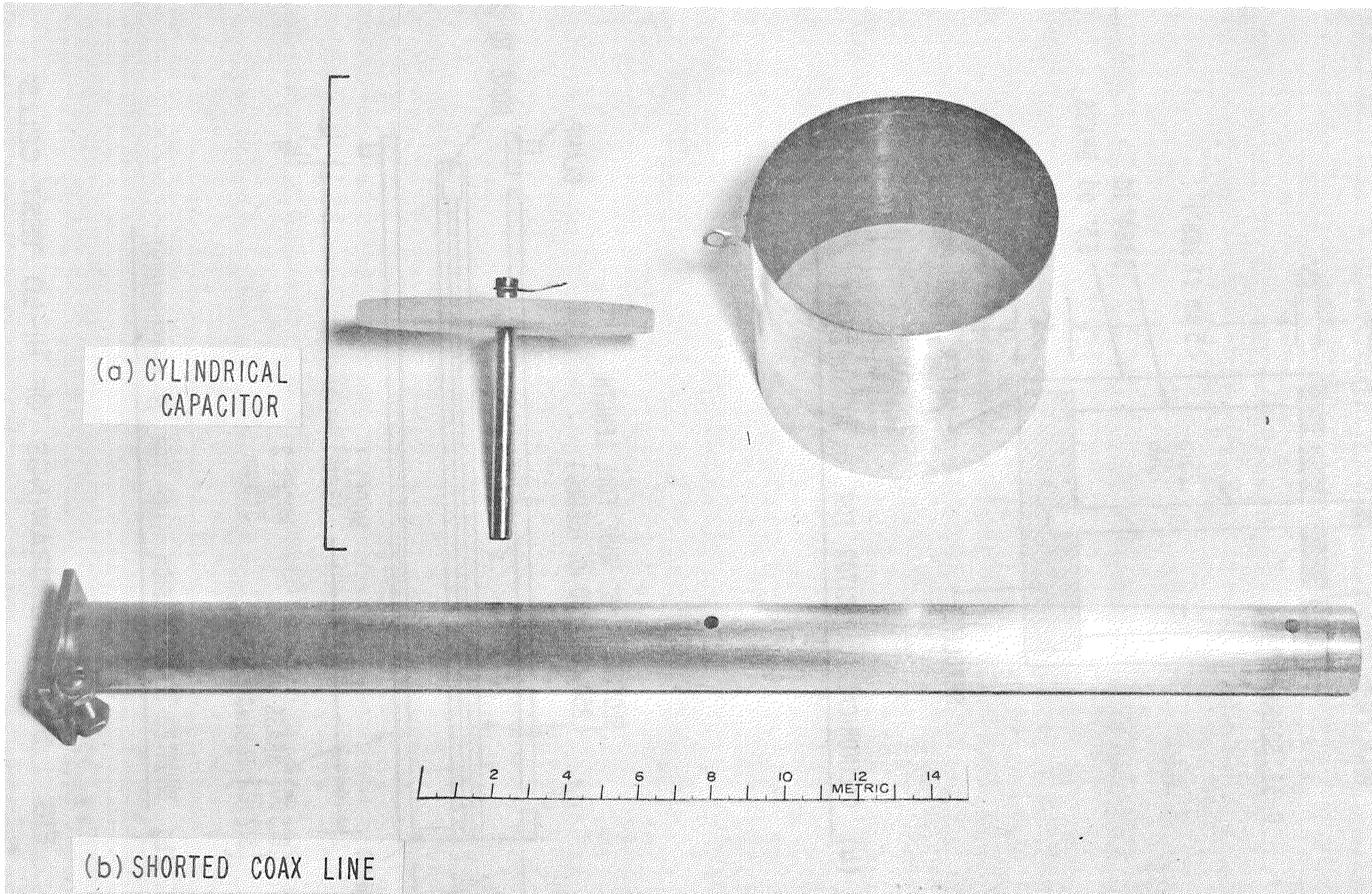


FIG. 4 HI-LO TEST CELLS

test cell is in all cases about 81. A quasistatic solution is adequate since the operating frequency is 100 KHz. To derive the impedance seen between the inner and outer conductors one may start with Maxwell's equation:

$$\mu_o^{-1} \nabla \times \vec{B} = \vec{J} + \epsilon \frac{\partial}{\partial t} \vec{E} \quad . \tag{2-1}$$

With harmonic time dependence $e^{j\omega t}$ and $\vec{J} = \sigma\vec{E}$, (2-1) becomes

$$\mu_o^{-1} \nabla \times \vec{B} = (\sigma + j\omega\epsilon)\vec{E} \quad . \tag{2-2}$$

Integrating both sides of (2-2) over a cap surface enclosing the inner conductor (Fig. 6), (2-2) becomes

$$\mu_o^{-1} \int_{\text{cap surface}} \hat{n} \cdot \nabla \times \vec{B} \, ds = \int_{\text{cap surface}} \hat{n} \cdot \vec{E}(\sigma + j\omega\epsilon) \, ds \quad . \tag{2-3}$$

Now consider another surface S (Fig. 6) which is a cross section of the inner conductor and bounded by C the circumference of this conductor. Integrating both sides of (2-2) over this surface yields

$$\mu_o^{-1} \int_S \hat{n} \cdot \nabla \times \vec{B} \, ds = \int_S \hat{n} \cdot \vec{E}(\sigma + j\omega\epsilon) \, ds \quad . \tag{2-4}$$

Then, through Stoke's theorem the right sides of (2-3) and (2-4) are equal because both surfaces of integration are bounded by the same contour C. Thus,

$$\int_{\text{cap surface}} \hat{n} \cdot \vec{E}(\sigma + j\omega\epsilon) \, ds = \int_S \hat{n} \cdot \vec{E}(\sigma + j\omega\epsilon) \, ds \quad . \tag{2-5}$$

The right hand side of (2-5) is simply I, the total current flowing in the inner conductor of which S is a cross section. So,

$$\int_{\text{cap surface}} \hat{n} \cdot \vec{E}(\sigma + j\omega\epsilon) \, ds = I \tag{2-6}$$

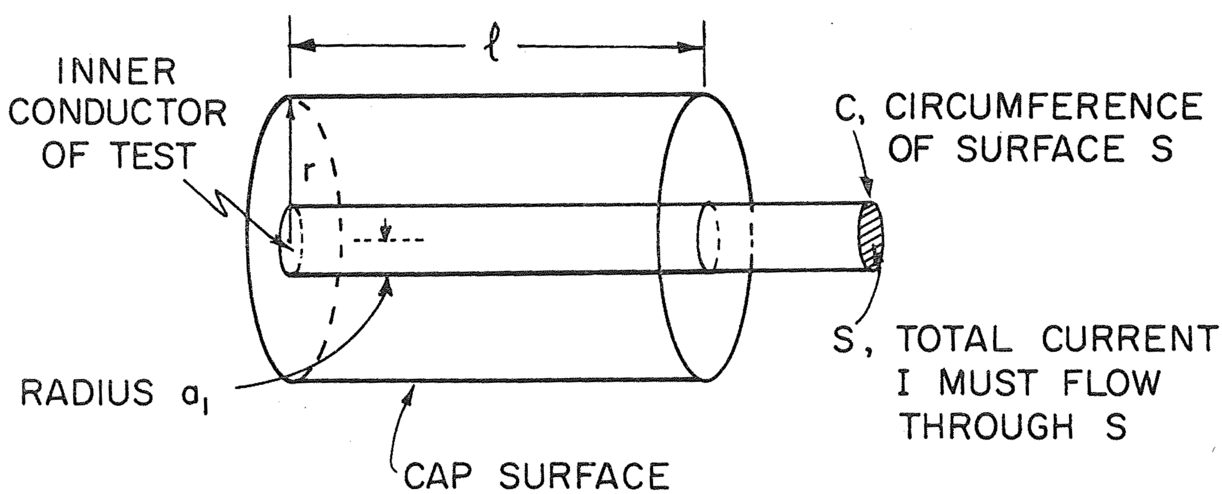


FIG. 6 CAP SURFACE OF INTEGRATION OVER INNER CONDUCTOR OF LOW FREQUENCY TEST CELL

Since $\vec{E}$ is radial (quasi-static case with fringing neglected)

$I = (\sigma + j\omega\epsilon)\ell 2\pi r E_r$ and

$$E_r = I/((\sigma + j\omega\epsilon)\ell 2\pi r) \quad . \tag{2-7}$$

The potential between the inner and outer conductor is then

$$V = \int_{a_1}^{a_2} E_r \, dr \tag{2-8}$$

and the impedance

$$Z = V/I = K/(\sigma + j\omega\epsilon) \tag{2-9}$$

where

$$K = \ln(a_2/a_1)/(2\pi\ell) \quad . \tag{2-10}$$

Or Z can be written as $Z = R + jX$ with

$$R = K\sigma/(\sigma^2 + \omega^2\epsilon^2) \tag{2-11}$$

$$X = -\omega\epsilon K/(\sigma^2 + \omega^2\epsilon^2) \quad . \tag{2-12}$$

Writing σ in terms of ϵ and R, the measured resistance of the cell,

$$\sigma = \frac{K + \sqrt{K^2 - 4R^2\omega^2\epsilon^2}}{2R} \quad . \tag{2-13}$$

For all media of interest in this study, the measured value of R is relatively low ($< 2000\Omega$) so that the term $4R^2\omega^2\epsilon^2$ is on the order of 0.37 or less. Since $K = 8.255$ for the test cell used, it is evident that a close approximation of σ is simply

$$\sigma = K/R \quad . \tag{2-14}$$

Apparently this method of measuring σ is ideal since the value of ϵ has an extremely small effect in the determination of σ.

The measuring apparatus for this approximate conductivity is shown in Fig. 7 with the block diagram in Fig. 8. The construction

FIG. 7 σ MEASURING EQUIPMENT

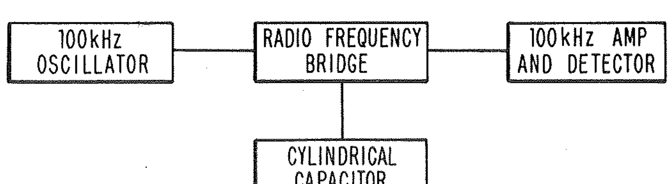


FIG. 8 BLOCK DIAGRAM OF APPROXIMATE CONDUCTIVITY MEASURING EQUIPMENT

details and critical dimensions of the coaxial or cylindrical capacitor are shown in Fig. 5a. The r. f. bridge is a General Radio Type 916-AL with a specified accuracy of $\pm 1\% + 0.1\,\Omega$ for measurement of R. The 100 KHz amplifier and detector is the General Radio Type 1232-A Tuned Amplifier and Null Detector having a rated sensitivity of $0.1\,\mu V$. The 100 KHz oscillator is an International Crystal Corp. Type OT-1 battery powered crystal controlled oscillator.

To accurately determine the dielectric constant $\epsilon = \epsilon_o \epsilon_r$, consider the expression for the phase of the current as a function of the distance from the short-circuited end of a transmission line. Starting with the polar form of the current [3]

$$I_z = \frac{V_x S_x S_w}{R_c S_s} e^{j(\sigma_x - \sigma_s + \sigma_w + \phi_c)} \qquad x \leqslant z \leqslant s \tag{2-15}$$

where $w = s - z$. Consider only the phase difference θ, for $0 \leqslant w \leqslant x$ and let

$$\theta = \sigma_{w=0} - \sigma_w \quad . \tag{2-16}$$

Now equation 5c of reference 3 is

$$\sigma_w = \tan^{-1}[\tan(\beta w + \Phi_s)\coth(\alpha w + \rho_s)] \tag{2-17}$$

and

$$\left.\begin{aligned} \Phi_s &= \pi/2 \\ \rho_s &= 0 \end{aligned}\right\} \text{ for the short circuit.} \tag{2-18}$$

So

$$\theta = \pi/2 - \tan^{-1}[\tan(\beta w + \pi/2)\coth(\alpha w)] \tag{2-19}$$

and the change in θ is,

$$\Delta\theta = \tan^{-1}[\tan(\beta w + \pi/2)\coth(\alpha w)] \tag{2-20}$$

Thus if the phase of the current on a short-circuited transmission line filled with the dissipative medium is measured along the line from the short-circuited end, a 90° phase shift will occur at $w = \lambda_g/4$. It should be noted that this shift of 90° is quite sharp at $\beta w = \pi/2$ regardless of the size of the attenuation constant α. This makes the determination of λg quite precise.

The equipment used to measure the wavelength λ_g in the coaxial line is essentially that used in probing the current distribution of a monopole immersed in the dissipative medium, which will be described in detail in a latter section. For measuring λ_g, the antenna is replaced by a short-circuited section of transmission line (Fig. 4b, 5b). The current probe is first precisely positioned at the short-circuited end of the line and the phase ϕ noted along with the scale reading locating the probe. The current probe is then moved toward the generator away from the short-circuited end until a change of 90° is noted in the phase ϕ. The difference between the scale reading locating the probe at this point and that of the short-circuited end of the line is $\lambda_g/4$. The phase is measured on a Hewlett-Packard Model 8405A Vector Voltmeter having a specified absolute phase accuracy of $\pm 1.5^{\circ}$.

The relative dielectric constant is related to λ_g by

$$\epsilon_r = \left[\frac{1}{f(p)} \frac{\lambda_o}{\lambda_g}\right]^2 \tag{2-21}$$

where λ_o is the free space wavelength and

$$f(p) = \mathrm{Re}\{\sqrt{1 + jp}\} = \sqrt{\tfrac{1}{2}\sqrt{1 + p^2} + 1} \tag{2-22}$$

$$p = \sigma/\omega\epsilon_o\epsilon_r \tag{2-23}$$

Since it is quite difficult to solve for ϵ_r explicitly, an iterative solution on a digital computer was used. The iteration proceeds by assuming ϵ_r to be 81 initially. It then computes σ using the measured 100 KHz resistance R and the value of ϵ_r assumed above in (2-13). It then calculates p using σ and ϵ_r as given above; a new ϵ_r is then determined from the p just calculated. The procedure is repeated until the value of σ and ϵ_r is within a given tolerance of the previously calculated values. For all values of R and λg measured this routine converges quite fast (two to ten iterations for 0.1% relative difference).

For sea water, $\sigma \approx 4$ mho/meter the determination of ϵ_r cannot be accomplished directly because excessive power is required to induce sufficient current in the short-circuited transmission line used in the measurement. In this case the value of ϵ_r is extrapolated from a graph of ϵ_r vs. σ for the other saline solutions (Fig. 9). This is not serious because an error in ϵ_r of 100% for this case only causes an error of 3% in the ratio α/β determined for the medium.

The Hi-Lo method of measuring the electrical conductivity σ and the dielectric constant ϵ_r utilizes the easiest and most accurately measured parameters of two test cell configurations at two frequencies. By doing this, the accuracy of the values of σ and ϵ_r is improved by two independent measurements. Since these measured values are used to characterize the dissipative medium at the higher of the two test frequencies (28 MHz), the only assumption inherent in the Hi-Lo measuring technique is that σ and ϵ_r are constant with respect to frequency in the range of 28 MHz to 100 KHz.

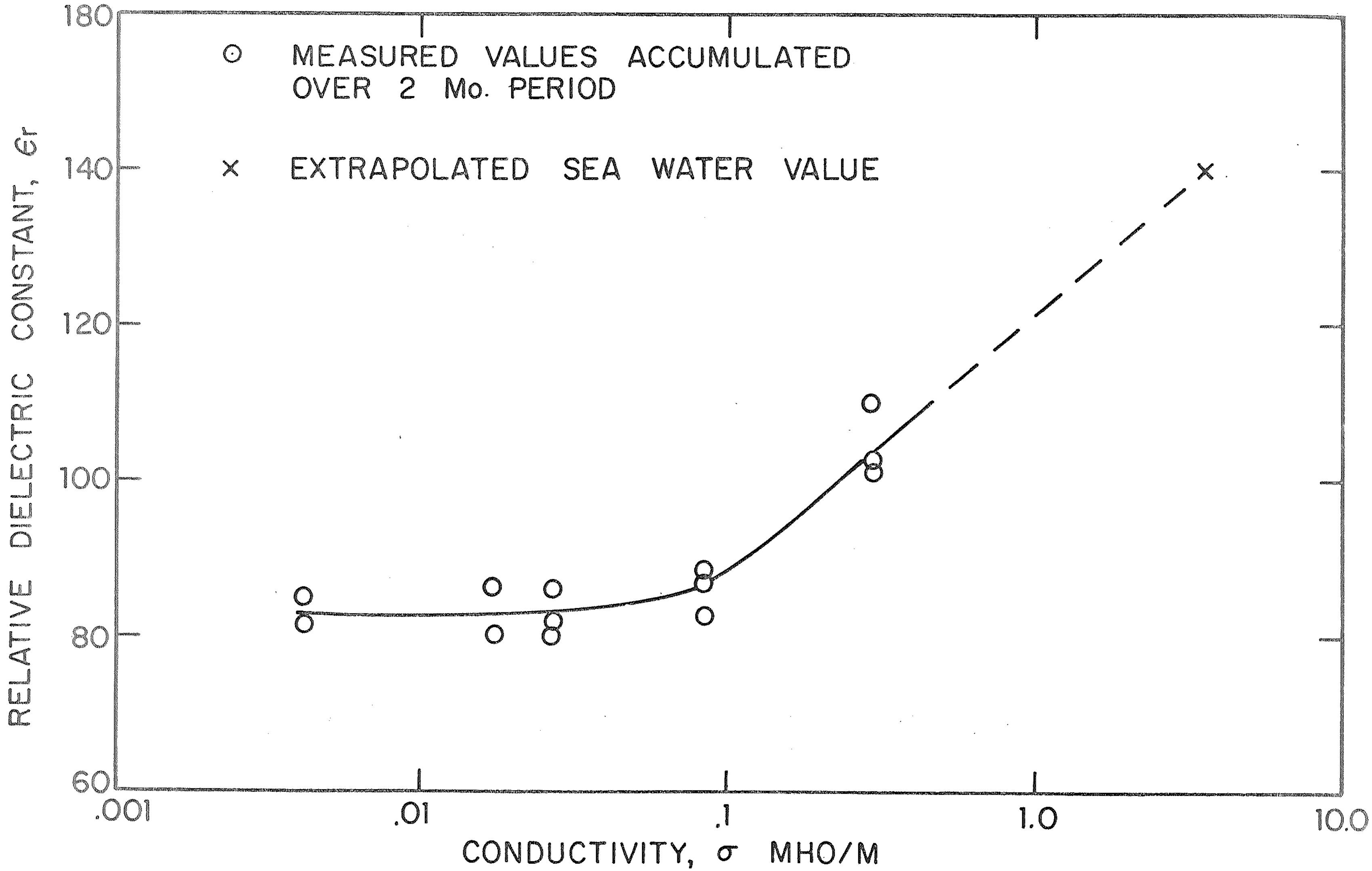


FIG. 9 RELATIVE DIELECTRIC CONSTANT VS CONDUCTIVITY FOR SODIUM CHLORIDE SOLUTION

3. Admittance Measuring Equipment and Techniques

The driving-point admittance of antennas in dissipative media is of considerable interest for a number of reasons. For one thing, it expresses how an antenna will accept power from a driving system. In any practical radiating system it is advantageous to have the admittance or equivalently the impedance of the antenna known so that a matching network may be designed to achieve maximum transfer of power to the antenna. The admittance is also useful in a general study of a dissipative medium since theoretically it contains information on the electrical properties of the medium. In some situations, the electrical properties may be determined from systematic admittance measurements [4]. Where driving point end effects can be characterized or ignored, the admittance may be used to normalize the measured current distribution on an antenna.

The admittance measuring system developed for this study centers around the Hewlett-Packard Model 8405A Vector Voltmeter. Fig. 10 is the block diagram of the system. The vector voltmeter measures the voltage at channel A which is proportional to the magnitude of the current $|I|$ at a point a distance ℓ away from the antenna drive point, on a test section of transmission line which feeds radio frequency power to the antenna. Channel B of the vector voltmeter measures a voltage proportional to the magnitude of the voltage $|V|$ on the test section line. The vector voltmeter also indicates the phase ϕ, between channel A and B voltages. In this way the ratio $|I|/|V| = |Y| = 1/|Z|$ is measured directly at a point on the test

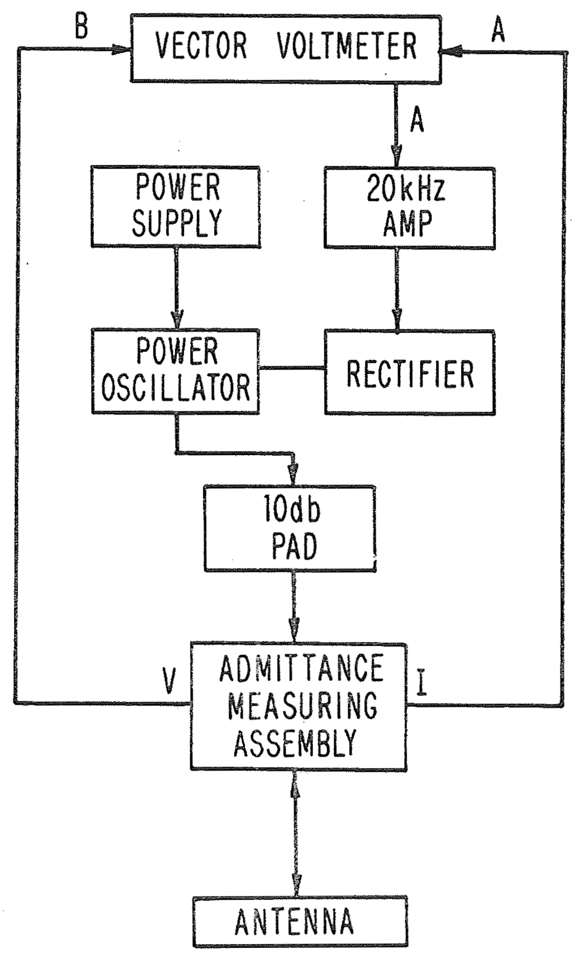


FIG. 10 BLOCK DIAGRAM FOR ADMITTANCE MEASURING EQUIPMENT

section of transmission line along with its phase θ. Since the admittance or impedance at a point on the test section is known, the driving point impedance Z_L of the antenna is determined by shifting the measured impedance down the section of line to the driving point using the transmission line equation

$$Z_L = Z_o \left[\frac{Z_i \cosh(-\gamma \ell) + Z_o \sinh(-\gamma \ell)}{Z_0 \cosh(-\gamma \ell) + Z_i \sinh(-\gamma \ell)} \right] \tag{3-1}$$

where

Z_i = measured impedance at the test point,

$\gamma = \alpha + j\beta$,

ℓ = distance from test point to driving point

and

Z_o = characteristic impedance of the test section transmission line.

Fig. 11 is an overall view of the test section of the transmission line with the voltage-current sensing block in place. The adapter section (detail drawing, Fig. 12) provides a mating flange to attach the whole assembly to the ground plane as well as a water tight seal at the driving point of the antenna. As seen in Fig. 12, a step discontinuity of the inner conductor as well as the dielectric constant occurs at a point 5/8 in. from the driving point of the antenna. At the highest operating frequency, the step discontinuity presents a negligible shunt capacitance across the line at that point. The change in dielectric within the 5/8 in. section changes the propagation constant and thus electrically lengthens the line. The change in diameter of the inner conductor and the increased dielectric constant compensate

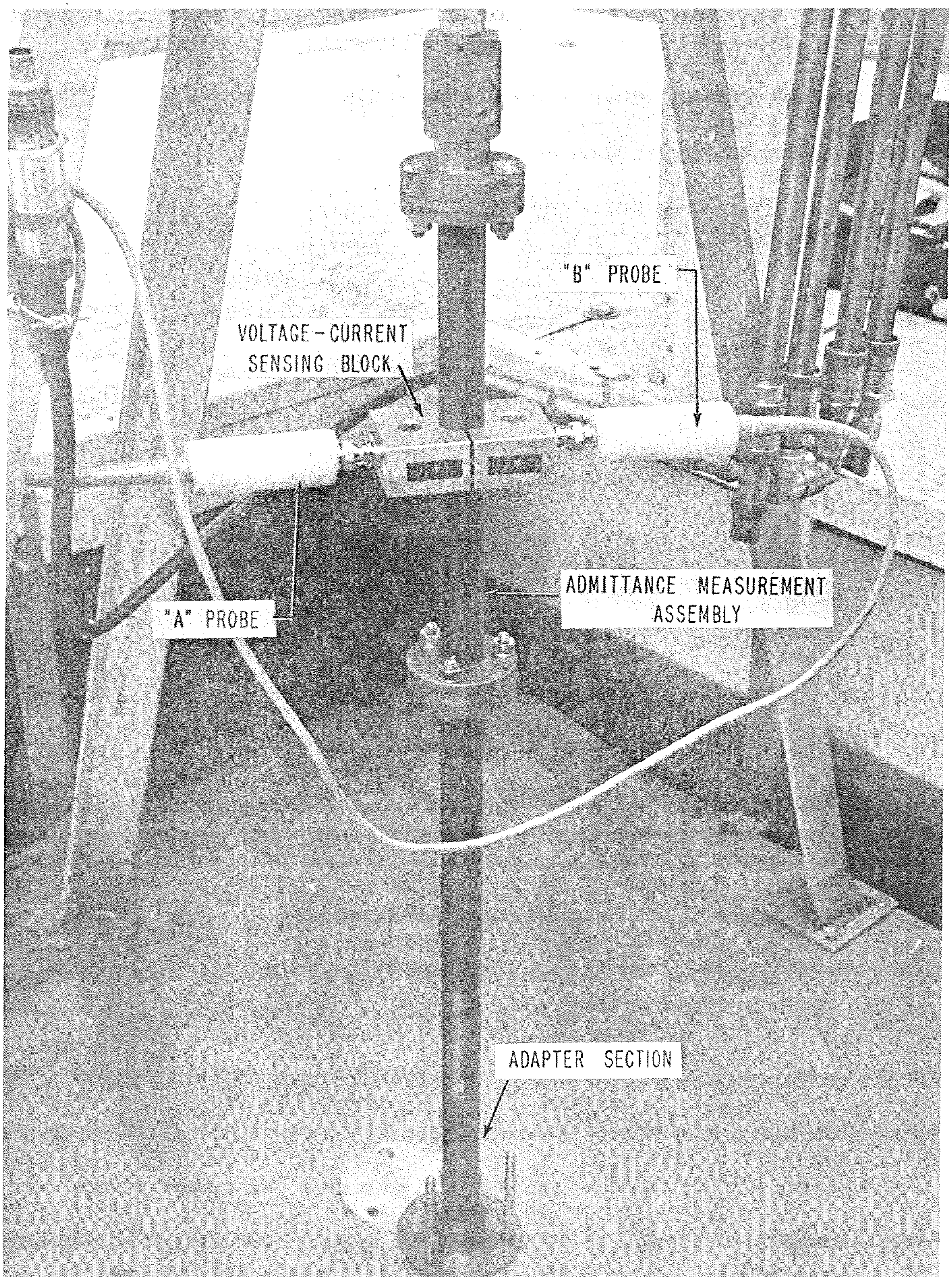


FIG. 11 OVERALL VIEW OF TEST SECTION TRANSMISSION LINE

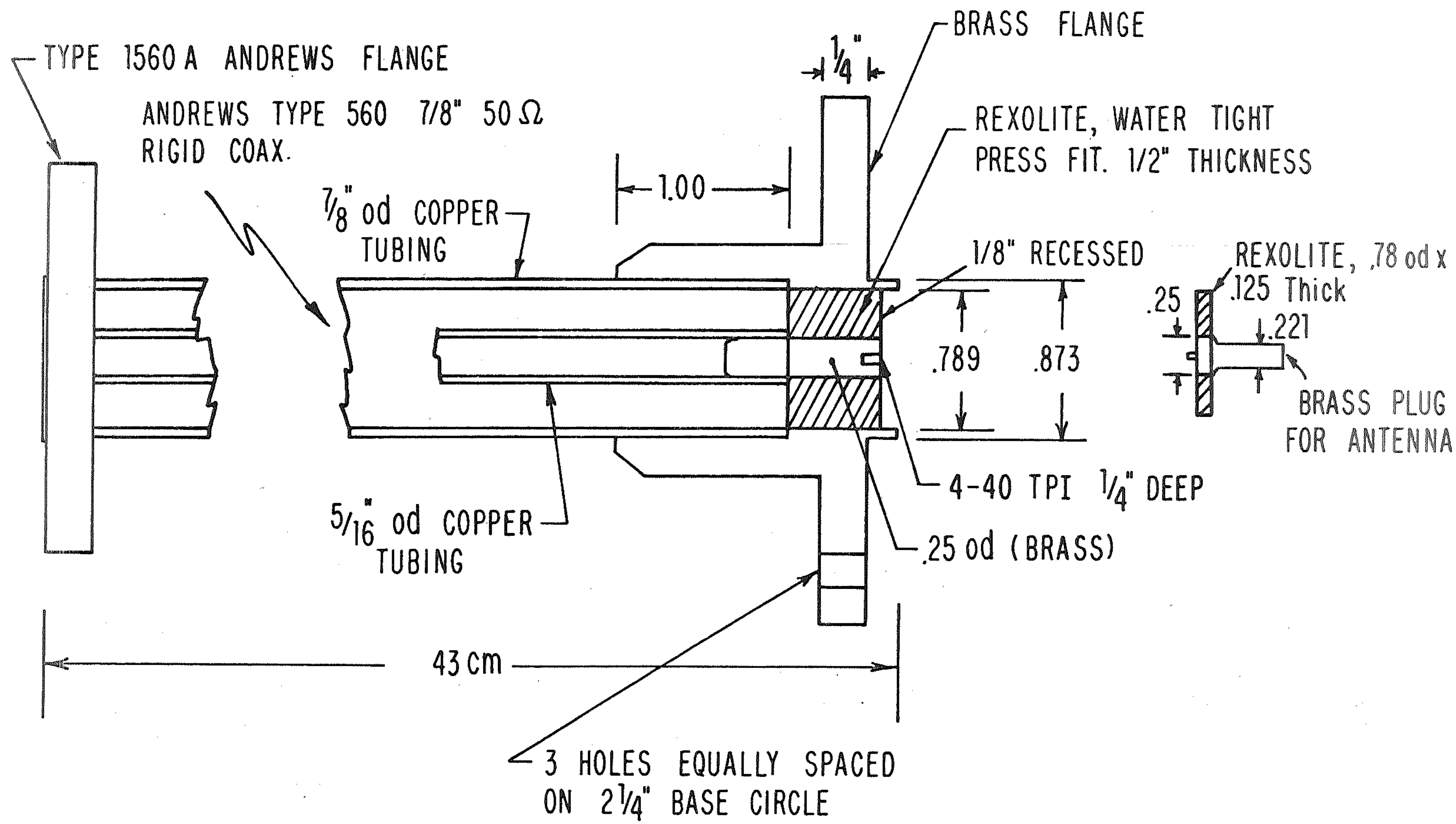


FIG. 12 ADAPTER SECTION

each other leaving the line impedance nearly unchanged. This difference in Z_o over such a short electrical length ($\approx .0026\lambda$) presents a negligible perturbation compared with an ideal transmission line. These perturbations are corrected to the extent that the electrical length of the line is determined by measuring the admittance of the section of line short-circuited at the antenna driving point and setting ℓ to be the value necessary to transform the measured admittance to that of a short-circuit at the driving point. This length is 57.5 cm while the physical length is 55.6 cm. This electrical length of the line was also checked at half the usual operating frequency and the same value was found.

Radio frequency power is delivered to the admittance measuring assembly through a 10 dB isolation pad by a modified Heath model HX-20 transmitter. This transmitter provides a regulated output of about 15 watts at the operating frequency (28.01 MHz). The output is "leveled" or regulated by a 20 KHz reference signal from the vector voltmeter that is proportional to the current $|I|$ on the test line. This signal is amplified by a General Radio Type 1232-A Tuned Amplifier and then rectified. The resulting dc voltage (proportional to $|I|$) is fed back to the automatic level control circuit of the transmitter. The regulating circuit tends to keep the output current of the transmitter constant under varying load conditions or line-voltage fluctuations. For example, 20% power-line-voltage variations are reduced to 10% transmission-line-current variations. With this regulating system it is most convenient to make all measurements at one predetermined current level. This current is selected so that the resulting reading of the test transmission-line voltage $|V|$ on the B channel meter can be read directly as $|Z|$ in ohms.

The central element of the admittance measuring assembly (Fig. 13, 14) is the voltage-current sensing block (Fig. 15). It consists of two precision machined and assembled probes. One, the electric probe, is sensitive only to the radial electric field and hence the line voltage V at a distance ℓ from the load; the other, the magnetic probe, is sensitive only to the circumferential magnetic field and hence the line current I at the same distance ℓ from the load. The electric probe (Fig. 16) is a monopole 0.000123 wave lengths long projecting through the outer conductor into the dielectric space of the test section of the coaxial line. The magnetic probe is a shielded loop (Fig. 16) that is 0.000197 wave lengths in diameter. It also projects into the dielectric space through the outer conductor of the test line. The plane of the loop is aligned to be parallel to the axis of the coaxial line. These probes are at least 50 times smaller than the minimum size determined by Whiteside [5] to cause negligible perturbations of VSWR due to line loading.

The theory of operation of these probes is discussed in section 8.6 of reference 6 by King et al. The expression for the voltage across the load of the electric probe is

$$V_e = I_L Z_L = -2h_e(\theta)E^i \cos\psi \; Z_L/(Z_o + Z_L) \quad . \tag{3-2}$$

E^i is the incident electric field (Fig. 8-10 of ref. 3). The effective height $h_e(\theta) = 0.5\,h\sin\theta$. Z_L is the load impedance. The input impedance Z_o for a short dipole is

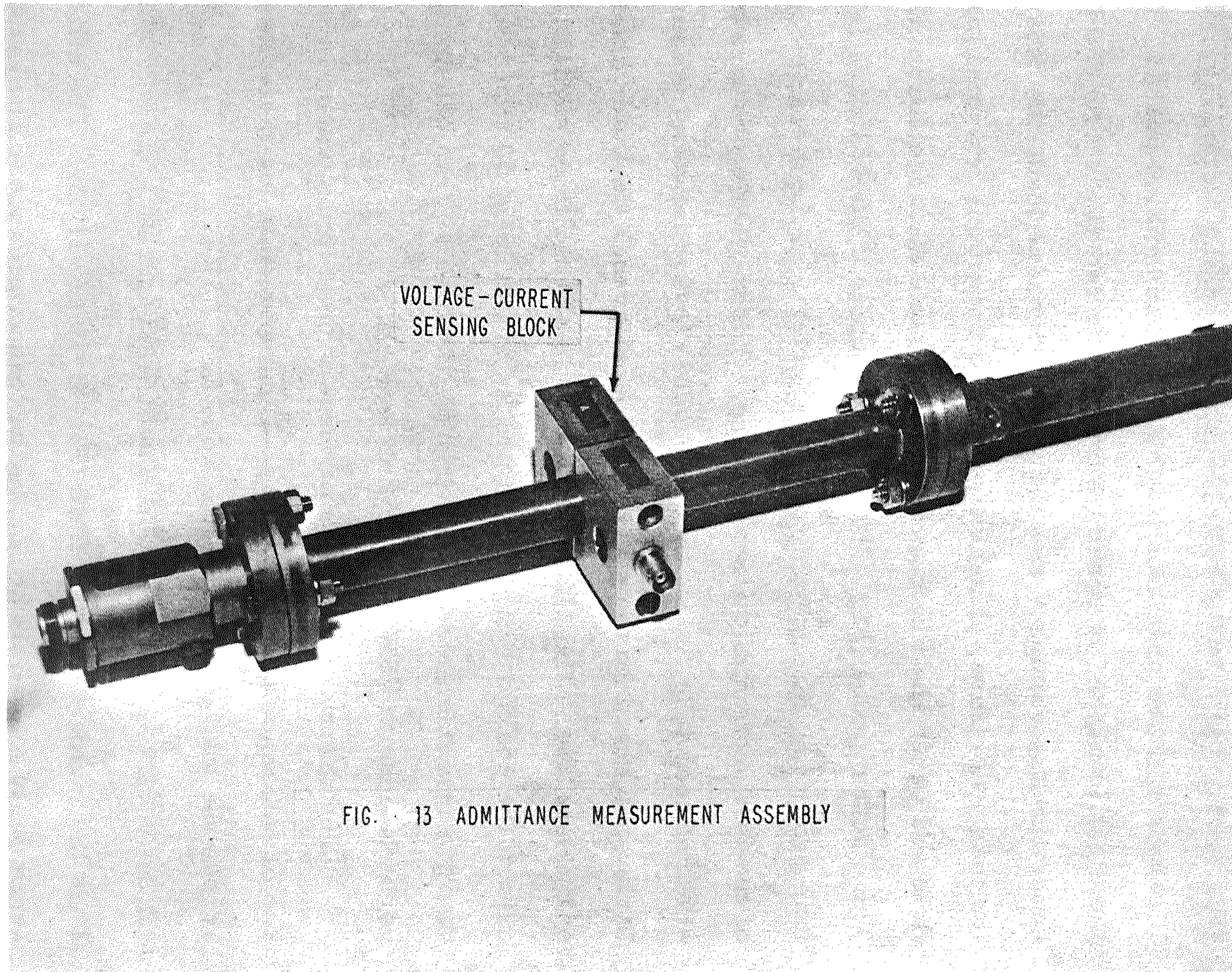


FIG. 13 ADMITTANCE MEASUREMENT ASSEMBLY

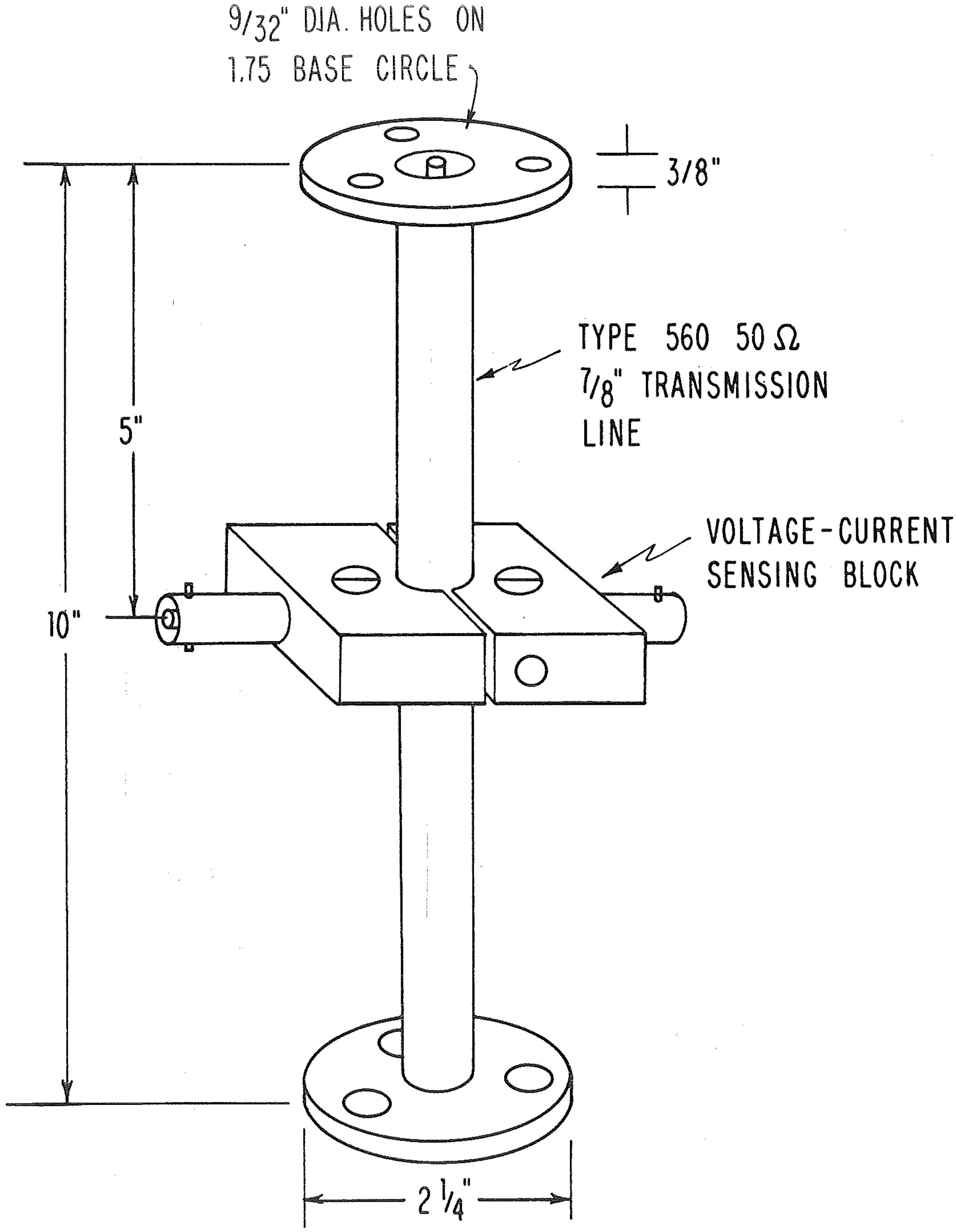


FIG. 14 ADMITTANCE MEASUREMENT ASSEMBLY
(DETAILS)

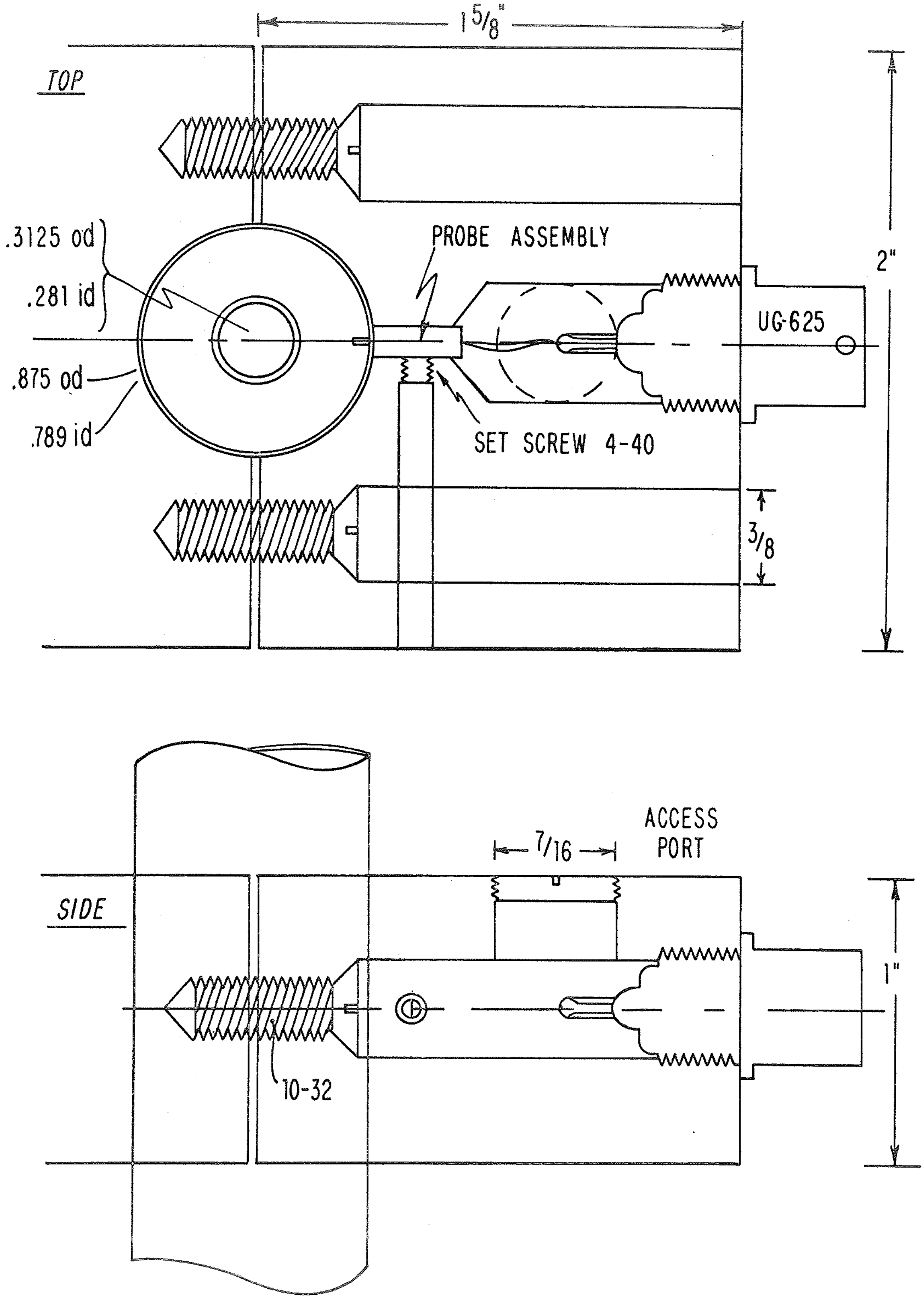
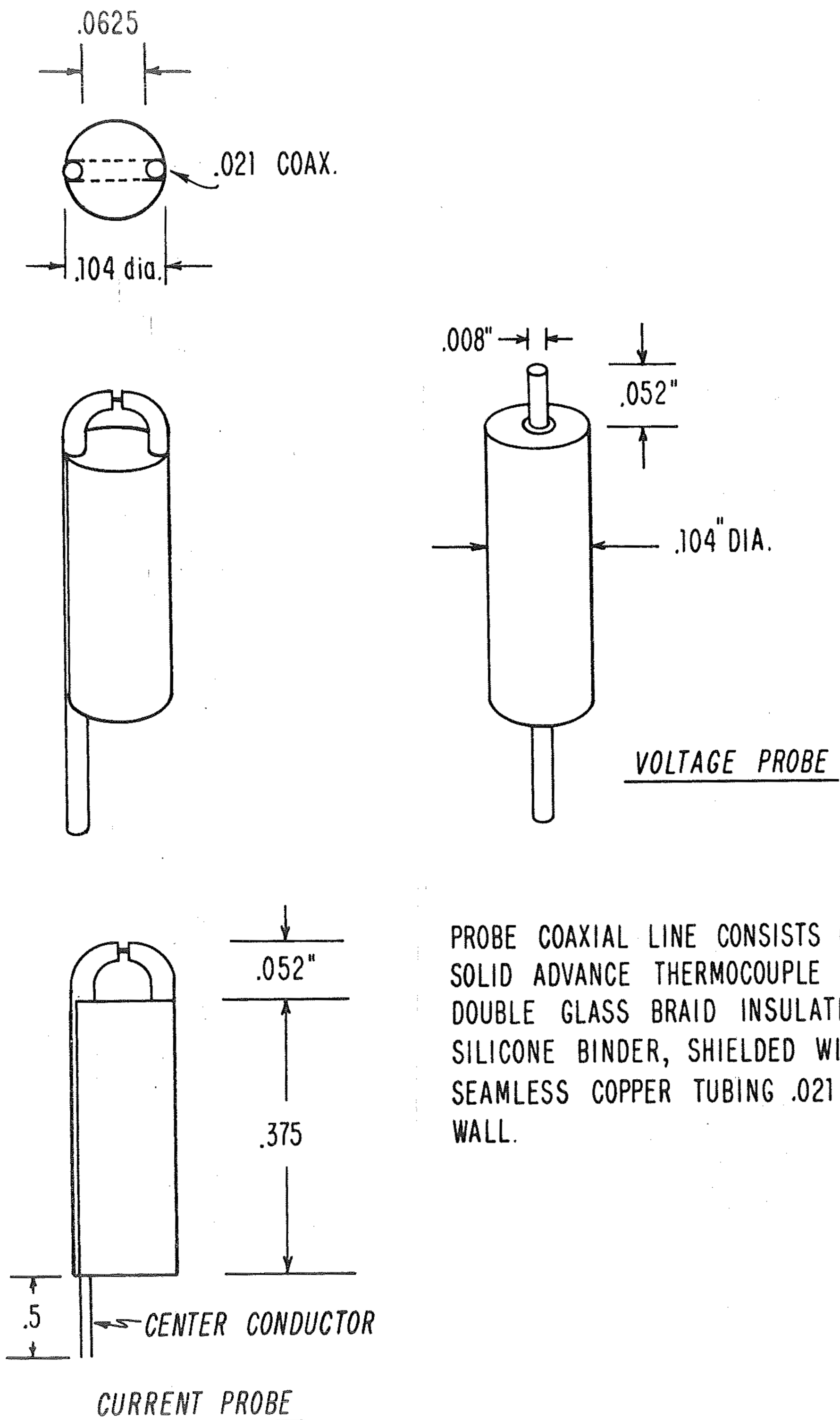


FIG. 15 VOLTAGE - CURRENT SENSING BLOCK



PROBE COAXIAL LINE CONSISTS OF #32 SOLID ADVANCE THERMOCOUPLE WIRE, DOUBLE GLASS BRAID INSULATION, SILICONE BINDER, SHIELDED WITH SEAMLESS COPPER TUBING .021 OD X .003 WALL.

FIG. 16 DETAIL OF PROBE ASSEMBLIES

$$Z_o = 20\beta_o^2h^2(1 - .133\beta_o^2h^2) - j60(\Omega - 3.39)/(\beta_o h)$$

$$\text{for } \beta_o h \leqslant .5 \quad \text{and} \quad a \ll h \quad . \tag{3-3}$$

$$\Omega = 2\ln(2h/a) \quad .$$

When for the electric probe of the voltage-current sensing block $h = 0.052$ in. and $a = 0.008$ in. at the operating frequency of 28.01 MHz, the expression for V_e reduces to

$$V_e = A E^i \underline{/ -178.7^o} \tag{3-4}$$

for a load impedance $Z_L = 52 - j2300$ ohms (vector voltmeter probe impedance at 28.01 MHz). A is a real constant. For a coaxial line operating in the TEM mode, E^i is proportional to V, the voltage between the inner and outer coaxial conductors. So the probe voltage

$$V_e = A'V \underline{/ -178.7^o} \tag{3-5}$$

at the operating frequency of 28.01 MHz.

The voltage expression for the current probe is

$$V_b = I_b Y_L = \frac{1}{2}\lambda S_B^{(2)} c B^i Y_L \tag{3-6}$$

where

$$S_B^{(2)} = -2\pi w Y_L/((Y_L + 2Y^{(0)})\lambda \zeta_o(\Omega - 3.52)) \tag{3-7}$$

and

$$Y^{(0)} = -j2\lambda/(\pi w \zeta_o(\Omega - 3.52)) \tag{3-8}$$

with $\Omega = 2\ln(\pi w/a)$ for a doubly-loaded circular loop with a very small diameter w. B^i is the incident magnetic field (Fig. 8.12 of ref. 6) and $\zeta_o = 377$ ohms, the free space wave impedance. The electric field contribution has been ignored since it is negligible for a loop as used here with $w = .00197\lambda$. With a load admittance $Y_L = (1 + j44)10^{-5}$ mhos,

$$V_b = CB^i \angle -87.4^\circ \tag{3-9}$$

at 28.01 MHz with w = .0832 in. and a = .021 in. B^i for the TEM mode is proportional to the current I on the coaxial line. Thus

$$V_b = C'I \angle -87.4^\circ \quad . \tag{3-10}$$

The impedance at the probing point on the test line is

$$Z = \frac{V}{I} = \frac{V_e}{V_b} \frac{C'}{K'} \angle 91.3^\circ \quad . \tag{3-11}$$

If I is maintained constant the measured impedance can be expressed as

$$Z = |V_e| K_z \angle 91.3^\circ + \phi = |Z| \angle \theta \tag{3-12}$$

where K_z is a real constant and ϕ is the phase of V_e with respect to V_b.

In actual operation using the vector voltmeter, the power level out of the radio frequency source is adjusted so that $K_z = 10\Omega$ /mV. Thus the 10 mV scale becomes a direct reading 100Ω scale. Also, the phase is offset by -91.3° so that θ may be read directly on the meter.

It is apparent that the calibration of the entire apparatus is best accomplished by terminating the test line in its intrinsic impedance (50Ω) and then adjusting the radio-frequency-power source for $K_z = 10\Omega$/mV along with an appropriate phase offset to obtain a reading of 0°.

The equipment designed as described above yields probe sensitivities along with transmission-line voltage and current levels such that for a 50Ω load with $K_z = 10\Omega$/mV, the current-probe voltage is $V_b = 1.34$ mV at 28.01 MHz and 0.67 mV at 14.01 MHz. Once the value for V_b at a particular operating frequency is determined for constant current operation and the value of phase offset is determined, it is unnecessary to recalibrate the system with a matched load except as an added precaution.

Over a six month period of operation in the laboratory and field all calibration checks indicated the accuracy of the measured $|Z|$ was $\pm 2\%$ with a phase accuracy of $\pm 1.5^{\circ}$. The specified accuracy of the HP 8405-A Vector Voltmeter is $\pm 4\%$ for absolute voltage and $\pm 2\%$ of full scale $\pm 1\%$ range to range in relative voltage accuracy. Phase accuracy is $\pm 1.5^{\circ}$ with a resolution of 0.1°. For the specified accuracies, the reference channel A, requires an input of $300\mu V \leq V_A \leq 1V$ rms. The measuring channel B, then measures over a range of $30\mu V \leq V_B \leq 1V$ rms. Isolation between channels is rated at greater than 100 dB.

The ground plane which images the monopole to be measured is of practical necessity finite in size. However, it must be large enough so that standing waves on its surface do not perturb the measured properties of the antenna from those values that would be present using an infinite ground plane. To ensure this desired condition, the ground plane for this study was built as large as was practical (i.e. 10 x 10 ft or $\approx$ 3 square wavelengths, see Fig. 17) with the antenna placed slightly off center. It was then tested by adding additional copper wire radials of lengths greater than 10 ft to see if a change in measured admittance was evident. This test indicated that the design

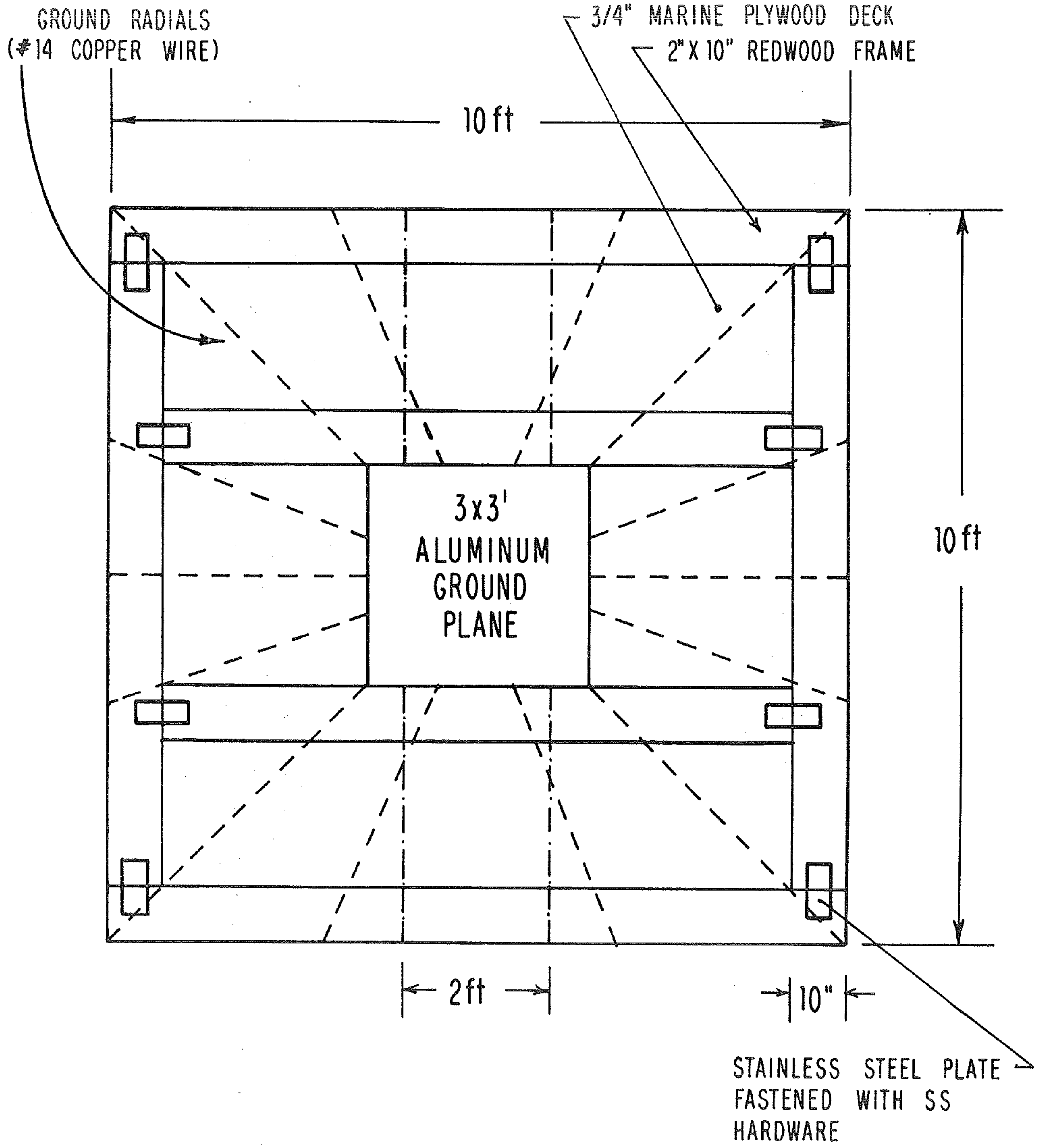


FIG. -17 EQUIPMENT FLOAT
(GROUND PLANE DETAILS)

was effective in approximating an infinite ground plane for the purposes of this study.

Measured monopole admittances using the above equipment and techniques are tabulated in Appendix A. The data were collected from a set of ten monopoles having a common radius a = 3.175 mm and heights h = 6, 9, 12, 18, 24, 30, 35, 40, 50 and 61 cm (Fig. 18). These monopoles were immersed in six media having ratios of α/β = .016, .070, .106, .301, .592 and .970, where

$$\alpha = \omega\sqrt{\mu\epsilon}\, g(p) \tag{3-13}$$

and

$$\beta = \omega\sqrt{\mu\epsilon}\, f(p) \tag{3-14}$$

with

$$g(p) = [\tfrac{1}{2}(\sqrt{1+p^2} - 1)]^{\frac{1}{2}} = \sinh(\tfrac{1}{2}\sinh^{-1} p) \tag{3-15}$$

and

$$f(p) = [\tfrac{1}{2}(\sqrt{1+p^2} + 1)]^{\frac{1}{2}} = \cosh(\tfrac{1}{2}\sinh^{-1} p) \quad . \tag{3-16}$$

The loss tangent $p = \sigma/\omega\epsilon$. The radian frequency $\omega = 2\pi 28.01(10)^6/\text{sec}$ for all measurements except for the medium with α/β = .970 where $\omega = 2\pi 14.01(10)^6/\text{sec}$. The normalizing factor

$$\Delta = f(p)\sqrt{\epsilon_r/\mu_r} \tag{3-17}$$

is used throughout the tables so that the tabulated values are universal. They apply to any monopole having the same h/a ratio and βh in a medium with α/β as listed.

4. Current and Charge Distribution Measuring Equipment

The equipment for measuring current and charge distributions is centered around a mechanism that allows electric or magnetic probes

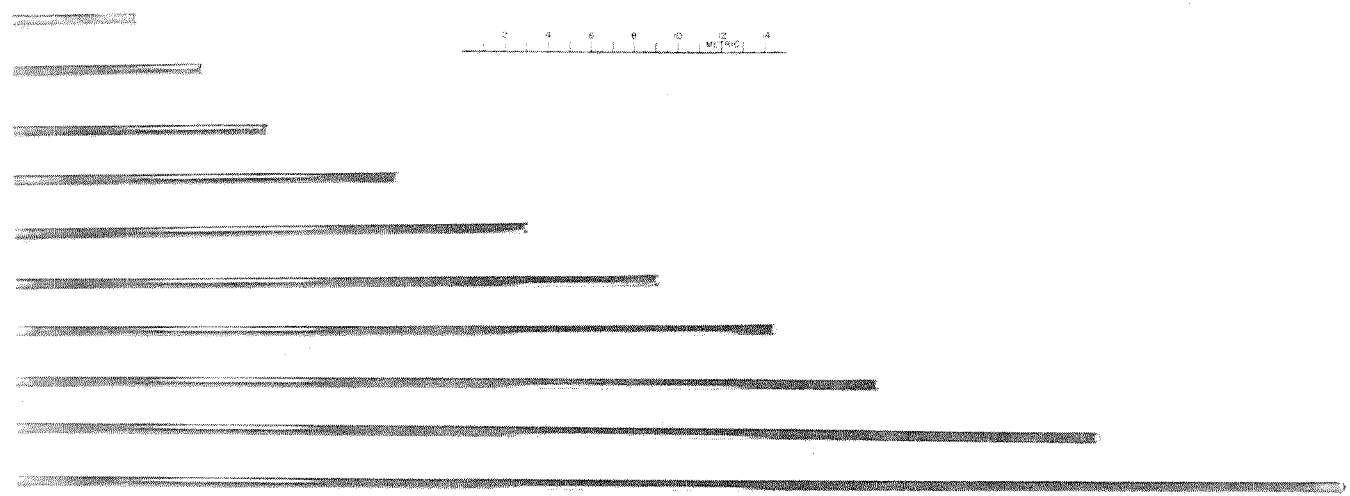


FIG. 18 ANTENNAS (RADIUS = 3.175 mm)

to move along the surface of an antenna in a precisely controlled manner, thus probing certain near fields of the antenna that are excited by a stable radio-frequency source. From the responses of these probes the current and charge distributions on the antenna are determined.

The r.f. feed is designed to have identical electrical properties (driving point end effect) as those of the admittance-measuring adapter section described in section 3. The r.f. feed section (Fig. 19) provides the mating flange which is attached to the ground plane as well as a water-tight seal at the driving point of the antenna. Power to excite the antenna is fed into the UHF connector on the r.f. feed section which is shunted by a 48 1/32" section of short-circuited coaxial line. The electric and magnetic probes are positioned along the antenna by a hollow push rod which travels inside the inner conductor of the r.f. feed section. The signal cable of the probe passes through the hollow push rod and then to the measuring equipment. The monopoles that plug into the r.f. feed section at the driving point are slotted to allow the axial travel of the probes. The push rod of the probe is attached by a trombone like member to the positioning rack and pinion assembly where the probe position is indicated on a scale (Fig. 20).

Figure 21 shows the magnetic or current-sensing probe in position on a short monopole. Both the electric and magnetic probes have electrical dimensions of $\approx .002\lambda$ for the media and frequencies used in this study. Thus they can be expected to be quite good in that they are sensitive to very localized fields and present negligible loading effects.

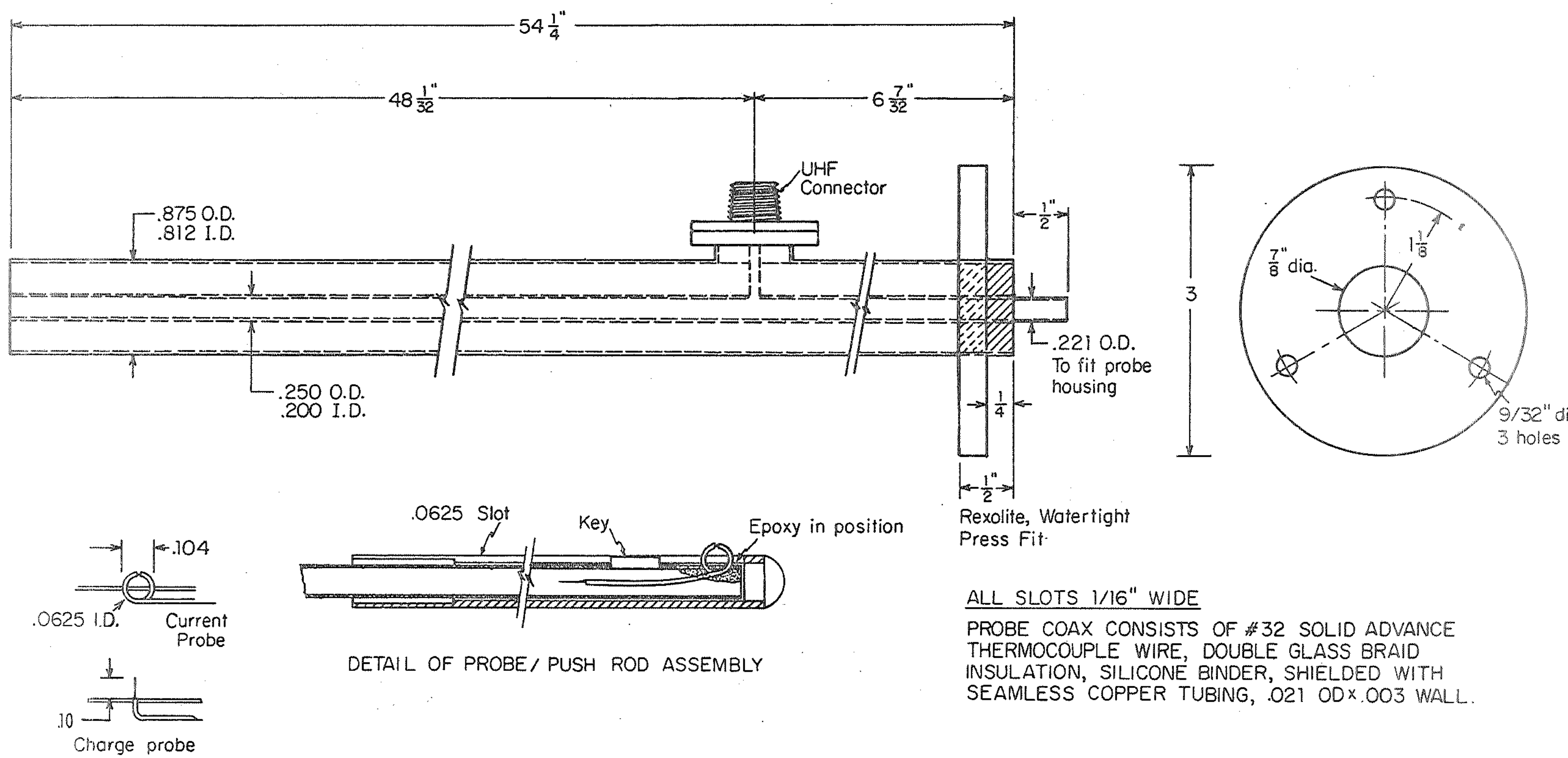


FIG. 19 R.F. FEED SECTION OF CURRENT AND CHARGE PROBING APPARATUS

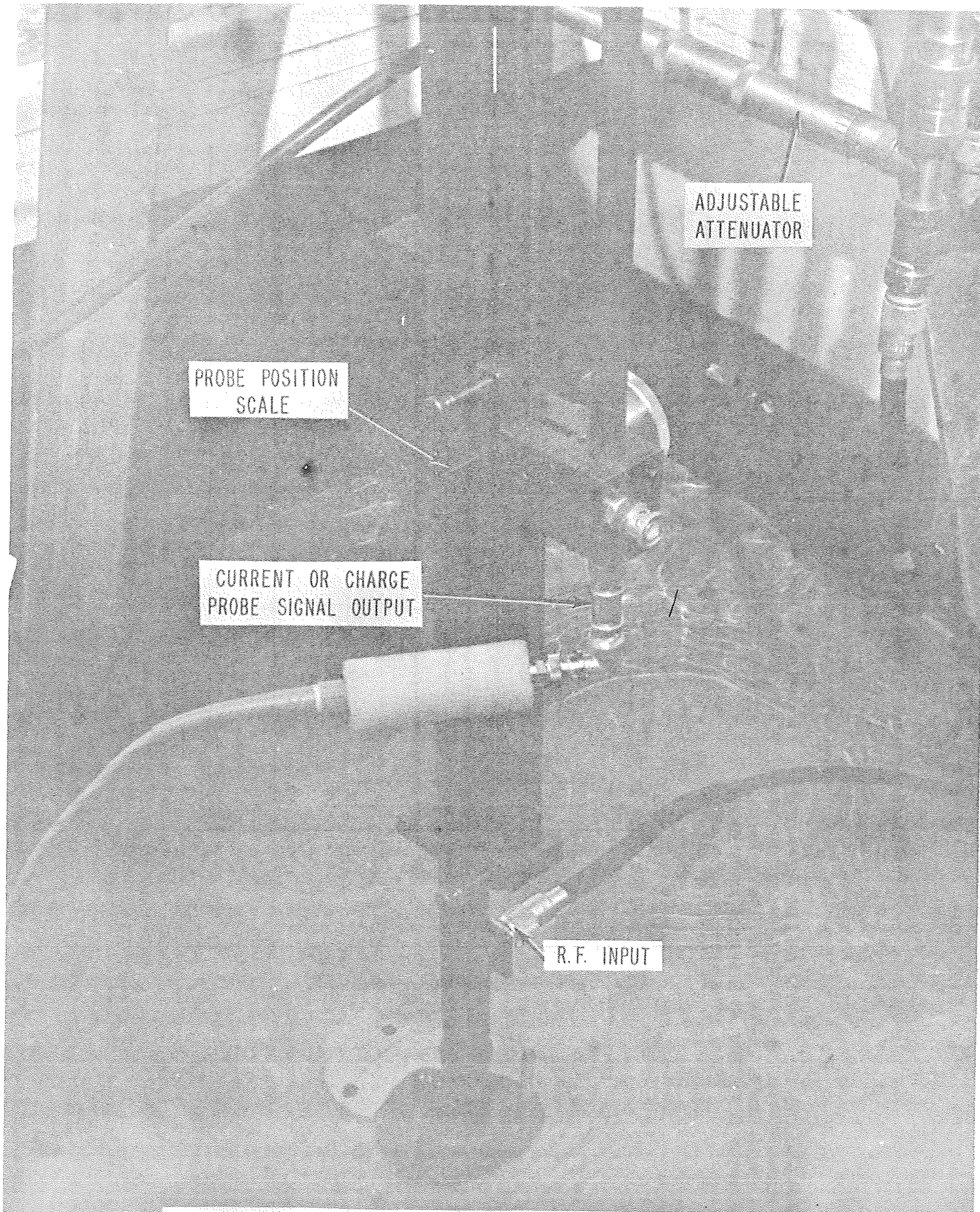


FIG. 20 CLOSE UP VIEW OF PROBE RACK AND PINION DRIVE AND PROBE POSITION SCALE

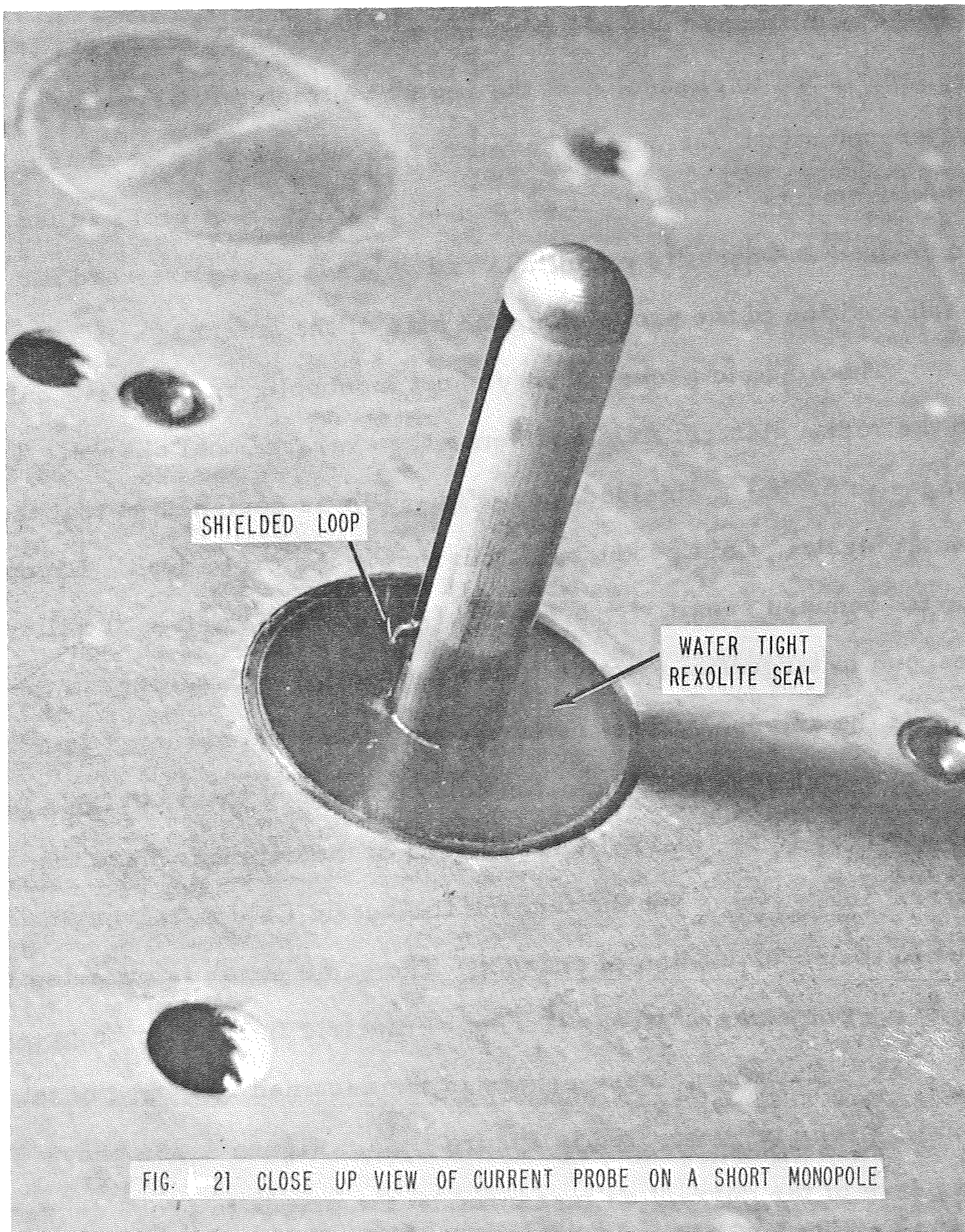


FIG. 21 CLOSE UP VIEW OF CURRENT PROBE ON A SHORT MONOPOLE

Figure 22 shows the overall electrical hookup for current or charge distribution measurements. The radio-frequency source and electronic output "leveler" are the same as described in section 3 for the admittance measuring equipment. A portion of the driving voltage is fed to channel A of the vector voltmeter to serve as a reference signal for output "levelling" as well as relative phase measurements. The output of the charge or current probe is fed to channel B where its magnitude and relative phase are read for each position of the probe along the axis of the antenna.

The electric probe, a very short monopole, is sensitive only to the radial electric field and hence the average local charge. The magnetic probe, a shielded loop (Fig. 19) is designed so that the radial electric field produces no current in the probe load. Except for its reduced sensitivity because of its small diameter, it will respond to tangential electric fields (tangential with respect to the axis of the antenna). This response will cause the assumed sensitivity only to circumferential magnetic fields and hence axial currents on the antenna, to be in error near the end of the antenna where the current is vanishing but the tangential electric field is increasing (due to the accumulation of charge). The same error is expected near the drive point where strong tangential electric fields may be present.

An indication of these errors in the assumed response of the current probe is illustrated in Figure 23. Figure 23a shows how the phase of the current as measured by the magnetic probe decreases quite rapidly as the probe nears the end of this short antenna. The magnitude appears to be somewhat high at $Z/H = .9$ also. The measured

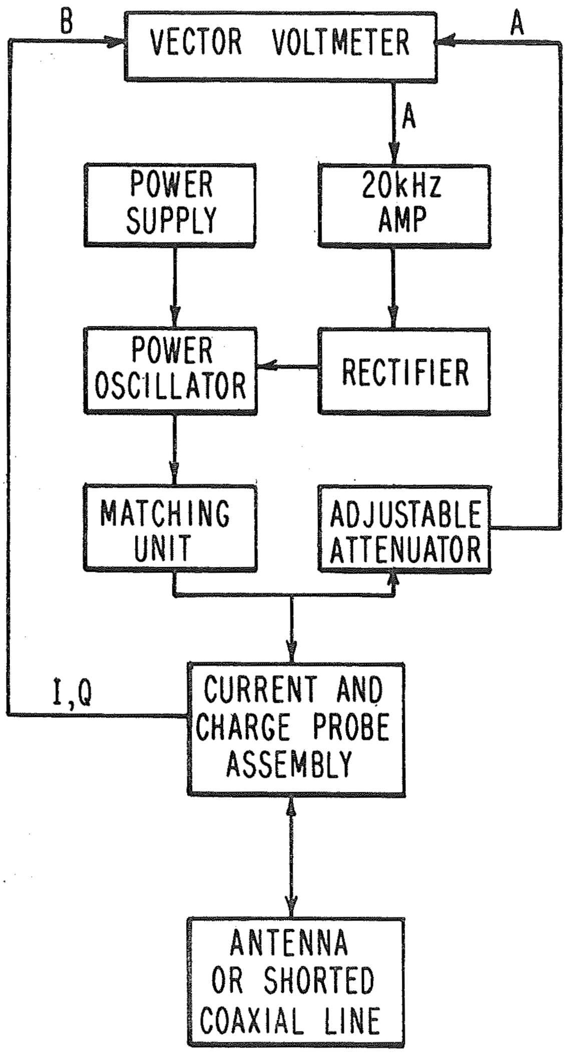


FIG. - 22 BLOCK DIAGRAM FOR CURRENT AND CHARGE DISTRIBUTION MEASURING EQUIPMENT

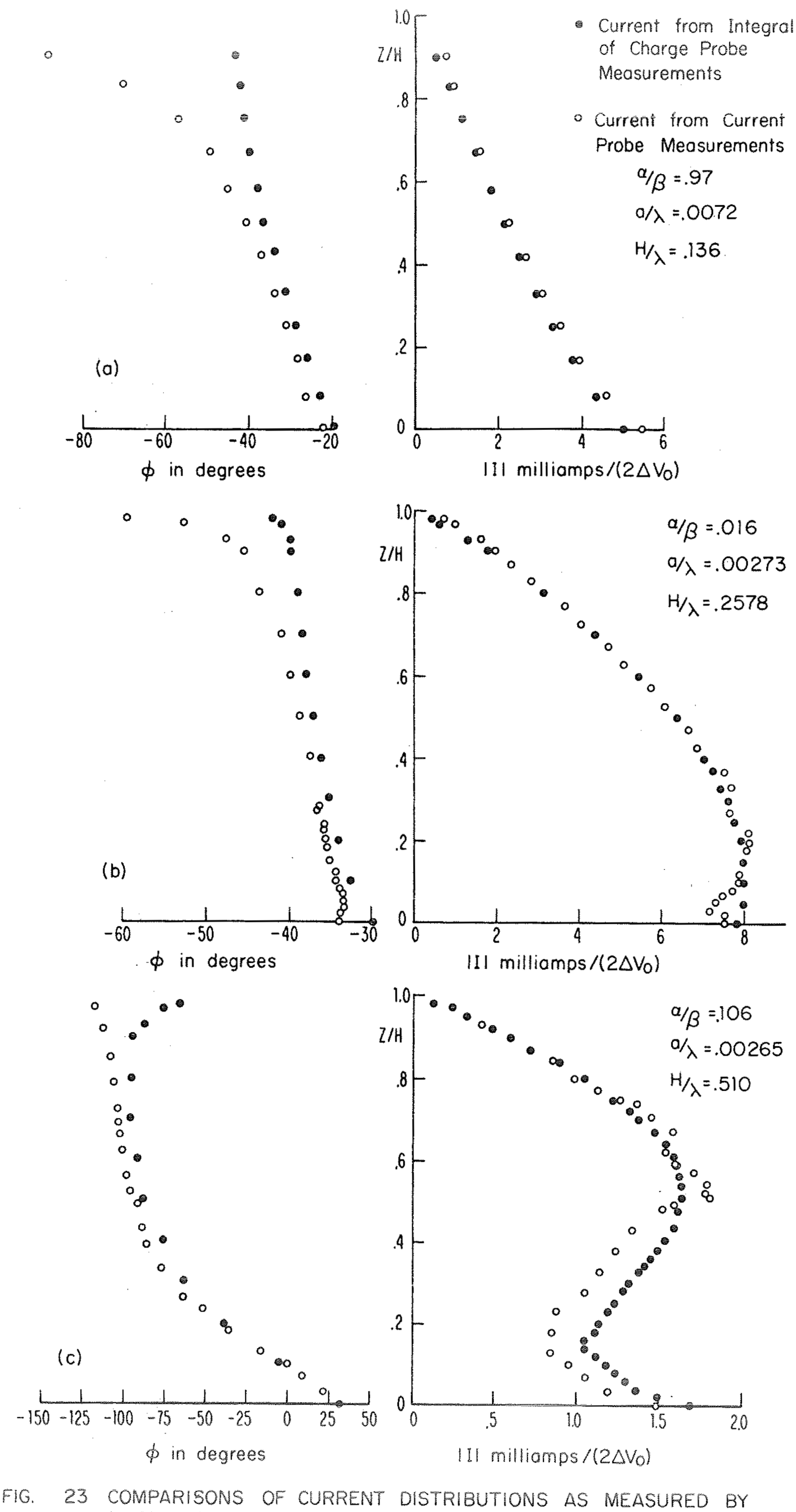


FIG. 23 COMPARISONS OF CURRENT DISTRIBUTIONS AS MEASURED BY MAGNETIC AND ELECTRIC PROBES.

current distribution derived from the electric probe by integrating the measured charge distribution looks quite reasonable for this case.

Figure 23b illustrates the discrepancy between the two methods at both the end and the driving point of the antenna. The end response is the same as for the short antenna above. At the driving point the magnetic probe indicates that there are pronounced ripples in the current distribution though no corresponding ripples were evident in the measured charge distribution nor in the derived current distribution as measured by the electric probe.

An entirely different kind of error is displayed in Figure 23c. This was introduced by severe power-line voltage fluctuations at certain times of the day at the field location (Lake Megunticook near Camden, Maine). These fluctuations were too severe to be regulated by the "leveling" system used. The data plotted for the current distribution as measured by the magnetic probe was obtained during one of these disturbances while the distribution derived from the electric probe was measured at a time when the line voltage was relatively constant.

In using the tables of measured current and charge distributions which appear in Appendix B, the above sources of error should be considered. In all cases the measurements of the distributions of current and charge were separated in time by at least 3 hours for a particular antenna. It is unlikely then, that both distributions for any one antenna were influenced by severe line voltage variations.

The reproducibility of measured data was checked for a case where the medium was known to be unchanged in electrical properties over a long period of time. This was with the antenna in lake water where $\alpha/\beta = .016$. From a comparison of the charge and current distributions for two antennas, one near resonance ($h/\lambda \approx .25$) and the other near anti-resonance ($h/\lambda \approx .5$), it was found that the magnitudes differed by less than $\pm 4\%$ from their average values while the phase difference was within 2 degrees. The measurements on these antennas were made 25 days apart. It is concluded that the reproducibility of the experimental results are quite good for media with stable electrical properties.

The current and charge distributions of the same ten monopoles discussed in section 3 are tabulated in Appendix B. They were measured using the above described equipment and techniques while immersed in the six media having various ratios of α/β. The same normalizing factor Δ as used in section 3 for the admittance tables is used so that the values are universal for any monopole having the same h/a ratio and βh in a medium with the α/β as listed.

5. Junction Effects

It is important to consider the junction effects at the driving point of the antenna. As indicated in the previous section, the assumption that the magnetic probe response is limited to the axial current on the antenna is apparently in error, at least for monopoles near resonance (Fig. 23). To investigate this probing error more thoroughly, the magnetic probe response near the driving point junction is plotted for five monopoles near resonance when immersed in five different media having α/β's of 0.016 to 0.592 (Fig. 24). In addition, the response of the probe in a water filled, $\lambda/2$ section of short-circuited coaxial line is also shown. For purposes of comparison with these cases where a severe dielectric discontinuity exists at the driving point (air line driving a monopole immersed in a salt water solution), a graph of the probe response of a resonant monopole driven by a section of water-filled coaxial line is included in Figure 24 (water-filled section is 5(b - a) in length, where b is the inside radius on the outer conductor and a is the outside radius of the inner conductor).

It is observed that the probe response of the antenna when driven by a water-filled line corresponds to the expected axial current response. When, for the less dissipative media the severe dielectric discontinuity exists, the probe response apparently is not strictly that of the axial current. This was also indicated in the previous section (Fig. 23). However, the current distribution as derived from the integral of the measured charge distribution is free of any ripple near the driving point. Thus, it is concluded that the current is indeed smooth in the junction region and that the magnetic probe response in this region is influenced by intense tangential electric fields set up near a severe dielectric discontinuity, but absent in a junction with a continuous dielectric. It is also observed that this ripple response is damped out in the two media with greatest dissipation. Further study of the measured data for various lengths of antennas shows this ripple in the response of the probe to be most pronounced for monopoles near resonance.

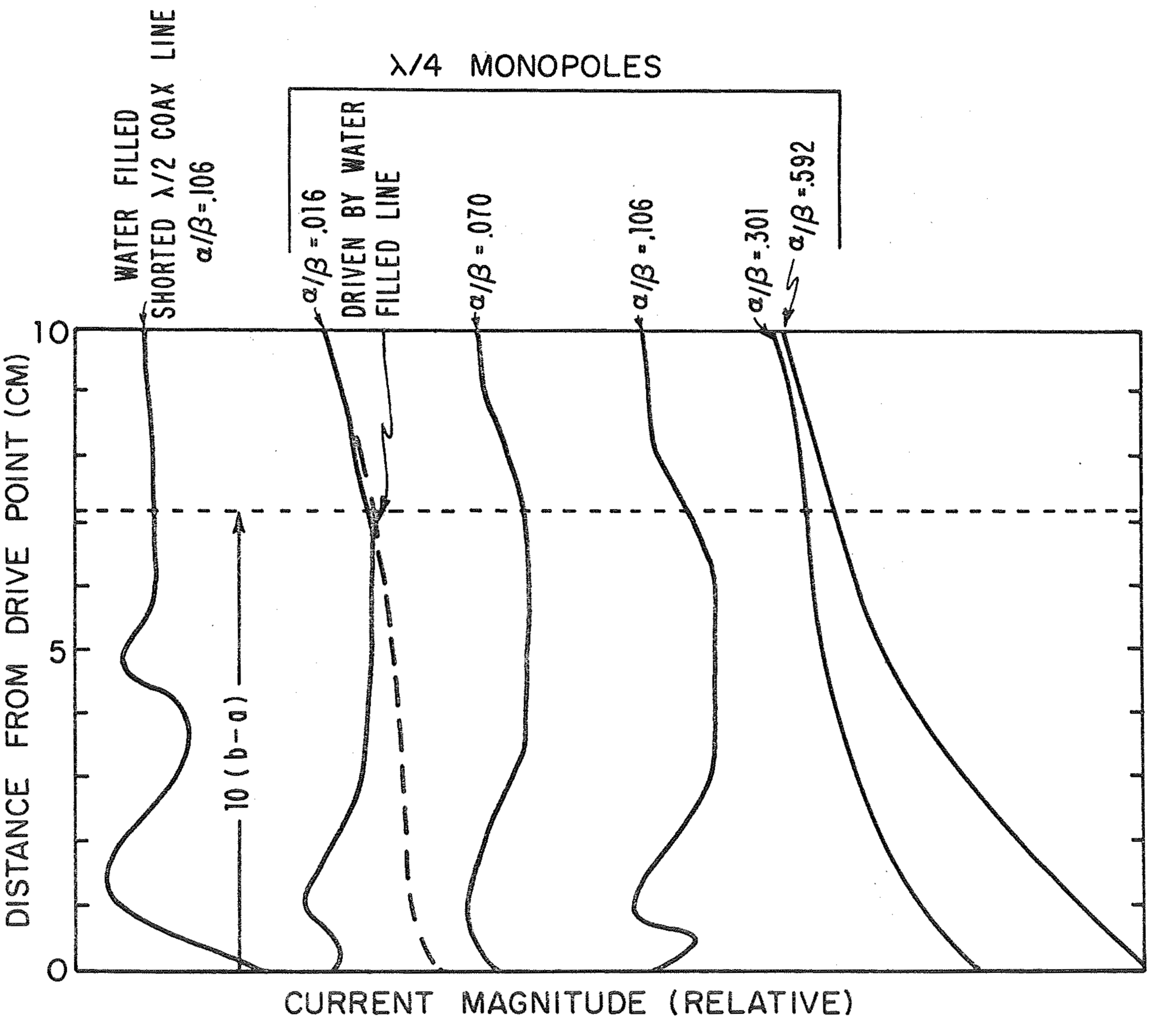


FIG. . 24 CURRENT PROBE RESPONSE FOR RESONANT STRUCTURES WITH SEVERE DIELECTRIC DISCONTINUITY AT DRIVE POINT.

The question now arises, whether this severe dielectric discontinuity significantly perturbs the driving point properties of the monopole from their values with a continuous dielectric. To investigate this, the admittances of nine antennas of various heights driven by the air-filled transmission line are shown plotted in Figure 25. And on the same graph the admittances of nine more antennas driven by a water-filled transmission line section are shown. There appears to be substantial evidence that the perturbation introduced by the dielectric discontinuity at the driving point is negligible in so far as admittance measurements are concerned.

It is impractical to carry this investigation much further since with the more highly dissipative media, the characteristic impedance of the water-filled line becomes lower and the attenuation increases, so that it becomes increasingly difficult to accurately measure the driving point admittances of the antennas. With this evidence, together with that in Figure 24 showing decreasing probe response errors for the increasingly dissipative media, it is reasonable to assume that for the electrical dimensions of the driving line and antennas used in this investigation there is no significant correction needed in the interpretation of data collected for monopoles driven with an air-filled line in a salt water solution from those which would be obtained for antennas driven with a water-filled line (i.e. no severe dielectric discontinuity), with the exception of the magnetic probe response within $10(b - a)$ of the junction.

Another aspect of the driving point junction effects is observed by varying the b/a ratio. These effects are studied for two extreme

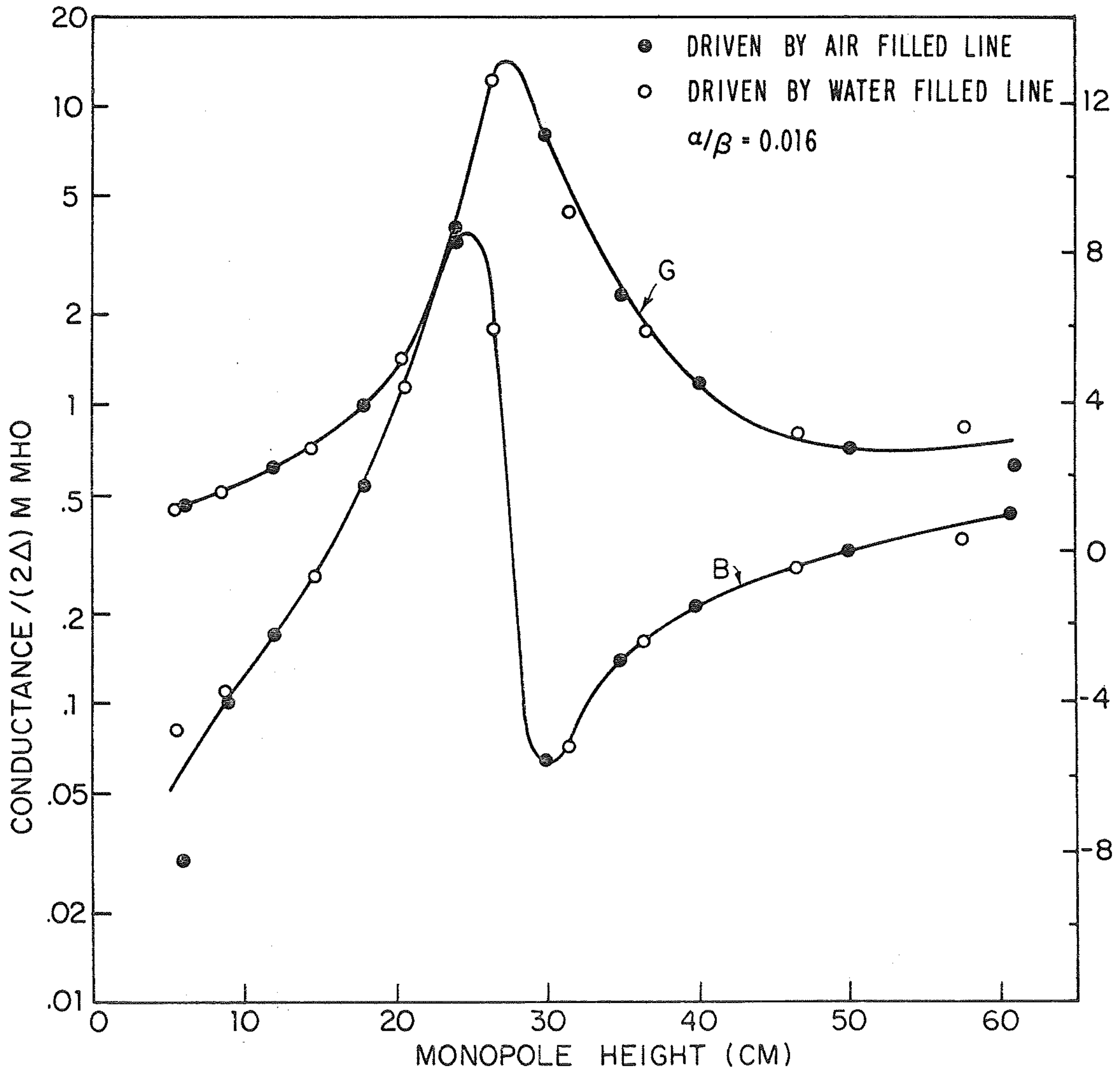


FIG. 25 ADMITTANCE VS. HEIGHT FOR ANTENNAS DRIVEN BY AIR AND WATER FILLED COAXIAL LINES.

cases, one for $\alpha/\beta = 0$, air, and the other for $\alpha/\beta = .986$, sea water. The results of this study are shown in Figure 26 and 27. In Figure 26a, the air case, it is noted that the conductance is essentially constant while the susceptance increases for decreasing b/a. For the smallest ratio of b/a, G appears to increase, but measurements at such a small b/a become very inaccurate since the very low impedance driving line cannot be maintained in a truly coaxial configuration.

In Figure 26b, the sea water case, it is noted that the susceptance is relatively constant and now the conductance increases with decreasing b/a. The significant evidence here is that any comparison of experimental admittances with a theory must consider the ratio b/a in determining an appropriate junction effect end correction unless the theory includes the driving line and hence the effects of various b/a ratios.

Figure 27 shows the effect of b/a on a range of antennas with various electrical lengths in sea water. Also, theoretical values have been calculated for comparison, using King's Short Antenna Theory [7] and the PEP theory [8]. Neither of these theories includes the ratio b/a in its formulations.

6. Conclusions

A practical experimental environment has been designed using a natural body of fresh water together with a thin polyethylene walled tank which effectively approximates an infinite, homogeneous, isotropic, dissipative medium for studying the electrical properties of

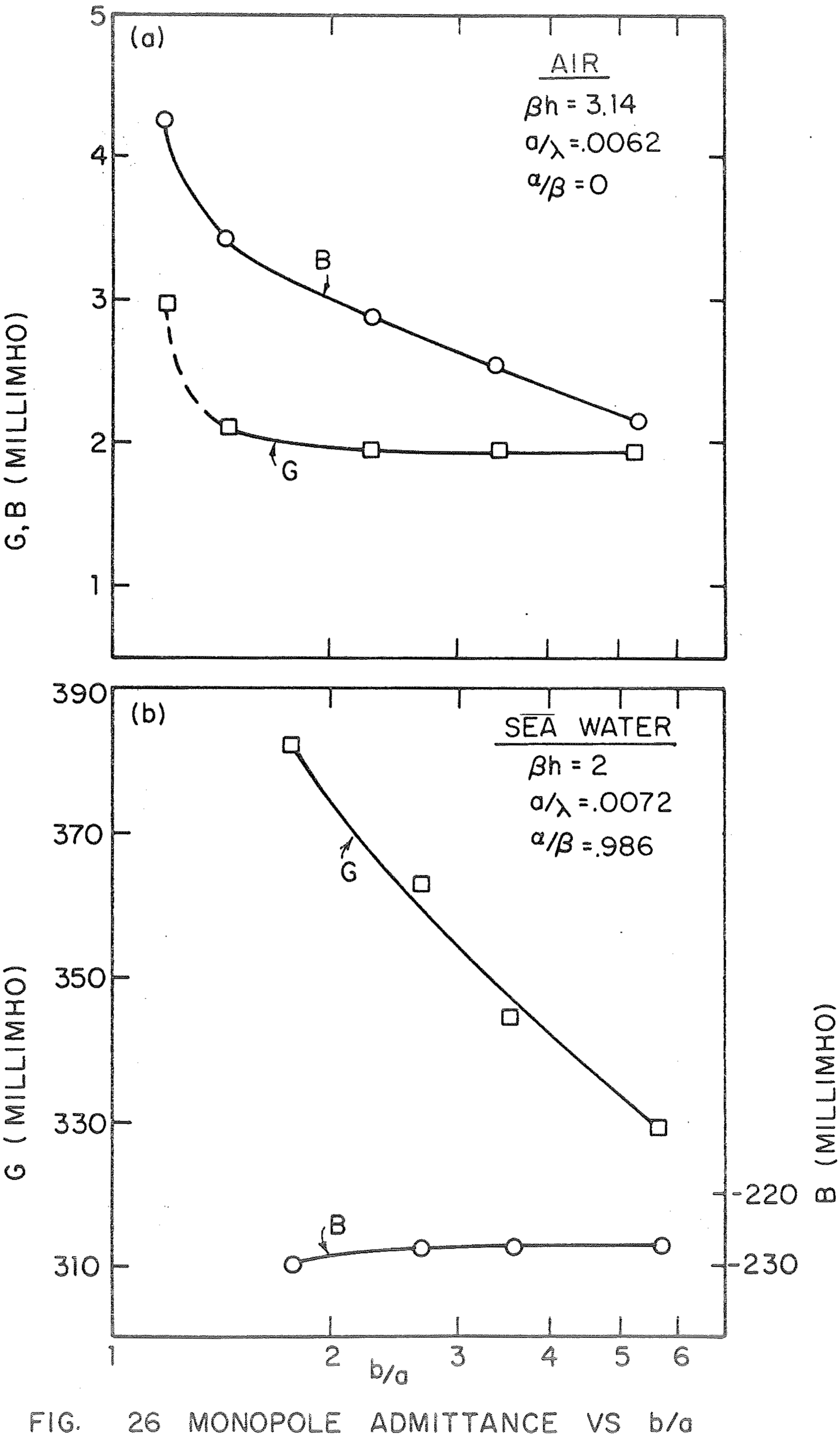
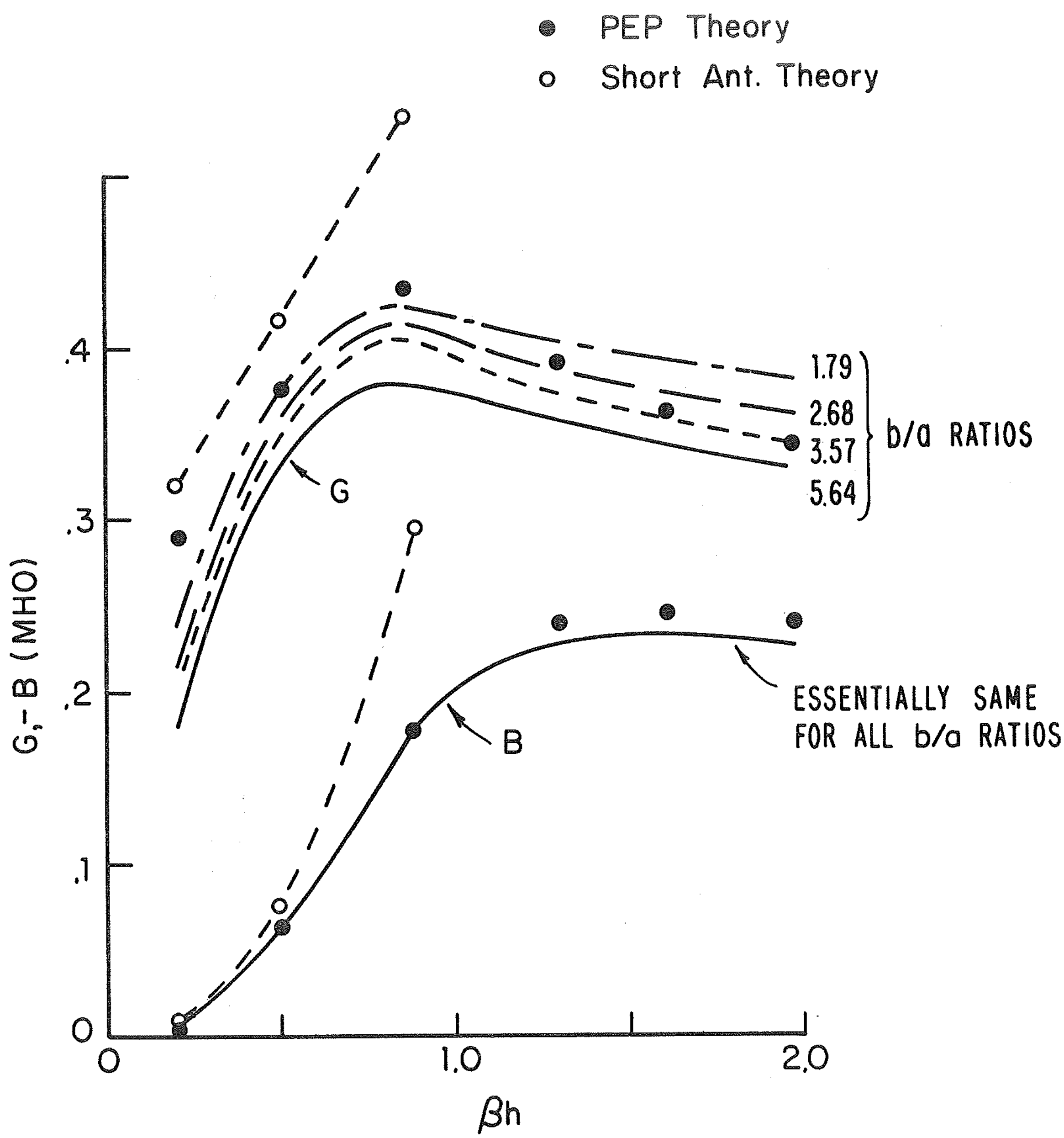


FIG. 26 MONOPOLE ADMITTANCE VS b/a



$\alpha/\beta = .986 \quad \sigma = 3.82 \quad a = 1.778$ mm

FIG. 27 DRIVE POINT ADMITTANCE FOR VARIOUS RATIOS OF b/a linear antennas immersed in such a medium. The ratio α/β of the medium may range from 0.016 to very near 1. An equipment float was designed to accomodate at least two researchers together with the necessary electronics. This float serves as the support structure for the ground plane which images the various length monopoles used in the study. The float also supports the polyethylene walled tank beneath it.

A special technique was developed to more accurately measure the effective conductivity and effective dielectric constant of the medium in which the monopoles are immersed. This involves a low frequency determination of an approximate value for σ together with a high frequency determination of β from which the values of σ and ϵ are found. The accuracy is improved by making the determining measurements under more ideal conditions for each component of data.

A simple and efficient, yet precise admittance-measuring technique was employed which involved the probing of fields on a precision section of transmission line at a precisely known distance from the driving point of the antenna. This system was self calibrating after its initial laboratory calibration. It presented a continuous direct reading of the admittance magnitude and phase at the probing point. Over a six month period of operation in the laboratory and field, all calibration checks indicated the accuracy of measured $|Y|$ was $\pm 2\%$ with a phase accuracy of $\pm 1.5^{\circ}$. The admittances of antennas of βh ranging from $\approx .3$ to 3.3 in media of $\alpha/\beta = 0.016$ to 0.97 were measured and tabulated.

Current and charge measuring apparatus was designed to precisely position probes of very small electrical dimensions along the surface of the monopoles being investigated. The response errors of the magnetic probe were investigated to determine the range of validity of its assumed current response with respect to operation near the end and the driving point of the antenna. A redundancy of data is available for the current distribution since the charge distribution for a particular antenna may be integrated to get another independent determination of the current distribution. Reproducibility of measured results were found to be $\pm 4\%$ in the magnitude with a 2° difference in phase for a typical case. The current and charge distributions for antennas of βh ranging from $\approx .3$ to 3.3 in media of $\alpha/\beta = 0.016$ to 0.97 were measured and tabulated.

Junction effects were investigated to determine the source of some probing errors and to find out if the abrupt air-water discontinuity at the antenna driving point caused an end correction in addition to that required with a continuous dielectric in the junction region. It was determined that it was not necessary to include any additional end corrections for the electrical dimensions of the apparatus used in this study. The effects of various b/a ratios in the coaxial line used to drive the antenna were investigated. The results were that for α/β near 0, only the susceptance is significantly affected by changing b/a. But, at α/β near 1 the conductance is significantly affected by changing b/a. Thus, in general, G and B are dependent on b/a for all α/β.

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Appendix A

Tables of Measured Admittances for Monopoles in Infinite Dissipative Media

The data in this set of tables were collected from a set of ten monopoles having physical dimensions of A = radius of 3.175 mm and H = height of 6, 9, 12, 18, 24, 30, 35, 40, 50, 61 cm. These monopoles were immersed in six media having α/β of .016, .070, .106, .301, .592, and .970, where

$$\alpha = \omega\sqrt{\mu\epsilon}\ g(p) \quad , \tag{A-1}$$

and

$$\beta = \omega\sqrt{\mu\epsilon}\ f(p) \tag{A-2}$$

with

$$g(p) = [\tfrac{1}{2}(\sqrt{1+p^2} - 1)]^{\frac{1}{2}} = \sinh(\tfrac{1}{2}\sinh^{-1}p) \tag{A-3}$$

and

$$f(p) = [\tfrac{1}{2}(\sqrt{1+p^2} + 1)]^{\frac{1}{2}} = \cosh(\tfrac{1}{2}\sinh^{-1}p) \quad . \tag{A-4}$$

The loss tangent

$$p = \sigma/\omega\epsilon \quad . \tag{A-5}$$

The radian frequency $\omega = 2\pi 28.01(10)^6/\mathrm{sec}$ for all measurements except for the medium with $\alpha/\beta = .97$ where $\omega = 2\pi 14.01(10)^6/\mathrm{sec}$. The normalizing factor

$$\Delta = f(p)\sqrt{\epsilon_r/\mu_r} \tag{A-6}$$

is used throughout the tables so that the tabulated values are universal. They apply to any monopole having the same H/A ratio and βH in a medium with α/β as listed.

All tabulated experimental monopole admittances are normalized such that

$$Y_{\mathrm{actual}}^{(\mathrm{mho})} = Y_{\mathrm{norm}}(2\Delta) = G(2\Delta) + jB(2\Delta) \quad . \tag{A-7}$$

Table A-1: Normalized Admittances

$\alpha/\beta = 0.016$ $a/\lambda = 0.00273$

$\Delta = 9.2$

βh	G	B
0.324	0.03	1.22
0.486	0.10	1.72
0.648	0.17	2.25
0.972	0.53	3.92
1.296	3.95	8.28
1.620	8.00	-5.59
1.890	2.13	-2.98
2.160	1.18	-1.53
2.700	0.70	-0.05
3.294	0.63	0.99

$\alpha/\beta = 0.070$ $a/\lambda = 0.00265$

$\Delta = 8.96$

βh	G	B
0.315	0.17	1.21
0.473	0.27	1.70
0.630	0.43	2.22
0.946	1.21	3.66
1.261	5.04	4.86
1.576	6.23	-1.92
1.839	2.79	-2.07
2.101	1.69	-1.20
2.627	1.05	-0.05
3.205	1.03	0.96

$\alpha/\beta = 0.106$ $a/\lambda = 0.00266$

$\Delta = 8.99$

βh	G	B
0.316	0.30	1.21
0.475	0.44	1.68
0.633	0.65	2.18
0.949	1.63	3.51
1.266	5.38	4.18
1.582	5.85	-1.72
1.846	2.76	-2.00
2.109	1.79	-1.24
2.637	1.24	-0.11
3.217	1.29	0.77

$\alpha/\beta = 0.301$ $a/\lambda = 0.0028$

$\Delta = 9.58$

βh	G	B
0.337	0.86	1.10
0.506	1.28	1.49
0.674	1.80	1.84
1.011	3.25	2.06
1.348	4.57	0.54
1.686	3.74	-0.94
1.966	2.77	-1.04
2.247	2.32	-0.78
2.809	2.09	-0.06
3.427	2.29	0.21

Table A-1 (continued)

$\alpha/\beta = 0.592$ $a/\lambda = 0.0037$

$\Delta = 12.54$

βh	G	B
0.441	2.15	0.65
0.662	2.96	0.54
0.883	3.58	0.10
1.324	3.68	-0.98
1.765	3.19	-1.31
2.207	2.92	-1.21
2.574	2.87	-1.09
2.942	2.88	-1.02
3.678	2.93	-0.99
4.487	2.93	-1.00

$\alpha/\beta = 0.97$ $a/\lambda = 0.0072$

$\Delta = 48.55$

βh	G	B
0.855	5.11	-2.06
1.282	4.68	-2.76
1.709	4.42	-2.79
2.564	4.32	-2.65
3.419	4.24	-2.63
4.273	4.30	-2.65
4.986	4.25	-2.67

Appendix B

Tables of Measured Current and Charge Distributions for Monopoles in Infinite Dissipative Media

The data in this set of tables were collected from a set of ten monopoles having physical dimensions of A = radius of 3.175 mm and H = height of 6, 9, 12, 18, 24, 30, 35, 40, 50, 61 cm. These monopoles were immersed in six media having α/β of .016, .070, .106, .301, .592, and .970, where

$$\alpha = \omega\sqrt{\mu\epsilon}\ g(p) \quad , \tag{B-1}$$

and

$$\beta = \omega\sqrt{\mu\epsilon}\ f(p) \tag{B-2}$$

with

$$g(p) = [\tfrac{1}{2}(\sqrt{1 + p^2} - 1)]^{\frac{1}{2}} = \sinh(\tfrac{1}{2}\sinh^{-1}p) \tag{B-3}$$

and

$$f(p) = [\tfrac{1}{2}(\sqrt{1 + p^2} + 1)]^{\frac{1}{2}} = \cosh(\tfrac{1}{2}\sinh^{-1}p) \quad . \tag{B-4}$$

The loss tangent

$$p = \sigma/\omega\epsilon \quad . \tag{B-5}$$

The radian frequency $\omega = 2\pi 28.01(10)^6/\text{sec}$ for all measurements except for the medium with $\alpha/\beta = .97$ where $\omega = 2\pi 14.01(10)^6/\text{sec}$. The normalizing factor

$$\Delta = f(p)\sqrt{\epsilon_r/\mu_r} \tag{B-6}$$

is used throughout the tables so that the tabulated values are universal. They apply to any monopole having the same H/A ratio and βH in a medium with α/β as listed.

All tabulated experimental monopole current distributions are normalized such that

$$I(z)_{actual}(\text{amperes}) = I(x)_{norm} * 2\,\Delta V_o * 10^3 \quad . \tag{B-7}$$

The normalized distance along the monopole $x = z/h$ and V_o is the driving voltage. $I(x)_{norm}$ has dimensions of milli-amp/volt.

The original raw data, in terms of relative magnitude and phase, were scaled either to the normalized measured driving point admittance or to the PEP Theory [1] value at a point on the monopole not too near the driving point $z = 0$. Table B-1 lists the scaling scheme. The reason for not scaling all of the distributions to the measured driving point admittance is that certain probing difficulties were encountered near the junction of the antenna and the transmission line. In general, for the less dissipative media the current probe does not respond exclusively to the axial current on the antenna, but is excited in addition by the evanescent fields in the junction region. It is therefore more realistic to normalize the measured distributions for these cases at a point outside the influence of the junction as shown in Table B-1.

All tabulated experimental charge distributions for monopoles are normalized such that

$$Q(z)_{actual}(\text{coulombs/meter}) = Q(x)_{norm} * 2\,\Delta V_o * 10^3/(\omega h) \tag{B-8}$$

where $\omega = 2\pi f$ the radian frequency and h is the monopole height in meters. $Q(x)_{norm}$ has dimensions of milli-coulombs/volt sec.

The original raw data, in terms of relative magnitude and phase, were scaled to the PEP Theory magnitude and phase at the midpoint on the monopole.

Table B-1: Normalization of Measured Current Distributions

Medium, α/β	Height, (cm)	Scaling Scheme
.016, .07, .106	6 9 12	at midpoint on antenna to PEP Theory value
	18 24 30 35 40 50	at point 7 cm from drive point (i.e. 10(b - a)*) to PEP Theory value
	61	at drive point to measured admittance
.301, .592, .97	all heights	

*(b - a) is the difference between the radius of the driving coaxial transmission line outer and inner conductors.

It should be emphasized that regardless of the normalization schemes used, the tabulated values for the magnitude and phase of the current or charge are simply scaled in magnitude and shifted by a constant in phase from the original measured relative quantities. Hence, the normalization of these quantities has in no way obscured the original experimental information.

TABLE B-2: CURRENT AND CHARGE DISTRIBUTIONS, α/β=.016

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT) — MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A = 18.90 BETA*H =0.324 ALPHA/BETA =0.016 DELTA = 9.20

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	0.11	1.51	1.51	85.8	0.0	1.63	-0.05	1.83	-1.6
0.08	0.09	1.27	1.27	86.0	0.08	1.62	-0.05	1.62	-1.7
0.17	0.04	1.06	1.06	87.9	0.17	1.36	-0.04	1.36	-1.8
0.25	0.04	0.92	0.92	87.5	0.25	1.23	-0.04	1.23	-1.8
0.33	0.03	0.83	0.83	87.9	0.33	1.13	-0.04	1.13	-1.8
0.42	0.03	0.74	0.74	87.8	0.42	1.10	-0.03	1.10	-1.8
0.50	0.02	0.65	0.65	87.8	0.50	1.07	-0.04	1.07	-2.1
0.58	0.03	0.56	0.56	87.4	0.58	1.07	-0.04	1.07	-2.2
0.67	0.02	0.47	0.47	87.9	0.67	1.07	-0.04	1.07	-2.2
0.75	0.01	0.39	0.39	87.9	0.75	1.69	-0.04	1.09	-2.1
0.83	0.02	0.30	0.30	86.7	0.83	1.15	-0.04	1.15	-2.0
0.90	0.01	0.22	0.22	86.8	0.90	1.25	-0.04	1.25	-1.8

H/A = 28.35 BETA*H =0.486

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	0.15	1.68	1.69	84.9	0.0	2.38	-0.07	2.38	-1.7
0.06	0.11	1.54	1.55	85.9	0.06	2.32	-0.11	2.32	-2.6
0.11	0.07	1.42	1.42	87.3	0.11	1.99	-0.08	2.00	-2.4
0.17	0.06	1.37	1.37	87.3	0.17	1.83	-0.07	1.83	-2.3
0.22	0.06	1.26	1.26	87.2	0.22	1.70	-0.07	1.70	-2.4
0.28	0.06	1.20	1.20	87.2	0.28	1.61	-0.07	1.61	-2.5
0.33	0.06	1.14	1.14	87.1	0.33	1.56	-0.07	1.56	-2.5
0.39	0.05	1.06	1.06	87.2	0.39	1.52	-0.07	1.52	-2.5
0.44	0.05	0.98	0.98	87.2	0.44	1.51	-0.07	1.51	-2.5
0.50	0.05	0.90	0.90	87.1	0.50	1.50	-0.07	1.50	-2.5
0.56	0.04	0.83	0.83	87.2	0.56	1.49	-0.07	1.49	-2.6
0.61	0.04	0.74	0.74	87.1	0.61	1.50	-0.07	1.50	-2.7
0.67	0.03	0.65	0.66	87.1	0.67	1.50	-0.07	1.51	-2.8
0.72	0.03	0.56	0.56	87.0	0.72	1.52	-0.07	1.53	-2.8
0.78	0.03	0.47	0.47	86.7	0.78	1.54	-0.08	1.55	-2.9
0.83	0.02	0.39	0.39	86.4	0.83	1.61	-0.08	1.61	-2.9
0.89	0.02	0.30	0.30	85.8	0.89	1.69	-0.08	1.69	-2.8
0.93	0.02	0.22	0.22	85.4	0.93	1.90	-0.08	1.90	-2.5

H/A = 37.80 BETA*H =0.648

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	0.22	2.37	2.38	84.6	0.0	3.50	-0.19	3.51	-3.1
0.04	0.15	2.10	2.10	85.8	0.04	3.24	-0.16	3.24	-2.8
0.08	0.14	1.99	2.00	86.1	0.08	2.76	-0.14	2.76	-2.8
0.13	0.13	1.93	1.94	86.1	0.13	2.50	-0.13	2.50	-2.9
0.17	0.12	1.83	1.83	86.1	0.17	2.34	-0.12	2.34	-2.9
0.21	0.12	1.76	1.77	86.1	0.21	2.23	-0.12	2.23	-3.0
0.25	0.12	1.70	1.70	86.1	0.25	2.12	-0.11	2.13	-3.1
0.29	0.11	1.63	1.63	86.0	0.29	2.12	-0.12	2.13	-3.2
0.33	0.11	1.56	1.57	86.0	0.33	2.05	-0.11	2.05	-3.2
0.38	0.11	1.51	1.51	86.0	0.38	2.03	-0.11	2.03	-3.2
0.42	0.10	1.41	1.41	86.0	0.42	2.62	-0.12	2.02	-3.3
0.46	0.09	1.32	1.33	85.9	0.46	2.02	-0.12	2.02	-3.3
0.50	0.09	1.22	1.22	85.8	0.50	2.62	-0.12	2.02	-3.4
0.54	0.09	1.13	1.14	85.7	0.54	2.02	-0.12	2.02	-3.4
0.58	0.08	1.04	1.04	85.5	0.58	2.03	-0.12	2.03	-3.4
0.63	0.08	0.95	0.96	85.5	0.63	2.05	-0.13	2.05	-3.5
0.67	0.07	0.87	0.87	85.5	0.67	2.08	-0.13	2.08	-3.5
0.71	0.06	0.80	0.80	85.4	0.71	2.09	-0.13	2.09	-3.5
0.75	0.06	0.69	0.69	85.3	0.75	2.14	-0.13	2.15	-3.6
0.79	0.05	0.61	0.61	85.0	0.79	2.21	-0.14	2.21	-3.6
0.83	0.05	0.51	0.52	84.6	0.83	2.26	-0.14	2.26	-3.6
0.88	0.04	0.42	0.42	84.5	0.88	2.33	-0.15	2.34	-3.6
0.92	0.03	0.31	0.32	83.7	0.92	2.49	-0.15	2.50	-3.5
0.96	0.03	0.21	0.21	82.8	0.96	2.74	-0.16	2.74	-3.4

H/A = 56.69 BETA*H =0.972

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	0.89	4.90	4.98	79.7	0.0	5.29	-0.39	5.30	-4.2
0.03	0.68	4.50	4.55	81.4	0.03	4.88	-0.35	4.90	-4.1
0.06	0.62	4.04	4.08	81.2	0.06	4.21	-0.32	4.22	-4.4
0.08	0.62	3.96	4.01	81.0	0.08	3.85	-0.32	3.87	-4.8
0.11	0.62	4.00	4.05	81.2	0.11	3.61	-0.32	3.62	-5.1
0.14	0.60	3.88	3.93	81.2	0.14	3.50	-0.33	3.52	-5.4
0.17	1.23	7.64	7.74	80.8	0.17	3.42	-0.34	3.44	-5.7
0.19	0.63	3.80	3.85	80.6	0.19	3.36	-0.35	3.38	-5.9
0.22	0.58	3.59	3.64	80.7	0.22	3.36	-0.37	3.38	-6.2
0.25	0.57	3.41	3.46	80.4	0.25	3.36	-0.39	3.38	-6.6
0.28	0.54	3.18	3.23	80.3	0.28	3.38	-0.41	3.41	-6.9
0.31	0.53	3.03	3.07	80.1	0.31	3.38	-0.42	3.41	-7.1
0.33	0.52	2.91	2.96	79.8	0.33	3.41	-0.44	3.44	-7.4
0.36	0.52	2.85	2.90	79.7	0.36	3.43	-0.46	3.46	-7.7
0.39	0.50	2.77	2.82	79.7	0.39	3.48	-0.48	3.52	-7.9
0.42	0.48	2.68	2.72	79.7	0.42	3.81	-0.50	3.54	-8.1
0.44	0.47	2.56	2.61	79.6	0.44	3.56	-0.51	3.60	-8.2
0.47	0.46	2.45	2.49	79.3	0.47	3.64	-0.54	3.68	-8.4
0.50	0.44	2.35	2.39	79.4	0.50	3.72	-0.56	3.76	-8.6
0.53	0.43	2.27	2.31	79.3	0.53	3.74	-0.59	3.79	-8.9
0.56	0.41	2.14	2.18	79.0	0.56	3.79	-0.60	3.84	-9.0

TABLE B-2: Cont'd

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT) — MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A = 56.69 BETA*H =0.972 ALPHA/BETA =0.016 DELTA = 9.20

Monopole currents

Z/H	REAL	IMAG	ABSVAL	PHASE
0.58	0.40	2.04	2.08	78.6
0.61	0.39	1.97	2.00	78.8
0.64	0.36	1.85	1.89	78.8
0.67	0.34	1.72	1.75	78.6
0.68	0.33	1.60	1.63	78.4
0.72	0.31	1.48	1.52	78.0
0.75	0.30	1.39	1.42	77.7
0.78	0.28	1.29	1.32	77.9
0.81	0.26	1.20	1.23	77.6
0.83	0.24	1.08	1.11	77.4
0.86	0.22	0.95	0.97	76.7
0.89	0.19	0.79	0.82	76.3
0.92	0.18	0.68	0.70	75.1
0.94	0.16	0.52	0.54	73.0
0.97	0.13	0.37	0.39	70.8

Monopole charge

Z/H	REAL	IMAG	ABSVAL	PHASE
0.61	3.90	-0.64	3.95	-9.3
0.67	4.05	-0.69	4.11	-9.6
0.72	4.21	-0.73	4.27	-9.9
0.78	4.37	-0.77	4.44	-10.0
0.83	4.52	-0.82	4.60	-10.3
0.89	4.87	-0.89	4.95	-10.4
0.94	5.50	-1.04	5.60	-10.7
0.97	6.12	-1.14	6.22	-10.6

H/A = 75.59 BETA*H =1.296

Monopole currents

Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	6.16	8.26	10.30	53.3
0.02	5.60	7.78	9.59	54.3
0.04	5.26	7.32	9.02	54.3
0.06	5.28	7.31	9.02	54.2
0.08	5.48	7.60	9.37	54.2
0.10	5.50	7.50	9.30	53.8
0.13	5.38	7.24	9.02	53.4
0.15	5.30	7.11	8.87	53.3
0.17	5.26	6.97	8.73	53.0
0.19	5.19	6.84	8.59	52.8
0.21	5.19	6.84	8.59	52.8
0.23	5.07	6.66	8.37	52.7
0.25	5.07	6.57	8.30	52.4
0.27	4.98	6.46	8.16	52.4
0.29	4.96	6.39	8.08	52.2
0.31	4.83	6.22	7.87	52.2
0.33	4.77	6.08	7.73	51.9
0.35	4.66	5.98	7.58	52.1
0.38	4.62	5.83	7.44	51.6
0.40	4.52	5.73	7.30	51.7
0.42	4.44	5.61	7.15	51.7
0.44	4.43	5.43	7.01	50.8
0.46	4.36	5.31	6.87	50.6
0.48	4.23	5.13	6.65	50.5
0.50	4.05	4.96	6.40	50.8
0.52	3.86	4.70	6.08	50.6
0.54	3.69	4.52	5.83	50.8
0.56	3.59	4.37	5.65	50.6
0.58	3.42	4.13	5.37	50.4
0.60	3.29	3.96	5.15	50.3
0.63	3.21	3.84	5.01	50.1
0.65	3.08	3.67	4.79	50.0
0.67	2.96	3.50	4.58	49.8
0.71	2.78	3.18	4.22	48.9
0.75	2.46	2.84	3.76	49.2
0.79	2.17	2.43	3.26	48.3
0.83	1.83	2.01	2.72	47.7
0.88	1.56	1.63	2.25	46.3
0.92	1.18	1.15	1.65	44.3
0.96	0.81	0.70	1.07	40.8
0.98	0.56	0.39	0.68	34.8

Monopole charge

Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	6.77	-1.55	6.94	-12.9
0.02	6.40	-1.55	6.58	-13.6
0.04	5.69	-1.56	5.90	-15.3
0.06	5.30	-1.62	5.54	-17.0
0.08	5.09	-1.72	5.38	-18.7
0.10	5.04	-1.87	5.38	-20.4
0.13	5.03	-2.02	5.42	-21.9
0.15	5.09	-2.19	5.54	-23.3
0.17	5.18	-2.37	5.70	-24.6
0.19	5.21	-2.50	5.78	-25.6
0.21	5.34	-2.69	5.98	-26.7
0.23	5.48	-2.86	6.18	-27.6
0.25	5.57	-3.04	6.34	-28.6
0.27	5.75	-3.21	6.58	-29.2
0.29	5.91	-3.40	6.82	-29.9
0.31	6.01	-3.55	6.98	-30.6
0.33	6.29	-3.72	7.30	-30.6
0.35	6.40	-4.00	7.54	-32.0
0.38	6.51	-4.13	7.71	-32.4
0.40	6.68	-4.30	7.95	-32.8
0.42	6.84	-4.49	8.19	-33.3
0.46	7.18	-4.86	8.67	-34.1
0.50	7.50	-5.25	9.15	-35.0
0.54	7.85	-5.58	9.63	-35.4
0.58	8.04	-5.86	9.95	-36.1
0.63	8.38	-6.22	10.43	-36.6
0.67	8.65	-6.52	10.84	-37.0
0.71	9.05	-6.92	11.40	-37.4
0.75	9.39	-7.28	11.88	-37.8
0.79	9.71	-7.64	12.36	-38.2
0.83	10.04	-8.01	12.84	-38.6
0.88	10.49	-8.47	13.48	-38.9
0.92	11.21	-9.11	14.45	-39.1
0.96	12.61	-10.32	16.29	-39.3
0.97	13.97	-11.44	18.06	-39.3

H/A = 94.49 BETA*H =1.620

Monopole currents

Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	6.29	-4.22	7.57	-33.9
0.02	6.31	-4.19	7.57	-33.6
0.03	6.01	-3.94	7.18	-33.3
0.05	6.14	-4.03	7.35	-33.3
0.07	6.28	-4.13	7.51	-33.4
0.08	6.43	-4.30	7.74	-33.8
0.10	6.54	-4.44	7.90	-34.2
0.12	6.53	-4.45	7.90	-34.3
0.13	6.57	-4.49	7.96	-34.4
0.15	6.52	-4.56	7.96	-35.0
0.17	6.67	-4.63	8.12	-34.8
0.18	6.60	-4.63	8.07	-35.1
0.20	6.61	-4.72	8.12	-35.6
0.22	6.60	-4.74	8.12	-35.7
0.23	6.47	-4.63	7.96	-35.6
0.25	6.40	-4.63	7.90	-35.9
0.27	6.13	-4.53	7.63	-36.5
0.28	6.24	-4.58	7.74	-36.3
0.30	6.21	-4.61	7.74	-36.6
0.32	6.21	-4.61	7.74	-36.6
0.33	6.15	-4.60	7.68	-36.8
0.37	6.02	-4.50	7.51	-36.8
0.40	5.71	-4.36	7.18	-37.4
0.43	5.41	-4.21	6.85	-37.9
0.47	5.21	-4.11	6.63	-38.3
0.50	4.97	-3.96	6.35	-38.6

Monopole charge

Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	6.36	0.04	6.36	0.4
0.02	5.71	-0.11	5.71	-1.1
0.03	4.64	-0.36	4.65	-4.4
0.05	3.78	-0.62	3.84	-9.3
0.07	3.15	-0.86	3.26	-15.3
0.08	2.66	-1.14	2.90	-23.1
0.10	2.20	-1.41	2.61	-32.6
0.12	1.86	-1.59	2.45	-40.6
0.13	1.54	-1.90	2.45	-50.9
0.15	1.18	-2.14	2.45	-61.1
0.17	0.88	-2.37	2.53	-69.6
0.18	0.58	-2.63	2.69	-77.6
0.20	0.27	-2.84	2.86	-84.6
0.22	0.01	-3.10	3.10	-89.9
0.23	-0.27	-3.33	3.35	-94.6
0.25	-0.55	-3.63	3.67	-98.6
0.27	-0.82	-3.83	3.92	-102.1
0.28	-1.07	-4.11	4.24	-104.6
0.30	-1.34	-4.37	4.57	-107.1
0.32	-1.59	-4.54	4.81	-109.3
0.33	-1.84	-4.80	5.14	-111.0
0.37	-2.36	-5.29	5.79	-114.0
0.40	-2.83	-5.70	6.36	-116.4
0.43	-3.27	-6.12	6.94	-118.1
0.47	-3.75	-6.60	7.59	-119.6
0.50	-4.20	-6.99	8.16	-121.0

TABLE B-2: Cont'd

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT) — MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A = 94.49 BETA*H =1.620 ALPHA/BETA =0.016 DELTA = 9.20

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.53	4.74	-3.81	6.08	-38.8	0.53	-4.70	-7.36	8.73	-122.6
0.57	4.47	-3.61	5.75	-39.0	0.57	-4.99	-7.56	9.06	-123.4
0.60	4.16	-3.47	5.41	-39.9	0.60	-5.85	-8.17	9.87	-124.2
0.63	3.90	-3.26	5.08	-39.9	0.63	-5.93	-8.50	10.36	-124.9
0.67	3.58	-3.04	4.70	-40.4	0.67	-6.33	-8.91	10.93	-125.4
0.70	3.30	-2.86	4.37	-40.9	0.70	-6.71	-9.24	11.42	-126.0
0.73	3.03	-2.67	4.03	-41.4	0.73	-7.10	-9.56	11.91	-126.6
0.77	2.73	-2.42	3.65	-41.6	0.77	-7.53	-9.96	12.48	-127.1
0.80	2.37	-2.24	3.26	-43.4	0.80	-7.97	-10.34	13.06	-127.6
0.83	2.05	-1.94	2.82	-43.4	0.83	-8.31	-10.60	13.46	-128.1
0.87	1.71	-1.65	2.38	-44.0	0.87	-8.75	-11.08	14.12	-128.3
0.90	1.40	-1.42	1.99	-45.4	0.90	-9.21	-11.54	14.77	-128.6
0.93	1.09	-1.18	1.60	-47.4	0.93	-10.04	-12.35	15.91	-129.1
0.97	0.60	-0.79	0.99	-52.9	0.97	-11.40	-13.98	18.03	-129.2
0.98	0.35	-0.60	0.70	-59.9	0.98	-12.64	-15.39	19.91	-129.4

H/A =110.24 BETA*H =1.890

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	2.73	-3.09	4.12	-48.5	0.0	9.57	1.08	9.63	6.4
0.01	2.54	-2.88	3.84	-48.6	0.01	8.52	0.93	8.57	6.2
0.03	2.30	-2.68	3.53	-49.4	0.03	6.82	0.64	6.85	5.3
0.04	2.23	-2.66	3.47	-50.0	0.04	5.78	0.45	5.80	4.4
0.06	2.50	-3.02	3.92	-50.4	0.06	5.02	0.29	5.02	3.3
0.07	2.39	-2.93	3.78	-50.8	0.07	4.46	0.15	4.46	1.9
0.09	2.43	-3.04	3.90	-51.4	0.09	4.04	0.02	4.04	0.3
0.10	2.43	-3.11	3.95	-52.0	0.10	3.62	-0.11	3.62	-1.8
0.11	2.44	-3.18	4.01	-52.5	0.11	3.33	-0.21	3.34	-3.6
0.13	2.42	-3.26	4.07	-53.4	0.13	2.97	-0.32	2.99	-6.1
0.14	2.43	-3.29	4.09	-53.6	0.14	2.67	-0.45	2.71	-9.6
0.16	2.43	-3.33	4.12	-53.8	0.16	2.40	-0.53	2.46	-12.6
0.17	2.38	-3.33	4.09	-54.5	0.17	2.09	-0.62	2.18	-16.6
0.19	2.37	-3.34	4.09	-54.6	0.19	1.82	-0.75	1.97	-22.3
0.20	2.38	-3.40	4.15	-55.0	0.20	1.55	-0.83	1.76	-28.1
0.21	2.38	-3.40	4.15	-55.0	0.21	1.34	-0.91	1.62	-34.1
0.23	2.27	-3.37	4.07	-56.0	0.23	1.04	-0.99	1.44	-43.7
0.24	2.29	-3.39	4.09	-56.0	0.24	0.85	-1.07	1.37	-51.6
0.26	2.29	-3.36	4.07	-55.7	0.26	0.60	-1.19	1.33	-63.1
0.27	2.25	-3.39	4.07	-56.4	0.27	0.39	-1.28	1.33	-73.1
0.29	2.21	-3.38	4.04	-56.8	0.29	0.17	-1.36	1.37	-83.1
0.31	2.15	-3.32	3.95	-57.1	0.31	-0.28	-1.56	1.58	-100.1
0.34	2.06	-3.24	3.84	-57.5	0.34	-0.71	-1.72	1.86	-112.6
0.37	2.03	-3.23	3.81	-57.8	0.37	-1.13	-1.90	2.21	-120.8
0.40	1.97	-3.23	3.78	-58.6	0.40	-1.53	-2.05	2.56	-126.8
0.43	1.92	-3.19	3.73	-59.0	0.43	-1.96	-2.25	2.99	-131.1
0.46	2.01	-3.34	3.90	-59.0	0.46	-2.39	-2.43	3.41	-134.6
0.49	1.99	-3.32	3.87	-59.0	0.49	-2.85	-2.61	3.86	-137.6
0.51	1.95	-3.24	3.78	-59.0	0.51	-3.21	-2.73	4.22	-139.6
0.54	1.93	-3.22	3.75	-59.0	0.54	-3.61	-2.91	4.64	-141.1
0.57	1.87	-3.16	3.67	-59.4	0.57	-4.00	-3.03	5.02	-142.9
0.60	1.80	-3.07	3.56	-59.6	0.60	-4.41	-3.20	5.45	-144.1
0.63	1.69	-2.93	3.39	-60.0	0.63	-4.74	-3.34	5.80	-144.9
0.66	1.56	-2.75	3.16	-60.5	0.66	-5.13	-3.45	6.18	-146.1
0.69	1.44	-2.59	2.96	-61.0	0.69	-5.49	-3.60	6.57	-146.8
0.71	1.32	-2.43	2.77	-61.5	0.71	-5.84	-3.71	6.92	-147.6
0.74	1.14	-2.24	2.51	-63.0	0.74	-6.14	-3.83	7.24	-148.1
0.77	1.03	-2.07	2.31	-63.6	0.77	-6.48	-3.95	7.59	-148.7
0.80	0.94	-1.86	2.09	-63.2	0.80	-6.84	-4.02	7.94	-149.6
0.83	0.82	-1.67	1.86	-64.0	0.83	-7.18	-4.14	8.29	-150.1
0.86	0.70	-1.54	1.69	-65.5	0.86	-7.53	-4.25	8.64	-150.6
0.89	0.59	-1.28	1.41	-65.5	0.89	-7.86	-4.38	8.99	-150.9
0.91	0.44	-1.07	1.16	-67.4	0.91	-8.24	-4.56	9.42	-151.1
0.94	0.32	-0.84	0.90	-69.2	0.94	-8.82	-4.82	10.05	-151.4
0.97	0.14	-0.58	0.59	-76.5	0.97	-9.79	-5.24	11.10	-151.9
0.99	0.05	-0.46	0.47	-84.0	0.98	-10.35	-5.53	11.73	-151.9

H/A =125.98 BETA*H =2.160

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	1.40	-1.57	2.10	-48.4	0.0	7.77	1.06	7.85	7.8
0.01	1.36	-1.56	2.07	-48.8	0.01	9.81	1.07	9.87	6.2
0.02	1.31	-1.58	2.06	-50.4	0.02	8.05	0.87	8.10	6.2
0.04	1.31	-1.68	2.14	-52.1	0.04	7.05	0.75	7.09	6.1
0.05	1.39	-1.83	2.29	-52.8	0.05	6.30	0.58	6.33	5.3
0.06	1.38	-1.91	2.36	-54.1	0.06	5.73	0.44	5.75	4.4
0.07	1.37	-2.00	2.42	-55.6	0.07	5.25	0.39	5.26	4.2
0.09	1.41	-2.05	2.49	-55.5	0.09	4.85	0.29	4.86	3.4
0.10	1.39	-2.10	2.52	-56.5	0.10	4.70	0.23	4.71	2.8
0.11	1.43	-2.19	2.61	-56.9	0.11	4.10	0.11	4.10	1.5
0.13	1.41	-2.24	2.64	-57.9	0.13	3.87	0.05	3.87	0.8
0.14	1.41	-2.24	2.64	-57.7	0.14	3.59	-0.01	3.59	-0.2
0.15	1.41	-2.26	2.66	-58.0	0.15	3.37	-0.07	3.37	-1.2
0.16	1.37	-2.28	2.66	-58.9	0.16	3.03	-0.14	3.04	-2.7
0.17	1.38	-2.26	2.64	-58.5	0.17	2.93	-0.22	2.94	-4.2
0.19	1.38	-2.29	2.68	-58.9	0.19	2.72	-0.27	2.73	-5.7
0.20	1.39	-2.33	2.71	-59.2	0.20	2.51	-0.33	2.53	-7.6
0.21	1.40	-2.36	2.74	-59.4	0.21	2.32	-0.40	2.35	-9.7
0.22	1.41	-2.43	2.80	-59.9	0.22	2.12	-0.47	2.18	-12.6
0.24	1.43	-2.52	2.90	-60.5	0.24	1.93	-0.53	2.00	-15.4
0.25	1.41	-2.53	2.90	-60.9	0.25	1.72	-0.60	1.82	-19.2
0.27	1.33	-2.52	2.85	-62.2	0.27	1.34	-0.71	1.52	-27.7

TABLE B-2: Cont'd

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT) — MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A =125.98 BETA*H =2.160 ALPHA/BETA =0.016 DELTA = 9.20

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.30	1.28	-2.50	2.80	-62.9	0.30	0.98	-0.80	1.27	-39.2
0.32	1.28	-2.50	2.80	-62.9	0.32	0.61	-0.93	1.11	-56.6
0.35	1.26	-2.58	2.87	-63.9	0.35	0.25	-1.03	1.06	-76.2
0.38	1.21	-2.56	2.84	-64.7	0.38	-0.11	-1.15	1.15	-95.6
0.40	1.22	-2.58	2.85	-64.7	0.40	-0.45	-1.24	1.32	-110.2
0.42	1.23	-2.68	2.95	-65.4	0.42	-0.81	-1.33	1.56	-121.2
0.45	1.22	-2.58	2.85	-64.7	0.45	-1.16	-1.44	1.85	-128.7
0.47	1.16	-2.48	2.74	-64.9	0.47	-1.48	-1.52	2.13	-134.2
0.50	1.12	-2.45	2.69	-65.4	0.50	-1.81	-1.62	2.43	-138.2
0.52	1.08	-2.41	2.64	-65.9	0.52	-2.15	-1.69	2.73	-141.7
0.55	1.02	-2.35	2.57	-66.6	0.55	-2.45	-1.79	3.04	-143.8
0.57	0.97	-2.34	2.53	-67.4	0.57	-2.77	-1.87	3.34	-145.9
0.60	0.95	-2.28	2.47	-67.4	0.60	-3.08	-1.95	3.64	-147.7
0.63	0.91	-2.16	2.34	-67.2	0.63	-3.37	-2.01	3.92	-149.2
0.65	0.82	-2.07	2.23	-68.4	0.65	-3.62	-2.05	4.16	-150.5
0.67	0.78	-1.95	2.10	-68.1	0.67	-3.93	-2.14	4.48	-151.4
0.70	0.74	-1.85	1.99	-68.2	0.70	-4.19	-2.20	4.73	-152.3
0.72	0.68	-1.75	1.88	-68.9	0.72	-4.41	-2.23	4.94	-153.2
0.75	0.62	-1.64	1.75	-69.3	0.75	-4.65	-2.30	5.19	-153.7
0.77	0.55	-1.53	1.63	-70.1	0.77	-4.93	-2.36	5.47	-154.4
0.80	0.50	-1.43	1.51	-70.9	0.80	-5.21	-2.43	5.75	-155.0
0.82	0.43	-1.30	1.37	-71.6	0.82	-5.54	-2.50	6.07	-155.7
0.85	0.36	-1.16	1.21	-72.9	0.85	-5.79	-2.55	6.33	-156.2
0.88	0.31	-1.01	1.05	-72.9	0.88	-5.95	-2.56	6.48	-156.7
0.90	0.26	-0.87	0.91	-73.4	0.90	-6.25	-2.56	6.76	-157.7
0.92	0.18	-0.71	0.73	-75.4	0.92	-6.63	-2.65	7.14	-158.2
0.95	0.11	-0.56	0.57	-79.4	0.95	-7.05	-2.82	7.59	-158.2
0.97	0.03	-0.38	0.38	-85.9	0.97	-8.07	-3.21	8.68	-158.3
0.99	-0.02	-0.27	0.27	-93.9	0.98	-9.08	-3.54	9.75	-158.7

H/A =157.48 BETA*H =2.700

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	0.68	0.08	0.68	7.1	0.0	14.53	1.60	14.62	6.3
0.01	0.68	-0.00	0.68	-0.2	0.01	14.24	1.57	14.32	6.3
0.02	0.69	-0.11	0.69	-8.9	0.02	11.63	1.24	11.69	6.1
0.03	0.73	-0.23	0.77	-17.4	0.03	10.32	1.07	10.38	5.9
0.04	0.72	-0.40	0.83	-28.9	0.04	9.43	0.87	9.47	5.3
0.05	0.79	-0.43	0.90	-28.5	0.05	8.74	0.75	8.77	4.9
0.06	0.83	-0.51	0.97	-31.9	0.06	8.01	0.64	8.04	4.6
0.07	0.83	-0.61	1.03	-36.4	0.07	7.58	0.61	7.60	4.6
0.08	0.85	-0.69	1.10	-38.9	0.08	7.20	0.57	7.22	4.5
0.09	0.86	-0.77	1.16	-41.9	0.09	6.85	0.52	6.87	4.3
0.10	0.87	-0.81	1.19	-42.9	0.10	6.59	0.47	6.61	4.1
0.11	0.85	-0.87	1.22	-45.9	0.11	6.27	0.39	6.28	3.6
0.12	0.85	-0.92	1.25	-47.5	0.12	6.13	0.30	6.14	2.8
0.13	0.85	-0.96	1.28	-48.4	0.13	5.93	0.26	5.93	2.5
0.14	0.82	-0.99	1.29	-50.4	0.14	5.67	0.25	5.67	2.5
0.15	0.84	-1.05	1.35	-51.3	0.15	5.43	0.20	5.44	2.1
0.16	0.86	-1.11	1.40	-52.3	0.16	5.26	0.12	5.26	1.3
0.17	0.87	-1.17	1.46	-53.5	0.17	5.14	0.10	5.14	1.1
0.18	0.85	-1.26	1.52	-55.9	0.18	4.97	0.10	4.97	1.1
0.19	0.86	-1.29	1.55	-56.4	0.19	4.79	0.03	4.79	0.3
0.20	0.88	-1.36	1.62	-56.9	0.20	4.62	0.01	4.62	0.1
0.22	0.89	-1.45	1.70	-58.4	0.22	4.18	-0.07	4.18	-1.0
0.24	0.88	-1.52	1.75	-59.9	0.24	3.91	-0.16	3.92	-2.4
0.26	0.84	-1.54	1.75	-61.4	0.26	3.56	-0.23	3.57	-3.7
0.28	0.84	-1.57	1.78	-61.9	0.28	3.26	-0.31	3.27	-5.4
0.30	0.82	-1.66	1.85	-63.7	0.30	2.93	-0.40	2.95	-7.7
0.32	0.84	-1.76	1.95	-64.4	0.32	2.59	-0.49	2.63	-10.7
0.34	0.86	-1.82	2.01	-64.7	0.34	2.26	-0.59	2.34	-14.7
0.36	0.87	-1.89	2.08	-65.4	0.36	1.94	-0.64	2.05	-18.2
0.38	0.84	-1.88	2.06	-65.9	0.38	1.61	-0.70	1.75	-23.7
0.40	0.81	-1.88	2.04	-66.7	0.40	1.24	-0.77	1.46	-31.7
0.42	0.80	-1.91	2.07	-67.4	0.42	0.94	-0.83	1.26	-41.4
0.44	0.80	-1.92	2.08	-67.5	0.44	0.64	-0.91	1.11	-54.7
0.46	0.80	-1.91	2.07	-67.4	0.46	0.28	-0.95	0.99	-73.7
0.48	0.76	-1.92	2.07	-68.5	0.48	-0.05	-1.02	1.02	-92.7
0.50	0.75	-1.91	2.06	-68.5	0.50	-0.37	-1.08	1.14	-109.2
0.52	0.76	-1.91	2.06	-68.4	0.52	-0.73	-1.13	1.34	-122.7
0.54	0.73	-1.94	2.07	-69.4	0.54	-1.05	-1.18	1.58	-131.7
0.56	0.73	-1.96	2.09	-69.6	0.56	-1.38	-1.22	1.84	-138.5
0.58	0.70	-1.97	2.09	-70.6	0.58	-1.69	-1.25	2.10	-143.4
0.60	0.69	-1.95	2.07	-70.6	0.60	-2.00	-1.32	2.40	-146.7
0.62	0.64	-1.90	2.01	-71.4	0.62	-2.32	-1.36	2.69	-149.7
0.64	0.62	-1.86	1.96	-71.7	0.64	-2.59	-1.36	2.92	-152.2
0.66	0.59	-1.84	1.93	-72.2	0.66	-2.90	-1.39	3.22	-154.4
0.68	0.55	-1.74	1.83	-72.5	0.68	-3.20	-1.43	3.51	-155.9
0.70	0.50	-1.67	1.74	-73.4	0.70	-3.51	-1.46	3.80	-157.4
0.72	0.47	-1.63	1.69	-73.9	0.72	-3.76	-1.47	4.03	-158.7
0.74	0.43	-1.52	1.58	-74.4	0.74	-4.04	-1.46	4.30	-160.2
0.76	0.39	-1.46	1.51	-74.9	0.76	-4.28	-1.50	4.53	-160.7
0.78	0.36	-1.35	1.40	-75.2	0.78	-4.58	-1.51	4.82	-161.7
0.80	0.33	-1.27	1.31	-75.4	0.80	-4.82	-1.53	5.06	-162.4
0.82	0.29	-1.18	1.22	-76.2	0.82	-5.14	-1.60	5.38	-162.7
0.84	0.26	-1.06	1.10	-76.4	0.84	-5.39	-1.58	5.61	-163.7
0.86	0.23	-1.01	1.03	-76.9	0.86	-5.62	-1.61	5.85	-164.0
0.88	0.18	-0.88	0.90	-78.4	0.88	-5.92	-1.62	6.14	-164.7
0.90	0.15	-0.78	0.79	-78.9	0.90	-6.14	-1.61	6.34	-165.3
0.92	0.11	-0.71	0.72	-80.9	0.92	-6.46	-1.62	6.66	-165.9
0.94	0.07	-0.58	0.58	-82.9	0.94	-6.82	-1.65	7.02	-166.4
0.96	0.03	-0.45	0.45	-85.9	0.96	-7.28	-1.73	7.48	-166.6
0.98	-0.01	-0.30	0.30	-92.4	0.98	-8.27	-1.88	8.48	-167.2
0.99	-0.04	-0.24	0.24	-98.9	0.99	-9.10	-2.15	9.35	-166.7

TABLE B-2: Cont'd

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT) MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A =192.13 BETA*H =3.294 ALPHA/BETA =0.016 DELTA = 9.20

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	0.63	0.99	1.17	57.5	0.0	18.15	0.47	18.16	1.5
0.01	0.58	0.86	1.03	56.0	0.01	17.71	0.46	17.72	1.5
0.02	0.54	0.76	0.94	54.6	0.02	14.61	0.38	14.62	1.5
0.02	0.52	0.66	0.84	51.6	0.02	13.66	0.27	13.07	1.2
0.03	0.53	0.57	0.78	47.4	0.03	11.96	0.20	11.96	1.0
0.04	0.53	0.50	0.73	43.4	0.04	11.25	0.15	11.25	0.8
0.05	0.51	0.42	0.66	39.3	0.05	10.54	0.09	10.54	0.5
0.06	0.50	0.35	0.61	34.5	0.06	10.19	0.08	10.19	0.5
0.07	0.50	0.28	0.57	29.0	0.07	9.74	-0.00	9.74	-0.0
0.07	0.50	0.21	0.54	23.0	0.07	9.39	-0.05	9.39	-0.3
0.08	0.49	0.15	0.51	17.0	0.08	9.12	-0.08	9.12	-0.5
0.09	0.47	0.08	0.47	10.0	0.09	8.95	-0.13	8.95	-0.8
0.10	0.47	0.02	0.47	2.3	0.10	8.68	-0.16	8.68	-1.0
0.11	0.46	-0.04	0.46	355.0	0.11	8.50	-0.18	8.50	-1.2
0.11	0.43	-0.10	0.44	347.0	0.11	8.41	-0.22	8.42	-1.5
0.12	0.41	-0.15	0.44	340.0	0.12	8.19	-0.29	8.19	-2.0
0.13	0.40	-0.20	0.45	333.0	0.13	8.06	-0.29	8.06	-2.0
0.14	0.38	-0.25	0.46	327.0	0.14	8.41	-0.34	8.42	-2.3
0.15	0.37	-0.30	0.47	321.0	0.15	7.74	-0.34	7.75	-2.5
0.16	0.35	-0.34	0.49	316.0	0.16	7.65	-0.36	7.66	-2.7
0.16	0.35	-0.39	0.53	312.0	0.16	7.52	-0.42	7.53	-3.2
0.18	0.32	-0.48	0.58	304.0	0.18	7.16	-0.46	7.18	-3.8
0.20	0.31	-0.56	0.64	299.0	0.20	7.33	-0.53	7.35	-4.1
0.21	0.29	-0.66	0.72	294.0	0.21	6.71	-0.59	6.73	-5.0
0.23	0.27	-0.73	0.78	290.5	0.23	6.44	-0.62	6.47	-5.5
0.25	0.26	-0.83	0.88	287.5	0.25	6.25	-0.68	6.29	-6.2
0.26	0.28	-0.96	1.00	286.0	0.26	5.80	-0.73	5.85	-7.1
0.28	0.29	-1.12	1.16	284.5	0.28	5.71	-0.76	5.76	-7.6
0.30	0.29	-1.25	1.28	283.0	0.30	5.39	-0.83	5.45	-8.7
0.31	0.26	-1.34	1.37	281.0	0.31	5.07	-0.85	5.14	-9.5
0.33	0.23	-1.40	1.42	279.5	0.33	4.79	-0.89	4.87	-10.5
0.34	0.22	-1.44	1.45	278.5	0.34	4.51	-0.92	4.61	-11.5
0.36	0.19	-1.48	1.49	277.5	0.36	4.19	-0.97	4.30	-13.0
0.38	0.16	-1.53	1.54	276.0	0.38	3.87	-0.97	3.99	-14.0
0.39	0.14	-1.60	1.61	275.0	0.39	3.54	-0.98	3.68	-15.5
0.41	0.13	-1.69	1.70	274.5	0.41	3.17	-1.00	3.32	-17.5
0.43	0.12	-1.75	1.75	274.0	0.43	2.88	-1.03	3.06	-19.7
0.44	0.11	-1.83	1.84	273.5	0.44	2.50	-1.04	2.70	-22.5
0.46	0.08	-1.87	1.87	272.5	0.46	2.15	-1.06	2.39	-26.2
0.48	0.07	-1.91	1.91	272.0	0.48	1.79	-1.06	2.08	-30.5
0.49	0.05	-1.91	1.91	271.5	0.49	1.41	-1.07	1.77	-37.0
0.51	0.03	-1.91	1.91	270.9	0.51	1.06	-1.07	1.51	-45.5
0.52	0.02	-2.03	2.03	270.6	0.52	0.67	-1.05	1.24	-57.5
0.54	0.00	-2.08	2.08	270.1	0.54	0.32	-1.06	1.11	-73.0
0.56	-0.01	-2.10	2.10	269.7	0.56	-0.06	-1.06	1.06	-93.0
0.57	-0.02	-2.10	2.10	269.3	0.57	-0.43	-1.04	1.13	-112.5
0.59	-0.04	-2.10	2.10	269.0	0.59	-0.78	-1.02	1.28	-127.5
0.61	-0.05	-2.10	2.10	268.5	0.61	-1.18	-1.01	1.55	-139.5
0.62	-0.07	-2.08	2.08	268.0	0.62	-1.52	-0.99	1.82	-147.0
0.64	-0.08	-2.05	2.05	267.7	0.64	-1.86	-0.94	2.08	-153.0
0.66	-0.09	-2.05	2.05	267.5	0.66	-2.20	-0.93	2.39	-157.0
0.67	-0.10	-2.03	2.03	267.2	0.67	-2.59	-0.92	2.75	-160.5
0.69	-0.10	-1.99	2.00	267.0	0.69	-2.92	-0.89	3.06	-163.0
0.70	-0.12	-1.96	1.96	266.5	0.70	-3.25	-0.87	3.37	-165.0
0.72	-0.13	-1.92	1.93	266.0	0.72	-3.58	-0.83	3.68	-167.0
0.74	-0.14	-1.83	1.84	265.5	0.74	-3.90	-0.81	3.99	-168.3
0.75	-0.15	-1.67	1.68	265.0	0.75	-4.23	-0.78	4.30	-169.5
0.77	-0.15	-1.52	1.52	264.4	0.77	-4.55	-0.72	4.61	-171.0
0.79	-0.15	-1.34	1.35	263.6	0.79	-4.82	-0.72	4.87	-171.5
0.80	-0.15	-1.23	1.24	263.0	0.80	-5.05	-0.66	5.09	-172.5
0.82	-0.14	-1.15	1.16	262.8	0.82	-5.33	-0.60	5.36	-173.5
0.84	-0.15	-1.10	1.11	262.3	0.84	-5.59	-0.59	5.63	-174.0
0.85	-0.14	-1.02	1.03	262.0	0.85	-5.91	-0.57	5.94	-174.5
0.87	-0.14	-0.95	0.96	261.5	0.87	-6.18	-0.52	6.20	-175.2
0.89	-0.14	-0.86	0.88	261.0	0.89	-6.41	-0.45	6.42	-176.0
0.90	-0.14	-0.82	0.83	260.5	0.90	-6.72	-0.48	6.73	-175.9
0.92	-0.13	-0.71	0.72	259.8	0.92	-6.99	-0.39	7.00	-176.8
0.93	-0.15	-0.75	0.76	259.0	0.93	-7.26	-0.35	7.26	-177.2
0.95	-0.11	-0.46	0.47	257.0	0.95	-7.57	-0.33	7.57	-177.5
0.97	-0.10	-0.34	0.35	253.5	0.97	-8.06	-0.28	8.06	-178.0
0.98	-0.09	-0.19	0.21	245.0	0.98	-9.21	-0.27	9.21	-178.3

TABLE B-3: CURRENT AND CHARGE DISTRIBUTIONS, $\alpha/\beta = .070$

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT) — MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A = 18.90 BETA*H = 0.315 ALPHA/BETA = 0.070 DELTA = 8.96

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	0.27	1.39	1.41	78.9	0.0	1.68	-0.24	1.70	-8.2
0.08	0.27	1.26	1.29	77.9	0.08	1.57	-0.22	1.59	-8.0
0.17	0.17	1.00	1.01	80.4	0.17	1.33	-0.19	1.34	-8.0
0.25	0.14	0.85	0.86	80.7	0.25	1.19	-0.17	1.20	-8.1
0.33	0.12	0.77	0.78	81.0	0.33	1.11	-0.16	1.12	-8.3
0.42	0.11	0.71	0.72	81.2	0.42	1.05	-0.15	1.06	-8.3
0.50	0.10	0.62	0.63	81.2	0.50	1.03	-0.15	1.04	-8.5
0.58	0.08	0.53	0.54	81.6	0.58	1.01	-0.16	1.03	-8.8
0.67	0.07	0.46	0.46	81.8	0.67	1.01	-0.16	1.03	-8.8
0.75	0.05	0.37	0.38	82.1	0.75	1.03	-0.16	1.04	-8.9
0.83	0.04	0.28	0.28	82.7	0.83	1.06	-0.17	1.09	-8.9
0.90	0.02	0.20	0.21	83.7	0.90	1.18	-0.18	1.20	-8.8

H/A = 28.35 BETA*H = 0.473

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	0.35	1.64	1.68	77.8	0.0	2.46	-0.35	2.51	-8.1
0.06	0.30	1.44	1.47	78.2	0.06	2.31	-0.33	2.34	-8.1
0.11	0.24	1.32	1.34	79.8	0.11	1.97	-0.28	1.99	-8.2
0.17	0.22	1.27	1.29	80.1	0.17	1.78	-0.26	1.80	-8.3
0.22	0.21	1.21	1.23	80.1	0.22	1.65	-0.25	1.67	-8.5
0.28	0.20	1.15	1.17	80.1	0.28	1.57	-0.24	1.59	-8.7
0.33	0.19	1.07	1.09	80.0	0.33	1.51	-0.24	1.53	-8.9
0.39	0.17	0.99	1.01	80.0	0.39	1.47	-0.23	1.49	-9.0
0.44	0.16	0.93	0.94	80.0	0.44	1.45	-0.24	1.47	-9.2
0.50	0.15	0.86	0.87	80.0	0.50	1.43	-0.23	1.45	-9.3
0.56	0.14	0.79	0.80	80.0	0.56	1.42	-0.24	1.44	-9.4
0.61	0.12	0.72	0.73	80.1	0.61	1.42	-0.24	1.44	-9.5
0.67	0.11	0.63	0.64	80.1	0.67	1.43	-0.24	1.45	-9.6
0.72	0.09	0.54	0.55	80.1	0.72	1.46	-0.25	1.48	-9.7
0.78	0.08	0.46	0.47	80.0	0.78	1.49	-0.26	1.51	-9.8
0.83	0.07	0.38	0.38	80.0	0.83	1.53	-0.27	1.55	-9.9
0.89	0.05	0.29	0.29	80.1	0.89	1.62	-0.29	1.64	-10.0
0.94	0.03	0.21	0.21	80.6	0.94	1.75	-0.31	1.77	-10.0

H/A = 37.80 BETA*H = 0.630

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	0.50	2.18	2.23	77.1	0.0	3.53	-0.49	3.56	-7.9
0.04	0.44	1.92	1.97	77.2	0.04	3.17	-0.45	3.20	-8.0
0.08	0.37	1.78	1.82	78.4	0.08	2.66	-0.39	2.71	-8.3
0.13	0.35	1.73	1.77	78.5	0.13	2.39	-0.36	2.42	-8.6
0.17	0.35	1.70	1.73	78.4	0.17	2.24	-0.35	2.27	-8.9
0.21	0.34	1.67	1.70	78.5	0.21	2.13	-0.35	2.16	-9.2
0.25	0.33	1.61	1.64	78.5	0.25	2.06	-0.34	2.09	-9.4
0.29	0.32	1.54	1.57	78.4	0.29	2.00	-0.34	2.03	-9.7
0.33	0.31	1.48	1.51	78.2	0.33	1.98	-0.35	2.01	-9.9
0.38	0.29	1.41	1.44	78.3	0.38	1.93	-0.35	1.96	-10.2
0.42	0.28	1.34	1.37	78.3	0.42	1.92	-0.35	1.95	-10.4
0.46	0.27	1.27	1.30	78.2	0.46	1.91	-0.36	1.94	-10.6
0.50	0.24	1.14	1.17	78.1	0.50	1.91	-0.36	1.94	-10.8
0.54	0.22	1.05	1.07	78.0	0.54	1.92	-0.38	1.95	-11.1
0.58	0.20	0.96	0.98	77.9	0.58	1.93	-0.38	1.96	-11.2
0.63	0.19	0.89	0.91	77.9	0.63	1.95	-0.39	1.99	-11.4
0.67	0.17	0.79	0.81	77.8	0.67	1.96	-0.40	2.02	-11.5
0.71	0.16	0.73	0.74	77.8	0.71	2.00	-0.41	2.05	-11.6
0.75	0.14	0.62	0.64	77.8	0.75	2.05	-0.42	2.09	-11.7
0.79	0.12	0.54	0.55	77.7	0.79	2.09	-0.44	2.14	-11.8
0.83	0.10	0.46	0.47	77.6	0.83	2.16	-0.46	2.21	-11.9
0.88	0.08	0.37	0.38	77.5	0.88	2.25	-0.48	2.30	-12.0
0.92	0.06	0.28	0.28	77.6	0.92	2.40	-0.52	2.45	-12.2
0.96	0.04	0.20	0.20	77.7	0.96	2.63	-0.57	2.69	-12.2

H/A = 56.69 BETA*H = 0.946

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	1.48	4.22	4.47	70.7	0.0	5.05	-0.77	5.11	-8.7
0.03	1.30	3.86	4.07	71.4	0.03	4.55	-0.71	4.61	-8.8
0.06	1.14	3.53	3.71	72.1	0.06	3.89	-0.64	3.95	-9.4
0.08	1.07	3.26	3.43	71.8	0.08	3.53	-0.65	3.59	-10.4
0.11	1.07	3.22	3.39	71.7	0.11	3.33	-0.64	3.39	-10.9
0.14	1.09	3.26	3.43	71.5	0.14	3.19	-0.65	3.26	-11.5
0.17	1.06	3.14	3.31	71.3	0.17	3.10	-0.67	3.17	-12.1
0.19	1.05	3.10	3.27	71.4	0.19	3.07	-0.68	3.15	-12.4
0.22	1.00	2.93	3.09	71.2	0.22	3.07	-0.71	3.15	-13.0
0.25	0.99	2.83	2.99	70.8	0.25	3.06	-0.74	3.15	-13.6
0.28	0.95	2.69	2.86	70.6	0.28	3.08	-0.78	3.17	-14.2
0.31	0.94	2.63	2.80	70.3	0.31	3.10	-0.82	3.20	-14.8
0.33	0.91	2.52	2.68	70.2	0.33	3.09	-0.84	3.20	-15.3
0.36	0.90	2.46	2.62	70.0	0.36	3.08	-0.87	3.20	-15.7
0.39	0.88	2.40	2.56	69.9	0.39	3.13	-0.91	3.26	-16.2
0.42	0.85	2.30	2.46	69.7	0.42	3.17	-0.95	3.31	-16.6
0.44	0.84	2.24	2.40	69.5	0.44	3.22	-0.98	3.37	-17.0
0.47	0.81	2.13	2.28	69.3	0.47	3.27	-1.02	3.42	-17.4
0.50	0.80	2.09	2.24	69.2	0.50	3.28	-1.05	3.45	-17.8
0.53	0.75	1.94	2.08	68.8	0.53	3.31	-1.08	3.48	-18.1
0.56	0.72	1.86	2.00	68.8	0.56	3.35	-1.12	3.53	-18.4
0.61	0.67	1.71	1.84	68.6	0.61	3.44	-1.19	3.64	-19.1
0.67	0.59	1.48	1.60	68.3	0.67	3.53	-1.27	3.75	-19.7
0.72	0.52	1.30	1.40	68.1	0.72	3.65	-1.35	3.89	-20.3
0.78	0.47	1.15	1.24	67.8	0.78	3.77	-1.42	4.03	-20.6
0.83	0.38	0.92	1.00	67.8	0.83	3.94	-1.51	4.22	-21.0

TABLE B-3: Cont'd

MONOPOLE CURRENTS IN MA/(DELTA*2) — MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A = 56.69 BETA*H =0.946 ALPHA/BETA =0.070 DELTA = 8.96

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.89	0.28	0.69	0.74	67.7	0.89	4.19	-1.64	4.50	-21.4
0.94	0.18	0.43	0.47	67.2	0.94	4.74	-1.89	5.11	-21.7
0.97	0.13	0.32	0.34	67.5	0.97	5.28	-2.10	5.69	-21.7

H/A = 75.59 BETA*H =1.261

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	5.48	5.58	7.82	45.5	0.0	5.97	-0.91	6.04	-8.7
0.02	4.94	5.20	7.17	46.5	0.02	5.74	-0.93	5.81	-9.2
0.04	4.62	4.88	6.72	46.6	0.04	4.92	-0.99	5.02	-11.4
0.06	4.61	4.80	6.66	46.2	0.06	4.49	-1.19	4.64	-14.8
0.08	4.63	4.78	6.66	45.9	0.08	4.27	-1.24	4.45	-16.2
0.10	4.69	4.82	6.72	45.8	0.10	4.16	-1.35	4.39	-18.5
0.13	4.86	4.92	6.92	45.3	0.13	4.03	-1.55	4.32	-21.0
0.15	4.71	4.71	6.66	45.0	0.15	3.97	-1.70	4.32	-23.2
0.17	4.69	4.64	6.59	44.7	0.17	3.99	-1.85	4.42	-25.3
0.19	4.67	4.56	6.53	44.3	0.19	4.07	-2.08	4.58	-27.1
0.21	4.59	4.46	6.40	44.2	0.21	4.06	-2.24	4.64	-28.9
0.23	4.57	4.38	6.33	43.8	0.23	4.11	-2.42	4.77	-30.5
0.25	4.49	4.29	6.20	43.7	0.25	4.15	-2.59	4.89	-32.0
0.27	4.37	4.13	6.01	43.4	0.27	4.24	-2.81	5.06	-33.5
0.29	4.31	4.05	5.91	43.2	0.29	4.31	-2.98	5.24	-34.7
0.31	4.30	4.01	5.88	43.0	0.31	4.38	-3.16	5.40	-35.8
0.33	4.21	3.92	5.75	42.9	0.33	4.47	-3.36	5.59	-36.9
0.35	4.21	3.83	5.69	42.3	0.35	4.52	-3.51	5.72	-37.8
0.38	4.17	3.77	5.62	42.1	0.38	4.56	-3.66	5.85	-38.7
0.40	4.09	3.67	5.49	41.9	0.40	4.63	-3.82	6.01	-39.5
0.42	4.03	3.59	5.40	41.7	0.42	4.69	-4.00	6.16	-40.5
0.46	3.93	3.45	5.23	41.3	0.46	4.82	-4.34	6.48	-42.0
0.50	3.71	3.22	4.91	41.0	0.50	4.95	-4.66	6.80	-43.3
0.54	3.33	2.87	4.39	40.7	0.54	5.08	-4.99	7.12	-44.5
0.58	3.10	2.64	4.07	40.4	0.58	5.19	-5.23	7.37	-45.2
0.63	2.92	2.45	3.81	40.0	0.63	5.27	-5.51	7.63	-46.3
0.67	2.64	2.19	3.43	39.7	0.67	5.32	-5.73	7.82	-47.1
0.71	2.40	1.97	3.10	39.4	0.71	5.46	-6.03	8.13	-47.8
0.75	2.16	1.75	2.78	39.0	0.75	5.65	-6.37	8.52	-48.4
0.79	1.87	1.50	2.39	38.7	0.79	5.85	-6.70	8.90	-48.9
0.83	1.53	1.19	1.94	37.9	0.83	6.03	-7.06	9.28	-49.5
0.88	1.25	0.94	1.56	37.0	0.88	6.34	-7.53	9.85	-49.9
0.92	0.92	0.66	1.13	35.7	0.92	6.70	-8.07	10.49	-50.3
0.96	0.53	0.32	0.61	31.2	0.96	7.61	-9.29	12.01	-50.7
0.97	0.37	0.20	0.42	28.1	0.97	8.43	-10.34	13.35	-50.8

H/A = 94.49 BETA*H =1.576

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	6.30	-1.89	6.57	-16.7	0.0	6.14	-0.55	6.16	-3.9
0.02	6.05	-1.71	6.28	-15.8	0.02	6.05	-0.62	6.08	-4.4
0.03	6.05	-1.70	6.28	-15.7	0.03	6.40	-0.77	6.45	-6.9
0.05	6.09	-1.76	6.34	-16.1	0.05	5.37	-1.01	5.47	-10.7
0.07	6.13	-1.84	6.40	-16.7	0.07	4.74	-1.24	4.90	-14.7
0.08	6.25	-1.94	6.55	-17.2	0.08	4.16	-1.46	4.41	-19.4
0.10	6.37	-2.03	6.69	-17.7	0.10	3.76	-1.72	4.08	-24.9
0.12	6.53	-2.13	6.87	-18.1	0.12	3.28	-1.91	3.79	-30.2
0.13	6.51	-2.18	6.87	-18.5	0.13	2.94	-2.13	3.63	-35.9
0.15	6.55	-2.25	6.92	-19.0	0.15	2.68	-2.39	3.59	-41.7
0.17	6.44	-2.38	6.87	-20.3	0.17	2.39	-2.63	3.55	-47.7
0.18	6.42	-2.43	6.87	-20.7	0.18	2.08	-2.83	3.51	-53.7
0.20	6.50	-2.38	6.92	-20.1	0.20	1.86	-3.12	3.63	-59.1
0.22	6.49	-2.42	6.92	-20.5	0.22	1.61	-3.35	3.71	-64.3
0.23	6.39	-2.44	6.84	-20.9	0.23	1.38	-3.62	3.88	-69.2
0.25	6.29	-2.44	6.75	-21.2	0.25	1.13	-3.84	4.00	-73.6
0.27	6.22	-2.47	6.69	-21.7	0.27	0.91	-4.06	4.16	-77.4
0.28	6.10	-2.46	6.57	-22.0	0.28	0.69	-4.31	4.37	-80.9
0.30	5.98	-2.44	6.46	-22.2	0.30	0.46	-4.55	4.57	-84.2
0.32	5.97	-2.47	6.46	-22.5	0.32	0.26	-4.77	4.77	-86.9
0.33	5.96	-2.49	6.46	-22.7	0.33	0.04	-4.96	4.98	-89.5
0.37	5.83	-2.50	6.34	-23.2	0.37	-0.37	-5.45	5.47	-93.9
0.40	5.64	-2.49	6.17	-23.8	0.40	-0.82	-5.90	5.96	-97.9
0.43	5.41	-2.44	5.93	-24.3	0.43	-1.22	-6.33	6.45	-100.9
0.47	5.20	-2.41	5.73	-24.9	0.47	-1.57	-6.55	6.77	-103.4
0.50	5.00	-2.35	5.53	-25.2	0.50	-1.94	-6.91	7.18	-105.7
0.53	4.77	-2.30	5.29	-25.7	0.53	-2.33	-7.35	7.71	-107.6
0.57	4.43	-2.19	4.95	-26.3	0.57	-2.66	-7.71	8.16	-109.0
0.60	4.16	-2.09	4.65	-26.7	0.60	-3.03	-8.10	8.65	-110.5
0.63	3.89	-1.97	4.36	-26.9	0.63	-3.35	-8.41	9.06	-111.7
0.67	3.67	-1.89	4.13	-27.3	0.67	-3.68	-8.72	9.46	-112.9
0.70	3.35	-1.76	3.78	-27.7	0.70	-4.00	-9.03	9.87	-113.9
0.73	3.08	-1.64	3.49	-28.1	0.73	-4.25	-9.27	10.20	-114.6
0.77	2.71	-1.48	3.08	-28.6	0.77	-4.55	-9.58	10.61	-115.4
0.80	2.45	-1.35	2.79	-28.9	0.80	-4.90	-9.96	11.10	-116.2
0.83	2.08	-1.17	2.39	-29.5	0.83	-5.13	-10.11	11.34	-116.9
0.87	1.71	-1.00	1.98	-30.2	0.87	-5.41	-10.43	11.75	-117.4
0.90	1.37	-0.82	1.59	-31.1	0.90	-5.96	-11.25	12.73	-117.9
0.93	0.98	-0.63	1.16	-33.0	0.93	-6.52	-12.06	13.71	-118.4
0.97	0.50	-0.40	0.64	-39.0	0.97	-7.57	-13.71	15.67	-118.9
0.98	0.30	-0.30	0.43	-45.0	0.98	-8.31	-14.99	17.13	-119.0

TABLE B-3: Cont'd

MONOPOLE CURRENTS IN MA/(DELTA*2) — MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A =110.24 BETA*H =1.839 ALPHA/BETA =0.070 DELTA = 8.96

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	3.70	-2.64	4.54	-35.5	0.0	11.08	-0.88	11.11	-4.5
0.01	3.17	-2.30	3.92	-36.0	0.01	9.73	-0.77	9.76	-4.5
0.03	2.87	-2.22	3.62	-37.7	0.03	7.71	-0.77	7.75	-5.7
0.04	2.79	-2.14	3.44	-38.4	0.04	6.73	-0.79	6.77	-6.7
0.06	2.83	-2.32	3.66	-39.4	0.06	5.90	-0.84	5.96	-8.1
0.07	2.94	-2.48	3.84	-40.2	0.07	5.28	-0.93	5.37	-10.0
0.09	2.98	-2.60	3.95	-41.1	0.09	4.72	-1.01	4.82	-12.0
0.10	2.92	-2.61	3.92	-41.7	0.10	4.26	-1.07	4.39	-14.1
0.11	2.92	-2.67	3.95	-42.4	0.11	3.87	-1.15	4.04	-16.5
0.13	2.97	-2.78	4.06	-43.1	0.13	3.54	-1.22	3.74	-19.0
0.14	2.99	-2.86	4.14	-43.7	0.14	3.21	-1.31	3.47	-22.1
0.16	2.99	-2.91	4.17	-44.3	0.16	2.93	-1.40	3.25	-25.5
0.17	2.99	-2.97	4.21	-44.8	0.17	2.67	-1.39	3.01	-27.5
0.19	2.99	-3.02	4.25	-45.3	0.19	2.37	-1.53	2.82	-32.8
0.20	2.93	-3.02	4.21	-45.9	0.20	2.12	-1.60	2.66	-37.0
0.21	2.89	-3.06	4.21	-46.7	0.21	1.88	-1.72	2.55	-42.5
0.23	2.87	-3.08	4.21	-47.1	0.23	-0.60	-2.31	2.38	-104.5
0.24	2.78	-3.06	4.14	-47.7	0.24	1.35	-1.86	2.30	-54.0
0.26	2.74	-3.05	4.10	-48.1	0.26	1.12	-1.95	2.25	-60.2
0.27	2.72	-3.07	4.10	-48.5	0.27	0.86	-2.05	2.22	-67.1
0.29	2.62	-3.01	3.99	-49.0	0.29	0.63	-2.07	2.17	-73.0
0.31	2.55	-3.02	3.95	-49.5	0.31	0.19	-2.27	2.28	-85.3
0.34	2.48	-3.03	3.92	-50.7	0.34	-0.25	-2.40	2.41	-95.9
0.37	2.38	-2.97	3.81	-51.3	0.37	-0.68	-2.54	2.63	-104.9
0.40	2.32	-2.97	3.77	-52.0	0.40	-1.12	-2.71	2.93	-112.4
0.43	2.27	-2.96	3.73	-52.5	0.43	-1.54	-2.86	3.25	-118.3
0.46	2.30	-3.03	3.81	-52.8	0.46	-1.98	-3.04	3.63	-123.1
0.49	2.23	-3.00	3.73	-53.4	0.49	-2.38	-3.16	3.96	-126.9
0.51	2.25	-3.07	3.81	-53.7	0.51	-2.83	-3.36	4.39	-130.1
0.54	2.14	-2.97	3.66	-54.2	0.54	-3.24	-3.50	4.77	-132.8
0.57	2.09	-2.96	3.62	-54.7	0.57	-3.65	-3.63	5.15	-135.1
0.60	1.99	-2.85	3.48	-55.1	0.60	-3.97	-3.69	5.42	-137.0
0.63	1.86	-2.72	3.29	-55.7	0.63	-4.35	-3.83	5.80	-138.6
0.66	1.70	-2.56	3.08	-56.5	0.66	-4.74	-3.96	6.18	-140.1
0.69	1.56	-2.39	2.86	-56.9	0.69	-5.01	-3.98	6.40	-141.5
0.71	1.44	-2.25	2.67	-57.5	0.71	-5.35	-4.07	6.72	-142.7
0.74	1.30	-2.08	2.45	-58.0	0.74	-5.67	-4.18	7.05	-143.6
0.77	1.17	-1.90	2.23	-58.4	0.77	-6.00	-4.28	7.37	-144.5
0.80	1.04	-1.73	2.01	-59.0	0.80	-6.34	-4.37	7.70	-145.4
0.83	0.92	-1.58	1.83	-59.8	0.83	-6.75	-4.53	8.13	-146.1
0.86	0.79	-1.40	1.61	-60.7	0.86	-7.08	-4.63	8.45	-146.8
0.89	0.63	-1.20	1.35	-62.1	0.89	-7.39	-4.74	8.78	-147.3
0.91	0.48	-0.99	1.10	-64.1	0.91	-7.81	-4.85	9.21	-147.9
0.94	0.34	-0.82	0.89	-67.3	0.94	-8.46	-5.18	9.92	-148.5
0.97	0.17	-0.57	0.59	-73.7	0.97	-9.38	-5.65	10.95	-148.9
0.98	0.08	-0.46	0.47	-79.7	0.98	-9.99	-6.00	11.65	-149.0

H/A =125.98 BETA*H =2.101

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	1.94	-1.38	2.37	-35.4	0.0	11.39	-1.34	11.47	-6.7
0.01	1.86	-1.44	2.35	-37.7	0.01	10.69	-1.24	10.76	-6.6
0.02	1.73	-1.37	2.21	-38.5	0.02	8.76	-1.09	8.83	-7.1
0.04	1.73	-1.47	2.27	-40.5	0.04	7.50	-1.01	7.57	-7.7
0.05	1.77	-1.61	2.40	-42.2	0.05	6.71	-0.99	6.78	-8.4
0.06	1.83	-1.74	2.52	-43.6	0.06	6.07	-0.98	6.15	-9.2
0.07	1.84	-1.84	2.61	-45.0	0.07	5.55	-1.00	5.64	-10.2
0.09	1.86	-1.92	2.67	-45.9	0.09	5.14	-1.01	5.24	-11.1
0.10	1.83	-2.00	2.71	-47.4	0.10	4.82	-1.04	4.93	-12.2
0.11	1.81	-2.05	2.73	-48.6	0.11	4.48	-1.06	4.61	-13.5
0.13	1.79	-2.09	2.75	-49.4	0.13	4.19	-1.10	4.34	-14.7
0.14	1.77	-2.14	2.77	-50.4	0.14	3.94	-1.14	4.10	-16.2
0.15	1.75	-2.18	2.79	-51.3	0.15	3.68	-1.19	3.86	-17.9
0.16	1.71	-2.21	2.79	-52.2	0.16	3.42	-1.22	3.63	-19.6
0.17	1.69	-2.22	2.79	-52.7	0.17	3.20	-1.24	3.43	-21.2
0.19	1.66	-2.25	2.79	-53.5	0.19	2.97	-1.27	3.23	-23.2
0.20	1.63	-2.27	2.79	-54.2	0.20	2.75	-1.29	3.04	-25.2
0.21	1.63	-2.32	2.84	-54.9	0.21	2.55	-1.33	2.88	-27.5
0.22	1.63	-2.37	2.89	-55.4	0.22	2.32	-1.35	2.68	-30.2
0.24	1.62	-2.41	2.90	-56.1	0.24	2.14	-1.40	2.56	-33.2
0.25	1.59	-2.42	2.90	-56.7	0.25	1.92	-1.45	2.40	-37.2
0.27	1.52	-2.42	2.86	-57.8	0.27	1.54	-1.53	2.17	-44.7
0.30	1.49	-2.46	2.88	-58.8	0.30	1.12	-1.58	1.93	-54.7
0.32	1.47	-2.50	2.90	-59.6	0.32	0.75	-1.65	1.81	-65.6
0.35	1.46	-2.58	2.96	-60.4	0.35	0.36	-1.72	1.75	-78.0
0.38	1.43	-2.60	2.96	-61.2	0.38	-0.01	-1.75	1.75	-90.4
0.40	1.38	-2.60	2.94	-62.0	0.40	-0.39	-1.81	1.85	-102.0
0.42	1.33	-2.57	2.90	-62.6	0.42	-0.77	-1.90	2.05	-112.2
0.45	1.27	-2.51	2.82	-63.2	0.45	-1.12	-1.92	2.23	-120.2
0.47	1.19	-2.44	2.71	-64.0	0.47	-1.48	-1.97	2.46	-126.8
0.50	1.13	-2.40	2.65	-64.8	0.50	-1.83	-2.01	2.72	-132.2
0.52	1.08	-2.35	2.58	-65.4	0.52	-2.16	-2.05	2.98	-136.5
0.55	1.01	-2.29	2.50	-66.1	0.55	-2.51	-2.09	3.27	-140.2
0.57	0.96	-2.24	2.44	-66.7	0.57	-2.83	-2.14	3.55	-143.0
0.60	0.92	-2.19	2.37	-67.2	0.60	-3.26	-2.22	3.94	-145.7
0.63	0.86	-2.10	2.27	-67.7	0.63	-3.57	-2.24	4.22	-147.9
0.65	0.80	-2.01	2.16	-68.2	0.65	-3.91	-2.30	4.53	-149.5
0.67	0.75	-1.96	2.10	-69.0	0.67	-4.18	-2.29	4.77	-151.3
0.70	0.71	-1.89	2.02	-69.3	0.70	-4.45	-2.29	5.01	-152.8
0.72	0.66	-1.80	1.91	-69.9	0.72	-4.72	-2.28	5.24	-154.2
0.75	0.59	-1.66	1.77	-70.5	0.75	-4.93	-2.31	5.44	-154.9
0.77	0.53	-1.55	1.64	-71.0	0.77	-5.18	-2.33	5.68	-155.8
0.80	0.47	-1.42	1.49	-71.8	0.80	-5.49	-2.41	5.99	-156.3
0.82	0.39	-1.26	1.32	-72.7	0.82	-5.80	-2.46	6.31	-156.8

TABLE B-3: Cont'd

MONOPOLE CURRENTS IN MA/(DELTA*2) — MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A =125.98 BETA*H =2.101 ALPHA/BETA =0.070 DELTA = 8.96

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.85	0.33	-1.13	1.18	-73.6	0.85	-6.05	-2.50	6.54	-157.5
0.88	0.29	-1.03	1.07	-74.4	0.88	-6.27	-2.48	6.74	-158.4
0.90	0.21	-0.86	0.88	-76.3	0.90	-6.51	-2.40	6.94	-159.8
0.92	0.13	-0.70	0.71	-79.2	0.92	-6.50	-2.47	7.33	-160.3
0.95	0.07	-0.56	0.57	-83.4	0.95	-7.44	-2.61	7.88	-160.7
0.97	-0.02	-0.37	0.37	-92.4	0.97	-8.51	-2.90	8.99	-161.2
0.98	-0.05	-0.26	0.26	-99.9	0.98	-9.27	-3.12	9.78	-161.4

H/A =157.48 BETA*H =2.627

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	1.22	0.09	1.22	-355.8	0.0	14.77	-2.60	15.00	-10.0
0.01	1.10	0.03	1.10	-358.6	0.01	13.46	-2.47	13.68	-10.4
0.02	1.03	-0.08	1.04	-364.2	0.02	11.01	-2.10	11.21	-10.8
0.03	1.08	-0.21	1.10	-371.2	0.03	9.66	-1.95	10.05	-11.2
0.04	1.07	-0.32	1.11	-376.8	0.04	8.91	-1.85	9.10	-11.7
0.05	1.06	-0.42	1.14	-381.6	0.05	8.18	-1.77	8.37	-12.2
0.06	1.09	-0.52	1.21	-385.4	0.06	7.92	-1.76	8.11	-12.5
0.07	1.10	-0.60	1.25	-388.9	0.07	7.17	-1.64	7.35	-12.9
0.08	1.09	-0.68	1.28	-392.1	0.08	6.83	-1.63	7.02	-13.4
0.09	1.07	-0.76	1.31	-35.6	0.09	6.49	-1.62	6.69	-14.0
0.10	1.06	-0.83	1.34	-38.0	0.10	6.22	-1.61	6.43	-14.5
0.11	1.04	-0.89	1.37	-40.6	0.11	5.95	-1.60	6.16	-15.0
0.12	1.03	-0.96	1.40	-43.1	0.12	5.78	-1.62	6.00	-15.7
0.13	1.01	-1.02	1.43	-45.3	0.13	5.51	-1.60	5.74	-16.2
0.14	1.01	-1.08	1.48	-47.1	0.14	5.37	-1.61	5.60	-16.7
0.15	1.00	-1.15	1.53	-49.1	0.15	5.18	-1.56	5.41	-16.8
0.16	1.00	-1.19	1.56	-50.1	0.16	4.93	-1.57	5.18	-17.7
0.17	0.95	-1.23	1.56	-52.4	0.17	4.78	-1.62	5.04	-18.7
0.18	0.95	-1.29	1.60	-53.6	0.18	4.57	-1.61	4.85	-19.4
0.19	0.92	-1.33	1.62	-55.3	0.19	4.39	-1.62	4.68	-20.2
0.20	0.91	-1.35	1.63	-56.1	0.20	4.19	-1.61	4.48	-21.0
0.22	0.90	-1.47	1.72	-58.6	0.22	3.92	-1.64	4.25	-22.7
0.24	0.85	-1.51	1.74	-60.6	0.24	3.61	-1.62	3.96	-24.2
0.26	0.83	-1.60	1.80	-62.6	0.26	3.28	-1.63	3.66	-26.4
0.28	0.82	-1.72	1.91	-64.6	0.28	2.98	-1.63	3.40	-28.7
0.30	0.81	-1.83	2.00	-66.0	0.30	2.58	-1.65	3.07	-32.6
0.32	0.81	-1.91	2.08	-67.1	0.32	2.28	-1.64	2.80	-35.7
0.34	0.84	-2.09	2.26	-68.1	0.34	1.95	-1.63	2.54	-39.9
0.36	0.80	-2.13	2.27	-69.5	0.36	1.64	-1.62	2.31	-44.7
0.38	0.75	-2.13	2.26	-70.6	0.38	1.29	-1.58	2.04	-50.7
0.40	0.70	-2.11	2.23	-71.6	0.40	0.96	-1.54	1.81	-58.2
0.42	0.65	-2.07	2.17	-72.6	0.42	0.66	-1.51	1.65	-66.4
0.44	0.63	-2.09	2.18	-73.2	0.44	0.36	-1.49	1.53	-76.5
0.46	0.60	-2.10	2.18	-74.0	0.46	0.04	-1.47	1.47	-88.5
0.48	0.57	-2.09	2.17	-74.8	0.48	-0.26	-1.43	1.45	-100.5
0.50	0.54	-2.08	2.15	-75.6	0.50	-0.57	-1.39	1.50	-112.5
0.52	0.51	-2.06	2.12	-76.2	0.52	-0.88	-1.35	1.62	-123.2
0.54	0.47	-2.04	2.09	-77.0	0.54	-1.21	-1.31	1.78	-132.8
0.56	0.44	-2.01	2.06	-77.6	0.56	-1.53	-1.26	1.98	-140.5
0.58	0.41	-1.97	2.01	-78.4	0.58	-1.76	-1.19	2.14	-146.2
0.60	0.39	-1.94	1.98	-78.6	0.60	-2.07	-1.14	2.36	-151.2
0.62	0.38	-1.95	1.98	-79.1	0.62	-2.37	-1.08	2.60	-155.4
0.64	0.35	-1.89	1.92	-79.4	0.64	-2.64	-1.03	2.84	-158.7
0.66	0.32	-1.80	1.83	-80.0	0.66	-2.91	-0.97	3.07	-161.5
0.68	0.26	-1.75	1.77	-81.6	0.68	-3.17	-0.90	3.30	-164.2
0.70	0.27	-1.67	1.69	-80.8	0.70	-3.42	-0.87	3.53	-165.8
0.72	0.25	-1.63	1.65	-81.4	0.72	-3.67	-0.82	3.76	-167.4
0.74	0.21	-1.54	1.56	-82.1	0.74	-3.94	-0.79	4.02	-168.7
0.76	0.17	-1.49	1.50	-83.6	0.76	-4.16	-0.72	4.22	-170.2
0.78	0.15	-1.41	1.42	-84.1	0.78	-4.40	-0.67	4.45	-171.4
0.80	0.10	-1.32	1.33	-85.6	0.80	-4.68	-0.61	4.71	-172.6
0.82	0.06	-1.22	1.22	-87.0	0.82	-4.91	-0.55	4.95	-173.6
0.84	0.04	-1.11	1.11	-88.0	0.84	-5.03	-0.42	5.04	-175.2
0.86	0.02	-0.99	0.99	-88.9	0.86	-5.20	-0.36	5.21	-176.0
0.88	0.02	-0.84	0.84	-88.6	0.88	-5.43	-0.31	5.44	-176.7
0.90	0.01	-0.73	0.73	-89.6	0.90	-5.66	-0.56	5.70	-174.4
0.92	-0.01	-0.64	0.44	-90.6	0.92	-5.93	-0.21	5.93	-178.0
0.94	-0.02	-0.53	0.53	-91.8	0.94	-6.13	-0.14	6.13	-178.7
0.96	-0.04	-0.39	0.40	-95.6	0.96	-6.59	-0.09	6.59	-179.2
0.98	-0.05	-0.23	0.24	-102.1	0.98	-7.48	-0.05	7.48	-179.6
0.99	-0.06	-0.16	0.17	-109.6	0.99	-8.24	-0.06	8.24	-179.6

H/A =192.13 BETA*H =3.205

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	1.03	0.91	1.37	41.4	0.0	15.35	-2.46	15.54	-9.1
0.01	0.90	0.74	1.17	39.4	0.01	15.13	-2.42	15.33	-9.1
0.02	0.85	0.68	1.09	38.7	0.02	12.60	-2.09	12.77	-9.4
0.02	0.83	0.61	1.03	36.3	0.04	11.17	-1.89	11.33	-9.6
0.03	0.83	0.53	0.98	32.9	0.03	10.15	-1.79	10.30	-10.0
0.04	0.89	0.49	1.01	28.9	0.04	9.46	-1.74	9.62	-10.4
0.05	0.88	0.43	0.98	25.9	0.05	8.91	-1.70	9.07	-10.8
0.06	0.87	0.35	0.94	22.3	0.06	8.48	-1.68	8.64	-11.2
0.07	0.84	0.28	0.89	18.2	0.07	8.13	-1.68	8.30	-11.7
0.07	0.82	0.21	0.84	14.2	0.07	7.79	-1.67	7.96	-12.1
0.08	0.78	0.15	0.80	10.9	0.08	7.61	-1.69	7.79	-12.5
0.09	0.76	0.09	0.76	6.4	0.09	7.47	-1.72	7.66	-13.0
0.10	0.75	0.03	0.75	2.4	0.10	7.25	-1.74	7.45	-13.5
0.11	0.75	-0.04	0.75	357.1	0.11	7.03	-1.74	7.24	-13.9
0.11	0.70	-0.08	0.70	353.2	0.11	6.89	-1.77	7.11	-14.4
0.12	0.66	-0.13	0.67	348.7	0.12	6.75	-1.80	6.98	-14.9

TABLE B-3: Cont'd

	MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT)					MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)			
H/A =192.13	BETA*H =3.205	ALPHA/BETA =0.070		DELTA = 8.96					
Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.13	0.63	-0.18	0.65	344.4	0.13	6.61	-1.82	6.85	-15.4
0.14	0.62	-0.22	0.65	340.2	0.14	6.38	-1.83	6.64	-16.0
0.15	0.59	-0.26	0.65	336.4	0.15	6.29	-1.85	6.56	-16.4
0.16	0.58	-0.30	0.65	332.4	0.16	6.15	-1.86	6.43	-16.8
0.16	0.56	-0.34	0.65	328.3	0.16	6.05	-1.90	6.34	-17.4
0.18	0.53	-0.43	0.68	320.9	0.18	5.82	-1.94	6.13	-18.4
0.20	0.53	-0.55	0.76	314.2	0.20	5.62	-1.98	5.96	-19.4
0.21	0.53	-0.66	0.84	308.6	0.21	5.39	-2.00	5.75	-20.4
0.23	0.46	-0.69	0.83	303.4	0.23	5.19	-2.05	5.58	-21.6
0.25	0.44	-0.79	0.90	299.2	0.25	4.95	-2.07	5.36	-22.7
0.26	0.44	-0.91	1.01	295.9	0.26	4.67	-2.07	5.11	-23.9
0.28	0.46	-1.09	1.18	292.8	0.28	4.43	-2.08	4.90	-25.1
0.30	0.45	-1.21	1.29	290.2	0.30	4.20	-2.08	4.68	-26.3
0.31	0.42	-1.31	1.37	287.8	0.31	3.96	-2.07	4.47	-27.6
0.33	0.37	-1.37	1.42	285.2	0.33	3.72	-2.07	4.26	-29.1
0.34	0.33	-1.41	1.45	283.0	0.34	3.44	-2.05	4.00	-30.8
0.36	0.28	-1.42	1.45	281.0	0.36	3.15	-2.02	3.75	-32.7
0.38	0.24	-1.46	1.48	279.4	0.38	2.87	-1.98	3.49	-34.6
0.39	0.21	-1.51	1.53	278.0	0.39	2.59	-1.94	3.24	-36.9
0.41	0.20	-1.58	1.59	277.2	0.41	2.29	-1.91	2.98	-39.8
0.43	0.17	-1.63	1.64	276.0	0.43	2.04	-1.87	2.77	-42.4
0.44	0.14	-1.66	1.67	274.9	0.44	1.72	-1.80	2.49	-46.4
0.46	0.12	-1.74	1.75	273.9	0.46	1.43	-1.74	2.26	-50.6
0.48	0.09	-1.79	1.79	272.9	0.48	1.13	-1.67	2.02	-55.9
0.49	0.06	-1.79	1.79	271.9	0.49	0.86	-1.62	1.83	-62.0
0.51	0.04	-1.78	1.78	271.2	0.51	0.56	-1.54	1.64	-70.0
0.52	0.02	-1.95	1.95	270.6	0.52	0.27	-1.46	1.49	-79.4
0.54	-0.00	-2.00	2.00	269.9	0.54	-0.01	-1.38	1.38	-90.4
0.56	-0.02	-2.06	2.06	269.4	0.56	-0.30	-1.31	1.34	-102.9
0.57	-0.04	-2.09	2.09	268.8	0.57	-0.59	-1.21	1.34	-116.0
0.59	-0.08	-2.07	2.07	267.8	0.59	-0.86	-1.11	1.41	-127.6
0.61	-0.11	-2.09	2.09	267.0	0.61	-1.14	-1.03	1.53	-137.9
0.62	-0.14	-2.07	2.07	266.0	0.62	-1.42	-0.94	1.70	-146.6
0.64	-0.18	-2.03	2.04	264.9	0.64	-1.68	-0.83	1.87	-153.6
0.66	-0.21	-1.98	2.00	263.8	0.66	-1.95	-0.74	2.09	-159.2
0.67	-0.24	-1.97	1.98	263.1	0.67	-2.23	-0.65	2.32	-163.7
0.69	-0.25	-1.93	1.95	262.6	0.69	-2.49	-0.56	2.55	-167.4
0.70	-0.26	-1.88	1.90	262.0	0.70	-2.75	-0.46	2.79	-170.6
0.72	-0.26	-1.81	1.82	261.8	0.72	-3.00	-0.36	3.02	-173.2
0.74	-0.27	-1.74	1.76	261.1	0.74	-3.23	-0.25	3.24	-175.6
0.75	-0.26	-1.62	1.64	260.8	0.75	-3.47	-0.14	3.47	-177.7
0.77	-0.25	-1.48	1.50	260.2	0.77	-3.70	-0.04	3.70	-179.4
0.79	-0.24	-1.30	1.33	259.6	0.79	-3.92	0.05	3.92	-180.8
0.80	-0.23	-1.19	1.22	259.0	0.80	-4.13	0.15	4.13	-182.1
0.82	-0.23	-1.13	1.15	258.7	0.82	-4.34	0.24	4.34	-183.2
0.84	-0.22	-1.05	1.08	258.2	0.84	-4.54	0.33	4.56	-184.2
0.85	-0.21	-0.93	0.95	257.4	0.85	-4.75	0.42	4.77	-185.1
0.87	-0.20	-0.90	0.92	257.1	0.87	-4.91	0.53	4.94	-186.2
0.89	-0.19	-0.80	0.83	256.4	0.89	-5.07	0.62	5.11	-187.0
0.90	-0.18	-0.76	0.78	256.3	0.90	-5.32	0.71	5.36	-187.6
0.92	-0.18	-0.69	0.72	255.6	0.92	-5.60	0.82	5.66	-188.3
0.93	-0.16	-0.57	0.59	254.4	0.93	-5.80	0.91	5.88	-188.9
0.95	-0.13	-0.42	0.44	252.0	0.95	-6.09	1.01	6.17	-189.4
0.97	-0.11	-0.28	0.30	248.4	0.97	-6.50	1.13	6.60	-189.9
0.98	-0.08	-0.16	0.18	242.1	0.98	-7.37	1.35	7.49	-190.4

TABLE B-4: CURRENT AND CHARGE DISTRIBUTIONS. α/β=.106

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT) — MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A = 18.90 BETA*H =0.316 ALPHA/BETA =0.106 DELTA = 8.99

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	0.34	1.27	1.31	75.0	0.0	1.72	-0.37	1.76	-12.1
0.08	0.34	1.21	1.26	74.4	0.08	1.62	-0.34	1.65	-11.9
0.17	0.23	0.97	1.00	76.7	0.17	1.35	-0.29	1.38	-12.1
0.25	0.20	0.85	0.87	76.8	0.25	1.21	-0.26	1.24	-12.2
0.33	0.18	0.76	0.78	76.8	0.33	1.11	-0.24	1.14	-12.4
0.42	0.16	0.70	0.72	76.8	0.42	1.06	-0.24	1.08	-12.5
0.50	0.14	0.61	0.63	76.9	0.50	1.02	-0.23	1.05	-12.7
0.58	0.12	0.53	0.54	77.0	0.58	1.01	-0.23	1.03	-12.8
0.67	0.10	0.44	0.45	77.1	0.67	1.01	-0.23	1.03	-12.9
0.75	0.08	0.36	0.37	77.2	0.75	1.02	-0.24	1.05	-13.0
0.83	0.06	0.27	0.27	77.5	0.83	1.07	-0.25	1.10	-13.0
0.90	0.04	0.19	0.20	78.0	0.90	1.14	-0.26	1.17	-12.9

H/A = 28.35 BETA*H =0.475

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	0.47	1.54	1.61	73.0	0.0	2.61	-0.56	2.67	-12.1
0.06	0.40	1.37	1.43	73.6	0.06	2.41	-0.51	2.46	-12.0
0.11	0.33	1.28	1.33	75.4	0.11	2.00	-0.44	2.05	-12.2
0.17	0.32	1.23	1.27	75.6	0.17	1.80	-0.40	1.85	-12.5
0.22	0.30	1.14	1.18	75.5	0.22	1.67	-0.38	1.71	-12.7
0.28	0.29	1.12	1.16	75.5	0.28	1.57	-0.36	1.61	-12.9
0.33	0.28	1.07	1.11	75.5	0.33	1.50	-0.35	1.55	-13.1
0.39	0.26	0.98	1.02	75.4	0.39	1.46	-0.35	1.50	-13.4
0.44	0.24	0.91	0.94	75.4	0.44	1.43	-0.35	1.47	-13.6
0.50	0.22	0.84	0.87	75.4	0.50	1.43	-0.35	1.47	-13.8
0.56	0.20	0.77	0.80	75.4	0.56	1.41	-0.35	1.46	-14.0
0.61	0.18	0.70	0.72	75.3	0.61	1.43	-0.36	1.47	-14.1
0.67	0.16	0.61	0.63	75.3	0.67	1.43	-0.36	1.48	-14.2
0.72	0.14	0.52	0.54	75.2	0.72	1.44	-0.37	1.49	-14.4
0.78	0.12	0.43	0.45	75.1	0.78	1.41	-0.37	1.46	-14.5
0.83	0.09	0.35	0.36	74.9	0.83	1.52	-0.40	1.57	-14.6
0.89	0.07	0.27	0.28	74.8	0.89	1.62	-0.43	1.68	-14.7
0.93	0.05	0.20	0.20	74.8	0.93	1.74	-0.46	1.80	-14.8

H/A = 37.80 BETA*H =0.633

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	0.68	2.14	2.24	72.4	0.0	3.22	-0.73	3.30	-12.8
0.04	0.60	1.87	1.96	72.1	0.04	3.30	-0.72	3.38	-12.3
0.08	0.52	1.77	1.84	73.6	0.08	2.75	-0.61	2.81	-12.5
0.13	0.50	1.71	1.78	73.6	0.13	2.42	-0.56	2.48	-12.9
0.17	0.48	1.64	1.71	73.6	0.17	2.23	-0.53	2.29	-13.2
0.21	0.48	1.64	1.71	73.6	0.21	2.11	-0.51	2.17	-13.7
0.25	0.46	1.57	1.64	73.5	0.25	2.04	-0.51	2.11	-14.0
0.29	0.45	1.50	1.57	73.4	0.29	1.99	-0.50	2.05	-14.2
0.33	0.43	1.44	1.51	73.3	0.33	1.94	-0.50	2.01	-14.5
0.38	0.42	1.39	1.45	73.3	0.38	1.91	-0.51	1.97	-14.8
0.42	0.40	1.31	1.37	73.2	0.42	1.90	-0.52	1.97	-15.1
0.46	0.37	1.21	1.27	73.1	0.46	1.90	-0.53	1.97	-15.4
0.50	0.34	1.12	1.17	72.9	0.50	1.88	-0.53	1.95	-15.7
0.54	0.31	1.00	1.05	72.8	0.54	1.87	-0.54	1.95	-15.9
0.58	0.28	0.91	0.95	72.6	0.58	1.88	-0.55	1.96	-16.1
0.63	0.27	0.85	0.89	72.5	0.63	1.91	-0.56	1.99	-16.4
0.67	0.25	0.77	0.81	72.4	0.67	1.93	-0.58	2.02	-16.6
0.71	0.23	0.71	0.74	72.3	0.71	1.94	-0.58	2.03	-16.7
0.75	0.20	0.61	0.64	72.1	0.75	1.98	-0.60	2.07	-16.9
0.79	0.17	0.53	0.56	71.9	0.79	2.03	-0.63	2.13	-17.2
0.83	0.15	0.46	0.48	71.7	0.83	2.08	-0.65	2.18	-17.3
0.88	0.12	0.37	0.39	71.4	0.88	2.17	-0.68	2.27	-17.4
0.92	0.10	0.28	0.30	71.0	0.92	2.30	-0.73	2.42	-17.6
0.95	0.07	0.20	0.21	70.4	0.95	2.48	-0.79	2.60	-17.6

H/A = 56.69 BETA*H =0.949

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	1.82	3.82	4.24	64.5	0.0	4.70	-1.14	4.83	-13.6
0.03	1.66	3.64	4.00	65.5	0.03	4.94	-1.13	5.07	-12.9
0.06	1.50	3.36	3.68	65.9	0.06	4.10	-0.99	4.22	-13.6
0.08	1.42	3.11	3.42	65.5	0.08	3.64	-0.93	3.75	-14.4
0.11	1.42	3.08	3.39	65.2	0.11	3.37	-0.92	3.50	-15.3
0.14	1.45	3.10	3.42	65.0	0.14	3.21	-0.93	3.34	-16.1
0.17	1.40	2.98	3.29	64.8	0.17	3.12	-0.95	3.27	-17.0
0.19	1.39	2.91	3.23	64.5	0.19	3.06	-0.98	3.21	-17.8
0.22	1.37	2.85	3.16	64.3	0.22	3.00	-1.01	3.16	-18.6
0.25	1.35	2.76	3.07	64.0	0.25	2.99	-1.05	3.16	-19.3
0.28	1.28	2.61	2.91	63.8	0.28	2.97	-1.08	3.16	-20.0
0.31	1.25	2.52	2.81	63.6	0.31	2.96	-1.12	3.16	-20.7
0.33	1.22	2.43	2.72	63.4	0.33	2.97	-1.15	3.19	-21.2
0.36	1.18	2.34	2.62	63.2	0.36	3.01	-1.20	3.24	-21.8
0.39	1.15	2.25	2.53	63.0	0.39	3.00	-1.23	3.24	-22.4
0.42	1.13	2.19	2.46	62.8	0.42	3.03	-1.28	3.29	-22.9
0.44	1.10	2.13	2.40	62.7	0.44	3.04	-1.32	3.32	-23.4
0.47	1.06	2.04	2.30	62.5	0.47	3.08	-1.36	3.37	-23.9
0.50	1.02	1.95	2.21	62.4	0.50	3.12	-1.41	3.42	-24.3
0.53	0.96	1.81	2.05	62.1	0.53	3.15	-1.45	3.47	-24.7
0.56	0.90	1.69	1.92	62.0	0.56	3.16	-1.49	3.50	-25.3
0.61	0.84	1.55	1.76	61.6	0.61	3.23	-1.58	3.60	-26.1
0.67	0.74	1.36	1.55	61.3	0.67	3.33	-1.68	3.73	-26.7

TABLE B-4: Cont'd

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT)					MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)				
H/A = 56.69	BETA*H =0.949	ALPHA/BETA =0.106	DELTA = 8.99						
Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.72	0.65	1.16	1.33	60.9	0.72	3.40	-1.76	3.83	-27.3
0.78	0.56	1.00	1.15	60.8	0.78	3.52	-1.87	3.99	-27.9
0.83	0.47	0.82	0.95	60.1	0.83	3.68	-1.95	4.17	-27.9
0.89	0.37	0.63	0.73	59.6	0.89	3.88	-2.12	4.42	-28.7
0.94	0.24	0.39	0.45	58.3	0.94	4.34	-2.41	4.96	-29.1
0.97	0.17	0.26	0.31	56.9	0.97	4.70	-2.61	5.37	-29.1

H/A = 75.59 BETA*H =1.266

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	5.28	4.12	6.70	37.9	0.0	6.42	-1.39	6.57	-12.2
0.02	5.25	4.15	6.70	38.3	0.02	6.18	-1.40	6.34	-12.8
0.04	4.79	3.84	6.14	38.7	0.04	5.24	-1.40	5.43	-15.0
0.06	4.79	3.76	6.09	38.1	0.06	4.65	-1.49	4.88	-17.7
0.08	4.81	3.74	6.09	37.8	0.08	4.28	-1.59	4.57	-20.4
0.10	4.85	3.70	6.09	37.3	0.10	4.08	-1.72	4.43	-22.8
0.13	4.82	3.64	6.04	37.0	0.13	3.92	-1.87	4.34	-25.5
0.15	4.84	3.61	6.04	36.7	0.15	3.82	-2.01	4.31	-27.8
0.17	4.87	3.58	6.04	36.3	0.17	3.73	-2.17	4.31	-30.2
0.19	4.81	3.49	5.94	35.9	0.19	3.69	-2.34	4.37	-32.3
0.21	4.67	3.34	5.74	35.6	0.21	3.66	-2.50	4.43	-34.3
0.23	4.57	3.22	5.59	35.2	0.23	3.64	-2.67	4.51	-36.2
0.25	4.50	3.14	5.49	34.9	0.25	3.60	-2.81	4.57	-38.0
0.27	4.43	3.06	5.39	34.6	0.27	3.65	-3.02	4.74	-39.6
0.29	4.41	3.01	5.34	34.3	0.29	3.65	-3.20	4.86	-41.2
0.31	4.42	3.00	5.34	34.1	0.31	3.65	-3.37	4.97	-42.7
0.33	4.39	2.94	5.29	33.8	0.33	3.66	-3.53	5.08	-43.9
0.35	4.30	2.86	5.16	33.6	0.35	3.67	-3.68	5.20	-45.1
0.38	4.29	2.82	5.14	33.3	0.38	3.67	-3.84	5.31	-46.3
0.40	4.22	2.75	5.04	33.1	0.40	3.70	-4.01	5.46	-47.3
0.42	4.19	2.70	4.99	32.8	0.42	3.76	-4.22	5.66	-48.3
0.46	4.00	2.54	4.73	32.4	0.46	3.81	-4.56	5.94	-50.1
0.50	3.80	2.38	4.48	32.0	0.50	3.82	-4.84	6.17	-51.7
0.54	3.54	2.17	4.15	31.5	0.54	3.84	-5.12	6.40	-53.1
0.58	3.28	1.97	3.83	31.0	0.58	3.87	-5.38	6.63	-54.3
0.63	2.95	1.74	3.42	30.6	0.63	3.92	-5.70	6.91	-55.5
0.67	2.70	1.57	3.12	30.1	0.67	3.98	-6.00	7.20	-56.4
0.71	2.45	1.39	2.82	29.5	0.71	4.01	-6.25	7.43	-57.3
0.75	2.16	1.20	2.47	29.1	0.75	4.06	-6.55	7.71	-58.2
0.79	1.90	1.04	2.17	28.6	0.79	4.16	-6.90	8.06	-58.9
0.83	1.58	0.83	1.79	27.8	0.83	4.23	-7.19	8.34	-59.5
0.88	1.26	0.64	1.41	26.8	0.88	4.36	-7.58	8.74	-60.1
0.92	0.93	0.44	1.03	25.2	0.92	4.53	-8.07	9.25	-60.7
0.96	0.55	0.21	0.59	21.0	0.96	5.05	-9.15	10.45	-61.1
0.97	0.39	0.12	0.41	17.5	0.97	5.51	-10.07	11.48	-61.3

H/A = 94.49 BETA*H =1.582

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	5.32	-1.33	5.48	-14.0	0.0	8.71	-1.60	8.85	-10.4
0.02	5.62	-1.47	5.81	-14.6	0.02	8.43	-1.61	8.58	-10.8
0.03	5.11	-1.15	5.24	-12.6	0.03	6.54	-1.50	6.71	-12.9
0.05	5.23	-1.30	5.38	-13.9	0.05	5.54	-1.59	5.77	-16.0
0.07	5.40	-1.40	5.58	-14.5	0.07	4.81	-1.69	5.10	-19.4
0.08	5.61	-1.52	5.81	-15.1	0.08	4.25	-1.84	4.63	-23.4
0.10	5.69	-1.60	5.91	-15.7	0.10	3.81	-1.98	4.29	-27.4
0.12	5.76	-1.69	6.00	-16.3	0.12	3.41	-2.14	4.02	-32.1
0.13	5.70	-1.73	5.96	-16.9	0.13	3.09	-2.25	3.82	-36.1
0.15	5.63	-1.78	5.91	-17.5	0.15	2.78	-2.42	3.69	-41.1
0.17	5.62	-1.83	5.91	-18.0	0.17	2.52	-2.61	3.62	-46.0
0.18	5.60	-1.88	5.91	-18.5	0.18	2.26	-2.78	3.59	-50.9
0.20	5.63	-1.93	5.96	-18.9	0.20	2.03	-3.00	3.62	-55.9
0.22	5.61	-1.99	5.96	-19.5	0.22	1.79	-3.15	3.62	-60.4
0.23	5.47	-1.98	5.81	-19.9	0.23	1.65	-3.35	3.69	-65.2
0.25	5.32	-1.97	5.67	-20.3	0.25	1.32	-3.52	3.76	-69.4
0.27	5.12	-1.94	5.48	-20.7	0.27	1.12	-3.69	3.86	-73.1
0.28	5.06	-1.97	5.43	-21.2	0.28	0.90	-3.85	3.96	-76.8
0.30	5.01	-1.98	5.38	-21.5	0.30	0.71	-4.03	4.09	-80.0
0.32	4.99	-2.01	5.38	-21.9	0.32	0.49	-4.23	4.26	-83.4
0.33	4.94	-2.01	5.34	-22.1	0.33	0.31	-4.38	4.39	-86.0
0.37	4.83	-2.03	5.24	-22.8	0.37	-0.06	-4.73	4.73	-90.7
0.40	4.67	-2.04	5.10	-23.6	0.40	-0.43	-5.04	5.06	-94.9
0.43	4.48	-2.01	4.91	-24.2	0.43	-0.79	-5.37	5.43	-98.4
0.47	4.33	-1.99	4.77	-24.7	0.47	-1.16	-5.72	5.83	-101.5
0.50	4.05	-1.92	4.48	-25.4	0.50	-1.51	-5.98	6.17	-104.2
0.53	3.85	-1.88	4.29	-26.0	0.53	-1.85	-6.27	6.54	-106.4
0.57	3.67	-1.83	4.10	-26.5	0.57	-2.20	-6.62	6.97	-108.4
0.60	3.46	-1.77	3.88	-27.0	0.60	-2.51	-6.86	7.31	-110.1
0.63	3.21	-1.69	3.62	-27.7	0.63	-2.81	-7.11	7.65	-111.6
0.67	3.02	-1.62	3.43	-28.2	0.67	-3.16	-7.48	8.11	-112.9
0.70	2.80	-1.53	3.19	-28.6	0.70	-3.45	-7.71	8.45	-114.1
0.73	2.62	-1.46	3.00	-29.0	0.73	-3.73	-7.96	8.79	-115.1
0.77	2.38	-1.35	2.74	-29.5	0.77	-4.00	-8.20	9.12	-116.0
0.80	2.12	-1.23	2.45	-30.0	0.80	-4.31	-8.49	9.52	-116.9
0.83	1.76	-1.05	2.05	-30.8	0.83	-4.57	-8.74	9.86	-117.6
0.87	1.46	-0.90	1.72	-31.7	0.87	-4.91	-9.09	10.33	-118.4
0.90	1.16	-0.75	1.38	-32.8	0.90	-5.20	-9.39	10.73	-119.0
0.93	0.82	-0.57	1.00	-34.8	0.93	-5.71	-10.10	11.60	-119.5
0.97	0.43	-0.37	0.57	-40.5	0.97	-6.54	-11.33	13.08	-120.0
0.98	0.26	-0.28	0.38	-46.5	0.98	-7.16	-12.36	14.28	-120.1

TABLE B-4: Cont'd

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT) — MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A =110.24 BETA*H =1.846 ALPHA/BETA =0.106 DELTA = 8.99

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	3.44	-1.99	3.98	-30.1	0.0	11.24	-2.10	11.43	-10.6
0.01	3.19	-1.89	3.71	-30.6	0.01	10.60	-2.04	10.80	-10.9
0.03	2.88	-1.83	3.41	-32.4	0.03	8.23	-1.75	8.41	-12.0
0.04	2.73	-1.81	3.28	-33.5	0.04	6.81	-1.62	7.00	-13.4
0.06	2.84	-1.89	3.41	-33.6	0.06	5.97	-1.59	6.18	-14.9
0.07	2.96	-2.13	3.64	-35.7	0.07	5.31	-1.58	5.54	-16.6
0.09	2.99	-2.25	3.74	-36.5	0.09	4.79	-1.62	5.06	-18.7
0.10	2.96	-2.29	3.74	-37.8	0.10	4.36	-1.67	4.67	-20.9
0.11	2.95	-2.36	3.78	-38.6	0.11	3.98	-1.71	4.33	-23.2
0.13	2.94	-2.42	3.81	-39.5	0.13	3.59	-1.73	3.99	-25.7
0.14	2.94	-2.48	3.84	-40.2	0.14	3.29	-1.79	3.75	-28.5
0.16	2.90	-2.52	3.84	-40.9	0.16	3.03	-1.86	3.55	-31.5
0.17	2.90	-2.57	3.88	-41.6	0.17	2.75	-1.92	3.36	-34.9
0.19	2.90	-2.63	3.91	-42.2	0.19	2.47	-1.97	3.16	-38.5
0.20	2.86	-2.66	3.91	-42.9	0.20	2.22	-2.04	3.02	-42.5
0.21	2.83	-2.70	3.91	-43.6	0.21	1.98	-2.08	2.87	-46.5
0.23	2.78	-2.70	3.88	-44.1	0.23	1.76	-2.15	2.77	-50.7
0.24	2.73	-2.71	3.84	-44.8	0.24	1.52	-2.20	2.68	-55.5
0.26	2.68	-2.71	3.81	-45.3	0.26	1.28	-2.29	2.63	-60.8
0.27	2.63	-2.71	3.78	-45.8	0.27	1.04	-2.33	2.55	-65.9
0.29	2.58	-2.71	3.74	-46.4	0.29	0.82	-2.37	2.50	-71.0
0.31	2.49	-2.71	3.68	-47.4	0.31	0.37	-2.50	2.53	-81.5
0.34	2.42	-2.72	3.64	-48.4	0.34	-0.06	-2.63	2.63	-91.3
0.37	2.34	-2.70	3.58	-49.1	0.37	-0.46	-2.76	2.80	-99.5
0.40	2.26	-2.68	3.51	-49.9	0.40	-0.88	-2.88	3.02	-107.0
0.43	2.21	-2.69	3.48	-50.6	0.43	-1.29	-3.02	3.28	-113.1
0.46	2.18	-2.70	3.48	-51.1	0.46	-1.69	-3.12	3.55	-118.5
0.49	2.15	-2.73	3.48	-51.8	0.49	-2.09	-3.22	3.84	-123.0
0.51	2.12	-2.75	3.48	-52.4	0.51	-2.46	-3.32	4.13	-126.5
0.54	2.03	-2.70	3.38	-53.1	0.54	-2.86	-3.44	4.47	-129.8
0.57	1.96	-2.66	3.31	-53.6	0.57	-3.22	-3.51	4.77	-132.5
0.60	1.84	-2.55	3.14	-54.2	0.60	-3.64	-3.65	5.16	-134.9
0.63	1.73	-2.46	3.01	-54.8	0.63	-3.95	-3.68	5.40	-137.0
0.66	1.58	-2.30	2.79	-55.4	0.66	-4.28	-3.76	5.69	-138.7
0.69	1.45	-2.14	2.59	-55.9	0.69	-4.59	-3.80	5.96	-140.4
0.71	1.31	-1.98	2.37	-56.5	0.71	-4.92	-3.90	6.27	-141.6
0.74	1.20	-1.85	2.21	-57.0	0.74	-5.21	-3.92	6.52	-143.0
0.77	1.07	-1.69	2.01	-57.7	0.77	-5.51	-4.00	6.81	-144.0
0.80	0.95	-1.54	1.80	-58.4	0.80	-5.82	-4.06	7.10	-145.1
0.83	0.83	-1.37	1.60	-59.0	0.83	-6.13	-4.13	7.39	-146.0
0.86	0.72	-1.23	1.42	-59.6	0.86	-6.40	-4.17	7.64	-146.9
0.89	0.57	-1.02	1.17	-60.6	0.89	-6.73	-4.29	7.98	-147.5
0.91	0.44	-0.84	0.95	-62.2	0.91	-7.11	-4.41	8.37	-148.2
0.94	0.34	-0.69	0.77	-63.5	0.94	-7.58	-4.57	8.85	-148.9
0.97	0.18	-0.44	0.48	-67.8	0.97	-8.37	-4.95	9.73	-149.4
0.98	0.10	-0.33	0.34	-72.4	0.98	-9.61	-5.31	10.46	-149.5

H/A =125.98 BETA*H =2.105

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	2.08	-1.18	2.40	-29.5	0.0	11.63	-2.52	11.90	-12.2
0.01	2.05	-1.20	2.37	-30.3	0.01	11.11	-2.34	11.35	-11.9
0.02	1.90	-1.21	2.25	-32.6	0.02	9.04	-2.02	9.27	-12.6
0.04	1.88	-1.31	2.29	-35.0	0.04	7.59	-1.81	7.80	-13.4
0.05	1.89	-1.44	2.37	-37.2	0.05	6.74	-1.72	6.96	-14.3
0.06	1.93	-1.56	2.48	-39.0	0.06	6.11	-1.66	6.34	-15.2
0.07	1.94	-1.67	2.56	-40.6	0.07	5.70	-1.65	5.93	-16.1
0.09	1.95	-1.75	2.62	-41.8	0.09	5.22	-1.64	5.57	-17.1
0.10	1.91	-1.79	2.62	-43.1	0.10	4.93	-1.65	5.20	-18.5
0.11	1.89	-1.85	2.64	-44.5	0.11	4.55	-1.64	4.83	-19.8
0.13	1.86	-1.90	2.66	-45.6	0.13	4.27	-1.64	4.58	-21.0
0.14	1.83	-1.96	2.68	-46.9	0.14	3.96	-1.64	4.28	-22.5
0.15	1.80	-1.99	2.66	-47.9	0.15	3.74	-1.67	4.10	-24.1
0.16	1.76	-2.02	2.68	-48.9	0.16	3.46	-1.69	3.85	-26.0
0.17	1.75	-2.07	2.70	-49.8	0.17	3.24	-1.71	3.66	-27.9
0.19	1.70	-2.08	2.68	-50.7	0.19	3.02	-1.73	3.48	-29.8
0.20	1.68	-2.12	2.70	-51.5	0.20	2.79	-1.75	3.30	-32.1
0.21	1.69	-2.19	2.77	-52.3	0.21	2.58	-1.78	3.13	-34.6
0.22	1.67	-2.21	2.77	-53.0	0.22	2.36	-1.80	2.97	-37.4
0.24	1.65	-2.24	2.79	-53.6	0.24	2.16	-1.82	2.82	-40.1
0.25	1.62	-2.27	2.79	-54.4	0.25	2.03	-1.74	2.67	-40.6
0.27	1.55	-2.27	2.75	-55.6	0.27	1.58	-1.88	2.45	-50.0
0.30	1.49	-2.26	2.70	-56.7	0.30	1.19	-1.91	2.25	-58.2
0.32	1.44	-2.29	2.70	-57.8	0.32	0.81	-1.97	2.12	-67.7
0.35	1.43	-2.34	2.75	-58.5	0.35	0.42	-1.99	2.03	-78.1
0.38	1.39	-2.37	2.75	-59.7	0.38	0.05	-2.01	2.01	-88.5
0.40	1.34	-2.39	2.75	-60.7	0.40	-0.31	-2.03	2.05	-98.6
0.42	1.30	-2.40	2.73	-61.5	0.42	-0.64	-2.06	2.16	-107.3
0.45	1.24	-2.38	2.68	-62.5	0.45	-0.99	-2.08	2.31	-115.5
0.47	1.16	-2.31	2.58	-63.4	0.47	-1.33	-2.10	2.49	-122.4
0.50	1.08	-2.23	2.48	-64.2	0.50	-1.49	-2.12	2.71	-128.6
0.52	1.02	-2.19	2.42	-65.0	0.52	-2.00	-2.14	2.93	-133.1
0.55	0.98	-2.16	2.37	-65.5	0.55	-2.33	-2.12	3.15	-137.6
0.57	0.93	-2.12	2.31	-66.3	0.57	-2.65	-2.14	3.41	-141.1
0.60	0.88	-2.05	2.23	-66.7	0.60	-2.96	-2.15	3.66	-144.0
0.63	0.82	-1.96	2.13	-67.3	0.63	-3.27	-2.16	3.92	-146.6
0.65	0.77	-1.90	2.04	-68.0	0.65	-3.54	-2.14	4.14	-148.9
0.67	0.71	-1.81	1.94	-68.6	0.67	-3.83	-2.15	4.39	-150.7
0.70	0.66	-1.72	1.84	-69.1	0.70	-4.06	-2.11	4.58	-152.6
0.72	0.60	-1.63	1.73	-69.7	0.72	-4.32	-2.10	4.80	-154.1
0.75	0.55	-1.53	1.62	-70.2	0.75	-4.57	-2.07	5.02	-155.6
0.77	0.49	-1.39	1.48	-70.8	0.77	-4.78	-2.06	5.20	-156.7
0.80	0.43	-1.27	1.34	-71.4	0.80	-5.08	-2.08	5.49	-157.7
0.82	0.36	-1.12	1.18	-72.1	0.82	-5.32	-2.08	5.71	-158.7

TABLE B-4: Cont'd

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT) — MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A =125.98 BETA*H =2.109 ALPHA/BETA =0.106 DELTA = 8.99

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.85	0.30	-0.99	1.03	-73.0	0.85	-5.56	-2.07	5.93	-159.6
0.88	0.25	-0.87	0.91	-73.5	0.88	-5.76	-2.05	6.12	-160.4
0.90	0.19	-0.72	0.74	-75.2	0.90	-6.00	-2.04	6.34	-161.2
0.92	0.13	-0.58	0.59	282.6	0.92	-6.34	-2.07	6.67	-161.9
0.95	0.07	-0.43	0.43	279.8	0.95	-6.61	-2.16	7.14	-162.4
0.97	0.01	-0.25	0.25	272.5	0.97	-7.77	-2.40	8.13	-162.8
0.98	-0.02	-0.17	0.17	264.0	0.98	-8.55	-2.61	8.94	-163.0

H/A =157.48 BETA*H =2.637

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	1.46	0.08	1.46	3.1	0.0	14.40	-3.97	14.94	-15.4
0.01	1.37	0.02	1.37	0.9	0.01	13.92	-3.84	14.44	-15.4
0.02	1.29	-0.08	1.29	-3.6	0.02	11.35	-3.19	11.79	-15.7
0.03	1.29	-0.21	1.30	-9.2	0.03	9.72	-2.83	10.13	-16.2
0.04	1.24	-0.31	1.28	-14.0	0.04	8.78	-2.63	9.16	-16.7
0.05	1.26	-0.41	1.32	-18.1	0.05	8.02	-2.46	8.40	-17.2
0.06	1.27	-0.52	1.37	-22.1	0.06	7.49	-2.42	7.87	-17.9
0.07	1.28	-0.61	1.41	-25.4	0.07	6.99	-2.34	7.37	-18.5
0.08	1.24	-0.68	1.41	-28.7	0.08	6.62	-2.25	7.01	-19.1
0.09	1.21	-0.76	1.43	-32.0	0.09	6.31	-2.26	6.71	-19.7
0.10	1.19	-0.82	1.44	-34.6	0.10	6.01	-2.22	6.41	-20.3
0.11	1.15	-0.87	1.44	-37.2	0.11	5.77	-2.19	6.18	-20.8
0.12	1.13	-0.94	1.47	-39.7	0.12	5.53	-2.17	5.94	-21.4
0.13	1.10	-1.00	1.49	-42.1	0.13	5.32	-2.16	5.74	-22.1
0.14	1.09	-1.06	1.52	-44.1	0.14	5.08	-2.14	5.51	-22.8
0.15	1.06	-1.11	1.53	-46.1	0.15	4.87	-2.12	5.31	-23.5
0.16	1.05	-1.16	1.56	-47.9	0.16	4.69	-2.12	5.15	-24.3
0.17	1.03	-1.22	1.59	-49.7	0.17	4.51	-2.11	4.98	-25.1
0.18	1.01	-1.25	1.61	-51.0	0.18	4.36	-2.12	4.85	-26.0
0.19	0.98	-1.31	1.64	306.9	0.19	3.91	-1.98	4.38	-26.9
0.20	0.97	-1.36	1.67	305.5	0.20	4.03	-2.11	4.55	-27.7
0.22	0.92	-1.43	1.70	302.8	0.22	3.69	-2.11	4.25	-29.7
0.24	0.86	-1.46	1.70	300.4	0.24	3.35	-2.10	3.95	-32.1
0.26	0.81	-1.51	1.71	298.1	0.26	3.04	-2.09	3.69	-34.5
0.28	0.78	-1.57	1.76	296.3	0.28	2.76	-2.08	3.45	-37.0
0.30	0.74	-1.64	1.80	294.2	0.30	2.44	-2.05	3.19	-40.1
0.32	0.70	-1.71	1.85	292.2	0.32	2.13	-2.05	2.95	-43.9
0.34	0.68	-1.80	1.92	290.8	0.34	1.81	-1.99	2.69	-47.7
0.36	0.65	-1.84	1.95	289.4	0.36	1.52	-1.97	2.49	-52.3
0.38	0.60	-1.87	1.96	287.9	0.38	1.18	-1.92	2.26	-58.5
0.40	0.55	-1.87	1.95	286.4	0.40	0.89	-1.86	2.06	-64.4
0.42	0.52	-1.88	1.95	285.4	0.42	0.58	-1.80	1.89	-72.1
0.44	0.49	-1.90	1.96	284.4	0.44	0.28	-1.74	1.76	-80.7
0.46	0.45	-1.91	1.96	283.4	0.46	-0.01	-1.69	1.69	-90.2
0.48	0.42	-1.90	1.95	282.4	0.48	-0.31	-1.63	1.66	-100.9
0.50	0.39	-1.89	1.93	281.7	0.50	-0.59	-1.55	1.66	-110.9
0.52	0.36	-1.89	1.92	280.9	0.52	-0.88	-1.48	1.73	-120.7
0.54	0.34	-1.88	1.90	280.2	0.54	-1.17	-1.40	1.83	-129.7
0.56	0.31	-1.86	1.89	279.5	0.56	-1.43	-1.34	1.96	-137.0
0.58	0.28	-1.84	1.86	278.8	0.58	-1.69	-1.25	2.11	-143.5
0.60	0.25	-1.81	1.83	278.0	0.60	-1.97	-1.18	2.29	-149.1
0.62	0.23	-1.79	1.80	277.4	0.62	-2.23	-1.10	2.49	-153.8
0.64	0.21	-1.77	1.79	276.8	0.64	-2.48	-1.03	2.69	-157.5
0.66	0.18	-1.70	1.71	276.1	0.66	-2.73	-0.94	2.89	-161.0
0.68	0.15	-1.60	1.61	275.4	0.68	-2.95	-0.86	3.07	-163.7
0.70	0.13	-1.53	1.53	274.9	0.70	-3.19	-0.76	3.29	-166.3
0.72	0.12	-1.48	1.49	274.6	0.72	-3.42	-0.70	3.49	-168.5
0.74	0.10	-1.40	1.40	274.0	0.74	-3.60	-0.62	3.65	-170.2
0.76	0.08	-1.31	1.31	273.4	0.76	-3.68	-0.54	3.92	-172.1
0.78	0.06	-1.22	1.22	272.9	0.78	-4.12	-0.46	4.15	-173.6
0.80	0.05	-1.14	1.15	272.4	0.80	-4.30	-0.38	4.32	-174.9
0.82	0.03	-1.06	1.06	271.7	0.82	-4.50	-0.31	4.52	-176.1
0.84	0.02	-0.97	0.97	271.1	0.84	-4.74	-0.23	4.75	-177.2
0.86	0.01	-0.88	0.88	270.4	0.86	-4.94	-0.16	4.95	-178.1
0.88	0.00	-0.79	0.79	270.1	0.88	-5.15	-0.10	5.15	-178.9
0.90	-0.00	-0.70	0.70	269.7	0.90	-5.35	-0.03	5.35	-179.7
0.92	-0.01	-0.60	0.60	268.8	0.92	-5.58	0.02	5.58	-180.2
0.94	-0.03	-0.46	0.46	266.9	0.94	-5.88	0.11	5.88	-181.1
0.96	-0.03	-0.32	0.32	264.1	0.96	-6.27	0.19	6.27	-181.7
0.98	-0.04	-0.17	0.18	257.4	0.98	-7.67	0.28	7.07	-182.3
0.99	-0.04	-0.11	0.12	250.4	0.99	-7.76	0.33	7.77	-182.4

H/A =192.13 BETA*H =3.217

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	1.29	0.77	1.50	30.9	0.0	16.44	-3.77	16.87	-12.9
0.01	1.17	0.73	1.38	31.9	0.01	15.79	-3.65	16.21	-13.0
0.02	1.13	0.66	1.31	30.4	0.02	13.20	-3.18	13.58	-13.5
0.02	1.10	0.54	1.23	25.9	0.02	11.48	-2.87	11.83	-14.0
0.03	1.09	0.46	1.19	22.7	0.03	10.30	-2.67	10.65	-14.5
0.04	1.08	0.38	1.14	19.6	0.04	10.45	-2.80	10.82	-15.0
0.05	1.08	0.32	1.13	16.4	0.05	9.63	-2.51	9.37	-15.5
0.06	1.07	0.25	1.10	13.4	0.06	8.59	-2.48	8.94	-16.1
0.07	1.03	0.18	1.05	9.9	0.07	8.22	-2.47	8.59	-16.7
0.07	1.01	0.12	1.02	6.9	0.07	7.90	-2.48	8.28	-17.4
0.08	0.99	0.07	0.99	3.9	0.08	7.58	-2.47	7.97	-18.0
0.09	0.96	0.02	0.97	1.2	0.09	7.35	-2.46	7.75	-18.5
0.10	0.95	-0.03	0.95	-2.1	0.10	7.19	-2.52	7.62	-19.3
0.11	0.92	-0.09	0.92	-5.6	0.11	1.32	-7.33	7.45	-79.8
0.11	0.89	-0.14	0.90	-8.9	0.11	6.81	-2.54	7.27	-20.4

TABLE B-4: Cont'd

H/A =192.13 BETA*H =3.217 ALPHA/BETA =0.106 DELTA = 8.99

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT)					MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)				
Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.12	0.85	-0.19	0.87	-12.3	0.12	6.88	-2.53	7.05	-21.0
0.13	0.82	-0.23	0.85	-15.7	0.13	6.43	-2.55	6.92	-21.6
0.14	0.79	-0.28	0.84	-19.6	0.14	6.32	-2.60	6.83	-22.3
0.15	0.77	-0.33	0.84	-23.1	0.15	6.17	-2.62	6.70	-23.0
0.16	0.74	-0.37	0.83	-26.6	0.16	6.07	-2.64	6.61	-23.5
0.16	0.73	-0.42	0.84	-30.3	0.16	5.91	-2.66	6.48	-24.2
0.18	0.69	-0.51	0.85	323.5	0.18	5.61	-2.68	6.22	-25.5
0.20	0.65	-0.57	0.87	318.6	0.20	5.40	-2.71	6.05	-26.6
0.21	0.59	-0.66	0.88	311.6	0.21	5.18	-2.76	5.87	-28.0
0.23	0.54	-0.70	0.88	307.9	0.23	4.93	-2.77	5.65	-29.3
0.25	0.48	-0.81	0.94	300.6	0.25	4.67	-2.78	5.43	-30.7
0.26	0.45	-0.92	1.02	296.2	0.26	4.42	-2.77	5.21	-32.1
0.28	0.40	-0.97	1.05	292.2	0.28	4.22	-2.75	5.04	-33.1
0.30	0.35	-1.03	1.09	288.9	0.30	3.95	-2.77	4.82	-35.0
0.31	0.31	-1.07	1.12	285.9	0.31	3.69	-2.74	4.60	-36.6
0.33	0.26	-1.11	1.14	283.2	0.33	3.47	-2.74	4.42	-38.3
0.34	0.23	-1.18	1.20	280.8	0.34	3.18	-2.68	4.16	-40.1
0.36	0.18	-1.20	1.21	278.4	0.36	2.89	-2.61	3.90	-42.1
0.38	0.14	-1.23	1.24	276.4	0.38	2.63	-2.57	3.68	-44.3
0.39	0.10	-1.26	1.26	274.5	0.39	2.35	-2.51	3.44	-46.8
0.41	0.06	-1.28	1.28	272.6	0.41	2.07	-2.44	3.20	-49.6
0.43	0.03	-1.34	1.34	271.2	0.43	1.80	-2.35	2.96	-52.6
0.44	-0.00	-1.41	1.41	269.9	0.44	1.54	-2.29	2.76	-56.1
0.46	-0.03	-1.48	1.48	268.6	0.46	1.23	-2.17	2.50	-60.5
0.48	-0.06	-1.53	1.53	267.6	0.48	0.96	-2.09	2.30	-65.4
0.49	-0.10	-1.58	1.59	266.4	0.49	0.66	-1.97	2.08	-71.5
0.51	-0.13	-1.80	1.81	265.7	0.51	0.39	-1.89	1.93	-78.2
0.52	-0.16	-1.79	1.79	264.7	0.52	0.11	-1.79	1.80	-86.4
0.54	-0.20	-1.78	1.79	263.6	0.54	-0.17	-1.66	1.66	-95.9
0.56	-0.22	-1.74	1.75	262.7	0.56	-0.45	-1.54	1.60	-106.2
0.57	-0.24	-1.69	1.71	261.9	0.57	-0.72	-1.40	1.58	-117.0
0.59	-0.25	-1.57	1.59	260.9	0.59	-0.96	-1.28	1.60	-127.0
0.61	-0.26	-1.54	1.56	260.2	0.61	-1.24	-1.14	1.69	-137.3
0.62	-0.28	-1.52	1.54	259.4	0.62	-1.50	-1.02	1.82	-145.7
0.64	-0.30	-1.53	1.56	258.8	0.64	-1.76	-0.89	1.97	-153.2
0.66	-0.32	-1.55	1.59	258.4	0.66	-2.01	-0.76	2.15	-159.2
0.67	-0.33	-1.54	1.57	257.9	0.67	-2.23	-0.63	2.32	-164.2
0.69	-0.34	-1.48	1.52	256.9	0.69	-2.49	-0.48	2.54	-169.0
0.70	-0.34	-1.42	1.46	256.4	0.70	-2.71	-0.36	2.74	-172.4
0.72	-0.35	-1.41	1.45	256.0	0.72	-2.97	-0.23	2.98	-175.5
0.74	-0.34	-1.32	1.37	255.4	0.74	-3.20	-0.11	3.20	-178.0
0.75	-0.33	-1.24	1.28	254.9	0.75	-3.44	0.02	3.44	-180.3
0.77	-0.29	-1.08	1.12	254.7	0.77	-3.65	0.15	3.66	-182.4
0.79	-0.28	-0.98	1.02	254.1	0.79	-3.85	0.27	3.85	-184.0
0.80	-0.27	-0.94	0.98	253.9	0.80	-4.05	0.41	4.07	-185.7
0.82	-0.28	-0.88	0.92	252.4	0.82	-4.24	0.52	4.27	-187.0
0.84	-0.27	-0.81	0.85	251.7	0.84	-4.33	0.64	4.38	-188.4
0.85	-0.26	-0.77	0.81	251.2	0.85	-4.54	0.76	4.60	-189.5
0.87	-0.24	-0.69	0.73	250.6	0.87	-4.74	0.88	4.82	-190.5
0.89	-0.23	-0.62	0.66	249.9	0.89	-4.94	1.00	5.04	-191.4
0.90	-0.21	-0.55	0.59	249.1	0.90	-5.14	1.10	5.26	-192.1
0.92	-0.19	-0.47	0.50	247.9	0.92	-5.34	1.23	5.48	-193.0
0.93	-0.17	-0.39	0.43	246.9	0.93	-5.54	1.33	5.69	-193.5
0.95	-0.14	-0.31	0.34	244.9	0.95	-5.74	1.43	5.91	-194.0
0.97	-0.12	-0.21	0.24	241.4	0.97	-6.10	1.60	6.31	-194.7
0.98	-0.08	-0.10	0.13	230.9	0.98	-6.93	1.89	7.18	-195.2

TABLE B-5: CURRENT AND CHARGE DISTRIBUTIONS, $\alpha/\beta = .301$

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT) | MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A = 18.90 BETA*H =0.337 ALPHA/BETA =0.301 DELTA = 9.58

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	0.86	1.11	1.40	52.2	0.0	1.69	-1.13	2.03	-33.7
0.08	0.81	1.02	1.30	51.6	0.08	1.56	-1.05	1.88	-33.8
0.17	0.66	0.87	1.10	52.8	0.17	1.33	-0.90	1.60	-34.1
0.25	0.59	0.76	0.96	52.5	0.25	1.15	-0.79	1.40	-34.5
0.33	0.54	0.70	0.88	52.3	0.33	1.06	-0.74	1.30	-34.9
0.42	0.48	0.62	0.79	52.0	0.42	1.02	-0.72	1.25	-35.2
0.50	0.43	0.54	0.69	51.7	0.50	0.99	-0.70	1.21	-35.5
0.58	0.38	0.47	0.61	51.2	0.58	0.97	-0.70	1.19	-35.8
0.67	0.34	0.42	0.54	50.6	0.67	0.97	-0.71	1.20	-36.0
0.75	0.30	0.35	0.46	49.9	0.75	0.98	-0.72	1.22	-36.3
0.83	0.25	0.29	0.39	48.7	0.83	1.02	-0.76	1.27	-36.5
0.90	0.23	0.24	0.33	47.0	0.90	1.12	-0.83	1.39	-36.5

H/A = 28.35 BETA*H =0.536

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	1.26	1.49	1.95	49.8	0.0	2.47	-1.66	2.97	-33.9
0.06	1.15	1.36	1.78	49.9	0.06	2.22	-1.50	2.68	-34.0
0.11	1.02	1.24	1.60	50.6	0.11	1.90	-1.31	2.31	-34.5
0.17	0.95	1.15	1.49	50.4	0.17	1.69	-1.19	2.07	-35.1
0.22	0.90	1.07	1.40	50.1	0.22	1.55	-1.12	1.91	-35.7
0.28	0.84	1.00	1.31	49.8	0.28	1.46	-1.07	1.82	-36.2
0.33	0.78	0.92	1.21	49.5	0.33	1.41	-1.05	1.76	-36.8
0.39	0.73	0.85	1.12	49.2	0.39	1.36	-1.04	1.71	-37.3
0.44	0.68	0.78	1.03	48.9	0.44	1.33	-1.04	1.69	-37.8
0.50	0.64	0.72	0.96	48.6	0.50	1.32	-1.04	1.68	-38.3
0.56	0.59	0.66	0.88	48.3	0.56	1.30	-1.05	1.67	-38.8
0.61	0.54	0.60	0.80	47.9	0.61	1.30	-1.06	1.68	-39.1
0.67	0.49	0.53	0.72	47.5	0.67	1.31	-1.08	1.70	-39.5
0.72	0.44	0.47	0.64	47.0	0.72	1.31	-1.10	1.71	-39.8
0.78	0.39	0.41	0.56	46.4	0.78	1.33	-1.12	1.74	-40.1
0.83	0.33	0.33	0.47	45.5	0.83	1.37	-1.17	1.80	-40.4
0.89	0.29	0.28	0.40	44.5	0.89	1.44	-1.23	1.89	-40.6
0.93	0.26	0.24	0.35	43.1	0.93	1.56	-1.35	2.06	-40.8

H/A = 37.80 BETA*H =0.674

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	1.75	1.84	2.54	46.4	0.0	3.28	-2.30	4.01	-35.0
0.04	1.61	1.72	2.36	46.9	0.04	3.18	-2.17	3.85	-34.3
0.08	1.49	1.60	2.18	47.0	0.08	2.60	-1.82	3.17	-34.9
0.13	1.38	1.47	2.01	46.7	0.13	2.41	-1.74	2.97	-35.9
0.17	1.33	1.39	1.92	46.3	0.17	2.06	-1.55	2.59	-36.7
0.21	1.27	1.31	1.83	45.9	0.21	1.96	-1.50	2.47	-37.5
0.25	1.22	1.24	1.74	45.5	0.25	1.66	-1.47	2.37	-38.4
0.29	1.15	1.15	1.63	45.1	0.29	1.79	-1.46	2.31	-39.2
0.33	1.09	1.08	1.53	44.8	0.33	1.72	-1.45	2.25	-40.1
0.38	1.03	1.01	1.44	44.4	0.38	1.69	-1.46	2.23	-40.7
0.42	0.99	0.96	1.39	44.1	0.42	1.66	-1.47	2.22	-41.4
0.46	0.93	0.89	1.28	43.8	0.46	1.63	-1.47	2.20	-42.1
0.50	0.88	0.83	1.21	43.5	0.50	1.61	-1.49	2.20	-42.8
0.54	0.82	0.77	1.13	43.1	0.54	1.60	-1.51	2.20	-43.4
0.58	0.76	0.70	1.03	42.8	0.58	1.59	-1.54	2.22	-44.0
0.63	0.71	0.65	0.96	42.5	0.63	1.59	-1.56	2.23	-44.5
0.67	0.67	0.61	0.91	42.1	0.67	1.59	-1.59	2.25	-44.9
0.71	0.62	0.55	0.83	41.7	0.71	1.59	-1.61	2.26	-45.5
0.75	0.56	0.49	0.75	41.3	0.75	1.94	-2.00	2.78	-45.9
0.79	0.51	0.44	0.67	40.8	0.79	1.63	-1.70	2.36	-46.3
0.83	0.45	0.38	0.59	40.1	0.83	1.67	-1.77	2.44	-46.6
0.88	0.39	0.31	0.50	39.1	0.88	1.73	-1.85	2.53	-46.9
0.92	0.34	0.26	0.43	38.1	0.92	1.64	-1.96	2.70	-47.1
0.95	0.30	0.23	0.38	36.6	0.95	1.59	-2.16	2.94	-47.3

H/A = 56.69 BETA*H =1.011

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	3.25	2.06	3.85	32.4	0.0	4.94	-3.53	6.07	-35.5
0.03	3.12	2.02	3.72	32.9	0.03	4.74	-3.33	5.80	-35.1
0.06	2.91	1.85	3.45	32.5	0.06	3.89	-2.67	4.83	-36.4
0.08	2.75	1.70	3.23	31.7	0.08	3.32	-2.59	4.21	-38.0
0.11	2.68	1.60	3.12	30.9	0.11	3.00	-2.49	3.90	-39.7
0.14	2.60	1.51	3.00	30.2	0.14	2.79	-2.46	3.73	-41.4
0.17	2.49	1.42	2.87	29.6	0.17	2.59	-2.43	3.55	-43.1
0.19	2.48	1.38	2.84	29.0	0.19	2.48	-2.45	3.48	-44.7
0.22	2.37	1.28	2.69	28.5	0.22	2.33	-2.45	3.38	-46.4
0.25	2.28	1.21	2.58	27.9	0.25	2.24	-2.49	3.35	-48.0
0.28	2.24	1.16	2.52	27.4	0.28	2.15	-2.52	3.31	-49.6
0.31	2.19	1.11	2.45	26.9	0.31	2.08	-2.58	3.31	-51.1
0.33	2.12	1.05	2.37	26.4	0.33	2.02	-2.63	3.31	-52.5
0.36	2.06	1.00	2.29	25.9	0.36	1.96	-2.67	3.31	-53.8
0.39	1.99	0.95	2.21	25.6	0.39	1.89	-2.72	3.31	-55.1
0.42	1.95	0.91	2.15	25.1	0.42	1.84	-2.76	3.31	-56.3
0.44	1.88	0.87	2.07	24.7	0.44	1.79	-2.83	3.35	-57.6
0.47	1.79	0.81	1.97	24.3	0.47	1.72	-2.95	3.42	-59.7
0.50	1.73	0.77	1.90	24.0	0.50	1.74	-2.98	3.45	-59.7
0.53	1.65	0.72	1.80	23.6	0.53	1.69	-3.04	3.48	-60.9
0.56	1.60	0.68	1.74	23.2	0.56	1.67	-3.10	3.52	-61.7
0.61	1.44	0.59	1.56	22.4	0.61	1.61	-3.21	3.59	-63.4
0.67	1.30	0.52	1.40	21.8	0.67	1.57	-3.34	3.69	-64.9

TABLE B-5: Cont'd

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT) — MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A = 50.69   BETA*H =1.011   ALPHA/BETA =0.301   DELTA = 9.58

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.72	1.18	0.45	1.27	21.0	0.72	1.53	-3.47	3.79	-66.2
0.78	1.01	0.37	1.08	20.2	0.78	1.53	-3.66	3.97	-67.3
0.83	0.86	0.30	0.92	19.3	0.83	1.52	-3.81	4.11	-68.3
0.89	0.71	0.23	0.75	18.2	0.89	1.55	-4.06	4.35	-69.1
0.94	0.53	0.15	0.55	16.0	0.94	1.69	-4.56	4.86	-69.7
0.97	0.47	0.12	0.48	14.4	0.97	1.82	-4.95	5.28	-69.8

H/A = 75.59   BETA*H =1.348

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	4.58	0.53	4.61	6.7	0.0	6.21	-4.72	7.80	-37.2
0.02	4.28	0.52	4.31	7.0	0.02	6.10	-4.45	7.55	-36.1
0.04	4.06	0.42	4.08	6.0	0.04	4.81	-3.76	6.10	-38.0
0.06	3.96	0.31	3.97	4.5	0.06	4.10	-3.44	5.35	-40.0
0.08	3.95	0.23	3.95	3.4	0.08	3.57	-3.28	4.85	-42.6
0.10	3.84	0.16	3.84	2.4	0.10	3.22	-3.22	4.55	-45.0
0.13	3.73	0.09	3.73	1.4	0.13	2.89	-3.18	4.30	-47.7
0.15	3.81	0.03	3.81	0.5	0.15	2.65	-3.20	4.15	-50.4
0.17	3.56	-0.03	3.56	-0.4	0.17	2.41	-3.19	4.00	-53.0
0.19	3.47	-0.08	3.47	-1.2	0.19	2.17	-3.24	3.90	-56.2
0.21	3.42	-0.12	3.42	-1.9	0.21	2.02	-3.28	3.85	-58.4
0.23	3.32	-0.16	3.33	-2.7	0.23	1.82	-3.33	3.80	-61.3
0.25	3.26	-0.20	3.27	-3.4	0.25	1.68	-3.38	3.77	-63.6
0.27	3.20	-0.23	3.20	-4.1	0.27	1.51	-3.46	3.77	-66.4
0.29	3.11	-0.26	3.13	-4.8	0.29	1.38	-3.51	3.77	-68.6
0.31	3.07	-0.29	3.08	-5.3	0.31	1.24	-3.57	3.77	-70.8
0.33	2.98	-0.31	3.00	-5.9	0.33	1.10	-3.64	3.80	-73.2
0.35	2.92	-0.33	2.94	-6.5	0.35	0.98	-3.72	3.85	-75.3
0.38	2.85	-0.36	2.88	-7.1	0.38	0.85	-3.78	3.87	-77.3
0.40	2.77	-0.38	2.80	-7.7	0.40	0.73	-3.86	3.95	-79.3
0.42	2.65	-0.39	2.72	-8.2	0.42	0.62	-3.95	4.00	-81.1
0.46	2.56	-0.42	2.59	-9.2	0.46	0.38	-4.08	4.10	-84.7
0.50	2.42	-0.43	2.45	-10.1	0.50	0.15	-4.20	4.20	-87.9
0.54	2.24	-0.44	2.28	-11.0	0.54	-0.03	-4.30	4.30	-90.4
0.58	2.08	-0.44	2.13	-11.8	0.58	-0.23	-4.44	4.45	-93.0
0.63	1.92	-0.43	1.97	-12.6	0.63	-0.42	-4.58	4.60	-95.2
0.67	1.78	-0.42	1.83	-13.3	0.67	-0.59	-4.71	4.75	-97.1
0.71	1.64	-0.41	1.69	-14.1	0.71	-0.77	-4.84	4.90	-99.1
0.75	1.51	-0.40	1.56	-14.9	0.75	-0.95	-5.01	5.10	-100.7
0.79	1.49	-0.42	1.55	-15.6	0.79	-1.10	-5.18	5.30	-102.0
0.83	1.11	-0.33	1.16	-16.4	0.83	-1.25	-5.36	5.50	-103.1
0.88	0.96	-0.30	1.01	-17.3	0.88	-1.40	-5.53	5.70	-104.2
0.92	0.76	-0.25	0.80	-18.6	0.92	-1.60	-5.89	6.10	-105.2
0.96	0.54	-0.21	0.58	-21.0	0.96	-1.88	-6.64	6.90	-105.8
0.97	0.47	-0.20	0.51	-22.6	0.97	-2.08	-7.31	7.60	-105.9

H/A = 94.49   BETA*H =1.686

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	3.74	-0.94	3.86	-14.1	0.0	7.48	-5.93	9.55	-38.4
0.02	3.56	-0.90	3.67	-14.1	0.02	7.63	-5.75	9.55	-37.0
0.03	3.38	-0.95	3.51	-15.7	0.03	6.04	-4.77	7.70	-38.3
0.05	3.23	-1.03	3.39	-17.7	0.05	5.05	-4.24	6.59	-40.0
0.07	3.16	-1.13	3.35	-19.6	0.07	4.40	-3.94	5.91	-41.8
0.08	3.04	-1.19	3.26	-21.4	0.08	3.92	-3.77	5.43	-43.9
0.10	2.98	-1.26	3.23	-22.9	0.10	3.52	-3.64	5.06	-45.9
0.12	2.86	-1.29	3.14	-24.2	0.12	3.17	-3.53	4.75	-48.1
0.13	2.78	-1.32	3.07	-25.4	0.13	2.85	-3.46	4.48	-50.6
0.15	2.71	-1.36	3.03	-26.6	0.15	2.57	-3.41	4.27	-53.0
0.17	2.63	-1.38	2.97	-27.7	0.17	2.31	-3.37	4.09	-55.6
0.18	2.58	-1.42	2.94	-28.8	0.18	2.04	-3.33	3.90	-58.5
0.20	2.54	-1.46	2.93	-29.8	0.20	1.79	-3.29	3.75	-61.4
0.22	2.53	-1.51	2.94	-30.8	0.22	1.60	-3.33	3.69	-64.4
0.23	2.48	-1.53	2.91	-31.6	0.23	1.38	-3.34	3.61	-67.5
0.25	2.43	-1.56	2.89	-32.6	0.25	1.17	-3.33	3.53	-70.6
0.27	2.40	-1.58	2.88	-33.4	0.27	0.98	-3.34	3.48	-73.6
0.28	2.34	-1.60	2.84	-34.3	0.28	0.79	-3.36	3.46	-76.8
0.30	2.28	-1.60	2.78	-35.1	0.30	0.61	-3.37	3.43	-79.8
0.32	2.22	-1.61	2.74	-35.9	0.32	0.44	-3.37	3.40	-82.6
0.33	2.17	-1.62	2.70	-36.7	0.33	0.25	-3.37	3.38	-85.8
0.37	2.09	-1.65	2.66	-38.2	0.37	-0.08	-3.38	3.38	-91.4
0.40	2.01	-1.65	2.60	-39.4	0.40	-0.42	-3.40	3.43	-97.1
0.43	1.89	-1.62	2.49	-40.7	0.43	-0.72	-3.35	3.43	-102.1
0.47	1.81	-1.61	2.42	-41.8	0.47	-1.02	-3.38	3.53	-106.8
0.50	1.69	-1.58	2.32	-43.0	0.50	-1.32	-3.39	3.64	-111.2
0.53	1.57	-1.52	2.18	-44.0	0.53	-1.58	-3.39	3.75	-115.0
0.57	1.50	-1.51	2.13	-45.1	0.57	-1.87	-3.43	3.90	-118.6
0.60	1.41	-1.45	2.02	-45.9	0.60	-2.11	-3.41	4.01	-121.8
0.63	1.31	-1.40	1.92	-46.8	0.63	-2.35	-3.41	4.14	-124.5
0.67	1.22	-1.34	1.81	-47.6	0.67	-2.55	-3.36	4.22	-127.2
0.70	1.13	-1.27	1.70	-48.4	0.70	-2.78	-3.38	4.38	-129.4
0.73	1.02	-1.18	1.56	-49.1	0.73	-3.00	-3.40	4.54	-131.4
0.77	0.92	-1.09	1.42	-49.9	0.77	-3.23	-3.45	4.72	-133.1
0.80	0.82	-1.01	1.30	309.1	0.80	-3.41	-3.45	4.85	-134.7
0.83	0.71	-0.90	1.14	308.2	0.83	-3.62	-3.46	5.01	-136.3
0.87	0.59	-0.77	0.97	307.5	0.87	-3.84	-3.54	5.22	-137.4
0.90	0.48	-0.65	0.81	306.5	0.90	-4.15	-3.66	5.54	-138.6
0.93	0.36	-0.51	0.63	305.1	0.93	-4.49	-3.84	5.91	-139.5
0.97	0.24	-0.38	0.45	302.6	0.97	-5.11	-4.25	6.65	-140.2
0.98	0.21	-0.34	0.40	300.9	0.98	-5.60	-4.65	7.28	-140.3

TABLE B-5: Cont'd

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT)

MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A =110.24 BETA*H =1.966 ALPHA/BETA =0.301 DELTA = 9.58

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	2.78	-1.05	2.97	-20.7	0.0	9.11	-7.36	11.72	-38.9
0.01	2.58	-1.01	2.77	-21.4	0.01	9.15	-7.00	11.52	-37.4
0.03	2.36	-1.02	2.57	-23.5	0.03	7.16	-5.68	9.13	-38.4
0.04	2.12	-1.04	2.36	-26.1	0.04	5.97	-4.93	7.74	-39.5
0.06	2.04	-1.14	2.34	-29.1	0.06	5.17	-4.50	6.85	-41.0
0.07	1.98	-1.20	2.32	-31.2	0.07	4.62	-4.22	6.25	-42.4
0.09	1.90	-1.23	2.27	-32.9	0.09	4.18	-4.03	5.81	-43.9
0.10	1.89	-1.30	2.30	-34.6	0.10	3.78	-3.87	5.41	-45.0
0.11	1.85	-1.36	2.30	-36.3	0.11	3.47	-3.76	5.11	-47.3
0.13	1.79	-1.40	2.28	-38.0	0.13	3.18	-3.68	4.86	-49.2
0.14	1.75	-1.44	2.27	-39.5	0.14	2.92	-3.57	4.62	-50.7
0.16	1.70	-1.47	2.25	-40.8	0.16	2.68	-3.52	4.42	-52.7
0.17	1.66	-1.50	2.24	-42.2	0.14	2.44	-3.47	4.24	-54.8
0.19	1.63	-1.53	2.24	-43.3	0.19	2.23	-3.41	4.07	-56.8
0.20	1.59	-1.56	2.23	-44.5	0.20	2.02	-3.36	3.92	-59.0
0.21	1.53	-1.59	2.21	314.0	0.21	1.82	-3.36	3.82	-61.5
0.23	1.49	-1.60	2.19	312.8	0.23	1.61	-3.30	3.67	-63.9
0.24	1.44	-1.61	2.16	311.8	0.24	1.41	-3.28	3.57	-66.7
0.26	1.40	-1.63	2.15	310.7	0.26	1.23	-3.25	3.47	-69.3
0.27	1.36	-1.64	2.13	309.6	0.27	1.04	-3.21	3.38	-72.0
0.29	1.30	-1.63	2.09	308.7	0.29	0.85	-3.16	3.28	-74.9
0.31	1.22	-1.64	2.05	306.7	0.31	0.49	-3.09	3.13	-80.9
0.34	1.16	-1.66	2.03	305.0	0.34	0.16	-3.02	3.03	-86.9
0.37	1.09	-1.66	1.99	303.2	0.37	-0.16	-2.97	2.98	-93.0
0.40	1.03	-1.67	1.96	301.6	0.40	-0.47	-2.92	2.95	-99.2
0.43	0.97	-1.67	1.93	300.2	0.43	-0.78	-2.85	2.95	-105.3
0.46	0.91	-1.65	1.89	298.7	0.46	-1.07	-2.78	2.98	-111.1
0.49	0.85	-1.63	1.84	297.6	0.49	-1.34	-2.69	3.00	-116.5
0.51	0.79	-1.60	1.79	296.3	0.51	-1.62	-2.59	3.05	-122.0
0.54	0.74	-1.58	1.75	295.2	0.54	-1.90	-2.55	3.18	-126.6
0.57	0.68	-1.54	1.69	293.9	0.57	-2.17	-2.49	3.30	-131.1
0.60	0.63	-1.49	1.62	292.8	0.60	-2.46	-2.45	3.47	-135.1
0.63	0.57	-1.43	1.55	291.8	0.63	-2.72	-2.40	3.62	-138.5
0.66	0.52	-1.36	1.45	290.9	0.66	-2.99	-2.34	3.80	-141.9
0.69	0.47	-1.28	1.36	290.0	0.69	-3.20	-2.26	3.92	-144.7
0.71	0.42	-1.19	1.26	289.2	0.71	-3.43	-2.19	4.07	-147.5
0.74	0.37	-1.12	1.18	288.3	0.74	-3.64	-2.14	4.22	-149.5
0.77	0.33	-1.03	1.08	287.5	0.77	-3.84	-2.08	4.37	-151.6
0.80	0.29	-0.96	1.00	286.7	0.80	-4.04	-2.01	4.52	-153.5
0.83	0.25	-0.89	0.92	286.0	0.83	-4.23	-1.97	4.67	-155.0
0.86	0.22	-0.80	0.83	285.4	0.86	-4.44	-1.93	4.84	-156.5
0.89	0.18	-0.69	0.71	284.7	0.89	-4.69	-1.90	5.06	-157.9
0.91	0.14	-0.59	0.60	283.6	0.91	-4.91	-1.89	5.26	-158.9
0.94	0.11	-0.49	0.50	282.4	0.94	-5.27	-1.93	5.61	-159.8
0.97	0.07	-0.37	0.38	280.5	0.97	-5.81	-2.04	6.16	-160.6
0.98	0.05	-0.33	0.33	279.2	1.00	-6.15	-2.12	6.50	-160.9

H/A =125.98 BETA*H =2.247

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	2.33	-0.78	2.46	-18.6	0.0	9.87	-7.46	12.37	-37.1
0.01	2.22	-0.80	2.36	-19.8	0.01	9.72	-7.11	12.04	-36.2
0.02	2.08	-0.85	2.24	-22.3	0.02	7.91	-5.96	9.90	-37.0
0.04	1.94	-0.92	2.15	-25.4	0.04	6.53	-5.10	8.28	-38.0
0.05	1.88	-1.02	2.14	-28.4	0.05	5.95	-4.83	7.66	-39.1
0.06	1.75	-1.06	2.05	-31.1	0.06	5.38	-4.55	7.04	-40.2
0.07	1.68	-1.11	2.01	-33.4	0.07	4.93	-4.33	6.57	-41.3
0.09	1.62	-1.17	2.00	-35.8	0.09	4.56	-4.18	6.19	-42.5
0.10	1.56	-1.20	1.97	-37.6	0.10	4.18	-4.03	5.81	-43.9
0.11	1.52	-1.25	1.97	-39.6	0.11	3.86	-3.88	5.47	-45.1
0.13	1.46	-1.28	1.94	-41.4	0.13	3.61	-3.79	5.24	-46.4
0.14	1.36	-1.28	1.86	-43.2	0.14	3.34	-3.72	5.00	-48.1
0.15	1.30	-1.31	1.85	314.9	0.15	3.12	-3.66	4.81	-49.5
0.16	1.27	-1.34	1.85	313.4	0.16	2.89	-3.60	4.62	-51.3
0.17	1.22	-1.37	1.84	311.7	0.17	2.68	-3.53	4.43	-52.8
0.19	1.18	-1.39	1.82	310.2	0.19	2.49	-3.49	4.28	-54.5
0.20	1.14	-1.42	1.82	308.8	0.20	2.29	-3.45	4.14	-56.5
0.21	1.11	-1.45	1.82	307.4	0.21	2.10	-3.37	3.97	-58.1
0.22	1.07	-1.48	1.82	305.9	0.22	1.92	-3.34	3.85	-60.1
0.24	1.02	-1.50	1.81	304.4	0.24	1.74	-3.26	3.71	-62.1
0.25	0.99	-1.51	1.80	303.4	0.25	1.56	-3.24	3.59	-64.3
0.27	0.92	-1.53	1.79	301.0	0.27	1.21	-3.13	3.36	-68.9
0.30	0.86	-1.56	1.78	298.9	0.30	0.91	-3.06	3.21	-73.6
0.32	0.78	-1.56	1.74	296.7	0.32	0.57	-2.94	3.00	-79.0
0.35	0.72	-1.59	1.74	294.4	0.35	0.28	-2.84	2.86	-84.3
0.38	0.67	-1.60	1.73	292.6	0.38	-0.00	-2.71	2.71	-90.1
0.40	0.61	-1.60	1.71	291.0	0.40	-0.28	-2.60	2.62	-96.1
0.42	0.55	-1.58	1.67	289.2	0.42	-0.54	-2.51	2.57	-102.1
0.45	0.50	-1.57	1.65	287.7	0.45	-0.80	-2.39	2.52	-108.4
0.47	0.45	-1.56	1.62	286.0	0.47	-1.05	-2.30	2.52	-114.5
0.50	0.41	-1.54	1.60	284.7	0.50	-1.31	-2.21	2.57	-120.6
0.52	0.35	-1.50	1.55	283.2	0.52	-1.54	-2.09	2.59	-126.5
0.55	0.31	-1.45	1.48	281.9	0.55	-1.76	-1.97	2.64	-131.9
0.57	0.27	-1.42	1.45	280.8	0.57	-1.99	-1.85	2.71	-137.1
0.60	0.24	-1.40	1.42	279.7	0.60	-2.20	-1.75	2.81	-141.5
0.63	0.20	-1.33	1.35	278.6	0.63	-2.40	-1.64	2.90	-145.7
0.65	0.17	-1.27	1.29	277.6	0.65	-2.58	-1.53	3.00	-149.4
0.67	0.14	-1.21	1.22	276.7	0.67	-2.75	-1.41	3.09	-152.8
0.70	0.11	-1.13	1.14	275.4	0.70	-2.93	-1.31	3.21	-155.9
0.72	0.09	-1.08	1.09	274.7	0.72	-3.08	-1.21	3.31	-158.5
0.75	0.07	-0.99	0.99	273.9	0.75	-3.24	-1.10	3.43	-161.2
0.77	0.05	-0.92	0.92	273.0	0.77	-3.39	-1.02	3.55	-163.2
0.80	0.03	-0.86	0.86	272.2	0.80	-3.56	-0.95	3.69	-165.1

TABLE B-5: Cont'd

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT) — MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A =125.98 BETA*H =2.247 ALPHA/BETA =0.301 DELTA = 9.58

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.82	0.02	-0.79	0.79	271.4	0.82	-3.71	-0.85	3.81	-167.1
0.85	0.01	-0.72	0.72	270.8	0.85	-3.87	-0.78	3.95	-168.6
0.88	0.00	-0.63	0.63	270.0	0.88	-3.96	-0.70	4.05	-170.0
0.90	-0.01	-0.54	0.54	269.1	0.90	-4.14	-0.63	4.19	-171.3
0.92	-0.01	-0.45	0.45	268.2	0.92	-4.34	-0.59	4.38	-172.3
0.95	-0.02	-0.36	0.36	266.9	0.95	-4.68	-0.57	4.71	-173.1
0.97	-0.03	-0.27	0.27	264.4	0.97	-5.35	-0.56	5.38	-174.0
0.98	-0.03	-0.20	0.20	261.9	0.98	-5.82	-0.60	5.85	-174.1

H/A =157.48 BETA*H =2.809

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	2.09	-0.16	2.10	-4.2	0.0	12.63	-9.45	15.77	-36.8
0.01	2.01	-0.19	2.02	-5.3	0.01	13.36	-9.18	16.21	-34.5
0.02	1.86	-0.28	1.88	-8.5	0.02	10.39	-7.35	12.73	-35.3
0.03	1.78	-0.37	1.82	-11.8	0.03	8.76	-6.36	10.82	-36.0
0.04	1.71	-0.48	1.78	-15.5	0.04	7.73	-5.83	9.68	-37.0
0.05	1.63	-0.53	1.71	-18.1	0.05	7.04	-5.48	8.92	-37.9
0.06	1.55	-0.59	1.66	-20.7	0.06	6.47	-5.24	8.32	-39.0
0.07	1.49	-0.65	1.63	-23.4	0.07	6.00	-5.03	7.83	-40.0
0.08	1.42	-0.69	1.57	-25.8	0.08	5.62	-4.89	7.45	-41.0
0.09	1.37	-0.73	1.55	-28.2	0.09	5.29	-4.77	7.12	-42.0
0.10	1.31	-0.77	1.52	-30.4	0.10	5.01	-4.67	6.85	-43.0
0.11	1.25	-0.81	1.49	327.1	0.11	4.75	-4.63	6.63	-44.3
0.12	1.20	-0.85	1.47	324.8	0.12	4.46	-4.54	6.36	-45.5
0.13	1.16	-0.88	1.46	322.7	0.13	4.30	-4.54	6.25	-46.5
0.14	1.11	-0.91	1.44	320.6	0.14	4.09	-4.51	6.09	-47.8
0.15	1.06	-0.94	1.42	318.4	0.15	3.65	-4.43	5.87	-49.0
0.16	1.02	-0.97	1.41	316.3	0.16	3.70	-4.42	5.76	-50.1
0.17	0.96	-0.98	1.37	314.3	0.17	3.49	-4.36	5.60	-51.4
0.18	0.91	-1.01	1.36	312.3	0.18	3.30	-4.33	5.44	-52.7
0.19	0.87	-1.02	1.34	310.5	0.19	3.09	-4.27	5.28	-54.1
0.20	0.83	-1.05	1.34	308.5	0.20	2.94	-4.25	5.17	-55.3
0.22	0.76	-1.10	1.34	304.8	0.22	2.60	-4.15	4.89	-57.9
0.24	0.69	-1.13	1.33	301.4	0.24	2.28	-4.02	4.62	-60.5
0.26	0.62	-1.17	1.33	298.0	0.26	1.95	-3.89	4.35	-63.4
0.28	0.56	-1.21	1.33	294.8	0.28	1.68	-3.83	4.19	-66.3
0.30	0.49	-1.24	1.33	291.6	0.30	1.40	-3.72	3.97	-69.4
0.32	0.42	-1.28	1.34	288.4	0.32	1.13	-3.58	3.75	-72.5
0.34	0.38	-1.35	1.41	285.8	0.34	0.86	-3.46	3.56	-76.1
0.36	0.34	-1.41	1.45	283.5	0.36	0.60	-3.35	3.40	-79.8
0.38	0.26	-1.39	1.41	280.8	0.38	0.35	-3.19	3.21	-83.8
0.40	0.20	-1.34	1.36	278.5	0.40	0.11	-3.02	3.02	-88.0
0.42	0.14	-1.34	1.34	276.2	0.42	-0.13	-2.88	2.88	-92.5
0.44	0.09	-1.33	1.33	274.0	0.44	-0.35	-2.72	2.75	-97.4
0.46	0.05	-1.31	1.31	272.1	0.46	-0.58	-2.55	2.61	-102.8
0.48	0.01	-1.31	1.31	270.3	0.48	-0.79	-2.37	2.50	-108.4
0.50	-0.04	-1.27	1.28	268.3	0.50	-1.00	-2.20	2.42	-114.4
0.52	-0.08	-1.26	1.26	266.6	0.52	-1.18	-2.02	2.34	-120.2
0.54	-0.11	-1.23	1.24	265.0	0.54	-1.39	-1.85	2.31	-126.9
0.56	-0.14	-1.20	1.21	263.5	0.56	-1.56	-1.67	2.28	-133.0
0.58	-0.14	-1.00	1.01	262.0	0.58	-1.73	-1.49	2.28	-139.3
0.60	-0.18	-1.11	1.12	260.7	0.60	-1.90	-1.32	2.31	-145.2
0.62	-0.20	-1.08	1.10	259.5	0.62	-2.06	-1.15	2.37	-150.8
0.64	-0.22	-1.05	1.07	258.2	0.64	-2.21	-0.98	2.42	-156.2
0.66	-0.23	-1.01	1.04	257.0	0.66	-2.34	-0.81	2.47	-160.8
0.68	-0.24	-0.96	0.99	255.9	0.68	-2.48	-0.62	2.56	-166.0
0.70	-0.25	-0.91	0.95	254.9	0.70	-2.62	-0.46	2.66	-170.0
0.72	-0.25	-0.88	0.92	254.0	0.72	-2.76	-0.30	2.77	-173.7
0.74	-0.26	-0.83	0.87	253.0	0.74	-2.88	-0.15	2.88	-177.0
0.76	-0.25	-0.78	0.82	252.1	0.76	-2.96	-0.00	2.96	-180.0
0.78	-0.25	-0.74	0.78	251.3	0.78	-3.10	0.15	3.10	-182.7
0.80	-0.25	-0.69	0.73	250.5	0.80	-3.19	0.30	3.21	-185.3
0.82	-0.24	-0.64	0.69	249.8	0.82	-3.29	0.43	3.32	-187.5
0.84	-0.22	-0.58	0.63	249.0	0.84	-3.38	0.55	3.43	-189.3
0.86	-0.20	-0.53	0.57	248.8	0.86	-3.50	0.69	3.56	-191.1
0.88	-0.19	-0.47	0.51	248.2	0.88	-3.61	0.81	3.70	-192.6
0.90	-0.17	-0.41	0.44	247.5	0.90	-3.74	0.95	3.86	-194.3
0.92	-0.16	-0.37	0.40	247.0	0.92	-3.85	1.07	4.00	-195.5
0.94	-0.13	-0.30	0.33	245.8	0.94	-4.02	1.18	4.19	-196.4
0.96	-0.12	-0.25	0.27	244.5	0.96	-4.28	1.34	4.49	-197.4
0.98	-0.10	-0.18	0.20	242.0	0.98	-4.81	1.57	5.06	-198.1
0.99	-0.09	-0.16	0.18	240.0	0.99	-5.27	1.73	5.55	-198.2

H/A =192.13 BETA*H =3.427

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	2.30	0.21	2.31	5.3	0.0	14.73	-11.21	18.52	-37.3
0.01	2.21	0.18	2.21	4.6	0.01	15.63	-10.73	18.96	-34.5
0.02	2.10	0.09	2.10	2.3	0.02	12.66	-8.89	15.47	-35.1
0.02	1.96	-0.01	1.96	-0.4	0.02	10.94	-7.97	13.53	-36.1
0.03	1.94	-0.11	1.95	-3.4	0.03	9.78	-7.41	12.27	-37.2
0.04	1.86	-0.18	1.87	-5.7	0.04	8.94	-7.03	11.38	-38.2
0.05	1.79	-0.25	1.81	-7.9	0.05	8.23	-6.73	10.63	-39.3
0.06	1.73	-0.30	1.75	-10.0	0.06	7.69	-6.56	10.11	-40.5
0.07	1.68	-0.36	1.72	-12.0	0.07	7.23	-6.42	9.67	-41.6
0.07	1.63	-0.42	1.68	-14.4	0.07	6.82	-6.31	9.30	-42.8
0.08	1.57	-0.46	1.63	-16.3	0.08	6.54	-6.29	9.07	-43.9
0.09	1.50	-0.50	1.58	-18.5	0.09	6.20	-6.21	8.78	-45.1
0.10	1.44	-0.54	1.54	-20.4	0.10	5.90	-6.19	8.55	-46.4
0.11	1.38	-0.57	1.49	-22.5	0.11	5.62	-6.15	8.33	-47.6
0.11	1.30	-0.60	1.43	335.3	0.11	5.40	-6.14	8.18	-48.7

TABLE B-5: Cont'd

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT) — MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A =192.13 BETA*H =3.427 ALPHA/BETA =0.301 DELTA = 9.58

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.12	1.23	-0.62	1.38	333.1	0.12	5.12	-6.05	7.96	-50.0
0.13	1.18	-0.65	1.35	331.1	0.13	4.90	-6.08	7.81	-51.2
0.14	1.13	-0.68	1.32	328.9	0.14	4.68	-6.07	7.66	-52.4
0.15	1.09	-0.71	1.30	326.9	0.15	4.50	-6.10	7.59	-53.6
0.16	1.06	-0.75	1.29	324.6	0.16	4.29	-6.07	7.44	-54.8
0.16	1.03	-0.78	1.29	322.7	0.16	4.09	-6.03	7.29	-55.9
0.18	0.97	-0.86	1.29	318.6	0.18	3.65	-5.96	6.99	-58.5
0.20	0.90	-0.92	1.29	314.3	0.20	3.31	-5.90	6.77	-60.7
0.21	0.83	-0.99	1.29	310.1	0.21	2.94	-5.76	6.47	-63.0
0.23	0.73	-1.02	1.26	305.6	0.23	2.59	-5.68	6.25	-65.5
0.25	0.65	-1.06	1.24	301.8	0.25	2.27	-5.62	6.06	-68.0
0.26	0.56	-1.07	1.21	297.6	0.26	1.99	-5.53	5.87	-70.2
0.28	0.49	-1.11	1.22	293.8	0.28	1.48	-5.40	5.65	-72.7
0.30	0.43	-1.18	1.26	290.1	0.30	1.41	-5.24	5.43	-75.0
0.31	0.34	-1.19	1.24	286.0	0.31	1.15	-5.08	5.21	-77.3
0.33	0.27	-1.21	1.24	282.3	0.33	0.90	-4.98	5.06	-79.8
0.34	0.19	-1.22	1.23	278.9	0.34	0.67	-4.86	4.91	-82.2
0.36	0.12	-1.21	1.22	275.5	0.36	0.42	-4.67	4.68	-84.9
0.38	0.05	-1.22	1.22	272.3	0.38	0.18	-4.46	4.46	-87.7
0.39	-0.02	-1.22	1.22	269.1	0.39	-0.04	-4.31	4.31	-90.6
0.41	-0.09	-1.20	1.21	265.9	0.41	-0.26	-4.08	4.09	-93.6
0.43	-0.14	-1.20	1.21	263.3	0.43	-0.46	-3.84	3.87	-96.9
0.44	-0.20	-1.20	1.22	260.5	0.44	-0.64	-3.66	3.72	-100.0
0.46	-0.26	-1.20	1.22	257.9	0.46	-0.82	-3.44	3.53	-103.5
0.48	-0.30	-1.21	1.24	256.1	0.48	-0.99	-3.20	3.35	-107.3
0.49	-0.35	-1.19	1.24	253.5	0.49	-1.14	-2.95	3.16	-111.2
0.51	-0.38	-1.15	1.22	251.6	0.51	-1.27	-2.69	2.97	-115.2
0.52	-0.43	-1.15	1.23	249.4	0.52	-1.43	-2.48	2.86	-120.0
0.54	-0.48	-1.15	1.24	247.3	0.54	-1.55	-2.23	2.71	-124.8
0.56	-0.53	-1.15	1.27	245.1	0.56	-1.67	-1.95	2.57	-130.6
0.57	-0.56	-1.13	1.26	243.4	0.57	-1.77	-1.70	2.45	-136.3
0.59	-0.59	-1.10	1.25	241.9	0.59	-1.86	-1.45	2.38	-142.4
0.61	-0.62	-1.09	1.25	240.2	0.61	-1.97	-1.20	2.31	-148.8
0.62	-0.63	-1.04	1.22	238.7	0.62	-2.05	-0.98	2.31	-154.8
0.64	-0.64	-0.98	1.17	237.1	0.64	-2.19	-0.73	2.31	-161.6
0.66	-0.65	-0.95	1.15	235.7	0.66	-2.25	-0.48	2.31	-167.9
0.67	-0.65	-0.91	1.12	234.5	0.67	-2.29	-0.25	2.31	-173.7
0.69	-0.67	-0.89	1.11	233.1	0.69	-2.34	-0.01	2.34	-179.8
0.70	-0.67	-0.85	1.09	231.9	0.70	-2.41	0.22	2.42	-185.2
0.72	-0.67	-0.82	1.06	230.8	0.72	-2.45	0.44	2.49	-190.2
0.74	-0.65	-0.77	1.01	229.8	0.74	-2.51	0.66	2.60	-195.2
0.75	-0.64	-0.73	0.97	228.8	0.75	-2.54	0.84	2.68	-198.2
0.77	-0.61	-0.68	0.91	227.9	0.77	-2.57	1.07	2.79	-202.6
0.79	-0.58	-0.62	0.84	226.9	0.79	-2.61	1.26	2.90	-205.7
0.80	-0.56	-0.57	0.80	225.9	0.80	-2.63	1.46	3.01	-209.0
0.82	-0.53	-0.54	0.76	225.1	0.82	-2.66	1.64	3.12	-211.6
0.84	-0.51	-0.50	0.71	224.3	0.84	-2.71	1.83	3.27	-214.0
0.85	-0.48	-0.46	0.66	223.6	0.85	-2.73	1.99	3.38	-216.1
0.87	-0.45	-0.41	0.61	222.9	0.87	-2.75	2.16	3.50	-218.2
0.89	-0.42	-0.38	0.56	222.4	0.89	-2.79	2.34	3.64	-220.0
0.90	-0.38	-0.33	0.50	221.6	0.90	-2.84	2.51	3.79	-221.5
0.92	-0.34	-0.30	0.45	220.9	0.92	-2.87	2.65	3.90	-222.8
0.93	-0.30	-0.25	0.39	220.1	0.93	-2.92	2.81	4.05	-223.9
0.95	-0.25	-0.20	0.32	219.1	0.95	-3.04	3.01	4.28	-224.8
0.97	-0.20	-0.15	0.25	217.6	0.97	-3.20	3.27	4.57	-225.7
0.98	-0.15	-0.11	0.18	215.5	0.98	-3.55	3.75	5.17	-226.6

TABLE B-6: CURRENT AND CHARGE DISTRIBUTIONS, α/β=.592

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT) — MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A = 18.90 BETA*H =0.441 ALPHA/BETA =0.592 DELTA =12.54

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	2.15	0.65	2.25	16.7	0.0	1.40	-2.94	3.34	-61.5
0.08	1.89	0.58	1.98	17.2	0.08	1.36	-2.63	2.97	-62.2
0.17	1.63	0.50	1.70	17.1	0.17	1.15	-2.28	2.55	-63.2
0.25	1.44	0.42	1.50	16.4	0.25	0.98	-2.05	2.27	-64.4
0.33	1.31	0.37	1.36	16.0	0.33	0.88	-1.93	2.12	-65.5
0.42	1.17	0.32	1.22	15.5	0.42	0.81	-1.85	2.01	-66.4
0.50	1.03	0.28	1.07	15.1	0.50	0.75	-1.80	1.95	-67.4
0.58	0.92	0.24	0.95	14.8	0.58	0.71	-1.77	1.90	-68.2
0.67	0.78	0.20	0.80	14.5	0.67	0.69	-1.79	1.91	-69.0
0.75	0.66	0.17	0.68	14.3	0.75	0.68	-1.83	1.95	-69.7
0.83	0.54	0.14	0.56	14.0	0.83	0.69	-1.92	2.04	-70.3
0.90	0.38	0.07	0.38	10.7	0.90	0.75	-2.12	2.25	-70.4

H/A = 28.35 BETA*H =0.662

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	2.95	0.54	3.00	10.3	0.0	2.30	-4.44	5.00	-62.6
0.06	2.60	0.48	2.65	10.5	0.06	1.57	-3.94	4.40	-63.4
0.11	2.38	0.42	2.42	10.0	0.11	1.61	-3.40	3.76	-64.7
0.17	2.19	0.35	2.22	9.0	0.17	1.36	-3.05	3.38	-66.3
0.22	2.04	0.29	2.06	8.1	0.22	1.17	-2.88	3.10	-67.9
0.28	1.87	0.24	1.89	7.3	0.28	1.03	-2.74	2.92	-69.4
0.33	1.75	0.20	1.76	6.7	0.33	0.92	-2.66	2.81	-71.0
0.39	1.71	0.16	1.72	6.0	0.39	0.84	-2.65	2.81	-72.7
0.44	1.49	0.14	1.50	5.5	0.44	0.73	-2.57	2.67	-74.2
0.50	1.37	0.12	1.37	5.0	0.50	0.66	-2.55	2.63	-75.4
0.56	1.25	0.10	1.26	4.5	0.56	0.61	-2.56	2.63	-76.6
0.61	1.13	0.08	1.13	4.1	0.61	0.55	-2.55	2.61	-77.8
0.67	1.02	0.07	1.02	3.7	0.67	0.50	-2.58	2.63	-79.0
0.72	0.91	0.05	0.91	3.2	0.72	0.46	-2.61	2.65	-79.9
0.78	0.79	0.04	0.79	2.9	0.78	0.44	-2.67	2.70	-80.6
0.83	0.66	0.03	0.66	2.7	0.83	0.41	-2.76	2.79	-81.5
0.89	0.54	0.02	0.54	2.5	0.89	0.42	-2.97	3.00	-82.0
0.93	0.43	0.00	0.43	0.4	0.93	0.43	-3.20	3.23	-82.3

H/A = 37.80 BETA*H =0.883

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	3.58	0.10	3.58	1.6	0.0	3.00	-5.97	6.68	-63.3
0.04	3.32	0.09	3.32	1.5	0.04	2.80	-5.19	5.75	-64.3
0.08	3.08	0.03	3.08	0.5	0.08	1.96	-4.50	4.91	-66.5
0.13	2.86	-0.05	2.86	-1.0	0.13	1.61	-4.07	4.38	-68.4
0.17	2.77	-0.10	2.77	-2.1	0.17	1.35	-3.78	4.01	-70.3
0.21	2.62	-0.15	2.62	-3.3	0.21	1.16	-3.58	3.76	-72.1
0.25	2.47	-0.19	2.48	-4.3	0.25	0.96	-3.46	3.59	-74.5
0.29	2.31	-0.21	2.32	-5.2	0.29	0.80	-3.42	3.51	-76.9
0.33	2.16	-0.23	2.17	-6.0	0.33	0.66	-3.30	3.37	-78.7
0.38	2.01	-0.25	2.03	-7.0	0.38	0.53	-3.27	3.31	-80.8
0.42	1.88	-0.25	1.90	-7.7	0.42	0.41	-3.23	3.26	-82.7
0.46	1.68	-0.25	1.70	-8.5	0.46	0.30	-3.21	3.23	-84.6
0.50	1.58	-0.25	1.60	-9.1	0.50	0.20	-3.19	3.20	-86.4
0.54	1.44	-0.25	1.46	-9.7	0.54	0.11	-3.20	3.20	-88.0
0.58	1.33	-0.24	1.35	-10.1	0.58	0.02	-3.17	3.17	-89.6
0.63	1.23	-0.23	1.26	-10.7	0.63	-0.06	-3.17	3.17	-91.0
0.67	1.13	-0.23	1.15	-11.3	0.67	-0.12	-3.17	3.17	-92.1
0.71	1.04	-0.22	1.07	-11.7	0.71	-0.19	-3.25	3.26	-93.4
0.75	0.94	-0.20	0.96	-12.1	0.75	-0.25	-3.27	3.28	-94.3
0.79	0.83	-0.18	0.85	-12.4	0.79	-0.31	-3.33	3.34	-95.4
0.83	0.73	-0.16	0.75	-12.7	0.83	-0.37	-3.43	3.45	-96.1
0.88	0.62	-0.14	0.64	-13.0	0.88	-0.43	-3.57	3.59	-96.8
0.92	0.54	-0.13	0.56	-13.2	0.92	1.45	-3.41	3.79	-64.2
0.95	0.48	-0.11	0.49	-13.4	0.95	-0.54	-4.06	4.10	-97.6

H/A = 56.69 BETA*H =1.324

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	3.68	-0.98	3.81	-14.9	0.0	3.50	-9.23	10.02	-67.1
0.03	3.46	-0.94	3.59	-15.1	0.03	3.36	-8.04	8.71	-67.3
0.06	3.14	-0.96	3.28	-17.0	0.06	2.64	-6.87	7.36	-69.0
0.08	2.92	-1.03	3.10	-19.3	0.08	2.05	-5.98	6.32	-71.1
0.11	2.79	-1.08	2.99	-21.1	0.11	1.89	-5.32	5.55	-73.4
0.14	2.64	-1.12	2.86	-22.9	0.14	1.24	-4.99	5.14	-76.0
0.17	2.46	-1.13	2.70	-24.6	0.17	0.97	-4.73	4.83	-78.4
0.19	2.43	-1.18	2.70	-25.9	0.19	0.71	-4.50	4.56	-81.1
0.22	2.27	-1.18	2.56	-27.5	0.22	0.47	-4.31	4.33	-83.8
0.25	2.16	-1.19	2.47	-28.8	0.25	0.25	-4.14	4.15	-86.5
0.28	2.04	-1.19	2.36	-30.2	0.28	0.66	-4.02	4.02	-89.1
0.33	1.76	-1.13	2.09	-32.6	0.31	-0.14	-3.92	3.93	-92.0
0.39	1.59	-1.10	1.93	-34.7	0.33	-0.32	-3.78	3.79	-94.9
0.44	1.44	-1.07	1.79	-36.7	0.36	-0.49	-3.71	3.75	-97.5
0.50	1.27	-1.01	1.62	-38.6	0.39	-0.46	-3.62	3.68	-100.3
0.56	1.14	-0.96	1.49	-40.1	0.42	-0.81	-3.52	3.61	-103.0
0.61	1.00	-0.89	1.34	-41.7	0.44	-0.93	-3.39	3.52	-105.4
0.67	0.89	-0.83	1.22	-42.9	0.47	-1.66	-3.36	3.52	-107.5
0.72	0.76	-0.73	1.06	-44.0	0.50	-1.20	-3.31	3.52	-109.9
0.78	0.63	-0.63	0.90	-45.0	0.53	-1.33	-3.23	3.50	-112.4
0.83	0.52	-0.54	0.75	-45.8	0.56	-1.44	-3.16	3.47	-114.4
0.89	0.41	-0.43	0.60	-46.5	0.61	-1.67	-3.10	3.52	-118.4
0.94	0.29	-0.31	0.43	-46.9	0.67	-1.89	-3.02	3.57	-122.0
0.97	0.25	-0.27	0.37	-47.2	0.72	-2.11	-2.95	3.66	-125.2
					0.78	-2.31	-2.95	3.75	-128.1
					0.83	-2.80	-2.91	3.84	-130.7
					0.89	-2.71	-2.96	4.02	-132.5
					0.94	-3.20	-3.31	4.60	-134.0
					0.97	-3.52	-3.63	5.05	-134.1

TABLE B-6: Cont'd

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT) MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A = 75.59 BETA*H =1.765 ALPHA/BETA =0.592 DELTA =12.54

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	3.19	-1.31	3.45	-22.4	0.0	4.59	-11.41	12.40	-66.4
0.02	2.94	-1.26	3.20	-23.2	0.04	3.31	-8.49	9.11	-68.7
0.04	2.70	-1.29	2.99	-25.5	0.08	2.19	-6.79	7.14	-72.1
0.06	2.50	-1.36	2.85	-28.6	0.13	1.43	-5.85	6.03	-76.3
0.08	2.37	-1.42	2.76	-30.9	0.17	0.84	-5.20	5.27	-80.8
0.10	2.24	-1.45	2.67	-33.0	0.21	0.35	-4.72	4.73	-85.7
0.13	2.07	-1.47	2.54	-35.4	0.25	-0.08	-4.35	4.35	-91.0
0.15	1.97	-1.50	2.48	-37.3	0.29	-0.43	-3.98	4.00	-96.2
0.17	1.85	-1.51	2.39	-39.2	0.33	-0.77	-3.67	3.75	-101.9
0.19	1.74	-1.51	2.30	-41.0	0.38	-1.08	-3.43	3.60	-107.4
0.21	1.65	-1.52	2.25	-42.8	0.42	-1.35	-3.14	3.42	-113.2
0.25	1.44	-1.50	2.08	-46.3	0.46	-1.59	-2.91	3.32	-118.6
0.29	1.25	-1.46	1.92	-49.5	0.50	-1.79	-2.64	3.19	-124.2
0.33	1.07	-1.40	1.76	-52.6	0.54	-2.02	-2.43	3.16	-129.7
0.38	0.95	-1.37	1.66	-55.4	0.58	-2.20	-2.20	3.11	-135.0
0.42	0.83	-1.33	1.57	-58.0	0.63	-2.44	-2.05	3.19	-139.9
0.46	0.72	-1.28	1.47	-60.5	0.67	-2.59	-1.86	3.19	-144.4
0.50	0.66	-1.27	1.43	-62.6	0.71	-2.73	-1.69	3.22	-148.2
0.54	0.54	-1.15	1.27	-64.8	0.75	-2.90	-1.55	3.29	-151.9
0.58	0.46	-1.08	1.17	-66.7	0.79	-2.98	-1.40	3.29	-154.9
0.63	0.40	-1.02	1.10	291.2	0.83	-3.20	-1.33	3.47	-157.4
0.67	0.34	-0.95	1.01	289.5	0.88	-3.38	-1.24	3.60	-159.9
0.71	0.28	-0.86	0.91	288.1	0.92	-3.63	-1.20	3.82	-161.7
0.75	0.25	-0.82	0.85	286.9	0.96	-4.07	-1.24	4.25	-163.0
0.79	0.21	-0.75	0.78	285.8	0.97	-4.62	-1.42	4.84	-162.9
0.83	0.17	-0.65	0.67	284.8					
0.88	0.13	-0.53	0.55	283.9					
0.92	0.10	-0.40	0.42	283.3					
0.96	0.06	-0.28	0.28	282.6					
0.97	0.05	-0.24	0.24	282.4					

H/A = 94.49 BETA*H =2.207

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	2.93	-1.22	3.17	-22.5	0.0	6.25	-14.03	15.36	-66.0
0.03	2.44	-1.21	2.72	-26.3	0.03	4.45	-10.49	11.40	-67.0
0.07	2.12	-1.33	2.51	-32.1	0.07	2.95	-8.19	8.70	-70.2
0.10	1.82	-1.39	2.29	-37.4	0.10	2.10	-7.14	7.44	-73.6
0.13	1.55	-1.40	2.09	-42.0	0.13	1.39	-6.33	6.48	-77.6
0.17	1.32	-1.38	1.91	-46.3	0.17	0.87	-5.82	5.88	-81.5
0.20	1.11	-1.35	1.75	-50.5	0.20	0.45	-5.32	5.34	-85.2
0.23	0.97	-1.35	1.66	-54.4	0.23	0.04	-4.92	4.92	-89.5
0.27	0.83	-1.34	1.58	-58.1	0.27	-0.32	-4.55	4.56	-94.0
0.30	0.70	-1.32	1.50	-62.0	0.30	-0.66	-4.15	4.20	-99.0
0.33	0.59	-1.29	1.42	-65.5	0.33	-0.92	-3.79	3.90	-103.7
0.37	0.49	-1.27	1.36	291.0	0.37	-1.16	-3.46	3.66	-108.8
0.40	0.40	-1.23	1.29	287.8	0.40	-1.40	-3.12	3.42	-114.2
0.43	0.32	-1.18	1.22	284.9	0.43	-1.61	-2.81	3.24	-119.7
0.47	0.24	-1.13	1.15	282.0	0.47	-1.74	-2.52	3.06	-124.7
0.50	0.17	-1.08	1.09	279.1	0.50	-1.93	-2.22	2.94	-131.0
0.53	0.12	-1.04	1.05	276.7	0.53	-2.06	-1.92	2.82	-137.0
0.57	0.07	-1.02	1.02	273.9	0.57	-2.19	-1.68	2.76	-142.5
0.60	0.03	-0.95	0.95	271.8	0.60	-2.29	-1.43	2.70	-148.0
0.63	-0.00	-0.88	0.88	269.8	0.63	-2.37	-1.17	2.64	-153.8
0.67	-0.03	-0.80	0.81	267.8	0.67	-2.46	-0.96	2.64	-158.6
0.70	-0.05	-0.74	0.74	266.0	0.70	-2.56	-0.75	2.67	-163.6
0.73	-0.07	-0.67	0.67	264.4	0.73	-2.64	-0.56	2.70	-168.0
0.77	-0.08	-0.61	0.61	262.9	0.77	-2.70	-0.38	2.73	-172.1
0.80	-0.08	-0.54	0.55	261.7	0.80	-2.78	-0.22	2.79	-175.5
0.83	-0.08	-0.46	0.47	260.2	0.83	-2.85	-0.06	2.85	-178.8
0.87	-0.07	-0.39	0.40	259.1	0.87	-2.91	0.07	2.91	-181.4
0.90	-0.07	-0.32	0.33	258.1	0.90	-3.05	0.19	3.06	-183.6
0.93	-0.05	-0.24	0.24	257.0	0.93	-3.22	0.32	3.24	-185.6
0.97	-0.04	-0.18	0.18	256.2	0.97	-3.63	0.45	3.66	-187.0
0.98	-0.04	-0.15	0.16	255.7	0.98	-3.93	0.52	3.96	-187.5

H/A =110.24 BETA*H =2.574

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	2.87	-1.09	3.07	-20.8	0.0	6.54	-16.48	17.88	-67.2
0.03	2.29	-1.04	2.52	-24.5	0.03	4.66	-12.18	13.04	-69.1
0.06	1.82	-1.08	2.11	-30.6	0.06	3.14	-9.63	10.13	-72.0
0.09	1.55	-1.12	1.92	-35.9	0.09	2.17	-8.19	8.48	-75.2
0.11	1.36	-1.17	1.80	-40.6	0.11	1.43	-7.34	7.48	-79.0
0.14	1.18	-1.18	1.67	-45.2	0.14	0.87	-6.70	6.75	-82.6
0.17	1.02	-1.22	1.59	-49.9	0.17	0.41	-6.14	6.16	-86.2
0.20	0.88	-1.22	1.50	-54.1	0.20	0.01	-5.69	5.69	-89.9
0.23	0.75	-1.23	1.44	-58.5	0.23	-0.34	-5.22	5.23	-93.8
0.26	0.63	-1.23	1.38	-62.7	0.26	-0.66	-4.79	4.83	-97.9
0.29	0.52	-1.21	1.31	-66.6	0.29	-0.92	-4.41	4.50	-101.8
0.31	0.41	-1.17	1.24	289.3	0.31	-1.14	-4.05	4.20	-105.7
0.34	0.32	-1.16	1.20	285.4	0.34	-1.35	-3.70	3.94	-110.0
0.37	0.24	-1.14	1.16	281.7	0.37	-1.52	-3.38	3.71	-114.2
0.40	0.16	-1.11	1.13	278.0	0.40	-1.67	-3.05	3.48	-118.8
0.43	0.08	-1.06	1.07	274.4	0.43	-1.82	-2.76	3.31	-123.4
0.46	0.02	-1.03	1.03	271.3	0.46	-1.93	-2.44	3.11	-128.4
0.49	-0.03	-0.99	0.99	268.0	0.49	-2.05	-2.17	2.98	-133.4
0.51	-0.08	-0.93	0.94	265.1	0.51	-2.15	-1.87	2.85	-139.0
0.54	-0.12	-0.89	0.90	262.3	0.54	-2.21	-1.58	2.71	-144.4
0.57	-0.16	-0.84	0.86	259.6	0.57	-2.27	-1.30	2.62	-150.2

TABLE B-6: Cont'd

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT) | MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A =110.24 BETA*H =2.574 ALPHA/BETA =0.592 DELTA =12.54

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.60	-0.18	-0.79	0.81	257.1	0.60	-2.29	-1.03	2.52	-155.8
0.63	-0.20	-0.74	0.77	254.6	0.63	-2.33	-0.77	2.45	-161.8
0.66	-0.22	-0.69	0.72	252.3	0.66	-2.33	-0.52	2.38	-167.5
0.69	-0.23	-0.63	0.67	250.1	0.69	-2.37	-0.25	2.38	-173.0
0.71	-0.24	-0.58	0.62	247.8	0.71	-2.38	-0.07	2.38	-178.4
0.74	-0.24	-0.53	0.58	245.9	0.74	-2.35	0.11	2.35	-182.8
0.77	-0.23	-0.48	0.53	244.3	0.77	-2.36	0.31	2.38	-187.5
0.80	-0.23	-0.44	0.49	242.3	0.80	-2.27	0.50	2.42	-191.9
0.83	-0.22	-0.39	0.44	240.9	0.83	-2.36	0.65	2.45	-195.4
0.86	-0.20	-0.33	0.38	239.4	0.86	-2.35	0.80	2.48	-198.8
0.89	-0.17	-0.28	0.33	238.2	0.89	-2.40	0.94	2.58	-201.4
0.91	-0.15	-0.23	0.27	237.0	0.91	-2.48	1.09	2.71	-203.8
0.94	-0.12	-0.18	0.22	235.8	0.94	-2.57	1.23	2.85	-205.7
0.97	-0.09	-0.13	0.16	234.5	0.97	-2.76	1.44	3.11	-207.5
0.98	-0.08	-0.11	0.14	233.6	0.98	-2.92	1.56	3.31	-208.1

H/A =125.98 BETA*H =2.942

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	2.88	-1.02	3.06	-19.5	0.0	8.52	-19.60	21.38	-66.5
0.02	2.45	-1.05	2.67	-23.1	0.02	5.69	-14.36	15.44	-68.4
0.05	2.12	-1.16	2.42	-28.7	0.05	3.91	-11.55	12.20	-71.3
0.07	1.81	-1.22	2.18	-33.9	0.07	2.83	-10.06	10.45	-74.3
0.10	1.60	-1.28	2.05	-38.6	0.10	1.51	-8.99	9.19	-78.0
0.13	1.40	-1.32	1.92	-43.3	0.13	1.23	-8.22	8.32	-81.5
0.15	1.21	-1.34	1.81	-47.9	0.15	0.66	-7.57	7.60	-84.9
0.17	1.02	-1.33	1.68	-52.4	0.17	0.22	-7.12	7.13	-88.2
0.20	0.86	-1.33	1.58	-57.1	0.20	-0.23	-6.57	6.57	-92.0
0.22	0.72	-1.31	1.49	-61.2	0.22	-0.61	-6.11	6.14	-95.7
0.25	0.57	-1.27	1.39	294.4	0.25	-0.91	-5.67	5.74	-99.1
0.27	0.44	-1.20	1.28	290.3	0.27	-1.21	-5.25	5.39	-103.0
0.30	0.33	-1.16	1.20	285.9	0.30	-1.44	-4.82	5.03	-106.6
0.32	0.23	-1.12	1.15	281.6	0.32	-1.62	-4.38	4.67	-110.3
0.35	0.15	-1.09	1.10	277.9	0.35	-1.80	-4.01	4.40	-114.2
0.38	0.07	-1.05	1.06	273.6	0.38	-1.97	-3.62	4.12	-118.5
0.40	-0.01	-1.02	1.02	269.6	0.40	-2.04	-3.21	3.80	-122.5
0.42	-0.07	-0.97	0.98	266.1	0.42	-1.62	-3.16	3.56	-117.0
0.45	-0.13	-0.93	0.94	262.3	0.45	-2.20	-2.49	3.33	-131.5
0.47	-0.17	-0.88	0.90	258.9	0.47	-2.29	-2.19	3.17	-136.3
0.50	-0.21	-0.82	0.85	255.5	0.50	-2.31	-1.87	2.97	-141.1
0.52	-0.25	-0.78	0.82	252.5	0.52	-2.34	-1.55	2.81	-146.5
0.55	-0.28	-0.73	0.78	249.3	0.55	-2.34	-1.26	2.65	-151.7
0.57	-0.30	-0.68	0.74	246.1	0.57	-2.33	-0.99	2.53	-157.0
0.60	-0.33	-0.64	0.72	243.1	0.60	-2.35	-0.72	2.46	-163.0
0.63	-0.33	-0.58	0.67	240.3	0.63	-2.29	-0.46	2.34	-168.7
0.65	-0.34	-0.53	0.63	237.7	0.65	-2.29	-0.22	2.30	-174.5
0.67	-0.34	-0.49	0.59	235.1	0.67	-2.22	0.01	2.22	-180.3
0.70	-0.33	-0.44	0.55	232.9	0.70	-2.17	0.24	2.18	-186.2
0.72	-0.33	-0.41	0.52	230.9	0.72	-2.14	0.43	2.18	-191.4
0.75	-0.32	-0.36	0.48	228.8	0.75	-2.09	0.62	2.18	-196.5
0.77	-0.31	-0.33	0.45	227.0	0.77	-2.04	0.79	2.19	-201.2
0.80	-0.29	-0.30	0.41	225.6	0.80	-2.00	0.96	2.22	-205.7
0.82	-0.27	-0.26	0.38	223.9	0.82	-2.02	1.15	2.33	-209.7
0.85	-0.25	-0.23	0.34	222.4	0.85	-1.91	1.26	2.29	-213.5
0.88	-0.22	-0.20	0.30	221.3	0.88	-1.86	1.40	2.33	-217.0
0.90	-0.19	-0.16	0.25	219.6	0.90	-1.83	1.52	2.38	-219.8
0.92	-0.16	-0.13	0.21	218.4	0.92	-1.83	1.65	2.46	-222.0
0.95	-0.13	-0.10	0.16	217.4	0.95	-1.69	1.81	2.61	-223.7
0.97	-0.09	-0.06	0.11	216.1	0.97	-2.09	2.11	2.97	-225.2
0.98	-0.08	-0.05	0.09	215.2	0.98	-2.30	2.34	3.29	-225.5

H/A =157.48 BETA*H =3.678

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	2.94	-0.99	3.10	-18.7	0.0	9.04	-22.38	24.13	-68.0
0.02	2.46	-1.02	2.66	-22.4	0.02	5.97	-16.93	17.89	-70.1
0.04	2.16	-1.16	2.45	-28.2	0.04	4.10	-13.33	13.95	-72.9
0.06	1.87	-1.22	2.24	-33.1	0.06	2.97	-11.84	12.20	-75.9
0.08	1.63	-1.26	2.06	-37.6	0.08	1.50	-10.66	10.83	-79.9
0.10	1.40	-1.26	1.88	-42.0	0.10	1.09	-9.76	9.82	-83.6
0.12	1.17	-1.25	1.71	-46.8	0.12	0.42	-9.17	9.18	-87.4
0.14	0.97	-1.20	1.54	-50.9	0.14	-0.10	-8.53	8.53	-90.7
0.16	0.84	-1.21	1.47	-55.4	0.16	-0.59	-7.87	7.89	-94.3
0.18	0.71	-1.21	1.40	-59.8	0.18	-1.05	-7.36	7.43	-98.1
0.20	0.58	-1.17	1.31	-63.9	0.20	-1.39	-6.83	6.97	-101.5
0.22	0.47	-1.17	1.26	291.9	0.22	-1.72	-6.28	6.52	-105.3
0.24	0.37	-1.17	1.23	287.5	0.24	-1.99	-5.82	6.15	-108.9
0.26	0.27	-1.13	1.16	283.3	0.26	-2.23	-5.38	5.83	-112.5
0.28	0.17	-1.07	1.08	279.1	0.28	-2.40	-4.95	5.51	-115.9
0.30	0.08	-1.02	1.03	274.6	0.30	-2.61	-4.58	5.28	-119.7
0.32	0.01	-0.98	0.98	270.6	0.32	-2.72	-4.14	4.96	-123.3
0.34	-0.06	-0.95	0.95	266.1	0.34	-2.82	-3.73	4.68	-127.1
0.36	-0.13	-0.92	0.93	261.9	0.36	-2.91	-3.43	4.50	-130.3
0.38	-0.19	-0.87	0.89	257.9	0.38	-2.93	-3.04	4.22	-134.0
0.40	-0.25	-0.82	0.85	253.1	0.40	-2.93	-2.65	3.95	-137.9
0.42	-0.29	-0.76	0.81	249.1	0.42	-2.95	-2.33	3.76	-141.7
0.44	-0.33	-0.70	0.77	244.6	0.44	-2.87	-1.99	3.49	-145.3
0.46	-0.36	-0.64	0.74	240.5	0.46	-2.84	-1.69	3.30	-149.3
0.48	-0.39	-0.59	0.71	236.6	0.48	-2.79	-1.40	3.12	-153.3

TABLE B-6: Cont'd

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT) — MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A =157.48 BETA*H =3.678 ALPHA/BETA =0.592 DELTA =12.54

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.50	-0.41	-0.54	0.68	232.4	0.50	-2.66	-1.20	3.12	-157.4
0.52	-0.44	-0.49	0.66	228.6	0.52	-2.61	-0.86	2.75	-161.7
0.54	-0.45	-0.45	0.63	224.6	0.54	-2.49	-0.62	2.57	-166.0
0.56	-0.46	-0.40	0.61	221.3	0.56	-2.36	-0.39	2.41	-170.6
0.58	-0.46	-0.35	0.58	217.6	0.58	-2.24	-0.18	2.25	-175.3
0.60	-0.46	-0.32	0.56	214.8	0.60	-2.11	0.01	2.11	-180.3
0.62	-0.45	-0.28	0.53	211.7	0.62	-1.98	0.18	1.99	-185.3
0.64	-0.45	-0.24	0.51	208.5	0.64	-1.84	0.37	1.88	-191.3
0.66	-0.44	-0.21	0.48	205.6	0.66	-1.72	0.52	1.80	-196.8
0.68	-0.43	-0.18	0.46	202.5	0.68	-1.59	0.66	1.72	-202.5
0.70	-0.41	-0.15	0.44	200.1	0.70	-1.45	0.80	1.65	-208.8
0.72	-0.40	-0.12	0.42	197.4	0.72	-1.32	0.91	1.61	-214.5
0.74	-0.37	-0.10	0.39	194.8	0.74	-1.20	1.03	1.58	-220.5
0.76	-0.36	-0.08	0.37	192.6	0.76	-1.08	1.13	1.56	-226.3
0.78	-0.34	-0.06	0.35	190.5	0.78	-0.94	1.19	1.51	-231.8
0.80	-0.33	-0.05	0.33	188.6	0.80	-0.82	1.27	1.51	-237.3
0.82	-0.30	-0.04	0.31	186.8	0.82	-0.73	1.37	1.55	-241.8
0.84	-0.28	-0.02	0.28	185.0	0.84	-0.64	1.45	1.59	-246.3
0.86	-0.25	-0.01	0.25	183.3	0.86	-0.56	1.55	1.65	-250.0
0.88	-0.22	-0.01	0.22	181.9	0.88	-0.49	1.63	1.70	-253.3
0.90	-0.19	-0.00	0.19	180.3	0.90	-0.40	1.70	1.74	-256.8
0.92	-0.16	0.00	0.16	178.6	0.92	-0.33	1.76	1.79	-259.4
0.94	-0.13	0.01	0.13	176.8	0.94	-0.26	1.85	1.86	-262.1
0.96	-0.10	0.01	0.10	175.1	0.96	-0.22	1.95	1.96	-263.7
0.98	-0.07	0.01	0.07	173.1	0.98	-0.19	2.19	2.20	-265.1
0.99	-0.07	0.01	0.07	171.1	0.99	-0.20	2.40	2.40	-265.3

H/A =192.13 BETA*H =4.487

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	2.93	-1.03	3.11	-19.4	0.0	10.61	-30.05	31.87	-70.5
0.02	2.48	-1.03	2.69	-22.6	0.02	7.16	-22.24	23.36	-72.1
0.03	2.22	-1.20	2.52	-28.3	0.03	4.70	-17.72	18.33	-75.1
0.05	1.94	-1.27	2.32	-33.1	0.05	3.04	-15.28	15.58	-78.7
0.07	1.71	-1.33	2.17	-37.9	0.07	2.03	-13.63	13.78	-81.5
0.08	1.50	-1.35	2.02	-42.1	0.08	1.15	-12.77	12.82	-84.8
0.10	1.28	-1.36	1.87	-46.6	0.10	0.17	-11.74	11.74	-89.1
0.11	1.10	-1.34	1.74	-50.6	0.11	-0.50	-10.89	10.90	-92.6
0.13	0.93	-1.31	1.61	-54.7	0.13	-1.16	-10.00	10.06	-96.6
0.15	0.78	-1.30	1.51	-59.1	0.15	-1.72	-9.43	9.58	-100.3
0.16	0.64	-1.27	1.42	-63.2	0.16	-2.23	-8.83	9.11	-104.1
0.18	0.51	-1.23	1.33	292.5	0.18	-2.65	-8.08	8.51	-108.1
0.20	0.40	-1.21	1.27	288.5	0.20	-3.03	-7.43	8.03	-112.1
0.21	0.30	-1.17	1.21	284.2	0.21	-3.33	-6.78	7.55	-116.1
0.23	0.20	-1.12	1.14	280.3	0.23	-3.59	-6.23	7.19	-119.9
0.25	0.12	-1.07	1.08	276.3	0.25	-3.78	-5.68	6.83	-123.6
0.26	0.03	-1.02	1.02	271.9	0.26	-3.91	-5.16	6.47	-127.1
0.28	-0.04	-0.98	0.98	267.9	0.28	-4.10	-4.69	6.23	-131.1
0.30	-0.10	-0.92	0.93	263.6	0.30	-4.21	-4.26	5.99	-134.6
0.31	-0.16	-0.87	0.89	259.7	0.31	-4.19	-3.76	5.63	-138.1
0.33	-0.21	-0.81	0.84	255.4	0.33	-4.26	-3.31	5.39	-142.1
0.34	-0.26	-0.74	0.79	251.1	0.34	-4.15	-2.85	5.03	-145.5
0.36	-0.30	-0.70	0.76	246.9	0.36	-4.11	-2.46	4.79	-149.1
0.38	-0.33	-0.63	0.72	242.3	0.38	-4.05	-2.07	4.55	-152.9
0.39	-0.36	-0.58	0.68	238.3	0.39	-4.01	-1.73	4.37	-156.6
0.41	-0.39	-0.52	0.65	233.4	0.41	-3.83	-1.38	4.07	-160.1
0.43	-0.40	-0.47	0.62	229.2	0.43	-3.73	-1.10	3.89	-163.5
0.44	-0.42	-0.42	0.60	225.1	0.44	-3.62	-0.83	3.71	-167.1
0.46	-0.43	-0.37	0.57	220.7	0.46	-3.49	-0.59	3.53	-170.4
0.48	-0.44	-0.32	0.54	216.2	0.48	-3.34	-0.34	3.35	-174.1
0.49	-0.43	-0.28	0.51	212.5	0.49	-3.17	-0.12	3.17	-177.7
0.51	-0.44	-0.23	0.49	208.1	0.51	-2.99	0.09	3.00	-181.6
0.52	-0.43	-0.19	0.47	203.9	0.52	-2.86	0.26	2.88	-185.1
0.54	-0.43	-0.15	0.45	199.5	0.54	-2.66	0.43	2.70	-189.1
0.56	-0.42	-0.11	0.43	195.3	0.56	-2.49	0.58	2.55	-193.1
0.57	-0.41	-0.08	0.42	191.4	0.57	-2.29	0.71	2.40	-197.1
0.59	-0.40	-0.05	0.40	187.4	0.59	-2.08	0.80	2.23	-201.1
0.61	-0.39	-0.02	0.39	183.4	0.61	-1.90	0.91	2.11	-205.6
0.62	-0.38	0.00	0.38	179.9	0.62	-1.71	1.00	1.98	-210.3
0.64	-0.37	0.03	0.37	176.1	0.64	-1.54	1.07	1.87	-214.7
0.66	-0.35	0.05	0.35	172.7	0.66	-1.37	1.13	1.77	-219.6
0.67	-0.33	0.06	0.34	169.5	0.67	-1.19	1.18	1.68	-224.6
0.69	-0.31	0.08	0.32	166.2	0.69	-1.02	1.22	1.59	-230.1
0.70	-0.30	0.09	0.31	163.3	0.70	-0.84	1.24	1.50	-235.9
0.72	-0.29	0.10	0.30	160.4	0.72	-0.69	1.26	1.44	-241.1
0.74	-0.27	0.11	0.29	157.6	0.74	-0.53	1.27	1.38	-247.3
0.75	-0.25	0.12	0.28	154.9	0.75	-0.39	1.30	1.35	-253.4
0.77	-0.23	0.12	0.26	152.6	0.77	-0.24	1.30	1.32	-259.6
0.79	-0.22	0.12	0.25	150.4	0.79	-0.10	1.29	1.29	-265.6
0.80	-0.20	0.12	0.23	148.2	0.80	0.02	1.29	1.29	-270.8
0.82	-0.18	0.12	0.22	146.2	0.82	0.14	1.27	1.28	-276.3
0.84	-0.17	0.12	0.21	144.1	0.84	0.25	1.26	1.28	-281.4
0.85	-0.15	0.12	0.19	142.4	0.85	0.36	1.23	1.28	-286.3
0.87	-0.14	0.11	0.18	140.7	0.87	0.46	1.23	1.32	-290.4
0.89	-0.12	0.11	0.16	139.2	0.89	0.56	1.25	1.37	-294.1
0.90	-0.11	0.10	0.15	137.6	0.90	0.65	1.23	1.39	-297.7
0.92	-0.09	0.09	0.13	136.3	0.92	0.73	1.24	1.44	-300.6
0.93	-0.08	0.08	0.12	134.4	0.93	0.83	1.25	1.50	-303.4
0.95	-0.06	0.07	0.10	132.6	0.95	0.91	1.27	1.56	-305.6
0.97	-0.05	0.05	0.07	130.9	0.97	1.01	1.32	1.67	-307.3
0.98	-0.03	0.04	0.05	127.4	0.98	1.20	1.48	1.90	-309.1

TABLE B-7: CURRENT AND CHARGE DISTRIBUTIONS, α/β =.970

MONOPOLE CURRENTS IN MA/(2*DELTA*VOLT) — MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A = 18.90 BETA*H =0.855 ALPHA/BETA =0.970 DELTA =48.55

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	5.11	-2.06	5.51	-21.9	0.0	0.44	-9.07	9.08	-87.2
0.08	4.11	-2.06	4.60	-26.6	0.08	-0.03	-7.89	7.89	-90.2
0.17	3.49	-1.88	3.96	-28.3	0.17	-0.62	-6.54	6.56	-94.5
0.25	2.98	-1.80	3.48	-31.1	0.25	-0.88	-5.57	5.64	-99.0
0.33	2.53	-1.70	3.04	-33.9	0.33	-1.20	-4.83	4.97	-104.0
0.42	2.12	-1.60	2.66	-37.0	0.42	-1.50	-4.32	4.58	-109.1
0.50	1.71	-1.46	2.25	-40.5	0.50	-1.75	-3.94	4.31	-114.0
0.58	1.32	-1.31	1.86	-44.9	0.58	-1.99	-3.60	4.11	-119.0
0.67	1.00	-1.18	1.55	-49.6	0.67	-2.21	-3.38	4.04	-123.2
0.75	0.64	-1.00	1.19	-57.5	0.75	-2.44	-3.26	4.07	-126.9
0.83	0.31	-0.86	0.91	-70.3	0.83	-2.73	-3.25	4.24	-130.1
0.90	0.03	-0.78	0.78	-87.9	0.90	-3.11	-3.45	4.64	-132.0

H/A = 28.35 BETA*H =1.282

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	4.68	-2.76	5.43	-30.5	0.0	0.62	-13.63	13.64	-87.4
0.06	3.78	-2.47	4.52	-33.1	0.06	-0.06	-11.77	11.77	-90.3
0.11	3.27	-2.33	4.02	-35.4	0.11	-0.64	-9.66	9.68	-93.8
0.17	2.81	-2.26	3.60	-38.9	0.17	-1.13	-8.04	8.12	-98.0
0.22	2.39	-2.19	3.24	-42.6	0.22	-1.56	-6.91	7.08	-102.7
0.28	2.03	-2.08	2.91	-45.7	0.28	-1.86	-5.96	6.25	-107.3
0.33	1.71	-1.96	2.60	-49.0	0.33	-2.13	-5.14	5.56	-112.5
0.39	1.43	-1.86	2.35	-52.4	0.39	-2.37	-4.45	5.04	-118.1
0.44	1.17	-1.72	2.08	-55.8	0.44	-2.56	-3.87	4.64	-123.5
0.50	0.98	-1.62	1.89	-58.7	0.50	-2.72	-3.32	4.29	-129.3
0.56	0.81	-1.51	1.71	-61.9	0.56	-2.85	-2.92	4.08	-134.3
0.61	0.62	-1.35	1.49	-65.3	0.61	-2.97	-2.49	3.87	-140.0
0.67	0.46	-1.20	1.29	-68.9	0.67	-3.08	-2.14	3.75	-145.2
0.72	0.30	-1.01	1.06	-73.3	0.72	-3.17	-1.84	3.67	-149.8
0.78	0.18	-0.85	0.87	-78.3	0.78	-3.30	-1.60	3.67	-154.1
0.83	0.05	-0.69	0.69	-85.8	0.83	-3.45	-1.41	3.73	-157.7
0.89	-0.07	-0.53	0.54	-97.1	0.89	-3.68	-1.29	3.89	-160.7
0.93	-0.19	-0.39	0.44	-115.8	0.93	-4.00	-1.24	4.19	-162.7

H/A = 37.80 BETA*H =1.709

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	4.41	-2.79	5.22	-32.3	0.0	0.51	-17.25	17.26	-88.3
0.04	3.59	-2.43	4.34	-34.0	0.04	-0.20	-15.99	15.99	-90.7
0.08	3.13	-2.39	3.94	-37.4	0.08	-0.88	-12.91	12.94	-93.9
0.13	2.66	-2.34	3.54	-41.3	0.13	-1.42	-10.82	10.91	-97.5
0.17	2.32	-2.34	3.30	-45.3	0.17	-1.65	-9.08	9.26	-101.5
0.21	1.97	-2.27	3.01	-49.0	0.21	-2.18	-7.82	8.12	-105.6
0.25	1.67	-2.21	2.76	-52.9	0.25	-2.44	-6.76	7.21	-109.8
0.29	1.38	-2.11	2.52	-56.7	0.29	-2.65	-5.88	6.45	-114.3
0.33	1.14	-2.00	2.30	-60.2	0.33	-2.81	-5.06	5.79	-119.0
0.38	0.92	-1.89	2.10	-63.9	0.38	-2.93	-4.36	5.25	-123.9
0.42	0.73	-1.76	1.90	-67.5	0.42	-3.00	-3.68	4.75	-129.2
0.46	0.55	-1.61	1.70	-71.0	0.46	-3.04	-3.10	4.34	-134.5
0.50	0.41	-1.47	1.53	-74.5	0.50	-3.06	-2.59	4.01	-139.8
0.54	0.29	-1.34	1.37	-77.6	0.54	-3.04	-2.11	3.71	-145.2
0.58	0.19	-1.21	1.23	-80.9	0.58	-2.94	-1.86	3.48	-147.7
0.63	0.11	-1.07	1.07	-84.2	0.63	-3.03	-1.31	3.30	-156.6
0.67	0.04	-0.94	0.94	-87.5	0.67	-2.99	-0.97	3.15	-162.1
0.71	-0.01	-0.83	0.83	-90.7	0.71	-2.97	-0.67	3.05	-167.3
0.75	-0.06	-0.72	0.73	-94.4	0.75	-2.94	-0.40	2.97	-172.3
0.79	-0.09	-0.60	0.61	-98.6	0.79	-2.92	-0.14	2.92	-177.3
0.83	-0.12	-0.49	0.51	-103.6	0.83	-2.92	0.08	2.92	-181.5
0.88	-0.15	-0.38	0.41	-111.2	0.88	-2.96	0.27	2.97	-185.3
0.92	-0.18	-0.27	0.32	-122.9	0.92	-3.09	0.45	3.12	-188.3
0.95	-0.21	-0.17	0.27	-140.9	0.95	-3.30	0.60	3.35	-190.3

H/A = 56.69 BETA*H =2.564

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	4.31	-2.64	5.06	-31.5	0.0	0.76	-27.21	27.22	-88.4
0.03	3.64	-2.59	4.47	-35.4	0.03	-0.29	-23.98	23.98	-90.7
0.06	3.05	-2.47	3.92	-39.0	0.06	-1.35	-19.75	19.79	-93.9
0.08	2.53	-2.37	3.46	-43.2	0.08	-2.16	-16.61	16.75	-97.4
0.11	2.14	-2.31	3.15	-47.2	0.11	-2.76	-14.20	14.46	-101.0
0.14	1.76	-2.21	2.83	-51.5	0.14	-3.21	-12.14	12.56	-104.8
0.17	1.44	-2.11	2.55	-55.8	0.17	-3.57	-10.61	11.19	-108.6
0.19	1.19	-2.05	2.37	-60.0	0.19	-3.83	-9.21	9.97	-112.6
0.22	0.93	-1.93	2.14	-64.2	0.22	-3.97	-8.06	8.98	-116.2
0.25	0.71	-1.80	1.94	-68.6	0.25	-4.13	-7.02	8.15	-120.5
0.28	0.54	-1.72	1.80	-72.6	0.28	-4.18	-6.09	7.38	-124.5
0.31	0.38	-1.60	1.64	-76.7	0.31	-4.18	-5.18	6.66	-128.9
0.33	0.24	-1.51	1.53	-80.8	0.33	-4.14	-4.47	6.09	-132.8
0.36	0.12	-1.41	1.41	-85.0	0.36	-4.04	-3.76	5.52	-137.1
0.39	0.02	-1.32	1.32	-89.0	0.39	-3.96	-3.16	5.06	-141.4
0.42	-0.07	-1.22	1.22	-93.3	0.42	-3.81	-2.59	4.61	-145.8
0.44	-0.14	-1.11	1.12	-97.0	0.44	-3.66	-2.11	4.23	-150.1
0.47	-0.20	-1.03	1.05	-101.0	0.47	-3.53	-1.71	3.92	-154.2
0.50	-0.25	-0.92	0.96	-105.1	0.50	-3.30	-1.27	3.54	-158.9
0.53	-0.28	-0.83	0.88	-108.8	0.53	-3.10	-0.91	3.24	-163.6
0.56	-0.31	-0.76	0.82	-112.5	0.56	-2.91	-0.61	2.97	-168.1
0.61	-0.35	-0.61	0.70	-119.7	0.61	-2.55	-0.08	2.55	-178.2
0.67	-0.34	-0.46	0.57	-126.6	0.67	-2.18	0.36	2.21	-189.4

TABLE B-7: Cont'd

MONOPOLE CURRENTS IN MA/(DELTA*2) — MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A = 56.69 BETA*H =2.564 ALPHA/BETA =0.970 DELTA =48.55

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.72	-0.32	-0.34	0.46	-133.1	0.72	-1.82	0.69	1.94	-200.7
0.78	-0.29	-0.24	0.37	-139.8	0.78	-1.50	0.94	1.77	-212.2
0.83	-0.24	-0.16	0.29	-146.9	0.83	-1.24	1.13	1.67	-222.4
0.89	-0.20	-0.09	0.21	-156.2	0.89	-1.04	1.31	1.67	-231.6
0.94	-0.14	-0.01	0.14	-174.8	0.94	-0.96	1.53	1.81	-238.1
0.97	-0.12	0.02	0.12	-190.6	0.97	-0.97	1.70	1.96	-240.2

H/A = 75.59 BETA*H =3.419

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	4.24	-2.63	4.99	-31.8	0.0	1.68	-35.58	35.62	272.7
0.02	3.31	-2.51	4.15	-37.2	0.02	0.22	-31.60	31.60	270.4
0.04	2.83	-2.39	3.71	-40.2	0.04	-1.27	-26.06	26.09	267.2
0.06	2.41	-2.37	3.38	-44.5	0.06	-2.42	-21.94	22.07	263.7
0.08	2.06	-2.31	3.09	-48.3	0.08	-3.27	-18.53	18.81	260.0
0.10	1.69	-2.21	2.78	-52.5	0.10	-3.89	-16.09	16.55	256.4
0.13	1.37	-2.08	2.49	-56.6	0.13	-4.45	-14.11	14.80	252.5
0.15	1.12	-2.00	2.30	-60.7	0.15	-4.88	-12.31	13.24	248.4
0.17	0.87	-1.88	2.08	-65.2	0.17	-5.16	-10.88	12.04	244.6
0.19	0.67	-1.78	1.90	-69.5	0.19	-5.35	-9.42	10.84	240.4
0.21	0.48	-1.68	1.74	-73.9	0.21	-5.47	-8.17	9.83	236.2
0.25	0.18	-1.40	1.41	-82.6	0.25	-5.46	-6.02	8.13	227.8
0.29	-0.02	-1.17	1.17	-91.1	0.29	-5.31	-4.44	6.92	219.9
0.33	-0.17	-0.98	0.99	-99.8	0.33	-4.95	-3.06	5.82	211.7
0.38	-0.27	-0.80	0.84	-108.7	0.38	-4.51	-1.97	4.92	203.6
0.42	-0.33	-0.64	0.72	-117.2	0.42	-4.06	-1.13	4.21	195.6
0.46	-0.36	-0.50	0.62	-126.0	0.46	-3.54	-0.43	3.56	187.0
0.50	-0.37	-0.38	0.53	-134.1	0.50	-3.01	0.05	3.01	179.0
0.54	-0.37	-0.28	0.46	-142.3	0.54	-2.52	0.43	2.56	170.4
0.58	-0.34	-0.20	0.40	-150.2	0.58	-2.05	0.68	2.16	161.7
0.63	-0.31	-0.13	0.34	-157.7	0.63	-1.60	0.83	1.81	152.7
0.67	-0.28	-0.07	0.29	-165.3	0.67	-1.22	0.92	1.53	142.9
0.71	-0.25	-0.03	0.25	-172.2	0.71	-0.89	0.97	1.31	132.7
0.75	-0.22	-0.00	0.22	-178.8	0.75	-0.59	0.97	1.14	121.3
0.79	-0.18	0.02	0.18	-184.9	0.79	-0.35	0.95	1.01	110.0
0.83	-0.15	0.03	0.15	-191.2	0.83	-0.14	0.92	0.93	98.6
0.88	-0.11	0.04	0.12	161.8	0.88	0.04	0.90	0.90	87.6
0.92	-0.07	0.04	0.08	152.4	0.92	0.18	0.89	0.91	78.7
0.96	-0.03	0.04	0.05	131.5	0.96	0.30	0.94	0.98	72.0
0.97	-0.02	0.04	0.04	115.0	0.97	0.37	1.02	1.08	70.0

H/A = 94.49 BETA*H =4.273

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	4.30	-2.65	5.05	-31.7	0.0	4.66	-47.57	47.80	275.6
0.02	3.55	-2.52	4.35	-35.3	0.02	2.27	-40.63	40.69	273.2
0.03	3.02	-2.41	3.86	-38.6	0.03	-0.00	-33.91	33.91	270.0
0.05	2.51	-2.31	3.41	-42.7	0.05	-1.81	-28.04	28.10	266.3
0.07	2.08	-2.24	3.05	-47.1	0.07	-3.12	-23.70	23.90	262.5
0.08	1.75	-2.17	2.78	-51.1	0.08	-4.14	-20.91	21.32	258.8
0.10	1.43	-2.07	2.51	-55.4	0.10	-4.57	-18.06	18.73	254.6
0.12	1.14	-1.94	2.24	-59.6	0.12	-5.52	-15.86	16.79	250.8
0.13	0.89	-1.81	2.02	-63.9	0.13	-6.01	-14.01	15.24	246.8
0.15	0.68	-1.71	1.84	-68.2	0.15	-6.36	-12.26	13.82	242.5
0.17	0.51	-1.63	1.71	-72.5	0.17	-6.53	-10.62	12.47	238.4
0.20	0.23	-1.42	1.44	-80.9	0.20	-6.63	-7.93	10.34	230.1
0.23	0.01	-1.23	1.23	-89.5	0.23	-6.50	-5.81	8.72	221.8
0.27	-0.15	-1.02	1.03	-98.1	0.27	-6.18	-4.12	7.43	213.7
0.30	-0.25	-0.83	0.87	-106.9	0.30	-5.66	-2.69	6.27	205.4
0.33	-0.32	-0.68	0.75	-115.6	0.33	-5.06	-1.58	5.30	197.3
0.37	-0.36	-0.53	0.64	-124.0	0.37	-4.43	-0.72	4.49	189.2
0.40	-0.36	-0.39	0.53	-132.8	0.40	-3.81	-0.07	3.81	181.0
0.43	-0.35	-0.28	0.45	-141.6	0.43	-3.23	0.42	3.26	172.6
0.47	-0.33	-0.19	0.38	-150.0	0.47	-2.67	0.75	2.78	164.3
0.50	-0.30	-0.12	0.33	-158.4	0.50	-2.19	0.96	2.39	156.2
0.53	-0.28	-0.07	0.28	-166.6	0.53	-1.72	1.08	2.03	147.8
0.57	-0.24	-0.02	0.24	-175.2	0.57	-1.33	1.13	1.74	139.7
0.60	-0.21	0.01	0.21	-183.2	0.60	-0.99	1.11	1.49	131.6
0.63	-0.18	0.03	0.18	168.9	0.63	-0.67	1.05	1.25	122.3
0.67	-0.15	0.05	0.15	160.9	0.67	-0.43	0.99	1.08	113.6
0.70	-0.12	0.06	0.13	153.2	0.70	-0.22	0.88	0.90	104.3
0.73	-0.10	0.07	0.12	145.8	0.73	-0.06	0.77	0.77	94.3
0.77	-0.07	0.07	0.10	138.8	0.77	0.07	0.66	0.66	84.0
0.80	-0.06	0.06	0.08	131.9	0.80	0.17	0.56	0.58	72.7
0.83	-0.04	0.06	0.07	125.4	0.83	0.24	0.46	0.52	62.3
0.87	-0.03	0.05	0.06	119.2	0.87	0.31	0.37	0.48	50.3
0.90	-0.02	0.04	0.04	111.6	0.90	0.35	0.29	0.46	39.8
0.93	-0.01	0.03	0.03	101.9	0.93	0.39	0.24	0.46	31.1
0.97	0.00	0.02	0.02	80.4	0.97	0.45	0.20	0.50	24.3
0.98	0.01	0.02	0.02	62.4	0.98	0.50	0.21	0.54	22.5

H/A =110.24 BETA*H =4.986

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.0	4.25	-2.67	5.02	-32.1	0.0	9.27	-56.33	57.09	279.3
0.01	3.43	-2.56	4.28	-36.7	0.01	5.65	-48.07	48.42	276.9
0.03	2.74	-2.31	3.58	-40.1	0.03	2.53	-38.73	38.81	273.7
0.04	2.14	-2.11	3.01	-44.6	0.04	0.08	-32.22	32.22	270.1
0.06	1.82	-2.06	2.75	-48.6	0.06	-1.70	-27.27	27.32	266.4
0.07	1.51	-1.98	2.49	-52.6	0.07	-3.06	-23.54	23.74	262.5

TABLE B-7: Cont'd

MONOPOLE CURRENTS IN MA/(DELTA*2) — MONOPOLE CHARGE IN MILLI-COUL/(2*DELTA*VOLT*SEC)

H/A =110.24 BETA*H =4.986 ALPHA/BETA =0.970 DELTA =48.55

Z/H	REAL	IMAG	ABSVAL	PHASE	Z/H	REAL	IMAG	ABSVAL	PHASE
0.09	1.23	-1.91	2.27	-57.1	0.09	-4.12	-20.70	21.10	256.7
0.10	1.00	-1.82	2.07	-61.2	0.10	-5.16	-18.33	19.03	254.4
0.11	0.78	-1.73	1.90	-65.7	0.11	-5.71	-16.17	17.15	250.5
0.13	0.61	-1.64	1.75	-69.7	0.13	-6.29	-14.22	15.54	246.1
0.14	0.44	-1.53	1.59	-74.1	0.14	-6.40	-12.49	14.13	242.1
0.17	0.17	-1.34	1.35	-82.6	0.17	-6.53	-9.52	11.78	233.9
0.20	-0.02	-1.15	1.15	-90.9	0.20	-6.53	-7.06	9.89	225.5
0.23	-0.16	-0.95	0.96	-99.8	0.23	-6.59	-5.03	8.29	217.3
0.26	-0.26	-0.78	0.82	-108.6	0.26	-6.18	-3.42	7.07	208.9
0.29	-0.37	-0.59	0.69	-122.1	0.29	-5.56	-2.07	5.94	200.4
0.31	-0.35	-0.48	0.59	-125.9	0.31	-4.57	-1.09	5.09	192.3
0.34	-0.35	-0.36	0.51	-134.1	0.34	-4.36	-0.32	4.37	184.1
0.37	-0.35	-0.26	0.44	-142.7	0.37	-3.70	0.27	3.71	175.8
0.40	-0.33	-0.19	0.38	-150.8	0.40	-3.68	0.72	3.17	166.9
0.43	-0.31	-0.12	0.33	-159.2	0.43	-2.55	0.97	2.73	159.1
0.46	-0.28	-0.06	0.28	-168.1	0.46	-2.06	1.14	2.36	150.9
0.49	-0.24	-0.02	0.24	-176.1	0.49	-1.60	1.22	2.02	142.7
0.51	-0.21	0.02	0.21	175.6	0.51	-1.22	1.25	1.74	134.3
0.54	-0.18	0.04	0.18	166.9	0.54	-0.67	1.20	1.46	125.8
0.57	-0.15	0.06	0.16	158.7	0.57	-0.58	1.12	1.26	117.4
0.60	-0.12	0.07	0.14	150.4	0.60	-0.35	1.02	1.08	109.0
0.63	-0.10	0.08	0.12	142.1	0.63	-0.17	0.91	0.92	100.5
0.66	-0.07	0.08	0.10	133.5	0.66	-0.03	0.79	0.79	92.1
0.69	-0.05	0.07	0.09	124.9	0.69	0.08	0.67	0.68	83.4
0.71	-0.04	0.07	0.08	117.3	0.71	0.15	0.55	0.57	74.8
0.74	-0.02	0.06	0.07	109.1	0.74	0.20	0.45	0.49	65.4
0.77	-0.01	0.06	0.06	101.8	0.77	0.23	0.35	0.42	55.9
0.80	-0.00	0.05	0.05	94.9	0.80	0.25	0.26	0.36	45.7
0.83	0.00	0.04	0.04	88.1	0.83	0.25	0.16	0.31	34.9
0.86	0.01	0.03	0.04	81.2	0.86	0.25	0.11	0.27	382.9
0.89	0.01	0.03	0.03	74.3	0.89	0.25	0.05	0.25	372.0
0.91	0.01	0.02	0.02	67.3	0.91	0.24	0.00	0.24	361.1
0.94	0.01	0.01	0.02	58.1	0.94	0.24	-0.03	0.24	351.6
0.97	0.01	0.01	0.01	41.1	0.97	0.24	-0.07	0.25	344.3
0.98	0.01	0.00	0.01	26.9	0.98	0.25	-0.08	0.27	342.1

References

1. Larry D. Scott, "Polynomial-Exponential-Product Theory for Antennas in Homogeneous Isotropic Media," NASA Scientific Report No. 7, Harvard University, Cambridge, Mass., December 1969.