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FINAL REPORT

FOR

BROADBAND MULTIMODE HORNS

(27 June 1968 - 10 December 1968)

JPL Contract 952326

Prepared By

Hughes Aircraft Company
Ground Systems Group
Fullerton, California



For

Jet Propulsion Laboratory
Pasadena, California

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ABSTRACT

This report describes a design study of a new multimode technique which permits broadband (up to 40% bandwidth) operation of low noise high efficiency antenna feeds. This technique utilizes a multimode section wherein the principal waveguide mode excites a TEM mode (in addition to the principal mode) in the mode control section. At the end of the mode control section the TEM mode is converted into the TM_{11}^{o} mode, which combined with the TE_{11}^{o} mode provides primary pattern shaping. The use of the TEM mode, which determines, in part, the phase of the TM_{11}^{o} mode at the horn aperture, is the key to the broadband operation because it has a slower phase velocity than the fundamental TE_{11}^{o} mode, which in turn has a slower phase velocity than the TM_{11}^{o} mode. That is, the phase of the TM_{11}^{o} mode at the horn aperture relative to that of the fundamental TE_{11}^{o} mode is determined by the "average" phase velocities of the TEM^{o} and TM_{11}^{o} modes which can be made nearly equal to the average phase velocity of the fundamental TE_{11}^{o} mode over a broad frequency band.

Theoretical design procedures are provided for this type of feed in either a conical or rectangular horn. Performance data on both types of multimode horns is included, illustrating an overall expected antenna efficiency in excess of 75% over most of the 1.7 to 2.6 GHz band.

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1. INTRODUCTION

1.1 Scope and Purpose

This report documents a study performed during the period of 27 June 1968 through 10 December 1968 for the purpose of designing broadband high efficiency multimode feed systems for Cassegrain antennas. Two separate feeds were studied, a conical horn, and a pyramidal horn, having dimensions scaled from the existing JPL-DSIF feedhorns, and designed to provide a primary feed pattern with maximum efficiency for a subtended cone angle of ± 13.5 degrees.

The goal of this study was to provide a design for each of the horn configurations which provides at least 75% overall efficiency, as calculated by the "J. P. L. Antenna Efficiency" computer program, over the minimum band of 2.1 to 2.4 GHz, and to attempt to extend this design over the total band of 1.7 to 2.6 GHz.

The approach to this problem is a new multimode technique, where four rods are inserted into the waveguide to form a multimode control section, and the TEM mode excited on the rods. The rods are then used to excite the proper mode for shaping of the E-plane radiation pattern. In the conical horn, the principal waveguide mode is the TE_{11}° mode. In the mode control section, both the TE_{11}° and TEM° modes exist. At the termination point of the rods, the TM_{11}° is excited, with the proper amplitude and phase to produce the desired radiation pattern from a combination of the TE_{11}° and TM_{11}° modes.

Similarly for the rectangular horn, where the $TE_{10}^{\square}$ mode is used, the rods are used to excite the $TE_{12}^{\square}$ mode, resulting in a radiation pattern of the $TE_{10}^{\square} + TE_{12}^{\square}$, again providing pattern shape control in the E-plane.

1.2 Summary of Work Performed

The principal effort of this study has been directed toward the design and theory of the conical multimode horn. A theoretical calculation of the fields in the multimode section was made to determine the correlation between the TEM fields and the TM_{11}^{o} fields. The loading effect of the rods on the TE_{11}^{o} mode was calculated by a variational technique to provide a more accurate calculation of the mode phasing. Radiation patterns were calculated for all modes which could be excited and propagate at the end of the rods, including the odd modes which would result due to asymmetries in the horn.

Experimentally, measurements were made on the TEM^{o} to TM_{11}^{o} mode transformation in a circular guide, and a rod design established which provides good multimode performance over most of the 1.7 to 2.6 GHz band (scaled to X-band for this study). Detailed amplitude and phase patterns were taken on the final design, and a computer efficiency analysis made on the primary patterns.

The data obtained from the conical horn was applied to the rectangular horn in two configurations. First, the rods were placed in the principal planes of the square cross section, and data taken. Second, the rods were placed along the diagonal planes of the horn, and detailed evaluation made. The results indicate the diagonal feeding method provides better performance. Extended data was taken on this latter case over the band 1.9 to 2.6 GHz.

2.0 CONICAL MULTIMODE HORN THEORY

The conical horn geometry was the principal item of this study, as it was felt the modal analysis was simpler to handle and it was expected the results of this portion of the study could be applied to the rectangular horn. This appears to be true only in part as will be discussed later.

It is well known that by exciting a circular horn aperture with the TE_{11}^{o} and TM_{11}^{o} modes in the proper amplitude and phase, a sector shaped pattern can be obtained. By proper adjustment of the modes, it is possible to obtain a pattern which is nearly rotationally symmetric and equal to that of the unperturbed TE_{11}^{o} mode H-plane.

The difficulty of using higher order modes in waveguide horns is normally the limited bandwidth over which the desired mode phasing can be obtained.

2.1 Broadband Phase Control

By use of a mode generation and control section consisting of a TEM transmission line in a cylindrical guide as shown in Figure 1, it is possible to extend this bandwidth considerably. This is possible because the two modes existing in the mode control section are the TE_{11}^{o} and TEM^{o} modes. At the junction "C", the TEM^{o} mode excites the TM_{11}^{o} mode which phases with the TE_{11}^{o} mode to provide the desired radiation pattern. The key to the broadband operation lies with the propagation constant relationship of the three modes.

In the region L_P and L_R there exists the dominant TE_{11} mode and the TEM mode. In the region L_M, there exists the dominant TE_{11}^{o} mode and the higher order TM_{11}^{o} mode, and at the aperture these modes have the proper relative amplitude and phases. The relative phase of the TE_{11}^{o} and TM_{11}^{o} modes at the aperture are retained over a broad frequency range. This is evident because the phase of the TM_{11}^{o} mode at the aperture depends on the propagation constant (β_{TEM}) of the

TEM wave, length $L_p + L_R$, the propagation constant ($\beta_{TM_{11}^o}$) of the TM_{11}^o mode, and the length L_M, while the aperture phase of the TE_{11}^o mode depends on the propagation constant ($\beta_{TE_{11}^o}$) of the TE_{11}^o mode and the length $L_p + L_R + L_M$.

Stated mathematically,

$$\int_a^c \beta_{TEM}\, d\ell + \int_c^{aperture} \beta_{TM_{11}^o}\, d\ell = \int_a^{aperture} \beta_{TE_{11}^o}\, d\ell$$

where

$$\beta_{TEM} = \frac{2\pi}{\lambda_{TEM}} \qquad \beta_{TM_{11}^o} = \frac{2\pi}{\lambda_{TM_{11}^o}} \qquad \beta_{TE_{11}^o} = \frac{2\pi}{\lambda_{TE_{11}^o}}$$

Phase of TM_{11}^o mode at horn aperture = phase of TE_{11}^o mode at horn aperture

$$\beta_{TEM} > \beta_{TE_{11}^o} > \beta_{TM_{11}^o}$$

Since β_{TEM} is greater than $\beta_{TE_{11}^o}$, and $\beta_{TM_{11}^o}$ is less than $\beta_{TE_{11}^o}$, the phase $\phi_{TM_{11}^o}$ and $\phi_{TE_{11}^o}$ can be made equal over a broad frequency range. In other words, a slow wave from "a" to "c" plus a fast wave from "c" to the aperture can equal a medium speed wave from "a" to the aperture, and this equality is held over a broad frequency range. Thus, by proper selection of the lengths of the horn and multimode control section, it is possible to obtain a design which nearly eliminates any phase error between the TE_{11}^o and TM_{11}^o modes at the horn aperture over a reasonably large frequency band.

In the conical horn used for the experimental portion of this study, the theoretical phase deviation between the TE_{11}^o and TM_{11}^o modes at the horn aperture is only 22 degrees over the 40% band 1.7 to 2.6 GHz. Most of this phase error occurs at the lower end of this band as the TM_{11}^o mode approaches cutoff at this point. Over the band 1.8 to 2.6 GHz, the phase error is less than 7 degrees.

2.2 Mode Generation and Field Matching

The function of the mode control section is to excite the TM_{11}^{o} mode in the horn section with the proper amplitude and phase to obtain the desired patterns. This is accomplished by two mode transfers. At the initial rod junction (terminal "a" in Figure 1), the rods must couple a portion of the incident TE_{11}^{o} mode to the TEM mode on the rods. This is accomplished by the shorting of the rods to the guide wall, thus requiring additional modes to meet the boundary conditions. As only the TE_{11}^{o} mode can propagate in the guide up to this point, no additional modes will be reflected from the rods, and the higher order modes at this junction will appear as merely a reactive mismatch which may be matched by conventional techniques. However, in the mode control section, the rods will support the TEM^{o} mode, and thus by proper insertion (i) of the rods, the magnitude of this mode can be controlled.

At the rod termination point, junction "c," the TEM^{o} mode must be transformed into the TM_{11}^{o} mode. One might expect this could be accomplished without excessive difficulty when the field configuration of these two modes are compared. Figure 2(a) shows the field lines for the TEM mode on two rods in a cylindrical guide, and Figure 2(b) the corresponding field lines for the TM_{11}^{o} mode in circular guide. As is readily seen, the transverse field components are nearly identical, and it is only necessary to provide a transformation from no longitudinal field component in the TEM^{o} mode to that component required by the TM_{11}^{o} mode.

To accomplish this field matching, it would appear reasonable to use a discontinuity near the end of the rod which would excite such longitudinal fields. It was determined experimentally that thin discs placed near the rod ends will indeed provide such a match. However, for very broadband operation, a rod resonance effect was experienced which led to difficulty in obtaining the results desired, and which complicated the rod design procedure. This will be discussed further in connection with the experimental work.

2.3 Effect of Rods on the Principal Mode

The presence of the rods in the waveguide effectively loads the dominant mode (TE_{11} in circular guide) resulting in less phase difference between the TEM and TE^{o}_{11} modes than would be expected. This effect can be calculated by use of a variational technique. The stationary[1] form for the cutoff propagation constant is:

$$k_c^2 = \frac{\int |\nabla \psi|^2 \, ds}{\int |\psi|^2 \, ds}$$

where

ψ = eigen function or generation function

$\nabla \psi$ = gradient of ψ

For this particular case, where the perturbation is small, the unperturbed mode for ψ may be used. The cutoff propagation constant can be rewritten as:

$$k_c^2 = \frac{\int_{\odot} |\nabla \psi|^2 \, ds - \int_{\Delta} |\nabla \psi|^2 \, ds}{\int_{\odot} |\psi|^2 \, ds - \int_{\Delta} |\psi|^2 \, ds}$$

where

$\odot$ = entire cross section excluding wires

Δ = cross section of wires (equals zero for unperturbed case)

Expanding $\int_{\odot} |\nabla \psi|^2 \, ds$ results in the expression:

$$k_c^2 = \frac{k_{co}^2 - \int_{\Delta} |\nabla \psi|^2 \, ds / \int_{\odot} |\psi|^2 \, ds}{1 - \int_{\Delta} |\psi|^2 \, ds / \int_{\odot} |\psi|^2 \, ds}$$

---

[1] Roger F. Harrington, Time-Harmonic Electromagnetic Fields, McGraw-Hill Book Co., Inc., New York, N. Y., p. 345; 1961.

or approximately

$$\frac{k_c^2}{k_{co}^2} \approx 1 + \frac{\int_\Delta |\psi|^2 \, ds}{\int_\odot |\psi|^2 \, ds} - \frac{\int_\Delta \left|\frac{\nabla\psi}{k_{co}}\right|^2 ds}{\int_\odot |\psi|^2 \, ds}$$

Since the area "Δ" is small, ψ and $\nabla\psi$ take on the value at the center of the area which gives

$$\frac{k_c^2}{k_{co}^2} = 1 + \frac{\Delta\left[\psi^2 - \left|\frac{\nabla\psi}{k_{co}}\right|^2\right]_{r = \text{center of } \Delta}}{\int_\odot \psi^2 \, ds}$$

This loading effect has been evaluated for the conical horn case under study. For the final conical horn geometry, the cutoff wavelength is increased approximately by 0.5 percent in the TEM line region. This amounts to about 5° less phase between the TE_{11}° and TEM modes than would be calculated if this term were neglected. This factor thus appears small enough to be almost negligible.

2.4 Higher Order Modes

At the termination point of the rods in the horn, the diameter of the horn is large enough to support several higher order modes, some of which could be excited by small asymmetries in rod position. It was found during the development that some of these modes would be strongly excited at certain frequencies if the rods were not accurately positioned in the guide, causing pronounced pattern deterioration. In order to more easily determine which modes were causing a problem, calculations were made for all possible propagating modes in the horn at this junction. Figure 3 illustrates the mode field characteristics and cutoff properties of these modes. The computed radiation patterns of these modes appear in Appendix I. By analysis of measured patterns in terms of the computed mode patterns, the modal content can, in principle, be determined and related to the structure of the rods.

2.5 Applicability to Rectangular Horn

The same basic principles discussed above apply also to a rectangular or square cross section, where the $TE^{\square}_{10}$ mode is dominant, and the $TE^{\square}_{12}$ and $TM^{\square}_{12}$ mode is used for E-plane pattern shaping. However, the higher order mode cutoff conditions are different from those experienced with the circular guide and horn. Also, the boundary conditions for the TEM mode are not satisfied as easily in the square cross section, probably affecting the propagation of this mode (see Section 4.2, Figure 14).

The relationship of the various mode cutoffs at the end of the rods appears to have marked effect on a "rod resonance" effect experienced in both horns, which appears to be one of the main developmental problems. This is further discussed in Section 3.0.

3.0 DESIGN PROCEDURE

Some guidelines for the design of this type of multimode horn have evolved during the course of this study. However, several effects have been noted which cannot be accounted for by theoretical prediction at this time, resulting in a semi-empirical design procedure rather than one resulting from a straightforward theoretical approach. The following outline, applicable to horns of either circular or square cross section, illustrates the procedure involved (refer to Figure 1).

(1) Aperture and Throat Dimensions of Horn

A. Determine aperture dimensions, radius, or width, as the case may be, to yield the desired beamwidth using the theoretical H-plane beamwidth with the dominant mode only since shaping is done primarily in the E-plane.

B. The throat radius "a_o" of the circular cross-section horn was chosen to be approximately 16% below cutoff for the TM^{o}_{11} mode at a frequency corresponding to the high end of the minimum required band. The throat width a_o of the square horn is approximately 27% below cutoff for the $TE^{\square}_{12}$ and $TM^{\square}_{12}$ modes for its corresponding frequency.

C. The flare angle of the horn is normally chosen to yield less than $\lambda/8$ quadratic phase error although this was not strictly adhered to due to imposed scaling restrictions.

(2) Choose the Cross Section of the Horn at the Rod Termination Such That Only Desired Higher Modes Propagate

A. The radius a of the circular cross-section was chosen to eliminate the TE^{o}_{12} mode in the minimum required frequency band.

B. The guide width a of the square cross-section was chosen to eliminate the TE_{30} mode in the minimum required frequency band.

(3) The Equation to Provide the Correct Phasing of the Modes is as follows:

A. For the circular cross-section horn

$$\phi_{(TE^{o}_{11})_{L_p}} + \phi_{(TE^{o}_{11})_{L_R}} + \phi_{(TE^{o}_{11})_{L_M}}$$

$$= \phi_{(TEM)_{L_p}} + \phi_{(TEM)_{L_R}} + \phi_{(TM^{o}_{11})_{L_M}}$$

or

$$\phi_{(TEM)_{L_p + L_R}} - \phi_{(TE^{o}_{11})_{L_p + L_R}}$$

$$= \phi_{(TE^{o}_{11})_{L_M}} - \phi_{(TM^{o}_{11})_{L_M}}$$

B. For the square cross-section horn

$$\phi_{(TEM)_{L_p + L_R}} - \phi_{(TE^{\square}_{10})_{L_p + L_R}}$$

$$= \phi_{(TE^{\square}_{10})_{L_M}} - \phi_{(TE^{\square}_{12} + TM^{\square}_{12})_{L_M}}$$

(4) All of the phase lengths required to solve the equations are predetermined by the selected parameters of the horn except the length L_p. Solving the equation for terms of L_p we have:

$$\phi_{(TEM)_{L_p}} - \phi_{(TE^{o}_{11})_{L_p}}$$

$$= \phi_{(TE^{o}_{11})_{L_R}} + \phi_{(TE^{o}_{11})_{L_M}} - \phi_{(TEM)_{L_R}} - \phi_{(TM^{o}_{11})_{L_M}}$$

Since $\phi_{(TEM)}\,L_p = \beta_{(TEM)}$ and $\phi_{(TE^{o}_{11})_{L_p}} = \beta_{(TE^{o}_{11})}\Big|_{a_o}\,L_p$

where

$$\beta_{TEM} = \frac{2\pi}{\lambda} \text{ and } \beta_{(TE^{o}_{11})_{a_o}} = \frac{2\pi}{\lambda_{g\,TE^{o}_{11}\,a_o}}$$

then

$$L_p\,(\beta_{TEM} - \beta_{(TE^{o}_{11})_{a_o}}) = \phi_{(TE^{o}_{11})_{L_R}} + \phi_{(TE^{o}_{11})_{L_M}}$$

$$- \phi_{(TEM)_{L_R}} - \phi_{(TM^{o}_{11})_{L_M}}$$

$$L_p = \frac{\phi_{(TE^{o}_{11})_{L_R}} + \phi_{(TE^{o}_{11})_{L_M}} - \phi_{(TEM)_{L_R}} - \phi_{(TM^{o}_{11})_{L_M}}}{\beta_{TEM} - \beta_{(TE^{o}_{11})_{a_o}}}$$

Similarly, for the square cross-section system

$$L_p = \frac{\phi_{(TE^{\square}_{10})_{L_R}} + \phi_{(TE^{\square}_{10})_{L_M}} - \phi_{(TEM)_{L_R}} - \phi_{(TE^{\square}_{12}+TM^{\square}_{12})_{L_M}}}{\beta_{TEM} - \beta_{(TE^{\square}_{10})_{a_o}}}$$

After calculating the phases of the given modes, the length of L_p may be predicted. It should be noted that due to junction effects and rod loading, the required length of L_p is longer than the predicted value by as much as 1.0 inch ($\Delta L_p \; \beta_{TEM - TE^{o}_{11}}{}_{a_o} = 55^{o}$) in the case of the circular cross-section system. The principal plane-fed square horn required 25^{o} additional phase and when fed on the diagonal is only 6^{o} longer than the predicted value for L_p.

The theoretical rod loading of the TE_{11} mode was analyzed for the circular cross-section (Section 2.1.3) and the results showed that the effects should be negligible. It would apppear that a junction effect at the rod termination planes is causing the excitation phase of the TM^{o}_{11} mode to be other than that predicted. Extended investigation of this effect was not possible at this time so that the final determination of L_p must be done empirically by observing pattern characteristics.

(5) In conjunction with the rod termination junction effect, there occurs a pronounced resonance condition that is cyclic at frequencies where the total rod length is $\frac{n\lambda}{2}$. It is possible to reduce this resonance effect by a series of discs located $\frac{n\lambda}{4}$, where n is odd from the rod feed point. Referring to Table I containing the conical horn rod resonance analysis, the first two columns give wavelength and frequency of resonances and anti-resonances for the total rod length. The other columns give similar data for the disc locations. The first disc has an anti-resonance at approximately 8.0 Gc where the total rod length is resonant. The discs themselves create resonances which appear to be minor compared to the rod length resonances except at 7.0 Gc. This resonance is created primarily by the third disc although there are others existing around this frequency. With additional discs this resonance could no doubt be minimized. Tables II and III contain similar data for the rectangular horn configuration.

(6) The flare of the conical rods was chosen to maintain approximately a constant impedance for the TEM mode in the horn, but is not believed to be critical as some reasonable results were obtained with constant diameter rods. Tapered sections were added to the feed points which improved the uniformity of the coupling to the TEM mode over the frequency band. The rod spacing, center to center, is nominally half the diameter or width as the case may be. The insertion depth of the rods was experimentally determined and has an effect on the amount of coupling to the TEM mode and consequently determines the excitation coefficient of TM_{11}° or $(TE_{12}^{\square} + TM_{12}^{\square})$ modes in their respective waveguides.

TABLE I

CONICAL HORN ROD RESONANCE

	Entire Rod		First Disc		Second Disc		Third Disc	
	Rod length/X = 11.050/X		10.740/X		10.360/X		10.050/X	
X No. of Wave-lengths	λ in.	f Gc	λ in.	f Gc	λ in.	f Gc	λ in.	f Gc
6.0	1.842	6.409	1.790	6.594	1.727	6.836	1.675	7.046
6.25	1.768	6.676	1.718	6.868	1.658	7.120	1.608	7.340
6.5	1.700	6.943	1.652	7.143	1.594	7.405	1.546	7.634
6.75	1.637	7.210	1.591	7.418	1.535	7.690	1.489	7.927
7.0	1.579	7.477	1.534	7.693	1.480	7.975	1.436	8.221
7.25	1.524	7.744	1.481	7.967	1.429	8.260	1.386	8.514
7.5	1.473	8.011	1.432	8.242	1.381	8.545	1.340	8.808
7.75	1.426	8.278	1.386	8.517	1.337	8.829	1.297	9.102
8.0	1.381	8.454	1.343	8.792	1.295	9.114	1.256	9.395
8.25	1.339	8.812	1.302	9.066	1.256	9.399	1.218	8.689
8.5	1.300	9.079	1.264	9.341	1.219	9.684	1.182	9.982
8.75	1.263	9.346	1.227	9.616	1.184	9.969	1.149	10.276
9.0	1.228	9.613	1.193	9.891	1.151	10.253	1.117	10.570
9.25	1.195	9.880	1.161	10.165	1.120	10.538	1.086	10.863
9.5	1.163	10.147	1.131	10.440	1.091	10.823	1.058	11.157

$$X = \frac{\text{length}}{\lambda} = \text{number of wavelengths along rod}$$

TABLE II

SQUARE HORN - RODS IN PRINCIPAL PLANES

ROD RESONANCES

	Entire Rod		First Disc		Second Disc	
	$\frac{\text{Rod Length}}{X} = \frac{8.330}{X}$		$\frac{7.930}{X}$		$\frac{7.480}{X}$	
X No. of Wave-lengths	λ in.	f Gc	λ in.	f Gc	λ in.	f Gc
4.5	1.851	6.376	1.762	6.698	1.662	7.101
4.75	1.754	6.730	1.669	7.070	1.575	7.495
5.0	1.666	7.085	1.586	7.442	1.496	7.890
5.25	1.587	7.439	1.510	7.814	1.425	8.284
5.5	1.515	7.793	1.442	8.186	1.360	8.679
5.75	1.449	8.147	1.379	8.558	1.301	9.073
6.0	1.388	8.501	1.322	8.930	1.247	9.468
6.25	1.333	8.856	1.269	9.302	1.197	9.862
6.5	1.282	9.210	1.220	9.674	1.151	10.256
6.75	1.234	9.564	1.175	10.047	1.108	10.651
7.0	1.190	9.918	1.133	10.419	1.069	11.045

TABLE III

SQUARE HORN - RODS IN DIAGONAL PLANES

ROD RESONANCES

	Entire Rod $\frac{8.115}{X}$		First Disc $\frac{7.755}{X}$		Second Disc $\frac{7.305}{X}$		Third Disc $\frac{6.905}{X}$	
X No. of Wave-lengths	λ in.	f Gc	λ	f Gc	λ in.	f Gc	λ in.	f Gc
4.5	1.803	6.543	1.723	6.847	1.623	7.269	1.534	7.690
4.75	1.708	6.909	1.633	7.229	1.538	7.675	1.534	7.690
5.	1.623	7.270	1.551	7.608	1.461	8.077	1.381	8.545
5.25	1.546	7.636	1.477	7.990	1.391	8.483	1.315	8.974
5.5	1.475	7.998	1.410	8.369	1.328	8.884	1.255	9.399
5.75	1.411	8.363	1.349	8.751	1.270	9.290	1.201	9.829
6.	1.353	8.725	1.293	9.130	1.217	9.692	1.151	10.253
6.25	1.298	9.090	1.241	9.512	1.169	10.098	1.105	10.683
6.5	1.248	9.452	1.193	9.89	1.124	10.50	1.062	11.111
6.75	1.202	9.818	1.149	10.273				
7.0	1.160	10.120	1.108	10.654				

4.0 EXPERIMENTAL RESULTS

4.1 Conical Multimode Horn

Using the design guidelines outlined above, a final geometry for the conical multimode horn was determined as illustrated in Figure 4. Figure 4(a) shows the horn geometry and rod location, and 4(b) the details of the TEM rods. With this geometry, pattern data were taken over the scaled frequency band of 1.7 to 2.6 GHz. This data appears in Appendix II. Appendix II-A contains the linear polarized patterns for E, H, and diagonal planes and diagonal cross polarized patterns from 6.82 GHz (scaled 1.71 GHz) to 10.359 GHz (scaled 2.6 GHz). Appendix II-B contains similar data for the horn fed with orthogonal linear as a check on symmetry. The patterns for each case are nearly identical at any given frequency. Appendix II-C contains phase patterns for this horn at 8.367, 9.164, 9.562 and 10 GHz (scaled 2.1, 2.3, 2.4, and 2.51 GHz) measured about a point one-half inch behind the horn aperture. Some variation in phase center was noticed over this frequency band, probably due to rod resonances causing some phasing error. Table IV lists the approximate best phase center over the minimum band 2.1 to 2.4 GHz.

TABLE IV

CONICAL MULTIMODE HORN PHASE CENTER

Freq. (GHz)	8.367	9.164	9.562
Scaled Freq. (GHz)	2.1	2.3	2.4
E-Plane	-3	-1	+1
H-Plane	-1	0	-2"
Diagonal	-2	0	---
Phase center given in inches from horn aperture; i.e., -1 indicates one inch inside horn.			

The pattern data was analyzed using the "J. P. L. Antenna Feed Efficiency" program, and the computer output is contained in Appendix II-D. The results of this analysis are summarized in Figures 5 and 6. The spillover efficiency and total antenna efficiency for a subtended cone angle of ± 13.5 degrees are shown in Figure 5. From 1.8 to 2.6 GHz, the overall efficiency is better than 76%, with a spillover efficiency greater than 80%. At about 1.75 GHz or 7 GHz in the model, the efficiency takes a large drop due to pattern broadening. This effect is due to one of the rod resonance conditions discussed previously. By referring to Table I, it is noticed that actually several resonances occur near this frequency, the entire rod having a resonance at 6.943 GHz, the first disc at 7.143 probably cancelled by the second disc at 7.120, and the third disc at 7.046 GHz. The combined effect of these resonance effects appears at this frequency to cause serious pattern distortion. The pattern effect can be seen on the 7 GHz pattern in Appendix II-B. Figure 6 is a plot of the maximum total efficiency for the conical horn. This plot indicates a higher possible efficiency if the beamwidth variation could be reduced over the frequency band. The variation in E- and H-plane 10 dB beamwidths is shown in Figure 7.

It should be noted that the computer analysis does not include phase data for the horns, as this was not available in time to include in the analysis. However, this should not make an appreciable difference at least over the minimum band 2.1 to 2.4 GHz, as the maximum phase error to the 10 dB points is no worse than 30 degrees in any plane. This should not reduce the overall gain by more than about 2% or 0.1 dB. Also, the cross polarization of the multimode horn is in general better than a conventional horn. Measured cross polarization on the model at 9.164 GHz was found to be only 18 dB with no multimoding. For the patterns in Appendix II-A, the cross polarization is generally between -20 and -28 dB, except for particular resonance conditions which could probably be improved by additional discs.

Figure 8 is a plot of the input VSWR to the multimoded horn. Over most of the band this is below 1.26, until the resonance condition near 7.0 GHz is approached. Here again the resonance effect is seen to cause disruptions with the VSWR going to 2.4 at 7.0 GHz. This match does not represent the best possible condition as no concerted attempt was made to lower the VSWR.

4.2 Rectangular Horn

Two configurations of rod placement were investigated in the rectangular (or square cross section) horn. First, the rods were placed in the principal planes of the horn, and an attempt made to obtain broadband performance. Some success was achieved; however, a more promising approach appeared to be with the rods in the diagonal planes. For this reason, rectangular horn data was taken only over the minimum bandwidth 2.1 to 2.4 GHz (scaled).

The geometry of this horn is shown in Figure 9, detailing both the horn and rod parameters. Appendix III contains the pattern, phase, and computer efficiency data for this case, with similar data to that discussed for the conical horn. The results are summarized in Figures 10, 11, and 12, which again illustrate the spillover efficiency, total antenna efficiency and beamwidth variation for the feed. The design goal of 75% overall efficiency was nearly achieved over the band for the $\pm 13.5^{o}$ subtended angle, except for one region. Figure 11 indicates the problem is mainly due to pattern shape, as the maximum overall efficiency disregarding subtended angle, is greater than 75% over the entire band. A plot of the 10 dB beamwidths, Figure 12, illustrates the beamshape problem, showing a variation of 12 degrees over the minimum bandwidth. Figure 13 is a plot of the input VSWR for this geometry.

The problems encountered with this configuration may be more fully appreciated by briefly considering the boundary conditions for the multimode control section. For the conical horn, it is possible to solve the TEM mode field problem by imaging the two rods with two additional rods outside the waveguide,[2] Figure 14. This is also true for the diagonal fed horn as shown in Figure 14(b) where six images complete the solution. However

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[2]Smythe, W. R., "Static and Dynamic Electricity," McGraw-Hill, New York, 1950, p. 70.

for the rectangular horn-principal plane fed, an infinite, or at least large number of images are required to meet the boundary conditions. This problem was not analyzed in detail, but may lead to better understanding of the restrictions on the design of this type feed.

4.3 Diagonal Fed Rectangular Horn

The horn geometry for the diagonal fed configuration appears in Figure 15. Time did not permit as detailed an investigation of this configuration as was devoted to the conical horn; however, the preliminary results obtained were encouraging. Appendix IV contains the patterns, phase plots, and efficiency analysis over the scaled frequency band 1.9 to 2.6 GHz. Scaling requirements on this geometry resulted in a horn lower in the frequency band than the conical horn, and this lower frequency was limited by the test setup.

The results are summarized in Figures 16 through 18. The total efficiency for a subtended angle of ± 13.5 degrees is not quite 75% over the minimum band, but analysis of Figure 17 indicates again the problem is in the beamwidth. Figure 18 illustrates the beamwidth variation. The VSWR for this horn is plotted in Figure 13. Referring to Appendix III and IV, it is noticed that the cross polarization for the diagonal fed horn is slightly better than the principal plane fed case averaging about -20 dB; however, neither is as good as the conical horn. A comparison of the cross polarization for the three cases is made in Table V.

As these results represent only a small effort to develop the diagonal horn, it is expected that the results obtained here could be significantly improved. More effort is required to reduce the resonance effects, which can be accomplished by correct disc placement. Also, it was felt that the scaling limitations applied perhaps did not result in the optimum mode cutoff characteristics for this case. Further development would probably result in a feed comparable to the conical multimode case.

TABLE V

DIAGONAL PLANE CROSS POLARIZATION LEVEL

CONICAL HORN			SQUARE HORN			
f(Gc)	Scaled f(Gc)	-dB	f(Gc)	Scaled f(Gc)	Norm. Fed -dB	Diag. Fed -dB
1.71	6.82	23.	1.91	6.82		19.0
1.91	7.6	21.2	2.1	7.487	16.3	21.2
2.1	3.367	28.	2.24	8.0		22.8
2.3	9.164	23.3	2.3	8.2	21.0	17.0
2.4	9.562	20.8	2.4	8.556		20.4
2.51	10.	16.7	2.6	9.27	17.3	17.0
2.6	10.359	21.0				

5.0 SUMMARY AND RECOMMENDATIONS

The results of this study have established the feasibility of obtaining broadband multimode performance from both conical and rectangular horns. The results obtained for the conical horn are significantly better than the rectangular horn; however, this appears mainly due to the more concerted effort applied to the conical horn development. It is expected the diagonal plane fed horn could equal the conical horn performance. Figure 19 illustrates the degree of broadband pattern shaping achieved with this design, representing a series of patterns taken over the band 8 to 10 GHz. The small beamwidth variation and low sidelobe level is typical of the results obtainable over large bandwidths by this method.

Several factors remain which should be further investigated. Some of these are:

a) The technique of resonance analysis illustrated in Tables I, II, and III of the design procedure was not arrived at until late in the program. In retrospect, it appears that further development based on such an analysis would improve the resonance cancellation, probably resulting in improved efficiency, VSWR and cross polarization over the frequency band.

b) Further effort is required to improve the rod input matching for better overall input VSWR.

c) Theoretical analysis of the mode cutoff characteristics at each end of the rod, including experimental investigation of the patterns for various conditions, may lead to a more optimum design from bandwidth considerations.

d) Possible use of the $TE^{\square}_{30}$ mode in the rectangular horn, and the TE°_{12} mode in the conical horn may permit even more pattern shape control, probably over a somewhat more limited bandwidth.

e) Investigation of rod support structure for high power capability.

f) Analysis of the field configuration of the TEM mode in the rectangular geometries by image techniques, as was done for the circular multimode section, thus leading to a better field matching technique at the end of the rods.

g) Further investigation of the junction phase effect and rod excitation coefficients to enabel a more concise design procedure would also be desirable.

Incorporation of the above topics into the multimode horn development program should result in an efficient design procedure for broadband, high performance multimode horn feed systems.

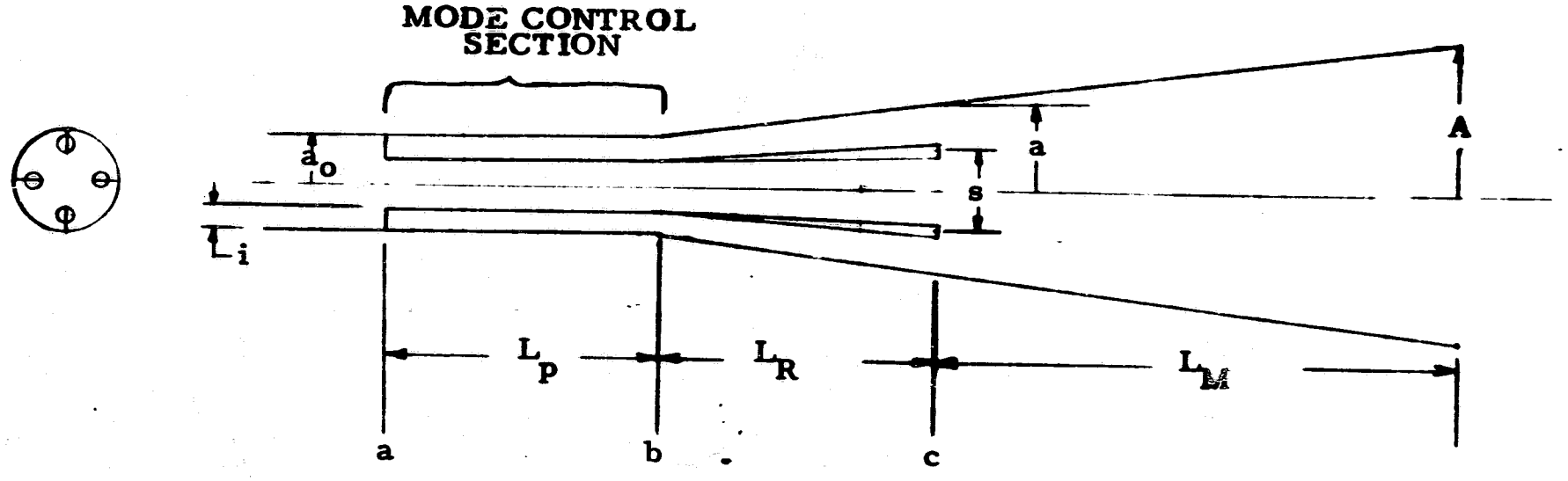
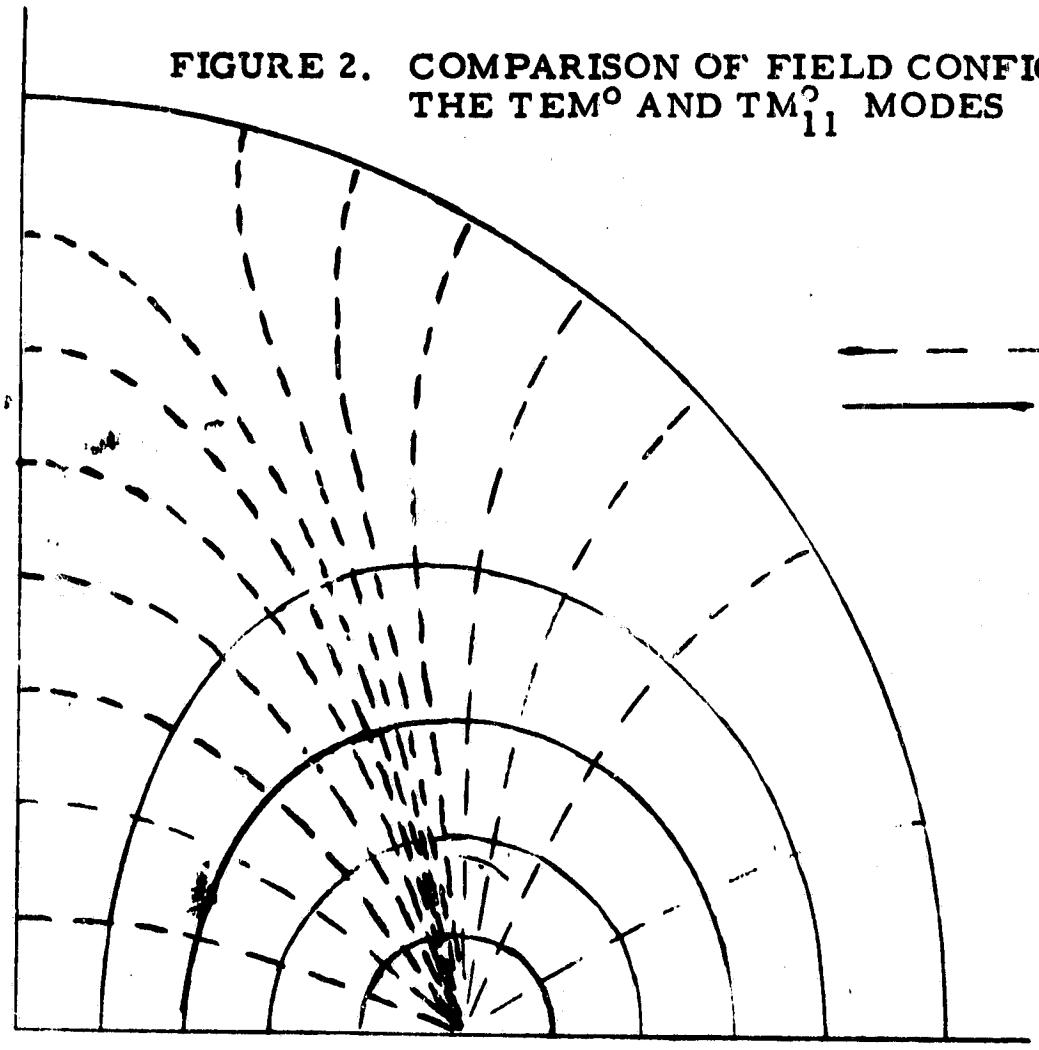
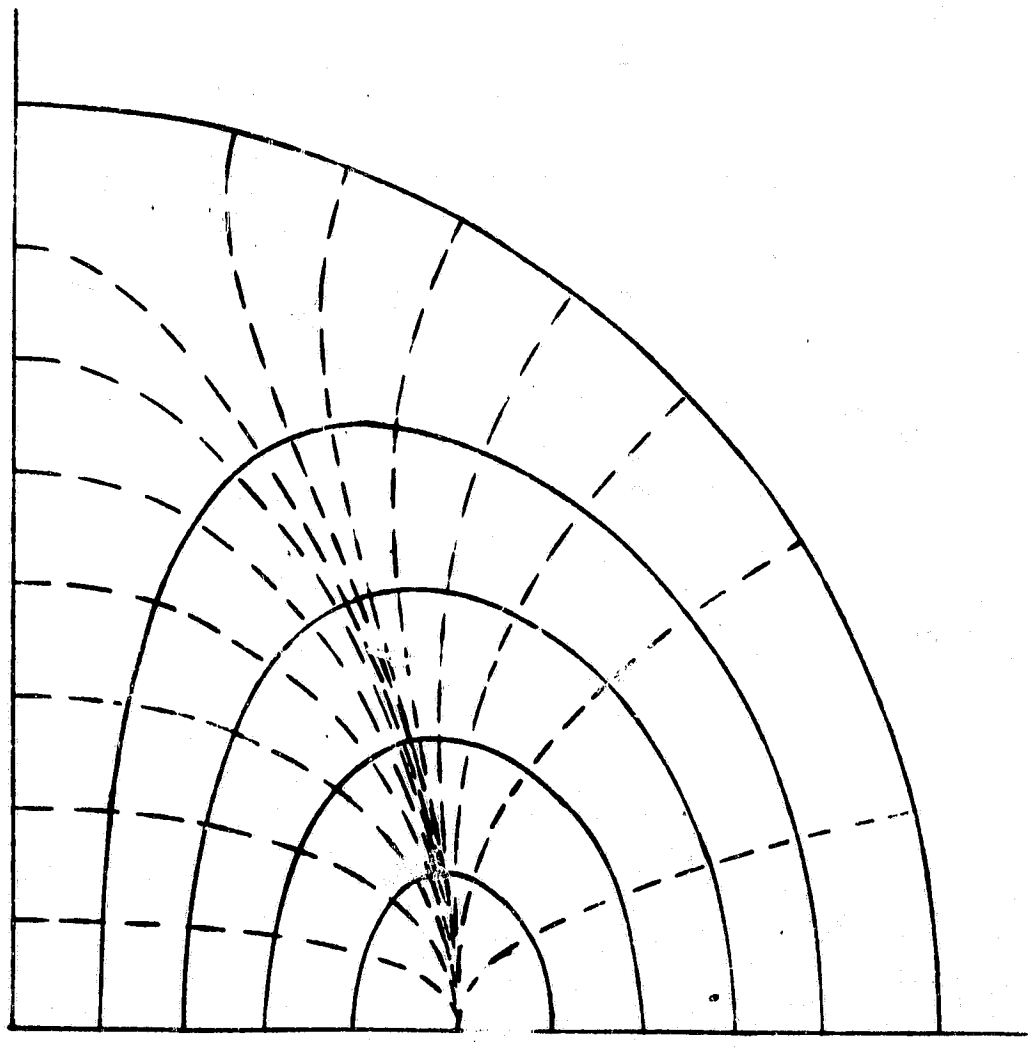


FIGURE 1. CONICAL MULTIMODE HORN PARAMETERS

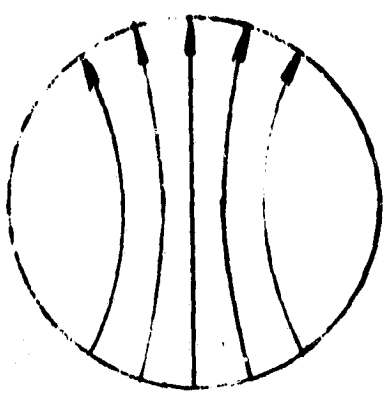
FIGURE 2. COMPARISON OF FIELD CONFIGURATION OF THE TEM^{o} AND TM$^{o}_{11}$ MODES



(a) TEM MODE ON TWO WIRES IN A CIRCULAR GUIDE

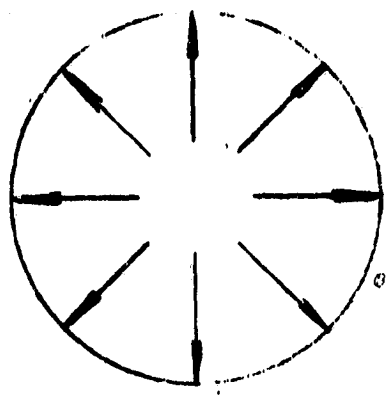


(b) TM$^{o}_{11}$ MODE IN CIRCULAR GUIDE



TE_{11}

$\lambda_c = 3.412\ a$



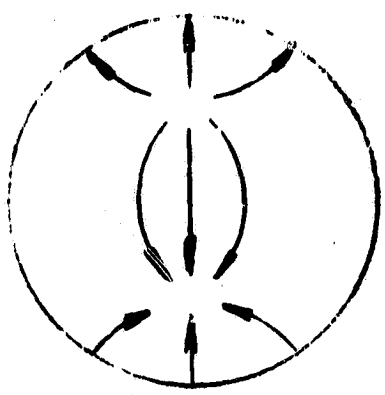
TM_{01}

$\lambda_c = 2.613\ a$



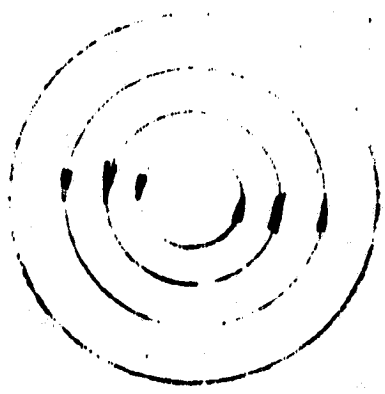
TE_{21}

$\lambda_c = 2.057\ a$



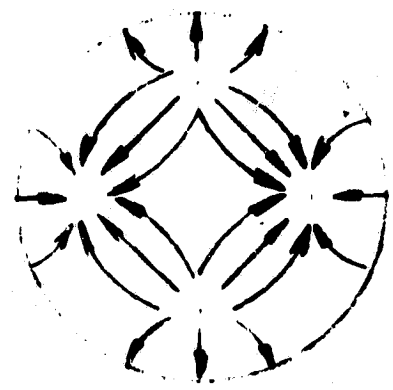
TM_{11}

$\lambda_c = 1.640\ a$



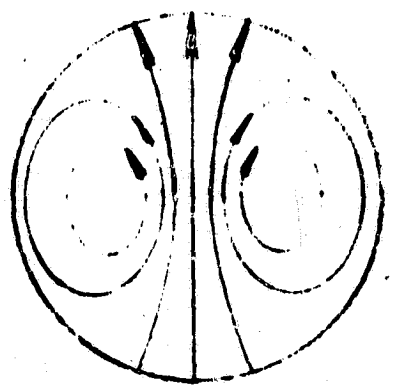
TE_{01}

$\lambda_c = 1.640\ a$



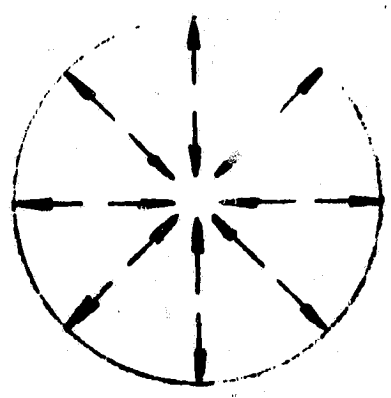
TM_{21}

$\lambda_c = 1.224\ a$



TE_{12}

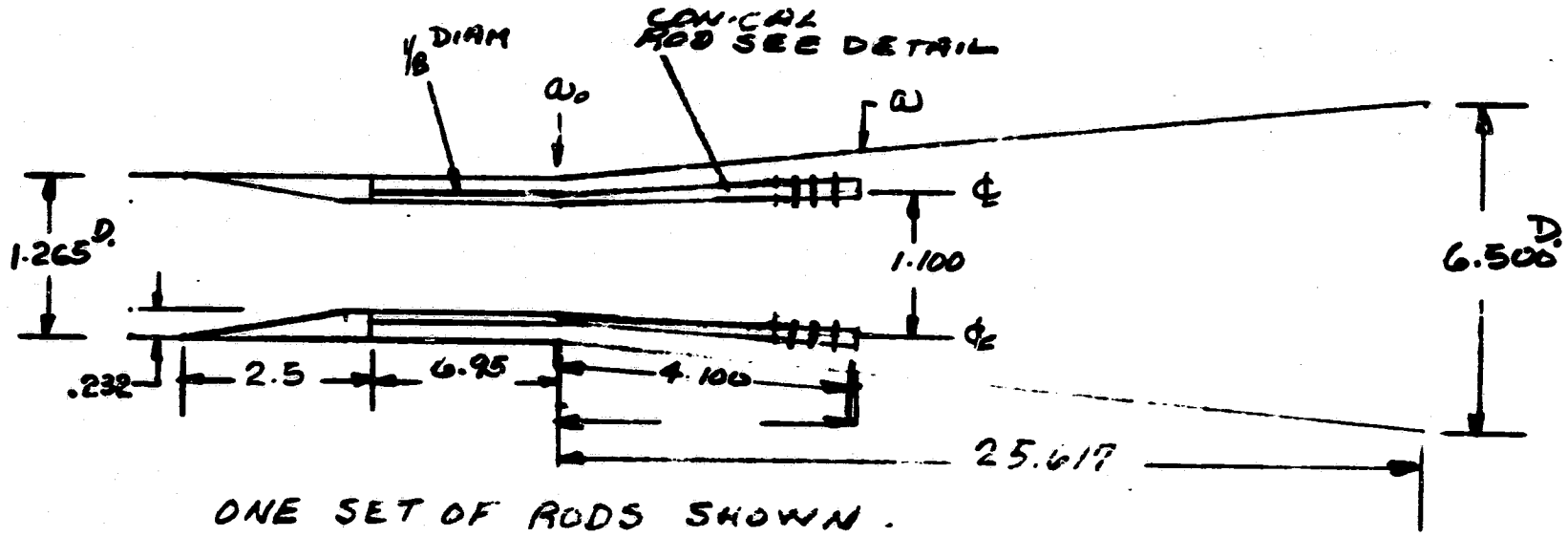
$\lambda_c = 1.179\ a$



TM_{02}

$\lambda_c = 1.138\ a$

FIGURE 3
CIRCULAR WAVEGUIDE MODE CHARACTERISTICS



ONE SET OF RODS SHOWN.

ORTHOGONAL PLANE IS SYMMETRICAL

HORN FLARE ANGLE θ = 5°50' TAN θ = .10216

a_o = RADIUS AT HORN THROAT = .6525

a = RADIUS AT ROD TERMINATION =

FIGURE 4(a). CONICAL MULTIMODE HORN GEOMETRY

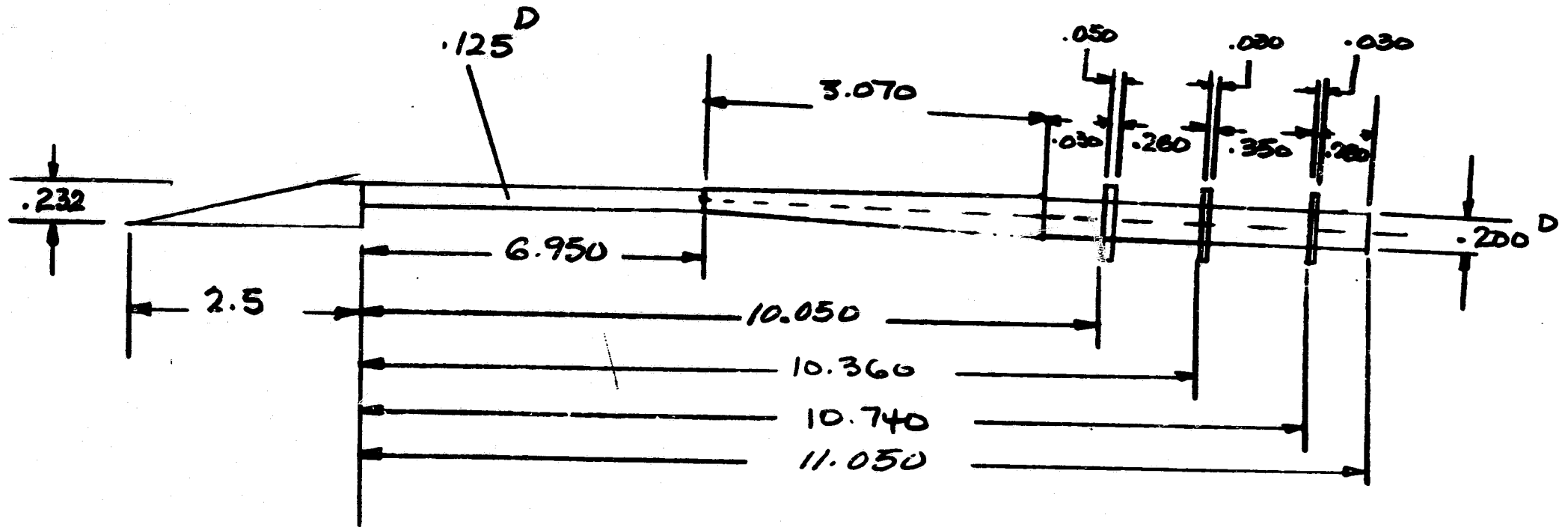


FIGURE 4(b). CONICAL MULTIMODE HORN ROD DETAIL

FIGURE 5. CONICAL MULTIMODE HORN
EFFICIENCY VS. FREQUENCY
$\alpha = 13.5^{\circ}$

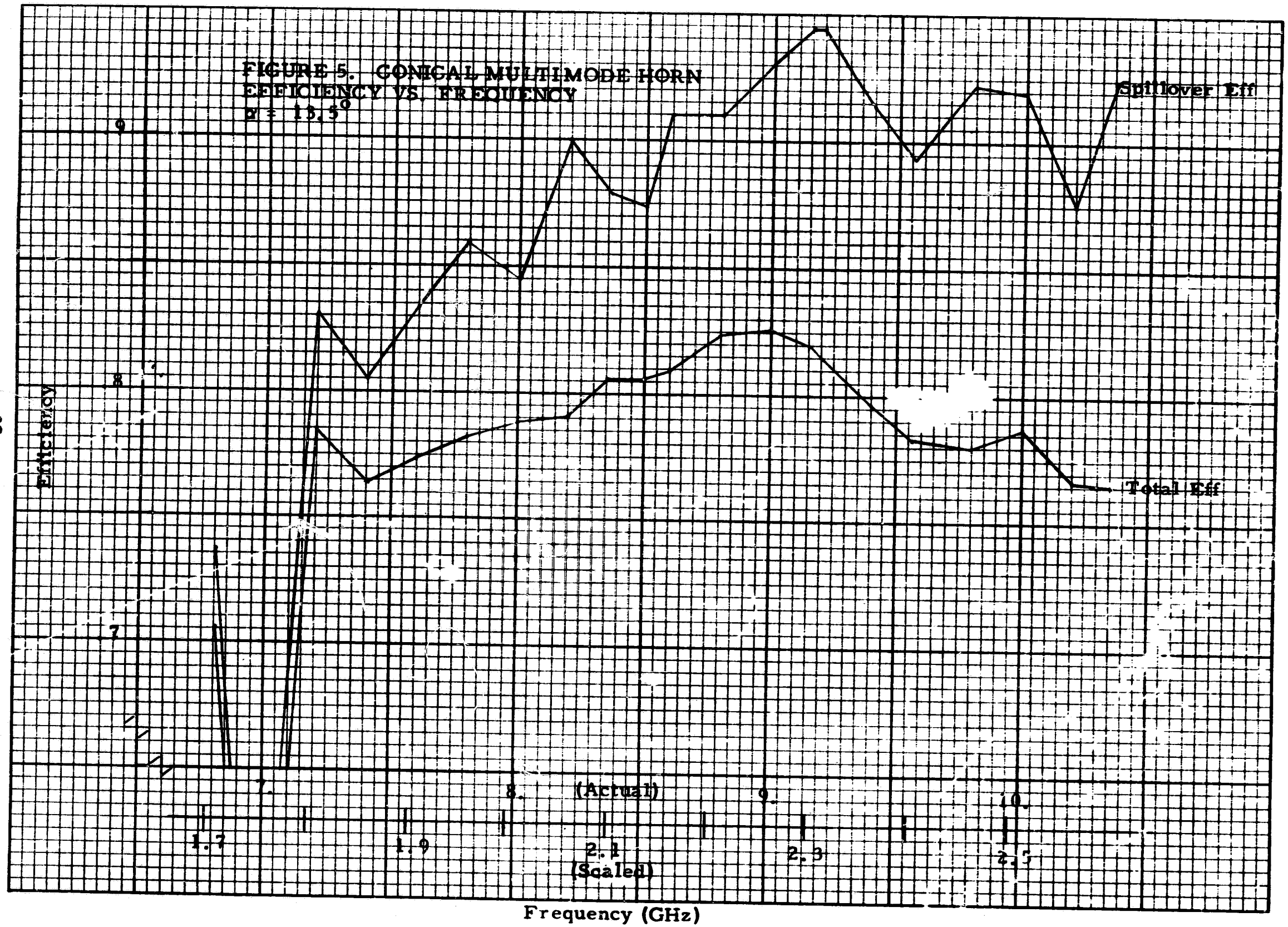


FIGURE 6. CONICAL MULTIMODE HORN
MAX. EFFICIENCY VS. FREQ.

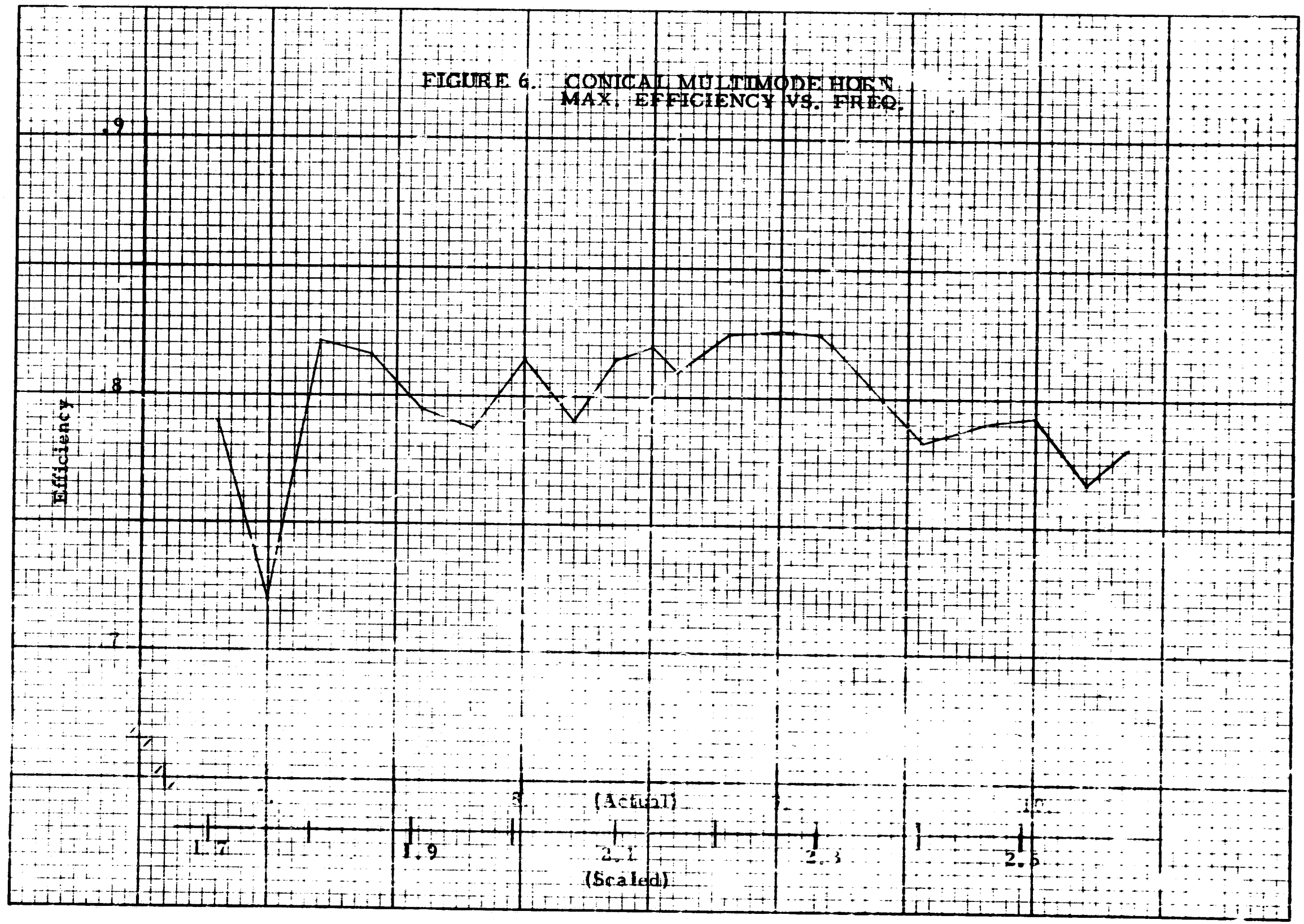


FIGURE 7. CONICAL MULTIMODE HORN
10 dB BEAMWIDTH VS. FREQ.

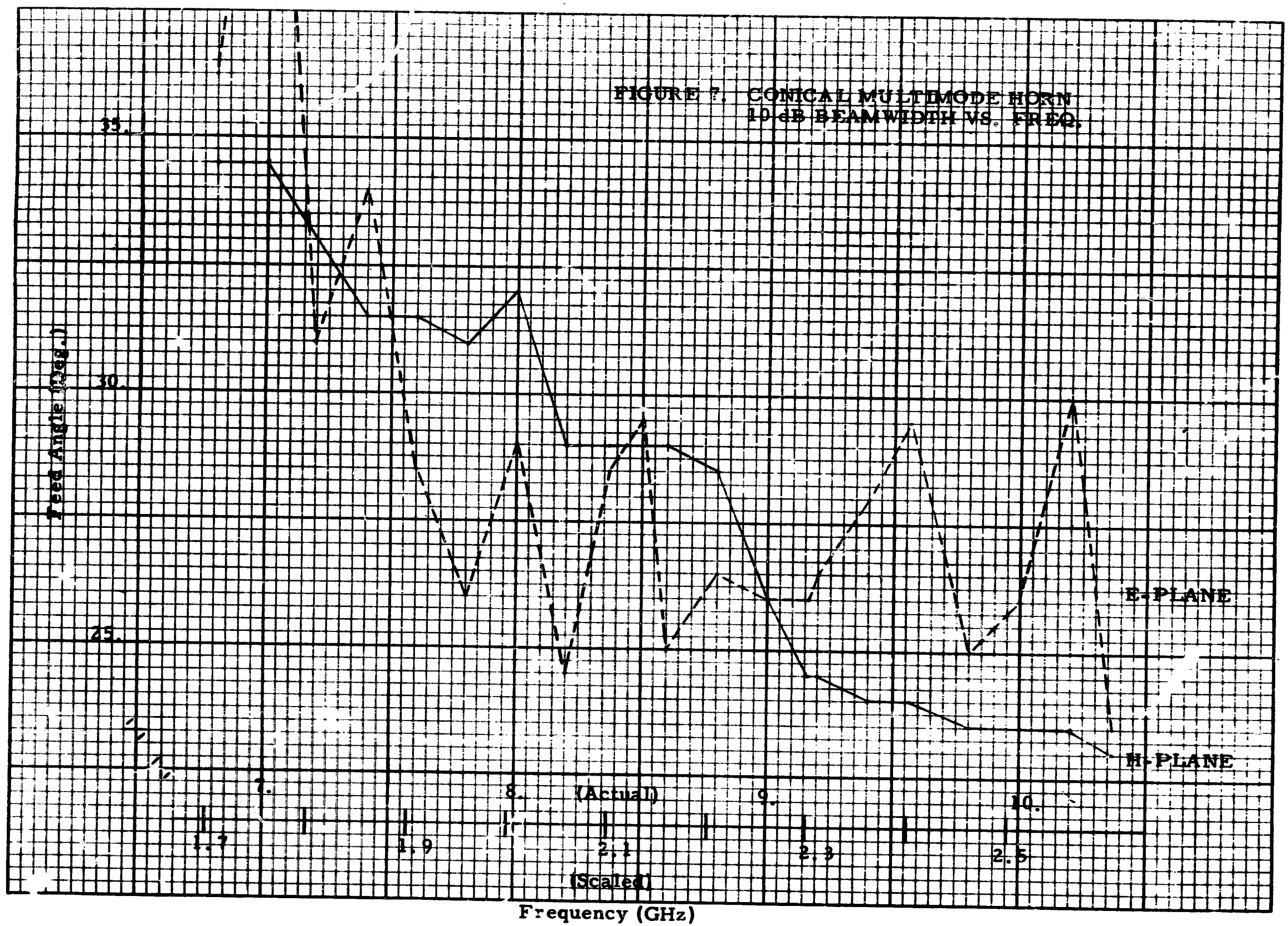


FIGURE 8. CONICAL MULTIMODE HORN
VSWR VS. FREQUENCY

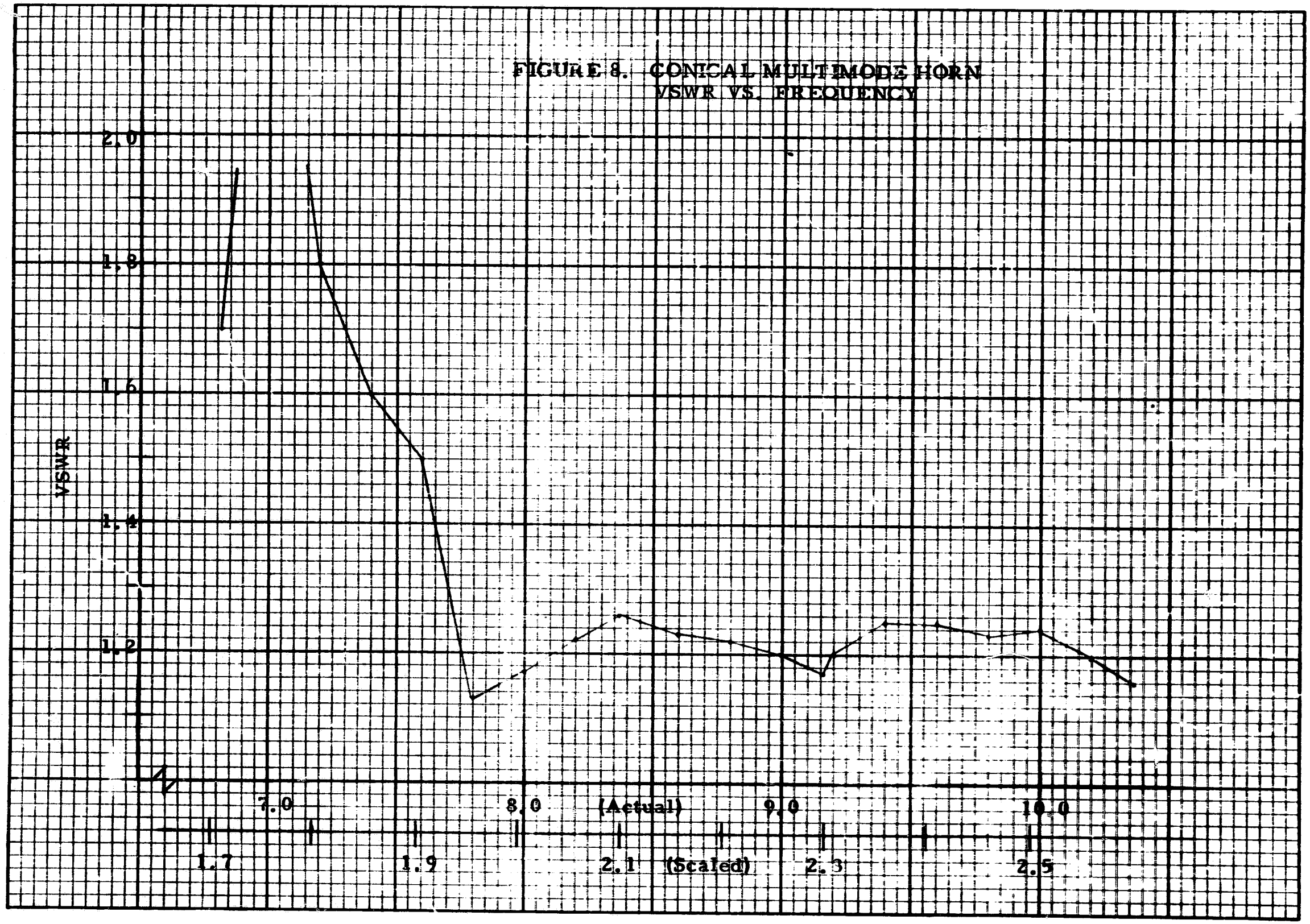
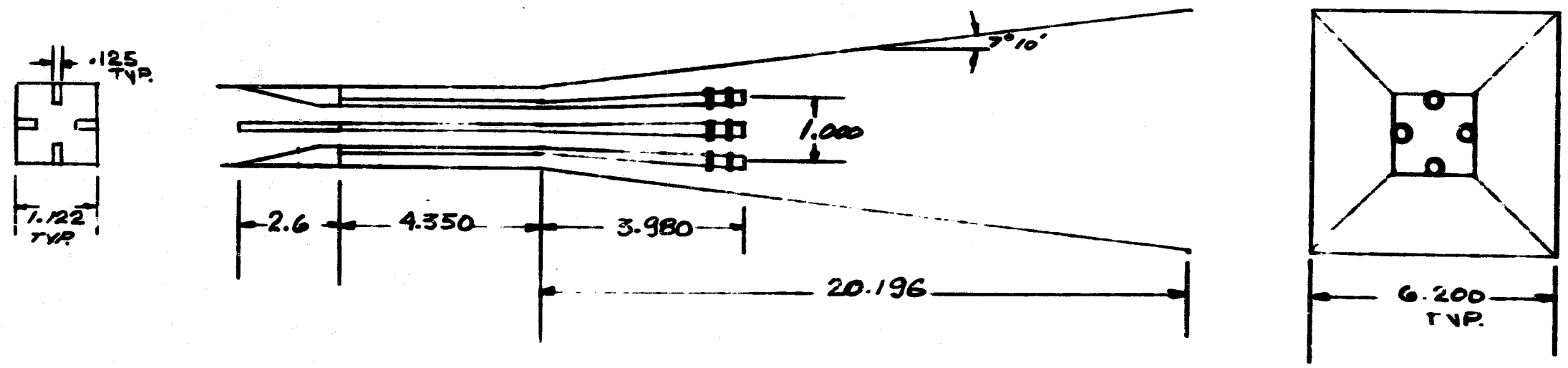
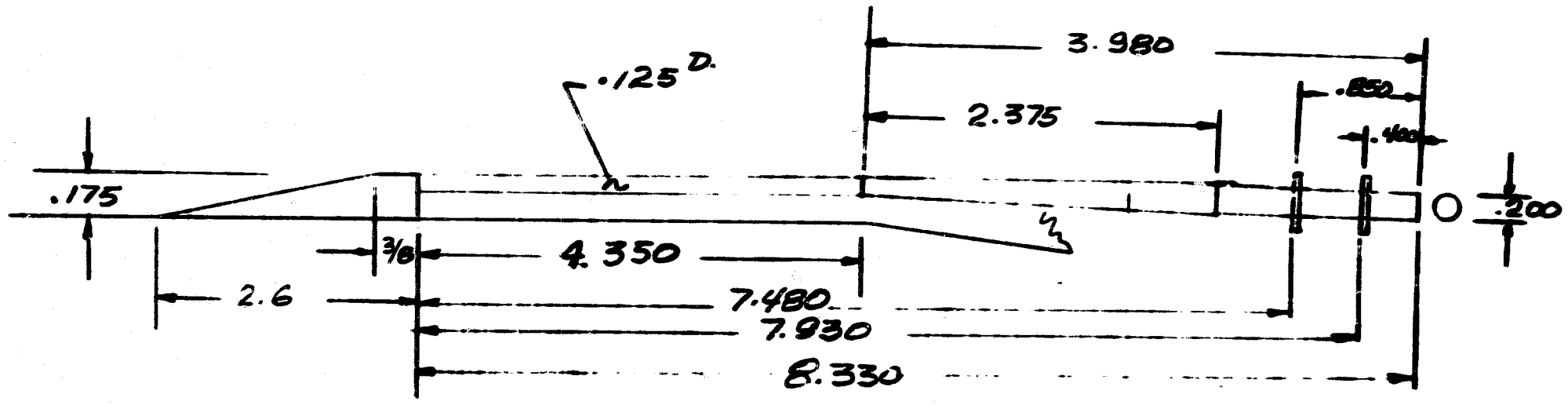


FIGURE 9. RECTANGULAR MULTIMODE HORN GEOMETRY





ROD DETAIL

DIS. DIAM. C.325 x .050

FIGURE 10. RECTANGULAR MULTIMODE HORN
PRINCIPAL PLANE FEED EFFICIENCY
VS. FREQUENCY
$\theta = 13.5^{\circ}$

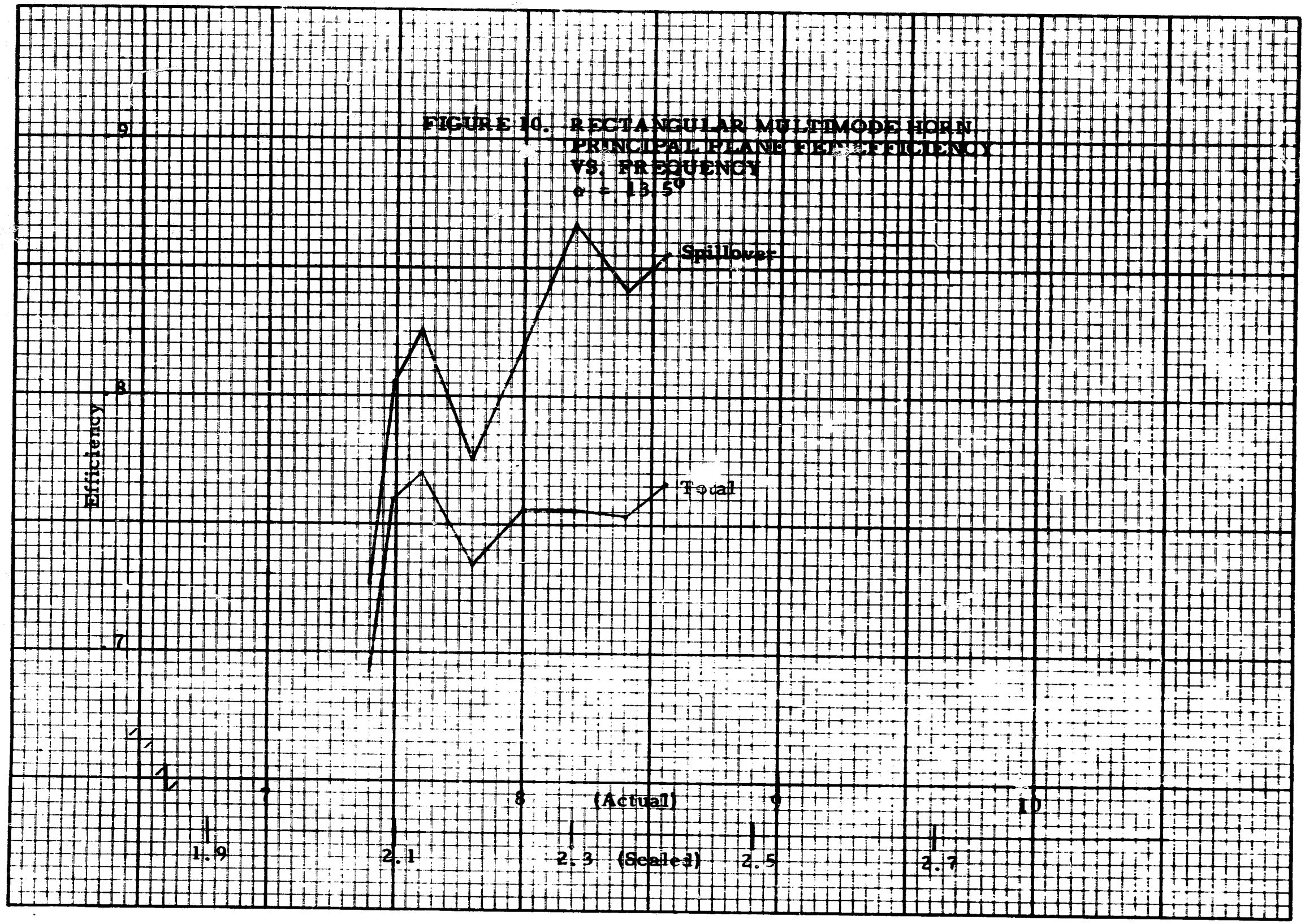


FIGURE 11. RECTANGULAR MULTIMODE HORN
PRINCIPAL PLANE FED
MAX. EFFICIENCY VS. FREQUENCY

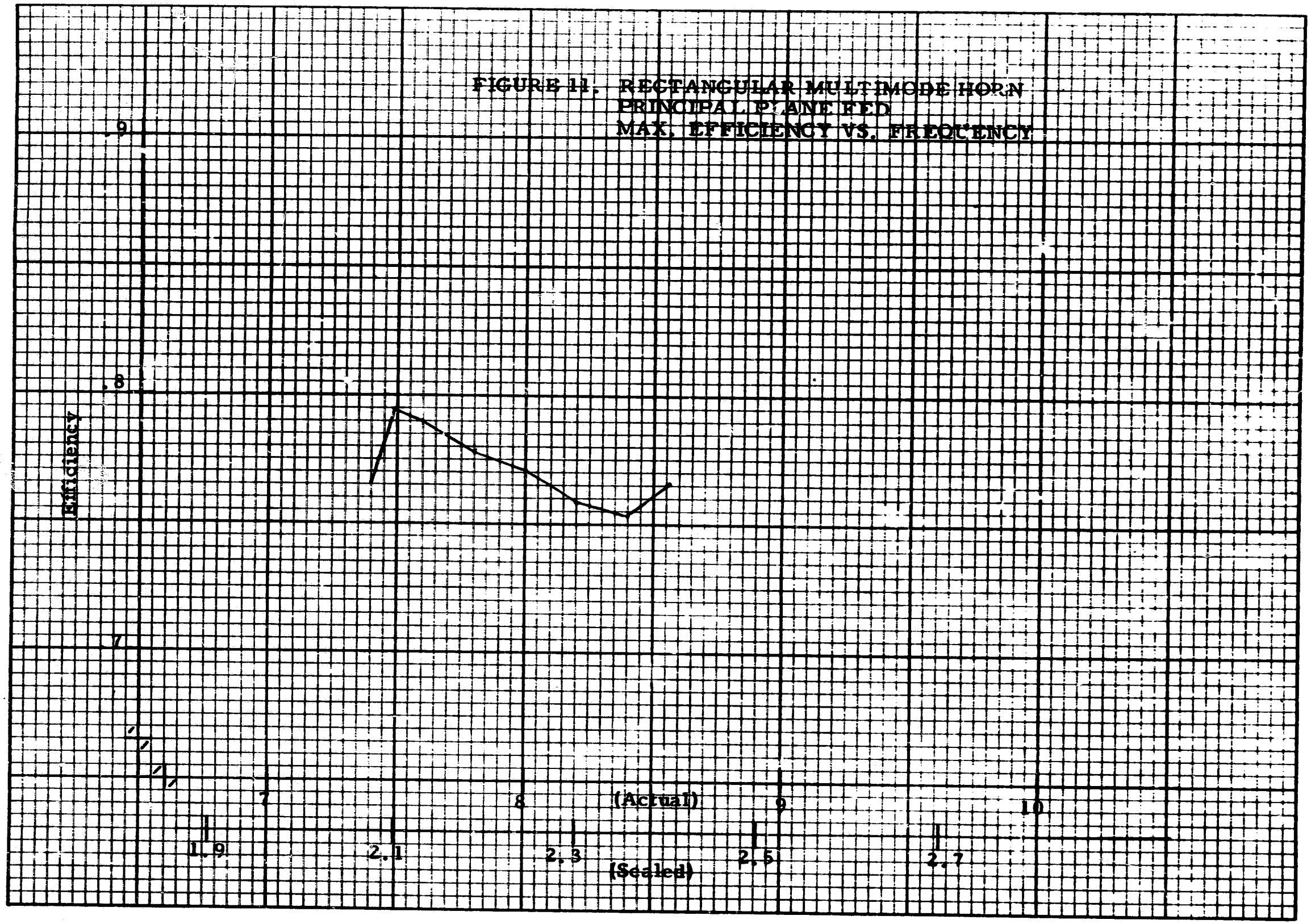


FIGURE 12. RECTANGULAR MULTIMODE HORN
PRINCIPAL PLANE FED
10 dB BEAMWIDTH VS. FREQUENCY

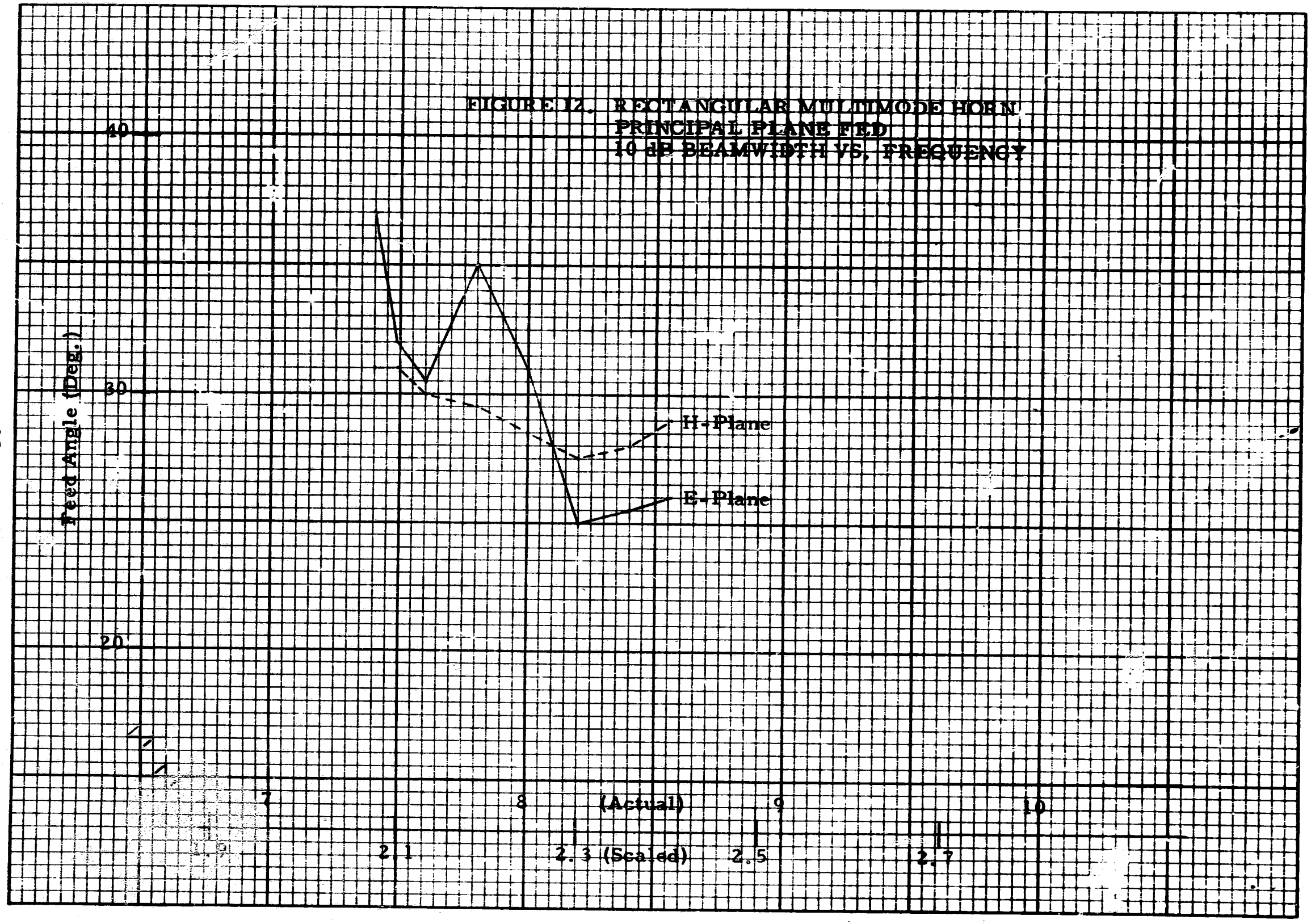
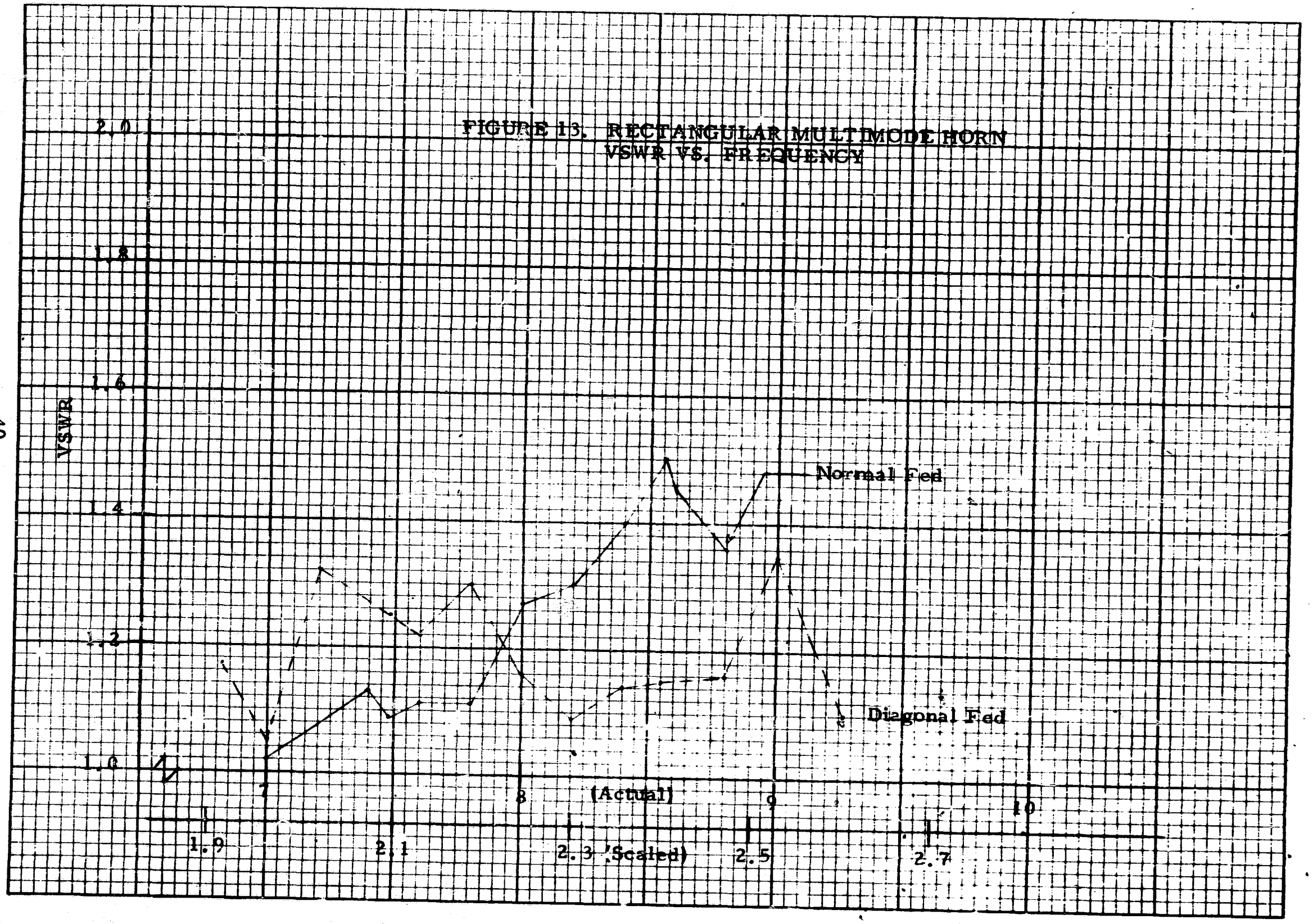
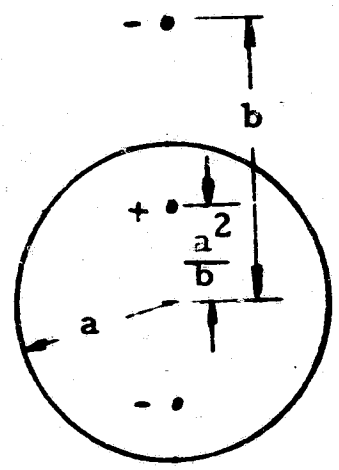
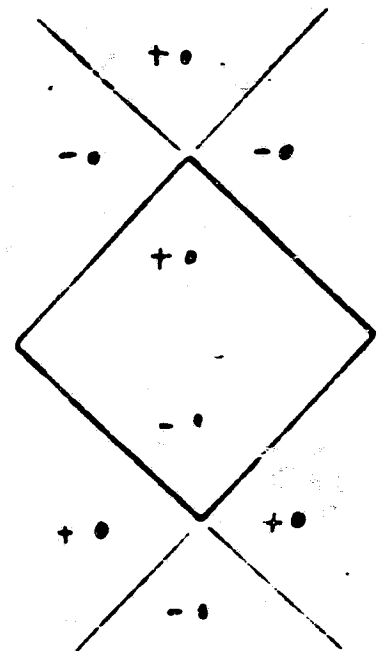


FIGURE 13. RECTANGULAR MULTIMODE HORN
VSWR VS. FREQUENCY

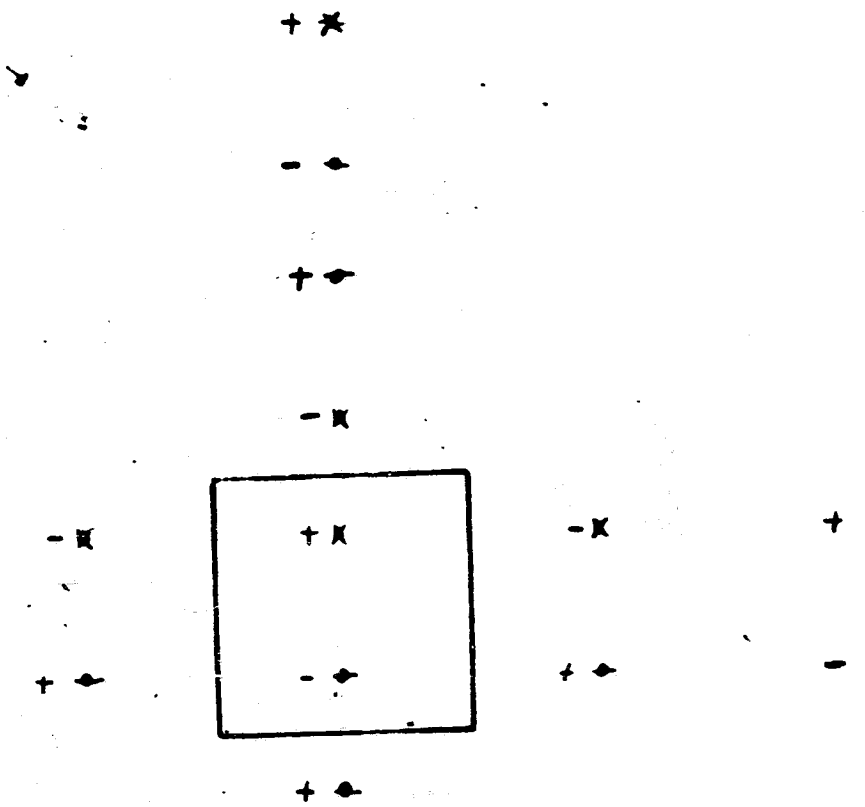




(a) Wires In Cylinder



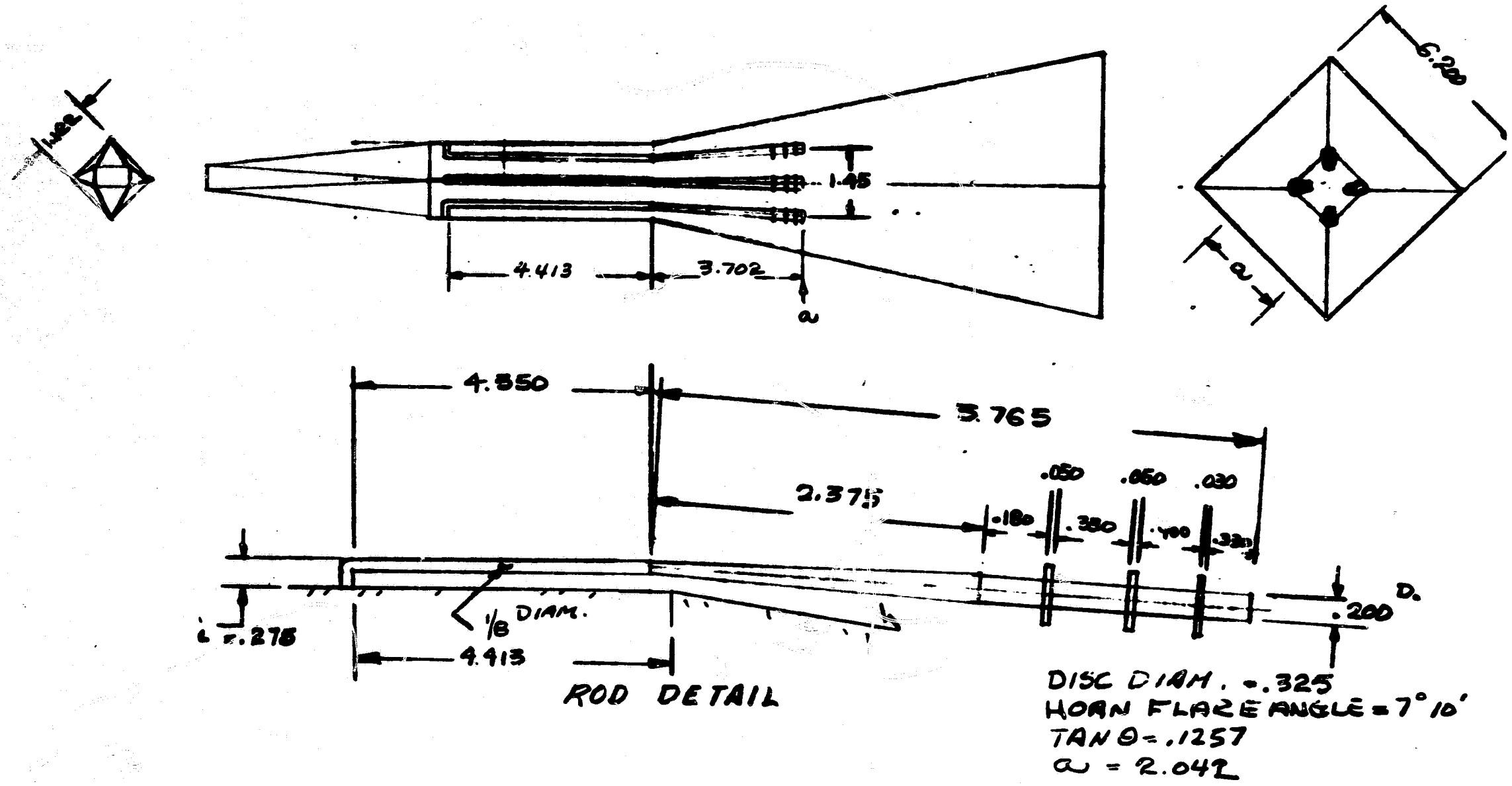
(b) Wires On Diagonals



(c) Wires In Square

FIGURE 14. TEM LINE IN CYLINDRICAL GUIDE IMAGES

FIGURE 15. DIAGONAL FED HORN - GEOMETRY



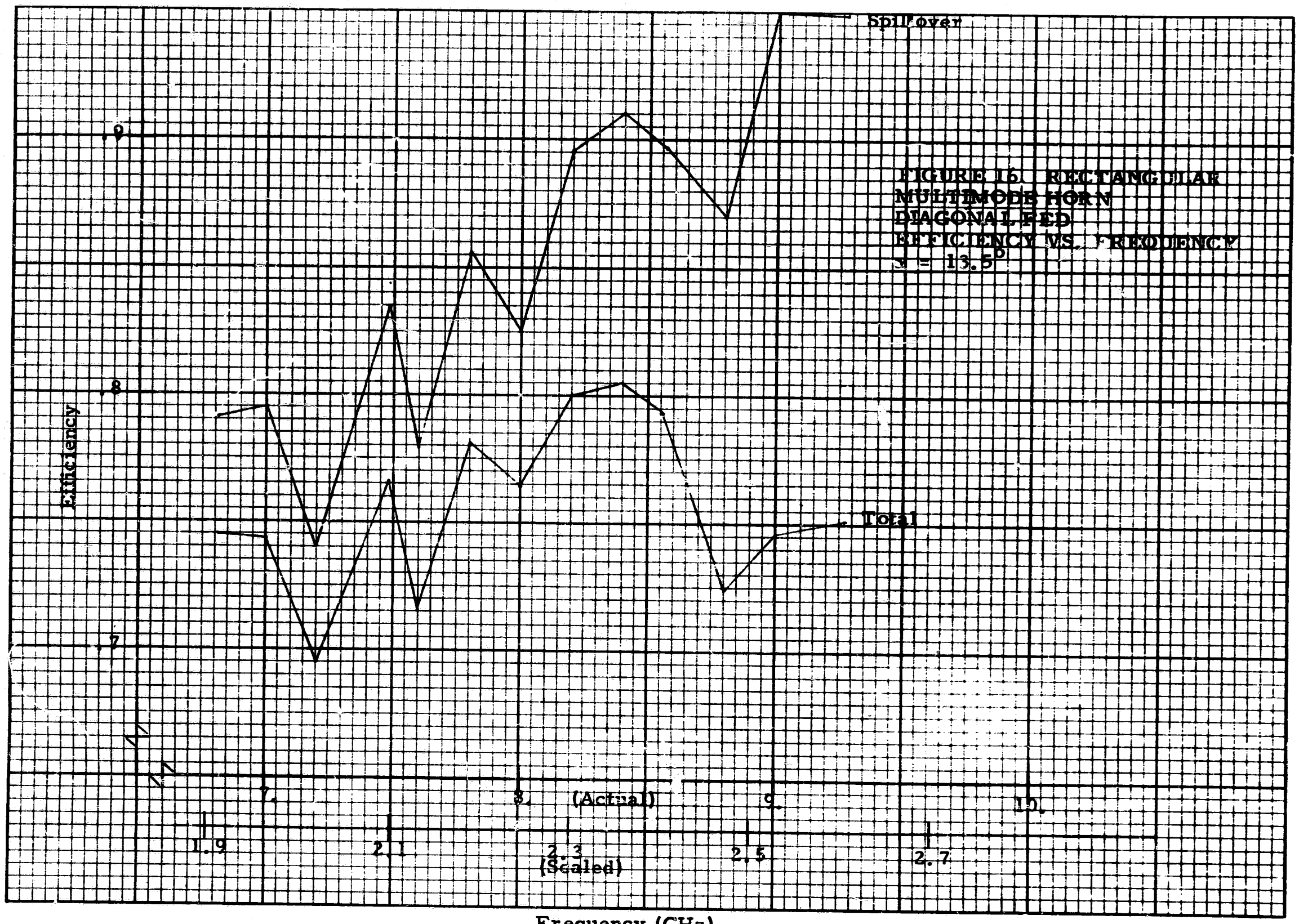


FIGURE 16. RECTANGULAR MULTIMODE HORN DIAGONAL FED EFFICIENCY VS. FREQUENCY $\psi = 13.5^{\circ}$

Frequency (GHz)

FIGURE 17. RECTANGULAR MULTIMODE HORN
DIAGONAL PLANE FED
MAX. EFFICIENCY VS. FREQUENCY

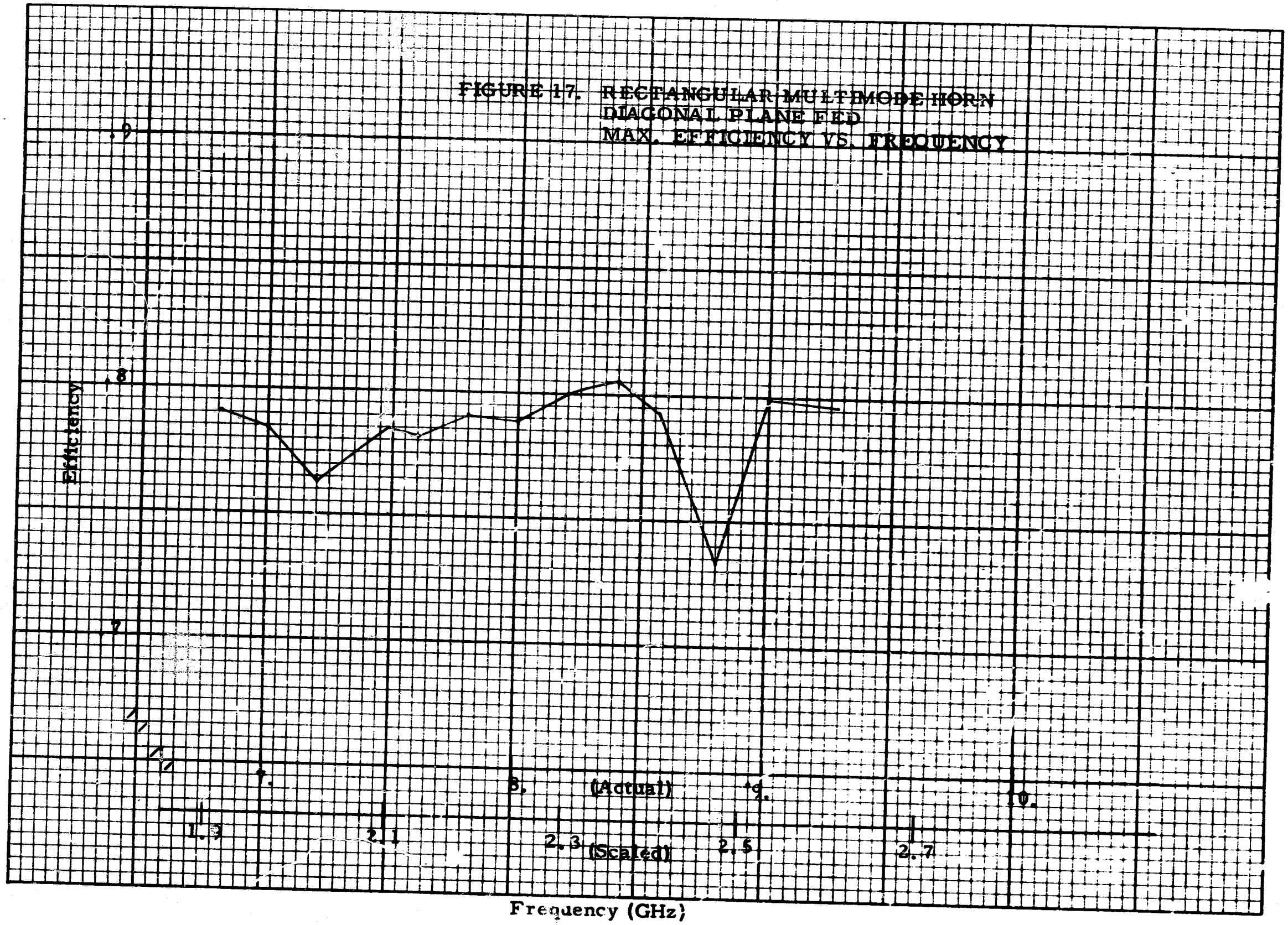
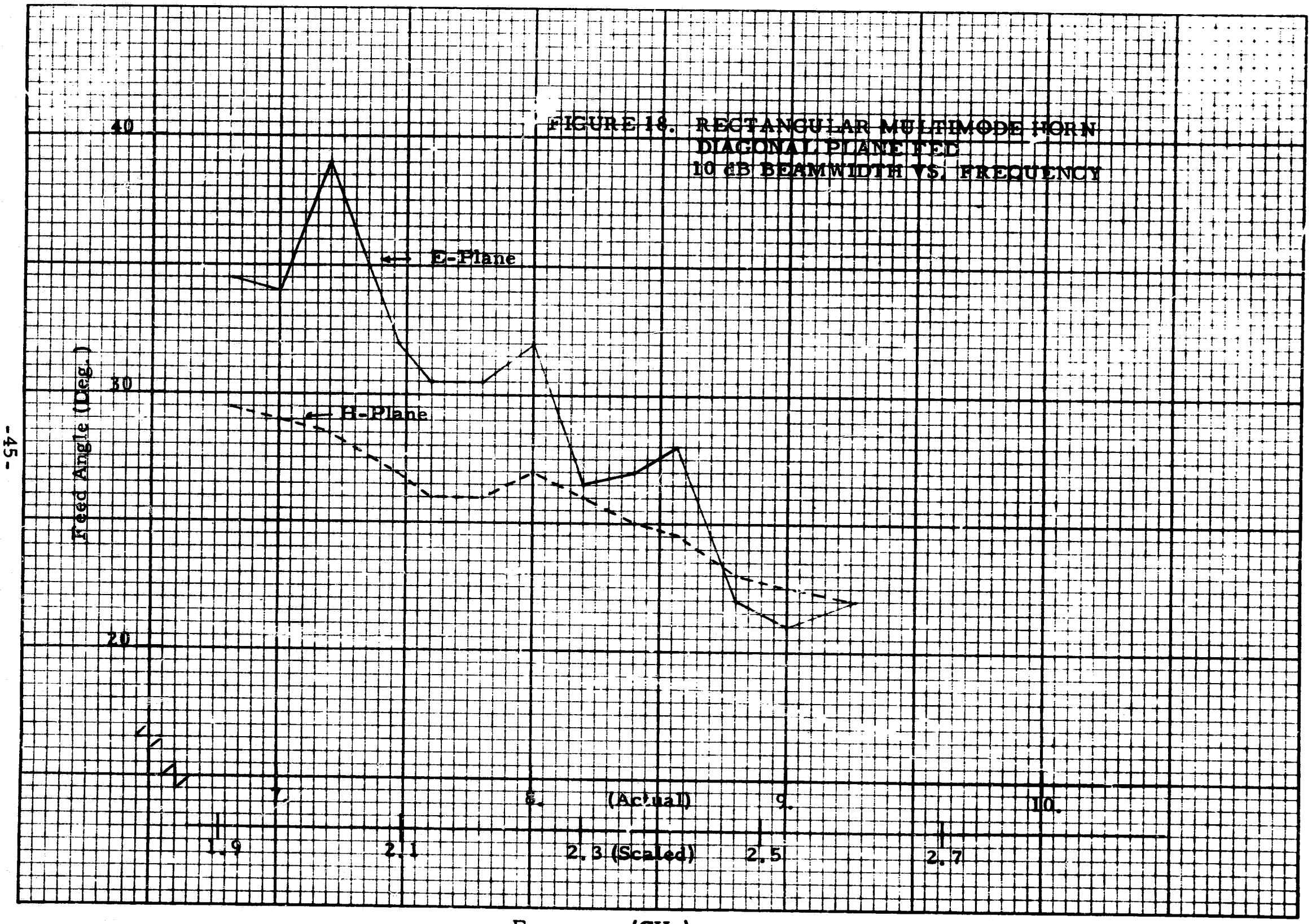


FIGURE 18. RECTANGULAR MULTIMODE HORN
DIAGONAL PLANE FED
10 dB BEAMWIDTH VS. FREQUENCY



ANTENNA PATTERN

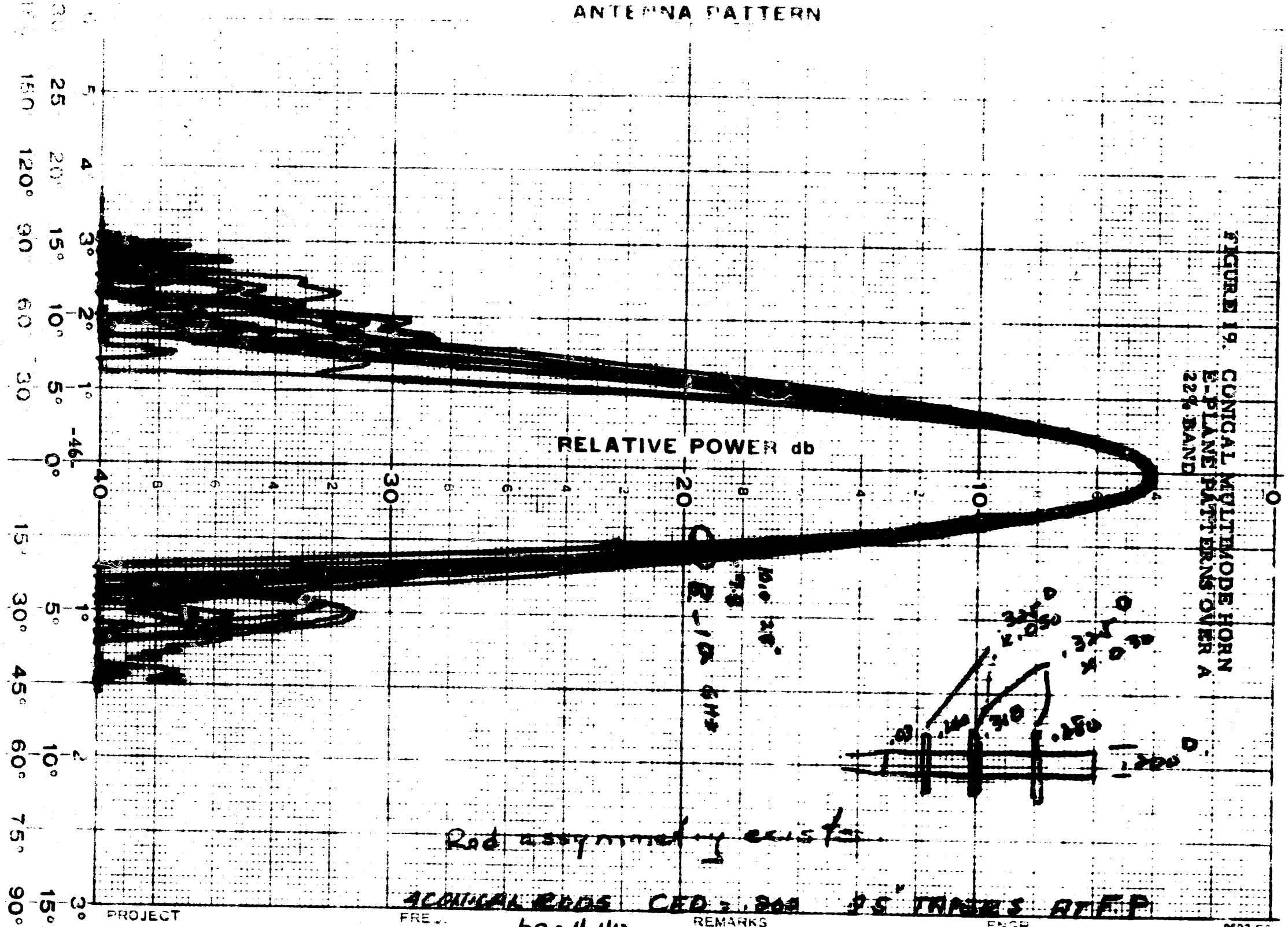


FIGURE 19. CONICAL MULTIMODE HORN

LE = 4.110
LD = 6.967
L = .732 FCT
S = 1.040 CED

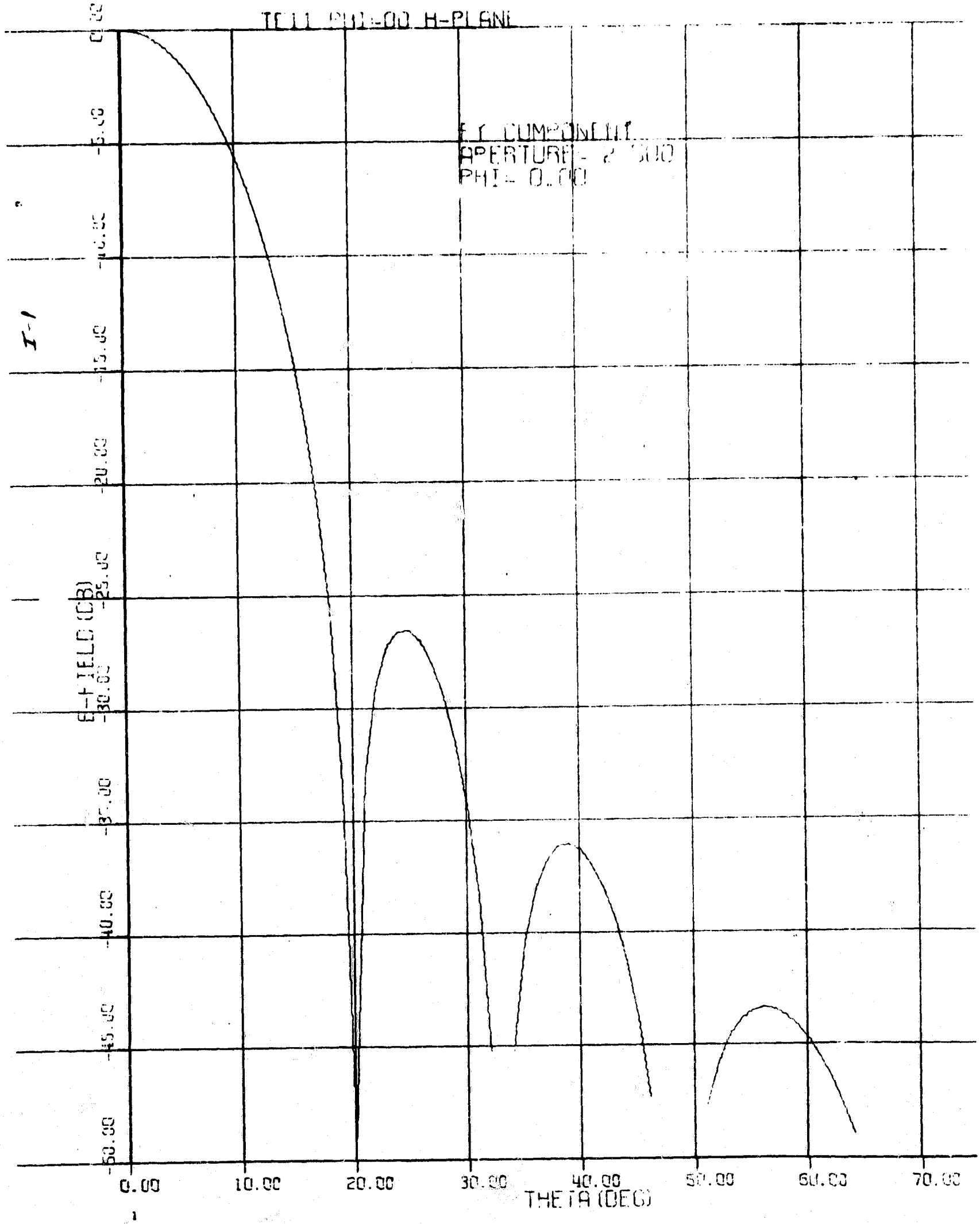
APPENDIX I

Radiation Patterns for Several Modes from Circular Waveguide

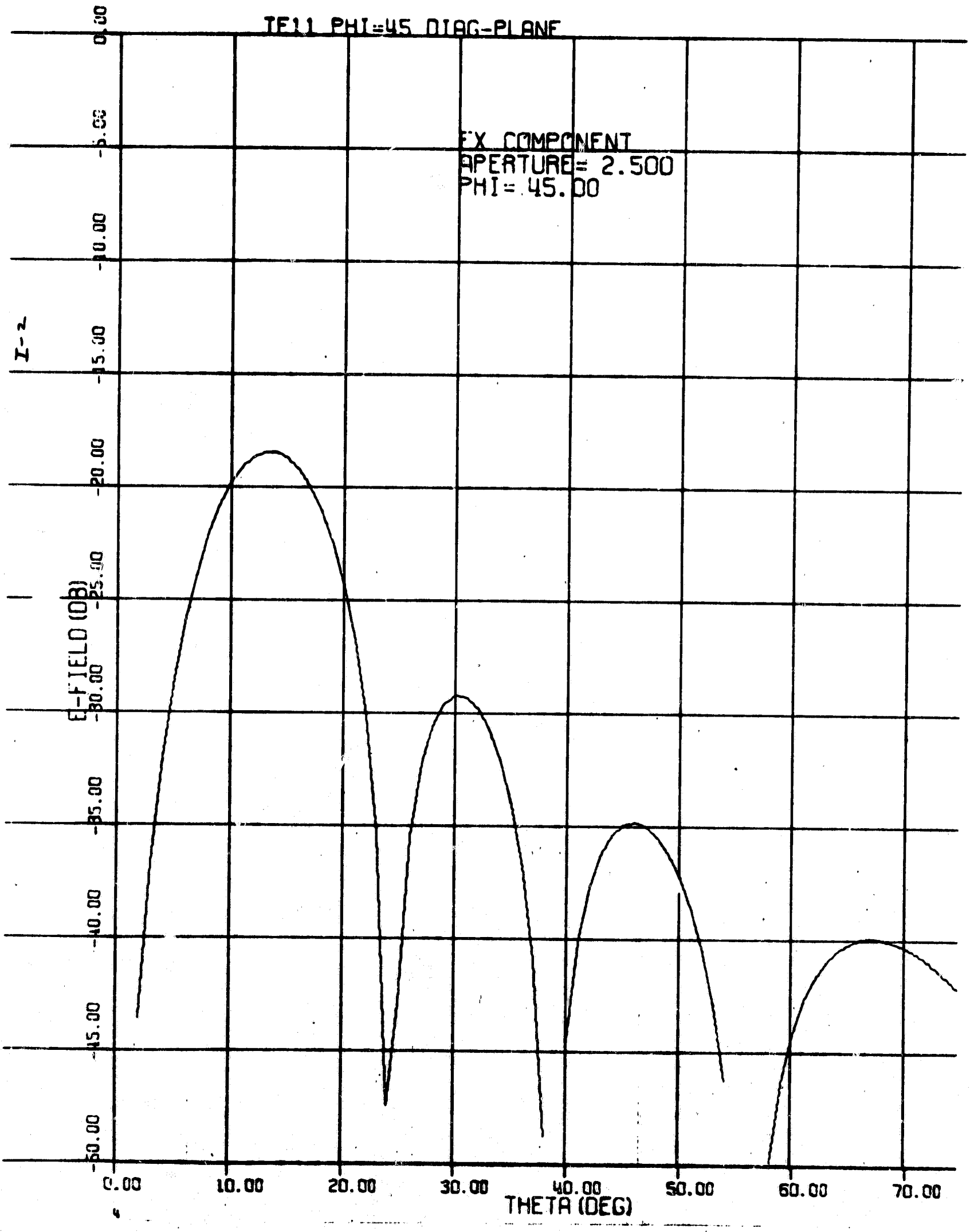
(Normalized to TE_{11} Mode)

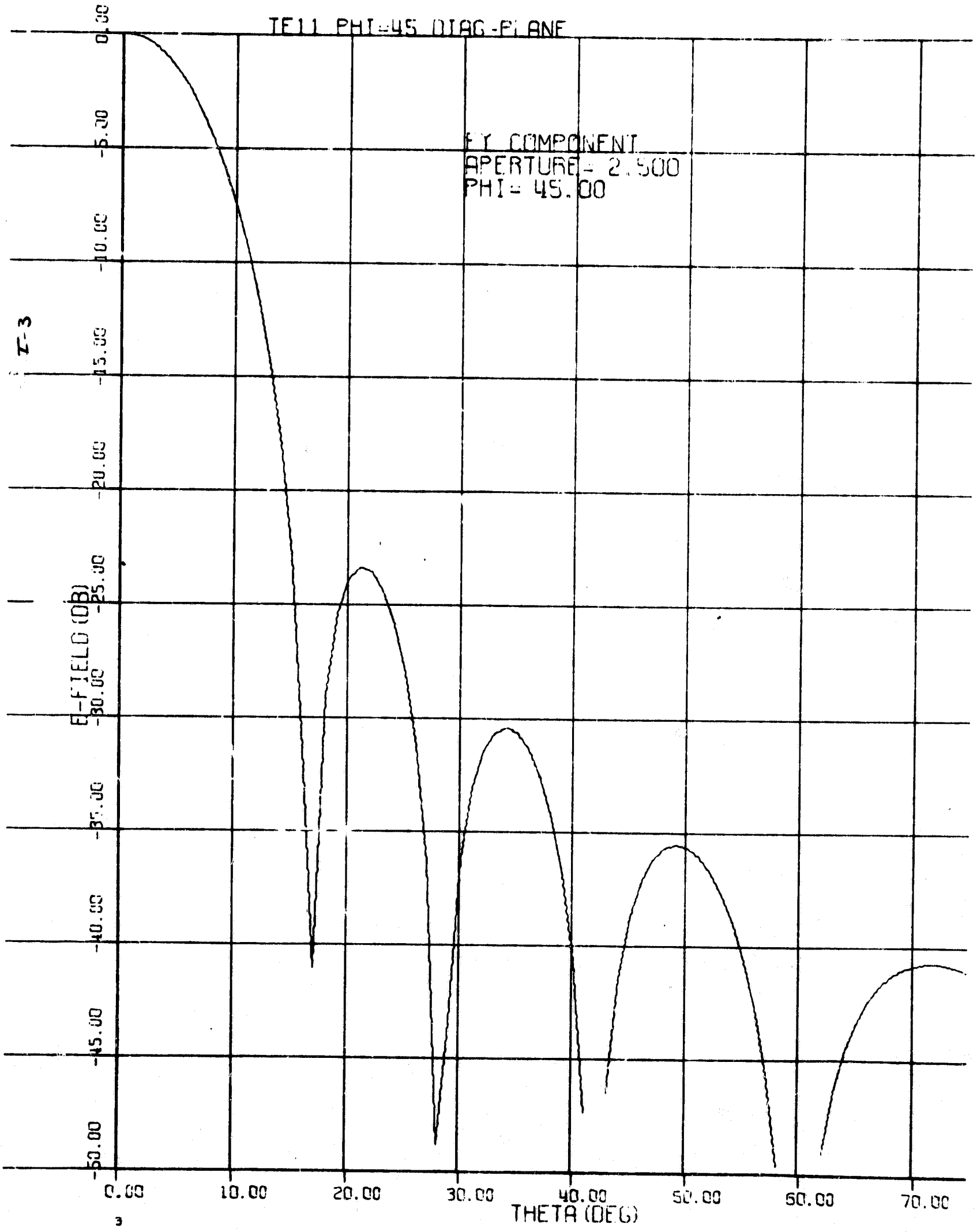
Patterns along null planes omitted

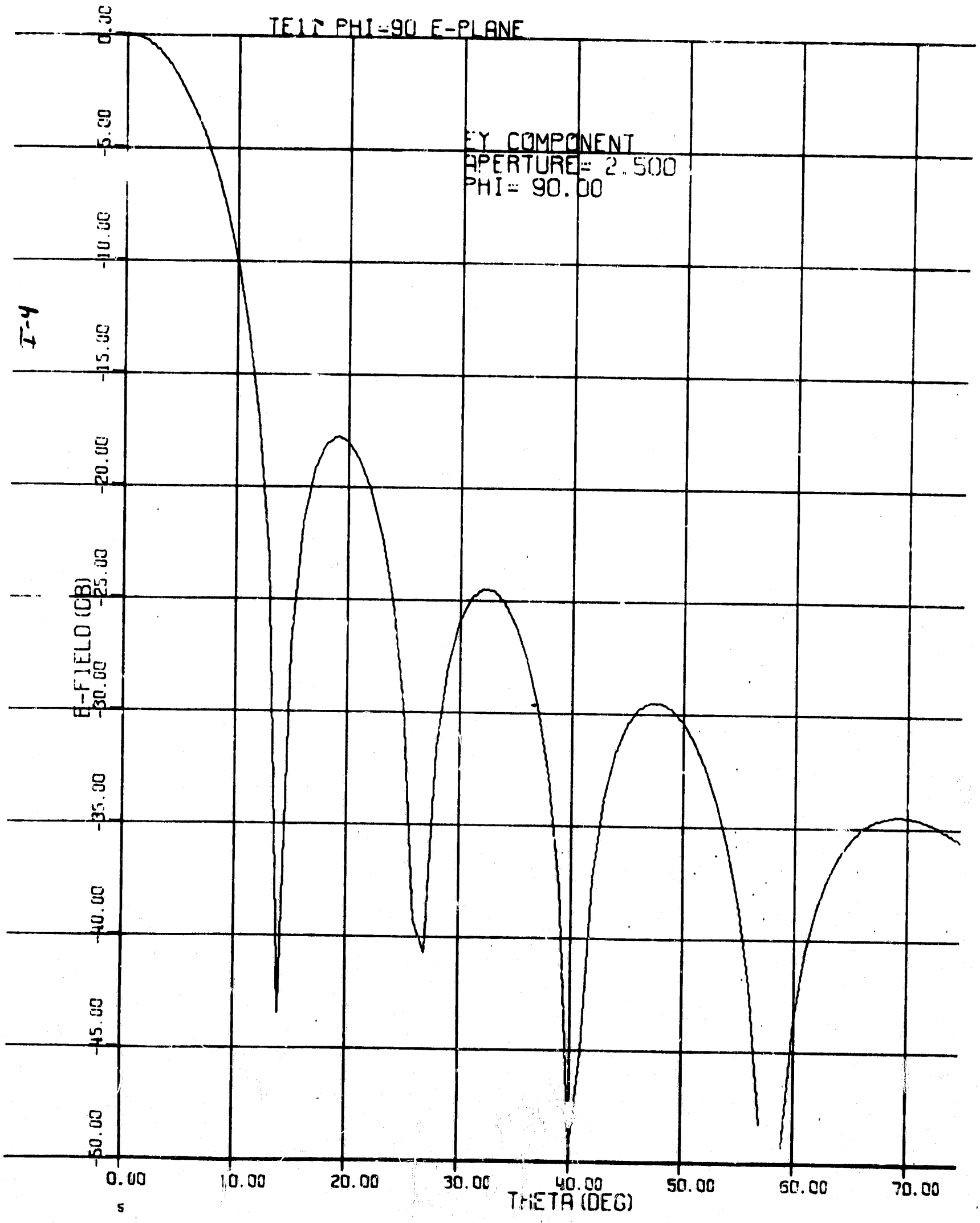
"REPRODUCILIBITY OF THE ORIGINAL PAGE IS POOR."



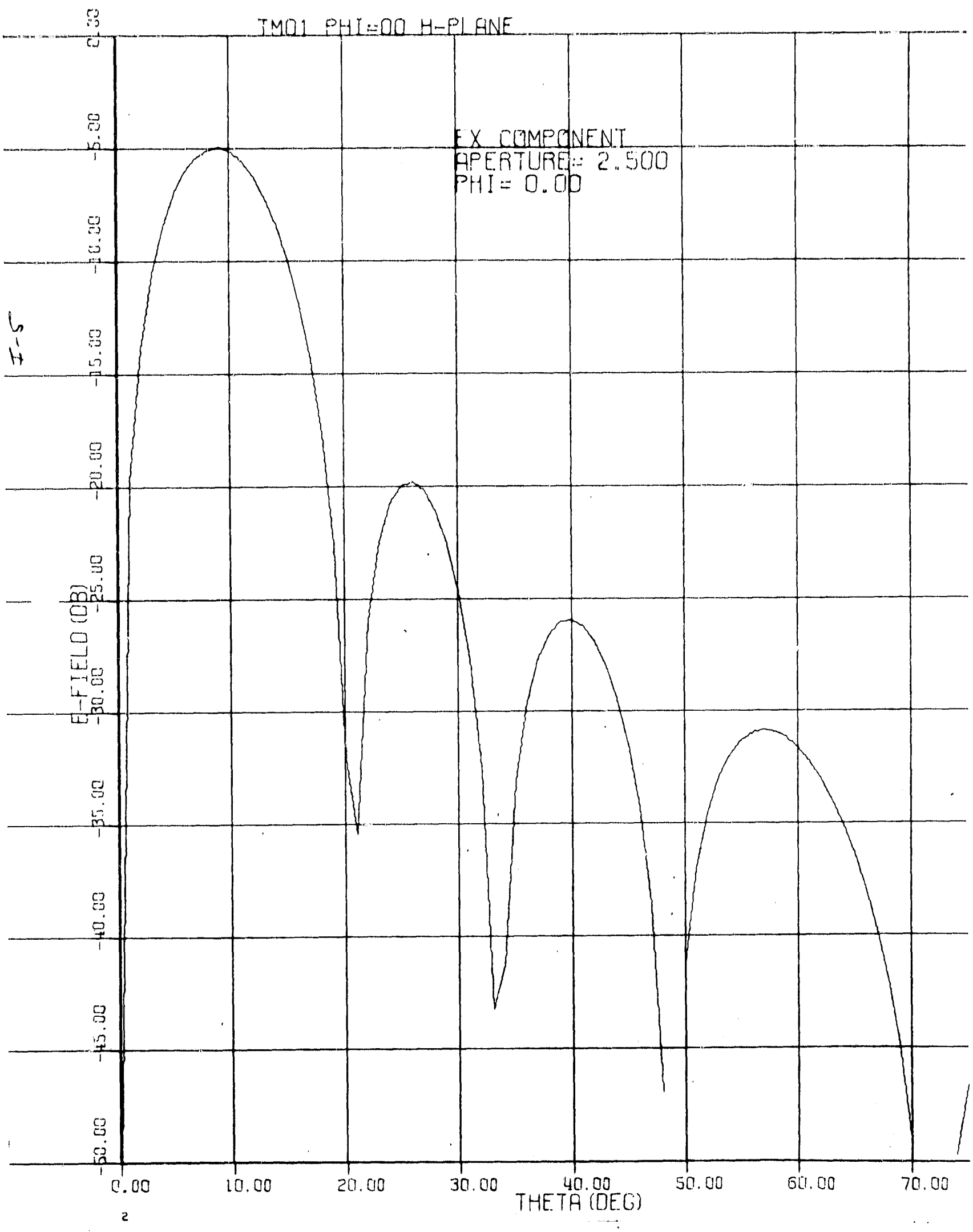
I-1

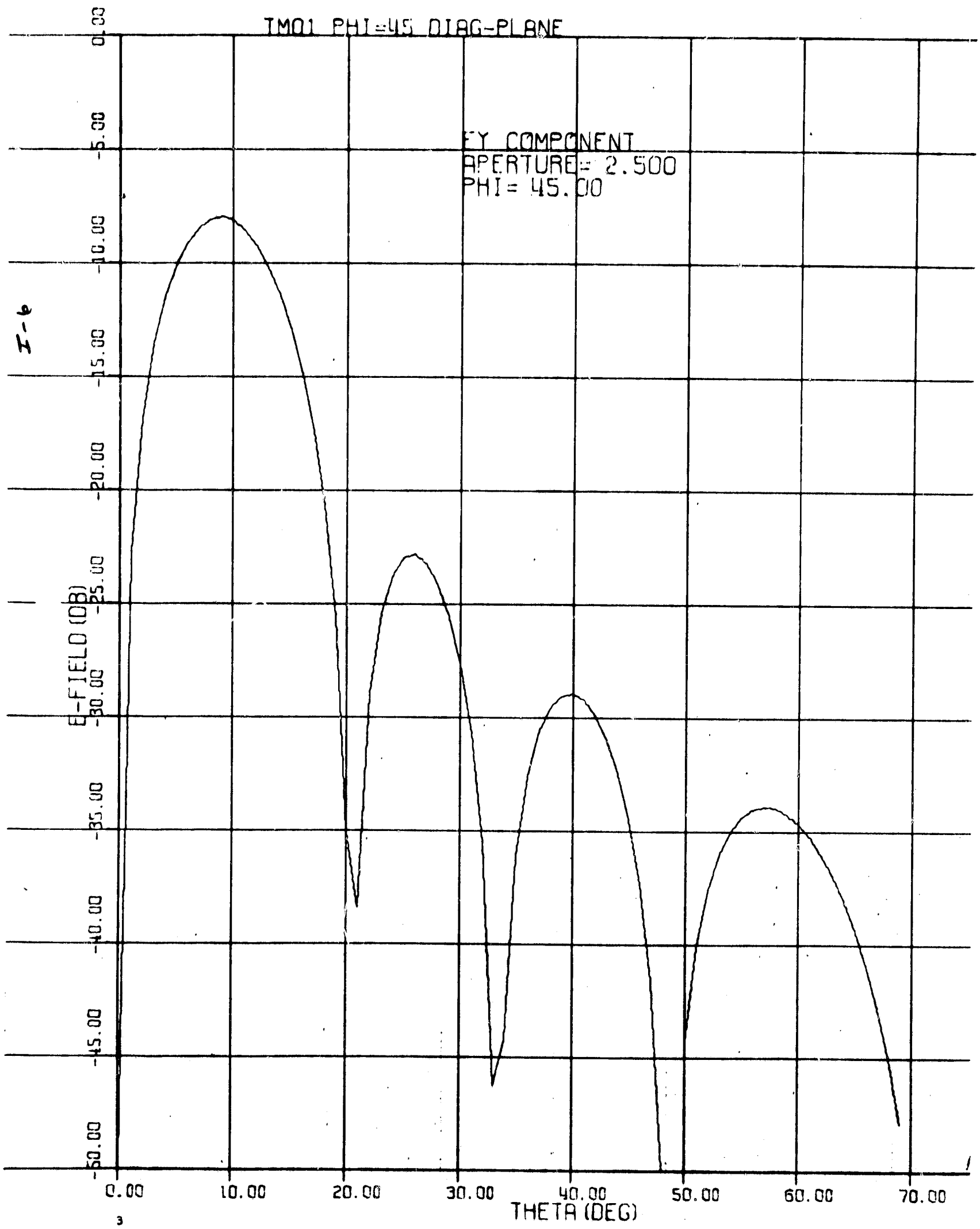

TE11 PHI=45 DIAG-PLANE
EX COMPONENT
APERTURE= 2.500
PHI= 45.00
E-FIELD (DB)
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)


TE11 PHI=45 DIAG-PLANE
EY COMPONENT
APERTURE= 2.500
PHI= 45.00
E-FIELD (DB)
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

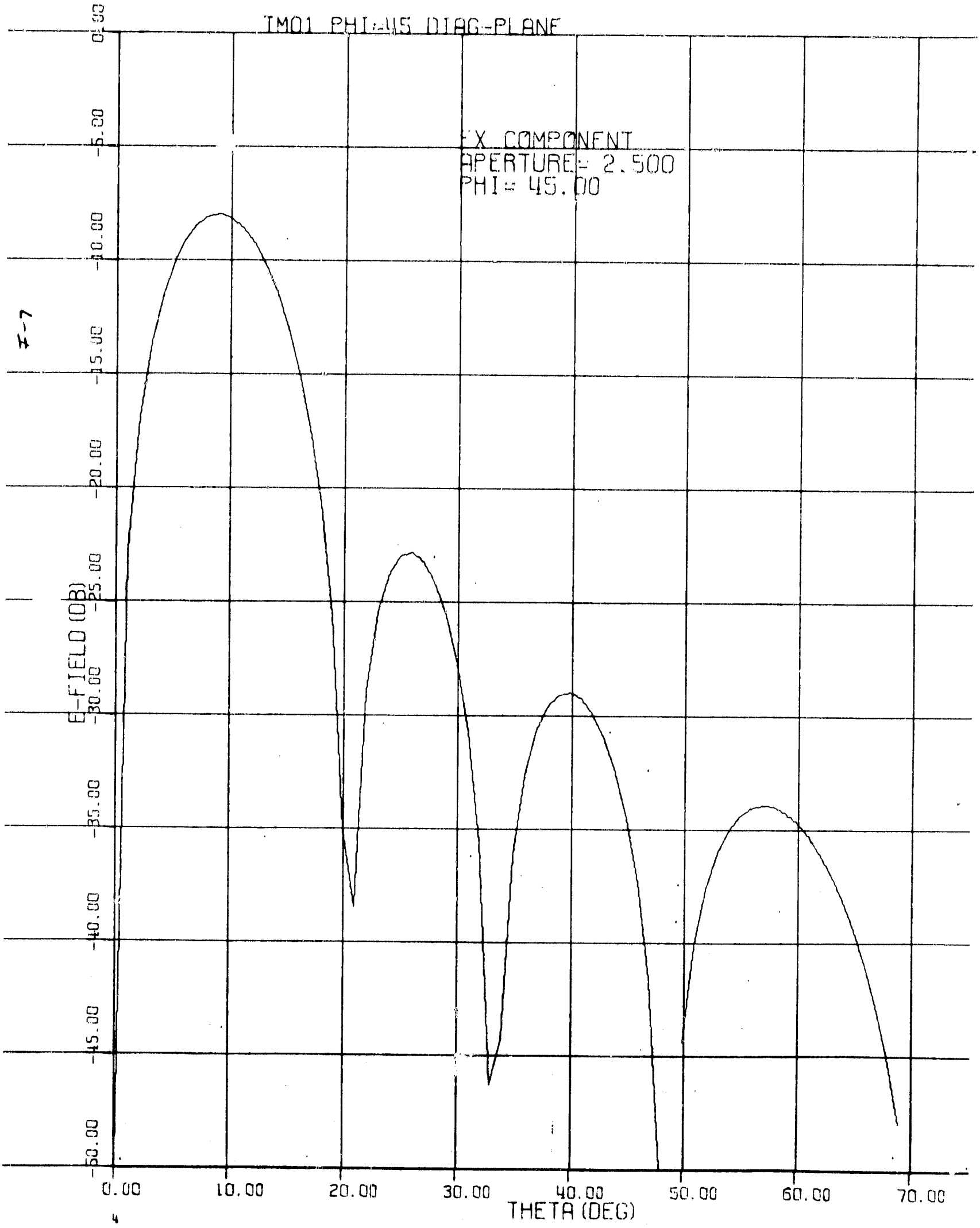

TE17 PHI=90 E-PLANE
EY COMPONENT
APERTURE= 2.500
PHI= 90.00
E-FIELD (DB)
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
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0.00
10.00
20.00
30.00
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50.00
60.00
70.00
THETA (DEG)

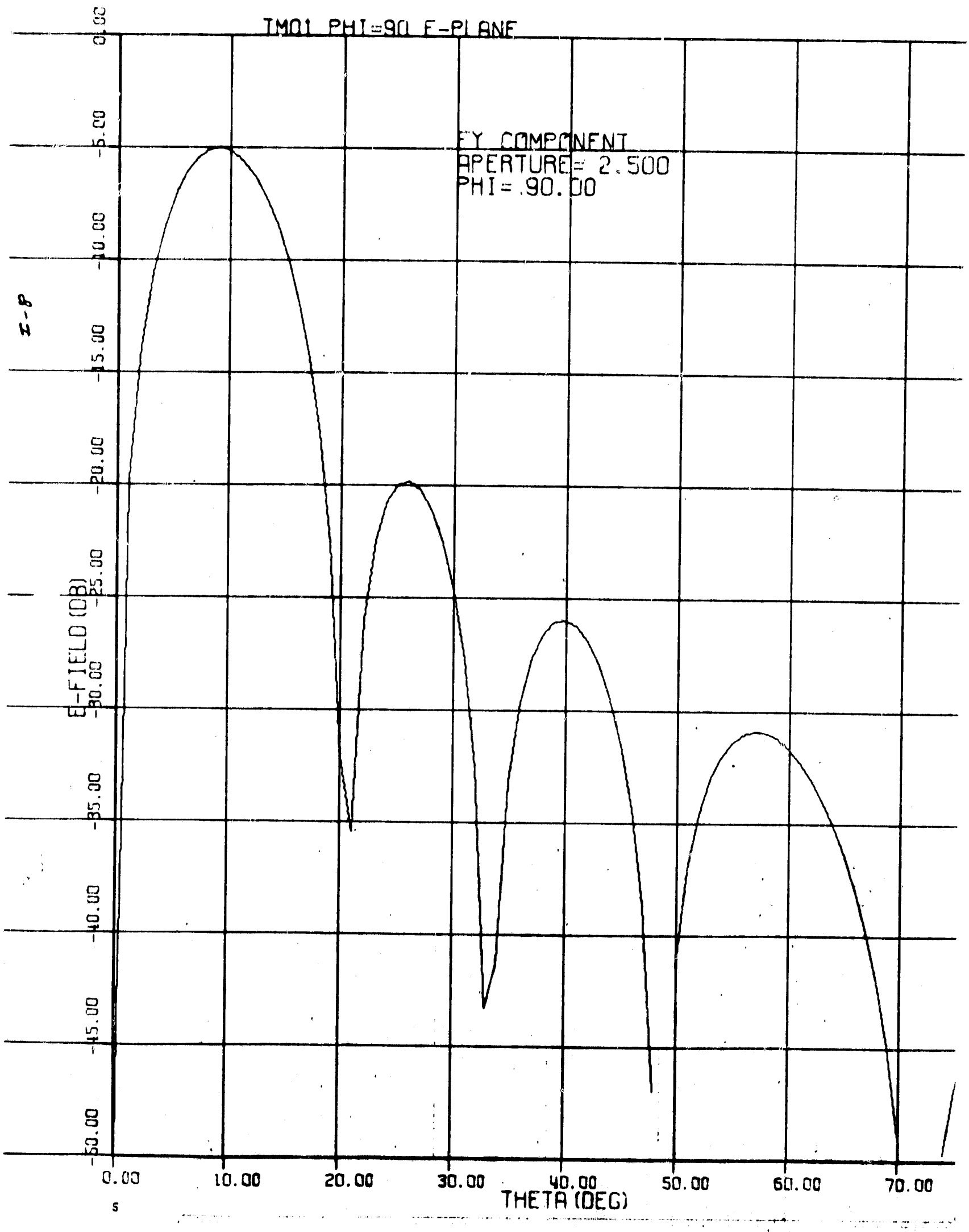
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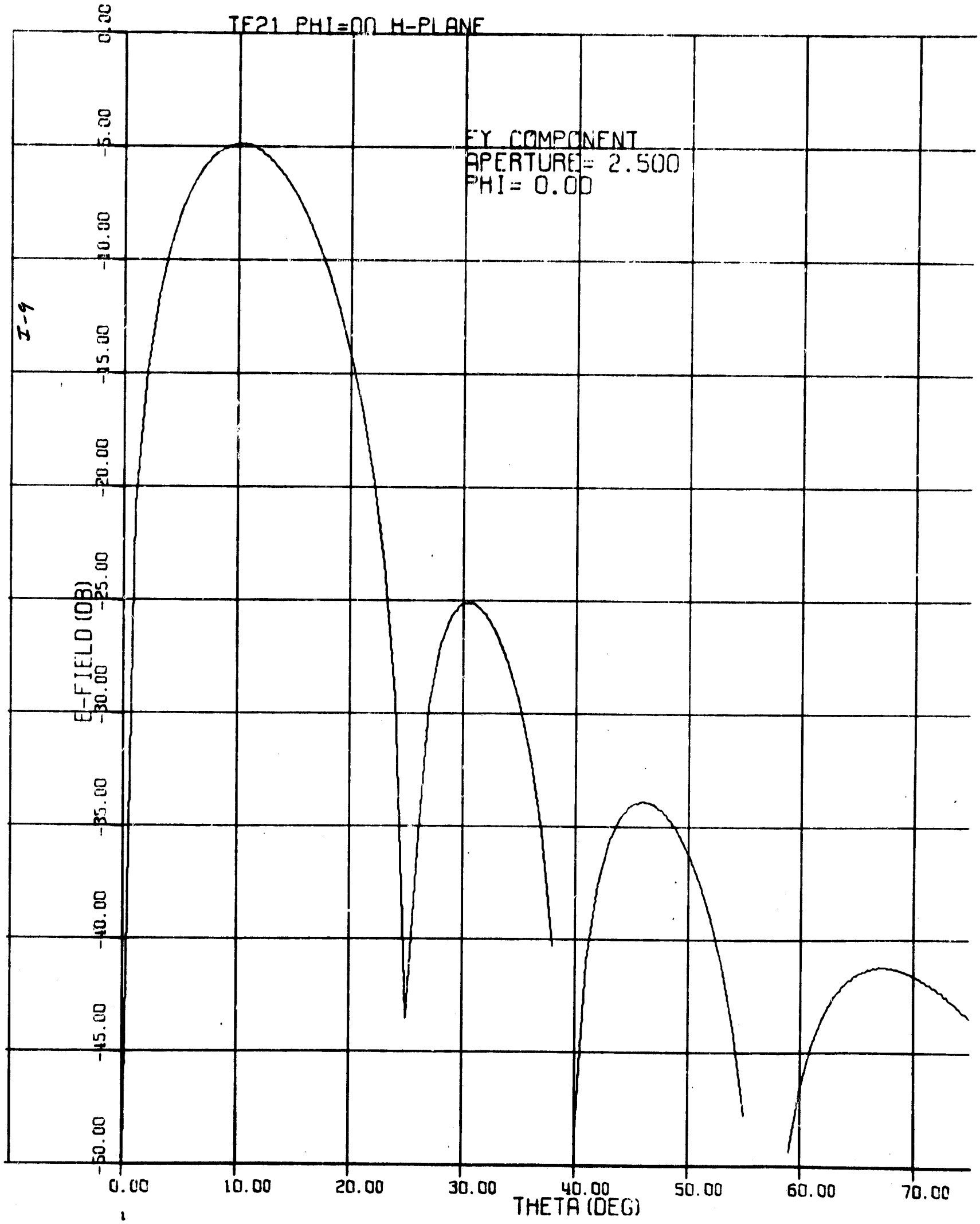

TM01 PHI=00 H-PLANE
EX COMPONENT
APERTURE= 2.500
PHI= 0.00
E-FIELD (DB)
-0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)


IM01 PHI=45 DIAG-PLANE
EY COMPONENT
APERTURE= 2.500
PHI= 45.00
E-FIELD (DB)
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

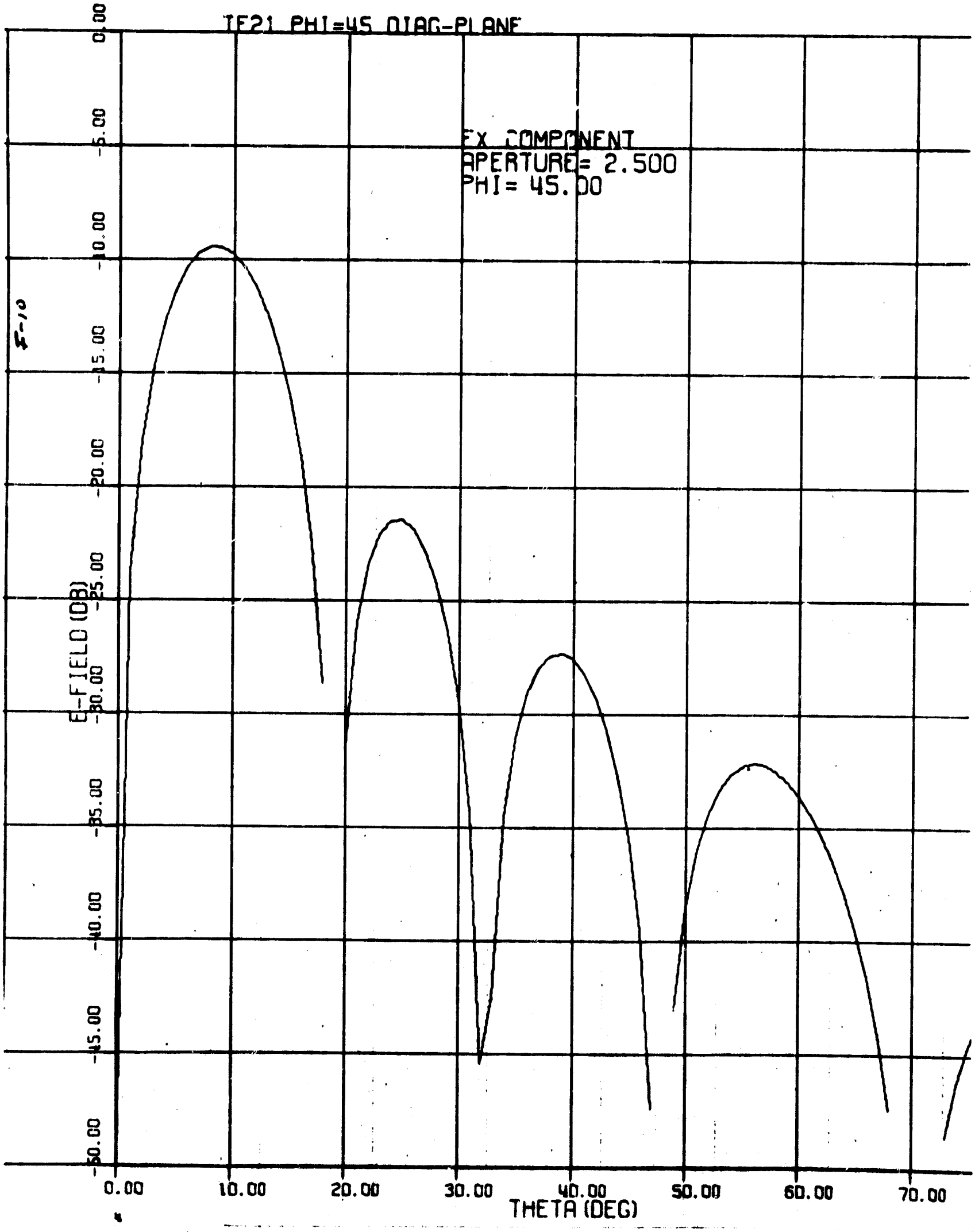
I-6


IM01 PHI=45 DIAG-PLANE
EX COMPONENT
APERTURE= 2.500
PHI= 45.00
E-FIELD (DB)
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

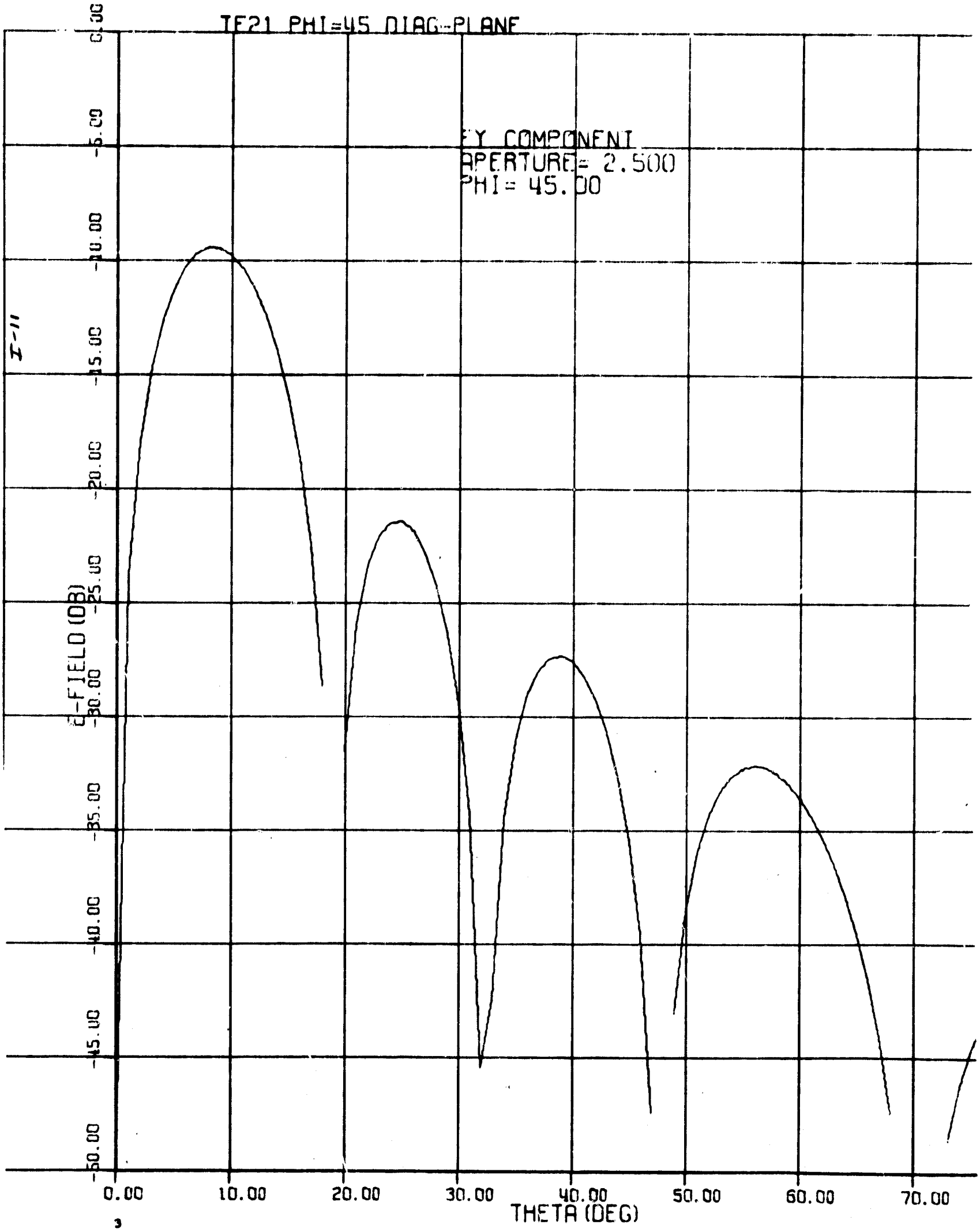

IM01 PHI=90 E-PLANE
EY COMPONENT
APERTURE= 2.500
PHI = 90.00
E-FIELD (DB)
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

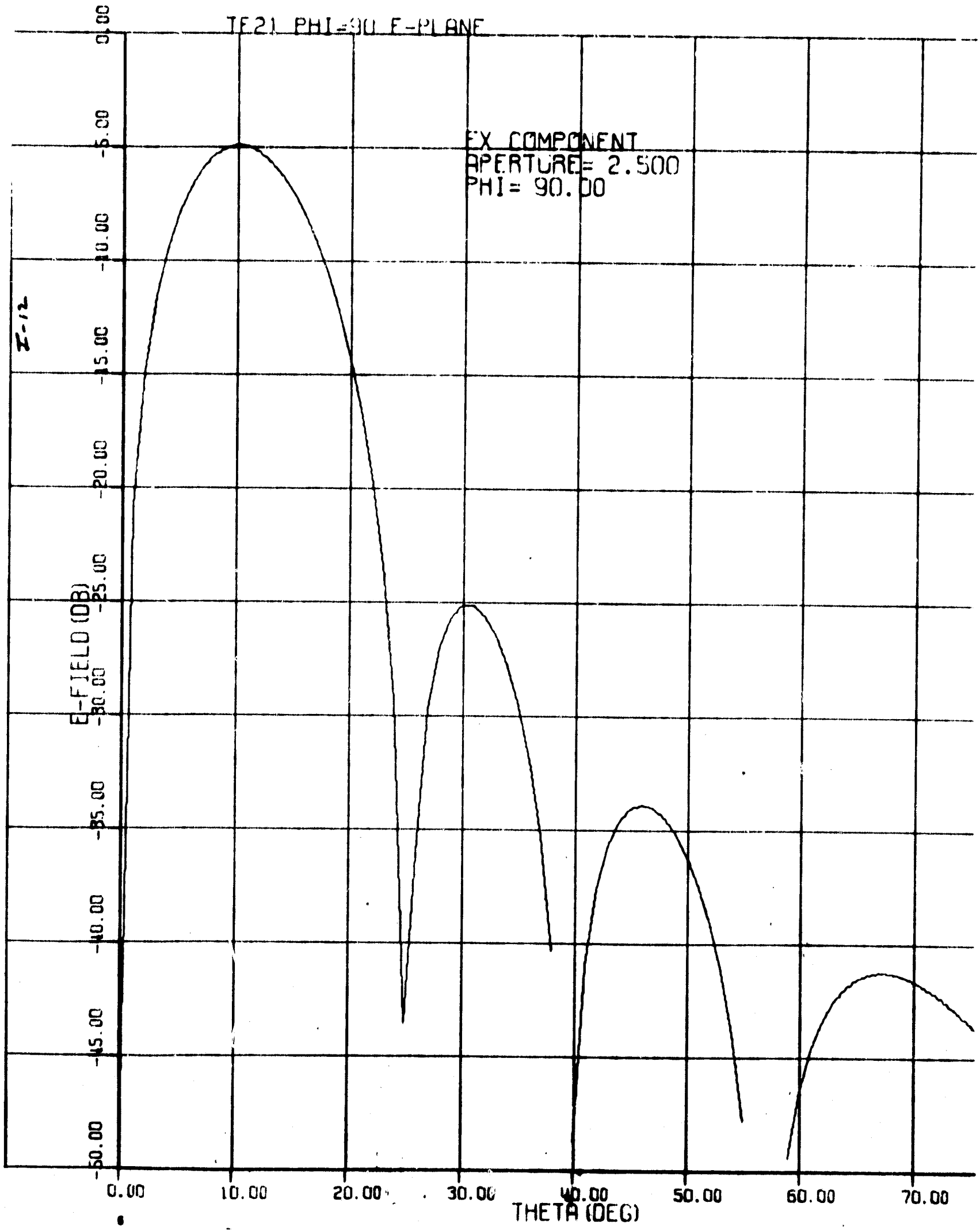

TE21 PHI=00 H-PLANE
EY COMPONENT
APERTURE= 2.500
PHI= 0.00
E-FIELD (DB)
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

I-9

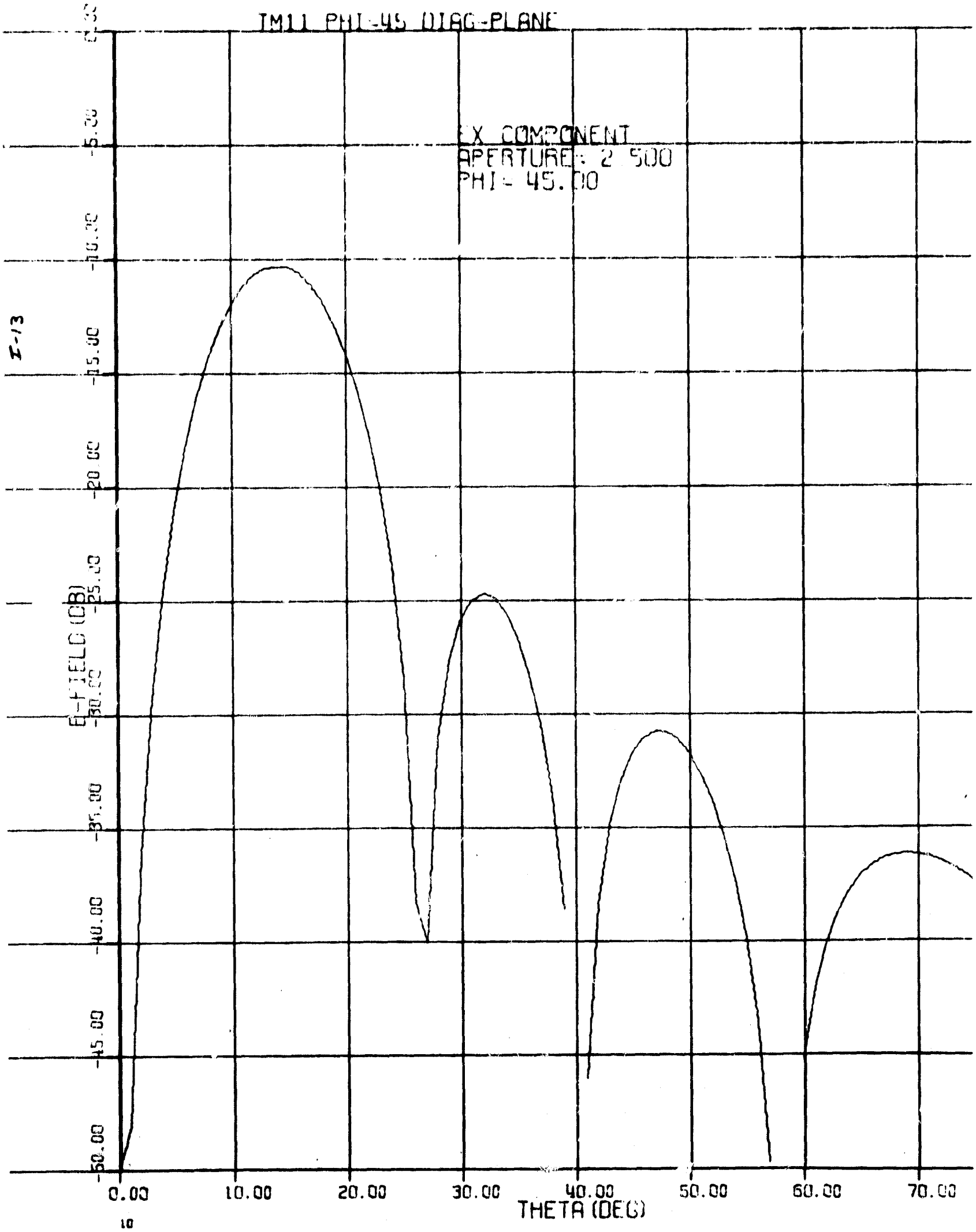

IE21 PHI=45 DIAG-PLANE
EX COMPONENT
APERTURE= 2.500
PHI= 45.00
E-FIELD (DB)
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

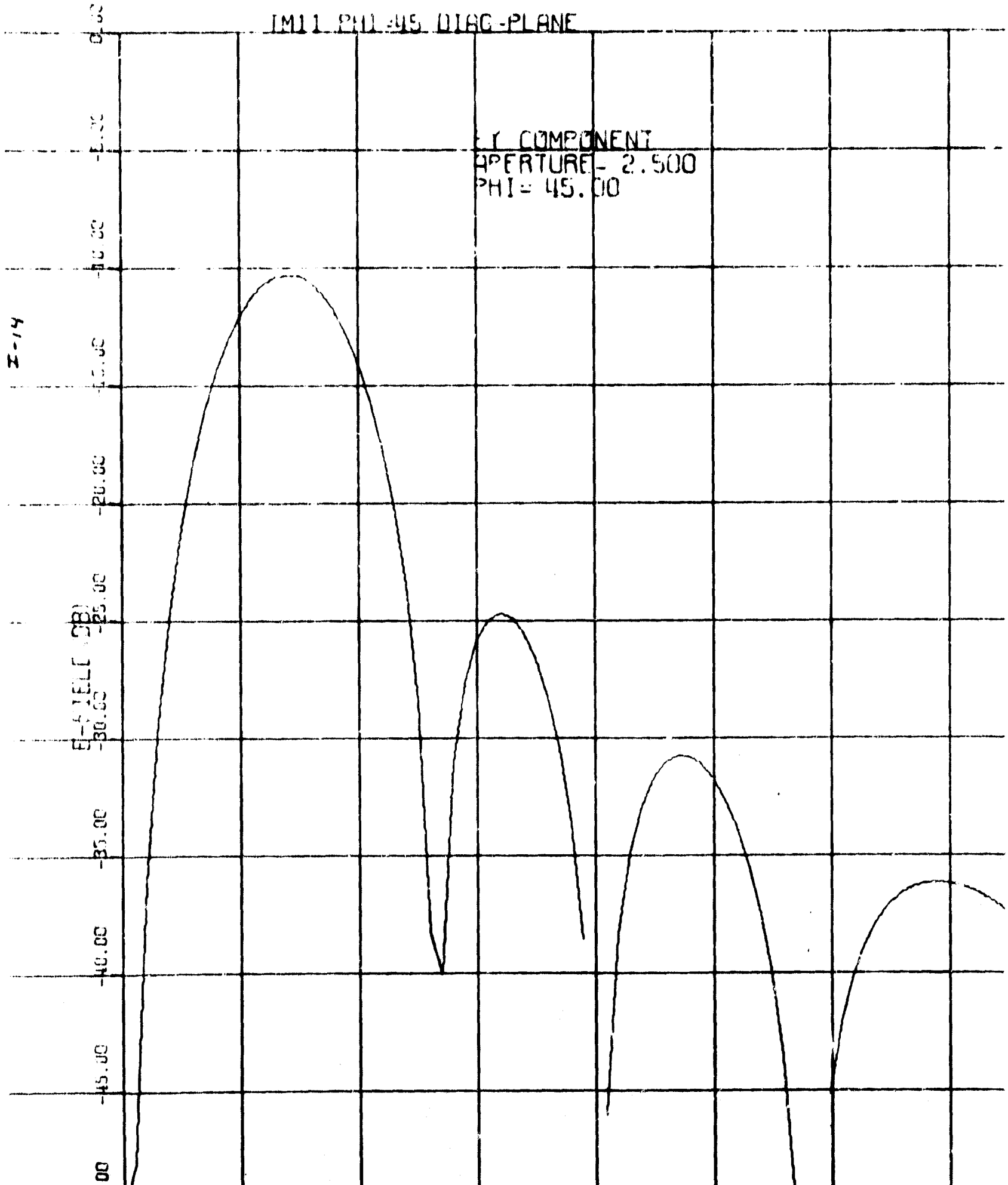
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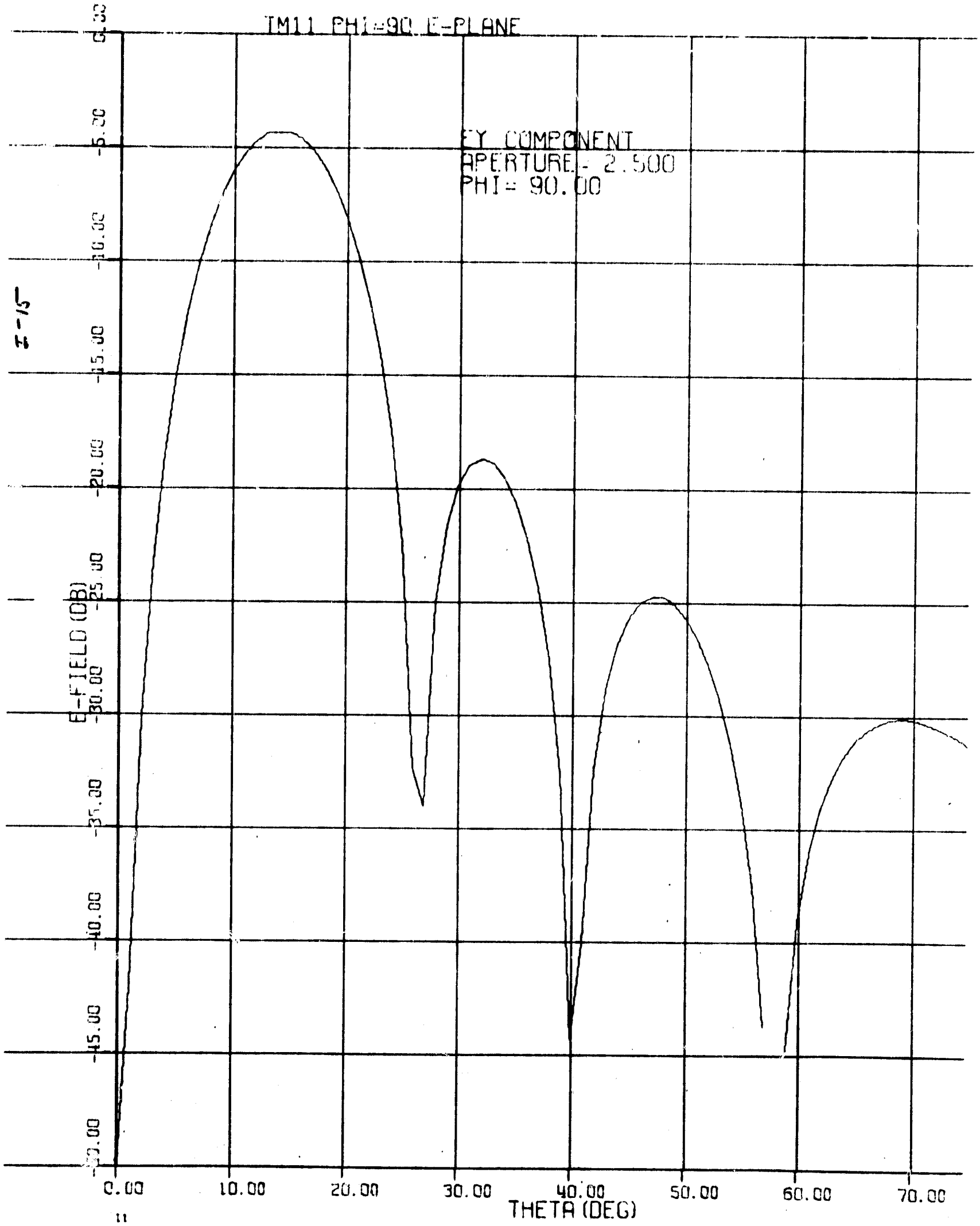

TE21 PHI=45 DIAG-PLANE
EY COMPONENT
APERTURE= 2.500
PHI= 45.00
E-FIELD (DB)
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

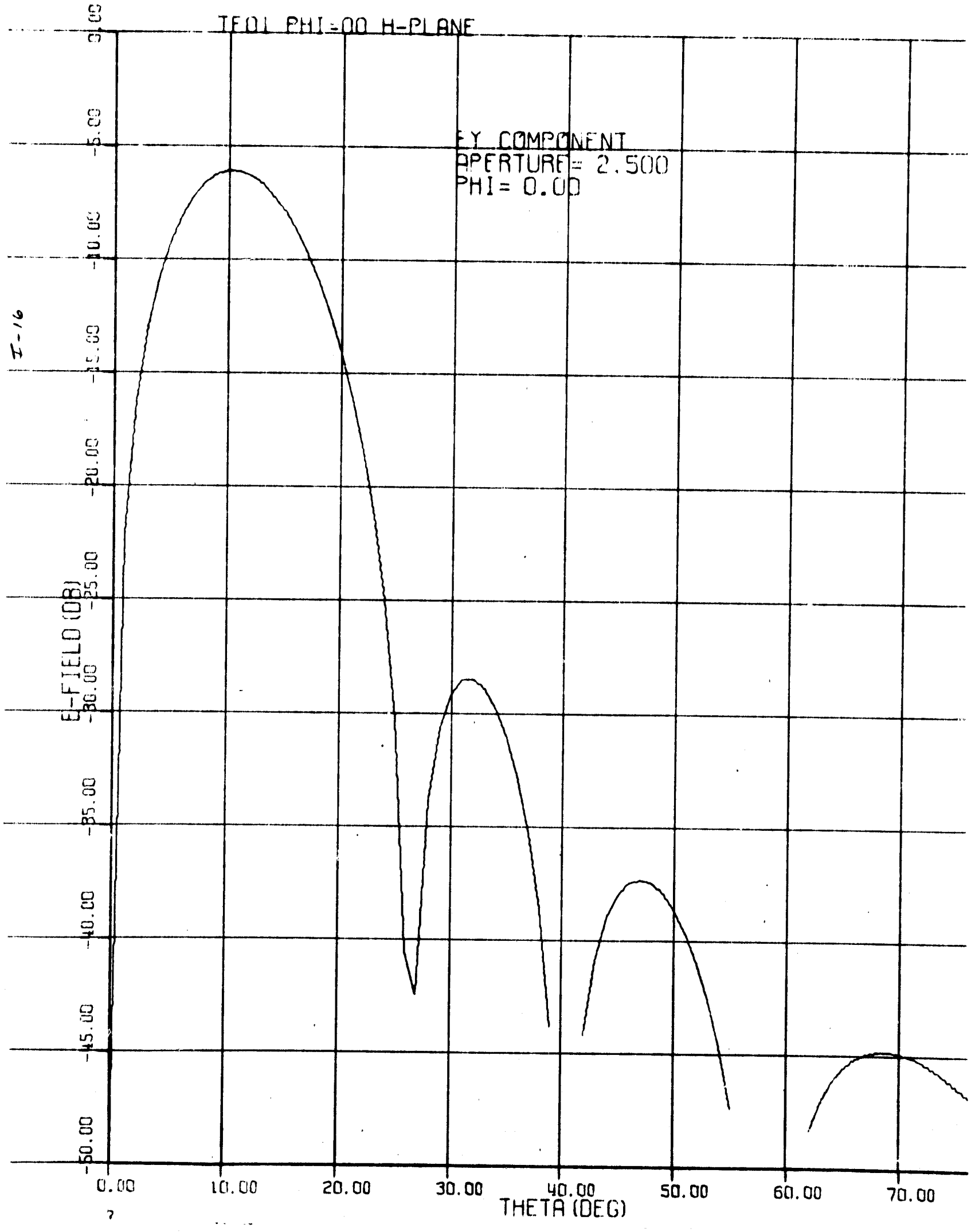

TE21 PHI=90 E-PLANE
EX COMPONENT
APERTURE= 2.500
PHI= 90.00
E-FIELD (DB)
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

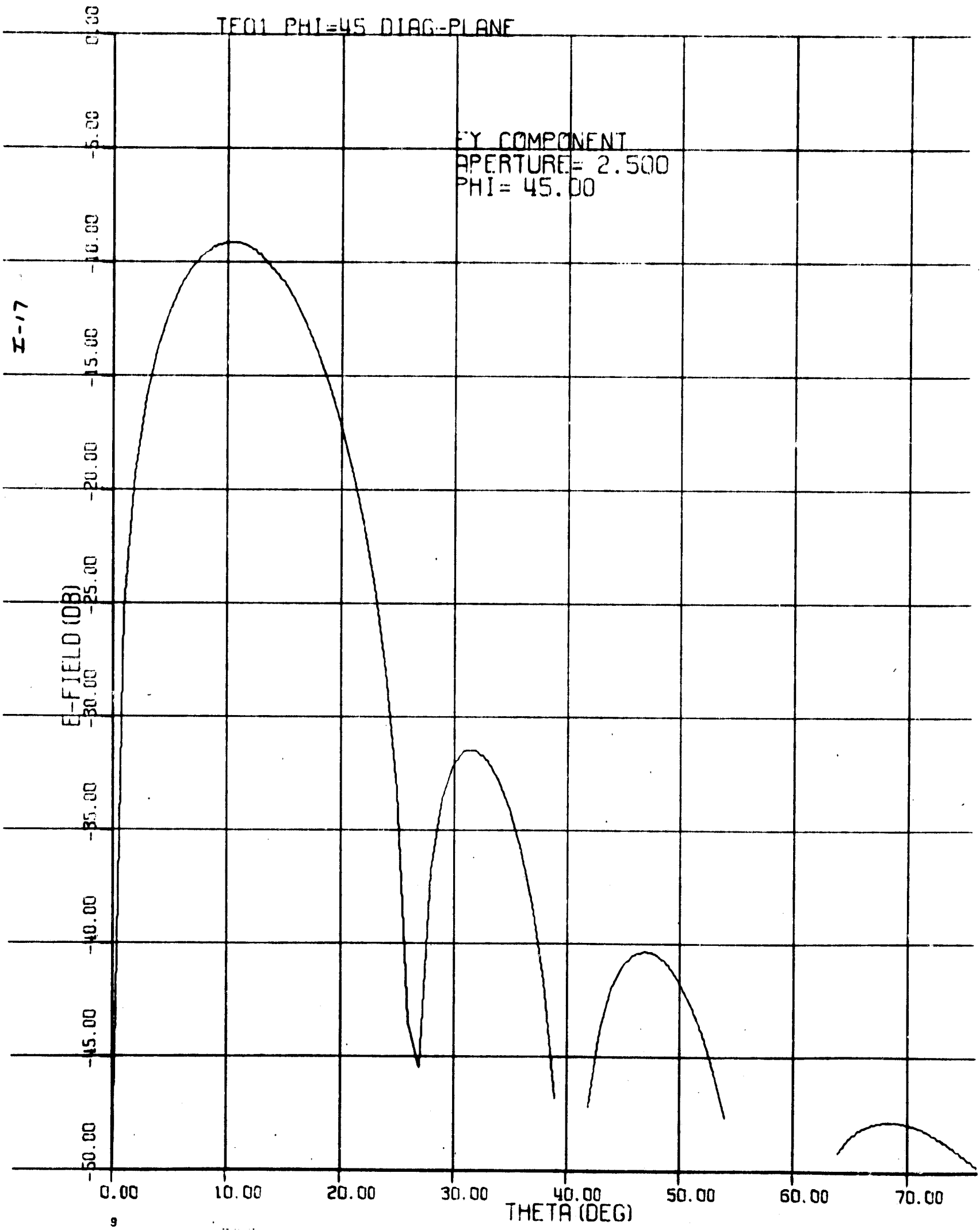
Z-12


TM11 PHI=45 DIAG-PLANE
EX COMPONENT
APERTURE= 2.500
PHI= 45.00
E-13
E-FIELD (DB)
-5.33
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

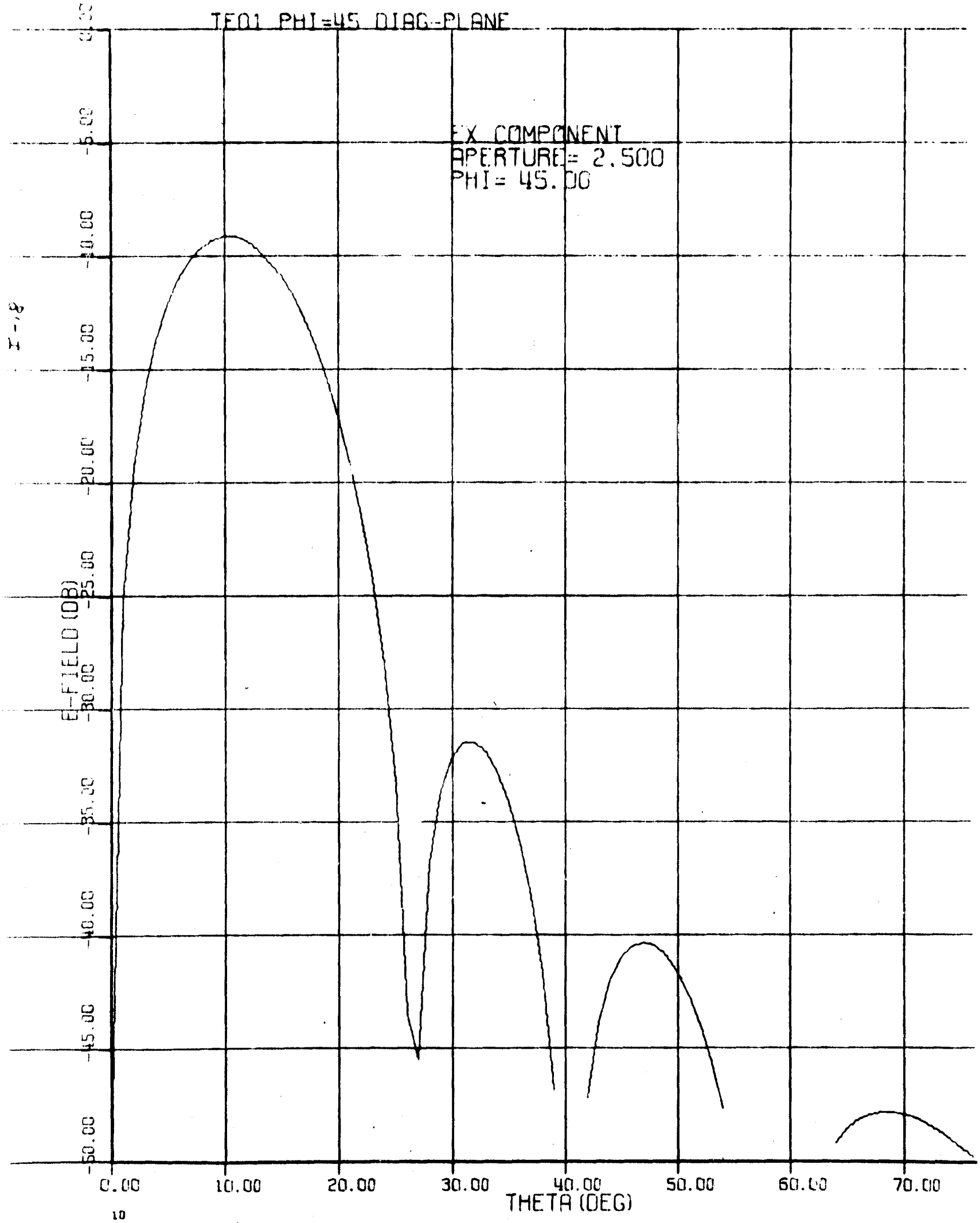

IM11 PH1=45 DIAG-PLANE
E Y COMPONENT
APERTURE= 2.500
PHI= 45.00
E-FIELD (DB)
-50.00
-45.00
-40.00
-35.00
-30.00
-25.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

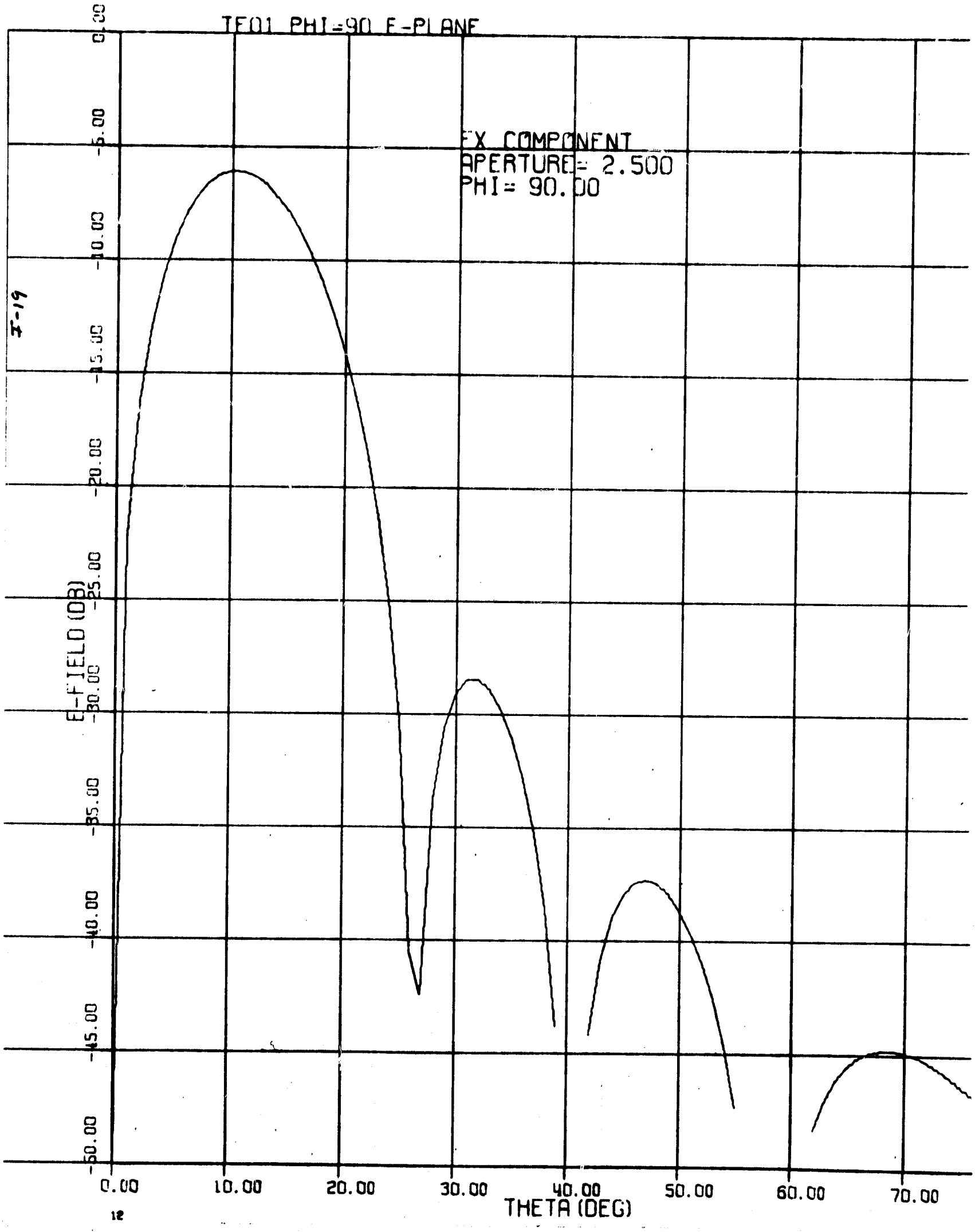

TM11 PHI=90 E-PLANE
EY COMPONENT
APERTURE = 2.500
PHI = 90.00
E-FIELD (DB)
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)


IE01 PHI=00 H-PLANE
EY COMPONENT
APERTURE= 2.500
PHI= 0.00
E-FIELD (DB)
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

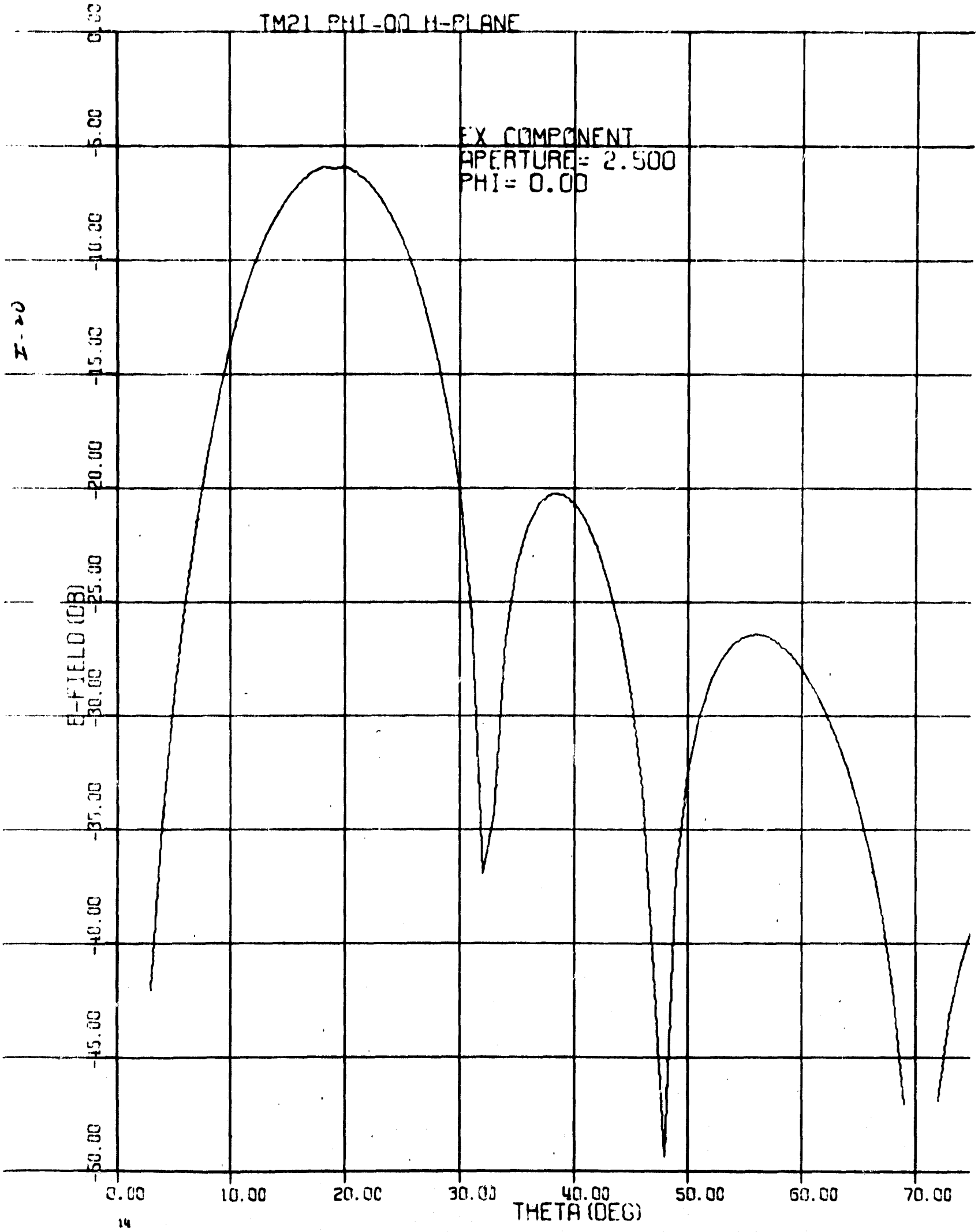

TE01 PHI=45 DIAG-PLANE
EY COMPONENT
APERTURE= 2.500
PHI= 45.00
E-FIELD (DB)
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

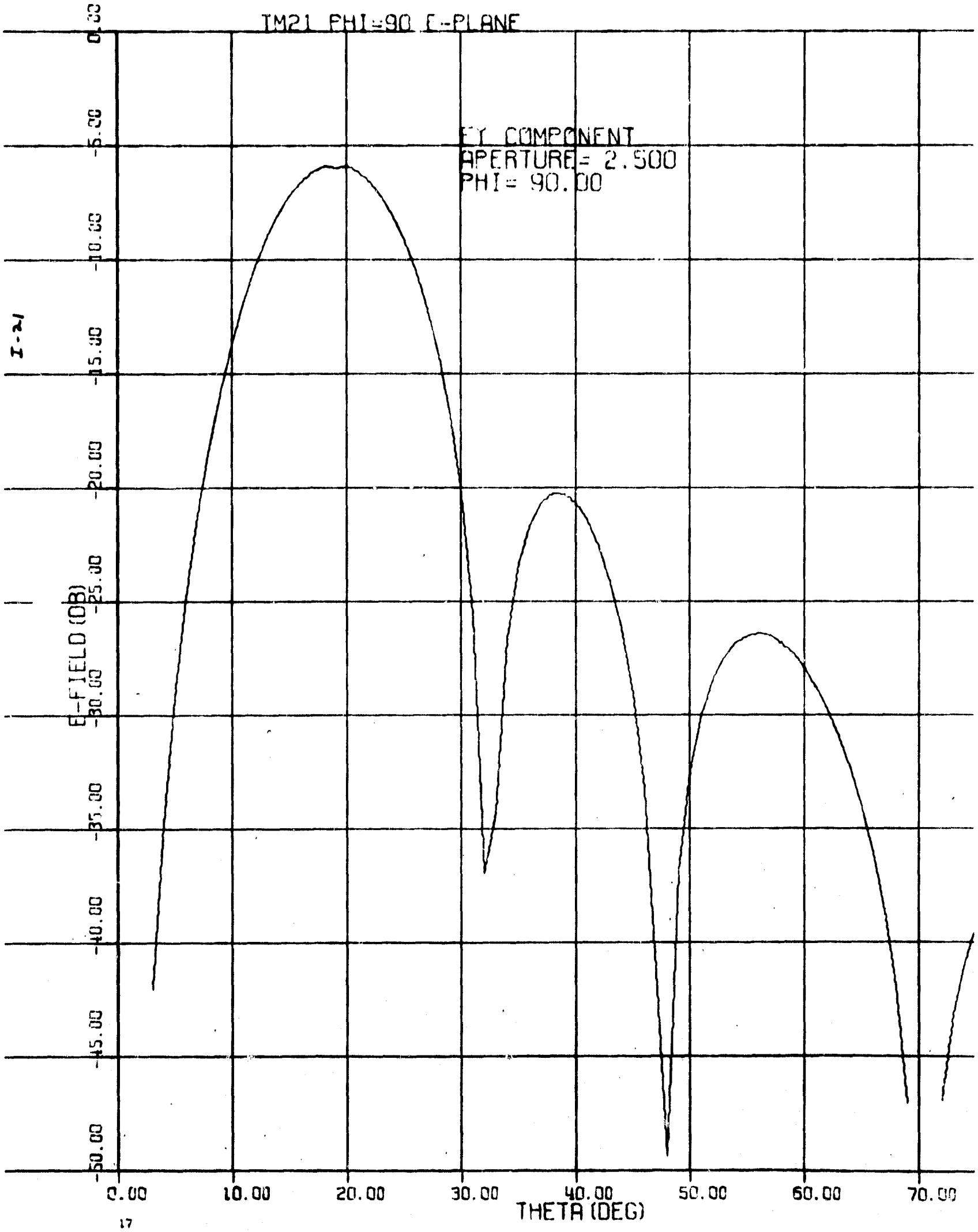
9


TE01 PHI=45 DIAG-PLANE
EX COMPONENT
APERTURE= 2.500
PHI= 45.00
E-FIELD (DB)
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

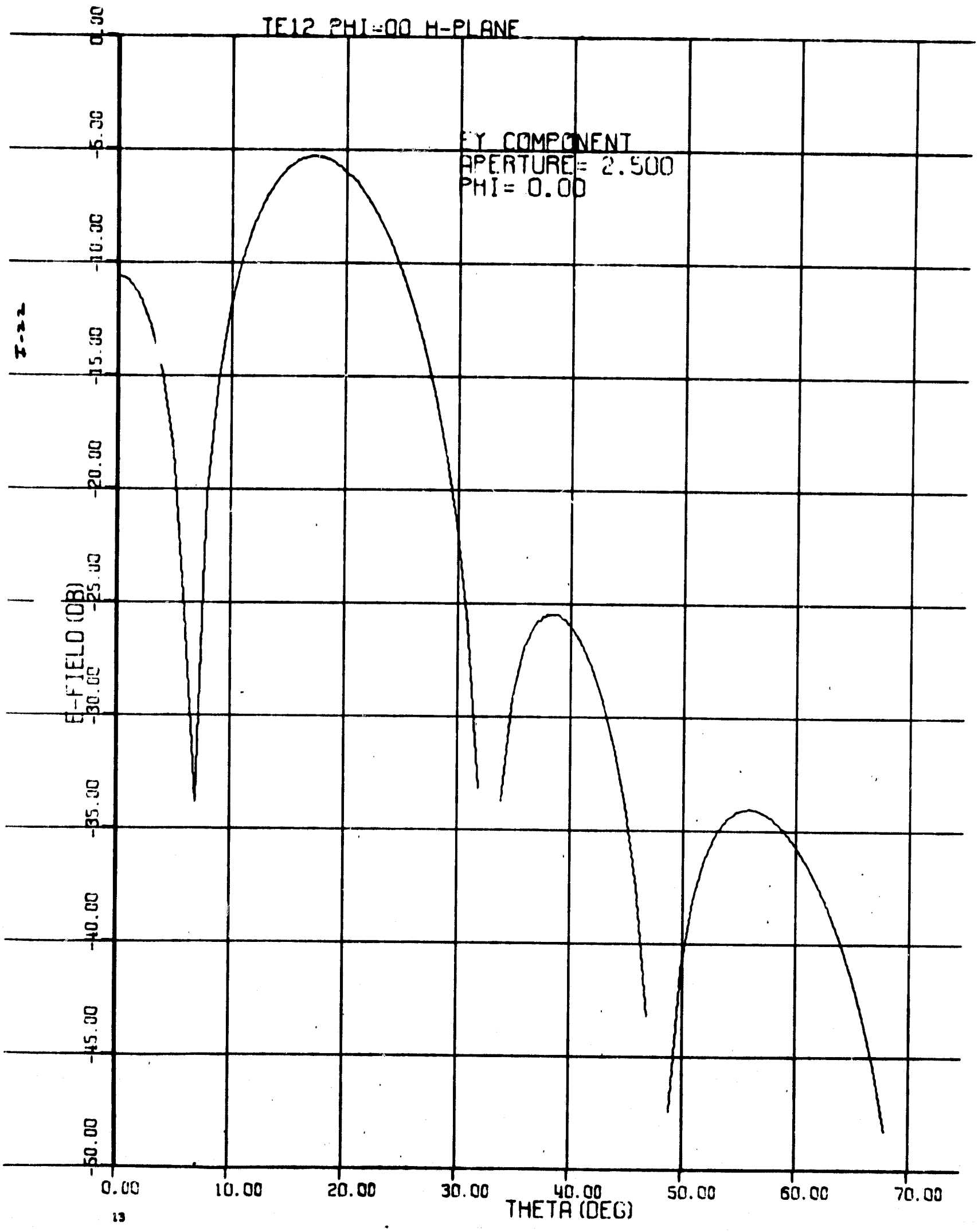

TE01 PHI=90 E-PLANE
EX COMPONENT
APERTURE= 2.500
PHI= 90.00
E-FIELD (DB)
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-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

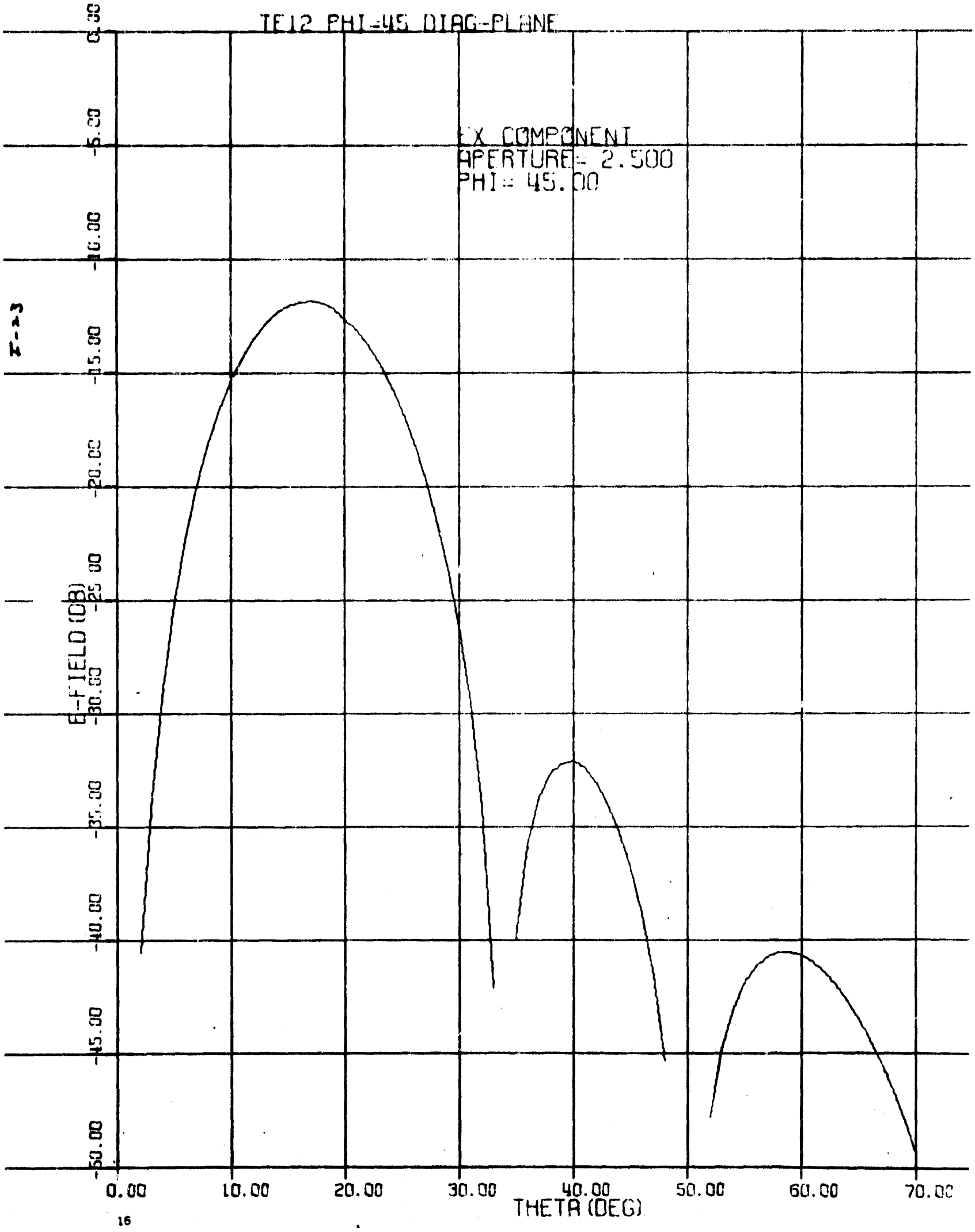
12

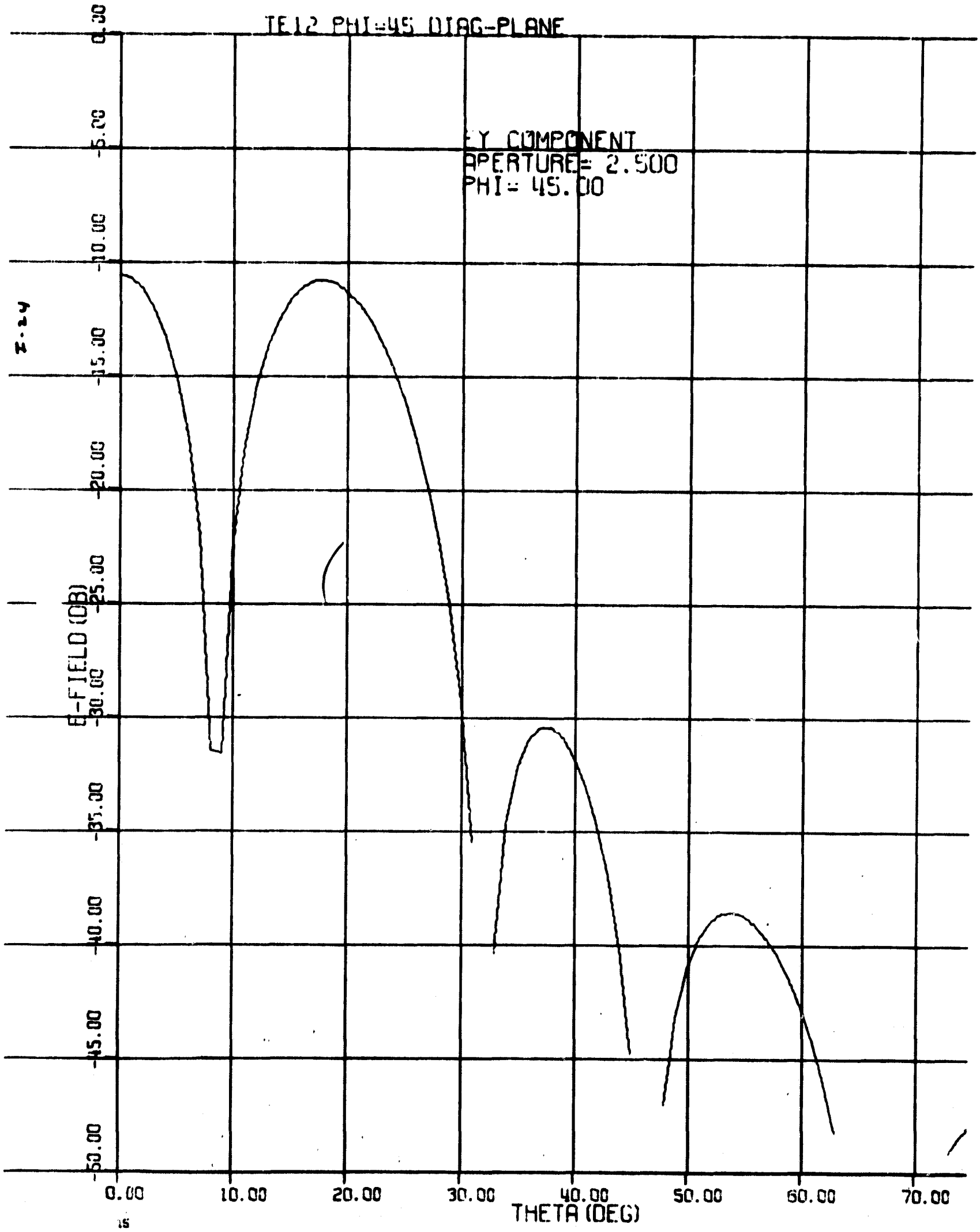

TM21 PHI=00 H-PLANE
EX COMPONENT
APERTURE= 2.500
PHI= 0.00
E-FIELD (DB)
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

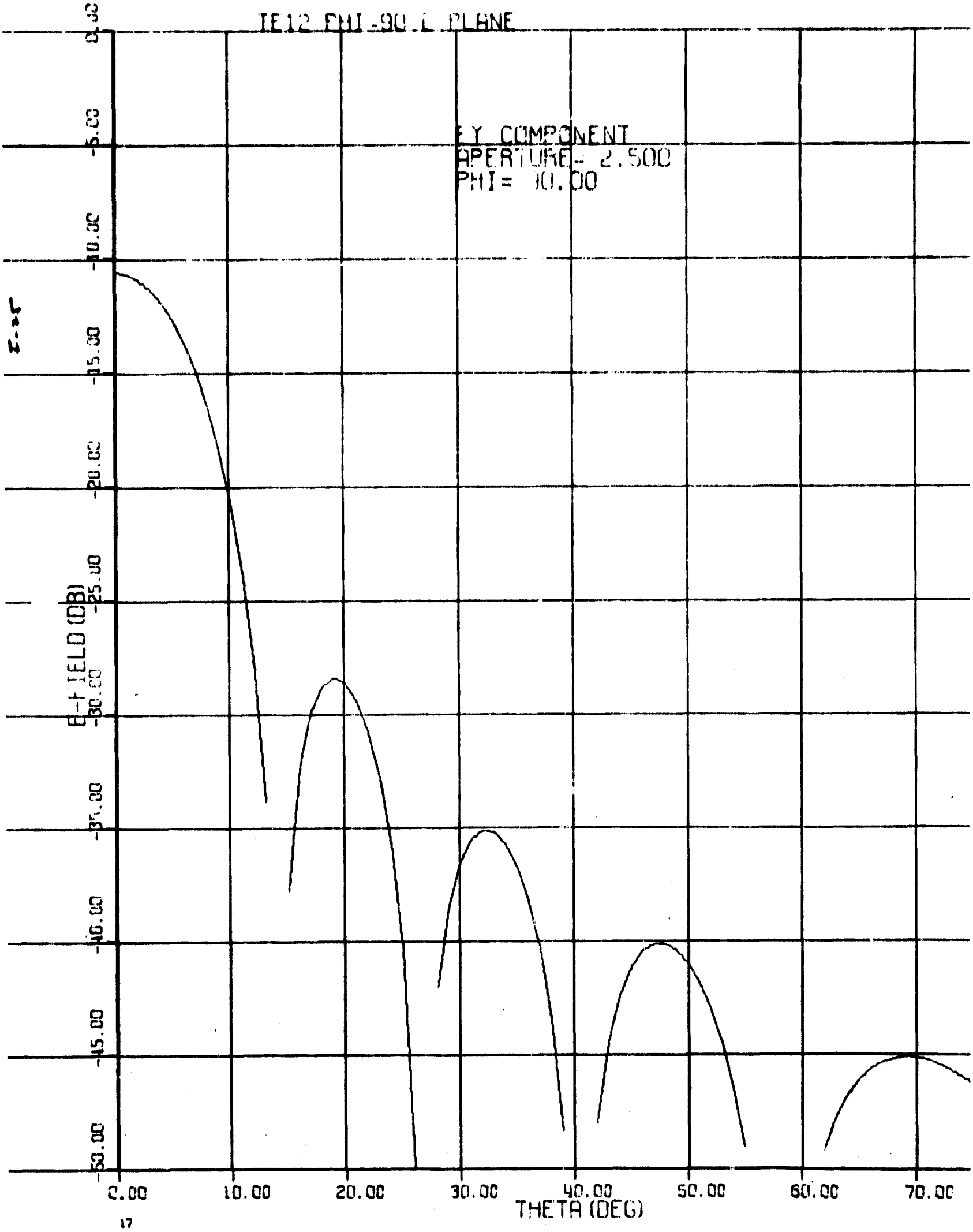

IM21 PHI=90 E-PLANE
EY COMPONENT
APERTURE= 2.500
PHI= 90.00
E-FIELD (DB)
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

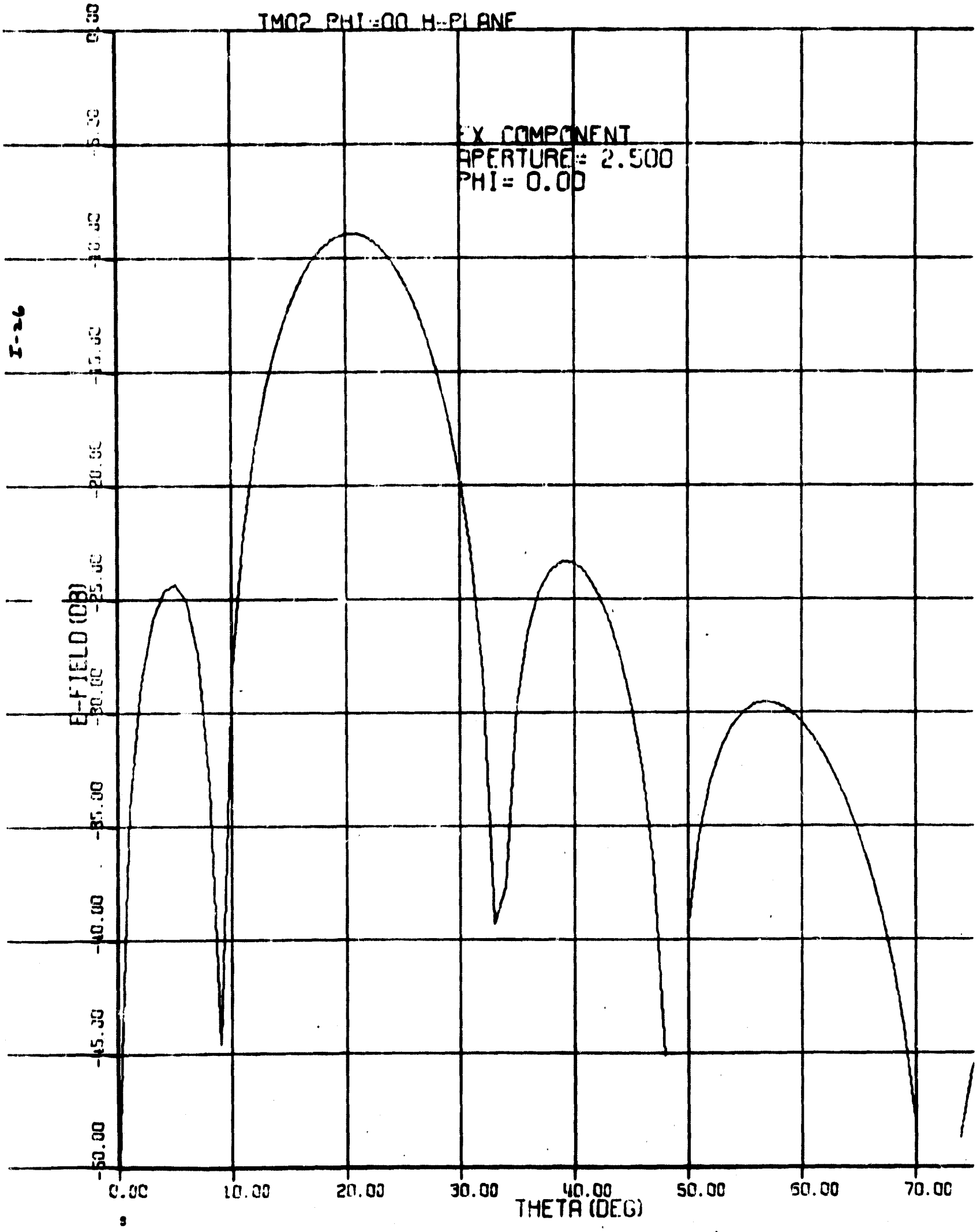
I-21

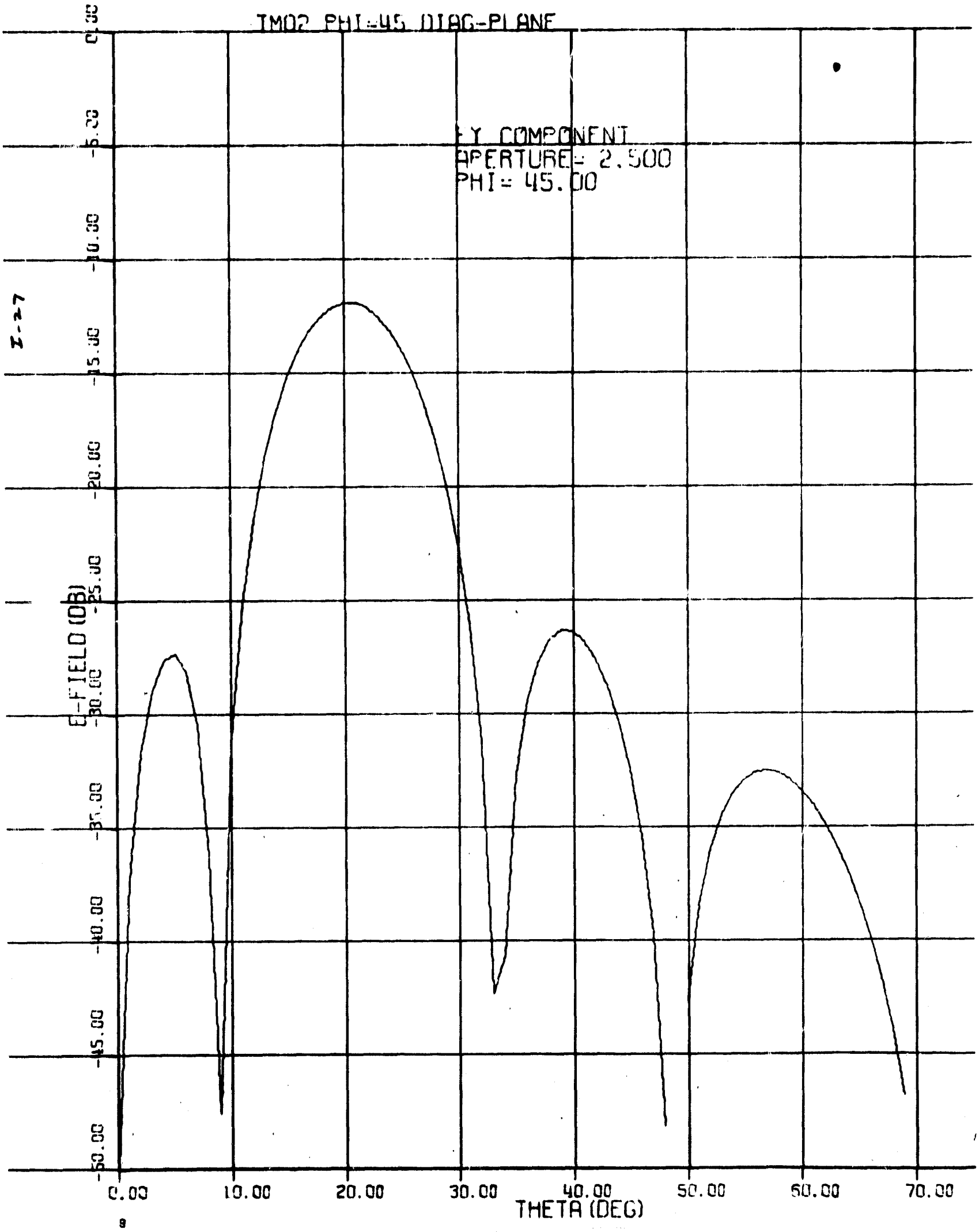

TE12 PHI=00 H-PLANE
EY COMPONENT
APERTURE= 2.500
PHI= 0.00
E-FIELD (DB)
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

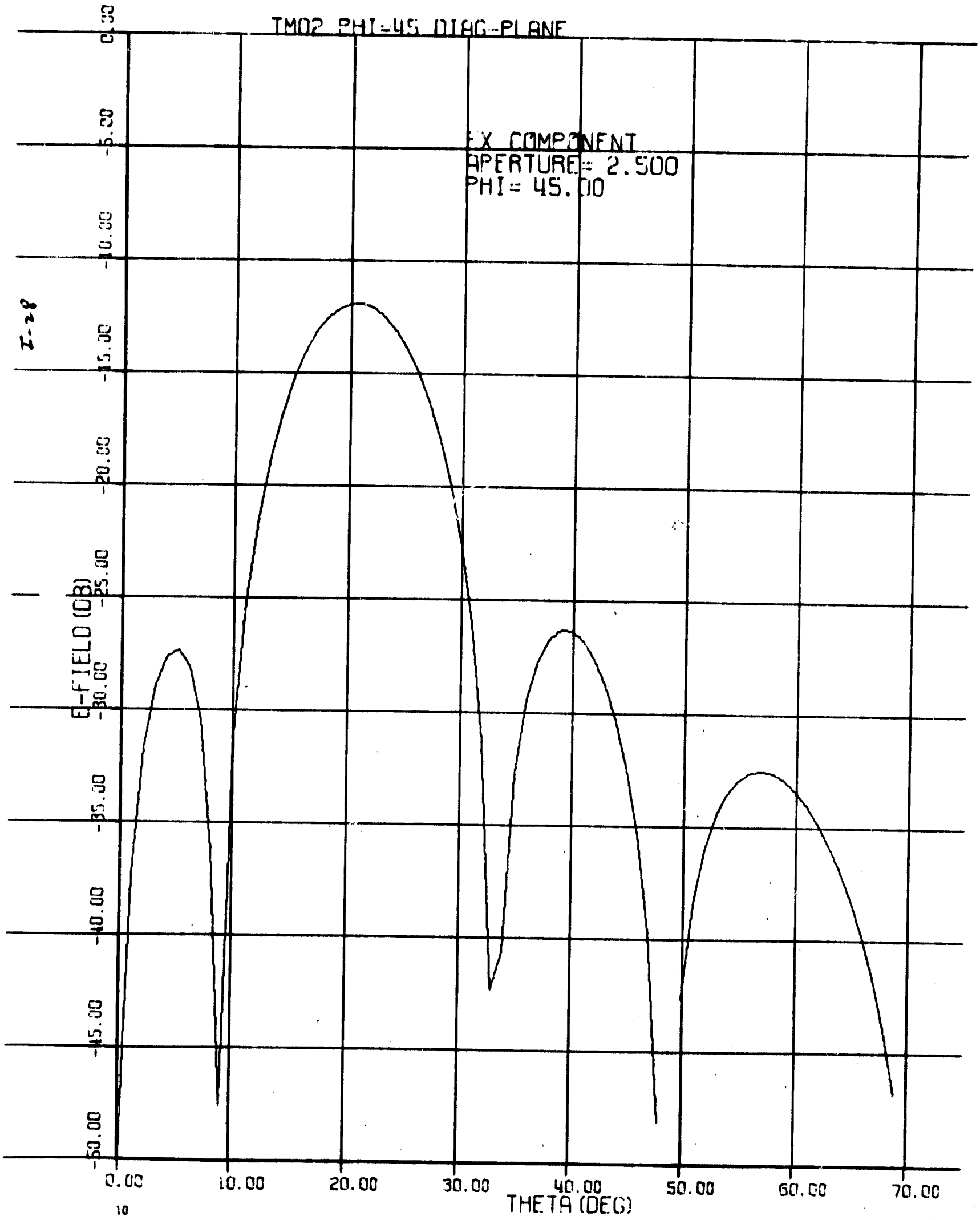

TE12 PHI=45 DIAG-PLANE
EX COMPONENT
APERTURE= 2.500
PHI= 45.00
E-FIELD (DB)
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

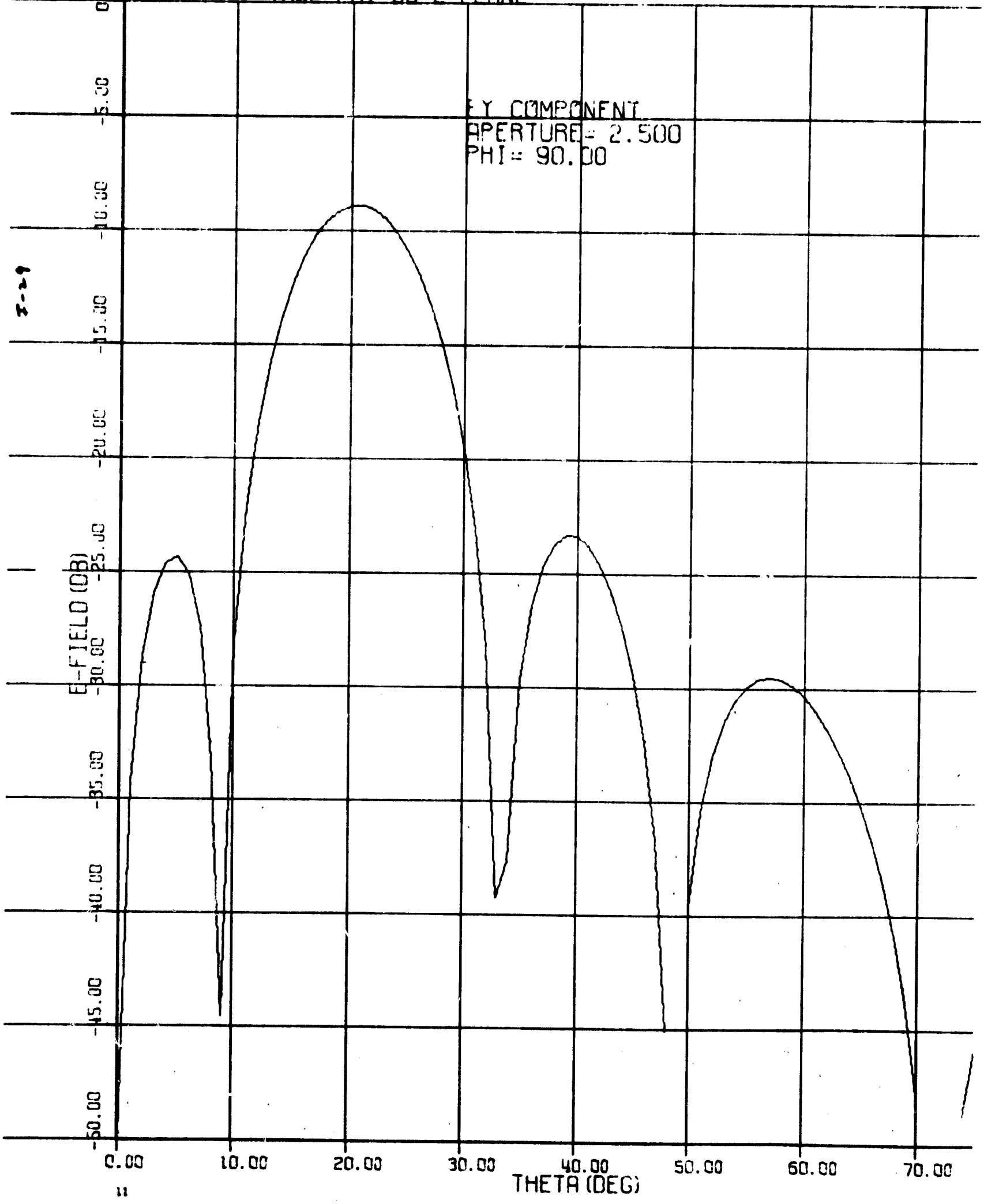

TE12 PHI=45 DIAG-PLANE
EY COMPONENT
APERTURE= 2.500
PHI= 45.00
E-FIELD (DB)
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)


IE12 PHI -90 E PLANE
EY COMPONENT
APERTURE= 2.500
PHI= 30.00
E-FIELD (DB)
-0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)


TM02 PHI=00 H-PLANE
EX COMPONENT
APERTURE= 2.500
PHI= 0.00
E-FIELD (DB)
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)


TM02 PHI=45 DIAG-PLANE
Y COMPONENT
APERTURE= 2.500
PHI= 45.00
E-FIELD (DB)
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

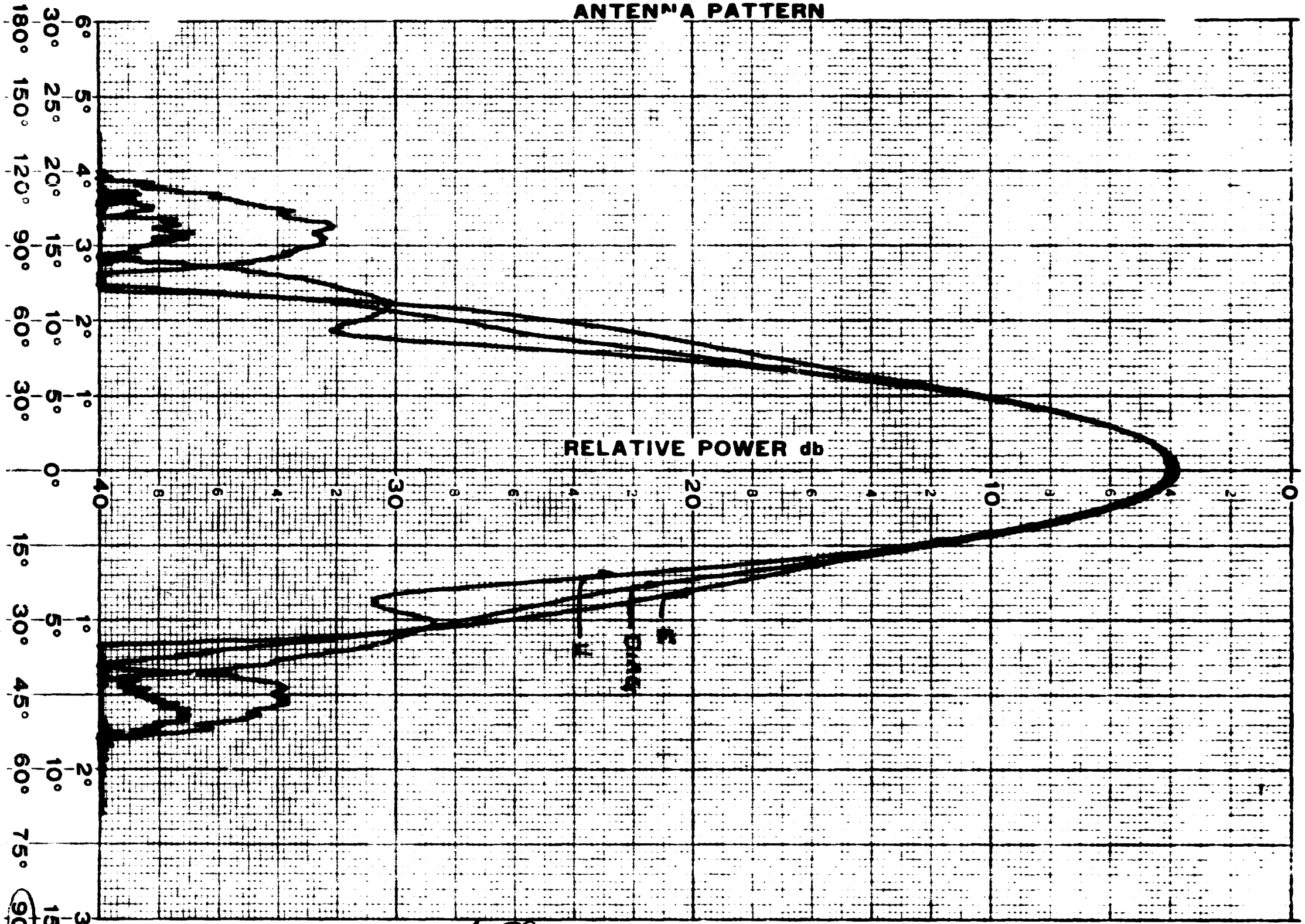

TM02 PHI=45 DIAG-PLANE
EX COMPONENT
APERTURE= 2.500
PHI= 45.00
E-FIELD (DB)
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)


TM02 PHI=90 E-PLANE
E Y COMPONENT
APERTURE= 2.500
PHI= 90.00
E-FIELD (DB)
0.00
-5.00
-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
THETA (DEG)

APPENDIX II A

Conical Multimode Horn
Linear Polarized Patterns

ANTENNA PATTERN



PROJECT

FREQ. 6.82

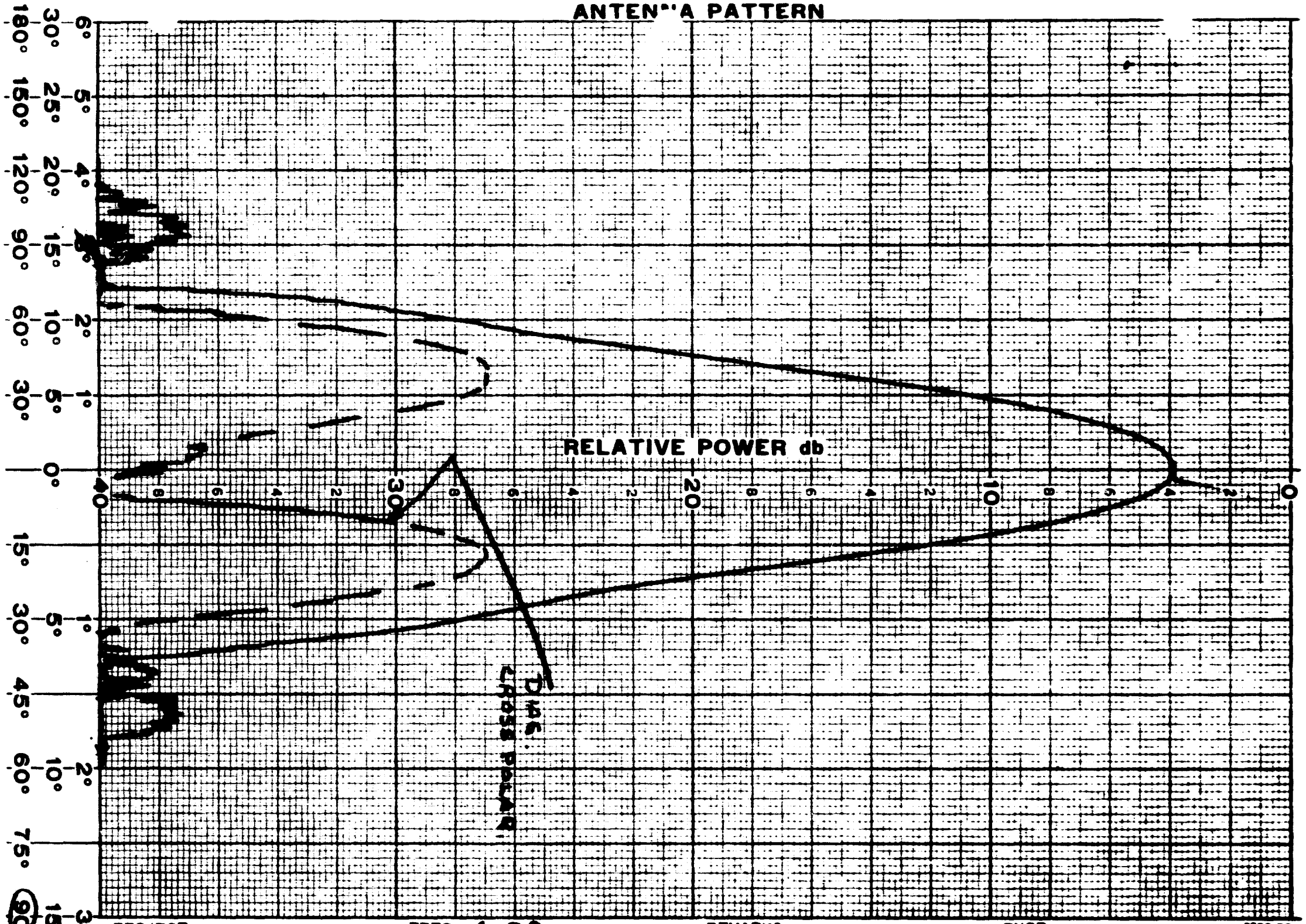
REMARKS

ENGR

PLANE E

DATE 11/25/68

ANTEN"A PATTERN



PROJECT

FREQ. 6.82

PLANE DIAG

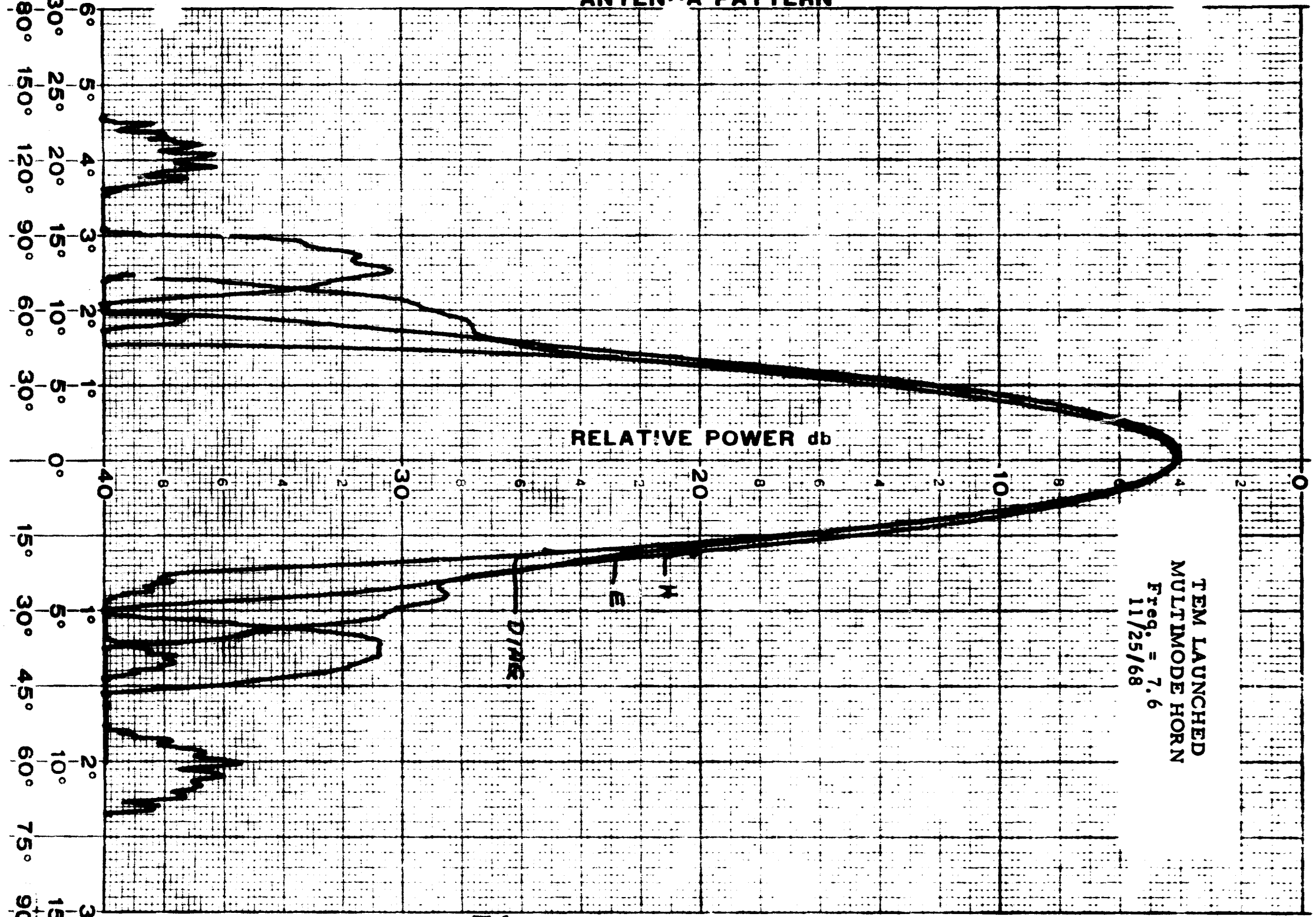
REMARKS

ENGR.

DATE 11/25/58

9883 GS

ANTENNA PATTERN



PROJECT

FREQ. 7.6

PLANE H E D

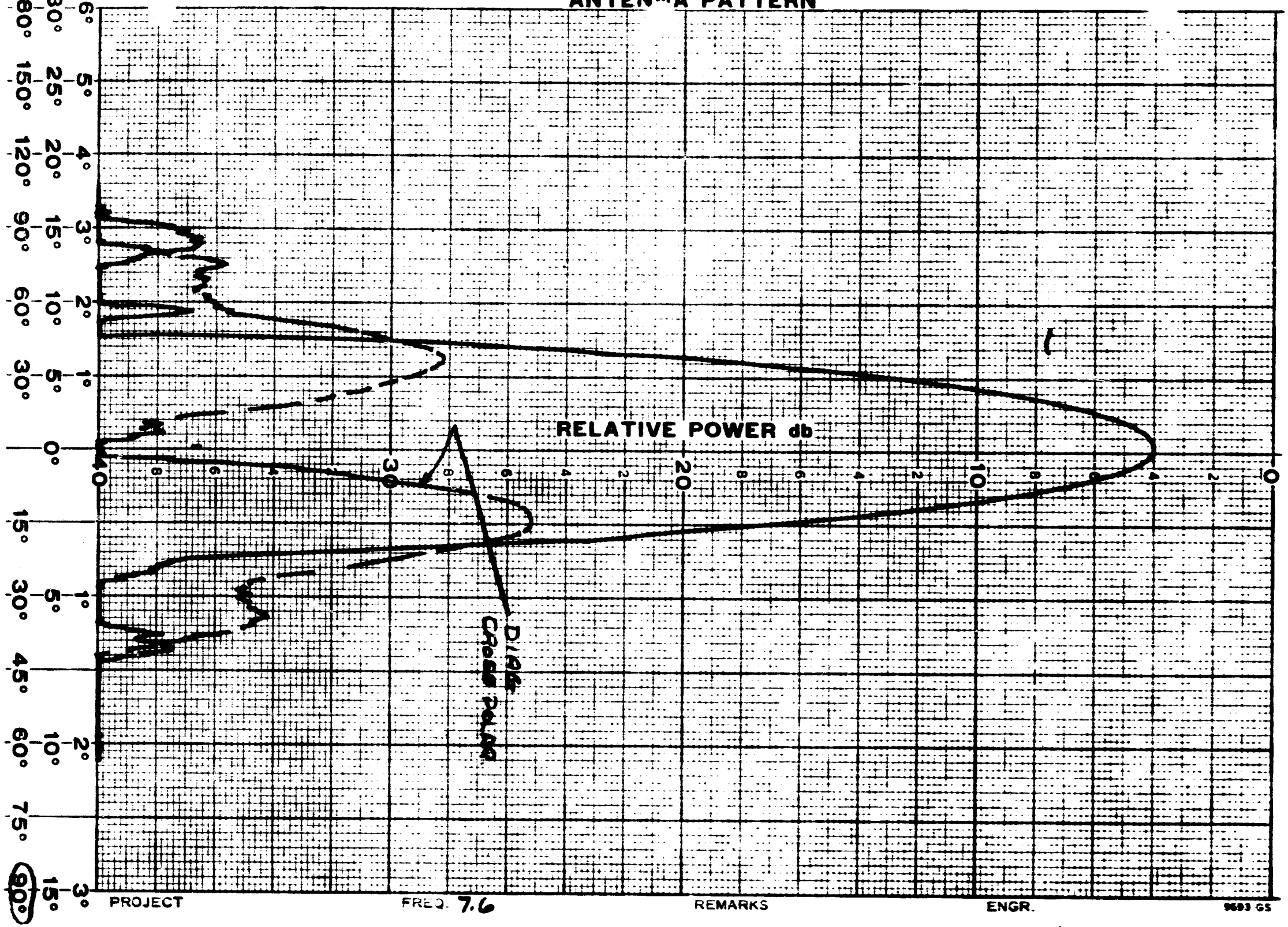
REMARKS

ENGR.

DATE 11/25/68

9693

ANTENNA PATTERN



PROJECT

FREQ. 7.6

REMARKS

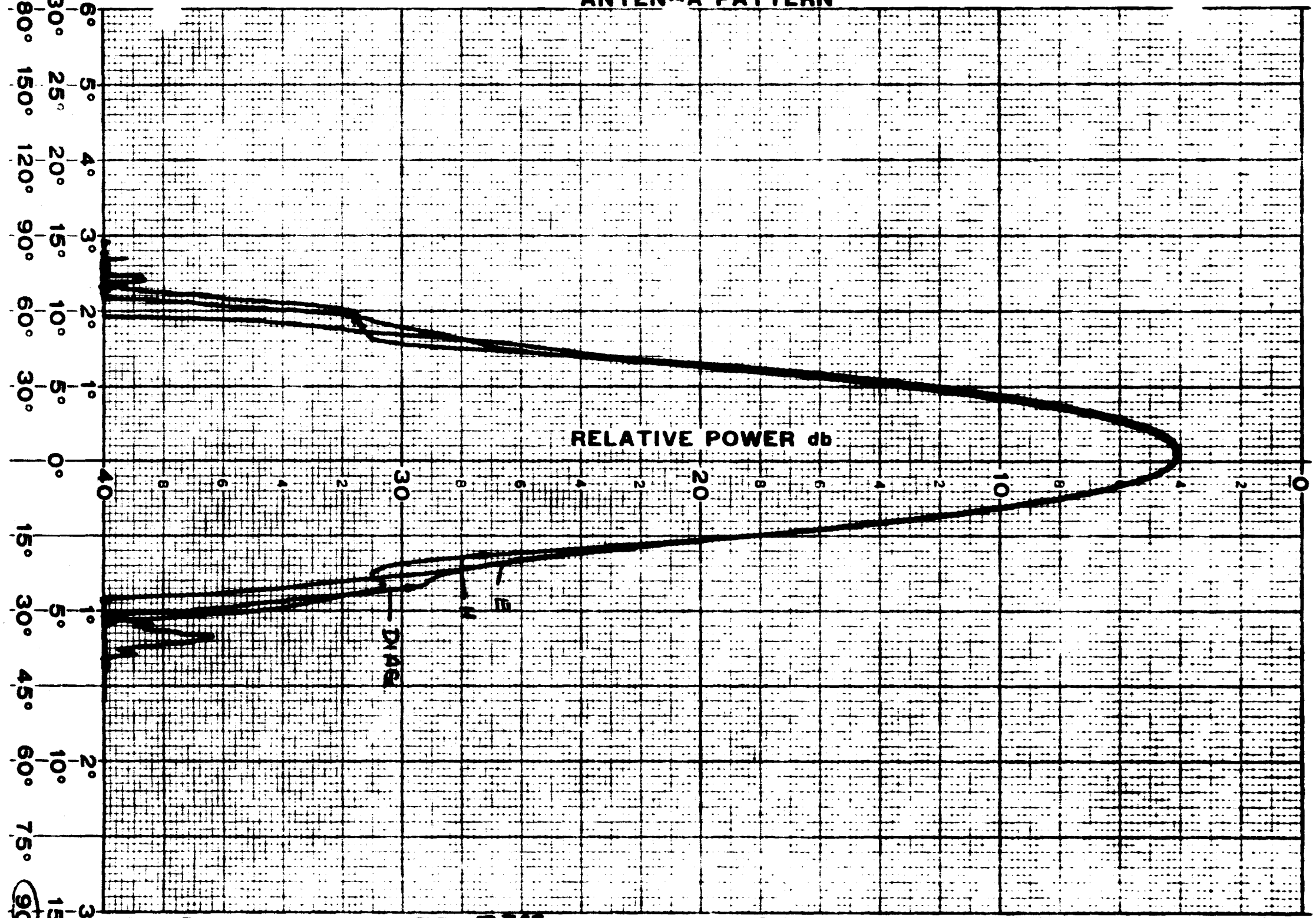
ENGR.

9693 GS

PLANE DIAG

DATE 11/25/68

ANTENNA PATTERN



PROJECT

FREQ. 8.367

PLANE H E D

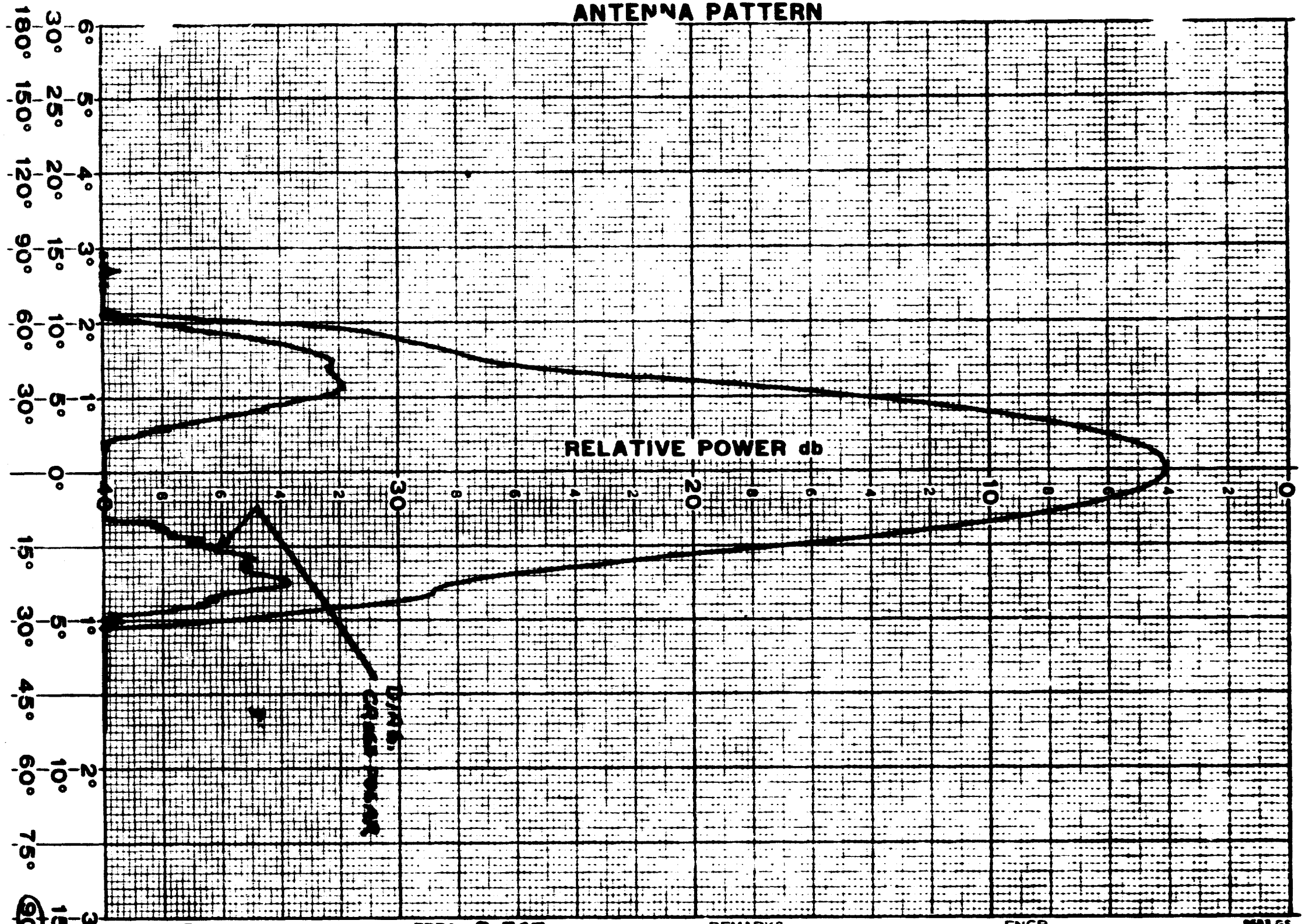
REMARKS

ENGR

DATE 11/25/68

9693 55

ANTENNA PATTERN



PROJECT

FREQ. 8.367

PLANE DIAG.

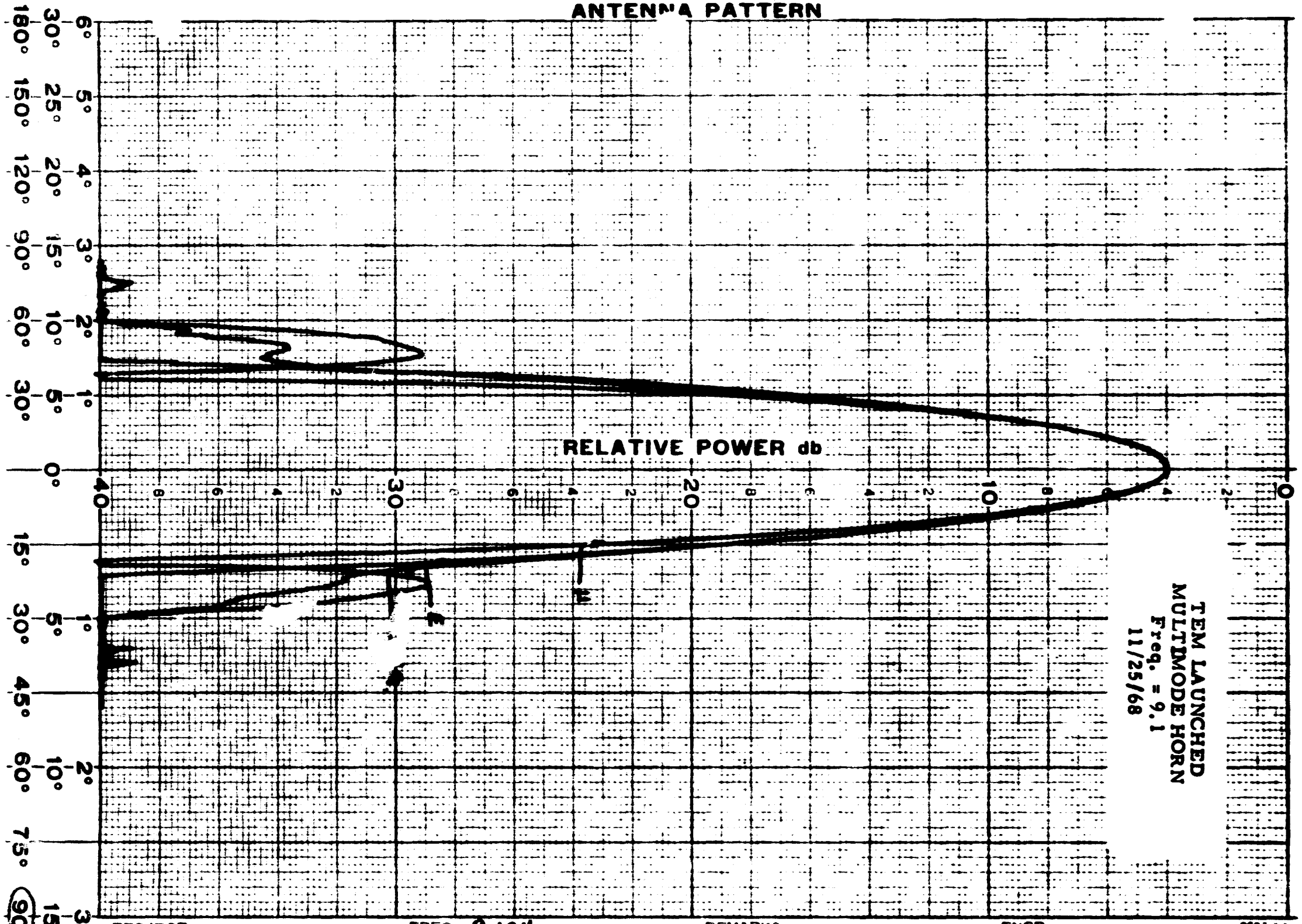
REMARKS

ENGR.

DATE 11/28/62

1693 GS

ANTENNA PATTERN



PROJECT

FREQ. 9.164

PLANE E-H

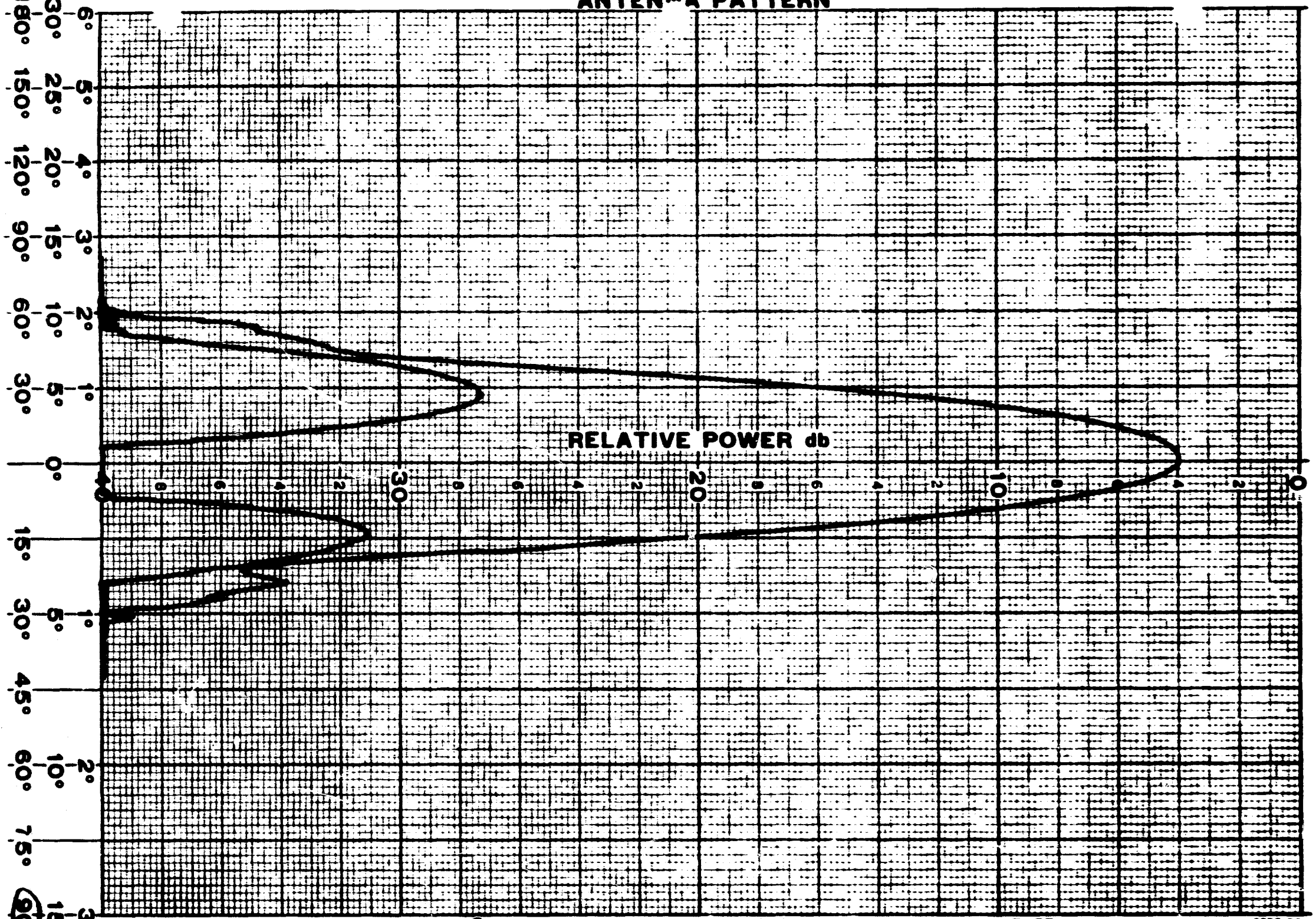
REMARKS

ENGR.

DATE 11/25/68

9693 55

ANTENNA PATTERN



PROJECT

FREQ. 9.164

PLANE DIAG

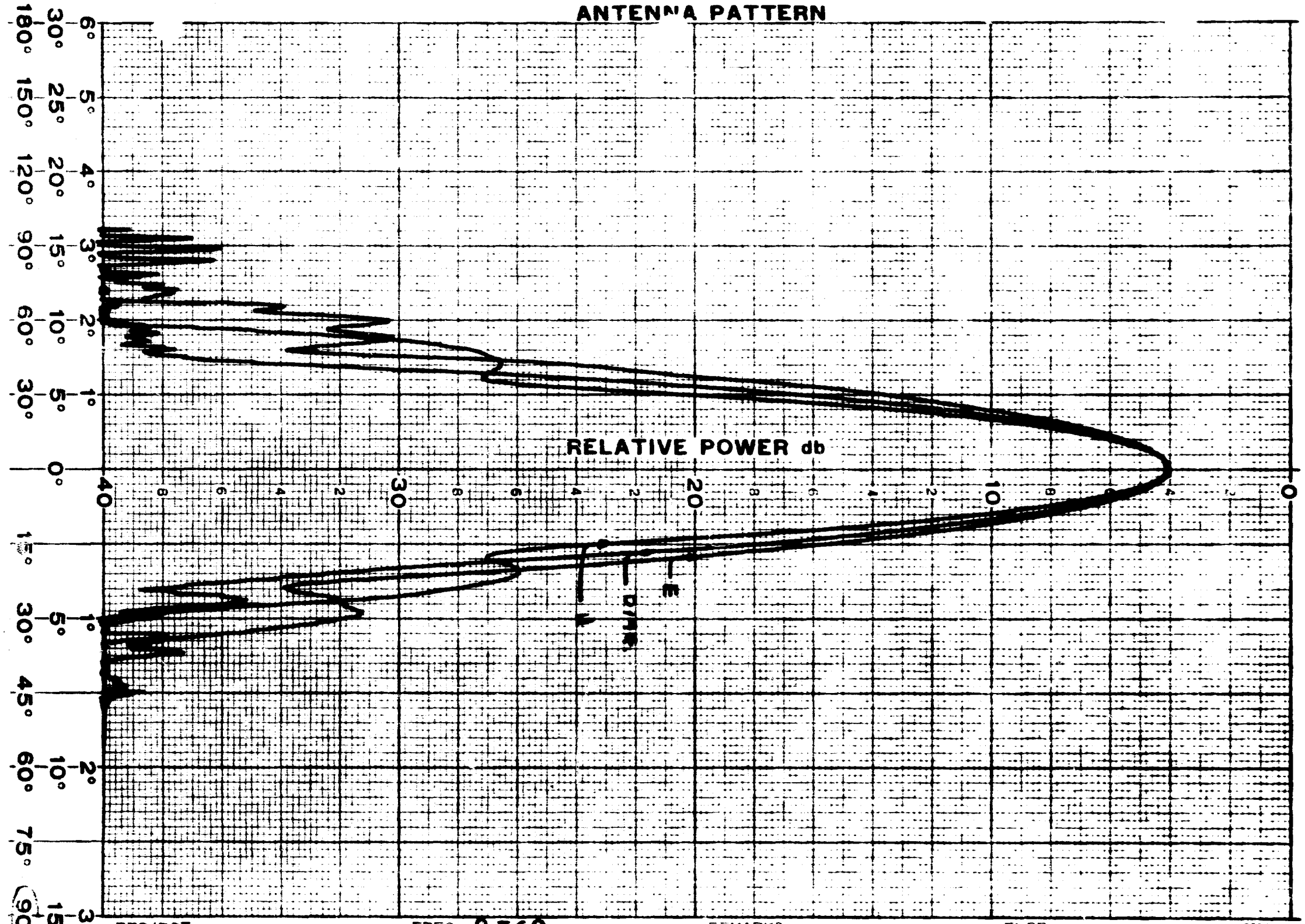
REMARKS

ENGR.

DATE 11/28/68

9303 65

ANTENNA PATTERN



PROJECT

FREQ. 9.562

REMARKS

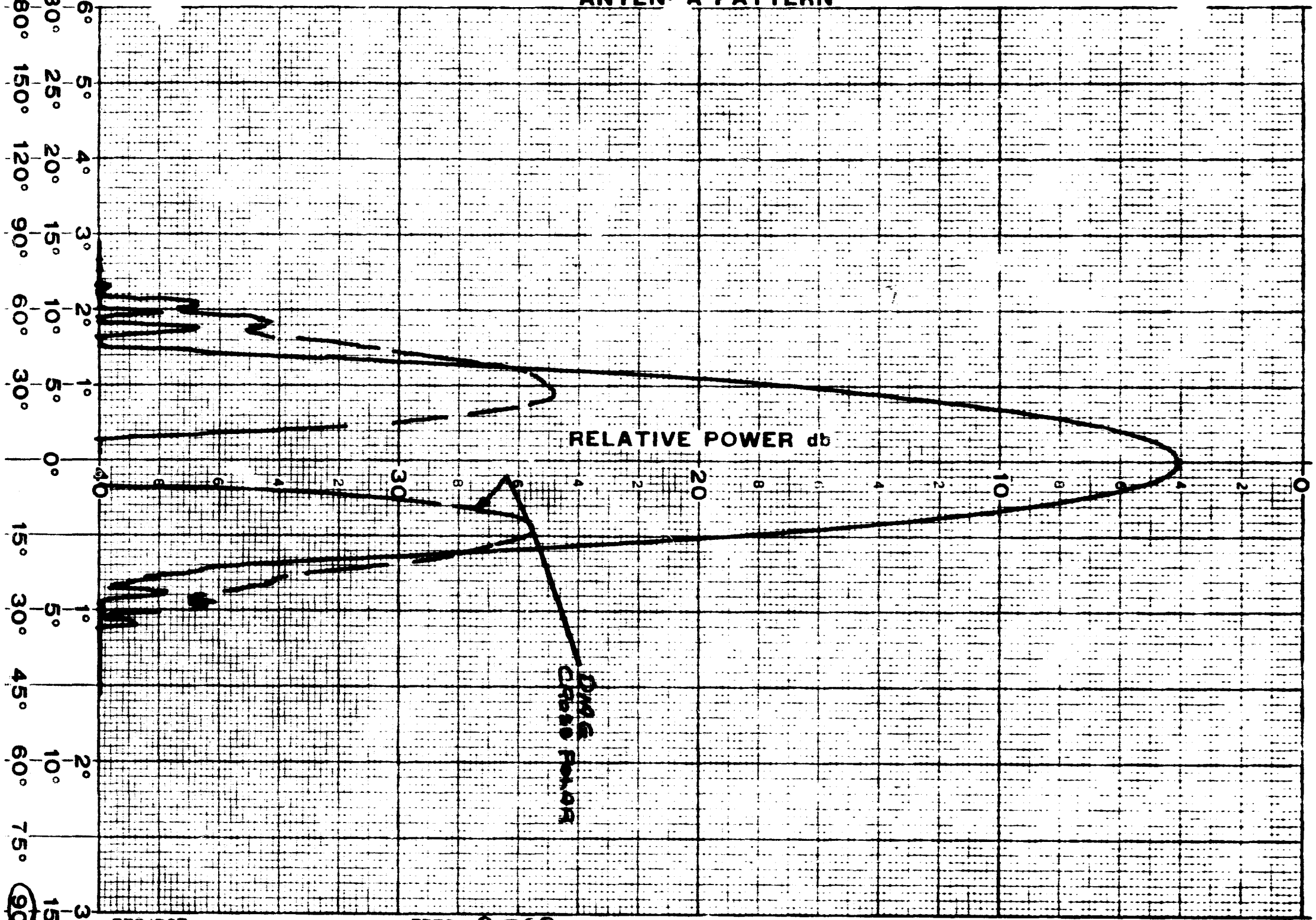
ENGR.

9693 GS

PLANE E

DATE 11/25/68

ANTENNA PATTERN



PROJECT

FREQ. 9.562

REMARKS

ENGR.

9693 5S

PLANE DIAG

DATE 11/25/68

ANTENNA PATTERN

RELATIVE POWER db

180° 150° 120° 90° 60° 30° 0°

30° 25° 20° 15° 10° 5° 2° 1° 5° 10° 2° 1° 5° 15° 30° 45° 60° 75° 90°

6° 5° 4° 3° 2° 1° 0° 1° 2° 3°

40 30 20 10 0

8 6 4 2 8 6 4 2 8 6 4 2 0

H

E

PROJECT

FREQ. 10.0

REMARKS

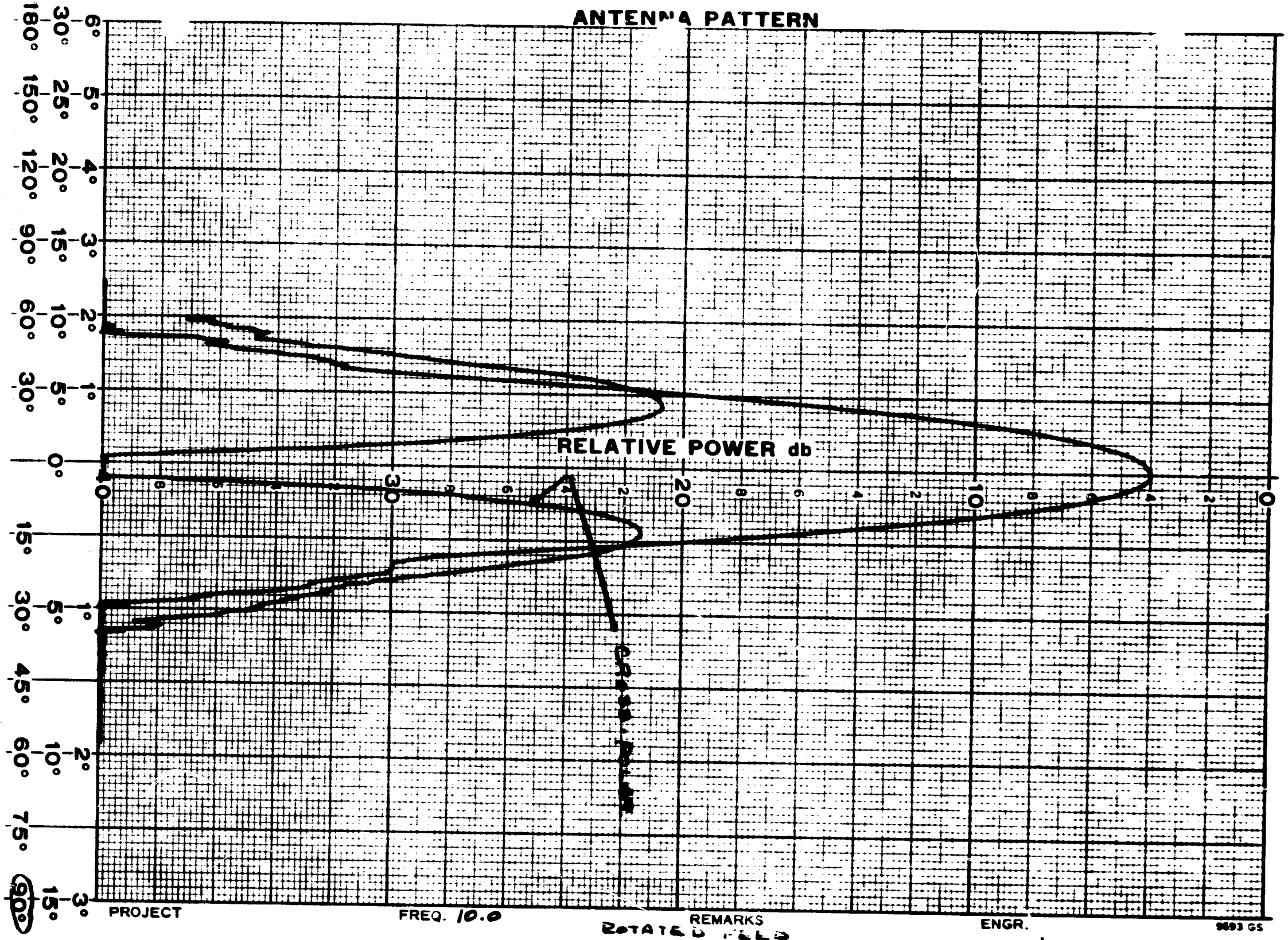
ENGR.

9693 GS

PLANE E-PLANE

DATE 11/25/68

ANTENNA PATTERN



PROJECT

FREQ. 10.0

REMARKS ROTATED FIELD

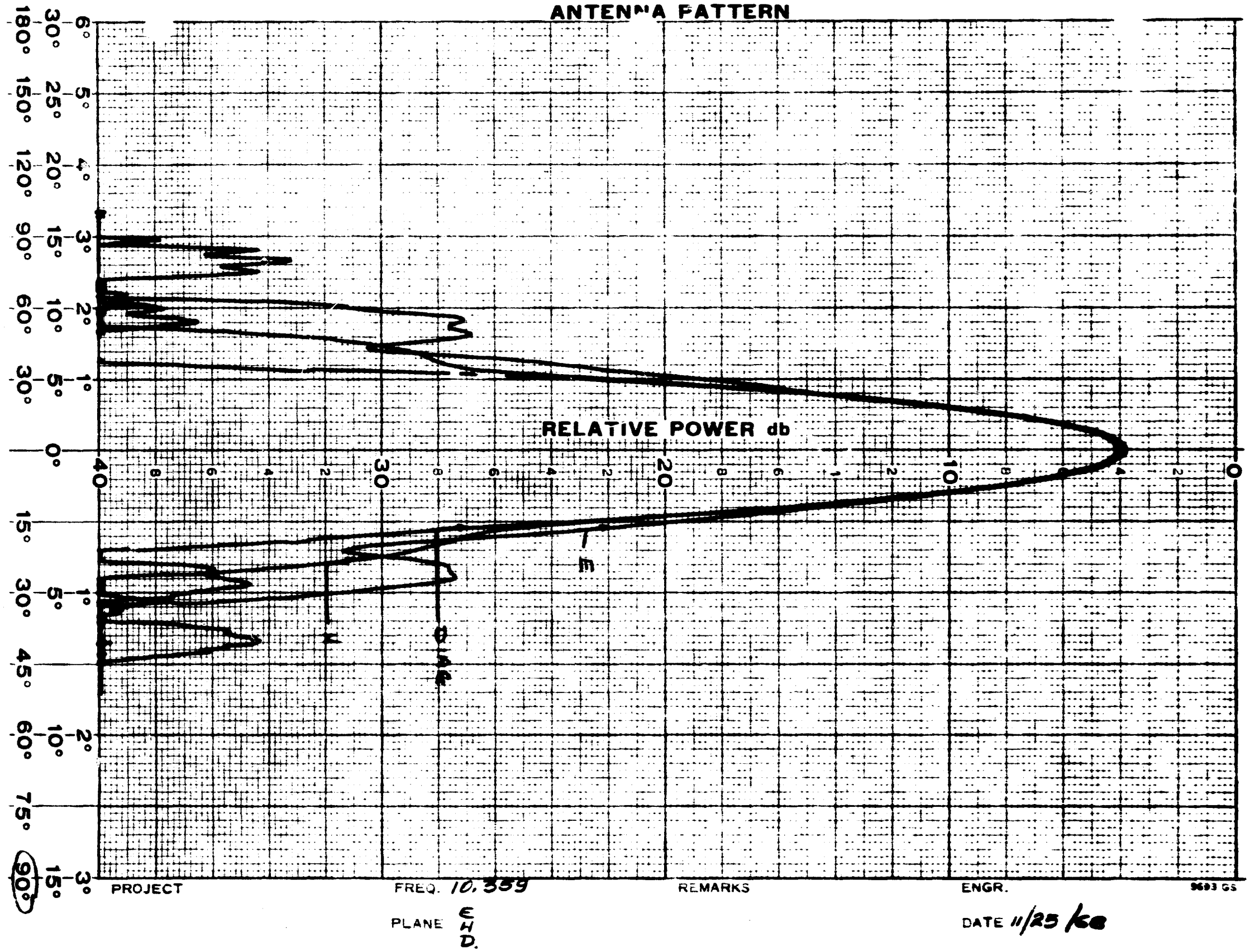
ENGR.

PLANE DIAG

DATE 11/25/68

9693 GS

ANTENNA PATTERN



PROJECT

FREQ. 10,359

PLANE E H D.

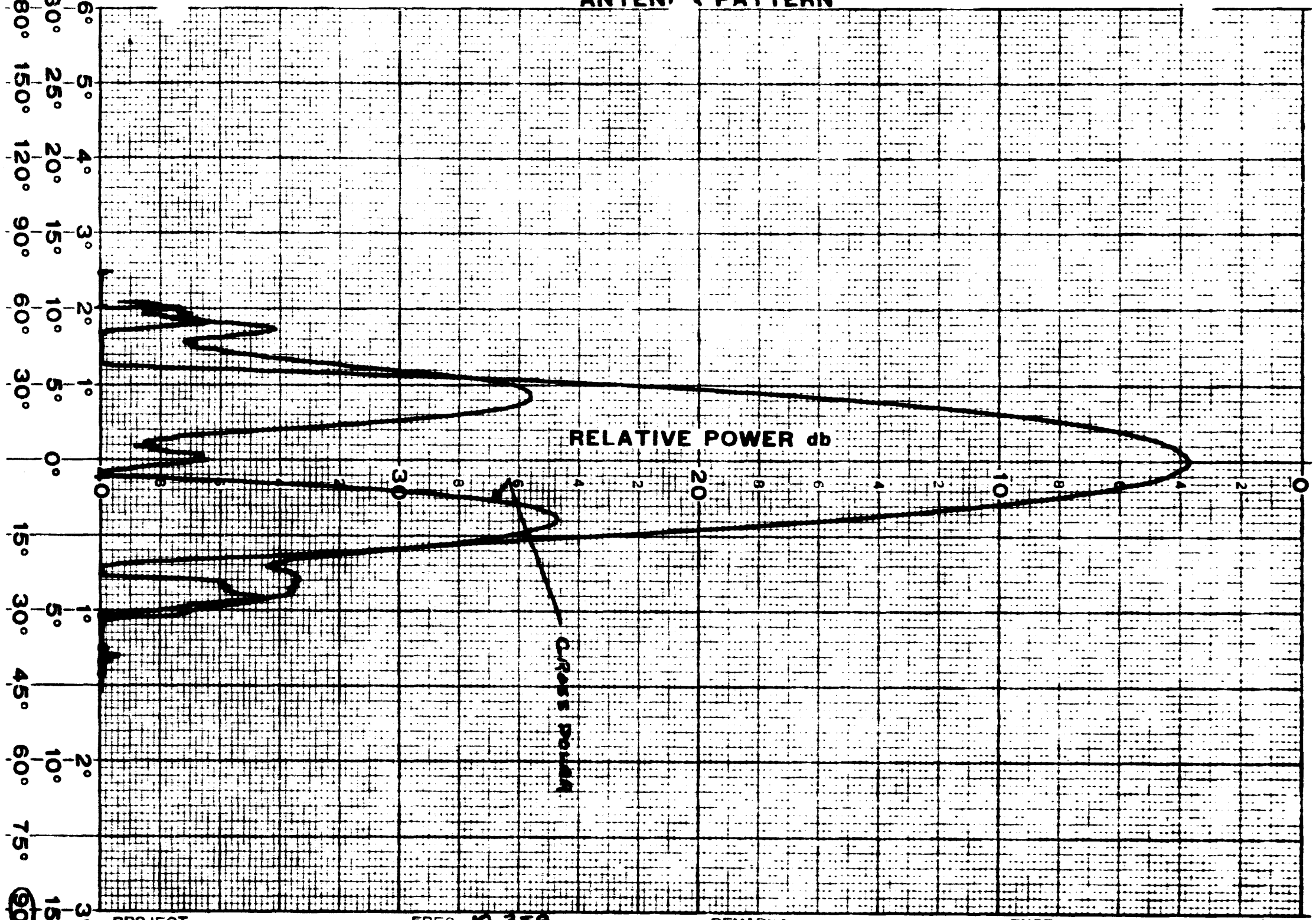
REMARKS

ENGR.

DATE 11/25 ke

9693 GS

ANTENNA PATTERN



PROJECT

FREQ. 10.359

REMARKS

ENGR.

9693 GS

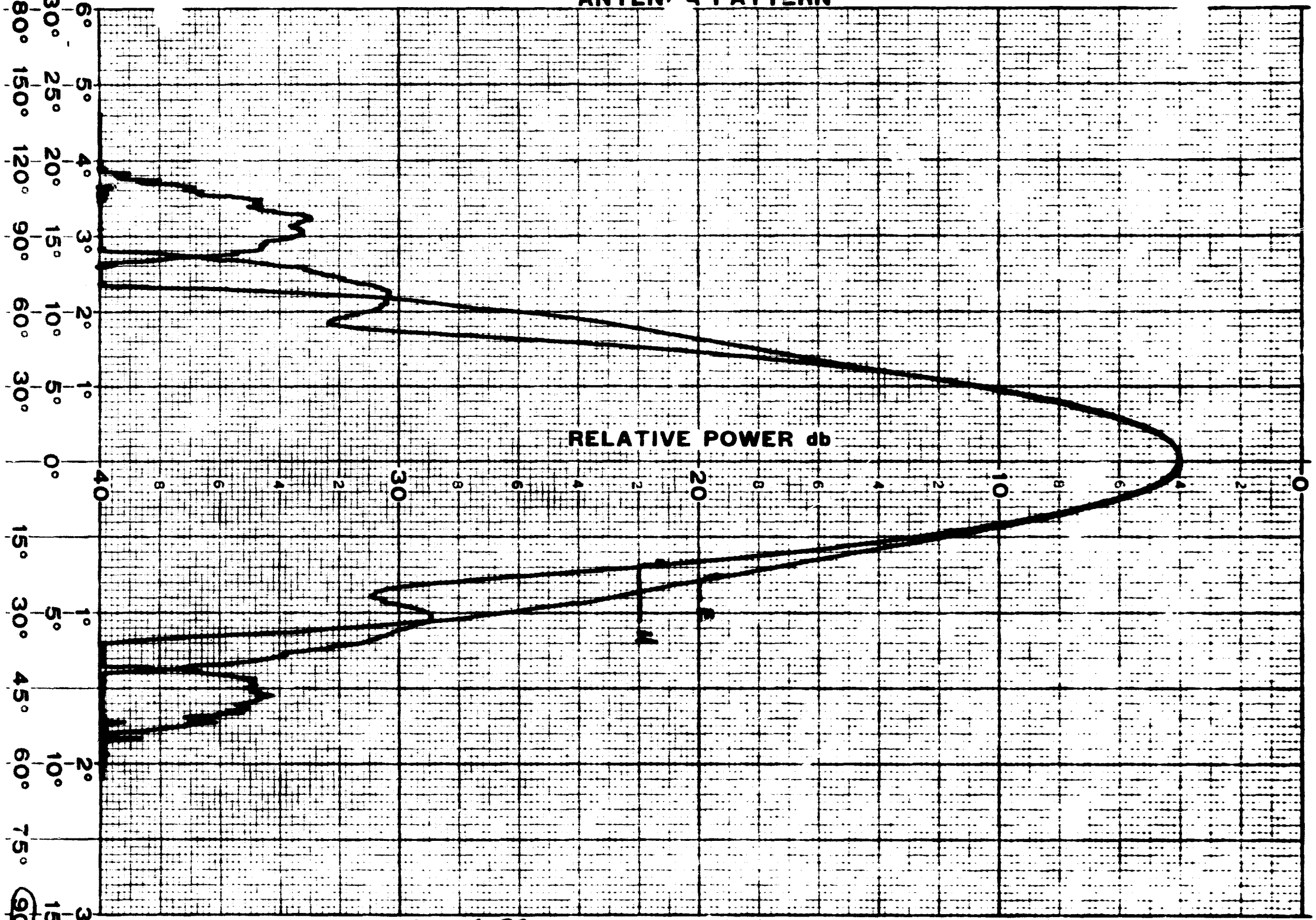
PLANE DIAG

DATE 11/28/60

APPENDIX II - B

CONICAL MULTIMODE HORN
ORTHOGONAL LINEAR PATTERNS

ANTENNA PATTERN



PROJECT

FREQ. 6.82

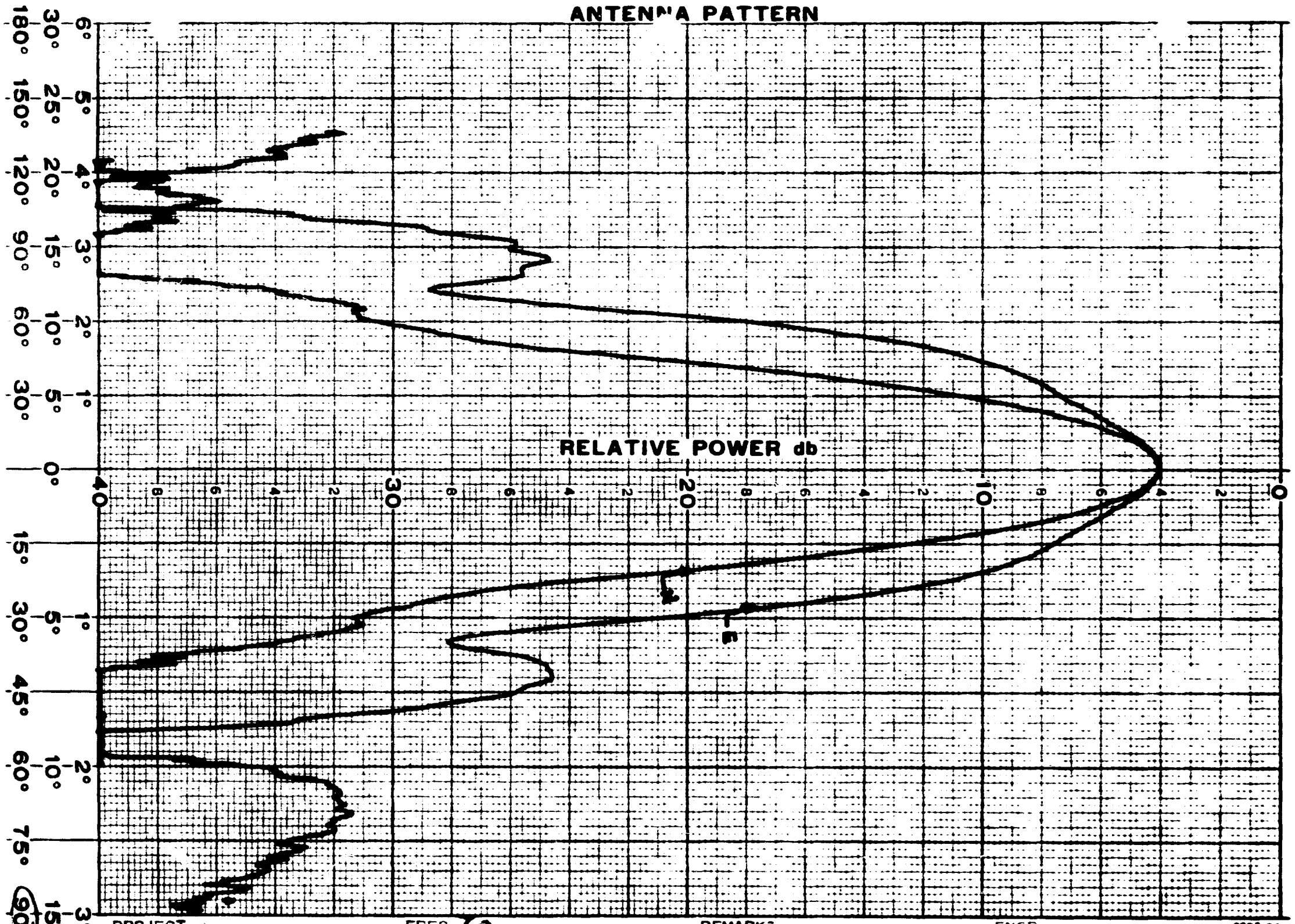
REMARKS ORTOGONAL LINEAR

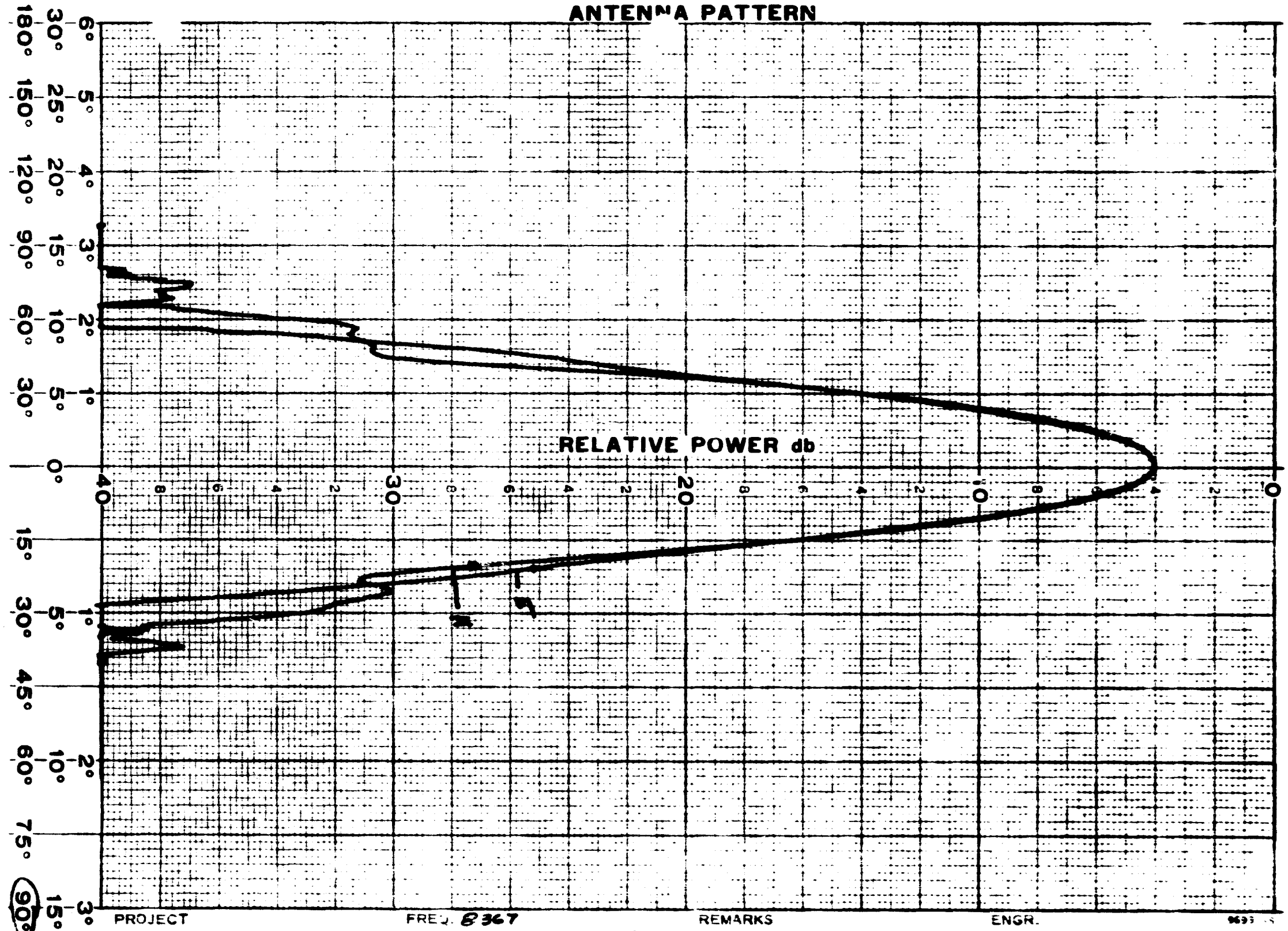
ENGR.

9693 GS

PLANE E H

DATE 11/25/68


ANTENNA PATTERN
RELATIVE POWER db
40
30
20
10
0
180°
150°
120°
90°
60°
30°
0°
15°
30°
45°
60°
75°
90°
6°
5°
4°
3°
2°
1°
5°
1°
2°
3°
15°
25°
20°
15°
10°
5°
1°
PROJECT
FREQ. 7.0
PLANE E H
REMARKS
ORTHOG. LINEAR
ENGR.
DATE 12/5/68
9693 G5



PROJECT

FREQ. 8367

REMARKS

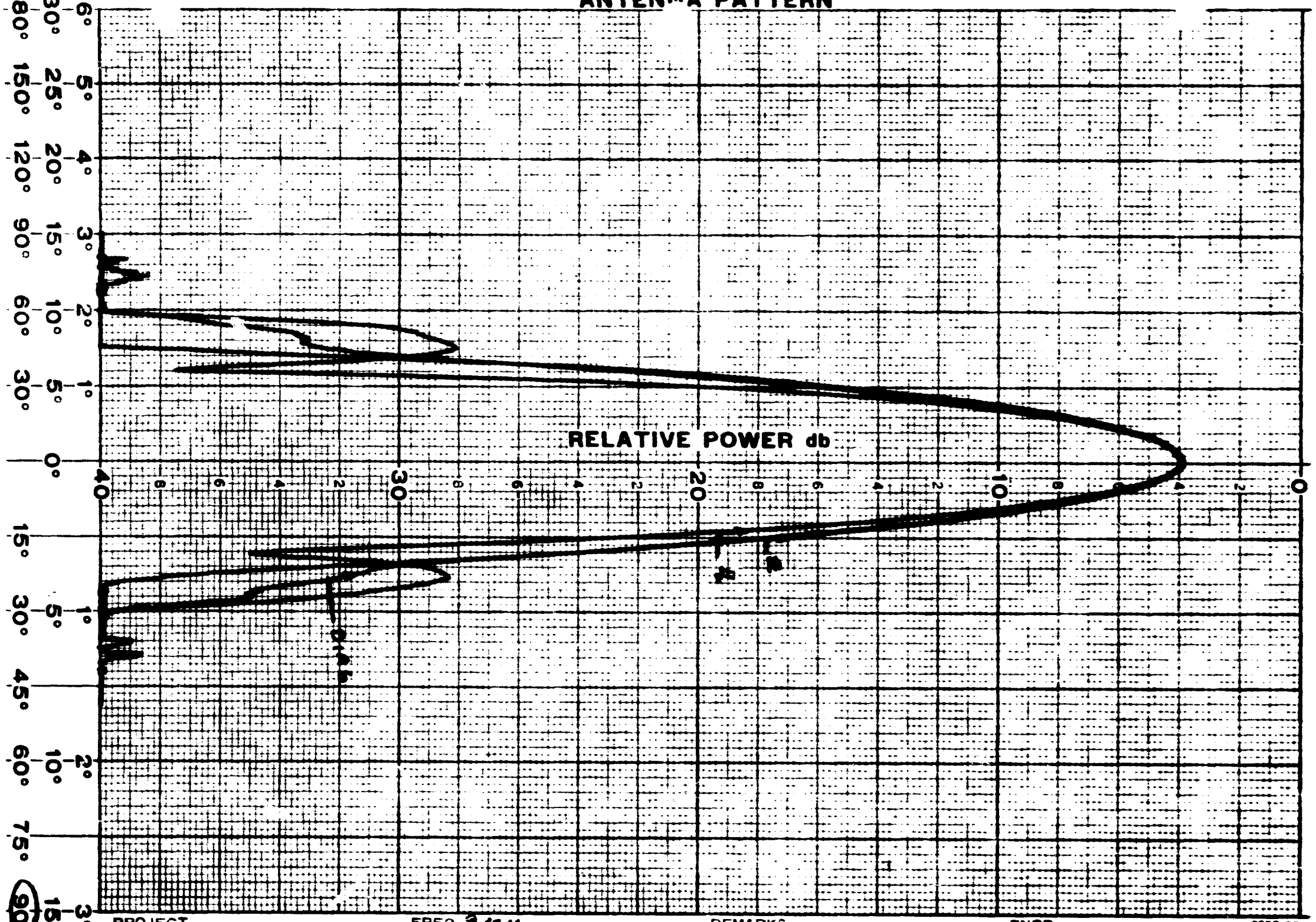
ORTHOGONAL LINEAR

ENGR.

PLANE E H

DATE 11/25/68

ANTENNA PATTERN



PROJECT

FREQ. 9.164

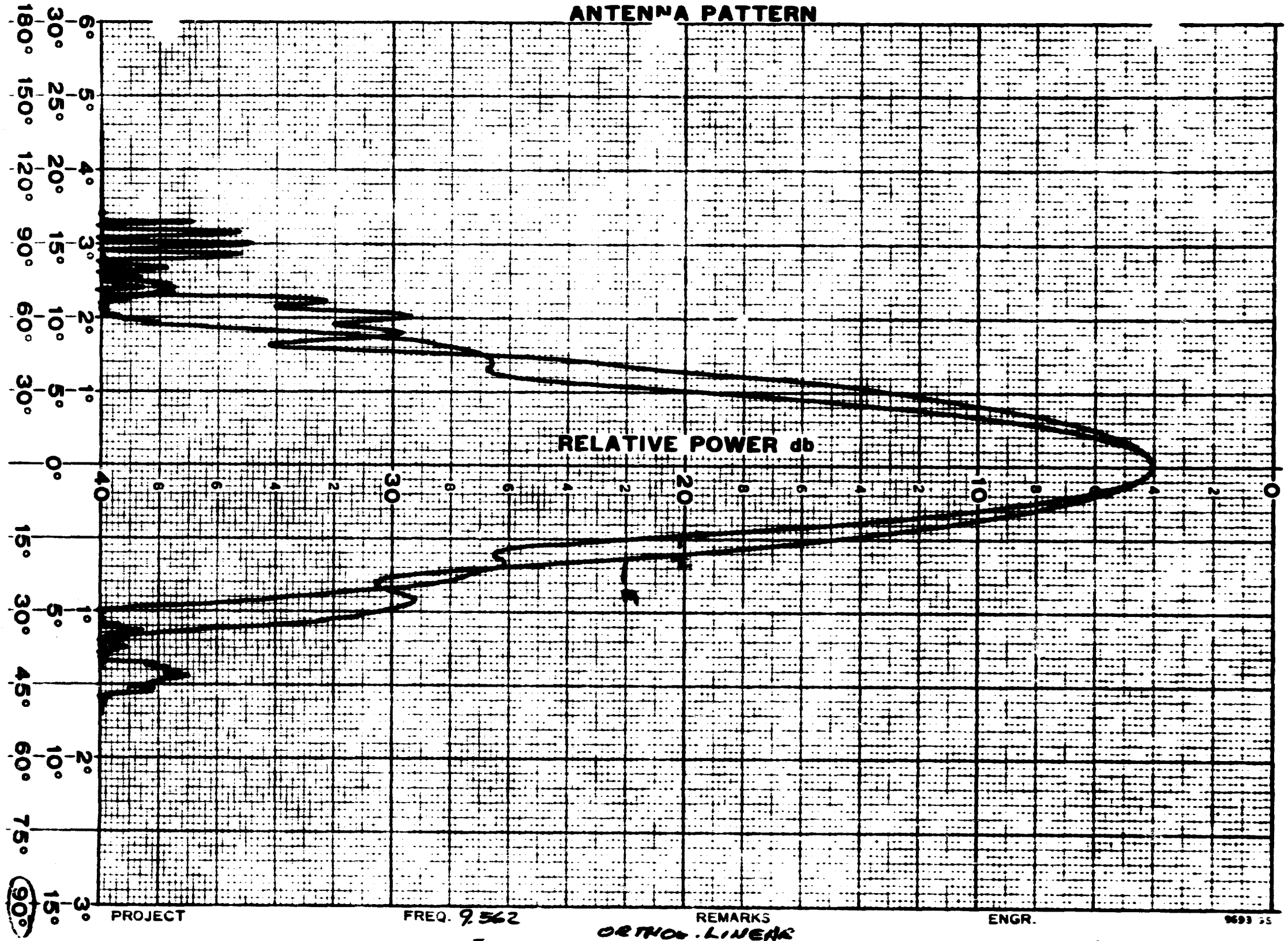
REMARKS ORTHOG. LINEAR

ENGR.

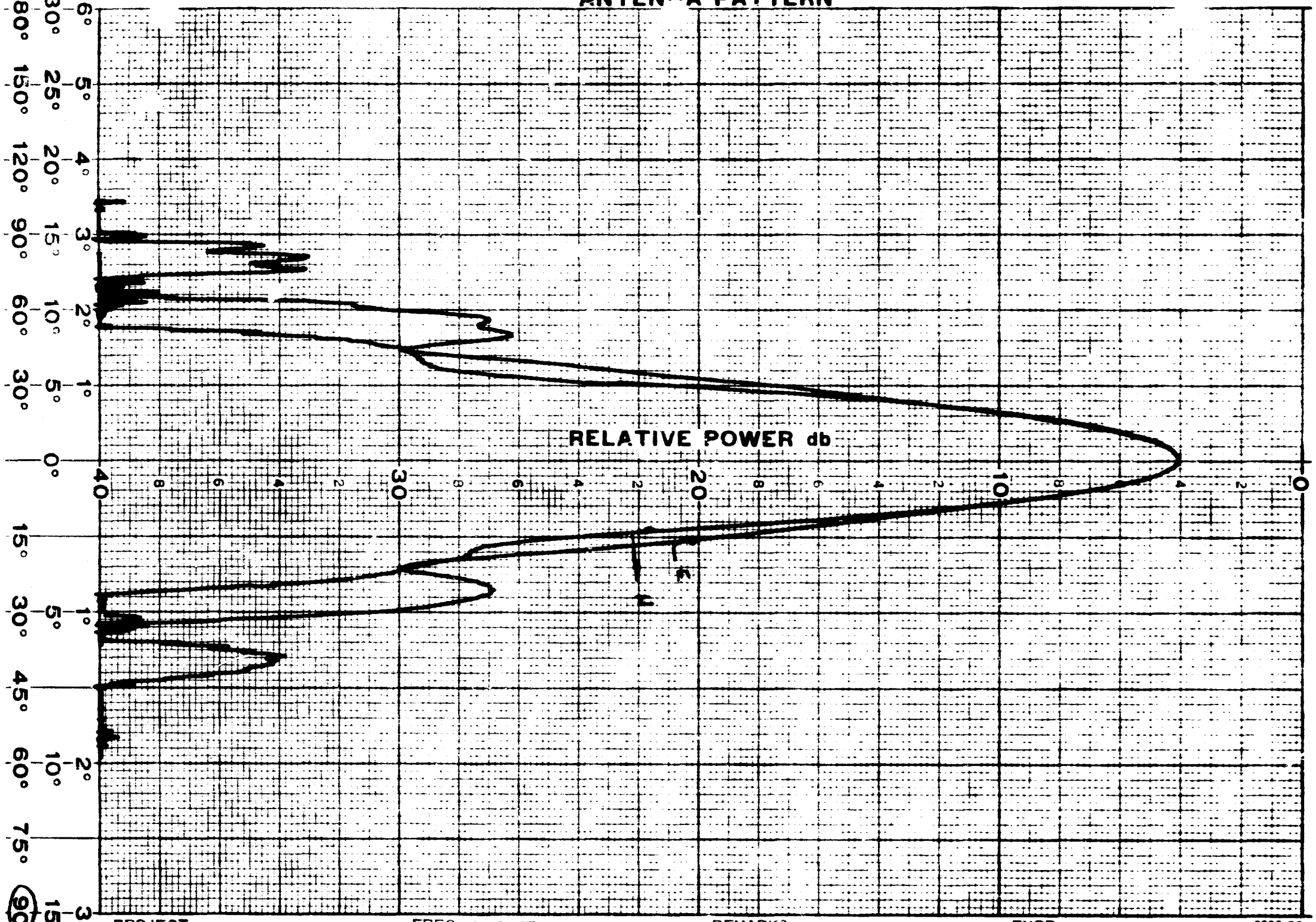
PLANE E H D.

DATE 11/26/68.

9603 GS


ANTENNA PATTERN
RELATIVE POWER db
40
30
20
10
0
180°
150°
120°
90°
60°
30°
0°
15°
30°
45°
60°
75°
90°
6°
5°
4°
3°
2°
1°
5°
1°
2°
3°
15°
10°
PROJECT
FREQ. 9.562
PLANE E
H
REMARKS
ORTHO. LINEAR
ENGR.
DATE 11/25/68

ANTENNA PATTERN



PROJECT

FREQ. 10.359

REMARKS OMNI-G LINEAR

ENGR.

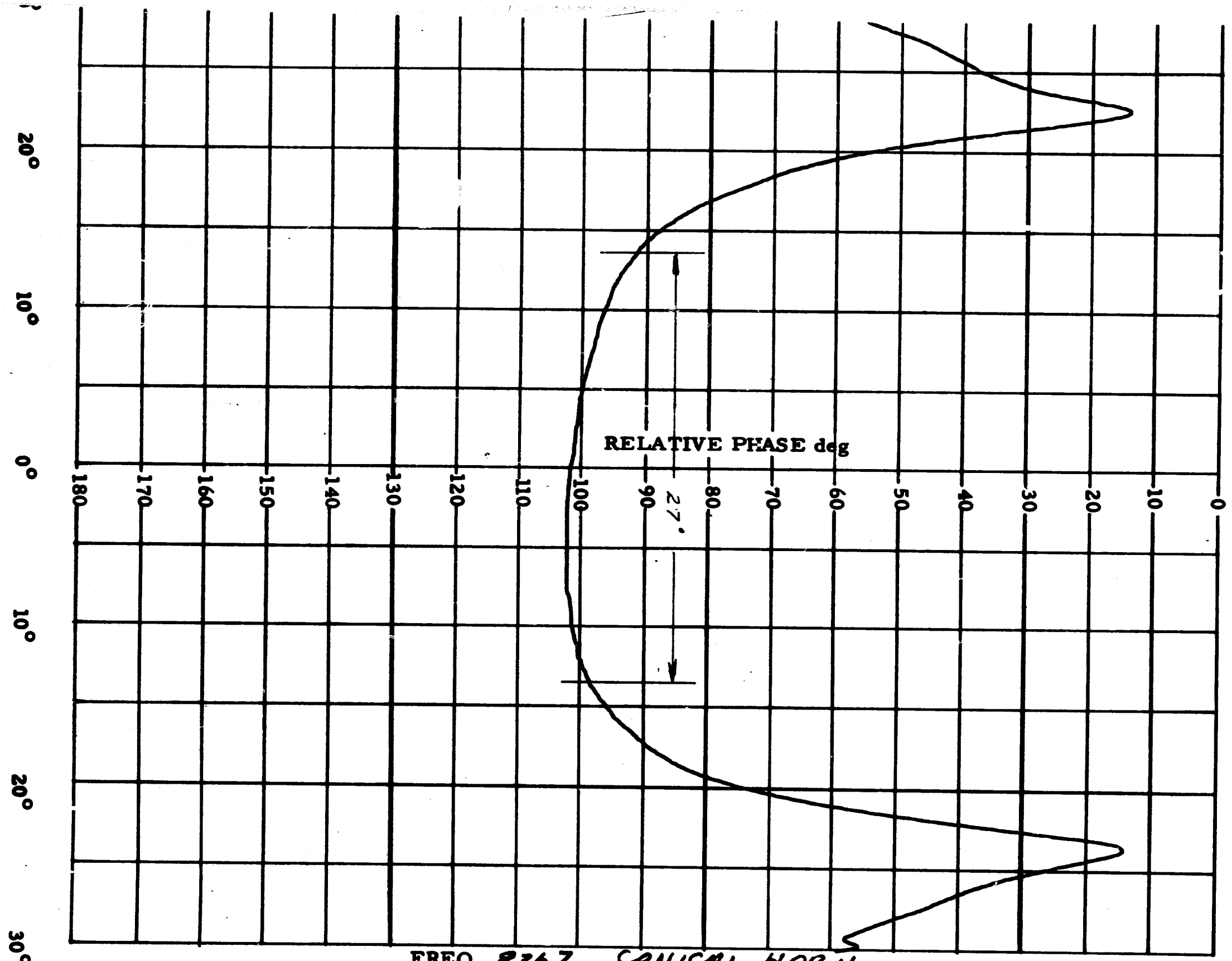
9693 GS

PLANE E H

DATE 11/25/68

APPENDIX II-C

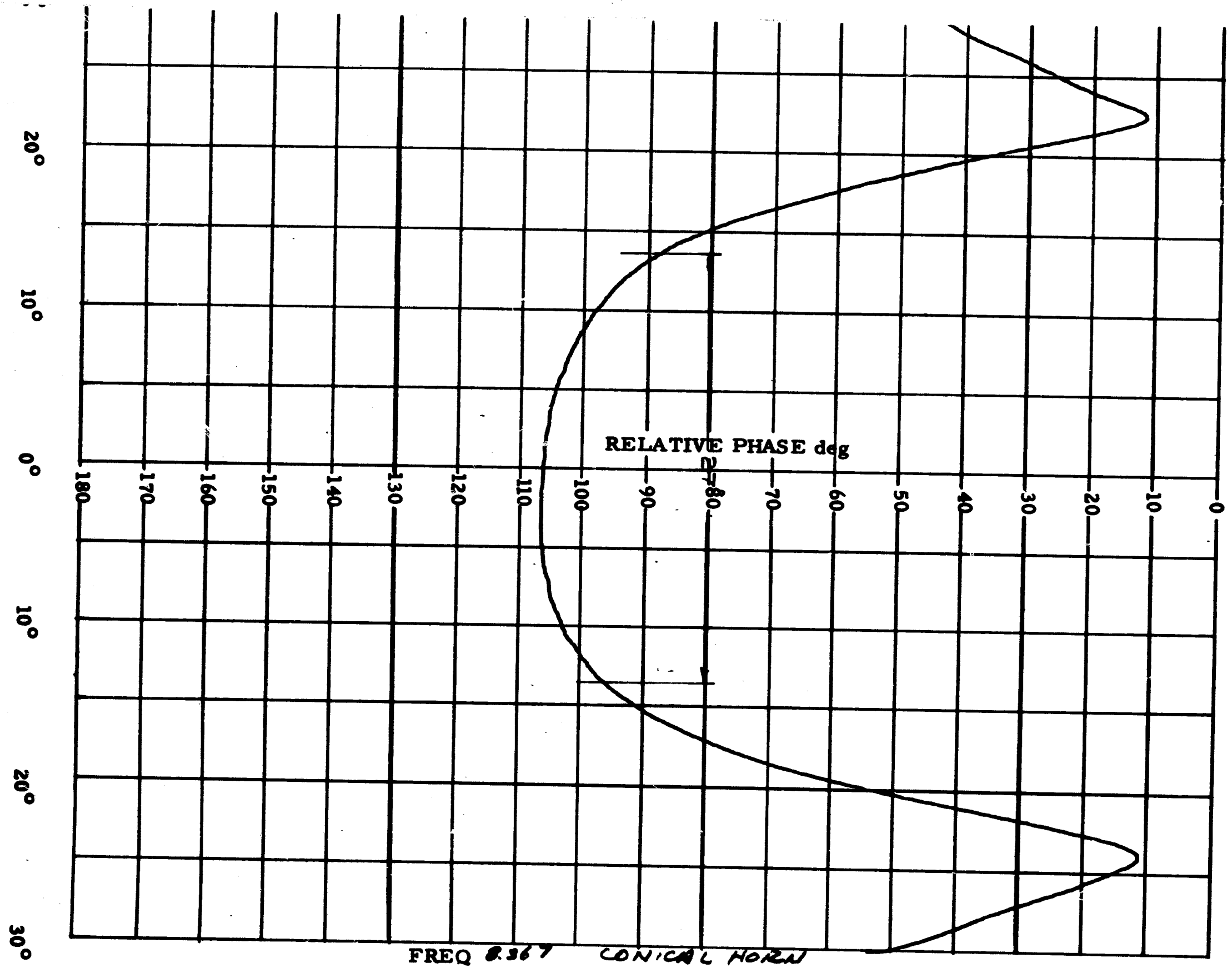
CONICAL MULTIMODE HORN
PHASE PATTERNS - LINEAR POLARIZATION
(CENTER ROTATION 1/2 INCH INSIDE HORN)



FREQ 8.367 CONICAL HORN

PLANE H CR = - 1/2

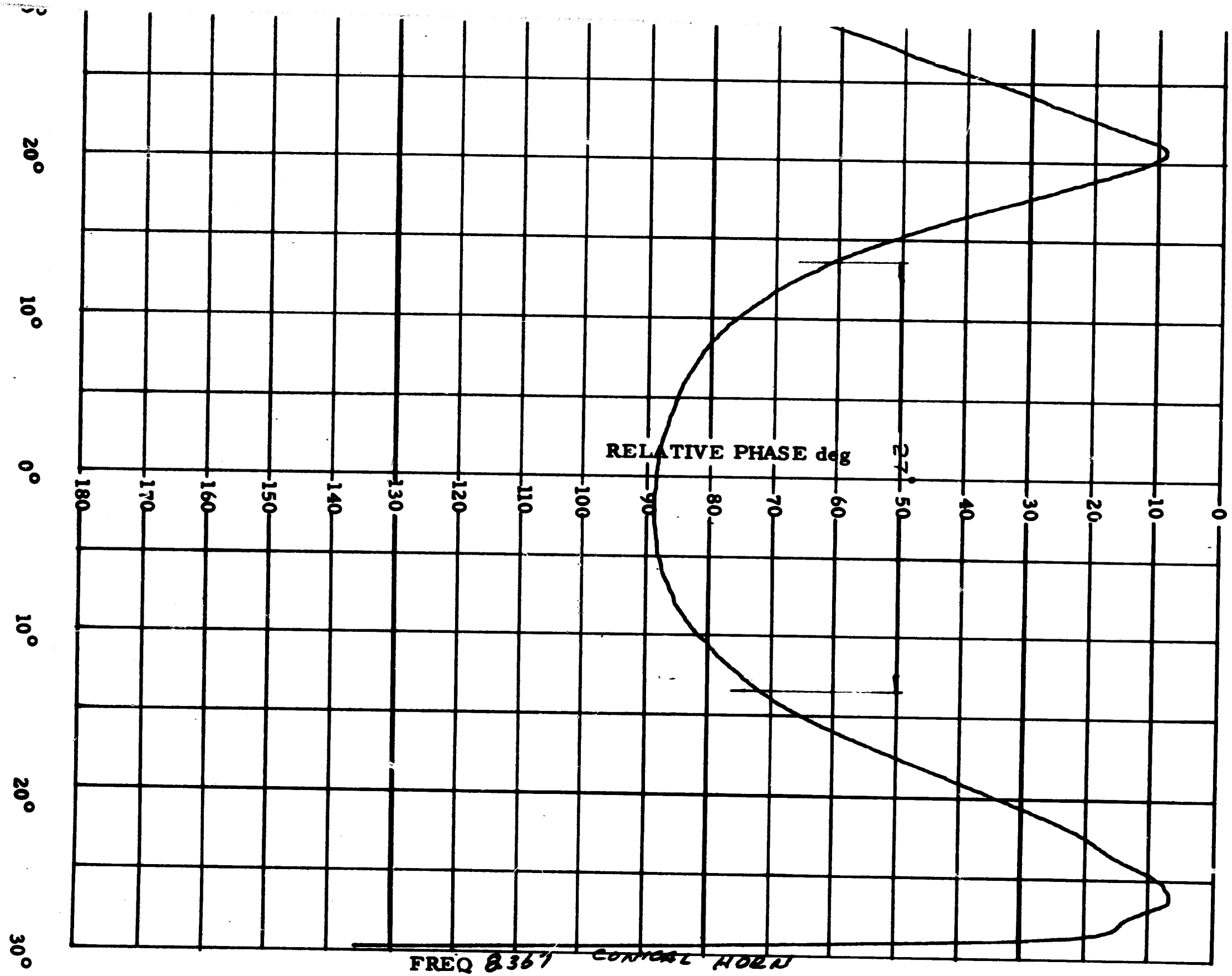
DATE 12/9/68



FREQ 8.367 CONICAL HORN

PLANE 45° CR = -1/2

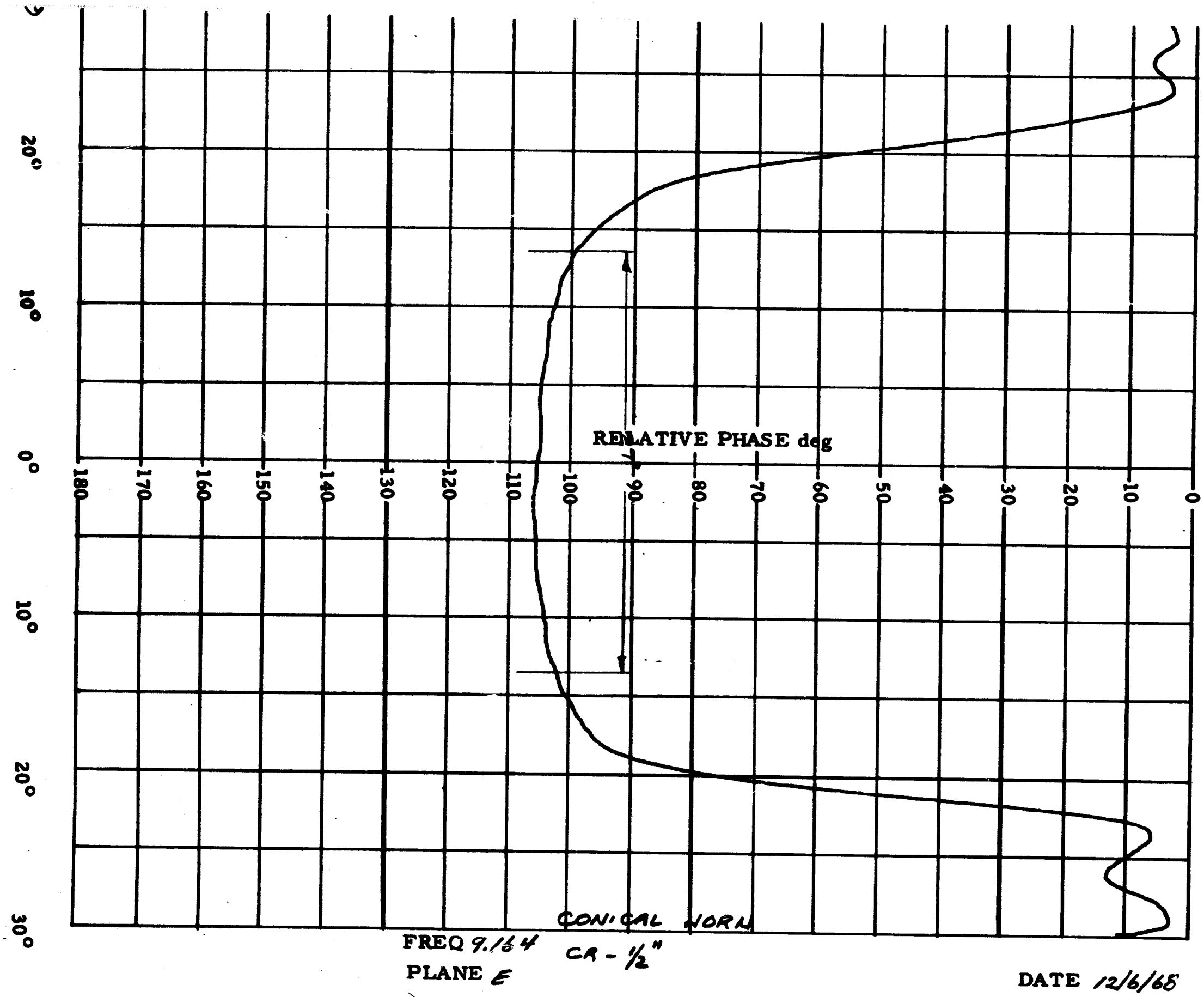
DATE 2/9/62

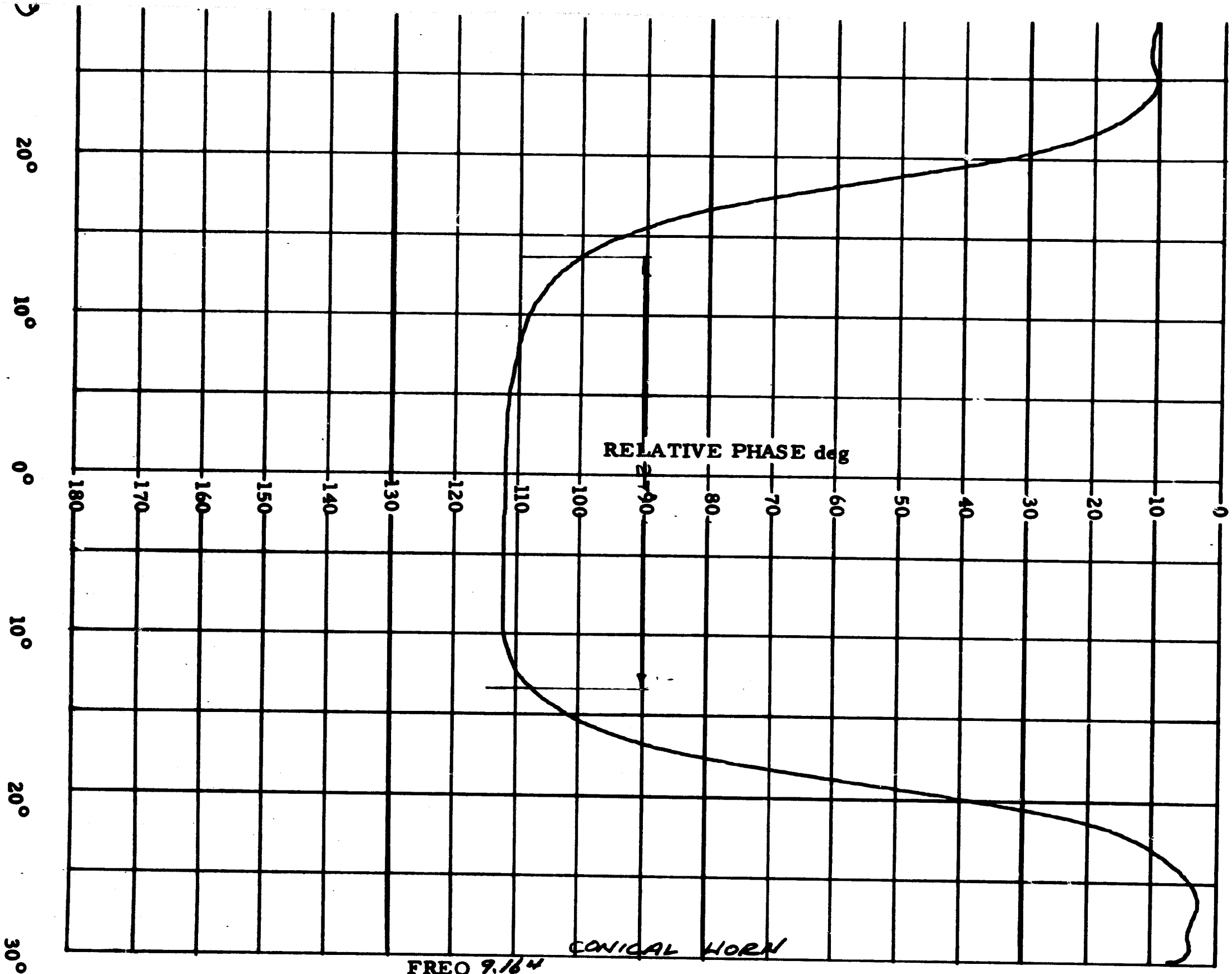


FREQ 8367 CONICAL HORN

PLANE E CR = -1/2

DATE 12/9/68


0°
10°
20°
RELATIVE PHASE deg
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
10°
20°
30°
CONICAL HORN
CR - 1/2"
FREQ 9.164
PLANE E
DATE 12/6/65

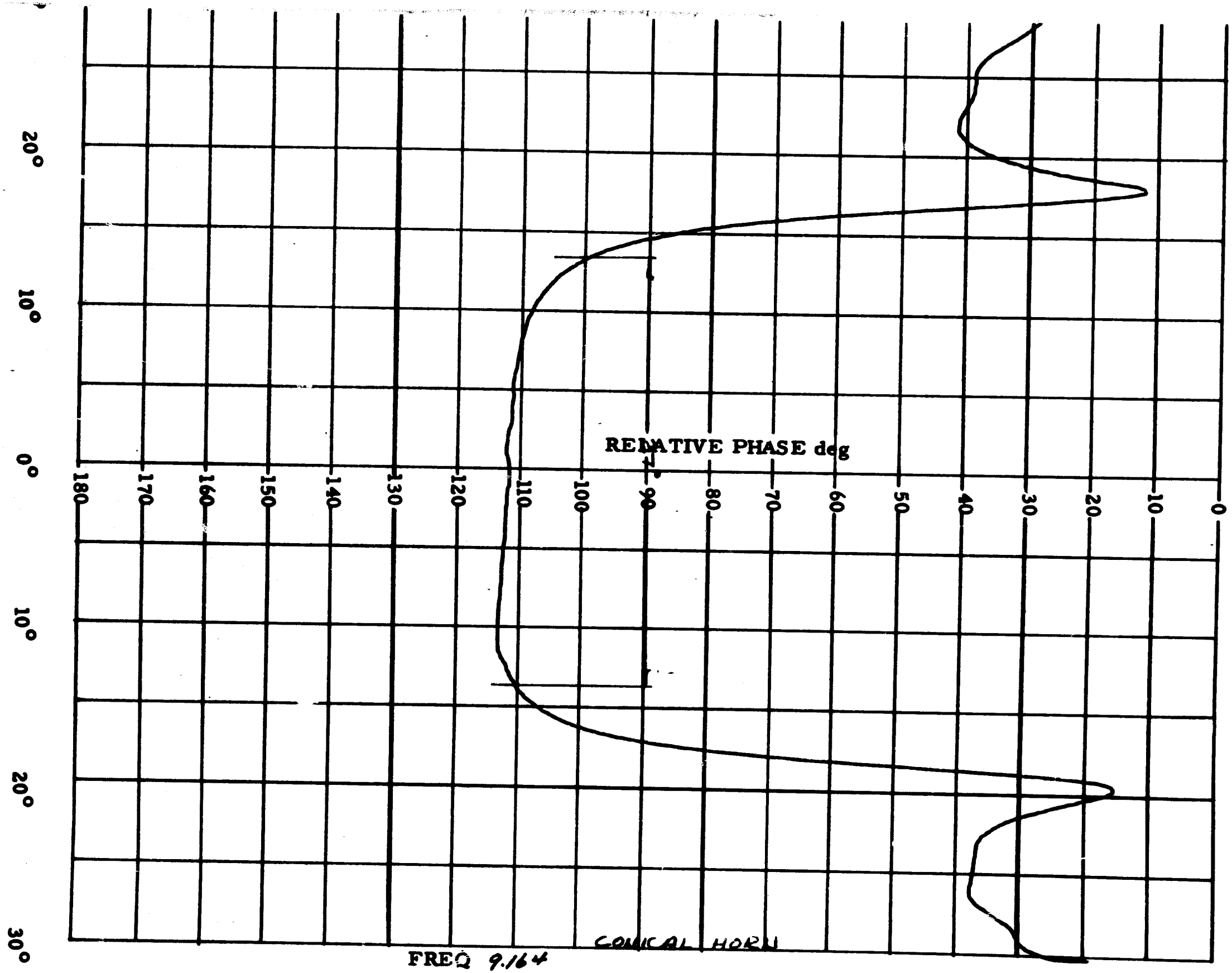


CONICAL HORN

FREQ 9.164

PLANE 45° CR = - 1/2"

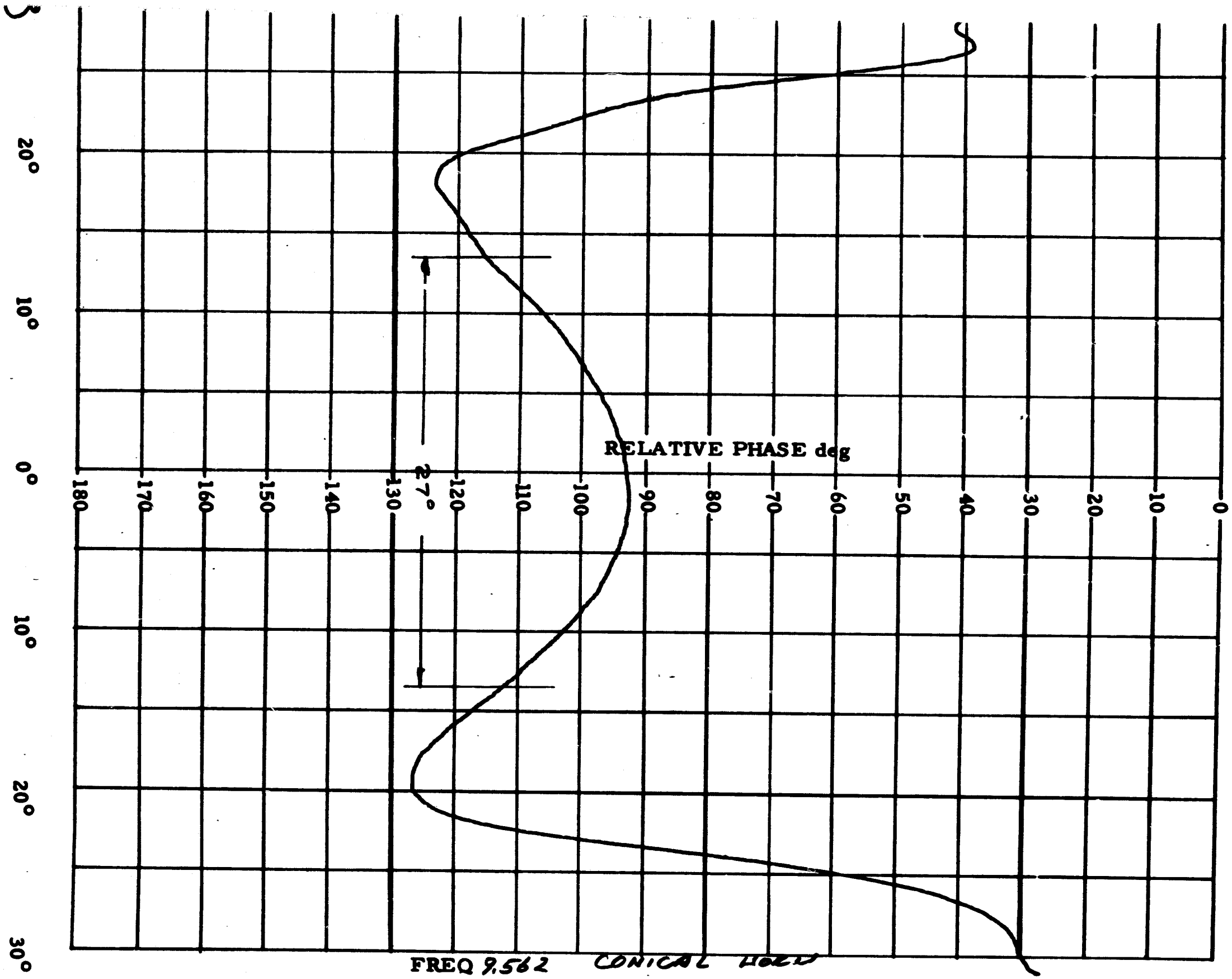
DATE 2/6/68

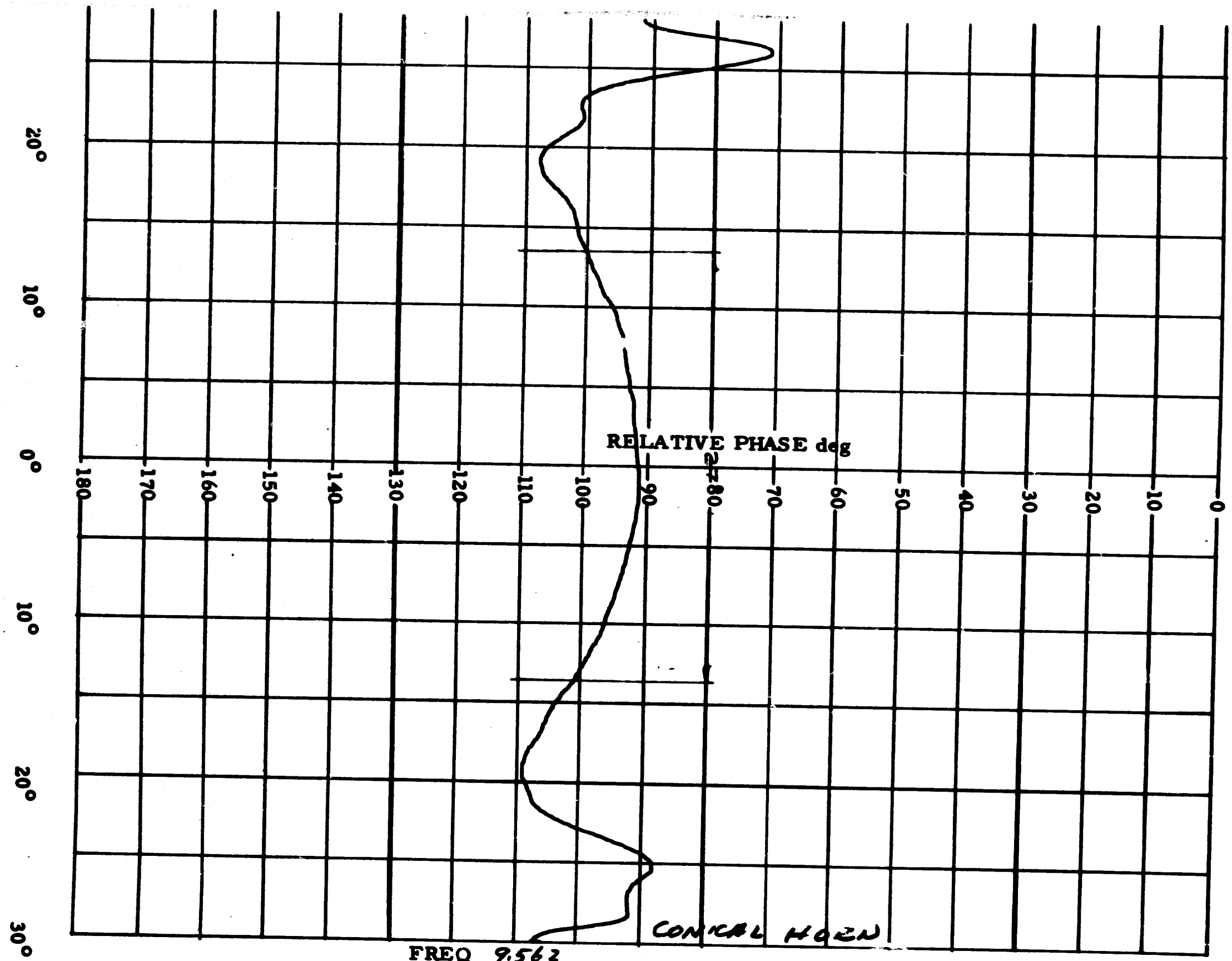


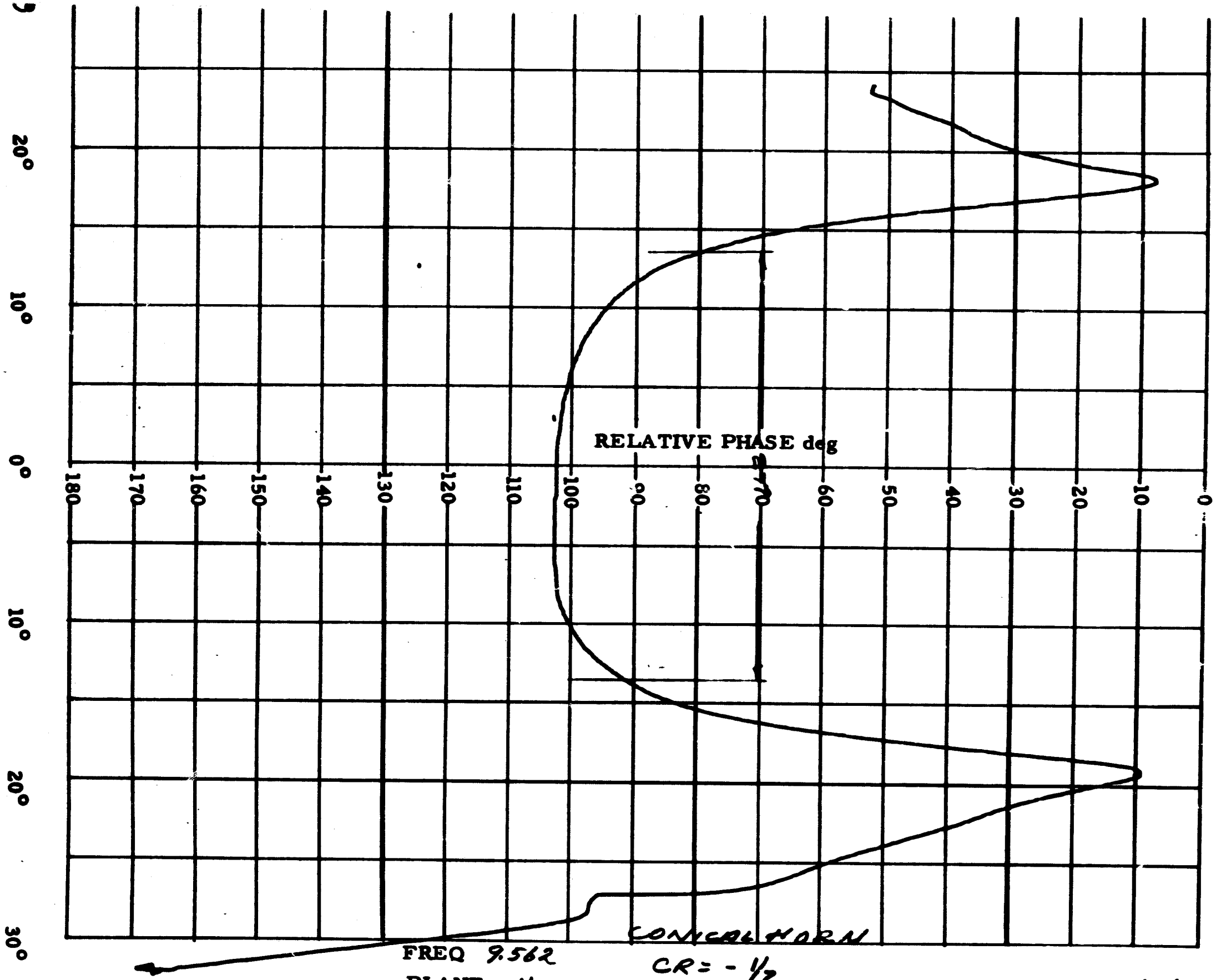
FREQ 9.164 CONICAL HORN

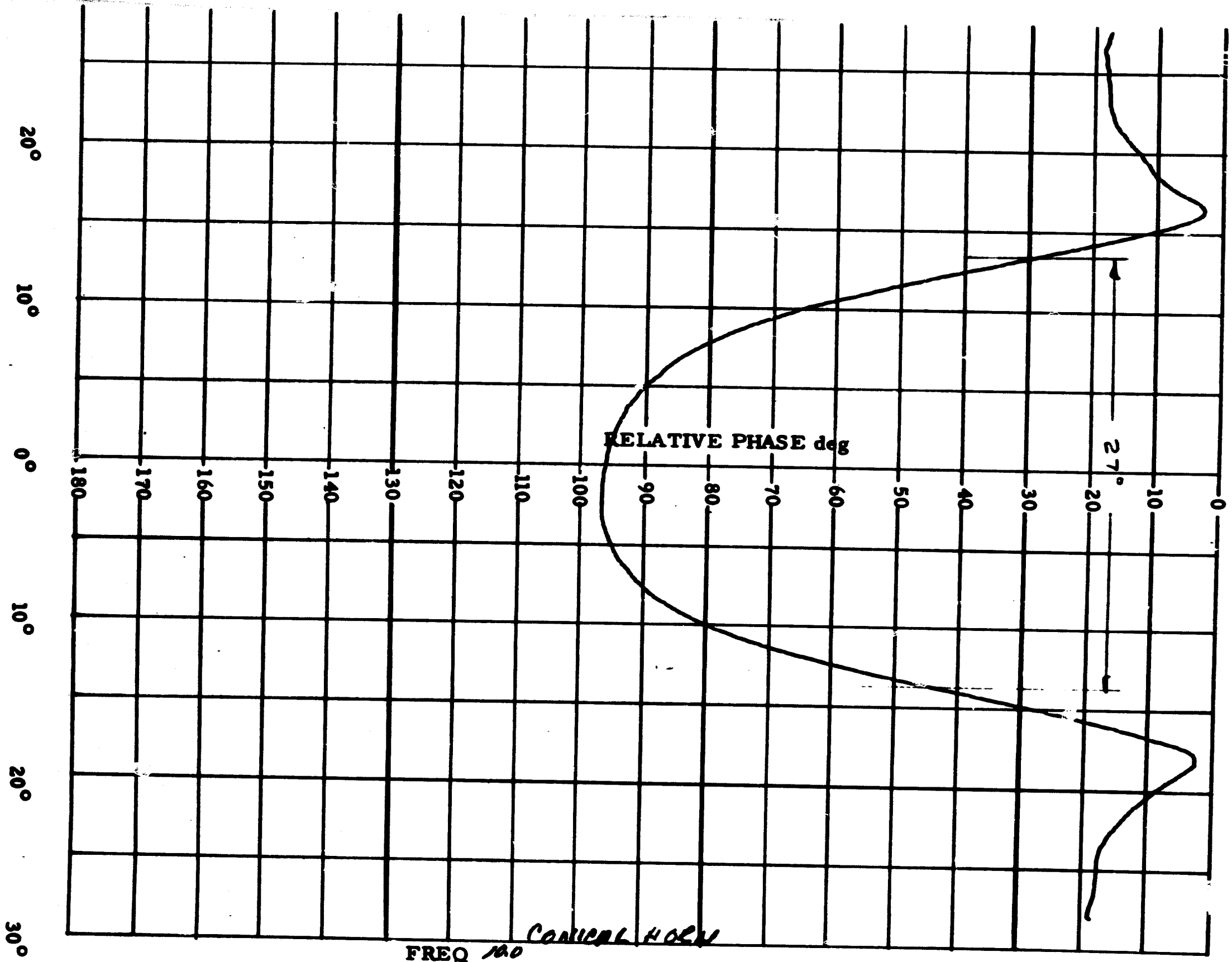
PLANE H CR = -½°

DATE 12/6/66


RELATIVE PHASE deg
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
27°
0° 10° 20° 30°
FREQ 9.562 CONICAL HORN
PLANE E
CL = -½
DATE 12/6/68


RELATIVE PHASE deg
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0°
10°
20°
30°
10°
20°
30°
CONICAL HORN
FREQ 9.562
PLANE 45°
CR = - ½
DATE 12/6/68

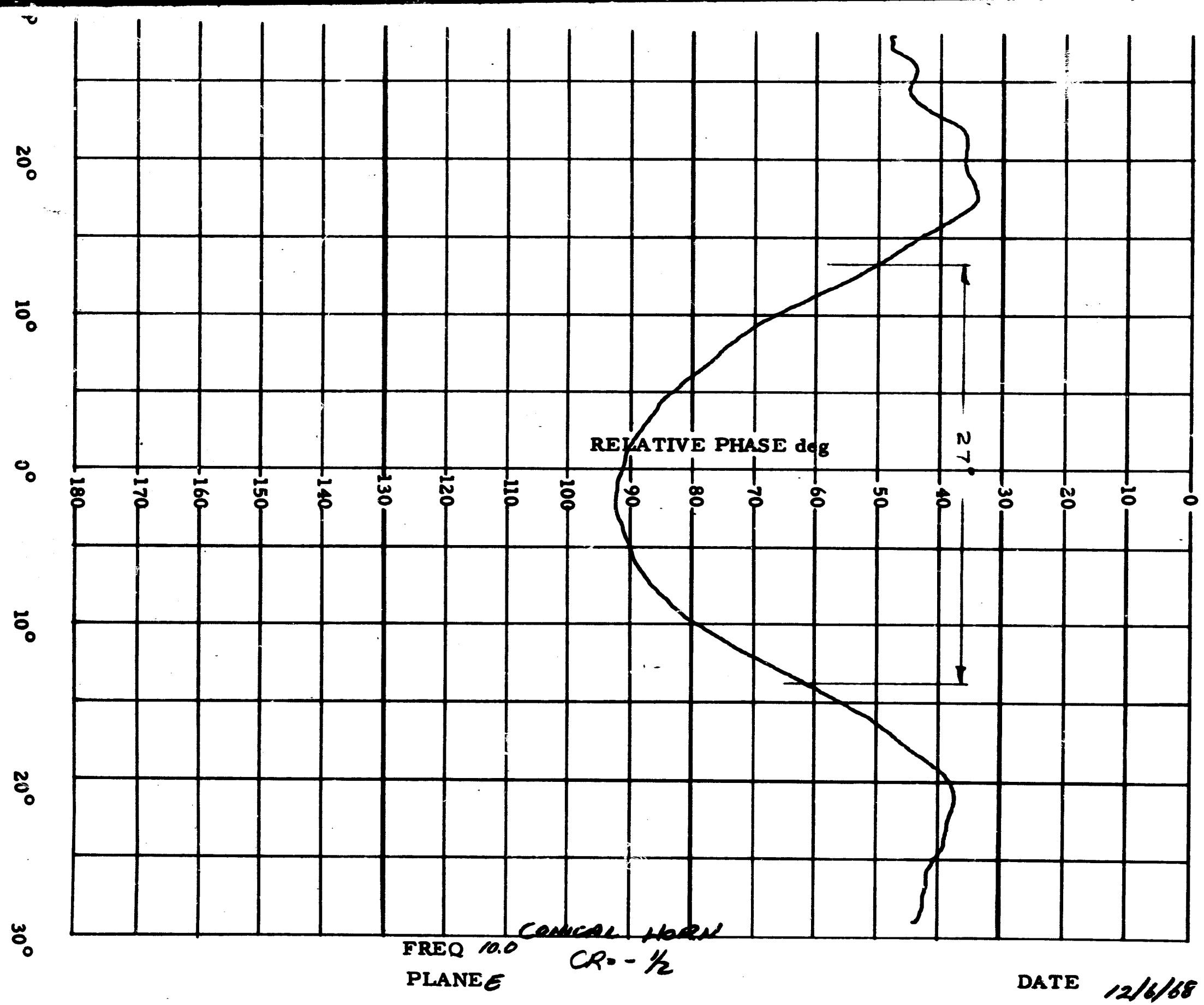

RELATIVE PHASE deg
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
0° 10° 20°
10° 20° 30°
FREQ 9.562
PLANE H
CONICAL HORN
CR = - 1/2
DATE 12/16/66



FREQ 100 CONICAL HORN

PLANE H CR-1

DATE 12/6/66


RELATIVE PHASE deg
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
27
0°
10°
20°
30°
FREQ 10.0
CONICAL HORN
CR. - ½
PLANE E
DATE 12/6/68

APPENDIX II - D

CONICAL MULTIMODE HORN
COMPUTER EFFICIENCY DATA

Legend

PSI	-	Polar Angle
ETA	-	Total Aperture Efficiency
ETS	-	Spillover Efficiency
ETI	-	Illumination Efficiency
ETX	-	Cross Polarization Efficiency
ETP	-	Phase Error Efficiency
ETB	-	Blockage Efficiency
E	-	E-Plane Pattern (dB)
EP	-	E-Plane Phase (deg)
H	-	H-Plane Pattern (dB)
HP	-	H-Plane Phase (deg)

FINAL JPL CONICAL FEED E & H PLANE 6.82 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 23
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.002	0.002	0.991	1.000	1.000	1.000	0.0	0.0	0.0	0.0
1.00	0.007	0.007	0.997	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.50	0.017	0.017	0.999	1.000	1.000	1.000	0.1	0.0	0.1	0.0
2.00	0.029	0.029	0.999	1.000	1.000	1.000	0.1	0.0	0.1	0.0
2.50	0.045	0.045	0.999	1.000	1.000	1.000	0.2	0.0	0.2	0.0
3.00	0.065	0.065	1.000	1.000	1.000	1.000	0.2	0.0	0.2	0.0
3.50	0.088	0.088	1.000	1.000	1.000	1.000	0.3	0.0	0.3	0.0
4.00	0.113	0.113	1.000	1.000	1.000	1.000	0.5	0.0	0.5	0.0
4.50	0.141	0.141	0.999	1.000	1.000	1.000	0.6	0.0	0.6	0.0
5.00	0.171	0.171	0.999	1.000	1.000	1.000	0.8	0.0	0.7	0.0
5.50	0.203	0.204	0.999	1.000	1.000	1.000	0.9	0.0	0.9	0.0
6.00	0.237	0.238	0.998	1.000	1.000	1.000	1.1	0.0	1.0	0.0
6.50	0.273	0.273	0.998	1.000	1.000	1.000	1.3	0.0	1.3	0.0
7.00	0.309	0.309	0.997	1.000	1.000	1.000	1.6	0.0	1.5	0.0
7.50	0.345	0.346	0.996	1.000	1.000	1.000	1.8	0.0	1.8	0.0
8.00	0.381	0.383	0.995	1.000	1.000	1.000	2.1	0.0	2.1	0.0
8.50	0.417	0.420	0.993	1.000	1.000	1.000	2.3	0.0	2.3	0.0
9.00	0.453	0.456	0.992	1.000	1.000	1.000	2.6	0.0	2.6	0.0
9.50	0.488	0.493	0.990	1.000	1.000	1.000	3.0	0.0	2.9	0.0
10.00	0.521	0.528	0.987	1.000	1.000	1.000	3.4	0.0	3.3	0.0
10.50	0.553	0.562	0.984	1.000	1.000	1.000	3.7	0.0	3.6	0.0
11.00	0.583	0.594	0.981	1.000	1.000	1.000	4.1	0.0	4.0	0.0
11.50	0.611	0.626	0.977	1.000	1.000	1.000	4.5	0.0	4.3	0.0
12.00	0.638	0.656	0.973	1.000	1.000	1.000	4.9	0.0	4.7	0.0
12.50	0.663	0.684	0.969	1.000	1.000	1.000	5.3	0.0	5.1	0.0
13.00	0.685	0.711	0.964	1.000	1.000	1.000	5.7	0.0	5.6	0.0
13.50	0.706	0.737	0.958	1.000	1.000	1.000	6.1	0.0	6.1	0.0
14.00	0.724	0.760	0.952	1.000	1.000	1.000	6.6	0.0	6.5	0.0
14.50	0.740	0.783	0.945	1.000	1.000	1.000	7.0	0.0	6.9	0.0
15.00	0.754	0.803	0.938	1.000	1.000	1.000	7.4	0.0	7.4	0.0
15.50	0.766	0.823	0.931	1.000	1.000	1.000	7.9	0.0	8.1	0.0
16.00	0.775	0.840	0.922	1.000	1.000	1.000	8.3	0.0	8.7	0.0
16.50	0.782	0.856	0.913	1.000	1.000	1.000	8.8	0.0	9.4	0.0
17.00	0.786	0.870	0.904	1.000	1.000	1.000	9.3	0.0	10.1	0.0
17.50	0.789	0.883	0.893	1.000	1.000	1.000	9.7	0.0	10.7	0.0
18.00	0.789	0.895	0.882	1.000	1.000	1.000	10.2	0.0	11.4	0.0
18.50	0.788	0.905	0.871	1.000	1.000	1.000	10.6	0.0	12.3	0.0
19.00	0.785	0.914	0.859	1.000	1.000	1.000	11.1	0.0	13.1	0.0
19.50	0.780	0.923	0.846	1.000	1.000	1.000	11.5	0.0	14.0	0.0
20.00	0.774	0.930	0.833	0.999	1.000	1.000	12.0	0.0	14.9	0.0
20.50	0.767	0.937	0.820	0.999	1.000	1.000	12.4	0.0	15.7	0.0
21.00	0.759	0.943	0.806	0.999	1.000	1.000	12.9	0.0	16.6	0.0
21.50	0.749	0.948	0.792	0.999	1.000	1.000	13.3	0.0	17.7	0.0
22.00	0.739	0.953	0.777	0.998	1.000	1.000	13.8	0.0	18.7	[illegible]
22.50	0.728	0.957	0.763	0.998	1.000	1.000	14.2	0.0	19.8	[illegible]
23.00	0.717	0.961	0.748	0.998	1.000	1.000	14.7	0.0	20.8	[illegible]
23.50	0.704	0.964	0.733	0.997	1.000	1.000	15.1	0.0	21.3	0.0
24.00	0.692	0.967	0.718	0.997	1.000	1.000	15.6	0.0	23.0	0.0
24.50	0.679	0.970	0.703	0.996	1.000	1.000	16.1	0.0	23.6	0.0

FINAL JPL CONICAL FEED E & H PLANE 7.2 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 20
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.002	0.002	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.009	0.009	0.997	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.50	0.020	0.020	0.999	1.000	1.000	1.000	0.2	0.0	0.1	0.0
2.00	0.036	0.036	0.999	1.000	1.000	1.000	0.3	0.0	0.2	0.0
2.50	0.056	0.056	0.999	1.000	1.000	1.000	0.3	0.0	0.2	0.0
3.00	0.079	0.079	0.999	1.000	1.000	1.000	0.4	0.0	0.3	0.0
3.50	0.107	0.107	0.999	1.000	1.000	1.000	0.6	0.0	0.4	0.0
4.00	0.137	0.137	0.999	1.000	1.000	1.000	0.7	0.0	0.6	0.0
4.50	0.171	0.171	0.999	1.000	1.000	1.000	0.9	0.0	0.7	0.0
5.00	0.206	0.207	0.999	1.000	1.000	1.000	1.1	0.0	0.9	0.0
5.50	0.244	0.245	0.998	1.000	1.000	1.000	1.2	0.0	1.0	0.0
6.00	0.285	0.285	0.998	1.000	1.000	1.000	1.4	0.0	1.2	0.0
6.50	0.326	0.327	0.997	1.000	1.000	1.000	1.7	0.0	1.5	0.0
7.00	0.367	0.369	0.996	1.000	1.000	1.000	2.0	0.0	1.8	0.0
7.50	0.409	0.411	0.995	1.000	1.000	1.000	2.3	0.0	2.0	0.0
8.00	0.450	0.453	0.993	1.000	1.000	1.000	2.7	0.0	2.3	0.0
8.50	0.490	0.495	0.991	1.000	1.000	1.000	3.0	0.0	2.6	0.0
9.00	0.530	0.536	0.989	1.000	1.000	1.000	3.3	0.0	2.9	0.0
9.50	0.568	0.576	0.987	1.000	1.000	1.000	3.7	0.0	3.3	0.0
10.00	0.604	0.614	0.983	1.000	1.000	1.000	4.2	0.0	3.7	0.0
10.50	0.638	0.651	0.980	1.000	1.000	1.000	4.6	0.0	4.0	0.0
11.00	0.669	0.686	0.975	1.000	1.000	1.000	5.1	0.0	4.4	0.0
11.50	0.698	0.719	0.971	1.000	1.000	1.000	5.5	0.0	4.8	0.0
12.00	0.724	0.751	0.965	1.000	1.000	1.000	6.0	0.0	5.2	0.0
12.50	0.748	0.780	0.959	0.999	1.000	1.000	6.6	0.0	5.7	0.0
13.00	0.768	0.807	0.952	0.999	1.000	1.000	7.2	0.0	6.3	0.0
13.50	0.784	0.831	0.945	0.999	1.000	1.000	7.8	0.0	6.8	0.0
14.00	0.798	0.853	0.936	0.999	1.000	1.000	8.5	0.0	7.4	0.0
14.50	0.808	0.873	0.926	0.999	1.000	1.000	9.1	0.0	7.9	0.0
15.00	0.816	0.891	0.916	0.999	1.000	1.000	9.7	0.0	8.5	0.0
15.50	0.820	0.907	0.905	0.999	1.000	1.000	10.6	0.0	9.2	0.0
16.00	0.821	0.921	0.893	0.999	1.000	1.000	11.4	0.0	9.9	0.0
16.50	0.819	0.933	0.879	0.999	1.000	1.000	12.3	0.0	10.6	0.0
17.00	0.815	0.943	0.865	0.999	1.000	1.000	13.2	0.0	11.3	0.0
17.50	0.808	0.952	0.850	0.999	1.000	1.000	14.0	0.0	12.0	0.0
18.00	0.799	0.960	0.834	0.999	1.000	1.000	14.9	0.0	12.7	0.0
18.50	0.788	0.966	0.817	0.998	1.000	1.000	16.2	0.0	13.7	0.0
19.00	0.775	0.971	0.799	0.998	1.000	1.000	17.5	0.0	14.7	0.0
19.50	0.759	0.975	0.780	0.998	1.000	1.000	18.8	0.0	15.7	0.0
20.00	0.742	0.978	0.760	0.998	1.000	1.000	20.1	0.0	16.7	0.0
20.50	0.724	0.981	0.740	0.998	1.000	1.000	21.4	0.0	17.7	0.0
21.00	0.706	0.983	0.719	0.998	1.000	1.000	22.7	0.0	18.7	0.0
21.50	0.686	0.985	0.699	0.998	1.000	1.000	24.6	0.0	19.6	0.0
22.00	0.667	0.986	0.678	0.998	1.000	1.000	26.5	0.0	20.6	0.0
22.50	0.647	0.987	0.657	0.998	1.000	1.000	28.3	0.0	21.5	0.0
23.00	0.627	0.988	0.636	0.998	1.000	1.000	30.2	0.0	22.5	0.0
23.50	0.607	0.988	0.616	0.997	1.000	1.000	32.1	0.0	23.4	0.0
24.00	0.587	0.989	0.596	0.997	1.000	1.000	34.0	0.0	24.4	0.0
24.50	0.568	0.989	0.576	0.997	1.000	1.000	36.0	0.0	24.7	0.0

FINAL JPL CONICAL FEED E & H PLANE 7.2 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 20
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.002	0.002	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.009	0.009	0.997	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.50	0.020	0.020	0.999	1.000	1.000	1.000	0.2	0.0	0.1	0.0
2.00	0.036	0.036	0.999	1.000	1.000	1.000	0.3	0.0	0.2	0.0
2.50	0.056	0.056	0.999	1.000	1.000	1.000	0.3	0.0	0.2	0.0
3.00	0.079	0.079	0.999	1.000	1.000	1.000	0.4	0.0	0.3	0.0
3.50	0.107	0.107	0.999	1.000	1.000	1.000	0.6	0.0	0.4	0.0
4.00	0.137	0.137	0.999	1.000	1.000	1.000	0.7	0.0	0.6	0.0
4.50	0.171	0.171	0.999	1.000	1.000	1.000	0.9	0.0	0.7	0.0
5.00	0.206	0.207	0.999	1.000	1.000	1.000	1.1	0.0	0.9	0.0
5.50	0.244	0.245	0.998	1.000	1.000	1.000	1.2	0.0	1.0	0.0
6.00	0.285	0.285	0.998	1.000	1.000	1.000	1.4	0.0	1.2	0.0
6.50	0.326	0.327	0.997	1.000	1.000	1.000	1.7	0.0	1.5	0.0
7.00	0.367	0.369	0.996	1.000	1.000	1.000	2.0	0.0	1.8	0.0
7.50	0.409	0.411	0.995	1.000	1.000	1.000	2.3	0.0	2.0	0.0
8.00	0.450	0.453	0.993	1.000	1.000	1.000	2.7	0.0	2.3	0.0
8.50	0.490	0.495	0.991	1.000	1.000	1.000	3.0	0.0	2.6	0.0
9.00	0.530	0.536	0.989	1.000	1.000	1.000	3.3	0.0	2.9	0.0
9.50	0.568	0.576	0.987	1.000	1.000	1.000	3.7	0.0	3.3	0.0
10.00	0.604	0.614	0.983	1.000	1.000	1.000	4.2	0.0	3.7	0.0
10.50	0.638	0.651	0.980	1.000	1.000	1.000	4.6	0.0	4.0	0.0
11.00	0.669	0.686	0.975	1.000	1.000	1.000	5.1	0.0	4.4	0.0
11.50	0.698	0.719	0.971	1.000	1.000	1.000	5.5	0.0	4.8	0.0
12.00	0.724	0.751	0.965	1.000	1.000	1.000	6.0	0.0	5.2	0.0
12.50	0.748	0.780	0.959	0.999	1.000	1.000	6.6	0.0	5.7	0.0
13.00	0.768	0.807	0.952	0.999	1.000	1.000	7.2	0.0	6.3	0.0
13.50	0.784	0.831	0.945	0.999	1.000	1.000	7.8	0.0	6.8	0.0
14.00	0.798	0.853	0.936	0.999	1.000	1.000	8.5	0.0	7.4	0.0
14.50	0.808	0.873	0.926	0.999	1.000	1.000	9.1	0.0	7.9	0.0
15.00	0.816	0.891	0.916	0.999	1.000	1.000	9.7	0.0	8.5	0.0
15.50	0.820	0.907	0.905	0.999	1.000	1.000	10.6	0.0	9.2	0.0
16.00	0.821	0.921	0.893	0.999	1.000	1.000	11.4	0.0	9.9	0.0
16.50	0.819	0.933	0.879	0.999	1.000	1.000	12.3	0.0	10.6	0.0
17.00	0.815	0.943	0.865	0.999	1.000	1.000	13.2	0.0	11.3	0.0
17.50	0.808	0.952	0.850	0.999	1.000	1.000	14.0	0.0	12.0	0.0
18.00	0.799	0.960	0.834	0.999	1.000	1.000	14.9	0.0	12.7	0.0
18.50	0.788	0.966	0.817	0.998	1.000	1.000	16.2	0.0	13.7	0.0
19.00	0.775	0.971	0.799	0.998	1.000	1.000	17.5	0.0	14.7	0.0
19.50	0.759	0.975	0.780	0.998	1.000	1.000	18.8	0.0	15.7	0.0
20.00	0.742	0.978	0.760	0.998	1.000	1.000	20.1	0.0	16.7	0.0
20.50	0.724	0.981	0.740	0.998	1.000	1.000	21.4	0.0	17.7	0.0
21.00	0.706	0.983	0.719	0.998	1.000	1.000	22.7	0.0	18.7	0.0
21.50	0.686	0.985	0.699	0.998	1.000	1.000	24.6	0.0	19.6	0.0
22.00	0.667	0.986	0.678	0.998	1.000	1.000	26.5	0.0	20.6	0.0
22.50	0.647	0.987	0.657	0.998	1.000	1.000	28.3	0.0	21.5	0.0
23.00	0.627	0.988	0.636	0.998	1.000	1.000	30.2	0.0	22.5	0.0
23.50	0.607	0.988	0.616	0.997	1.000	1.000	32.1	0.0	23.4	0.0
24.00	0.587	0.989	0.596	0.997	1.000	1.000	34.0	0.0	24.4	0.0
24.50	0.568	0.989	0.576	0.997	1.000	1.000	36.0	0.0	24.7	0.0

FINAL JPL CONICAL FEED E & H PLANE 7.4 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 18
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.002	0.002	0.991	1.000	1.000	1.000	0.0	0.0	0.1	0.0
1.00	0.009	0.009	0.997	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.50	0.019	0.019	0.999	1.000	1.000	1.000	0.1	0.0	0.2	0.0
2.00	0.034	0.034	0.999	1.000	1.000	1.000	0.1	0.0	0.3	0.0
2.50	0.052	0.053	0.999	1.000	1.000	1.000	0.2	0.0	0.3	0.0
3.00	0.075	0.075	1.000	1.000	1.000	1.000	0.2	0.0	0.4	0.0
3.50	0.101	0.101	1.000	1.000	1.000	1.000	0.3	0.0	0.6	0.0
4.00	0.130	0.130	0.999	1.000	1.000	1.000	0.5	0.0	0.7	0.0
4.50	0.161	0.162	0.999	1.000	1.000	1.000	0.6	0.0	0.9	0.0
5.00	0.195	0.196	0.999	1.000	1.000	1.000	0.8	0.0	1.1	0.0
5.50	0.232	0.232	0.999	1.000	1.000	1.000	0.9	0.0	1.2	0.0
6.00	0.270	0.270	0.998	1.000	1.000	1.000	1.1	0.0	1.4	0.0
6.50	0.309	0.310	0.997	1.000	1.000	1.000	1.4	0.0	1.7	0.0
7.00	0.348	0.350	0.996	1.000	1.000	1.000	1.6	0.0	2.0	0.0
7.50	0.388	0.390	0.995	1.000	1.000	1.000	1.9	0.0	2.3	0.0
8.00	0.428	0.430	0.994	1.000	1.000	1.000	2.2	0.0	2.6	0.0
8.50	0.467	0.471	0.992	1.000	1.000	1.000	2.4	0.0	2.9	0.0
9.00	0.505	0.511	0.990	1.000	1.000	1.000	2.7	0.0	3.2	0.0
9.50	0.543	0.550	0.988	1.000	1.000	1.000	3.1	0.0	3.6	0.0
10.00	0.578	0.587	0.985	1.000	1.000	1.000	3.5	0.0	4.0	0.0
10.50	0.611	0.623	0.981	1.000	1.000	1.000	3.8	0.0	4.4	0.0
11.00	0.643	0.658	0.977	1.000	1.000	1.000	4.2	0.0	4.8	0.0
11.50	0.672	0.691	0.973	0.999	1.000	1.000	4.6	0.0	5.2	0.0
12.00	0.699	0.723	0.969	0.999	1.000	1.000	5.0	0.0	5.6	0.0
12.50	0.724	0.752	0.963	0.999	1.000	1.000	5.5	0.0	6.2	0.0
13.00	0.745	0.779	0.957	0.999	1.000	1.000	6.0	0.0	6.7	0.0
13.50	0.764	0.805	0.950	0.999	1.000	1.000	6.4	0.0	7.3	0.0
14.00	0.780	0.828	0.943	0.999	1.000	1.000	6.9	0.0	7.9	0.0
14.50	0.793	0.849	0.934	0.999	1.000	1.000	7.4	0.0	8.4	0.0
15.00	0.803	0.868	0.925	0.999	1.000	1.000	7.9	0.0	9.0	0.0
15.50	0.811	0.886	0.916	0.999	1.000	1.000	8.5	0.0	9.8	0.0
16.00	0.815	0.901	0.905	0.999	1.000	1.000	9.2	0.0	10.6	0.0
16.50	0.816	0.915	0.893	0.999	1.000	1.000	9.8	0.0	11.4	0.0
17.00	0.814	0.926	0.880	0.999	1.000	1.000	10.5	0.0	12.2	0.0
17.50	0.810	0.937	0.867	0.999	1.000	1.000	11.1	0.0	13.0	0.0
18.00	0.805	0.945	0.852	0.999	1.000	1.000	11.8	0.0	13.8	0.0
18.50	0.797	0.953	0.837	0.999	1.000	1.000	12.6	0.0	14.8	0.0
19.00	0.787	0.960	0.821	0.998	1.000	1.000	13.5	0.0	15.7	0.0
19.50	0.775	0.965	0.804	0.998	1.000	1.000	14.3	0.0	16.7	0.0
20.00	0.762	0.969	0.787	0.998	1.000	1.000	15.1	0.0	17.7	0.0
20.50	0.747	0.973	0.769	0.998	1.000	1.000	16.0	0.0	18.6	0.0
21.00	0.732	0.976	0.751	0.998	1.000	1.000	16.8	0.0	19.6	0.0
21.50	0.716	0.979	0.733	0.998	1.000	1.000	17.7	0.0	20.2	0.0
22.00	0.700	0.981	0.714	0.998	1.000	1.000	18.6	0.0	20.9	0.0
22.50	0.683	0.983	0.696	0.998	1.000	1.000	19.5	0.0	21.5	0.0
23.00	0.667	0.985	0.678	0.998	1.000	1.000	20.5	0.0	22.2	0.0
23.50	0.650	0.986	0.660	0.998	1.000	1.000	21.4	0.0	22.8	0.0
24.00	0.633	0.987	0.643	0.998	1.000	1.000	22.3	0.0	23.5	0.0
24.50	0.617	0.988	0.626	0.998	1.000	1.000	23.4	0.0	23.6	0.0

FINAL JPL CONICAL FEED E & H PLANE 7.6 GHZ 13A

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 26
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.002	0.002	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.010	0.010	0.997	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.50	0.022	0.022	0.999	1.000	1.000	1.000	0.1	0.0	0.1	0.0
2.00	0.039	0.039	0.999	1.000	1.000	1.000	0.2	0.0	0.2	0.0
2.50	0.061	0.061	0.999	1.000	1.000	1.000	0.2	0.0	0.2	0.0
3.00	0.086	0.087	1.000	1.000	1.000	1.000	0.3	0.0	0.3	0.0
3.50	0.116	0.116	1.000	1.000	1.000	1.000	0.5	0.0	0.5	0.0
4.00	0.149	0.149	0.999	1.000	1.000	1.000	0.7	0.0	0.7	0.0
4.50	0.184	0.185	0.999	1.000	1.000	1.000	0.9	0.0	0.8	0.0
5.00	0.222	0.223	0.998	1.000	1.000	1.000	1.2	0.0	1.0	0.0
5.50	0.262	0.263	0.998	1.000	1.000	1.000	1.4	0.0	1.2	0.0
6.00	0.304	0.305	0.997	1.000	1.000	1.000	1.6	0.0	1.4	0.0
6.50	0.346	0.347	0.996	1.000	1.000	1.000	1.9	0.0	1.7	0.0
7.00	0.388	0.390	0.995	1.000	1.000	1.000	2.3	0.0	2.0	0.0
7.50	0.430	0.433	0.993	1.000	1.000	1.000	2.6	0.0	2.3	0.0
8.00	0.471	0.475	0.991	1.000	1.000	1.000	3.0	0.0	2.6	0.0
8.50	0.511	0.517	0.989	1.000	1.000	1.000	3.3	0.0	2.9	0.0
9.00	0.551	0.559	0.986	1.000	1.000	1.000	3.7	0.0	3.2	0.0
9.50	0.588	0.598	0.983	1.000	1.000	1.000	4.3	0.0	3.6	0.0
10.00	0.622	0.635	0.979	1.000	1.000	1.000	4.8	0.0	4.1	0.0
10.50	0.653	0.670	0.974	1.000	1.000	1.000	5.4	0.0	4.5	0.0
11.00	0.680	0.703	0.968	0.999	1.000	1.000	6.0	0.0	4.9	0.0
11.50	0.705	0.734	0.962	0.999	1.000	1.000	6.5	0.0	5.4	0.0
12.00	0.727	0.762	0.955	0.999	1.000	1.000	7.1	0.0	5.8	0.0
12.50	0.746	0.788	0.947	0.999	1.000	1.000	7.7	0.0	6.4	0.0
13.00	0.761	0.812	0.939	0.999	1.000	1.000	8.4	0.0	6.9	0.0
13.50	0.773	0.833	0.929	0.999	1.000	1.000	9.0	0.0	7.5	0.0
14.00	0.783	0.853	0.919	0.998	1.000	1.000	9.7	0.0	8.1	0.0
14.50	0.789	0.870	0.908	0.998	1.000	1.000	10.3	0.0	8.6	0.0
15.00	0.793	0.886	0.896	0.998	1.000	1.000	11.0	0.0	9.2	0.0
15.50	0.794	0.900	0.884	0.998	1.000	1.000	11.8	0.0	10.0	0.0
16.00	0.792	0.912	0.870	0.998	1.000	1.000	12.6	0.0	10.9	0.0
16.50	0.787	0.922	0.855	0.998	1.000	1.000	13.4	0.0	11.7	0.0
17.00	0.779	0.930	0.840	0.998	1.000	1.000	14.2	0.0	12.5	0.0
17.50	0.770	0.938	0.823	0.998	1.000	1.000	15.0	0.0	13.4	0.0
18.00	0.759	0.944	0.806	0.998	1.000	1.000	15.8	0.0	14.2	0.0
18.50	0.747	0.949	0.789	0.998	1.000	1.000	16.5	0.0	15.1	0.0
19.00	0.734	0.954	0.771	0.998	1.000	1.000	17.3	0.0	15.9	0.0
19.50	0.719	0.957	0.753	0.998	1.000	1.000	18.0	0.0	16.8	0.0
20.00	0.704	0.961	0.735	0.998	1.000	1.000	18.7	0.0	17.7	0.0
20.50	0.689	0.963	0.717	0.998	1.000	1.000	19.5	0.0	18.5	0.0
21.00	0.673	0.966	0.699	0.998	1.000	1.000	20.2	0.0	19.4	0.0
21.50	0.657	0.968	0.681	0.998	1.000	1.000	20.8	0.0	20.1	0.0
22.00	0.642	0.970	0.663	0.998	1.000	1.000	21.3	0.0	20.8	0.0
22.50	0.626	0.971	0.646	0.998	1.000	1.000	21.9	0.0	21.5	0.0
23.00	0.611	0.973	0.629	0.998	1.000	1.000	22.5	0.0	22.3	0.0
23.50	0.595	0.974	0.613	0.998	1.000	1.000	23.0	0.0	23.0	0.0
24.00	0.580	0.975	0.597	0.998	1.000	1.000	23.6	0.0	23.7	0.0
24.50	0.566	0.976	0.581	0.998	1.000	1.000	24.2	0.0	23.9	0.0

FINAL JPL CONICAL FEED E & H PLANE 7.8 GHZ

16A

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 26
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.011	0.011	0.997	1.000	1.000	1.000	0.2	0.0	0.1	0.0
1.50	0.024	0.024	0.999	1.000	1.000	1.000	0.3	0.0	0.2	0.0
2.00	0.043	0.043	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.50	0.066	0.066	0.999	1.000	1.000	1.000	0.4	0.0	0.3	0.0
3.00	0.095	0.095	0.999	1.000	1.000	1.000	0.5	0.0	0.4	0.0
3.50	0.127	0.127	0.999	1.000	1.000	1.000	0.7	0.0	0.6	0.0
4.00	0.162	0.162	0.999	1.000	1.000	1.000	1.0	0.0	0.7	0.0
4.50	0.200	0.200	0.999	1.000	1.000	1.000	1.2	0.0	0.9	0.0
5.00	0.241	0.241	0.998	1.000	1.000	1.000	1.5	0.0	1.1	0.0
5.50	0.283	0.284	0.997	1.000	1.000	1.000	1.7	0.0	1.2	0.0
6.00	0.328	0.329	0.997	1.000	1.000	1.000	2.0	0.0	1.4	0.0
6.50	0.373	0.374	0.996	1.000	1.000	1.000	2.4	0.0	1.7	0.0
7.00	0.417	0.420	0.994	0.999	1.000	1.000	2.8	0.0	2.1	0.0
7.50	0.460	0.464	0.992	0.999	1.000	1.000	3.2	0.0	2.4	0.0
8.00	0.502	0.508	0.989	0.999	1.000	1.000	3.7	0.0	2.7	0.0
8.50	0.542	0.551	0.986	0.999	1.000	1.000	4.1	0.0	3.1	0.0
9.00	0.581	0.592	0.983	0.999	1.000	1.000	4.5	0.0	3.4	0.0
9.50	0.618	0.632	0.979	0.998	1.000	1.000	5.1	0.0	3.8	0.0
10.00	0.650	0.669	0.974	0.998	1.000	1.000	5.8	0.0	4.3	0.0
10.50	0.679	0.703	0.968	0.998	1.000	1.000	6.4	0.0	4.7	0.0
11.00	0.705	0.735	0.962	0.997	1.000	1.000	7.1	0.0	5.1	0.0
11.50	0.728	0.765	0.954	0.997	1.000	1.000	7.7	0.0	5.6	0.0
12.00	0.747	0.793	0.946	0.997	1.000	1.000	8.4	0.0	6.0	0.0
12.50	0.763	0.818	0.937	0.996	1.000	1.000	9.4	0.0	6.6	0.0
13.00	0.775	0.840	0.927	0.995	1.000	1.000	10.3	0.0	7.1	0.0
13.50	0.782	0.859	0.915	0.995	1.000	1.000	11.3	0.0	7.7	0.0
14.00	0.786	0.877	0.903	0.994	1.000	1.000	12.3	0.0	8.3	0.0
14.50	0.787	0.892	0.889	0.993	1.000	1.000	13.2	0.0	8.8	0.0
15.00	0.786	0.905	0.875	0.992	1.000	1.000	14.2	0.0	9.4	0.0
15.50	0.781	0.917	0.859	0.991	1.000	1.000	15.8	0.0	10.1	0.0
16.00	0.773	0.927	0.842	0.990	1.000	1.000	17.5	0.0	10.9	0.0
16.50	0.762	0.935	0.823	0.989	1.000	1.000	19.1	0.0	11.6	0.0
17.00	0.748	0.942	0.804	0.988	1.000	1.000	20.7	0.0	12.4	0.0
17.50	0.733	0.947	0.784	0.987	1.000	1.000	22.4	0.0	13.1	0.0
18.00	0.717	0.952	0.764	0.986	1.000	1.000	24.0	0.0	13.9	0.0
18.50	0.700	0.956	0.743	0.985	1.000	1.000	26.0	0.0	14.6	0.0
19.00	0.682	0.960	0.722	0.985	1.000	1.000	28.1	0.0	15.4	0.0
19.50	0.664	0.963	0.701	0.984	1.000	1.000	30.1	0.0	16.1	0.0
20.00	0.645	0.965	0.680	0.983	1.000	1.000	32.1	0.0	16.9	0.0
20.50	0.627	0.967	0.659	0.982	1.000	1.000	34.2	0.0	17.6	0.0
21.00	0.608	0.969	0.639	0.982	1.000	1.000	36.2	0.0	18.4	0.0
21.50	0.590	0.971	0.620	0.981	1.000	1.000	35.2	0.0	19.0	0.0
22.00	0.573	0.972	0.601	0.980	1.000	1.000	34.3	0.0	19.7	0.0
22.50	0.556	0.974	0.583	0.980	1.000	1.000	33.3	0.0	20.3	0.0
23.00	0.541	0.975	0.566	0.980	1.000	1.000	32.3	0.0	21.0	0.0
23.50	0.526	0.976	0.550	0.980	1.000	1.000	31.4	0.0	21.6	0.0
24.00	0.512	0.977	0.535	0.979	1.000	1.000	30.4	0.0	22.3	0.0
24.50	0.498	0.978	0.520	0.979	1.000	1.000	30.6	0.0	22.5	0.0

FINAL JPL CONICAL FEED E & H PLANE 8.0 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 23
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.002	0.002	0.991	1.000	1.000	1.000	0.1	0.0	0.0	0.0
1.00	0.010	0.010	0.997	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.50	0.022	0.022	0.999	1.000	1.000	1.000	0.2	0.0	0.1	0.0
2.00	0.039	0.039	0.999	1.000	1.000	1.000	0.3	0.0	0.1	0.0
2.50	0.060	0.060	0.999	1.000	1.000	1.000	0.3	0.0	0.2	0.0
3.00	0.085	0.086	1.000	1.000	1.000	1.000	0.4	0.0	0.2	0.0
3.50	0.115	0.115	1.000	1.000	1.000	1.000	0.6	0.0	0.4	0.0
4.00	0.147	0.148	0.999	1.000	1.000	1.000	0.8	0.0	0.6	0.0
4.50	0.183	0.183	0.999	1.000	1.000	1.000	1.0	0.0	0.7	0.0
5.00	0.220	0.221	0.999	1.000	1.000	1.000	1.2	0.0	0.9	0.0
5.50	0.260	0.261	0.998	1.000	1.000	1.000	1.4	0.0	1.1	0.0
6.00	0.302	0.302	0.997	1.000	1.000	1.000	1.6	0.0	1.3	0.0
6.50	0.344	0.345	0.996	1.000	1.000	1.000	1.9	0.0	1.6	0.0
7.00	0.387	0.389	0.995	1.000	1.000	1.000	2.3	0.0	1.9	0.0
7.50	0.429	0.432	0.994	1.000	1.000	1.000	2.6	0.0	2.1	0.0
8.00	0.471	0.475	0.992	1.000	1.000	1.000	2.9	0.0	2.4	0.0
8.50	0.512	0.517	0.990	1.000	1.000	1.000	3.3	0.0	2.7	0.0
9.00	0.552	0.560	0.987	1.000	1.000	1.000	3.6	0.0	3.0	0.0
9.50	0.591	0.600	0.984	1.000	1.000	1.000	4.1	0.0	3.4	0.0
10.00	0.626	0.639	0.981	0.999	1.000	1.000	4.7	0.0	3.9	0.0
10.50	0.658	0.675	0.976	0.999	1.000	1.000	5.2	0.0	4.3	0.0
11.00	0.687	0.709	0.971	0.999	1.000	1.000	5.7	0.0	4.7	0.0
11.50	0.714	0.740	0.965	0.999	1.000	1.000	6.3	0.0	5.2	0.0
12.00	0.737	0.770	0.959	0.999	1.000	1.000	6.8	0.0	5.6	0.0
12.50	0.758	0.798	0.951	0.999	1.000	1.000	7.4	0.0	6.1	0.0
13.00	0.775	0.822	0.943	0.999	1.000	1.000	8.1	0.0	6.7	0.0
13.50	0.788	0.845	0.934	0.999	1.000	1.000	8.7	0.0	7.2	0.0
14.00	0.799	0.866	0.924	0.998	1.000	1.000	9.3	0.0	7.8	0.0
14.50	0.807	0.884	0.914	0.998	1.000	1.000	10.0	0.0	8.3	0.0
15.00	0.812	0.901	0.903	0.998	1.000	1.000	10.6	0.0	8.9	0.0
15.50	0.814	0.916	0.891	0.998	1.000	1.000	11.4	0.0	9.6	0.0
16.00	0.813	0.928	0.878	0.998	1.000	1.000	12.3	0.0	10.4	0.0
16.50	0.809	0.939	0.864	0.998	1.000	1.000	13.1	0.0	11.1	0.0
17.00	0.803	0.949	0.848	0.998	1.000	1.000	14.0	0.0	11.9	0.0
17.50	0.795	0.957	0.833	0.998	1.000	1.000	14.8	0.0	12.6	0.0
18.00	0.785	0.964	0.816	0.997	1.000	1.000	15.7	0.0	13.4	0.0
18.50	0.773	0.970	0.799	0.997	1.000	1.000	16.8	0.0	14.4	0.0
19.00	0.759	0.974	0.781	0.997	1.000	1.000	17.9	0.0	15.3	0.0
19.50	0.743	0.978	0.762	0.997	1.000	1.000	18.9	0.0	16.3	0.0
20.00	0.727	0.981	0.743	0.997	1.000	1.000	20.0	0.0	17.3	0.0
20.50	0.710	0.984	0.723	0.997	1.000	1.000	21.1	0.0	18.2	0.0
21.00	0.692	0.986	0.704	0.997	1.000	1.000	22.2	0.0	19.2	0.0
21.50	0.673	0.988	0.684	0.997	1.000	1.000	23.4	0.0	20.2	0.0
22.00	0.655	0.989	0.664	0.997	1.000	1.000	24.6	0.0	21.3	0.0

FINAL JPL CONICAL FEED E & H PLANE 8.2 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 24
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	FTA	ETS	ETI	FTX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.012	0.012	0.997	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.50	0.027	0.027	0.999	1.000	1.000	1.000	0.2	0.0	0.1	0.0
2.00	0.048	0.048	0.999	1.000	1.000	1.000	0.3	0.0	0.2	0.0
2.50	0.075	0.075	0.999	1.000	1.000	1.000	0.3	0.0	0.2	0.0
3.00	0.107	0.107	0.999	1.000	1.000	1.000	0.4	0.0	0.3	0.0
3.50	0.143	0.143	0.999	1.000	1.000	1.000	0.7	0.0	0.5	0.0
4.00	0.183	0.183	0.999	1.000	1.000	1.000	1.0	0.0	0.7	0.0
4.50	0.226	0.226	0.999	1.000	1.000	1.000	1.3	0.0	0.8	0.0
5.00	0.270	0.271	0.998	1.000	1.000	1.000	1.6	0.0	1.0	0.0
5.50	0.317	0.318	0.997	1.000	1.000	1.000	1.9	0.0	1.2	0.0
6.00	0.366	0.367	0.996	0.999	1.000	1.000	2.2	0.0	1.4	0.0
6.50	0.414	0.417	0.995	0.999	1.000	1.000	2.7	0.0	1.7	0.0
7.00	0.461	0.465	0.992	0.999	1.000	1.000	3.2	0.0	2.1	0.0
7.50	0.507	0.513	0.990	0.998	1.000	1.000	3.7	0.0	2.4	0.0
8.00	0.550	0.559	0.987	0.998	1.000	1.000	4.3	0.0	2.7	0.0
8.50	0.592	0.603	0.983	0.998	1.000	1.000	4.8	0.0	3.1	0.0
9.00	0.631	0.646	0.979	0.997	1.000	1.000	5.3	0.0	3.4	0.0
9.50	0.666	0.687	0.974	0.996	1.000	1.000	6.1	0.0	3.9	0.0
10.00	0.697	0.724	0.967	0.996	1.000	1.000	6.9	0.0	4.4	0.0
10.50	0.723	0.757	0.959	0.995	1.000	1.000	7.7	0.0	4.9	0.0
11.00	0.745	0.788	0.951	0.994	1.000	1.000	8.5	0.0	5.5	0.0
11.50	0.762	0.816	0.941	0.993	1.000	1.000	9.3	0.0	6.0	0.0
12.00	0.777	0.841	0.931	0.992	1.000	1.000	10.1	0.0	6.5	0.0
12.50	0.786	0.863	0.919	0.991	1.000	1.000	11.4	0.0	7.1	0.0
13.00	0.791	0.882	0.905	0.990	1.000	1.000	12.6	0.0	7.8	0.0
13.50	0.791	0.899	0.890	0.989	1.000	1.000	13.9	0.0	8.4	0.0
14.00	0.788	0.913	0.874	0.988	1.000	1.000	15.2	0.0	9.1	0.0
14.50	0.782	0.926	0.857	0.986	1.000	1.000	16.4	0.0	9.7	0.0
15.00	0.774	0.937	0.839	0.985	1.000	1.000	17.7	0.0	10.4	0.0
15.50	0.763	0.946	0.820	0.984	1.000	1.000	19.4	0.0	11.3	0.0
16.00	0.749	0.953	0.799	0.983	1.000	1.000	21.1	0.0	12.3	0.0
16.50	0.732	0.959	0.778	0.982	1.000	1.000	22.8	0.0	13.2	0.0
17.00	0.715	0.964	0.756	0.981	1.000	1.000	24.5	0.0	14.1	0.0
17.50	0.696	0.968	0.733	0.980	1.000	1.000	26.2	0.0	15.1	0.0
18.00	0.676	0.971	0.711	0.979	1.000	1.000	27.9	0.0	16.0	0.0
18.50	0.656	0.974	0.689	0.978	1.000	1.000	27.9	0.0	17.2	0.0
19.00	0.636	0.976	0.667	0.978	1.000	1.000	27.9	0.0	18.5	0.0
19.50	0.616	0.978	0.645	0.978	1.000	1.000	27.9	0.0	19.7	0.0
20.00	0.597	0.979	0.624	0.977	1.000	1.000	27.9	0.0	20.9	0.0
20.50	0.578	0.980	0.603	0.977	1.000	1.000	27.9	0.0	22.2	0.0
21.00	0.560	0.981	0.584	0.977	1.000	1.000	27.9	0.0	23.4	0.0
21.50	0.542	0.982	0.565	0.977	1.000	1.000	27.8	0.0	24.1	0.0
22.00	0.525	0.982	0.547	0.977	1.000	1.000	27.8	0.0	24.8	0.0
22.50	0.509	0.983	0.530	0.977	1.000	1.000	27.7	0.0	25.5	0.0
23.00	0.493	0.984	0.513	0.977	1.000	1.000	27.6	0.0	26.3	0.0
23.50	0.479	0.984	0.498	0.977	1.000	1.000	27.6	0.0	27.0	0.0
24.00	0.465	0.985	0.483	0.977	1.000	1.000	27.5	0.0	27.7	0.0
24.50	0.452	0.985	0.469	0.977	1.000	1.000	28.4	0.0	27.6	0.0

FINAL JPL CONICAL FEED E & H PLANE 8.367 GHZ

26A

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 18
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.011	0.011	0.997	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.50	0.025	0.025	0.999	1.000	1.000	1.000	0.2	0.0	0.2	0.0
2.00	0.043	0.044	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.50	0.067	0.067	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
3.00	0.096	0.096	0.999	1.000	1.000	1.000	0.4	0.0	0.4	0.0
3.50	0.129	0.129	0.999	1.000	1.000	1.000	0.6	0.0	0.6	0.0
4.00	0.164	0.165	0.999	1.000	1.000	1.000	0.9	0.0	0.8	0.0
4.50	0.203	0.203	0.999	1.000	1.000	1.000	1.1	0.0	1.0	0.0
5.00	0.244	0.244	0.998	1.000	1.000	1.000	1.3	0.0	1.2	0.0
5.50	0.287	0.288	0.997	1.000	1.000	1.000	1.6	0.0	1.4	0.0
6.00	0.332	0.333	0.997	1.000	1.000	1.000	1.8	0.0	1.6	0.0
6.50	0.377	0.379	0.995	1.000	1.000	1.000	2.1	0.0	1.9	0.0
7.00	0.422	0.425	0.994	1.000	1.000	1.000	2.5	0.0	2.3	0.0
7.50	0.466	0.470	0.992	1.000	1.000	1.000	2.8	0.0	2.6	0.0
8.00	0.510	0.515	0.990	1.000	1.000	1.000	3.2	0.0	2.9	0.0
8.50	0.552	0.559	0.987	1.000	1.000	1.000	3.5	0.0	3.3	0.0
9.00	0.593	0.603	0.984	1.000	1.000	1.000	3.9	0.0	3.6	0.0
9.50	0.631	0.644	0.981	1.000	1.000	1.000	4.4	0.0	4.1	0.0
10.00	0.666	0.683	0.976	1.000	1.000	1.000	5.0	0.0	4.7	0.0
10.50	0.697	0.718	0.970	1.000	1.000	1.000	5.5	0.0	5.2	0.0
11.00	0.724	0.751	0.964	1.000	1.000	1.000	6.1	0.0	5.7	0.0
11.50	0.748	0.782	0.957	1.000	1.000	1.000	6.6	0.0	6.3	0.0
12.00	0.768	0.810	0.949	1.000	1.000	1.000	7.2	0.0	6.8	0.0
12.50	0.785	0.835	0.940	1.000	1.000	1.000	7.9	0.0	7.5	0.0
13.00	0.797	0.858	0.930	1.000	1.000	1.000	8.6	0.0	8.2	0.0
13.50	0.806	0.878	0.918	1.000	1.000	1.000	9.3	0.0	8.9	0.0
14.00	0.811	0.895	0.906	1.000	1.000	1.000	10.0	0.0	9.6	0.0
14.50	0.813	0.911	0.893	1.000	1.000	1.000	10.7	0.0	10.3	0.0
15.00	0.813	0.924	0.879	1.000	1.000	1.000	11.4	0.0	11.0	0.0
15.50	0.809	0.936	0.864	1.000	1.000	1.000	12.2	0.0	12.0	0.0
16.00	0.802	0.946	0.848	1.000	1.000	1.000	13.0	0.0	13.0	0.0
16.50	0.793	0.954	0.831	1.000	1.000	1.000	13.8	0.0	14.0	0.0
17.00	0.781	0.961	0.813	1.000	1.000	1.000	14.7	0.0	15.1	0.0
17.50	0.768	0.967	0.794	1.000	1.000	1.000	15.5	0.0	16.1	0.0
18.00	0.753	0.971	0.775	1.000	1.000	1.000	16.3	0.0	17.1	0.0
18.50	0.737	0.975	0.756	1.000	1.000	1.000	17.1	0.0	18.2	0.0
19.00	0.720	0.978	0.736	1.000	1.000	1.000	17.9	0.0	19.4	0.0
19.50	0.702	0.981	0.716	1.000	1.000	1.000	18.7	0.0	20.5	0.0
20.00	0.684	0.983	0.696	1.000	1.000	1.000	19.6	0.0	21.7	0.0
20.50	0.665	0.985	0.675	1.000	1.000	1.000	20.4	0.0	22.8	0.0
21.00	0.647	0.987	0.656	1.000	1.000	1.000	21.2	0.0	24.0	0.0
21.50	0.628	0.988	0.636	1.000	1.000	1.000	21.9	0.0	24.5	0.0
22.00	0.610	0.989	0.617	1.000	1.000	1.000	22.7	0.0	25.1	0.0
22.50	0.593	0.990	0.599	1.000	1.000	1.000	23.4	0.0	25.6	0.0
23.00	0.576	0.991	0.581	1.000	1.000	1.000	24.2	0.0	26.1	0.0
23.50	0.559	0.991	0.564	1.000	1.000	1.000	24.9	0.0	26.7	0.0
24.00	0.543	0.992	0.548	1.000	1.000	1.000	25.7	0.0	27.2	0.0
24.50	0.528	0.993	0.532	1.000	1.000	1.000	26.6	0.0	27.1	0.0

FINAL JPL CONICAL FEED E & H PLANE 8.5 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 18
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.011	0.011	0.997	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.50	0.024	0.024	0.999	1.000	1.000	1.000	0.2	0.0	0.1	0.0
2.00	0.042	0.042	0.999	1.000	1.000	1.000	0.3	0.0	0.2	0.0
2.50	0.065	0.065	0.999	1.000	1.000	1.000	0.3	0.0	0.2	0.0
3.00	0.093	0.093	0.999	1.000	1.000	1.000	0.4	0.0	0.3	0.0
3.50	0.125	0.125	0.999	1.000	1.000	1.000	0.6	0.0	0.5	0.0
4.00	0.160	0.160	0.999	1.000	1.000	1.000	0.8	0.0	0.7	0.0
4.50	0.198	0.198	0.999	1.000	1.000	1.000	1.0	0.0	0.9	0.0
5.00	0.239	0.239	0.998	1.000	1.000	1.000	1.2	0.0	1.2	0.0
5.50	0.281	0.282	0.998	1.000	1.000	1.000	1.4	0.0	1.4	0.0
6.00	0.325	0.326	0.997	1.000	1.000	1.000	1.6	0.0	1.6	0.0
6.50	0.370	0.372	0.996	1.000	1.000	1.000	1.9	0.0	1.9	0.0
7.00	0.415	0.417	0.994	1.000	1.000	1.000	2.3	0.0	2.3	0.0
7.50	0.459	0.462	0.993	1.000	1.000	1.000	2.6	0.0	2.6	0.0
8.00	0.502	0.507	0.990	1.000	1.000	1.000	2.9	0.0	2.9	0.0
8.50	0.544	0.551	0.988	1.000	1.000	1.000	3.3	0.0	3.3	0.0
9.00	0.585	0.594	0.985	1.000	1.000	1.000	3.6	0.0	3.6	0.0
9.50	0.624	0.636	0.982	1.000	1.000	1.000	4.1	0.0	4.1	0.0
10.00	0.659	0.674	0.977	1.000	1.000	1.000	4.6	0.0	4.7	0.0
10.50	0.690	0.710	0.972	1.000	1.000	1.000	5.1	0.0	5.2	0.0
11.00	0.718	0.744	0.966	1.000	1.000	1.000	5.7	0.0	5.7	0.0
11.50	0.743	0.775	0.959	1.000	1.000	1.000	6.2	0.0	6.3	0.0
12.00	0.764	0.803	0.952	1.000	1.000	1.000	6.7	0.0	6.8	0.0
12.50	0.782	0.829	0.943	1.000	1.000	1.000	7.3	0.0	7.5	0.0
13.00	0.796	0.853	0.934	1.000	1.000	1.000	8.0	0.0	8.2	0.0
13.50	0.806	0.873	0.923	1.000	1.000	1.000	8.6	0.0	8.9	0.0
14.00	0.813	0.892	0.911	1.000	1.000	1.000	9.2	0.0	9.6	0.0
14.50	0.817	0.908	0.899	1.000	1.000	1.000	9.9	0.0	10.3	0.0
15.00	0.818	0.923	0.886	1.000	1.000	1.000	10.5	0.0	11.0	0.0
15.50	0.816	0.935	0.872	1.000	1.000	1.000	11.3	0.0	11.9	0.0
16.00	0.810	0.946	0.857	1.000	1.000	1.000	12.2	0.0	12.9	0.0
16.50	0.802	0.955	0.840	1.000	1.000	1.000	13.0	0.0	13.8	0.0
17.00	0.792	0.962	0.823	1.000	1.000	1.000	13.9	0.0	14.8	0.0
17.50	0.779	0.968	0.805	1.000	1.000	1.000	14.7	0.0	15.7	0.0
18.00	0.765	0.974	0.786	1.000	1.000	1.000	15.6	0.0	16.7	0.0
18.50	0.750	0.978	0.767	1.000	1.000	1.000	16.6	0.0	17.9	0.0
19.00	0.733	0.981	0.747	1.000	1.000	1.000	17.6	0.0	19.1	0.0
19.50	0.715	0.984	0.727	1.000	1.000	1.000	18.6	0.0	20.2	0.0
20.00	0.696	0.986	0.706	1.000	1.000	1.000	19.6	0.0	21.4	0.0
20.50	0.677	0.988	0.685	1.000	1.000	1.000	20.6	0.0	22.6	0.0
21.00	0.658	0.989	0.665	1.000	1.000	1.000	21.6	0.0	23.8	0.0
21.50	0.638	0.990	0.645	1.000	1.000	1.000	22.7	0.0	24.2	0.0
22.00	0.619	0.991	0.625	1.000	1.000	1.000	23.8	0.0	24.7	0.0
22.50	0.601	0.992	0.606	1.000	1.000	1.000	[illegible]	0.0	25.1	0.0
23.00	0.583	0.993	0.587	1.000	1.000	1.000	[illegible]	0.0	25.6	0.0
23.50	0.565	0.993	0.569	1.000	1.000	1.000	27.0	0.0	26.0	0.0
24.00	0.548	0.994	0.552	1.000	1.000	1.000	28.1	0.0	26.5	0.0
24.50	0.532	0.994	0.535	1.000	1.000	1.000	28.9	0.0	26.6	0.0

FINAL JPL CONICAL FEED E & H PLANE 8.6 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 18
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.013	0.013	0.997	1.000	1.000	1.000	0.2	0.0	0.1	0.0
1.50	0.028	0.028	0.999	1.000	1.000	1.000	0.3	0.0	0.2	0.0
2.00	0.049	0.049	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.50	0.076	0.076	0.999	1.000	1.000	1.000	0.4	0.0	0.3	0.0
3.00	0.108	0.108	0.999	1.000	1.000	1.000	0.5	0.0	0.4	0.0
3.50	0.144	0.144	0.999	1.000	1.000	1.000	0.8	0.0	0.6	0.0
4.00	0.184	0.184	0.999	1.000	1.000	1.000	1.1	0.0	0.8	0.0
4.50	0.227	0.227	0.998	1.000	1.000	1.000	1.3	0.0	1.0	0.0
5.00	0.272	0.272	0.998	1.000	1.000	1.000	1.6	0.0	1.2	0.0
5.50	0.318	0.319	0.997	1.000	1.000	1.000	1.9	0.0	1.4	0.0
6.00	0.367	0.368	0.996	1.000	1.000	1.000	2.2	0.0	1.6	0.0
6.50	0.415	0.418	0.994	1.000	1.000	1.000	2.7	0.0	1.9	0.0
7.00	0.463	0.467	0.992	0.999	1.000	1.000	3.1	0.0	2.3	0.0
7.50	0.509	0.515	0.990	0.999	1.000	1.000	3.6	0.0	2.6	0.0
8.00	0.553	0.561	0.987	0.999	1.000	1.000	4.1	0.0	2.9	0.0
8.50	0.596	0.607	0.983	0.999	1.000	1.000	4.5	0.0	3.3	0.0
9.00	0.636	0.651	0.980	0.998	1.000	1.000	5.0	0.0	3.6	0.0
9.50	0.674	0.692	0.975	0.998	1.000	1.000	5.7	0.0	4.1	0.0
10.00	0.706	0.730	0.969	0.998	1.000	1.000	6.5	0.0	4.7	0.0
10.50	0.733	0.765	0.962	0.997	1.000	1.000	7.2	0.0	5.2	0.0
11.00	0.756	0.796	0.953	0.997	1.000	1.000	8.0	0.0	5.7	0.0
11.50	0.775	0.824	0.944	0.996	1.000	1.000	8.7	0.0	6.3	0.0
12.00	0.790	0.850	0.934	0.996	1.000	1.000	9.5	0.0	6.8	0.0
12.50	0.801	0.873	0.922	0.995	1.000	1.000	10.5	0.0	7.5	0.0
13.00	0.807	0.893	0.909	0.995	1.000	1.000	11.5	0.0	8.3	0.0
13.50	0.809	0.910	0.895	0.994	1.000	1.000	12.5	0.0	9.0	0.0
14.00	0.807	0.924	0.879	0.993	1.000	1.000	13.6	0.0	9.7	0.0
14.50	0.802	0.936	0.862	0.993	1.000	1.000	14.6	0.0	10.5	0.0
15.00	0.794	0.947	0.845	0.992	1.000	1.000	15.6	0.0	11.2	0.0
15.50	0.783	0.956	0.826	0.992	1.000	1.000	16.9	0.0	12.2	0.0
16.00	0.770	0.963	0.806	0.991	1.000	1.000	18.3	0.0	13.2	0.0
16.50	0.754	0.969	0.785	0.991	1.000	1.000	19.6	0.0	14.1	0.0
17.00	0.737	0.974	0.764	0.991	1.000	1.000	20.9	0.0	15.1	0.0
17.50	0.718	0.977	0.742	0.990	1.000	1.000	22.3	0.0	16.1	0.0
18.00	0.698	0.980	0.719	0.990	1.000	1.000	23.6	0.0	17.1	0.0
18.50	0.678	0.983	0.697	0.990	1.000	1.000	24.7	0.0	18.3	0.0
19.00	0.657	0.985	0.675	0.989	1.000	1.000	25.8	0.0	19.5	0.0
19.50	0.636	0.986	0.652	0.989	1.000	1.000	26.9	0.0	20.7	0.0
20.00	0.615	0.987	0.630	0.989	1.000	1.000	28.1	0.0	22.0	0.0
20.50	0.595	0.988	0.609	0.989	1.000	1.000	29.2	0.0	23.2	0.0
21.00	0.574	0.989	0.587	0.989	1.000	1.000	30.3	0.0	24.4	0.0
21.50	0.555	0.989	0.567	0.989	1.000	1.000	31.1	0.0	25.0	0.0
22.00	0.536	0.990	0.547	0.989	1.000	1.000	32.0	0.0	25.6	0.0
22.50	0.518	0.990	0.529	0.989	1.000	1.000	32.8	0.0	26.2	0.0
23.00	0.500	0.991	0.511	0.989	1.000	1.000	33.7	0.0	26.9	0.0
23.50	0.483	0.991	0.493	0.989	1.000	1.000	34.5	0.0	27.5	0.0
24.00	0.467	0.991	0.477	0.989	1.000	1.000	35.4	0.0	28.1	0.0
24.50	0.452	0.991	0.461	0.989	1.000	1.000	37.2	0.0	28.1	0.0

FINAL JPL CONICAL FEED E & H PLANE 8.8 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 16
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.012	0.012	0.997	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.50	0.027	0.027	0.999	1.000	1.000	1.000	0.2	0.0	0.2	0.0
2.00	0.047	0.047	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.50	0.073	0.073	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
3.00	0.104	0.104	0.999	1.000	1.000	1.000	0.4	0.0	0.4	0.0
3.50	0.139	0.139	0.999	1.000	1.000	1.000	0.6	0.0	0.6	0.0
4.00	0.178	0.178	0.999	1.000	1.000	1.000	0.9	0.0	0.8	0.0
4.50	0.220	0.220	0.999	1.000	1.000	1.000	1.1	0.0	1.0	0.0
5.00	0.264	0.264	0.998	1.000	1.000	1.000	1.4	0.0	1.2	0.0
5.50	0.310	0.311	0.997	1.000	1.000	1.000	1.6	0.0	1.4	0.0
6.00	0.358	0.359	0.996	1.000	1.000	1.000	1.9	0.0	1.6	0.0
6.50	0.406	0.408	0.995	1.000	1.000	1.000	2.3	0.0	1.9	0.0
7.00	0.454	0.457	0.993	1.000	1.000	1.000	2.7	0.0	2.3	0.0
7.50	0.500	0.505	0.991	1.000	1.000	1.000	3.1	0.0	2.6	0.0
8.00	0.545	0.551	0.988	1.000	1.000	1.000	3.6	0.0	3.0	0.0
8.50	0.588	0.597	0.985	1.000	1.000	1.000	4.0	0.0	3.3	0.0
9.00	0.629	0.641	0.981	1.000	1.000	1.000	4.4	0.0	3.7	0.0
9.50	0.667	0.683	0.977	1.000	1.000	1.000	5.0	0.0	4.3	0.0
10.00	0.701	0.721	0.972	0.999	1.000	1.000	5.6	0.0	4.8	0.0
10.50	0.730	0.757	0.965	0.999	1.000	1.000	6.2	0.0	5.4	0.0
11.00	0.755	0.789	0.958	0.999	1.000	1.000	6.8	0.0	6.0	0.0
11.50	0.777	0.819	0.949	0.999	1.000	1.000	7.4	0.0	6.5	0.0
12.00	0.795	0.846	0.940	0.999	1.000	1.000	8.0	0.0	7.1	0.0
12.50	0.809	0.870	0.930	0.999	1.000	1.000	8.8	0.0	7.8	0.0
13.00	0.818	0.891	0.918	0.999	1.000	1.000	9.7	0.0	8.5	0.0
13.50	0.823	0.910	0.905	0.999	1.000	1.000	10.5	0.0	9.2	0.0
14.00	0.824	0.925	0.891	0.999	1.000	1.000	11.4	0.0	10.0	0.0
14.50	0.822	0.939	0.876	0.999	1.000	1.000	12.2	0.0	10.7	0.0
15.00	0.817	0.951	0.861	0.999	1.000	1.000	13.1	0.0	11.4	0.0
15.50	0.809	0.961	0.843	0.999	1.000	1.000	14.3	0.0	12.5	0.0
16.00	0.798	0.969	0.825	0.999	1.000	1.000	15.5	0.0	13.6	0.0
16.50	0.784	0.975	0.805	0.998	1.000	1.000	16.6	0.0	14.6	0.0
17.00	0.767	0.980	0.784	0.998	1.000	1.000	17.8	0.0	15.7	0.0
17.50	0.749	0.984	0.762	0.998	1.000	1.000	19.0	0.0	16.8	0.0
18.00	0.730	0.987	0.740	0.998	1.000	1.000	20.2	0.0	17.9	0.0
18.50	0.709	0.990	0.718	0.998	1.000	1.000	21.6	0.0	19.3	0.0
19.00	0.687	0.992	0.694	0.998	1.000	1.000	23.0	0.0	20.8	0.0
19.50	0.665	0.993	0.671	0.998	1.000	1.000	24.4	0.0	22.2	0.0
20.00	0.643	0.994	0.648	0.998	1.000	1.000	25.8	0.0	23.7	0.0
20.50	0.620	0.995	0.625	0.998	1.000	1.000	27.2	0.0	25.1	0.0
21.00	0.598	0.995	0.602	0.998	1.000	1.000	28.6	0.0	26.6	0.0
21.50	0.577	0.996	0.581	0.998	1.000	1.000	29.5	0.0	27.3	0.0
22.00	0.556	0.996	0.560	0.998	1.000	1.000	30.4	0.0	28.1	0.0
22.50	0.537	0.996	0.540	0.998	1.000	1.000	31.3	0.0	28.8	0.0
23.00	0.518	0.996	0.520	0.998	1.000	1.000	32.2	0.0	29.5	0.0
23.50	0.500	0.997	0.502	0.998	1.000	1.000	33.1	0.0	30.3	0.0
24.00	0.482	0.997	0.485	0.998	1.000	1.000	34.0	0.0	31.0	0.0
24.50	0.466	0.997	0.468	0.998	1.000	1.000	36.0	0.0	30.9	0.0

FINAL JPL CONICAL FEED E & H PLANE 9.0 GHZ

B-9A

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 16
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.013	0.013	0.997	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.50	0.029	0.029	0.999	1.000	1.000	1.000	0.2	0.0	0.2	0.0
2.00	0.052	0.052	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.50	0.080	0.080	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
3.00	0.114	0.114	0.999	1.000	1.000	1.000	0.4	0.0	0.4	0.0
3.50	0.153	0.153	0.999	1.000	1.000	1.000	0.6	0.0	0.6	0.0
4.00	0.195	0.195	0.999	1.000	1.000	1.000	0.9	0.0	0.9	0.0
4.50	0.240	0.241	0.998	1.000	1.000	1.000	1.1	0.0	1.1	0.0
5.00	0.288	0.288	0.998	1.000	1.000	1.000	1.4	0.0	1.4	0.0
5.50	0.337	0.338	0.997	1.000	1.000	1.000	1.6	0.0	1.6	0.0
6.00	0.388	0.390	0.996	1.000	1.000	1.000	1.9	0.0	1.9	0.0
6.50	0.439	0.441	0.994	1.000	1.000	1.000	2.3	0.0	2.3	0.0
7.00	0.488	0.492	0.992	1.000	1.000	1.000	2.8	0.0	2.8	0.0
7.50	0.535	0.541	0.989	1.000	1.000	1.000	3.2	0.0	3.2	0.0
8.00	0.580	0.589	0.985	1.000	1.000	1.000	3.6	0.0	3.6	0.0
8.50	0.623	0.634	0.981	1.000	1.000	1.000	4.1	0.0	4.1	0.0
9.00	0.663	0.678	0.977	1.000	1.000	1.000	4.5	0.0	4.5	0.0
9.50	0.699	0.719	0.972	1.000	1.000	1.000	5.1	0.0	5.1	0.0
10.00	0.730	0.757	0.965	1.000	1.000	1.000	5.7	0.0	5.8	0.0
10.50	0.757	0.791	0.957	1.000	1.000	1.000	6.3	0.0	6.4	0.0
11.00	0.779	0.821	0.948	1.000	1.000	1.000	7.0	0.0	7.1	0.0
11.50	0.797	0.849	0.938	1.000	1.000	1.000	7.6	0.0	7.7	0.0
12.00	0.811	0.874	0.928	1.000	1.000	1.000	8.2	0.0	8.4	0.0
12.50	0.821	0.896	0.916	1.000	1.000	1.000	9.0	0.0	9.3	0.0
13.00	0.826	0.915	0.902	1.000	1.000	1.000	9.9	0.0	10.2	0.0
13.50	0.826	0.931	0.887	1.000	1.000	1.000	10.7	0.0	11.0	0.0
14.00	0.823	0.945	0.871	1.000	1.000	1.000	11.6	0.0	11.9	0.0
14.50	0.816	0.956	0.854	1.000	1.000	1.000	12.4	0.0	12.8	0.0
15.00	0.807	0.966	0.836	1.000	1.000	1.000	13.3	0.0	13.7	0.0
15.50	0.795	0.974	0.816	1.000	1.000	1.000	14.4	0.0	15.2	0.0
16.00	0.779	0.980	0.795	1.000	1.000	1.000	15.6	0.0	16.7	0.0
16.50	0.761	0.984	0.773	1.000	1.000	1.000	16.7	0.0	18.2	0.0
17.00	0.740	0.988	0.750	1.000	1.000	1.000	17.9	0.0	19.7	0.0
17.50	0.719	0.990	0.726	1.000	1.000	1.000	19.0	0.0	21.2	0.0
18.00	0.696	0.993	0.702	1.000	1.000	1.000	20.2	0.0	22.7	0.0
18.50	0.673	0.994	0.677	1.000	1.000	1.000	21.9	0.0	24.9	0.0
19.00	0.649	0.995	0.652	1.000	1.000	1.000	23.7	0.0	27.1	0.0
19.50	0.624	0.996	0.627	1.000	1.000	1.000	25.4	0.0	29.3	0.0
20.00	0.600	0.996	0.602	1.000	1.000	1.000	27.1	0.0	31.6	0.0
20.50	0.576	0.996	0.578	1.000	1.000	1.000	28.9	0.0	33.8	0.0
21.00	0.552	0.997	0.554	1.000	1.000	1.000	30.6	0.0	36.0	0.0
21.50	0.530	0.997	0.532	1.000	1.000	1.000	34.3	0.0	35.0	0.0
22.00	0.508	0.997	0.510	1.000	1.000	1.000	38.1	0.0	34.0	0.0
22.50	0.488	0.997	0.490	1.000	1.000	1.000	41.8	0.0	33.0	0.0
23.00	0.469	0.997	0.470	1.000	1.000	1.000	45.5	0.0	32.0	0.0
23.50	0.451	0.997	0.452	1.000	1.000	1.000	49.3	0.0	31.0	0.0
24.00	0.434	0.997	0.436	1.000	1.000	1.000	53.0	0.0	30.0	0.0
24.50	0.419	0.997	0.420	0.999	1.000	1.000	51.8	0.0	30.2	0.0

FINAL JPL CONICAL FEED E & H PLANE 9.164 GHZ

41A

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 16
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.004	0.004	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.014	0.014	0.997	1.000	1.000	1.000	0.1	0.0	0.2	0.0
1.50	0.031	0.031	0.999	1.000	1.000	1.000	0.2	0.0	0.3	0.0
2.00	0.055	0.055	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.50	0.085	0.085	0.999	1.000	1.000	1.000	0.3	0.0	0.4	0.0
3.00	0.121	0.121	0.999	1.000	1.000	1.000	0.4	0.0	0.5	0.0
3.50	0.161	0.162	0.999	1.000	1.000	1.000	0.6	0.0	0.8	0.0
4.00	0.206	0.206	0.999	1.000	1.000	1.000	0.9	0.0	1.0	0.0
4.50	0.253	0.253	0.998	1.000	1.000	1.000	1.1	0.0	1.3	0.0
5.00	0.302	0.303	0.997	1.000	1.000	1.000	1.4	0.0	1.6	0.0
5.50	0.354	0.355	0.996	1.000	1.000	1.000	1.6	0.0	1.8	0.0
6.00	0.407	0.409	0.995	1.000	1.000	1.000	1.9	0.0	2.1	0.0
6.50	0.459	0.462	0.994	1.000	1.000	1.000	2.3	0.0	2.6	0.0
7.00	0.510	0.515	0.991	1.000	1.000	1.000	2.7	0.0	3.1	0.0
7.50	0.558	0.565	0.988	1.000	1.000	1.000	3.1	0.0	3.6	0.0
8.00	0.604	0.614	0.984	1.000	1.000	1.000	3.6	0.0	4.1	0.0
8.50	0.646	0.660	0.980	1.000	1.000	1.000	4.0	0.0	4.6	0.0
9.00	0.686	0.704	0.975	1.000	1.000	1.000	4.4	0.0	5.1	0.0
9.50	0.722	0.745	0.969	1.000	1.000	1.000	5.0	0.0	5.9	0.0
10.00	0.751	0.782	0.961	0.999	1.000	1.000	5.7	0.0	6.7	0.0
10.50	0.775	0.815	0.952	0.999	1.000	1.000	6.3	0.0	7.5	0.0
11.00	0.794	0.844	0.942	0.999	1.000	1.000	6.9	0.0	8.3	0.0
11.50	0.809	0.870	0.930	0.999	1.000	1.000	7.6	0.0	9.1	0.0
12.00	0.819	0.893	0.918	0.999	1.000	1.000	8.2	0.0	9.9	0.0
12.50	0.824	0.913	0.904	0.999	1.000	1.000	9.1	0.0	11.0	0.0
13.00	0.824	0.930	0.888	0.998	1.000	1.000	10.0	0.0	12.1	0.0
13.50	0.819	0.943	0.870	0.998	1.000	1.000	10.9	0.0	13.2	0.0
14.00	0.811	0.955	0.851	0.998	1.000	1.000	11.8	0.0	14.3	0.0
14.50	0.800	0.964	0.831	0.998	1.000	1.000	12.7	0.0	15.4	0.0
15.00	0.786	0.972	0.811	0.998	1.000	1.000	13.6	0.0	16.5	0.0
15.50	0.768	0.978	0.788	0.997	1.000	1.000	14.8	0.0	19.7	0.0
16.00	0.746	0.982	0.763	0.997	1.000	1.000	16.1	0.0	23.0	0.0
16.50	0.722	0.985	0.736	0.997	1.000	1.000	17.3	0.0	26.2	0.0
17.00	0.696	0.987	0.708	0.996	1.000	1.000	18.5	0.0	29.5	0.0
17.50	0.669	0.988	0.680	0.996	1.000	1.000	19.8	0.0	32.7	0.0
18.00	0.643	0.989	0.653	0.995	1.000	1.000	21.0	0.0	36.0	0.0
18.50	0.617	0.990	0.626	0.995	1.000	1.000	23.1	0.0	34.7	0.0
19.00	0.592	0.991	0.600	0.995	1.000	1.000	25.2	0.0	33.3	0.0
19.50	0.568	0.991	0.576	0.995	1.000	1.000	27.3	0.0	32.0	0.0
20.00	0.545	0.992	0.552	0.995	1.000	1.000	29.5	0.0	30.7	0.0
20.50	0.523	0.992	0.530	0.995	1.000	1.000	31.6	0.0	29.3	0.0
21.00	0.503	0.992	0.510	0.995	1.000	1.000	33.7	0.0	28.0	0.0
21.50	0.484	0.992	0.491	0.995	1.000	1.000	36.9	0.0	27.5	0.0
22.00	0.467	0.993	0.473	0.995	1.000	1.000	40.1	0.0	26.9	0.0
22.50	0.450	0.993	0.456	0.995	1.000	1.000	43.3	0.0	26.4	0.0
23.00	0.434	0.993	0.440	0.995	1.000	1.000	46.6	0.0	25.9	0.0
23.50	0.420	0.994	0.425	0.994	1.000	1.000	49.8	0.0	25.3	0.0
24.00	0.407	0.994	0.411	0.994	1.000	1.000	53.0	0.0	24.8	0.0
24.50	0.394	0.995	0.398	0.994	1.000	1.000	51.8	0.0	25.1	0.0

FINAL JPL CONICAL FEED E & H PLANE 9.2 GHZ

INPUT DATA ANC CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 16
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.004	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.014	0.014	0.997	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.50	0.031	0.031	0.999	1.000	1.000	1.000	0.2	0.0	0.2	0.0
2.00	0.055	0.055	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.50	0.085	0.085	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
3.00	0.121	0.121	0.999	1.000	1.000	1.000	0.4	0.0	0.4	0.0
3.50	0.162	0.162	0.999	1.000	1.000	1.000	0.6	0.0	0.7	0.0
4.00	0.206	0.206	0.999	1.000	1.000	1.000	0.9	0.0	1.0	0.0
4.50	0.254	0.254	0.998	1.000	1.000	1.000	1.1	0.0	1.2	0.0
5.00	0.303	0.304	0.998	1.000	1.000	1.000	1.3	0.0	1.5	0.0
5.50	0.355	0.356	0.997	1.000	1.000	1.000	1.6	0.0	1.8	0.0
6.00	0.408	0.410	0.995	1.000	1.000	1.000	1.8	0.0	2.1	0.0
6.50	0.461	0.464	0.994	1.000	1.000	1.000	2.2	0.0	2.6	0.0
7.00	0.512	0.516	0.991	1.000	1.000	1.000	2.6	0.0	3.1	0.0
7.50	0.560	0.567	0.988	1.000	1.000	1.000	3.0	0.0	3.6	0.0
8.00	0.605	0.615	0.984	1.000	1.000	1.000	3.5	0.0	4.2	0.0
8.50	0.648	0.662	0.979	1.000	1.000	1.000	3.9	0.0	4.7	0.0
9.00	0.687	0.706	0.974	0.999	1.000	1.000	4.3	0.0	5.2	0.0
9.50	0.722	0.747	0.968	0.999	1.000	1.000	4.9	0.0	6.0	0.0
10.00	0.751	0.783	0.960	0.999	1.000	1.000	5.6	0.0	6.8	0.0
10.50	0.775	0.815	0.951	0.999	1.000	1.000	6.2	0.0	7.6	0.0
11.00	0.793	0.844	0.941	0.999	1.000	1.000	6.9	0.0	8.4	0.0
11.50	0.807	0.870	0.929	0.999	1.000	1.000	7.5	0.0	9.2	0.0
12.00	0.817	0.893	0.916	0.998	1.000	1.000	8.2	0.0	10.0	0.0
12.50	0.821	0.912	0.902	0.998	1.000	1.000	9.0	0.0	11.3	0.0
13.00	0.820	0.928	0.885	0.998	1.000	1.000	9.9	0.0	12.5	0.0
13.50	0.815	0.942	0.867	0.997	1.000	1.000	10.7	0.0	13.8	0.0
14.00	0.805	0.953	0.848	0.997	1.000	1.000	11.6	0.0	15.1	0.0
14.50	0.793	0.962	0.827	0.997	1.000	1.000	12.4	0.0	16.3	0.0
15.00	0.778	0.969	0.806	0.996	1.000	1.000	13.3	0.0	17.6	0.0
15.50	0.760	0.975	0.783	0.996	1.000	1.000	14.5	0.0	20.3	0.0
16.00	0.739	0.979	0.758	0.996	1.000	1.000	15.6	0.0	22.9	0.0
16.50	0.716	0.982	0.732	0.995	1.000	1.000	16.8	0.0	25.6	0.0
17.00	0.691	0.985	0.706	0.995	1.000	1.000	18.0	0.0	28.3	0.0
17.50	0.666	0.987	0.679	0.994	1.000	1.000	19.1	0.0	30.9	0.0
18.00	0.641	0.988	0.653	0.994	1.000	1.000	20.3	0.0	33.6	0.0
18.50	0.617	0.989	0.628	0.993	1.000	1.000	22.2	0.0	32.2	0.0
19.00	0.593	0.990	0.603	0.993	1.000	1.000	24.0	0.0	30.9	0.0
19.50	0.570	0.990	0.579	0.993	1.000	1.000	25.9	0.0	29.5	0.0
20.00	0.548	0.991	0.557	0.993	1.000	1.000	27.8	0.0	28.1	0.0
20.50	0.528	0.991	0.537	0.993	1.000	1.000	29.6	0.0	26.8	0.0
21.00	0.510	0.992	0.517	0.993	1.000	1.000	31.5	0.0	25.4	0.0
21.50	0.492	0.992	0.499	0.993	1.000	1.000	35.1	0.0	25.2	0.0
22.00	0.475	0.993	0.482	0.993	1.000	1.000	38.7	0.0	25.1	0.0
22.50	0.459	0.993	0.465	0.993	1.000	1.000	42.2	0.0	24.9	0.0
23.00	0.443	0.994	0.450	0.993	1.000	1.000	45.8	0.0	24.8	0.0
23.50	0.429	0.994	0.435	0.993	1.000	1.000	49.4	0.0	24.6	0.0
24.00	0.416	0.995	0.421	0.992	1.000	1.000	53.0	0.0	24.5	0.0
24.50	0.403	0.995	0.408	0.992	1.000	1.000	51.8	0.0	25.0	0.0

FINAL JPL CONICAL FEED E & H PLANE 9.4 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 18
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.013	0.013	0.997	1.000	1.000	1.000	0.2	0.0	0.2	0.0
1.50	0.030	0.030	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.00	0.052	0.052	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.50	0.081	0.081	0.999	1.000	1.000	1.000	0.4	0.0	0.4	0.0
3.00	0.115	0.115	0.999	1.000	1.000	1.000	0.5	0.0	0.5	0.0
3.50	0.153	0.153	0.999	1.000	1.000	1.000	0.7	0.0	0.8	0.0
4.00	0.195	0.195	0.999	1.000	1.000	1.000	0.9	0.0	1.1	0.0
4.50	0.240	0.240	0.998	1.000	1.000	1.000	1.1	0.0	1.4	0.0
5.00	0.286	0.287	0.997	1.000	1.000	1.000	1.4	0.0	1.7	0.0
5.50	0.335	0.336	0.996	1.000	1.000	1.000	1.6	0.0	2.0	0.0
6.00	0.385	0.387	0.995	1.000	1.000	1.000	1.8	0.0	2.3	0.0
6.50	0.435	0.438	0.994	1.000	1.000	1.000	2.2	0.0	2.8	0.0
7.00	0.483	0.488	0.991	1.000	1.000	1.000	2.5	0.0	3.3	0.0
7.50	0.529	0.536	0.988	0.999	1.000	1.000	2.9	0.0	3.8	0.0
8.00	0.573	0.583	0.985	0.999	1.000	1.000	3.3	0.0	4.4	0.0
8.50	0.615	0.628	0.980	0.999	1.000	1.000	3.6	0.0	4.9	0.0
9.00	0.654	0.671	0.976	0.999	1.000	1.000	4.0	0.0	5.4	0.0
9.50	0.689	0.711	0.970	0.998	1.000	1.000	4.6	0.0	6.2	0.0
10.00	0.719	0.748	0.963	0.998	1.000	1.000	5.1	0.0	7.1	0.0
10.50	0.743	0.780	0.955	0.997	1.000	1.000	5.7	0.0	7.9	0.0
11.00	0.763	0.810	0.945	0.997	1.000	1.000	6.3	0.0	8.7	0.0
11.50	0.778	0.836	0.934	0.996	1.000	1.000	6.8	0.0	9.6	0.0
12.00	0.790	0.860	0.922	0.996	1.000	1.000	7.4	0.0	10.4	0.0
12.50	0.797	0.880	0.909	0.995	1.000	1.000	8.1	0.0	11.7	0.0
13.00	0.799	0.898	0.894	0.994	1.000	1.000	8.8	0.0	12.9	0.0
13.50	0.797	0.913	0.878	0.993	1.000	1.000	9.4	0.0	14.2	0.0
14.00	0.791	0.926	0.861	0.992	1.000	1.000	10.1	0.0	15.5	0.0
14.50	0.783	0.937	0.843	0.991	1.000	1.000	10.8	0.0	16.7	0.0
15.00	0.772	0.947	0.823	0.990	1.000	1.000	11.5	0.0	18.0	0.0
15.50	0.759	0.955	0.804	0.989	1.000	1.000	12.5	0.0	19.1	0.0
16.00	0.744	0.961	0.783	0.989	1.000	1.000	13.6	0.0	20.3	0.0
16.50	0.727	0.966	0.761	0.988	1.000	1.000	14.6	0.0	21.4	0.0
17.00	0.709	0.971	0.740	0.988	1.000	1.000	15.6	0.0	22.6	0.0
17.50	0.690	0.974	0.717	0.987	1.000	1.000	16.7	0.0	23.7	0.0
18.00	0.670	0.977	0.695	0.987	1.000	1.000	17.7	0.0	24.9	0.0
18.50	0.651	0.979	0.673	0.987	1.000	1.000	19.0	0.0	24.5	0.0
19.00	0.631	0.981	0.652	0.987	1.000	1.000	20.4	0.0	24.1	0.0
19.50	0.612	0.982	0.632	0.987	1.000	1.000	21.7	0.0	23.7	0.0
20.00	0.594	0.984	0.612	0.987	1.000	1.000	23.1	0.0	23.4	0.0
20.50	0.577	0.985	0.593	0.987	1.000	1.000	24.4	0.0	23.0	0.0
21.00	0.560	0.986	0.576	0.987	1.000	1.000	25.8	0.0	22.6	0.0
21.50	0.544	0.987	0.558	0.987	1.000	1.000	27.0	0.0	22.8	0.0
22.00	0.528	0.988	0.542	0.987	1.000	1.000	28.2	0.0	22.9	0.0
22.50	0.514	0.989	0.526	0.986	1.000	1.000	29.3	0.0	23.1	0.0
23.00	0.499	0.990	0.511	0.986	1.000	1.000	30.5	0.0	23.3	0.0
23.50	0.485	0.991	0.497	0.986	1.000	1.000	31.7	0.0	23.4	0.0
24.00	0.472	0.992	0.483	0.986	1.000	1.000	32.9	0.0	23.6	0.0
24.50	0.459	0.992	0.469	0.986	1.000	1.000	32.7	0.0	24.2	0.0

FINAL JPL CONICAL FEED E & H PLANE 9.562 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 18
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.013	0.013	0.997	1.000	1.000	1.000	0.1	0.0	0.2	0.0
1.50	0.028	0.028	0.999	1.000	1.000	1.000	0.1	0.0	0.3	0.0
2.00	0.049	0.049	0.999	1.000	1.000	1.000	0.2	0.0	0.3	0.0
2.50	0.076	0.076	0.999	1.000	1.000	1.000	0.2	0.0	0.4	0.0
3.00	0.109	0.109	0.999	1.000	1.000	1.000	0.3	0.0	0.5	0.0
3.50	0.146	0.146	0.999	1.000	1.000	1.000	0.5	0.0	0.8	0.0
4.00	0.186	0.186	0.999	1.000	1.000	1.000	0.7	0.0	1.1	0.0
4.50	0.229	0.229	0.998	1.000	1.000	1.000	0.9	0.0	1.4	0.0
5.00	0.274	0.274	0.998	1.000	1.000	1.000	1.1	0.0	1.7	0.0
5.50	0.321	0.322	0.997	0.999	1.000	1.000	1.3	0.0	2.0	0.0
6.00	0.369	0.371	0.996	0.999	1.000	1.000	1.5	0.0	2.3	0.0
6.50	0.418	0.420	0.994	0.999	1.000	1.000	1.8	0.0	2.8	0.0
7.00	0.464	0.469	0.992	0.999	1.000	1.000	2.2	0.0	3.4	0.0
7.50	0.509	0.516	0.989	0.998	1.000	1.000	2.5	0.0	3.9	0.0
8.00	0.552	0.561	0.985	0.998	1.000	1.000	2.9	0.0	4.4	0.0
8.50	0.592	0.605	0.981	0.998	1.000	1.000	3.2	0.0	5.0	0.0
9.00	0.630	0.647	0.977	0.997	1.000	1.000	3.6	0.0	5.5	0.0
9.50	0.665	0.687	0.971	0.996	1.000	1.000	4.1	0.0	6.3	0.0
10.00	0.694	0.723	0.965	0.996	1.000	1.000	4.6	0.0	7.2	0.0
10.50	0.719	0.755	0.957	0.995	1.000	1.000	5.1	0.0	8.0	0.0
11.00	0.739	0.785	0.947	0.994	1.000	1.000	5.7	0.0	8.8	0.0
11.50	0.756	0.812	0.937	0.993	1.000	1.000	6.2	0.0	9.7	0.0
12.00	0.769	0.836	0.926	0.992	1.000	1.000	6.7	0.0	10.5	0.0
12.50	0.777	0.858	0.914	0.991	1.000	1.000	7.3	0.0	11.7	0.0
13.00	0.781	0.877	0.900	0.990	1.000	1.000	8.0	0.0	12.9	0.0
13.50	0.782	0.893	0.885	0.989	1.000	1.000	8.6	0.0	14.1	0.0
14.00	0.779	0.907	0.869	0.987	1.000	1.000	9.2	0.0	15.3	0.0
14.50	0.773	0.920	0.852	0.986	1.000	1.000	9.9	0.0	16.5	0.0
15.00	0.765	0.930	0.835	0.985	1.000	1.000	10.5	0.0	17.7	0.0
15.50	0.755	0.940	0.817	0.984	1.000	1.000	11.4	0.0	18.6	0.0
16.00	0.743	0.948	0.798	0.983	1.000	1.000	12.3	0.0	19.4	0.0
16.50	0.729	0.954	0.779	0.982	1.000	1.000	13.1	0.0	20.3	0.0
17.00	0.715	0.960	0.759	0.981	1.000	1.000	14.0	0.0	21.2	0.0
17.50	0.699	0.964	0.739	0.981	1.000	1.000	14.9	0.0	22.0	0.0
18.00	0.683	0.968	0.719	0.980	1.000	1.000	15.8	0.0	22.9	0.0
18.50	0.666	0.972	0.700	0.980	1.000	1.000	16.8	0.0	22.7	0.0
19.00	0.650	0.974	0.681	0.980	1.000	1.000	17.8	0.0	22.5	0.0
19.50	0.634	0.977	0.662	0.980	1.000	1.000	18.8	0.0	22.3	0.0
20.00	0.618	0.979	0.644	0.980	1.000	1.000	19.8	0.0	22.2	0.0
20.50	0.603	0.981	0.627	0.980	1.000	1.000	20.8	0.0	22.0	0.0
21.00	0.588	0.983	0.611	0.980	1.000	1.000	21.8	0.0	21.8	0.0
21.50	0.573	0.985	0.594	0.980	1.000	1.000	23.0	0.0	22.1	0.0
22.00	0.559	0.986	0.579	0.980	1.000	1.000	24.3	0.0	22.4	0.0
22.50	0.544	0.987	0.563	0.980	1.000	1.000	25.5	0.0	22.7	0.0
23.00	0.530	0.988	0.548	0.980	1.000	1.000	26.7	0.0	23.1	0.0
23.50	0.516	0.989	0.533	0.980	1.000	1.000	28.0	0.0	23.4	0.0
24.00	0.503	0.990	0.518	0.980	1.000	1.000	29.2	0.0	23.7	0.0
24.50	0.489	0.991	0.504	0.980	1.000	1.000	29.0	0.0	24.4	0.0

FINAL JPL CONICAL FEED E & H PLANE 9.8 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 20
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.004	0.004	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.015	0.015	0.997	1.000	1.000	1.000	0.2	0.0	0.2	0.0
1.50	0.034	0.034	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.00	0.059	0.059	0.999	1.000	1.000	1.000	0.4	0.0	0.3	0.0
2.50	0.092	0.092	0.999	1.000	1.000	1.000	0.5	0.0	0.4	0.0
3.00	0.130	0.130	0.999	1.000	1.000	1.000	0.6	0.0	0.5	0.0
3.50	0.173	0.174	0.999	1.000	1.000	1.000	0.9	0.0	0.8	0.0
4.00	0.220	0.220	0.999	1.000	1.000	1.000	1.2	0.0	1.1	0.0
4.50	0.269	0.270	0.998	1.000	1.000	1.000	1.5	0.0	1.4	0.0
5.00	0.320	0.321	0.997	1.000	1.000	1.000	1.8	0.0	1.7	0.0
5.50	0.373	0.375	0.995	1.000	1.000	1.000	2.1	0.0	2.0	0.0
6.00	0.426	0.429	0.994	1.000	1.000	1.000	2.4	0.0	2.3	0.0
6.50	0.479	0.483	0.991	1.000	1.000	1.000	2.9	0.0	2.8	0.0
7.00	0.528	0.534	0.988	1.000	1.000	1.000	3.4	0.0	3.4	0.0
7.50	0.574	0.583	0.984	1.000	1.000	1.000	3.9	0.0	3.9	0.0
8.00	0.616	0.630	0.979	1.000	1.000	1.000	4.4	0.0	4.5	0.0
8.50	0.655	0.673	0.973	1.000	1.000	1.000	4.9	0.0	5.0	0.0
9.00	0.691	0.714	0.967	1.000	1.000	1.000	5.4	0.0	5.6	0.0
9.50	0.721	0.752	0.959	1.000	1.000	1.000	6.1	0.0	6.4	0.0
10.00	0.745	0.785	0.950	1.000	1.000	1.000	6.9	0.0	7.3	0.0
10.50	0.764	0.814	0.939	1.000	1.000	1.000	7.6	0.0	8.1	0.0
11.00	0.777	0.839	0.926	1.000	1.000	1.000	8.3	0.0	8.9	0.0
11.50	0.785	0.861	0.912	1.000	1.000	1.000	9.1	0.0	9.8	0.0
12.00	0.790	0.880	0.898	1.000	1.000	1.000	9.8	0.0	10.6	0.0
12.50	0.790	0.897	0.882	1.000	1.000	1.000	10.5	0.0	11.8	0.0
13.00	0.787	0.911	0.864	1.000	1.000	1.000	11.2	0.0	13.0	0.0
13.50	0.780	0.922	0.846	0.999	1.000	1.000	11.9	0.0	14.2	0.0
14.00	0.770	0.932	0.826	0.999	1.000	1.000	12.6	0.0	15.5	0.0
14.50	0.757	0.941	0.806	0.999	1.000	1.000	13.3	0.0	16.7	0.0
15.00	0.743	0.948	0.785	0.999	1.000	1.000	14.0	0.0	17.9	0.0
15.50	0.728	0.954	0.764	0.998	1.000	1.000	15.1	0.0	18.6	0.0
16.00	0.711	0.959	0.743	0.998	1.000	1.000	16.1	0.0	19.3	0.0
16.50	0.694	0.963	0.722	0.998	1.000	1.000	17.2	0.0	19.9	0.0
17.00	0.676	0.966	0.701	0.998	1.000	1.000	18.3	0.0	20.6	0.0
17.50	0.658	0.969	0.680	0.998	1.000	1.000	19.3	0.0	21.3	0.0
18.00	0.639	0.971	0.659	0.998	1.000	1.000	20.4	0.0	22.0	0.0
18.50	0.621	0.973	0.639	0.998	1.000	1.000	21.5	0.0	22.0	0.0
19.00	0.603	0.975	0.620	0.998	1.000	1.000	22.6	0.0	21.9	0.0
19.50	0.586	0.977	0.601	0.998	1.000	1.000	23.6	0.0	21.9	0.0
20.00	0.570	0.979	0.584	0.998	1.000	1.000	24.7	0.0	21.9	0.0
20.50	0.554	0.980	0.567	0.998	1.000	1.000	25.8	0.0	21.8	0.0
21.00	0.540	0.981	0.551	0.998	1.000	1.000	26.9	0.0	21.8	0.0
21.50	0.525	0.983	0.535	0.998	1.000	1.000	28.0	0.0	22.1	0.0
22.00	0.511	0.984	0.521	0.998	1.000	1.000	29.2	0.0	22.5	0.0
22.50	0.497	0.985	0.506	0.997	1.000	1.000	30.3	0.0	22.8	0.0
23.00	0.484	0.986	0.492	0.997	1.000	1.000	31.4	0.0	23.1	0.0
23.50	0.471	0.987	0.478	0.997	1.000	1.000	32.6	0.0	23.5	0.0
24.00	0.458	0.988	0.465	0.997	1.000	1.000	33.7	0.0	23.8	0.0
24.50	0.446	0.989	0.453	0.997	1.000	1.000	32.9	0.0	24.7	0.0

FINAL JPL CONICAL FEED E & H PLANE 10.0 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 18
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.004	0.004	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.015	0.015	0.997	1.000	1.000	1.000	0.2	0.0	0.2	0.0
1.50	0.032	0.032	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.00	0.057	0.057	0.999	1.000	1.000	1.000	0.3	0.0	0.4	0.0
2.50	0.088	0.088	0.999	1.000	1.000	1.000	0.4	0.0	0.5	0.0
3.00	0.124	0.124	0.999	1.000	1.000	1.000	0.5	0.0	0.6	0.0
3.50	0.166	0.166	0.999	1.000	1.000	1.000	0.8	0.0	0.9	0.0
4.00	0.211	0.211	0.999	1.000	1.000	1.000	1.0	0.0	1.2	0.0
4.50	0.258	0.259	0.998	1.000	1.000	1.000	1.3	0.0	1.5	0.0
5.00	0.308	0.309	0.997	1.000	1.000	1.000	1.6	0.0	1.8	0.0
5.50	0.359	0.361	0.996	1.000	1.000	1.000	1.8	0.0	2.1	0.0
6.00	0.411	0.414	0.994	1.000	1.000	1.000	2.1	0.0	2.4	0.0
6.50	0.463	0.467	0.992	1.000	1.000	1.000	2.5	0.0	2.9	0.0
7.00	0.512	0.518	0.989	1.000	1.000	1.000	3.0	0.0	3.5	0.0
7.50	0.558	0.566	0.986	1.000	1.000	1.000	3.4	0.0	4.0	0.0
8.00	0.601	0.613	0.981	1.000	1.000	1.000	3.9	0.0	4.6	0.0
8.50	0.641	0.657	0.976	1.000	1.000	1.000	4.3	0.0	5.1	0.0
9.00	0.677	0.698	0.970	0.999	1.000	1.000	4.8	0.0	5.7	0.0
9.50	0.709	0.737	0.963	0.999	1.000	1.000	5.4	0.0	6.5	0.0
10.00	0.735	0.771	0.954	0.999	1.000	1.000	6.1	0.0	7.4	0.0
10.50	0.755	0.801	0.944	0.999	1.000	1.000	6.7	0.0	8.2	0.0
11.00	0.771	0.828	0.933	0.999	1.000	1.000	7.4	0.0	9.1	0.0
11.50	0.782	0.851	0.920	0.998	1.000	1.000	8.0	0.0	9.9	0.0
12.00	0.789	0.872	0.907	0.998	1.000	1.000	8.7	0.0	10.8	0.0
12.50	0.792	0.890	0.892	0.998	1.000	1.000	9.5	0.0	11.7	0.0
13.00	0.791	0.906	0.876	0.998	1.000	1.000	10.3	0.0	12.7	0.0
13.50	0.787	0.919	0.859	0.997	1.000	1.000	11.1	0.0	13.6	0.0
14.00	0.780	0.930	0.841	0.997	1.000	1.000	11.9	0.0	14.5	0.0
14.50	0.770	0.940	0.822	0.997	1.000	1.000	12.7	0.0	15.5	0.0
15.00	0.759	0.948	0.803	0.997	1.000	1.000	13.5	0.0	16.4	0.0
15.50	0.746	0.955	0.783	0.997	1.000	1.000	14.8	0.0	16.9	0.0
16.00	0.731	0.961	0.763	0.997	1.000	1.000	16.0	0.0	17.4	0.0
16.50	0.715	0.965	0.743	0.997	1.000	1.000	17.3	0.0	17.8	0.0
17.00	0.698	0.969	0.723	0.997	1.000	1.000	18.6	0.0	18.3	0.0
17.50	0.680	0.972	0.702	0.997	1.000	1.000	19.8	0.0	18.8	0.0
18.00	0.663	0.975	0.682	0.997	1.000	1.000	21.1	0.0	19.3	0.0
18.50	0.645	0.978	0.662	0.997	1.000	1.000	22.5	0.0	19.5	0.0
19.00	0.627	0.980	0.643	0.997	1.000	1.000	23.8	0.0	19.8	0.0
19.50	0.610	0.982	0.624	0.996	1.000	1.000	25.2	0.0	20.0	0.0
20.00	0.593	0.984	0.605	0.996	1.000	1.000	26.6	0.0	20.3	0.0
20.50	0.577	0.985	0.588	0.996	1.000	1.000	27.9	0.0	20.5	0.0
21.00	0.561	0.987	0.571	0.996	1.000	1.000	29.3	0.0	20.8	0.0
21.50	0.545	0.988	0.554	0.996	1.000	1.000	30.3	0.0	21.3	0.0
22.00	0.530	0.989	0.538	0.995	1.000	1.000	31.4	0.0	21.9	0.0
22.50	0.515	0.990	0.522	0.995	1.000	1.000	32.4	0.0	22.4	0.0
23.00	0.500	0.991	0.507	0.995	1.000	1.000	33.4	0.0	23.0	0.0
23.50	0.486	0.992	0.493	0.995	1.000	1.000	34.5	0.0	23.5	0.0
24.00	0.472	0.993	0.478	0.995	1.000	1.000	35.5	0.0	24.1	0.0
24.50	0.459	0.994	0.465	0.994	1.000	1.000	35.0	0.0	25.1	0.0

FINAL JPL CONICAL FEED E & H PLANE 10.2 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 24
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.013	0.013	0.997	1.000	1.000	1.000	0.2	0.0	0.2	0.0
1.50	0.029	0.029	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.00	0.051	0.051	0.999	1.000	1.000	1.000	0.3	0.0	0.4	0.0
2.50	0.079	0.079	0.999	1.000	1.000	1.000	0.4	0.0	0.5	0.0
3.00	0.112	0.112	0.999	1.000	1.000	1.000	0.5	0.0	0.6	0.0
3.50	0.149	0.150	0.999	1.000	1.000	1.000	0.7	0.0	0.9	0.0
4.00	0.190	0.190	0.999	1.000	1.000	1.000	1.0	0.0	1.2	0.0
4.50	0.233	0.233	0.998	1.000	1.000	1.000	1.2	0.0	1.5	0.0
5.00	0.277	0.278	0.997	1.000	1.000	1.000	1.5	0.0	1.9	0.0
5.50	0.324	0.325	0.996	1.000	1.000	1.000	1.7	0.0	2.2	0.0
6.00	0.371	0.373	0.994	1.000	1.000	1.000	2.0	0.0	2.5	0.0
6.50	0.418	0.421	0.992	1.000	1.000	1.000	2.4	0.0	3.0	0.0
7.00	0.463	0.468	0.990	1.000	1.000	1.000	2.8	0.0	3.5	0.0
7.50	0.506	0.513	0.986	0.999	1.000	1.000	3.1	0.0	4.0	0.0
8.00	0.546	0.557	0.983	0.999	1.000	1.000	3.5	0.0	4.6	0.0
8.50	0.585	0.598	0.978	0.999	1.000	1.000	3.9	0.0	5.1	0.0
9.00	0.621	0.639	0.973	0.999	1.000	1.000	4.3	0.0	5.6	0.0
9.50	0.653	0.676	0.968	0.998	1.000	1.000	4.8	0.0	6.4	0.0
10.00	0.681	0.711	0.960	0.998	1.000	1.000	5.3	0.0	7.2	0.0
10.50	0.704	0.742	0.952	0.997	1.000	1.000	5.8	0.0	8.0	0.0
11.00	0.724	0.770	0.943	0.997	1.000	1.000	6.3	0.0	8.9	0.0
11.50	0.739	0.796	0.933	0.996	1.000	1.000	6.8	0.0	9.7	0.0
12.00	0.752	0.819	0.922	0.995	1.000	1.000	7.3	0.0	10.5	0.0
12.50	0.760	0.840	0.910	0.995	1.000	1.000	7.8	0.0	11.6	0.0
13.00	0.765	0.859	0.897	0.994	1.000	1.000	8.3	0.0	12.7	0.0
13.50	0.767	0.875	0.883	0.993	1.000	1.000	8.8	0.0	13.8	0.0
14.00	0.766	0.890	0.868	0.991	1.000	1.000	9.3	0.0	15.0	0.0
14.50	0.763	0.903	0.853	0.990	1.000	1.000	9.8	0.0	16.1	0.0
15.00	0.758	0.915	0.837	0.989	1.000	1.000	10.3	0.0	17.2	0.0
15.50	0.750	0.926	0.821	0.987	1.000	1.000	11.1	0.0	18.1	0.0
16.00	0.741	0.935	0.804	0.986	1.000	1.000	12.0	0.0	19.0	0.0
16.50	0.730	0.942	0.786	0.985	1.000	1.000	12.8	0.0	19.9	0.0
17.00	0.717	0.949	0.768	0.984	1.000	1.000	13.6	0.0	20.9	0.0
17.50	0.703	0.954	0.749	0.984	1.000	1.000	14.5	0.0	21.8	0.0
18.00	0.688	0.959	0.730	0.983	1.000	1.000	15.3	0.0	22.7	0.0
18.50	0.673	0.962	0.711	0.983	1.000	1.000	16.5	0.0	23.0	0.0
19.00	0.656	0.965	0.692	0.983	1.000	1.000	17.8	0.0	23.3	0.0
19.50	0.640	0.968	0.673	0.982	1.000	1.000	19.0	0.0	23.6	0.0
20.00	0.623	0.970	0.654	0.982	1.000	1.000	20.2	0.0	24.0	0.0
20.50	0.606	0.971	0.635	0.982	1.000	1.000	21.5	0.0	24.3	0.0
21.00	0.589	0.973	0.616	0.982	1.000	1.000	22.7	0.0	24.6	0.0
21.50	0.572	0.974	0.598	0.982	1.000	1.000	23.0	0.0	25.2	0.0
22.00	0.556	0.975	0.581	0.982	1.000	1.000	23.4	0.0	25.8	0.0
22.50	0.541	0.976	0.564	0.982	1.000	1.000	23.7	0.0	26.4	0.0
23.00	0.526	0.977	0.548	0.982	1.000	1.000	24.1	0.0	27.0	0.0
23.50	0.512	0.978	0.533	0.982	1.000	1.000	24.4	0.0	27.6	0.0
24.00	0.498	0.979	0.518	0.982	1.000	1.000	24.8	0.0	28.2	0.0
24.50	0.485	0.979	0.504	0.982	1.000	1.000	24.4	0.0	29.1	0.0

FINAL JPL CONICAL FFED E & H PLANE 10.359 GHZ 634

INPUT DATA AND CONTROLS FOR MAIN

THETA INCKEMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 20
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	FTI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.004	0.004	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.017	0.017	0.997	1.000	1.000	1.000	0.2	0.0	0.2	0.0
1.50	0.037	0.037	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.00	0.065	0.065	0.999	1.000	1.000	1.000	0.3	0.0	0.4	0.0
2.50	0.100	0.100	0.999	1.000	1.000	1.000	0.4	0.0	0.5	0.0
3.00	0.142	0.142	0.999	1.000	1.000	1.000	0.5	0.0	0.6	0.0
3.50	0.189	0.189	0.999	1.000	1.000	1.000	0.9	0.0	0.9	0.0
4.00	0.239	0.239	0.998	1.000	1.000	1.000	1.3	0.0	1.3	0.0
4.50	0.290	0.291	0.997	1.000	1.000	1.000	1.7	0.0	1.6	0.0
5.00	0.343	0.345	0.995	1.000	1.000	1.000	2.1	0.0	1.9	0.0
5.50	0.396	0.399	0.993	1.000	1.000	1.000	2.5	0.0	2.3	0.0
6.00	0.449	0.453	0.991	1.000	1.000	1.000	2.9	0.0	2.6	0.0
6.50	0.501	0.507	0.988	1.000	1.000	1.000	3.5	0.0	3.1	0.0
7.00	0.548	0.557	0.984	1.000	1.000	1.000	4.0	0.0	3.7	0.0
7.50	0.592	0.605	0.979	1.000	1.000	1.000	4.6	0.0	4.2	0.0
8.00	0.632	0.650	0.973	1.000	1.000	1.000	5.2	0.0	4.8	0.0
8.50	0.669	0.692	0.966	1.000	1.000	1.000	5.7	0.0	5.3	0.0
9.00	0.701	0.732	0.958	1.000	1.000	1.000	6.3	0.0	5.9	0.0
9.50	0.728	0.767	0.950	1.000	1.000	1.000	7.0	0.0	6.8	0.0
10.00	0.749	0.798	0.939	1.000	1.000	1.000	7.7	0.0	7.7	0.0
10.50	0.764	0.825	0.927	1.000	1.000	1.000	8.4	0.0	8.6	0.0
11.00	0.774	0.848	0.913	1.000	1.000	1.000	9.2	0.0	9.6	0.0
11.50	0.780	0.869	0.898	1.000	1.000	1.000	9.9	0.0	10.5	0.0
12.00	0.781	0.886	0.882	1.000	1.000	1.000	10.6	0.0	11.4	0.0
12.50	0.779	0.901	0.865	1.000	1.000	1.000	11.3	0.0	12.5	0.0
13.00	0.773	0.914	0.847	1.000	1.000	1.000	12.1	0.0	13.7	0.0
13.50	0.765	0.924	0.827	1.000	1.000	1.000	12.8	0.0	14.8	0.0
14.00	0.753	0.933	0.807	0.999	1.000	1.000	13.6	0.0	15.9	0.0
14.50	0.740	0.941	0.787	0.999	1.000	1.000	14.3	0.0	17.1	0.0
15.00	0.725	0.947	0.766	0.999	1.000	1.000	15.1	0.0	18.2	0.0
15.50	0.709	0.953	0.745	0.999	1.000	1.000	16.1	0.0	19.0	0.0
16.00	0.692	0.957	0.724	0.999	1.000	1.000	17.1	0.0	19.8	0.0
16.50	0.674	0.961	0.702	0.999	1.000	1.000	18.1	0.0	20.6	0.0
17.00	0.656	0.964	0.681	0.999	1.000	1.000	19.2	0.0	21.5	0.0
17.50	0.637	0.966	0.660	0.999	1.000	1.000	20.2	0.0	22.3	0.0
18.00	0.618	0.969	0.639	0.999	1.000	1.000	21.2	0.0	23.1	0.0
18.50	0.600	0.970	0.619	0.999	1.000	1.000	22.2	0.0	23.3	0.0
19.00	0.582	0.972	0.600	0.999	1.000	1.000	23.2	0.0	23.6	0.0
19.50	0.565	0.973	0.581	0.999	1.000	1.000	24.1	0.0	23.8	0.0
20.00	0.548	0.975	0.563	0.999	1.000	1.000	25.1	0.0	24.1	0.0
20.50	0.532	0.976	0.546	0.999	1.000	1.000	26.1	0.0	24.3	0.0
21.00	0.516	0.977	0.529	0.999	1.000	1.000	27.1	0.0	24.6	0.0
21.50	0.501	0.978	0.513	0.999	1.000	1.000	26.6	0.0	25.2	0.0
22.00	0.487	0.978	0.498	0.999	1.000	1.000	26.2	0.0	25.9	0.0
22.50	0.474	0.979	0.484	0.999	1.000	1.000	25.7	0.0	26.5	0.0
23.00	0.461	0.980	0.471	0.999	1.000	1.000	25.3	0.0	27.1	0.0
23.50	0.450	0.981	0.459	0.999	1.000	1.000	24.8	0.0	27.8	0.0
24.00	0.439	0.982	0.448	0.998	1.000	1.000	24.4	0.0	28.4	0.0
24.50	0.429	0.983	0.437	0.998	1.000	1.000	24.3	0.0	29.5	0.0

APPENDIX III - A

RECTANGULAR MULTIMODE HORN
LINEAR POLARIZED PATTERNS

ANTENNA PATTERN

RELATIVE POWER db

E
H
45°

PROJECT

FREQ. 7.487

PLANE E H 45

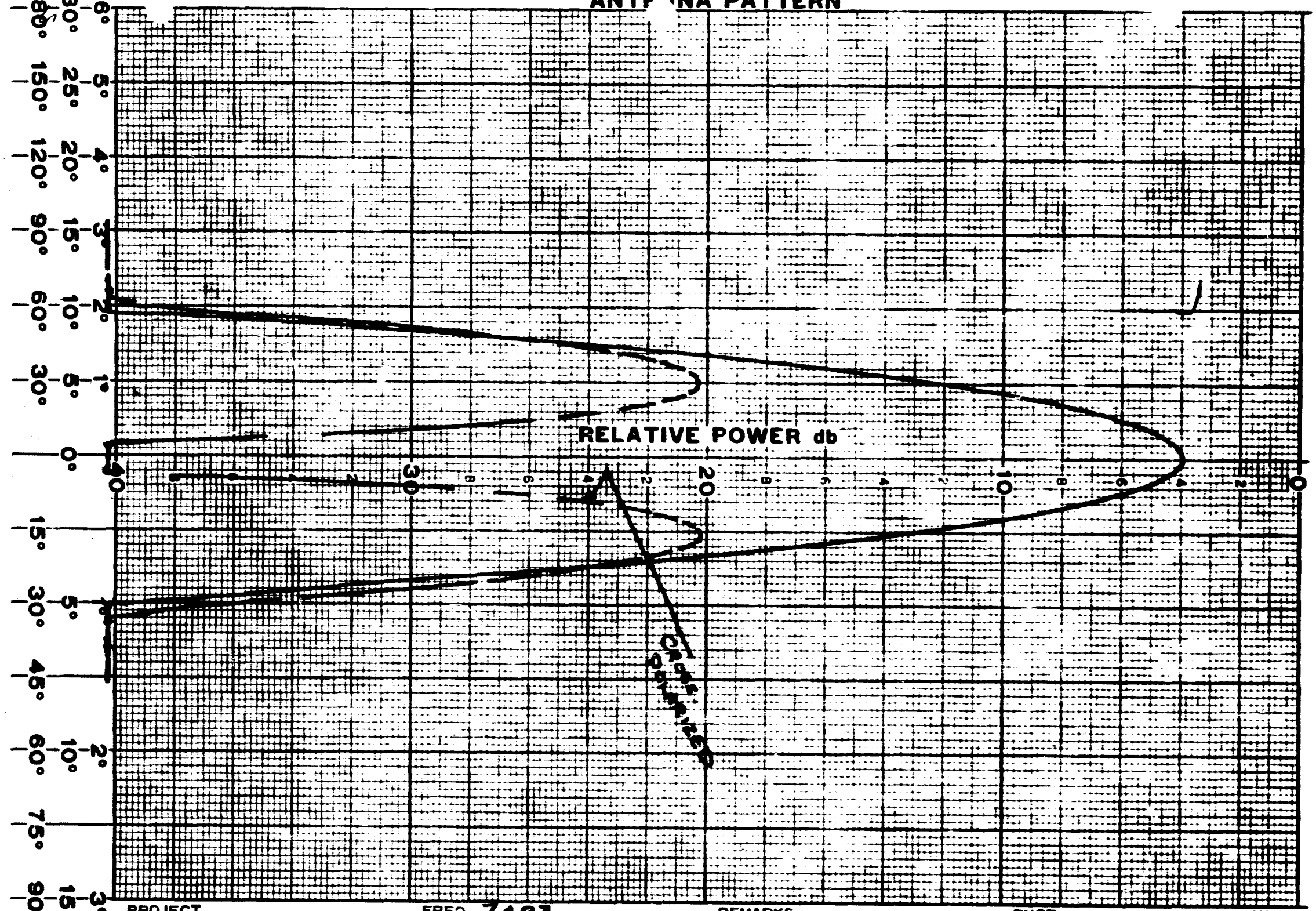
REMARKS

ENGR

DATE 12/4/68

9693 35

ANTENNA PATTERN



PROJECT

FREQ. 7481

PLANE 45°

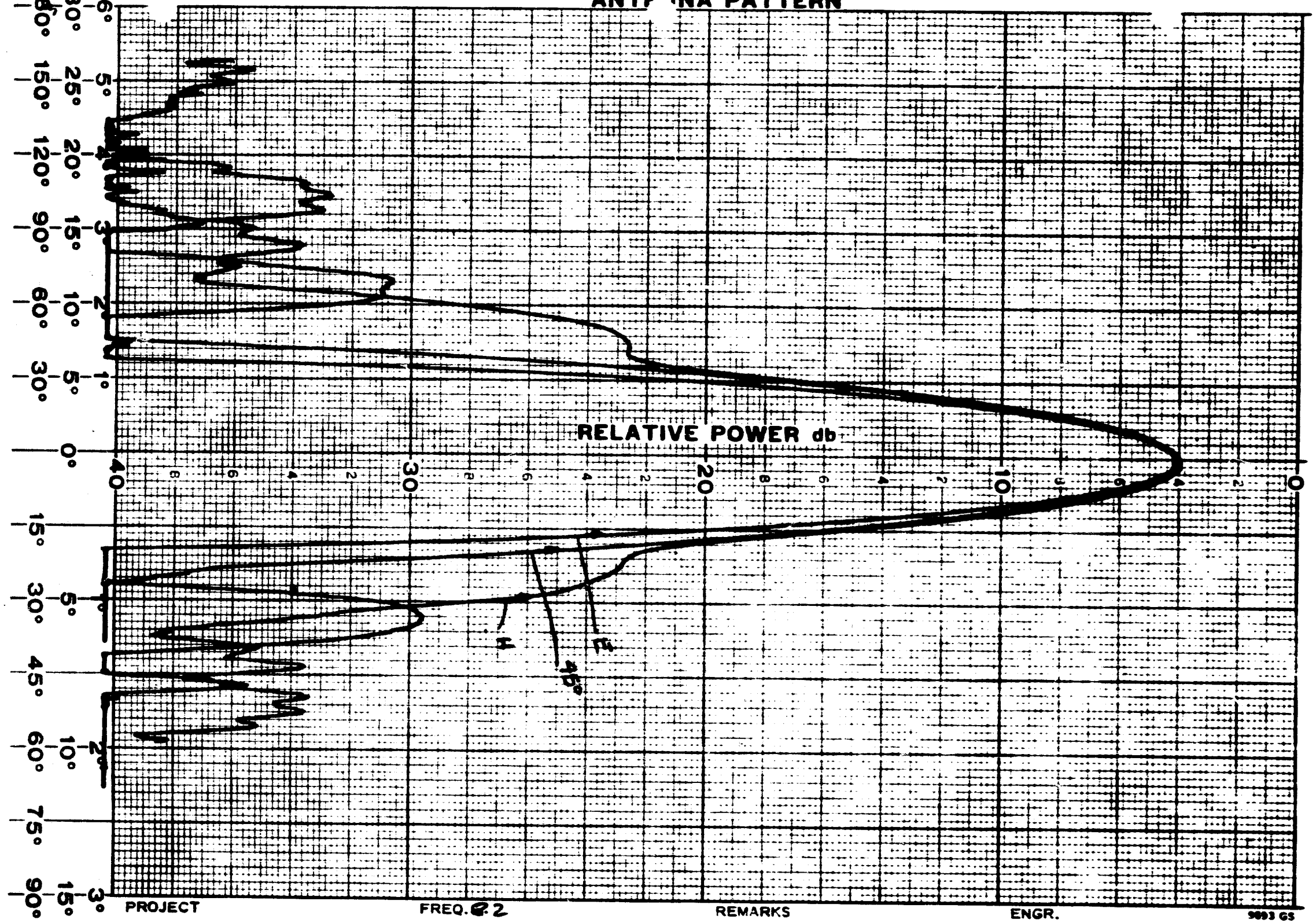
REMARKS

ENGR.

DATE 12/4/68

9003 GS

ANTENNA PATTERN



PROJECT

FREQ. 9.2

PLANE E H 45

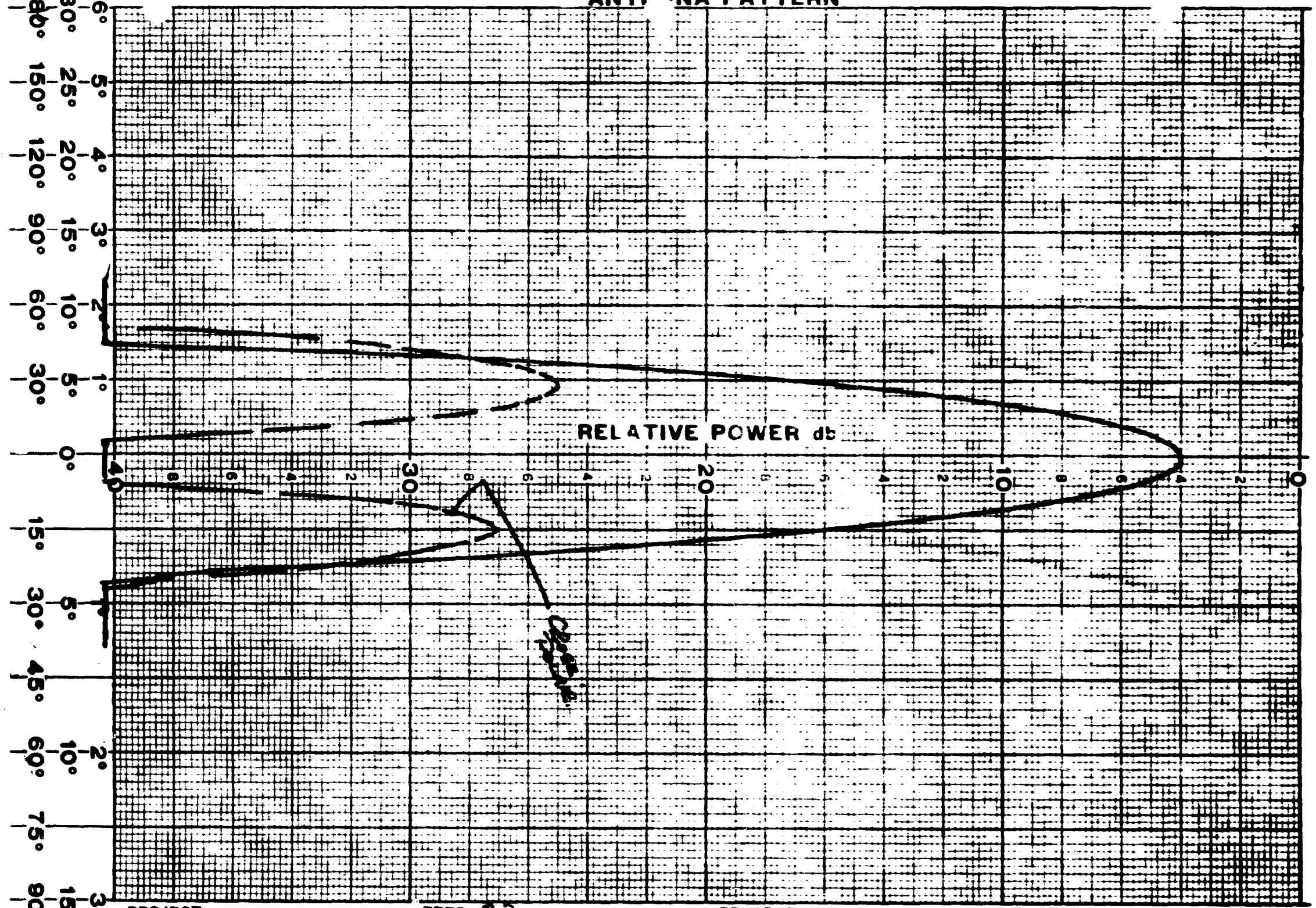
REMARKS

ENGR.

DATE 12/4/68

9093 GS

ANTENNA PATTERN



PROJECT

FREQ. 8.2

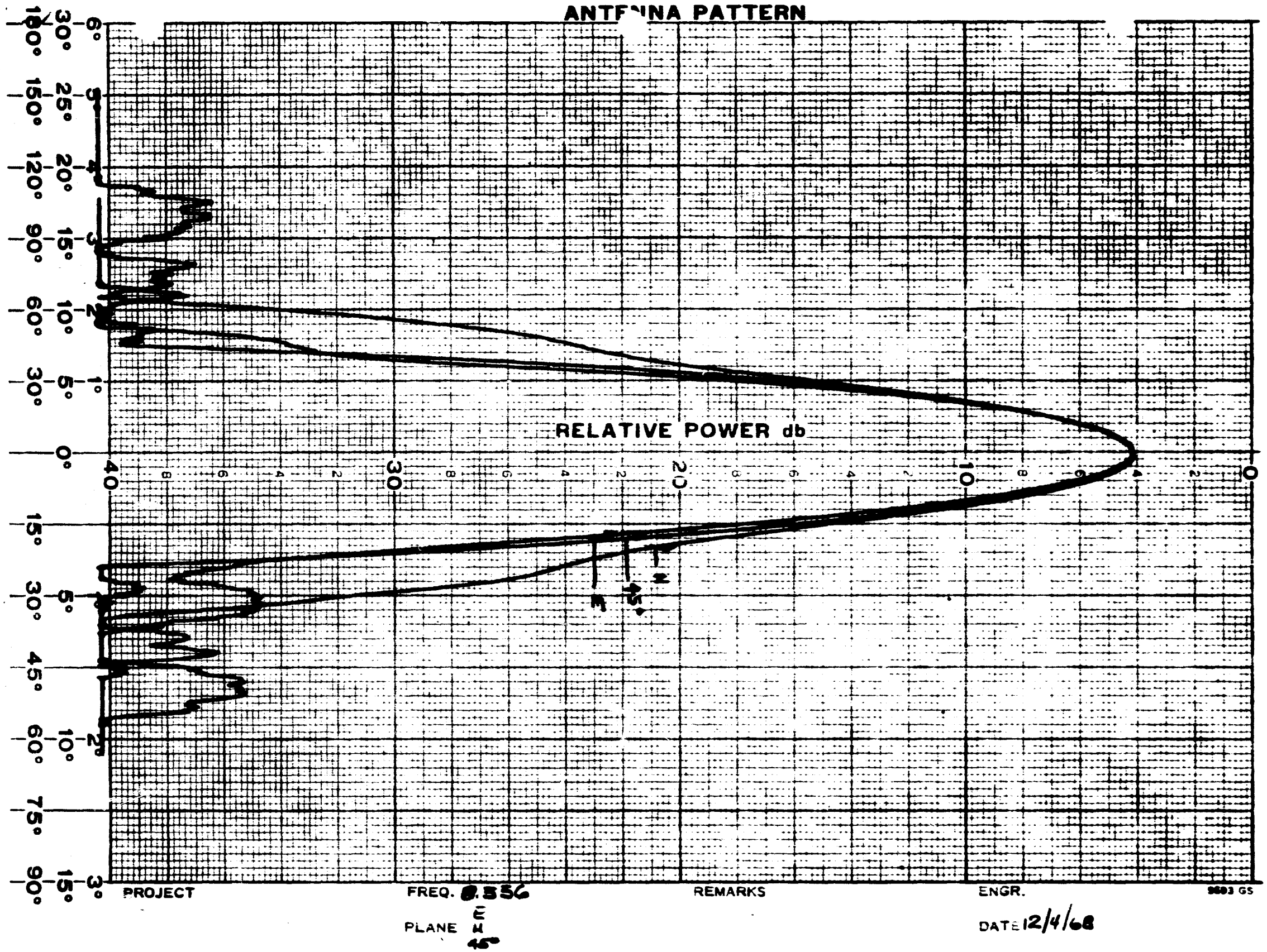
REMARKS

ENGR.

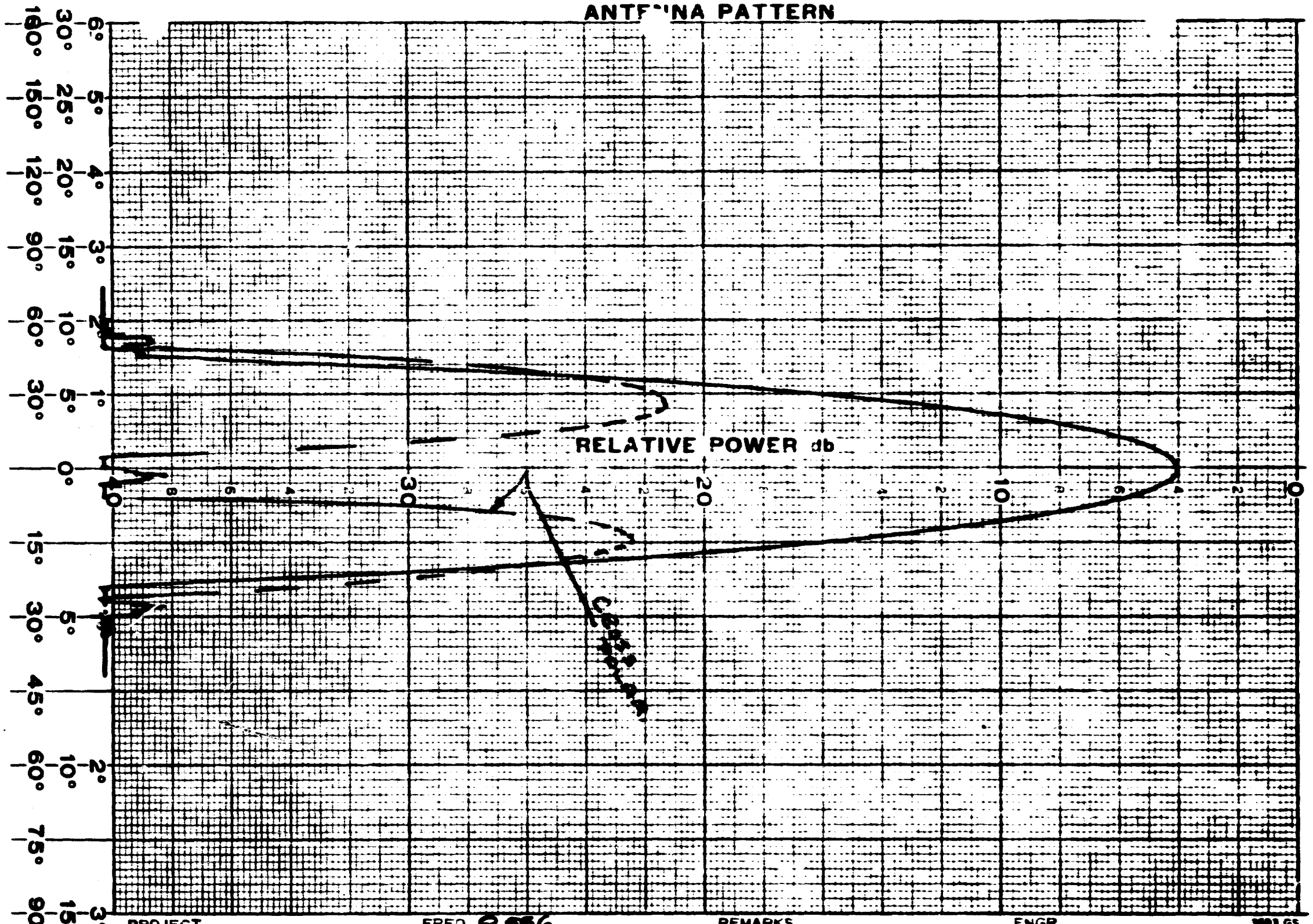
PLANE 45°

DATE 12/4/68

5803 GS


ANTENNA PATTERN
RELATIVE POWER db
40
30
20
10
0
E
H
45°
PROJECT
FREQ. 8.556
PLANE E H 45°
REMARKS
ENGR.
DATE 12/4/68
9803 GS

ANTENNA PATTERN



PROJECT

FREQ. 8.886

PLANE 45°

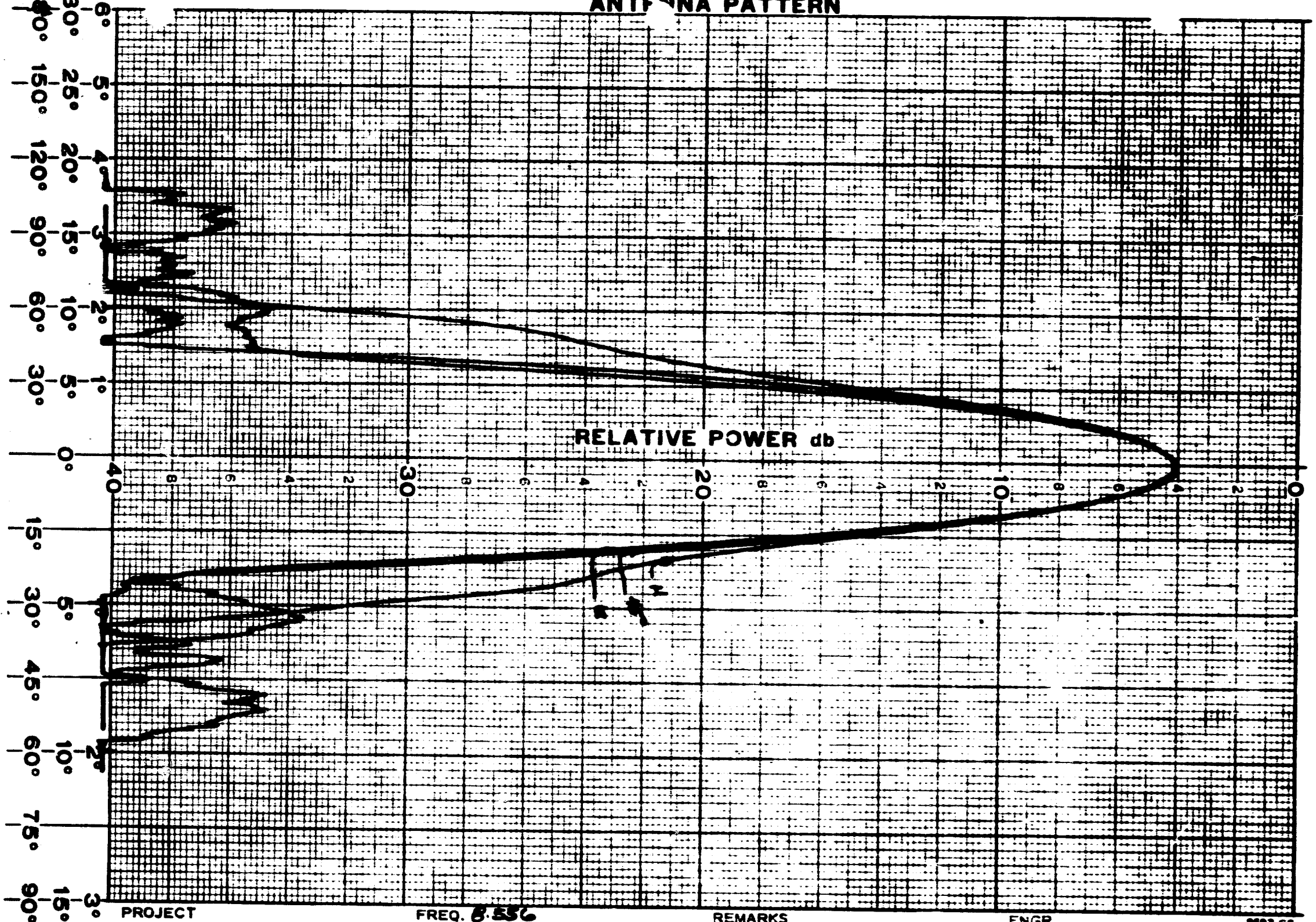
REMARKS

ENGR.

DATE 12/4/68

9003 GS

ANTENNA PATTERN



PROJECT

FREQ. 8.556

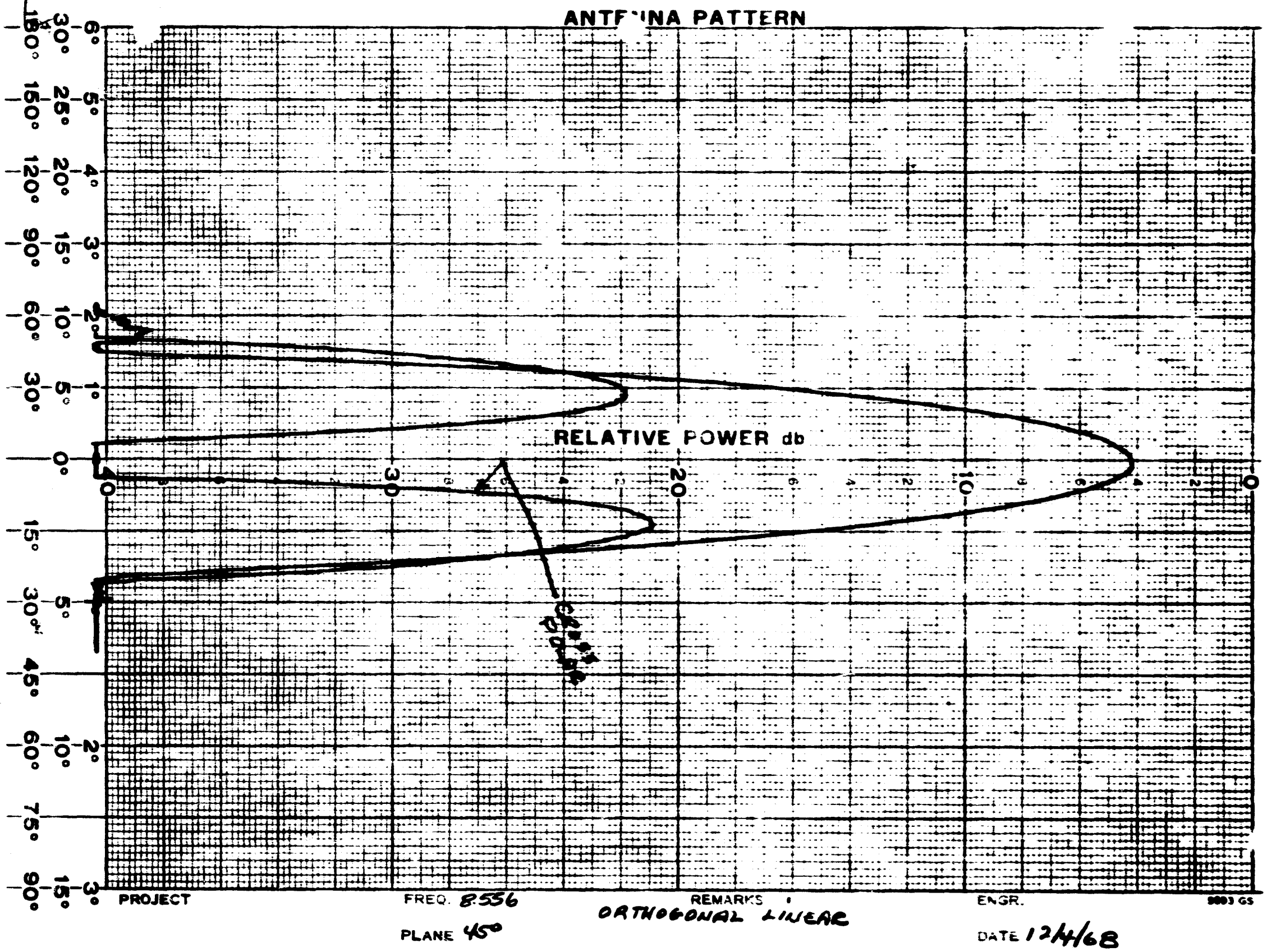
PLANE E H 45°

REMARKS
ORTHOGONAL LINEAR.

ENGR.

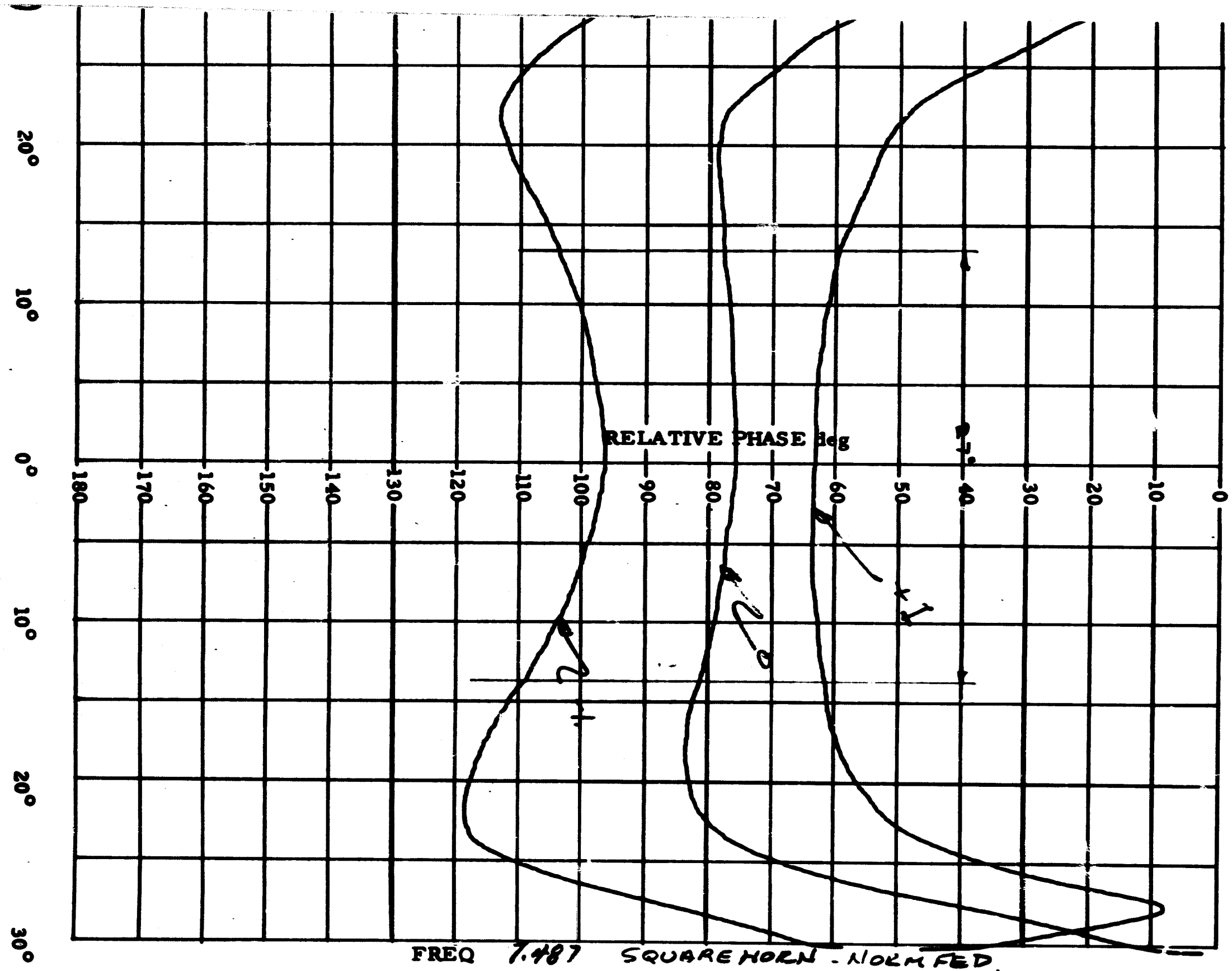
DATE 12/14/65

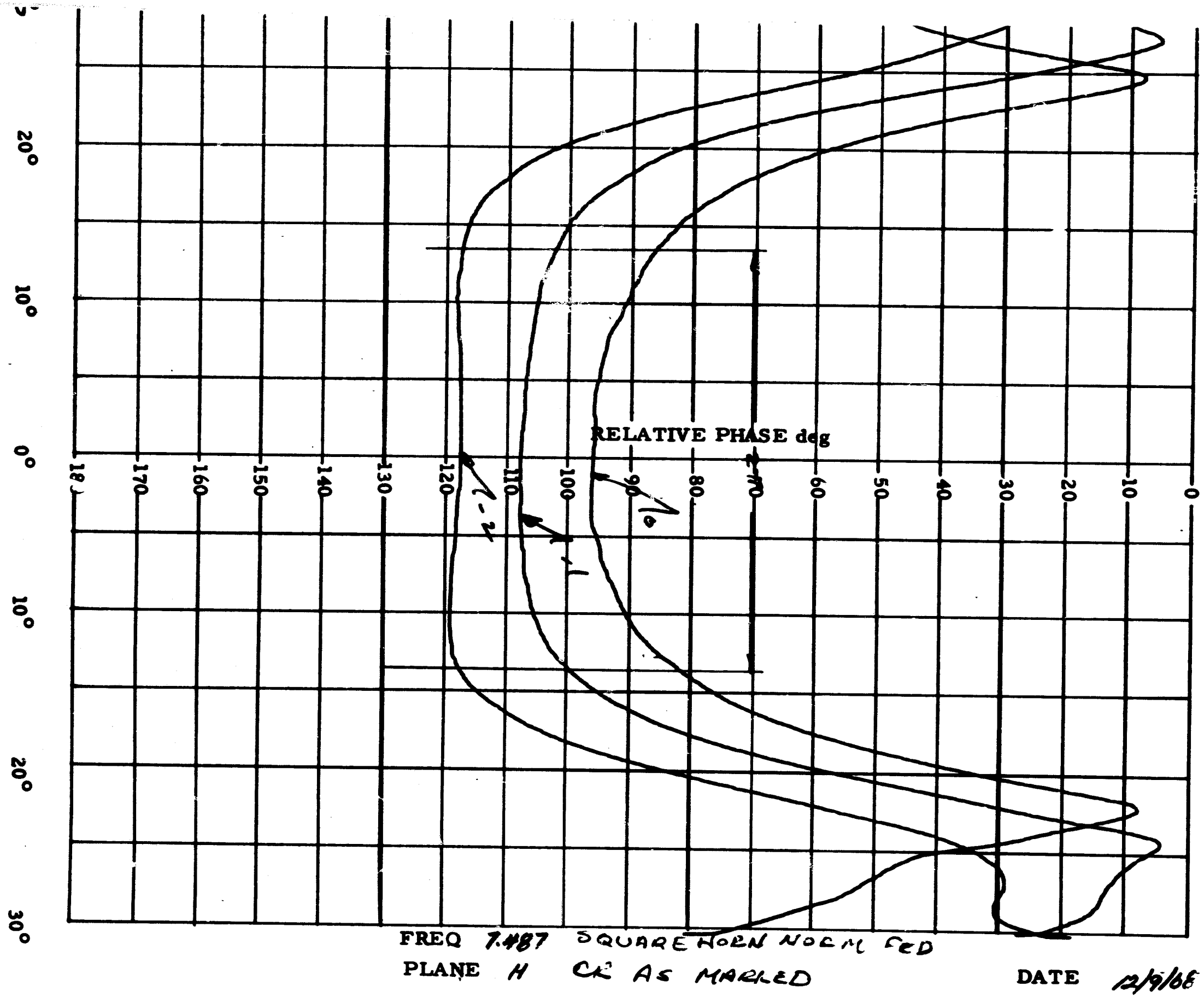
9693 GS


ANTENNA PATTERN
RELATIVE POWER db
30°
150°
120°
90°
60°
30°
0°
15°
30°
45°
60°
75°
90°
6°
5°
4°
3°
2°
1°
0°
5°
10°
15°
20°
30°
10
20
30
PROJECT
FREQ. 8.556
PLANE 45°
REMARKS
ORTHOGONAL LINEAR
ENGR.
DATE 12/4/68
3003 GS

APPENDIX III - B

RECTANGULAR MULTIMODE HORN FED ON PRINCIPAL PLANE PHASE PATTERNS

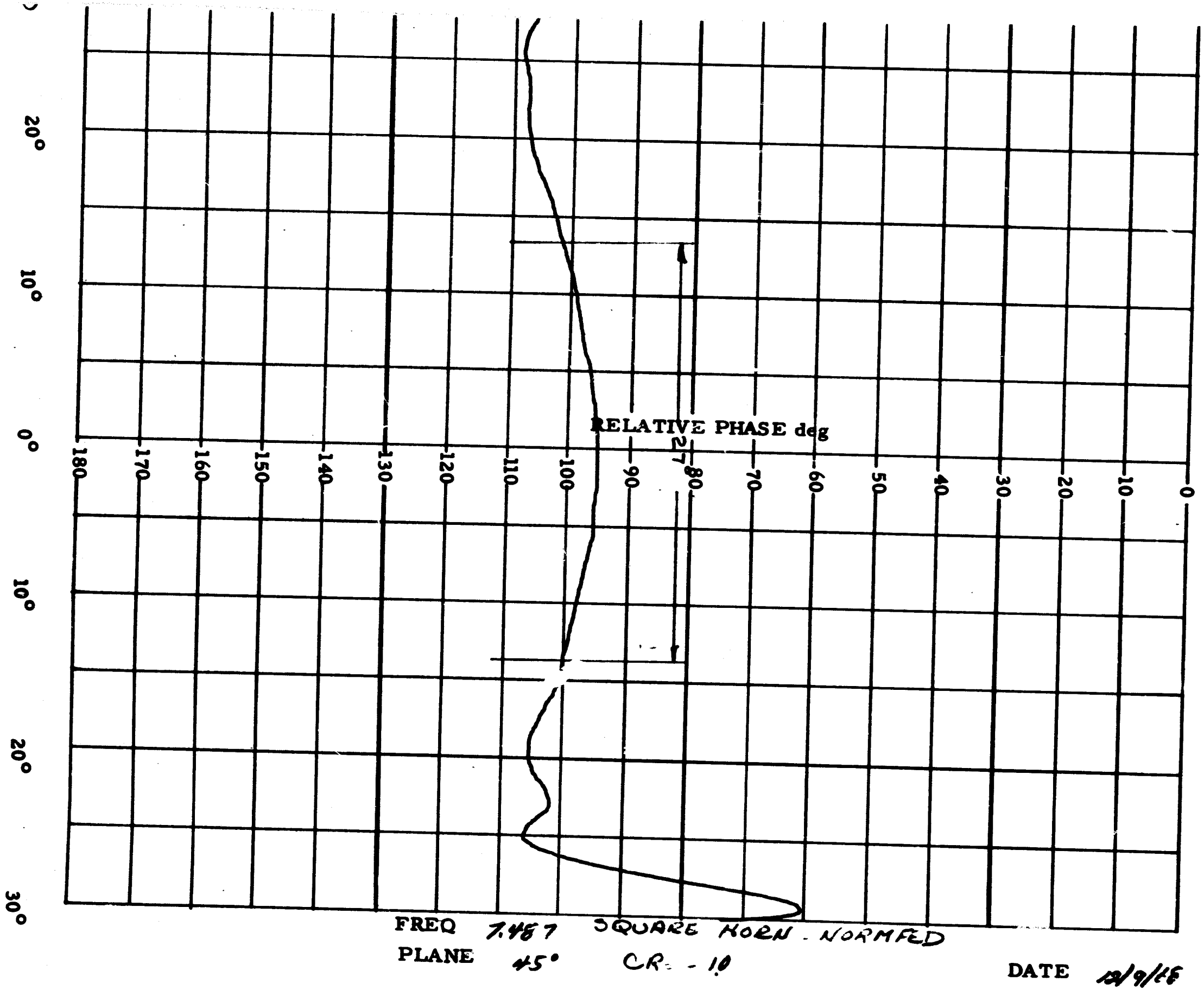

RELATIVE PHASE deg
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0°
10°
20°
30°
FREQ 7.487 SQUARE HORN - NORM FED
PLANE E CR AS MARKED
⊕ IN FRONT OF APERTURE
DATE 12/9/66

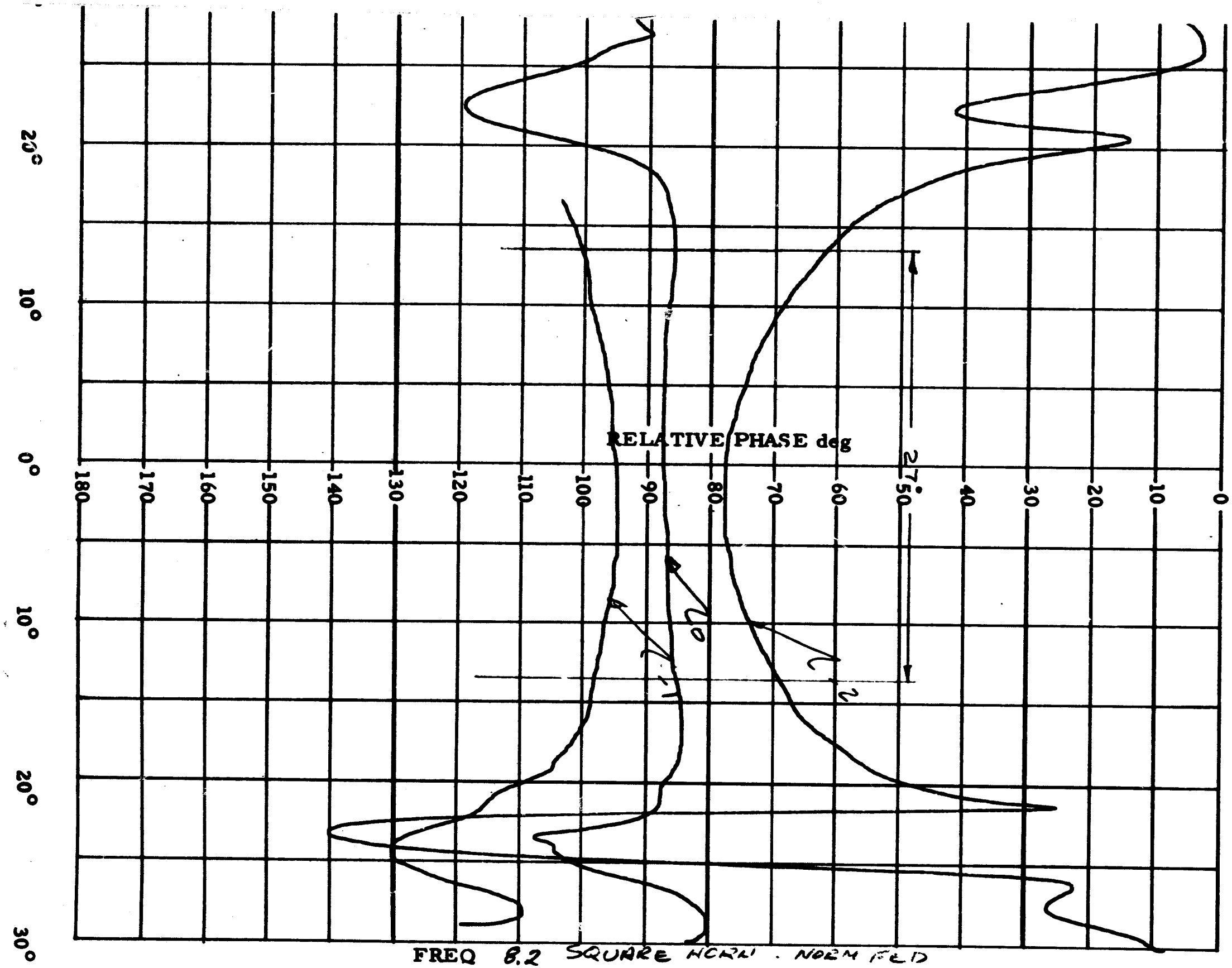


FREQ 7.487 SQUARE HORN NOCM FED

PLANE H CK AS MARKED

DATE 12/9/66

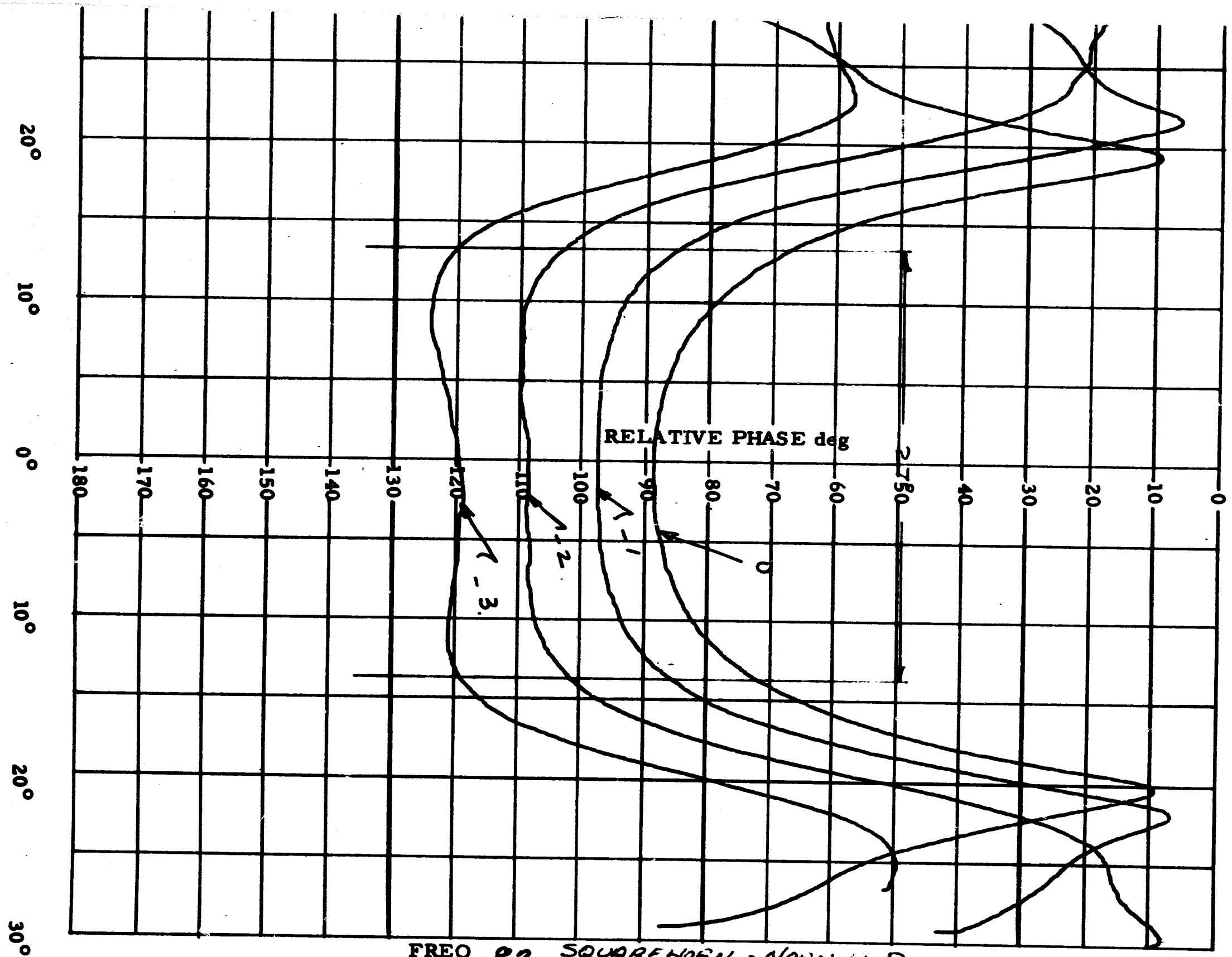

RELATIVE PHASE deg
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0°
10°
20°
30°
FREQ 7.467 SQUARE HORN - NORMED
PLANE 45° CR - 1.0
DATE 12/9/66



FREQ 8.2 SQUARE HORN . NORMFLD

PLANE E CR AS MARKED

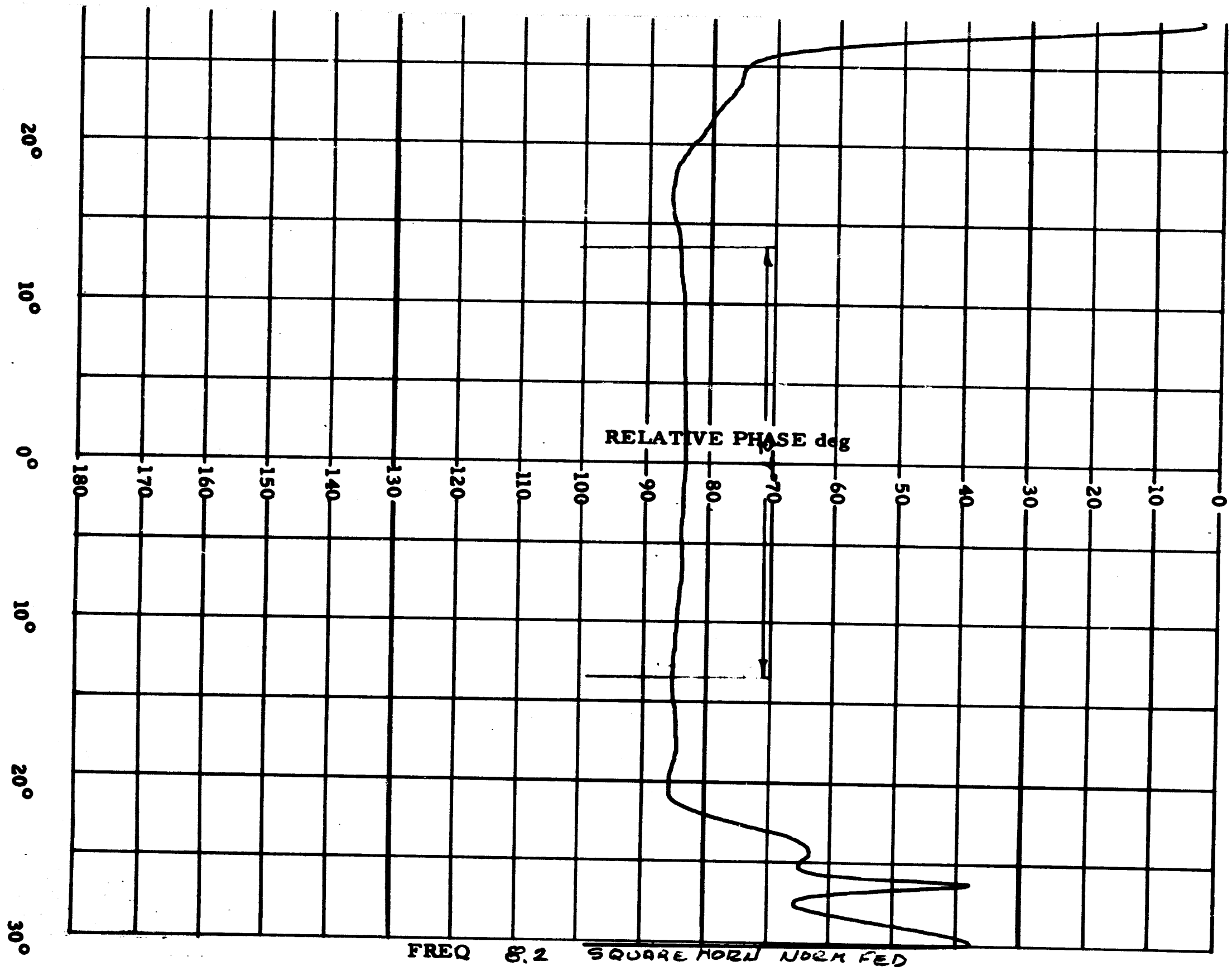
DATE 12/9/68



FREQ 8.2 SQUAREHORN - NORMALIZED

PLANE H CR AS MARKED.

DATE 12/9/68



FREQ 8.2 SQUARE HORN NORM FED

PLANE 45° CR:-1

DATE 12/9/65

APPENDIX III - C

RECTANGULAR MULTIMODE HORN COMPUTER EFFICIENCY DATA

Legend

PSI	-	Polar Angle
ETA	-	Total Aperture Efficiency
ETS	-	Spillover Efficiency
ETI	-	Illumination Efficiency
ETX	-	Cross Polarization Efficiency
ETP	-	Phase Error Efficiency
ETB	-	Blockage Efficiency
E	-	E-Plane Pattern (dB)
EP	-	E-Plane Phase (deg)
H	-	H-Plane Pattern (dB)
HP	-	H-Plane Phase (deg)

JPL HECT FEEC PRIN FEC 7.4 GHZ

INPUT CATA ANC CCNT..CLS FOR MAIN

THETA INCREMENT= C.5CCCC
ENC VALUE CF THETA= 5C.CCCCC
SIGN CF INPUT DATA= -1.CCCCC
BLCCKAGE= C.C
NUMBER CF INPUT VALUES READ IN OR CALC= 15
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEEC EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.5C	C.CC2	C.CC2	C.99I	1.CCC	1.CCC	1.CCC	C.1	0.0	0.1	0.0
1.CC	C.CC8	C.CCE	C.997	1.CCC	1.CCC	1.CCC	0.1	0.0	0.1	0.0
1.5C	C.C17	C.C17	C.999	1.CCC	1.CCC	1.CCC	0.2	0.0	0.2	0.0
2.CC	C.C3C	C.03C	C.999	1.CCC	1.CCC	1.CCC	0.3	0.0	0.3	0.0
2.5C	C.C47	0.C47	C.999	1.CCC	1.CCC	1.CCC	C.3	0.0	0.3	0.0
3.CC	C.C6E	C.C6E	C.999	1.CCC	1.CCC	1.CCC	C.4	C.C	0.4	0.0
3.5C	C.C8S	C.C8S	C.999	1.CCC	1.CCC	1.CCC	0.5	0.0	0.6	0.0
4.CC	0.115	C.11S	C.999	1.CCC	1.CCC	1.CCC	0.7	0.0	0.7	0.0
4.5C	C.143	C.143	C.999	1.CCC	1.CCC	1.CCC	C.8	0.0	0.9	0.0
5.CC	0.173	C.173	C.999	1.CCC	1.CCC	1.CCC	C.9	0.0	1.1	0.0
5.5C	C.2C5	C.2C5	C.999	1.CCC	1.CCC	1.CCC	1.1	0.0	1.2	0.0
6.CC	0.23S	C.23S	C.99E	1.CCC	1.CCC	1.CCC	1.2	0.0	1.4	0.0
6.5C	0.274	C.274	C.99E	1.CCC	1.CCC	1.CCC	1.4	0.0	1.7	0.0
7.CC	0.3C9	C.31C	C.997	1.CCC	1.CCC	1.CCC	1.7	0.0	2.0	0.0
7.5C	0.344	C.34E	C.995	1.CCC	1.CCC	1.CCC	1.9	0.0	2.3	0.0
8.CC	C.380	C.382	C.994	1.CCC	1.CCC	1.CCC	2.1	0.0	2.7	0.0
8.5C	C.415	C.418	C.992	1.CCC	1.CCC	1.CCC	2.4	0.0	3.0	0.0
9.CC	0.450	C.454	C.991	1.CCC	1.CCC	1.CCC	2.6	0.0	3.3	0.0
9.5C	0.483	C.48S	C.988	1.CCC	1.CCC	1.CCC	2.9	0.0	3.7	0.0
10.CC	0.516	C.524	C.9EE	C.999	1.CCC	1.CCC	3.2	0.0	4.1	0.0
10.5C	0.547	C.557	C.983	C.999	1.CCC	1.CCC	3.5	0.0	4.5	0.0
11.CC	0.57E	C.58S	C.97S	C.999	1.CCC	1.CCC	3.9	0.0	5.0	0.0
11.5C	C.6C3	C.61S	C.975	C.999	1.CCC	1.CCC	4.2	0.0	5.4	0.0
12.CC	0.629	C.64S	C.971	0.999	1.CCC	1.CCC	4.5	0.0	5.8	0.0
12.5C	0.653	C.677	C.96E	C.999	1.CCC	1.CCC	4.8	0.0	6.4	0.0
13.CC	C.674	C.7C3	C.961	C.998	1.CCC	1.CCC	5.2	0.0	7.0	0.0
13.5C	C.693	C.727	C.955	C.998	1.CCC	1.CCC	5.5	0.0	7.6	0.0
14.CC	C.71C	C.75C	C.94S	C.997	1.CCC	1.CCC	5.9	0.0	8.3	0.0
14.5C	C.724	C.772	C.941	C.997	1.CCC	1.CCC	6.2	0.0	8.9	0.0
15.CC	0.737	C.792	C.934	C.996	1.CCC	1.CCC	6.6	0.0	9.5	0.0
15.5C	C.747	C.81C	C.926	C.996	1.CCC	1.CCC	7.C	0.0	10.2	0.0
16.CC	C.755	C.827	C.917	C.995	1.CCC	1.CCC	7.4	0.0	11.0	0.0
16.5C	C.76C	C.843	C.9C7	C.995	1.CCC	1.CCC	7.8	0.0	11.7	0.0
17.CC	0.764	C.857	C.8F7	C.994	1.CCC	1.CCC	8.3	0.0	12.4	0.0
17.5C	0.766	C.87C	C.8E7	C.993	1.CCC	1.CCC	8.7	0.0	13.2	0.0
18.CC	C.766	C.8E2	C.E76	C.992	1.CCC	1.CCC	9.1	0.0	13.9	0.0
18.5C	C.765	C.8S2	C.E65	C.992	1.CCC	1.CCC	9.7	0.0	14.7	0.0
19.CC	0.762	C.9C2	C.852	C.991	1.CCC	1.CCC	10.2	0.0	15.6	0.0
19.5C	C.757	C.91C	C.84C	C.990	1.CCC	1.CCC	10.8	0.0	16.4	0.0
20.CC	0.751	C.918	C.826	C.989	1.CCC	1.CCC	11.4	0.0	17.2	0.0
20.5C	0.743	C.925	C.813	C.989	1.CCC	1.CCC	11.9	0.0	18.1	0.0
21.CC	0.734	C.93C	C.799	C.988	1.CCC	1.CCC	12.5	0.0	18.9	0.0
21.5C	0.725	C.936	C.784	C.988	1.CCC	1.CCC	13.2	0.0	19.3	0.0
22.CC	0.715	C.94C	C.77C	C.987	1.CCC	1.CCC	13.9	0.0	19.7	0.0

JPL RECT FEED PRINT,FEC 7.467 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= C.5CCCC
END VALUE OF THETA= 9C.CCCCC
SIGN OF INPUT DATA= -1.CCCCC
BLOCKAGE= C.C
NUMBER OF INPUT VALUES READ IN OR CALC= 19
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.5C	C.CC2	C.CC2	C.991	1.CCC	1.CCC	1.00C	C.1	0.0	C.1	0.0
1.0C	C.CC9	C.CC9	C.997	1.C00	1.CCC	1.00C	0.1	0.0	0.1	0.0
1.5C	C.C2C	C.02C	C.999	1.C00	1.CCC	1.CCC	C.1	0.0	0.2	0.0
2.0C	C.C3E	C.C3E	C.999	1.CCC	1.CCC	1.00C	C.2	0.0	0.3	0.0
2.5C	0.C59	C.C59	C.999	1.00C	1.CCC	1.00C	0.2	0.0	0.3	0.0
3.0C	C.C79	C.C79	C.999	1.CCC	1.CCC	1.C0C	C.3	0.0	C.4	0.0
3.5C	C.1C6	C.1C6	C.999	1.CCC	1.CCC	1.00C	0.5	0.0	0.6	0.0
4.0C	C.13E	C.13E	C.999	1.C00	1.CCC	1.CCC	0.7	0.0	0.7	0.0
4.5C	C.1EE	C.1EE	C.999	1.C00	1.CCC	1.00C	C.8	0.0	0.9	0.0
5.0C	C.203	C.2C4	C.999	1.C0C	1.C0C	1.000	1.C	0.0	1.1	0.0
5.5C	C.24C	C.241	C.998	1.C00	1.CCC	1.00C	1.2	0.0	1.2	0.0
6.0C	0.279	C.28C	C.998	1.CCC	1.CCC	1.00C	1.4	0.0	1.4	0.0
6.5C	0.31S	C.32C	C.997	1.CCC	1.CCC	1.000	1.7	0.0	1.7	0.0
7.0C	C.359	C.3E1	C.996	1.C0C	1.CCC	1.CCC	2.C	0.0	2.0	0.0
7.5C	0.399	C.4C1	C.994	1.C0C	1.CCC	1.00C	2.3	0.0	2.3	0.0
8.0C	0.43S	C.442	C.993	1.C00	1.0CC	1.000	2.6	0.0	2.6	0.0
8.5C	0.478	C.482	C.991	1.C00	1.0CC	1.C0C	2.9	0.0	2.9	0.0
9.0C	0.51E	C.522	C.9E8	1.C00	1.CCC	1.0CC	3.2	0.0	3.2	0.0
9.5C	C.553	C.561	C.9E6	1.C00	1.CCC	1.C0C	3.6	0.0	3.6	0.0
10.00	C.587	C.59E	C.982	1.0CC	1.CCC	1.00C	4.C	0.0	4.1	0.0
10.5C	C.62C	C.633	0.979	1.C0C	1.CCC	1.00C	4.4	0.0	4.5	0.0
11.0C	C.65C	C.667	C.974	1.C0C	1.CCC	1.00C	4.8	0.0	4.9	0.0
11.5C	0.678	C.695	C.969	1.CC0	1.CCC	1.C0C	5.2	0.0	5.4	0.0
12.CC	C.7C3	C.73C	C.964	1.CCC	1.CCC	1.00C	5.6	0.0	5.8	0.0
12.5C	C.72E	C.75E	C.95E	1.CCC	1.CCC	1.00C	6.2	0.0	6.4	0.0
13.CC	C.745	C.783	C.951	1.C0C	1.CCC	1.CCC	6.7	0.0	7.1	0.0
13.5C	0.76C	C.8C6	C.943	1.C0C	1.0CC	1.00C	7.3	0.0	7.7	0.0
14.0C	C.773	C.827	C.934	1.C0C	1.0CC	1.000	7.9	0.0	8.3	0.0
14.5C	0.782	C.84E	C.924	1.C0C	1.CCC	1.CCC	8.4	0.0	9.0	0.0
15.0C	C.789	C.8E3	C.914	1.CCC	1.0CC	1.000	9.C	0.0	9.6	0.0
15.5C	C.793	C.87E	C.9C2	1.C00	1.CCC	1.000	9.6	0.0	10.3	0.0
16.C0	C.794	C.892	C.89C	1.C00	1.CCC	1.0CC	10.2	0.0	11.0	0.0
16.5C	C.793	C.9C4	C.87E	1.C0C	1.0CC	1.00C	10.8	0.0	11.7	0.0
17.00	C.79C	C.914	C.864	1.C0C	1.0CC	1.00C	11.5	0.0	12.4	0.0
17.50	C.785	C.924	C.85C	1.C0C	1.CCC	1.00C	12.1	0.0	13.1	0.0
18.00	0.779	C.932	0.83E	1.CCC	1.0CC	1.000	12.7	0.0	13.8	0.0
18.5C	C.771	C.939	C.821	1.000	1.CCC	1.000	13.6	0.0	14.7	0.0
19.0C	0.761	C.945	C.8C9	1.C00	1.CCC	1.00C	14.5	0.0	15.5	0.0
19.50	0.749	C.95C	0.7E9	1.CCC	1.0CC	1.000	15.4	0.0	16.4	0.0
20.0C	C.73E	C.954	C.771	1.C00	1.0CC	1.00C	16.3	0.0	17.3	0.0
20.5C	C.722	C.958	C.754	1.C0C	1.0CC	1.0CC	17.2	0.0	18.1	0.0
21.00	0.7C7	C.961	C.73E	1.C00	1.C0C	1.00C	18.1	0.0	19.0	0.0
21.5C	0.692	C.963	C.718	1.C00	1.00C	1.00C	19.2	0.0	19.4	0.0
22.00	C.67E	C.965	C.7CC	1.C00	1.0CC	1.0CC	20.3	0.0	19.8	0.0

JPL RECT FEED PRIN FED 7.6 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= C.5COCC
END VALUE OF THETA= 9C.CCCCC
SIGN OF INPUT DATA= -1.CCCCC
BLOCKAGE= C.C
NUMBER OF INPUT VALUES READ IN OR CALC= 19
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.5C	0.CC3	C.CC3	C.991	1.CCC	1.CCC	1.CCC	C.1	0.0	0.1	0.0
1.0C	C.C1C	C.C1C	C.997	1.CCC	1.CCC	1.00C	0.2	0.0	0.2	0.0
1.5C	C.C22	C.C22	C.999	1.CCC	1.CCC	1.CCC	0.3	0.C	0.3	0.0
2.0C	C.C39	C.C39	C.999	1.COC	1.CCC	1.CCC	C.3	0.0	0.3	0.0
2.5C	C.C6C	C.C6C	C.999	1.CCC	1.CCC	1.CCC	C.4	0.0	0.4	0.0
3.CC	C.C8E	C.C8E	C.999	1.CCC	1.CCC	1.0CC	0.5	0.0	0.5	0.0
3.50	0.115	C.115	C.999	1.CCC	1.CCC	1.0CC	C.7	0.0	0.7	0.0
4.CC	C.147	C.147	C.999	1.CCC	1.CCC	1.0CC	C.9	0.0	0.9	0.0
4.5C	0.182	C.182	C.999	1.CCC	1.CCC	1.0CC	1.0	0.0	1.1	0.0
5.0C	C.219	C.22C	C.99E	1.CCC	1.CCC	1.CCC	1.2	0.0	1.3	0.0
5.5C	0.25E	C.259	C.99E	1.CCC	1.CCC	1.0CC	1.4	0.0	1.5	0.0
6.CC	C.299	C.3CC	C.997	1.COC	1.CCC	1.0CC	1.6	0.0	1.7	0.0
6.5C	0.341	C.343	C.996	1.CCC	1.CCC	1.CCC	1.9	0.0	2.0	0.0
7.0C	0.383	C.385	C.995	1.CCC	1.CCC	1.000	2.3	0.0	2.3	0.0
7.5C	0.424	C.427	C.993	1.COC	1.CCC	1.0CC	2.6	0.0	2.6	0.0
8.00	C.465	C.469	C.991	1.COC	1.CCC	1.CCC	2.9	0.0	3.0	0.0
8.5C	C.505	C.511	C.985	1.COC	1.CCC	1.COC	3.3	0.0	3.3	0.0
9.CC	C.544	C.551	C.986	1.COO	1.CCC	1.0CC	3.6	0.0	3.6	0.0
9.5C	0.581	C.591	C.983	1.CCC	1.CCC	1.CCC	4.1	0.0	4.1	0.0
10.00	C.614	C.628	C.979	1.COC	1.CCC	1.00C	4.5	C.0	4.6	0.0
10.5C	C.646	C.663	C.974	1.CCC	1.CCC	1.000	5.C	0.0	5.0	0.0
11.00	0.674	C.695	C.969	1.CCC	1.CCC	1.CCC	5.5	0.0	5.5	0.0
11.5C	C.695	C.72E	C.963	1.00C	1.CCC	1.0CC	5.9	0.0	6.C	0.0
12.0C	C.722	C.755	C.957	1.CCC	1.0CC	1.0CC	6.4	0.0	6.5	0.0
12.50	C.742	C.781	C.949	1.CCC	1.CCC	1.0CC	7.C	0.0	7.1	0.0
13.0C	C.75E	C.8C5	C.941	1.COC	1.CCC	1.0CC	7.7	0.0	7.7	0.0
13.5C	C.77C	C.827	C.931	1.CCC	1.CCC	1.CCC	8.3	0.0	8.3	0.0
14.0C	0.779	C.84E	C.921	1.COC	1.CCC	1.CCC	8.9	0.0	9.0	0.0
14.5C	C.78E	C.8E3	C.91C	1.00C	1.CCC	1.00C	9.6	0.0	9.6	0.0
15.00	C.789	C.87E	C.89E	1.CCC	1.COC	1.0CC	10.2	0.0	10.2	0.0
15.5C	C.79C	C.892	C.8EE	1.COC	1.CCC	1.00C	10.9	0.0	10.9	0.0
16.00	C.789	C.9C4	C.873	1.COC	1.CCC	1.00C	11.6	0.0	11.7	0.0
16.50	C.785	C.915	C.85E	1.CCC	1.CCC	1.CCC	12.3	0.0	12.4	0.0
17.CC	0.779	C.924	C.844	1.COC	1.CCC	1.0CC	13.C	0.0	13.1	0.0
17.5C	0.772	C.932	C.82E	1.COC	1.CCC	1.00C	13.7	0.0	13.9	0.0
18.CC	C.763	C.939	C.813	1.CCC	1.00C	1.0CC	14.4	0.0	14.6	0.0
18.5C	0.752	C.945	C.79E	1.CCC	1.CCC	1.CCC	15.2	0.0	15.5	0.0
19.00	C.74C	C.95C	C.78C	1.0CC	1.CCC	1.000	16.0	0.0	16.4	0.0
19.5C	C.727	C.954	C.762	1.COC	1.0CC	1.00C	16.7	0.0	17.3	0.0
20.0C	0.713	C.957	C.745	1.CCC	1.CCC	1.CCC	17.5	0.0	18.3	0.0
20.5C	0.69E	C.96C	C.727	1.00C	1.CCC	1.00C	18.3	0.0	19.2	0.0
21.00	0.6E3	C.963	C.7C9	1.COC	1.CCC	1.CCC	19.1	0.0	20.1	0.0
21.50	0.667	C.965	C.691	1.0CC	1.CCC	1.0CC	19.9	0.0	20.4	0.0
22.00	C.652	C.967	C.674	1.COO	1.CCC	1.0CC	20.8	0.0	20.6	0.0

JPL RECT FEED PRINTED 7.8 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= C.5COCC
END VALUE OF THETA= 5C.COCCC
SIGN OF INPUT DATA= -1.CCCCC
BLOCKAGE= C.C
NUMBER OF INPUT VALUES READ IN OR CALC= 19
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.5C	C.CC2	C.CC2	C.991	1.CCC	1.CCC	1.CCC	C.1	0.0	0.1	0.0
1.CC	C.CC9	C.CC9	C.997	1.COC	1.CCC	1.OCC	0.1	0.0	0.1	0.0
1.5C	C.C19	C.C19	C.999	1.CCC	1.CCC	1.00C	C.2	0.0	0.1	0.0
2.0C	0.C34	C.C34	C.999	1.CCC	1.CCC	1.CCC	C.3	0.0	0.2	0.0
2.5C	C.C52	C.C52	C.999	1.CCC	1.CCC	1.00C	0.3	0.0	0.2	0.0
3.0C	0.C74	C.C74	C.999	1.COC	1.CCC	1.CCC	0.4	0.0	0.3	0.0
3.5C	C.1CC	C.10C	C.999	1.COO	1.CCC	1.OCC	0.5	0.0	0.5	0.0
4.0C	0.12E	C.12E	C.999	1.CCO	1.CCC	1.00C	C.7	0.0	0.7	0.0
4.5C	C.15S	C.15S	C.999	1.000	1.CCC	1.OCC	0.8	0.0	0.9	0.0
5.0C	0.192	C.192	C.999	1.CCC	1.OCC	1.OCC	1.C	0.0	1.1	0.0
5.50	0.227	C.22E	C.998	1.COC	1.CCC	1.00C	1.1	0.0	1.3	0.0
6.CC	C.264	C.265	C.998	1.COO	1.CCC	1.00C	1.3	0.0	1.5	0.0
6.5C	0.302	C.303	C.997	1.CCC	1.CCC	1.CCC	1.5	0.0	1.8	0.0
7.00	C.340	C.341	C.996	1.000	1.CCC	1.00C	1.8	0.0	2.2	0.0
7.50	C.378	C.38C	C.994	1.COO	1.CCC	1.00C	2.C	0.0	2.5	0.0
8.0C	0.415	C.419	C.993	1.COC	1.CCC	1.OCC	2.3	0.0	2.8	0.0
8.50	C.453	C.457	C.991	1.CCC	1.CCC	1.00C	2.5	C.0	3.2	0.0
9.00	C.48S	C.495	C.98S	1.COO	1.CCC	1.OCC	2.8	0.0	3.5	0.0
9.5C	C.525	C.533	C.986	1.CCC	1.CCC	1.CCC	3.1	0.0	3.9	0.0
10.CC	C.559	C.56S	C.983	0.999	1.CCC	1.CCC	3.5	C.0	4.4	0.0
10.5C	C.59C	C.6C3	C.98C	C.999	1.CCC	1.CCC	3.8	0.0	4.8	0.0
11.00	0.62C	0.63E	C.97E	C.999	1.CCC	1.00C	4.1	0.0	5.3	0.0
11.5C	C.64E	C.66E	C.972	0.999	1.CCC	1.00C	4.5	0.0	5.7	0.0
12.0C	0.674	C.69E	C.967	C.999	1.00C	1.00C	4.8	0.0	6.2	0.0
12.5C	0.69E	C.727	C.961	C.99E	1.CCC	1.CCC	5.3	0.0	6.9	0.0
13.0C	C.71E	C.753	C.995	C.99E	1.CCC	1.00C	5.7	0.0	7.6	0.0
13.5C	C.734	C.77E	C.94E	C.998	1.00C	1.00C	6.2	0.0	8.3	0.0
14.00	C.74E	C.79E	C.939	C.997	1.CCC	1.00C	6.7	0.0	9.C	0.0
14.50	C.759	C.81E	C.930	C.997	1.CCC	1.00C	7.1	0.0	9.7	0.0
15.0C	C.767	C.83E	C.921	C.997	1.CCC	1.CCC	7.6	0.0	10.4	0.0
15.50	0.773	C.852	C.910	C.996	1.OCC	1.00C	8.C	0.0	11.2	0.0
16.CC	C.77E	C.867	C.899	C.996	1.OCC	1.00C	8.5	0.0	12.0	0.0
16.5C	0.77E	C.88C	C.88E	C.995	1.CCC	1.00C	8.9	0.0	12.8	0.0
17.0C	C.777	C.893	C.87E	C.994	1.CCC	1.00C	9.4	0.0	13.6	0.0
17.5C	0.775	C.904	0.863	C.994	1.OCC	1.000	9.8	0.0	14.4	0.0
18.0C	C.772	C.914	C.851	C.993	1.COC	1.00C	10.3	0.0	15.2	0.0
18.5C	C.767	C.923	C.837	C.993	1.OCC	1.COC	10.9	0.0	16.0	0.0
19.00	C.76C	C.931	C.823	C.992	1.00C	1.00C	11.5	0.0	16.9	0.0
19.5C	C.752	C.93E	C.8C9	0.991	1.00C	1.CCC	12.C	0.0	17.7	0.0
20.00	C.743	C.944	C.795	0.991	1.OCC	1.CCC	12.6	0.0	18.5	0.0
20.5C	C.733	C.949	C.78C	C.990	1.OCC	1.COC	13.2	0.0	19.4	0.0
21.0C	0.722	C.954	C.765	C.990	1.COC	1.00C	13.8	0.0	20.2	0.0
21.5C	0.711	C.95E	C.75C	0.989	1.OCC	1.00C	14.5	0.0	20.4	0.0
22.0C	C.69S	C.962	0.734	C.989	1.00C	1.00C	15.3	0.0	20.7	0.0

JPL RECT FEED PRINTED 8.C GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= C.5CCCC
END VALUE OF THETA= 5C.CCCCC
SIGN OF INPUT DATA= -1.CCCCC
BLOCKAGE= C.C
NUMBER OF INPUT VALUES READ IN OR CALC= 15
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.5C	C.CC3	C.CC3	C.S91	1.COC	1.CCC	1.CCC	0.1	C.0	0.1	0.0
1.0C	0.C11	C.C11	C.S97	1.CCC	1.CCC	1.CCC	C.2	0.0	0.2	0.0
1.5C	0.C24	C.C24	C.S95	1.CCC	1.CCC	1.CCC	C.3	0.0	0.3	0.0
2.CC	C.C41	C.041	C.S95	1.CCC	1.CCC	1.CCC	0.3	0.0	0.3	0.0
2.5C	0.C64	C.C64	C.S95	1.CCC	1.CCC	1.CCC	C.4	0.0	0.4	0.0
3.0C	0.C91	C.C91	C.S95	1.CCC	1.CCC	1.CCC	C.5	C.C	0.5	0.0
3.5C	C.122	C.122	C.S95	1.CCC	1.CCC	1.CCC	C.7	0.0	0.7	0.0
4.C0	0.155	C.155	C.S95	1.CCC	1.CCC	1.COC	1.C	0.0	0.9	0.0
4.5C	0.191	C.192	C.98E	1.CCC	1.CCC	1.COC	1.2	0.0	1.1	0.0
5.0C	C.229	C.23C	C.95E	1.CCO	1.CCC	1.CCC	1.5	0.0	1.4	0.0
5.5C	C.269	C.27C	C.S97	1.CCC	1.CCC	1.CCC	1.7	0.0	1.6	0.0
6.00	C.31C	C.311	C.S9E	1.COC	1.CCC	1.CCC	2.C	0.0	1.8	0.0
6.5C	C.352	C.354	C.S95	1.CCO	1.COC	1.CCC	2.3	0.0	2.2	0.0
7.0C	0.393	C.395	C.S93	1.CCC	1.CCC	1.CCC	2.7	0.0	2.6	0.0
7.50	0.433	C.437	C.991	1.COC	1.CCC	1.CCC	3.C	0.0	3.0	0.0
8.C0	0.471	0.477	C.988	1.COC	1.CCC	1.CCC	3.3	0.0	3.4	0.0
8.50	0.5C9	C.517	C.9E5	1.CCC	1.CCC	1.CCC	3.7	0.C	3.8	0.0
9.CC	C.545	C.555	C.982	1.COC	1.CCC	1.CCC	4.C	0.0	4.2	0.0
9.50	0.579	C.593	C.97E	1.COO	1.CCC	1.CCC	4.4	0.0	4.7	0.0
10.0C	C.611	C.62E	C.973	1.CCC	1.CCC	1.CCC	4.8	0.0	5.2	0.0
10.50	C.64C	0.661	C.96E	1.COO	1.CCC	1.COO	5.2	0.0	5.7	0.0
11.00	0.667	C.693	C.962	1.CCC	1.CCC	1.CCC	5.7	0.0	6.2	0.0
11.5C	0.691	C.722	C.956	1.CCO	1.CCC	1.CCC	6.1	0.0	6.7	0.0
12.00	0.712	C.75C	C.95C	1.COC	1.CCC	1.CCC	6.5	0.0	7.2	0.0
12.5C	0.731	C.77E	C.942	1.CCC	1.CCC	1.CCC	7.1	0.0	7.9	0.0
13.00	0.745	C.79E	C.934	1.COC	1.CCC	1.[illegible]	7.7	0.0	8.6	0.0
13.50	0.756	C.815	C.924	1.COC	1.CCC	1.OC[illegible]	8.3	0.0	9.3	0.0
14.0C	C.764	C.837	C.913	1.COC	1.CCC	1.OCC	8.9	0.0	10.1	0.0
14.50	0.769	C.853	C.9C2	0.999	1.CCC	1.OCC	9.5	0.0	10.8	0.0
15.00	0.771	C.86E	C.8E5	C.999	1.CCC	1.CCC	10.1	0.0	11.5	0.0
15.5C	C.771	C.881	C.87E	C.995	1.CCC	1.[illegible]OC	10.7	0.0	12.3	0.0
16.00	0.769	C.892	C.863	C.995	1.CCC	1.[illegible]OC	11.3	0.0	13.1	0.0
16.50	C.764	C.9C2	0.84E	C.995	1.CCC	1.CCC	11.9	0.0	13.9	0.0
17.0C	0.75E	C.911	C.833	C.995	1.CCC	1.OCC	12.6	0.0	14.7	0.0
17.50	0.75C	C.91E	C.81E	C.995	1.CCC	1.OCC	13.2	0.0	15.5	0.0
18.C0	0.741	C.925	C.8C2	C.995	1.CCC	1.[illegible]OC	13.8	0.0	16.3	0.0
18.5C	C.731	C.931	C.78E	C.995	1.CCC	1.OOC	14.5	0.0	16.9	0.0
19.0C	0.72C	C.93E	C.77C	C.998	1.CCC	1.COC	15.3	0.0	17.6	0.0
19.50	0.7CE	C.941	0.754	C.99E	1.CCC	1.OCC	16.C	0.0	18.2	0.0
20.00	0.695	C.944	C.737	C.99E	1.CCC	1.OCC	16.7	0.0	18.8	0.0
20.5C	C.682	C.94E	C.721	C.998	1.CCC	1.CCC	17.5	C.0	19.5	0.0
21.00	C.669	C.951	C.7C4	C.99E	1.CCC	1.OOC	18.2	0.0	20.1	0.0
21.50	0.655	C.954	C.6EE	C.99E	1.CCC	1.OOC	19.C	0.0	20.2	0.0
22.00	C.642	C.95E	C.673	C.998	1.CCC	1.CCC	19.9	0.0	20.3	0.0

JPL RECT FEED PRIMFED 8.2 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= C.5COCC
END VALUE OF THETA= 9C.COCOC
SIGN OF INPUT DATA= -1.CCCCC
BLOCKAGE= C.C
NUMBER OF INPUT VALUES READ IN OR CALC= 19
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.5C	C.CC3	C.CC3	C.991	1.COC	1.CCC	1.CCC	C.1	0.0	0.1	0.0
1.0C	0.C13	C.C13	C.997	1.COC	1.CCC	1.00C	C.2	0.0	0.1	0.0
1.5C	0.C29	C.C29	C.999	1.COC	1.CCC	1.00C	C.3	0.C	0.2	0.0
2.0C	C.C51	C.C51	C.999	1.CCC	1.CCC	1.0CC	0.5	0.0	0.3	0.0
2.5C	C.C79	0.C79	C.999	1.CCC	1.CCC	1.00C	C.6	0.0	0.3	0.0
3.00	C.112	C.112	C.999	1.00C	1.CCC	1.CCC	C.7	0.0	0.4	0.0
3.50	C.149	C.149	C.999	1.COC	1.0CC	1.CCC	1.C	0.0	0.6	0.0
4.CC	C.189	C.19C	C.999	1.COC	1.CCC	1.CCC	1.3	0.0	0.9	0.0
4.50	C.232	C.233	C.998	1.COC	1.CCC	1.COC	1.6	0.0	1.1	0.0
5.0C	C.277	C.27E	C.997	C.999	1.0CC	1.CCC	2.0	0.0	1.3	0.0
5.50	C.324	C.325	C.996	0.999	1.CCC	1.CCC	2.3	0.0	1.6	0.0
6.00	0.371	C.374	C.995	0.999	1.CCC	1.00C	2.6	0.0	1.8	0.0
6.5C	0.419	C.422	C.993	0.999	1.CCC	1.CCC	3.1	0.0	2.2	0.0
7.00	0.464	C.469	C.990	0.999	1.CCC	1.CCC	3.6	0.C	2.6	0.0
7.50	C.507	C.515	C.987	C.999	1.0CC	1.0CC	4.1	0.0	3.0	0.0
8.00	0.548	C.55E	C.983	C.998	1.CCC	1.00C	4.6	0.0	3.5	0.0
8.5C	0.58E	C.60C	C.978	C.998	1.CCC	1.0CC	5.1	0.0	3.9	0.0
9.0C	C.622	C.641	C.973	C.998	1.COC	1.00C	5.6	0.0	4.3	0.0
9.5C	C.654	C.67E	C.96E	0.998	1.CCC	1.0CC	6.3	0.0	4.9	0.0
10.00	0.682	C.712	C.960	C.998	1.CCC	1.0CC	7.1	0.0	5.5	0.0
10.50	C.704	C.742	C.952	C.997	1.COC	1.COC	7.8	0.0	6.1	0.0
11.0C	C.723	C.77C	C.942	C.997	1.CCC	1.00C	8.5	0.0	6.7	0.0
11.50	0.73E	C.795	C.931	C.997	1.CCC	1.0CC	9.3	0.0	7.3	0.0
12.0C	0.749	C.817	C.92C	C.996	1.00C	1.CCC	10.0	0.0	7.9	0.0
12.5C	0.75E	C.83E	C.9C7	C.996	1.CCC	1.00C	11.1	0.0	8.7	0.0
13.00	0.75E	C.853	C.893	C.996	1.CCC	1.CCC	12.2	0.0	9.4	0.0
13.5C	C.756	C.867	C.87E	C.995	1.CCC	1.00C	13.3	0.0	10.2	0.0
14.CC	0.751	C.879	C.859	C.995	1.CCC	1.00C	14.5	0.0	11.0	0.0
14.50	0.743	C.889	C.841	C.995	1.CCC	1.00C	15.6	0.0	11.7	0.0
15.0C	0.733	C.897	C.822	C.994	1.COC	1.00C	16.7	0.0	12.5	0.0
15.50	0.721	C.904	C.8C2	C.994	1.CCC	1.00C	18.2	0.0	13.2	0.0
16.00	0.7CE	C.91C	C.781	0.993	1.CCC	1.CCC	19.6	0.0	14.0	0.0
16.50	C.691	C.915	C.76C	C.993	1.00C	1.COC	21.1	0.0	14.7	0.0
17.0C	0.674	C.919	C.739	C.992	1.CCC	1.00C	22.6	0.0	15.4	0.0
17.5C	C.657	C.923	C.718	C.992	1.0CC	1.00C	24.0	0.0	16.2	0.0
18.00	C.639	C.92E	C.696	C.991	1.COC	1.00C	25.5	0.0	16.9	0.0
18.5C	0.621	C.929	0.675	0.991	1.CCC	1.00C	27.9	0.0	17.1	0.0
19.0C	C.604	C.931	0.655	C.990	1.CCC	1.CCC	30.3	0.0	17.4	0.0
19.50	0.587	C.933	0.635	C.989	1.CCC	1.00C	32.7	0.0	17.6	0.0
20.00	0.57C	C.936	C.61E	0.988	1.CCC	1.00C	35.2	0.0	17.8	0.0
20.50	C.554	C.93E	0.59E	C.988	1.CCC	1.CCC	37.6	0.0	18.1	0.0
21.00	0.535	C.94C	0.581	0.987	1.CCC	1.00C	40.C	0.0	18.3	0.0
21.50	0.524	C.942	C.564	C.986	1.00C	1.0CC	40.C	0.0	18.4	0.0
22.00	0.511	C.944	C.545	C.985	1.CCC	1.00C	40.0	0.0	18.6	0.0

JPL PECT FEEC PRIN FED 8.4 GHZ

INPUT CATA ANC CONTRCLS FOR MAIN

THETA INCREMENT= C.5COCC
ENC VALUE CF THETA= 5C.CCCCC
SIGN CF INPUT CATA= -1.COCCC
BLCCKAGE= C.C
NUMBEF CF INPUT VALUES READ IN OR CALC= 15
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEEC EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.5C	C.CC3	C.CC3	C.551	1.COC	1.CCC	1.OCC	C.1	C.C	0.1	0.0
1.0C	0.C12	C.C12	C.557	1.COC	1.CCC	1.OCC	0.2	0.0	0.2	0.0
1.50	0.C27	C.C27	C.555	1.COC	1.CCC	1.CCC	C.3	0.C	0.3	0.0
2.0C	0.C4E	C.C4E	C.555	1.CCC	1.CCC	1.COC	C.4	C.0	0.4	0.0
2.5C	0.C7E	C.C7E	C.555	1.COC	1.CCC	1.CCC	0.5	0.0	0.5	0.0
3.00	C.1C4	C.1C4	C.555	1.CCC	1.CCC	1.OCC	C.6	0.C	0.6	0.0
3.50	C.139	C.135	C.555	1.COC	1.CCC	1.COC	C.5	0.0	0.9	0.0
4.CC	0.17E	C.17E	C.555	1.COC	1.CCC	1.CCC	1.1	0.0	1.1	0.0
4.50	0.21E	C.217	C.55E	1.COC	1.CCC	1.OCC	1.4	0.C	1.4	0.0
5.00	0.25E	C.255	0.557	1.COC	1.CCC	1.00C	1.7	0.0	1.7	0.0
5.5C	0.3C2	C.303	C.55E	1.CCC	1.CCC	1.CCC	1.5	0.0	1.9	0.0
6.00	0.34E	C.34E	C.555	1.COC	1.OCC	1.OCO	2.2	0.0	2.2	0.0
6.5C	0.391	C.393	C.553	1.OOC	1.CCC	1.OCC	2.6	0.0	2.6	0.0
7.0C	0.434	C.43E	C.551	1.COC	1.CCC	1.CCC	3.0	0.0	3.0	0.0
7.50	0.47E	0.482	C.58E	1.COC	1.CCC	1.00C	3.4	0.C	3.4	0.0
8.00	C.51E	C.524	C.5E5	1.CCO	1.CCC	1.OCC	3.9	0.C	3.8	0.0
8.50	C.554	C.5E5	C.5E1	1.CCC	1.CCC	1.COC	4.3	0.0	4.2	0.0
9.00	0.591	C.6C5	C.577	1.COC	1.CCC	1.OCC	4.7	C.0	4.6	0.0
9.5C	C.624	C.642	C.572	1.OOC	1.CCC	1.OCC	5.3	0.0	5.2	0.0
10.00	0.653	C.677	C.5EE	1.COC	1.CCC	1.CCC	6.C	0.0	5.7	0.0
10.50	0.679	0.70E	C.55E	1.CCC	1.CCC	1.00C	6.6	0.0	6.3	0.0
11.0C	C.7CC	C.737	C.55C	1.COO	1.CCC	1.OCC	7.2	0.0	6.9	0.0
11.50	0.71E	C.763	C.541	1.CCC	1.CCC	1.CCC	7.9	0.0	7.4	0.0
12.00	0.733	C.78E	C.532	1.OCC	1.CCC	1.OOO	E.5	C.C	8.0	0.0
12.5C	C.743	C.8C8	C.521	1.OOO	1.CCC	1.OOO	9.4	0.0	8.7	0.0
13.00	C.75C	C.82E	C.5CE	1.CCC	1.CCC	1.OCC	1C.4	0.0	9.3	0.0
13.50	0.753	C.842	C.E95	1.COC	1.CCC	1.00C	11.3	0.0	10.0	0.0
14.0C	0.753	C.85E	C.E8C	1.00C	1.CCC	1.OCC	12.2	0.C	10.7	0.0
14.50	0.745	C.867	C.E64	1.CCC	1.CCC	1.CCC	13.2	0.0	11.3	0.0
15.00	C.744	C.87E	C.E48	C.555	1.CCC	1.CCC	14.1	0.0	12.0	0.0
15.5C	C.737	C.E87	C.E31	C.959	1.COC	1.COC	15.C	0.0	12.5	0.0
16.0C	0.728	C.895	C.E14	C.555	1.CCC	1.CCO	16.C	0.C	13.0	0.0
16.50	0.718	C.5C2	C.797	0.555	1.CCC	1.OOC	16.9	0.0	13.5	0.0
17.00	C.7C7	C.5CE	C.78C	C.558	1.CCC	1.CCC	17.9	0.0	14.0	0.0
17.50	0.695	C.914	C.762	C.55E	1.CCC	1.00C	18.8	0.0	14.5	0.0
18.00	0.683	C.91C	C.745	C.55E	1.CCC	1.OOC	19.8	0.0	15.0	0.0
18.5C	0.671	C.923	C.72E	C.557	1.CCC	1.OCC	20.7	0.0	15.3	0.0
19.00	0.65E	C.92E	C.712	C.557	1.CCC	1.00C	21.5	0.0	15.6	0.0
19.50	0.64E	C.932	C.65E	C.557	1.CCC	1.00C	22.4	0.0	15.8	0.0
20.00	0.634	C.935	C.68C	C.55E	1.OCC	1.00C	23.3	0.0	16.1	0.0
20.50	C.621	C.93C	C.665	C.556	1.CCC	1.00C	24.1	0.0	16.4	0.0
21.00	0.61C	C.942	C.65C	0.555	1.CCC	1.COC	25.C	0.0	16.7	0.0
21.50	0.59E	C.945	0.63E	0.555	1.CCC	1.00C	25.8	0.0	17.0	0.0
22.0?	C.58E	C.94E	C.622	C.554	1.OCC	1.CCO	26.7	0.0	17.3	0.0

JPL RECT FEED PRIM FED 8.556 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= C.5COCC
END VALUE OF THETA= 9C.CCCCC
SIGN OF INPUT DATA= -1.CCCCC
BLOCKAGE= C.C
NUMBER OF INPUT VALUES READ IN OR CALC= 19
IC1= 1 IC2= 2 IC3= 1 IC4= 1

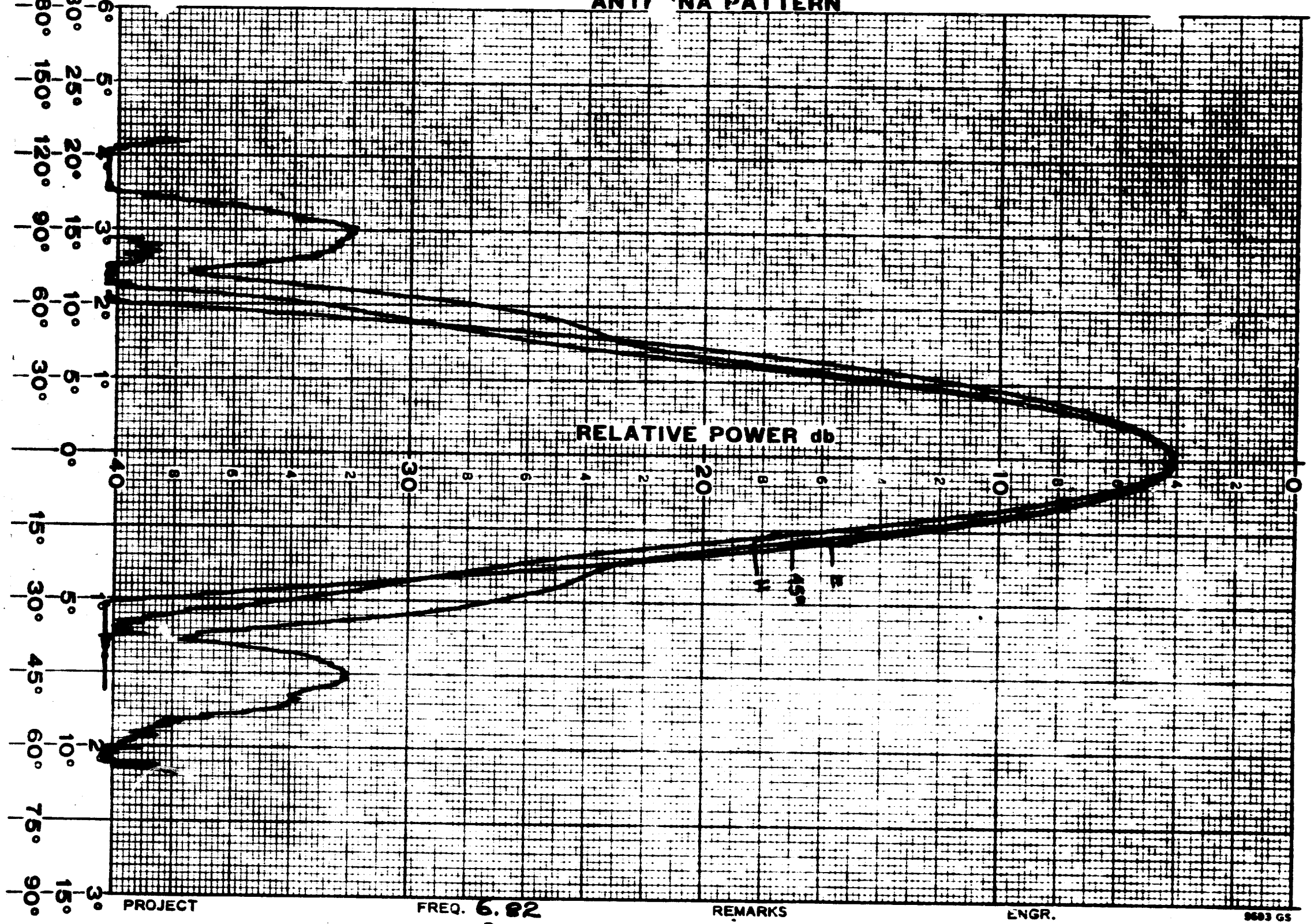
ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.5C	0.CC3	C.CC3	C.991	1.CCC	1.CCC	1.00C	C.1	0.0	C.1	0.0
1.0C	0.C12	C.012	C.997	1.C0C	1.CCC	1.0CC	0.2	0.C	0.2	0.0
1.5C	C.C2E	C.C2E	C.995	1.C0C	1.0CC	1.CCC	C.3	0.C	0.3	0.0
2.CC	0.C4E	C.C4S	C.995	1.CCC	1.CCC	1.0CC	C.4	C.0	0.3	0.0
2.5C	0.C75	C.C75	C.995	1.CCC	1.CCC	1.CCC	0.5	0.0	0.4	0.0
3.0C	C.1CE	C.1CE	C.995	1.C0C	1.CCC	1.CCC	C.6	0.0	0.5	0.0
3.5C	0.142	C.142	C.995	1.CCC	1.CCC	1.00C	C.9	0.0	0.8	0.0
4.00	C.18C	C.18C	C.995	1.C0C	1.CCC	1.00C	1.2	0.0	1.0	0.0
4.5C	C.221	C.221	C.998	1.C0C	1.CCC	1.00C	1.4	0.0	1.3	0.0
5.0C	C.263	C.264	0.997	1.CCC	1.CCC	1.CCC	1.7	0.0	1.6	0.0
5.5C	0.307	C.3C9	C.996	1.0CC	1.CCC	1.00C	2.C	0.0	1.8	0.0
6.00	C.352	C.354	C.995	1.C0C	1.CCC	1.00C	2.3	0.0	2.1	0.0
6.5C	C.39E	C.4CC	C.993	1.CCC	1.CCC	1.0CC	2.7	0.0	2.5	0.0
7.00	0.441	C.44E	C.99C	1.C0C	1.CCC	1.C0C	3.1	0.0	2.9	0.0
7.5C	C.484	C.49C	C.988	1.CCC	1.CCC	1.0CC	3.5	0.0	3.3	0.0
8.00	0.524	C.533	C.9E4	1.CCC	1.CCC	1.CCC	4.C	0.0	3.7	0.0
8.5C	0.563	C.574	C.9EC	1.C0C	1.CCC	1.00C	4.4	0.0	4.1	0.0
9.0C	C.60C	C.615	C.976	1.C0C	1.CCC	1.C0C	4.8	0.0	4.5	0.0
9.50	C.634	C.653	C.971	1.CCC	1.CCC	1.00C	5.5	0.0	5.0	0.0
10.00	0.663	0.687	C.965	1.CCC	1.CCC	1.00C	6.1	0.0	5.6	0.0
10.5C	C.68S	C.719	C.958	1.C0C	1.CCC	1.00C	6.8	0.0	6.1	0.0
11.00	C.71C	C.748	C.95C	1.CCC	1.0CC	1.CCC	7.5	0.0	6.6	0.0
11.5C	C.729	C.775	C.941	1.0CC	1.CCC	1.0CC	8.1	0.0	7.2	0.0
12.00	C.744	C.799	C.931	1.C0C	1.CCC	1.000	8.8	0.0	7.7	0.0
12.5C	C.755	C.821	C.92C	C.995	1.0CC	1.CCC	9.7	[illegible]	8.3	0.0
13.00	0.762	C.84C	C.9CE	C.995	1.CCC	1.C0C	10.5	0.0	9.0	0.0
13.5C	C.76E	C.856	C.895	C.999	1.CCC	1.00C	11.4	0.0	9.6	0.0
14.00	0.76E	C.871	C.881	C.995	1.CCC	1.0CC	12.3	0.C	10.3	0.0
14.5C	C.764	C.883	C.86E	C.999	1.CCC	1.000	13.1	0.0	10.9	0.0
15.0C	C.76C	C.895	C.850	C.999	1.0CC	1.00C	14.0	0.0	11.6	0.0
15.50	0.753	C.904	C.834	C.99E	1.CCC	1.00C	14.9	0.0	12.2	0.0
16.00	0.745	C.913	C.818	C.998	1.CCC	1.00C	15.9	0.0	12.8	0.0
16.5C	C.735	C.920	C.801	C.998	1.CCC	1.00C	16.8	0.0	13.3	0.0
17.00	C.725	C.927	C.784	C.998	1.CCC	1.00C	17.7	0.0	13.9	0.0
17.50	C.713	C.933	C.76E	C.997	1.CCC	1.00C	18.7	0.0	14.5	0.0
18.0C	C.70C	C.93E	C.749	C.997	1.CCC	1.00C	19.6	0.0	15.1	0.0
18.50	0.687	C.942	C.731	C.997	1.CCC	1.00C	20.8	0.0	15.6	0.0
19.00	C.673	C.946	C.714	C.996	1.CCC	1.00C	22.0	0.0	16.1	0.0
19.5C	C.65E	C.95C	C.69E	C.996	1.CCC	1.CCC	23.2	0.0	16.6	0.0
20.00	C.644	0.953	C.679	C.996	1.C0C	1.00C	24.4	0.0	17.2	0.0
20.50	0.625	C.955	C.662	0.995	1.CCC	1.00C	25.6	0.0	17.7	0.0
21.00	0.614	C.95E	0.645	0.995	1.C0C	1.000	26.8	0.0	18.2	0.0
21.50	C.599	C.96C	C.62E	C.994	1.CCC	1.00C	27.7	0.0	18.5	0.0
22.00	0.585	C.962	C.612	0.994	1.CCC	1.00C	28.6	0.0	18.9	0.0

APPENDIX IV - A

RECTANGULAR MULTIMODE HORN
DIAGONAL FED
LINEAR POLARIZED PATTERNS

ANTENNA PATTERN



PROJECT

FREQ. 6.82

PLANE E H 45°

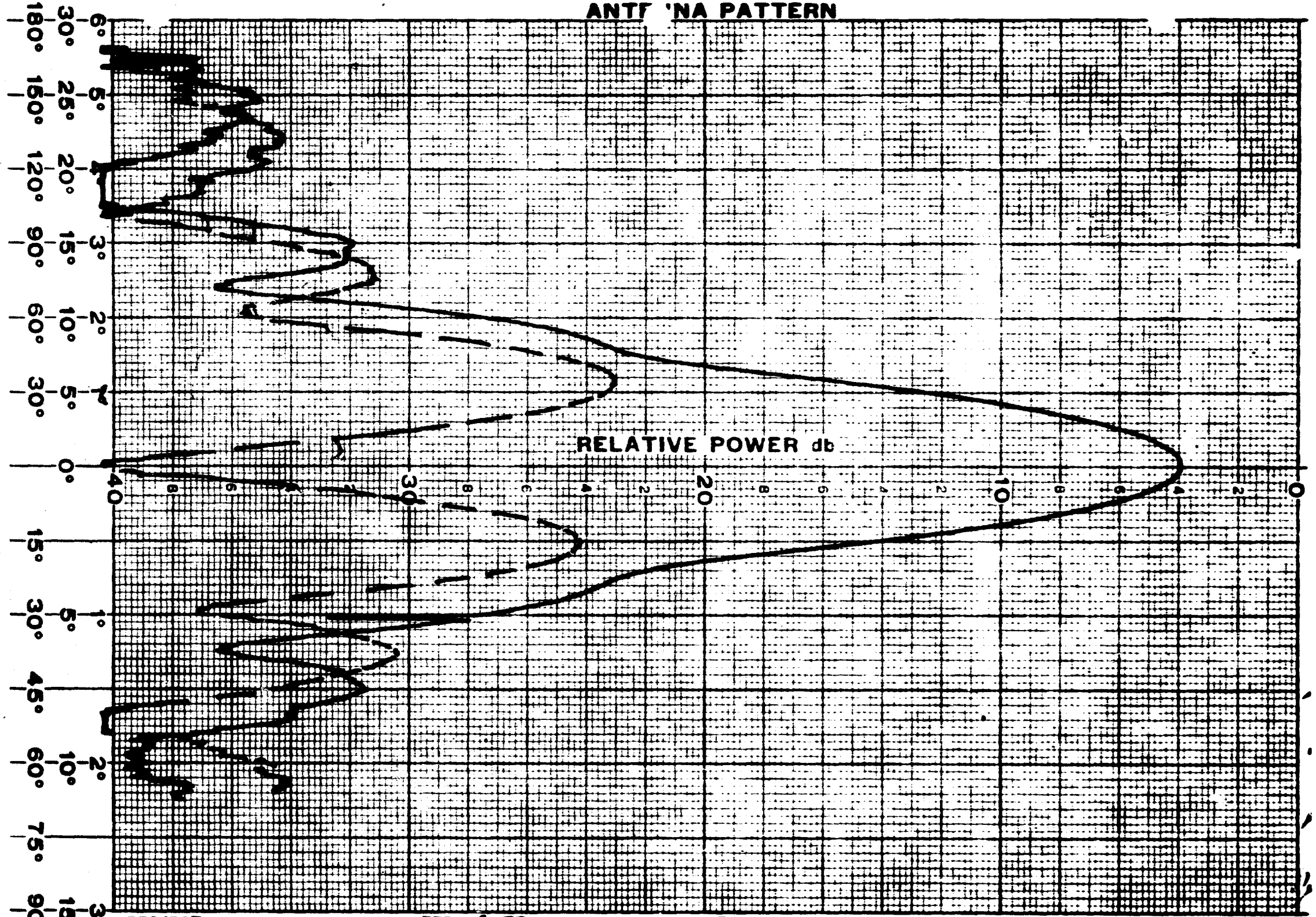
REMARKS

ENGR.

DATE 12/3/68

9603 GS

ANTENNA PATTERN



PROJECT

FREQ. 6.82

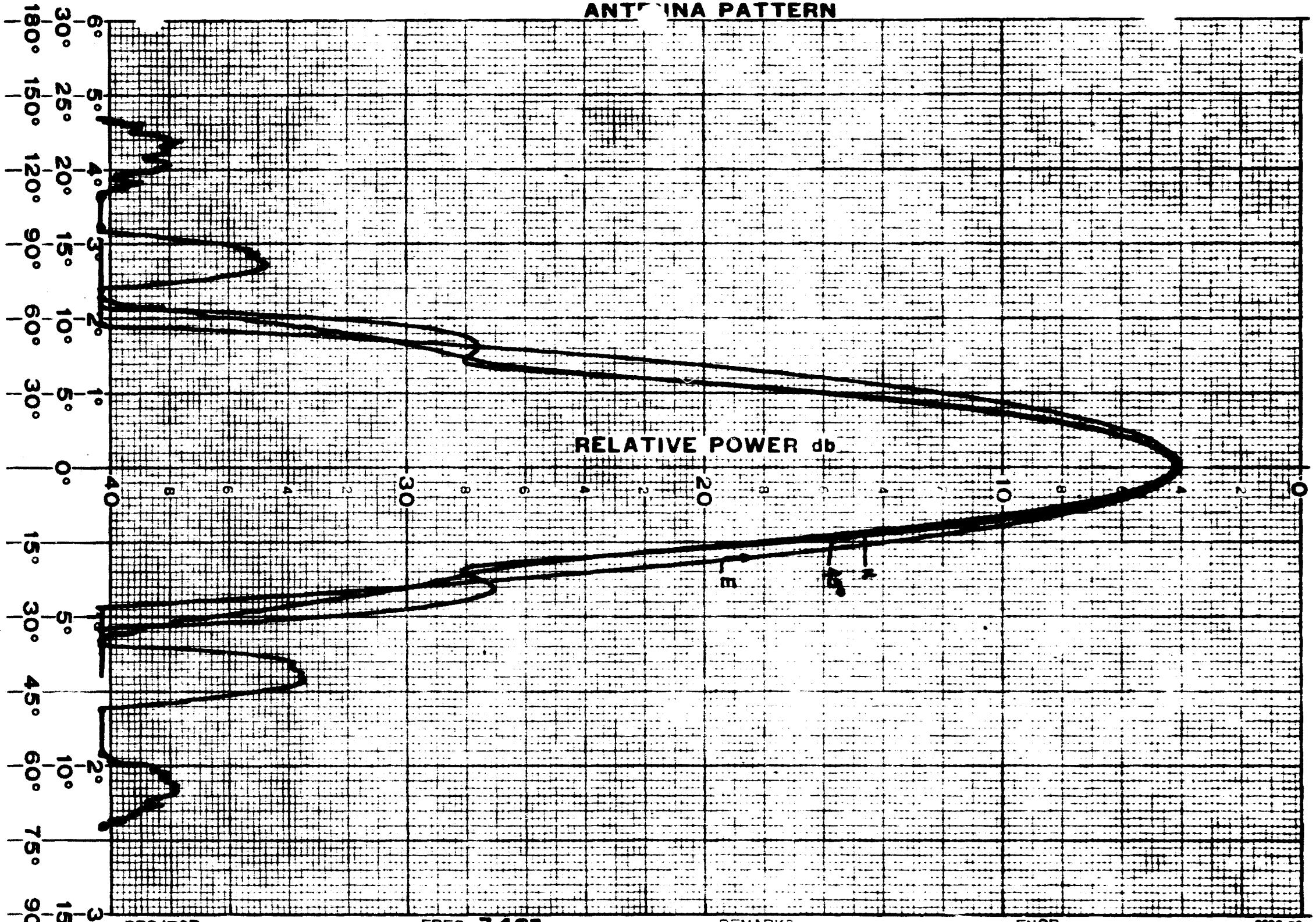
REMARKS

ENGR.

PLANE 45°

DATE 12/8/62

ANTENNA PATTERN



PROJECT

FREQ. 7.487

PLANE E H 45

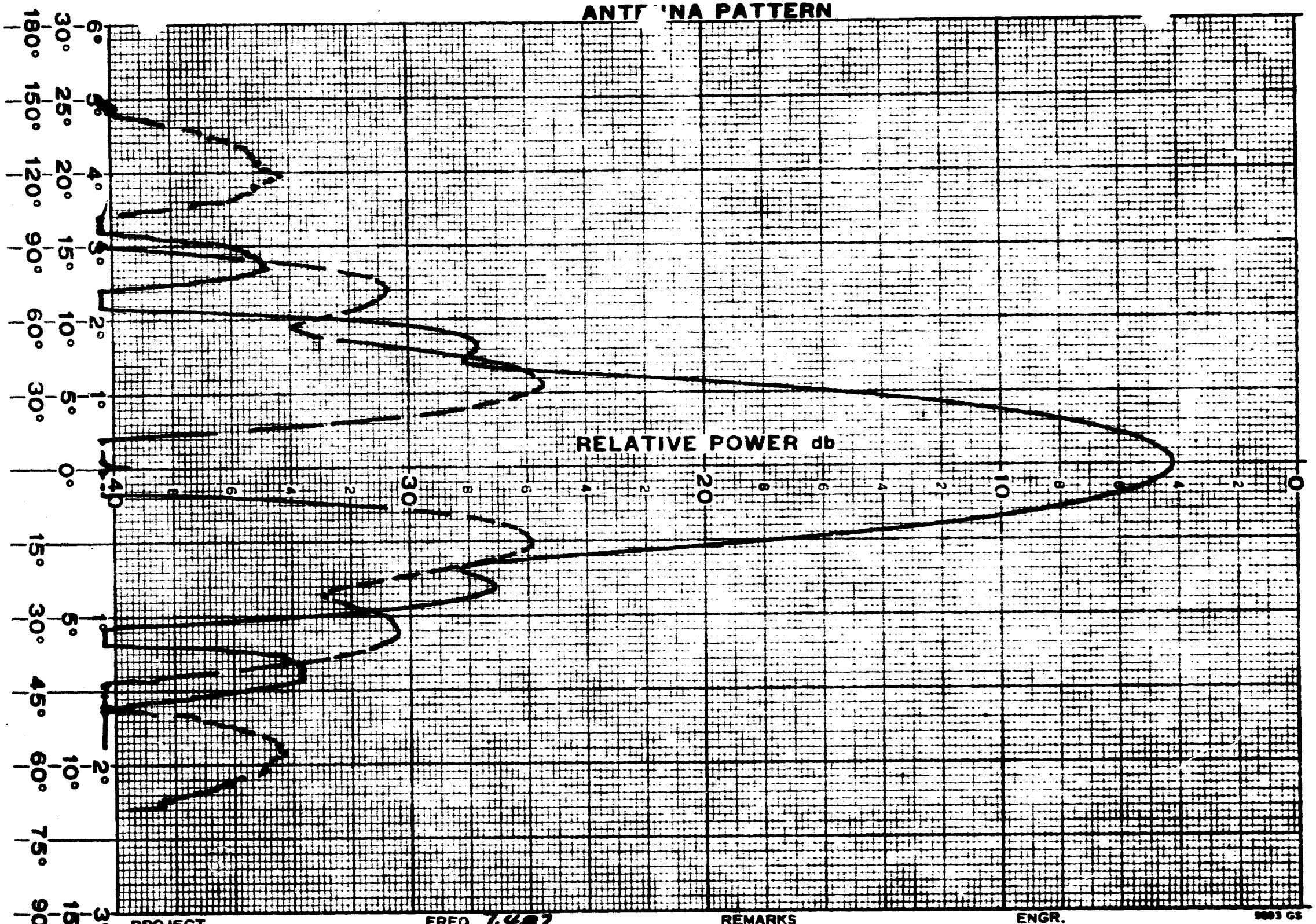
REMARKS

ENGR.

DATE 12/3/68

9003 GS

ANTENNA PATTERN



PROJECT

FREQ. 7.407

PLANE 45°

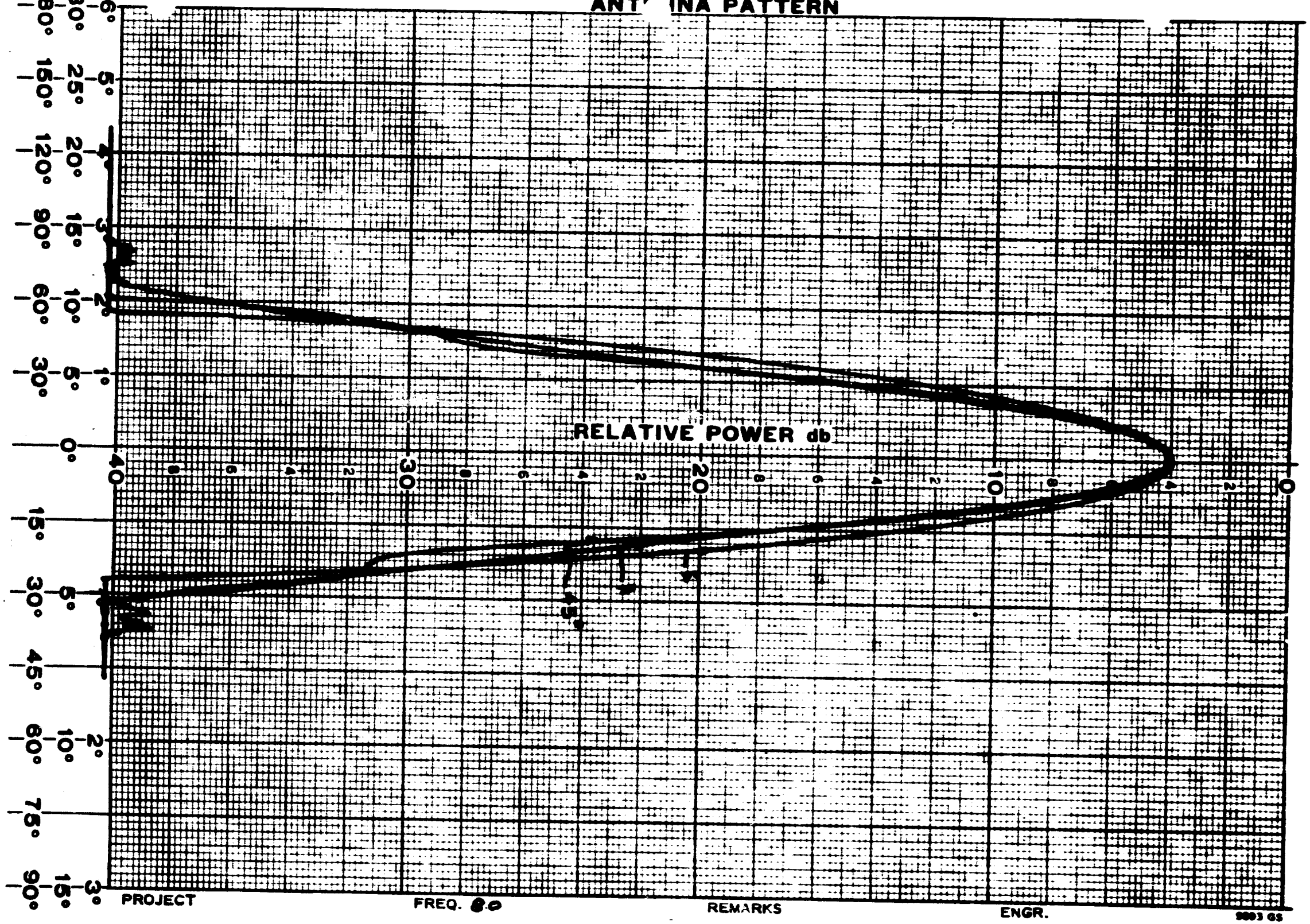
REMARKS

ENGR.

DATE 12/3/68

9003 GS

ANTENNA PATTERN



PROJECT

FREQ. 8.0

PLANE E Horiz

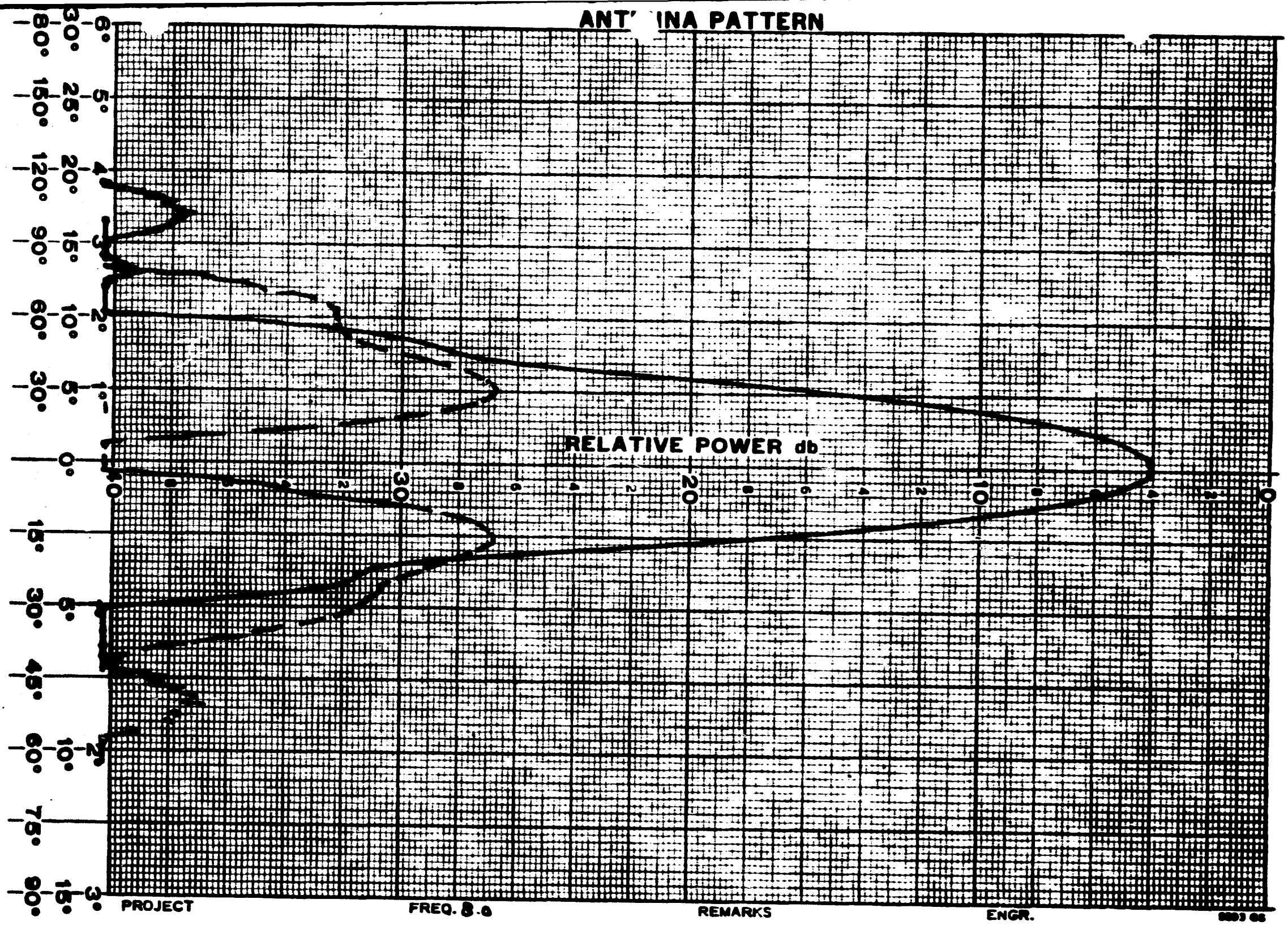
REMARKS

ENGR.

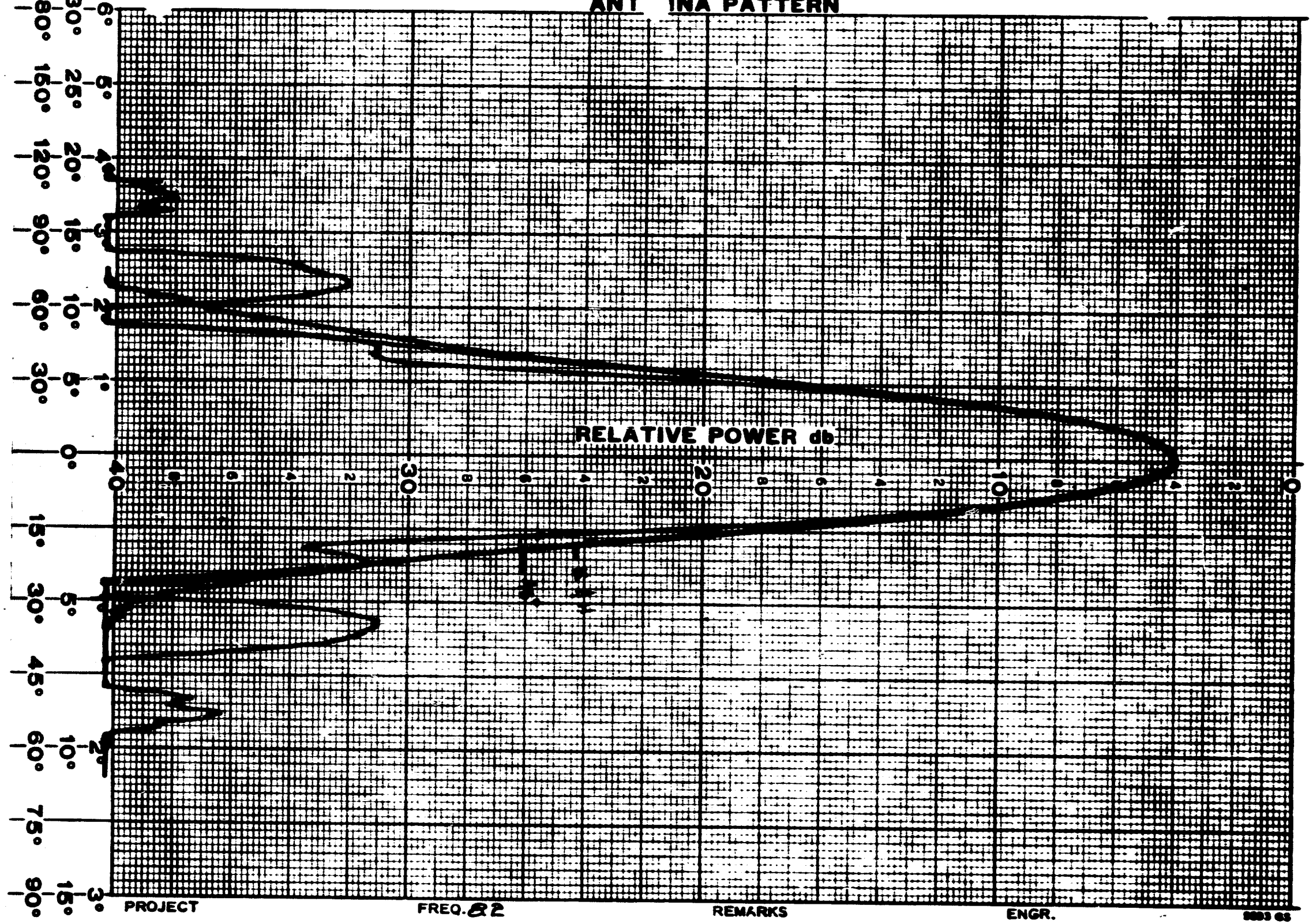
DATE 12/3/68

9003 65

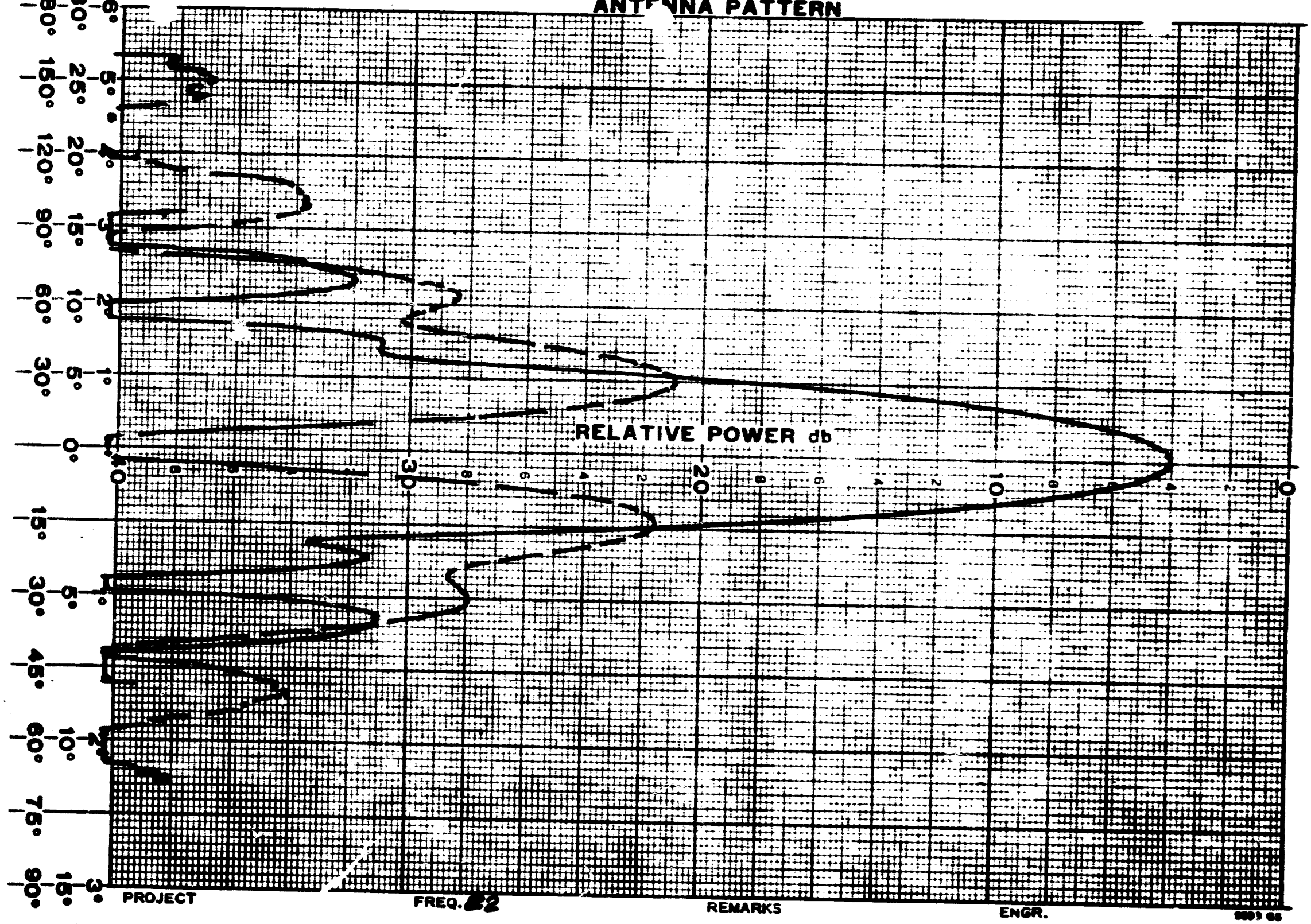
ANT' INA PATTERN


RELATIVE POWER db
30
20
10
0
6
4
2
8
6
4
2
8
6
4
2
8

ANT INA PATTERN



ANTENNA PATTERN



PROJECT

FREQ. 82

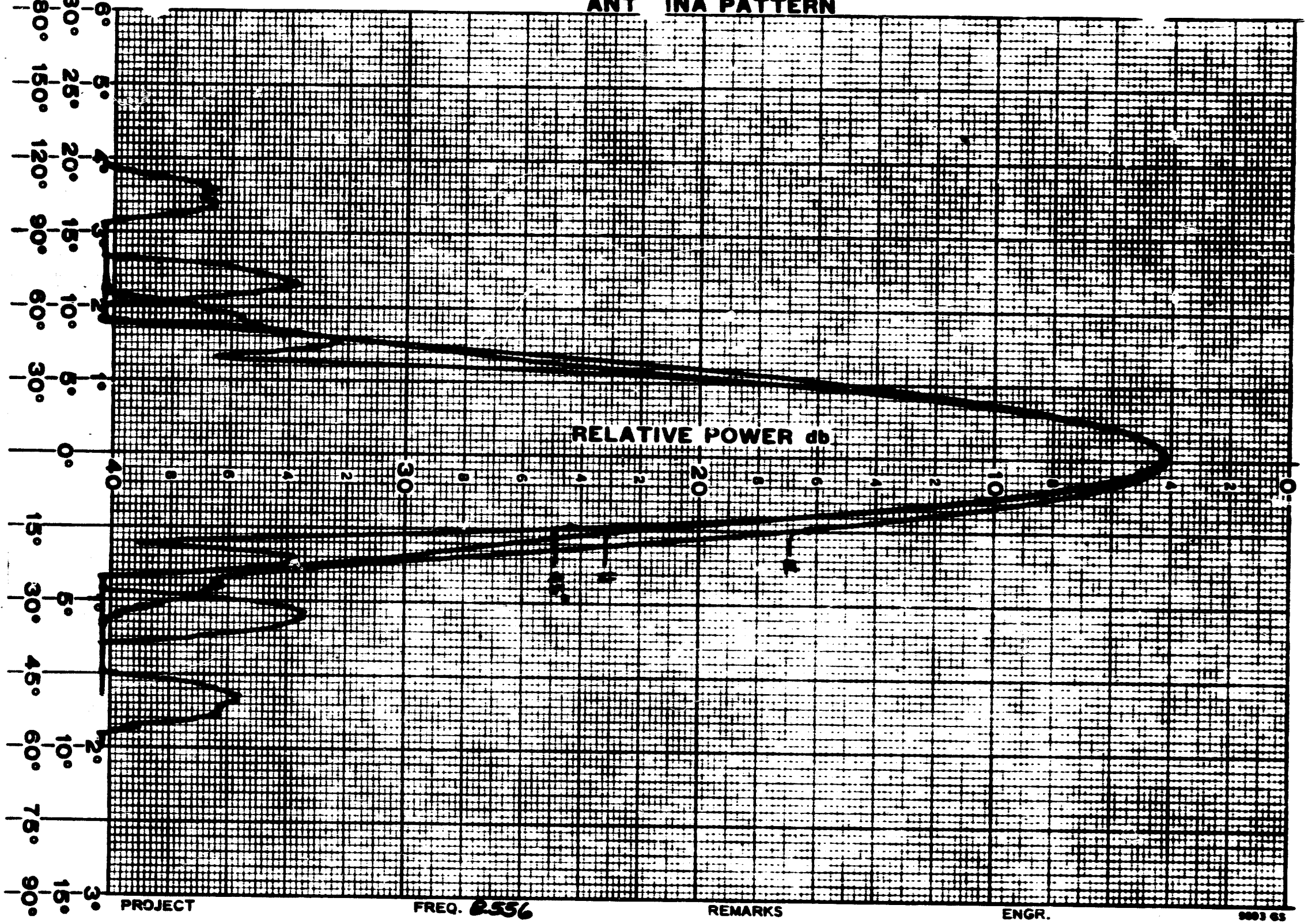
PLANE 45°

REMARKS

ENGR.

DATE 2/3/58

ANT INA PATTERN



PROJECT

FREQ. 8556

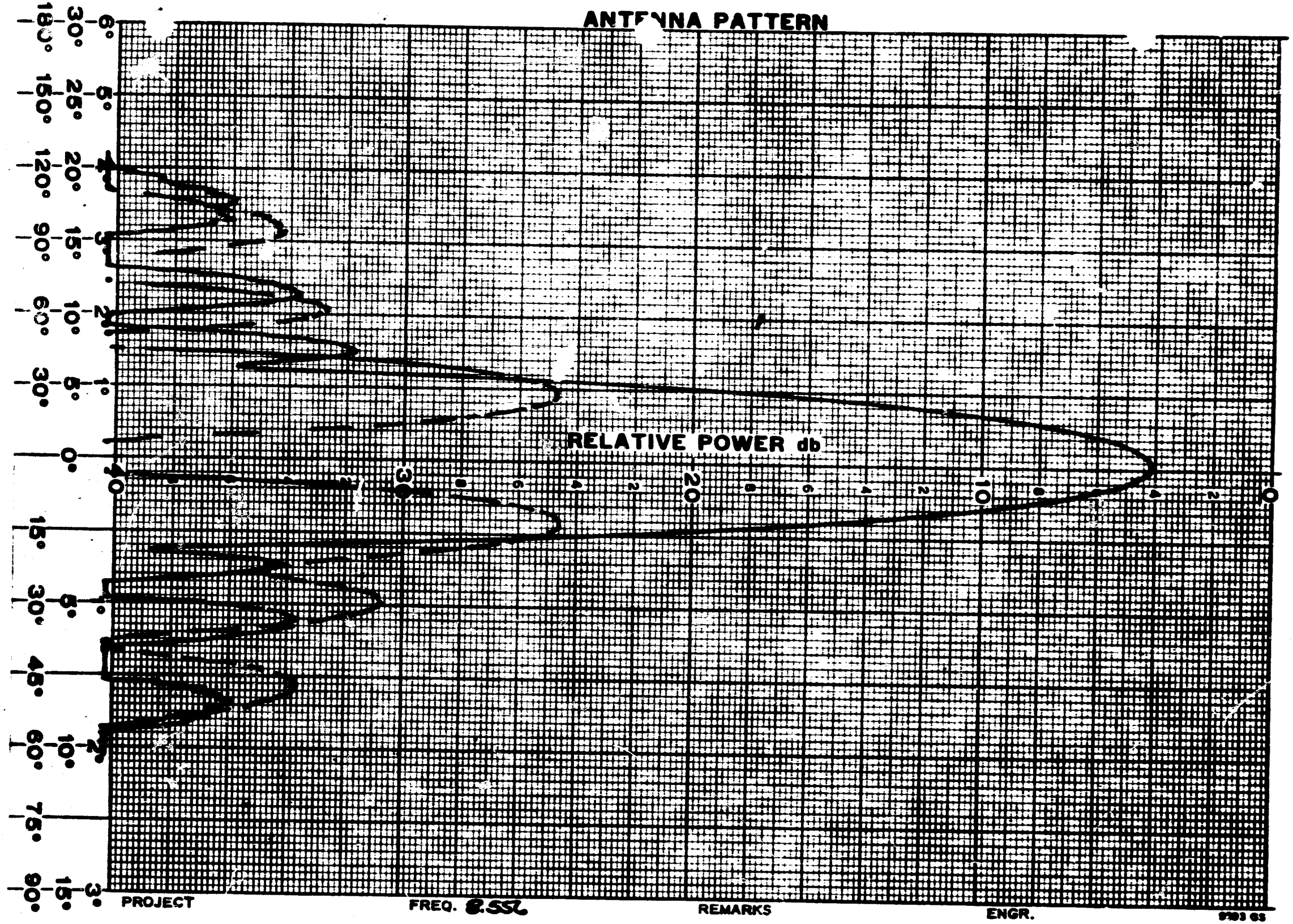
PLANE C H 45°

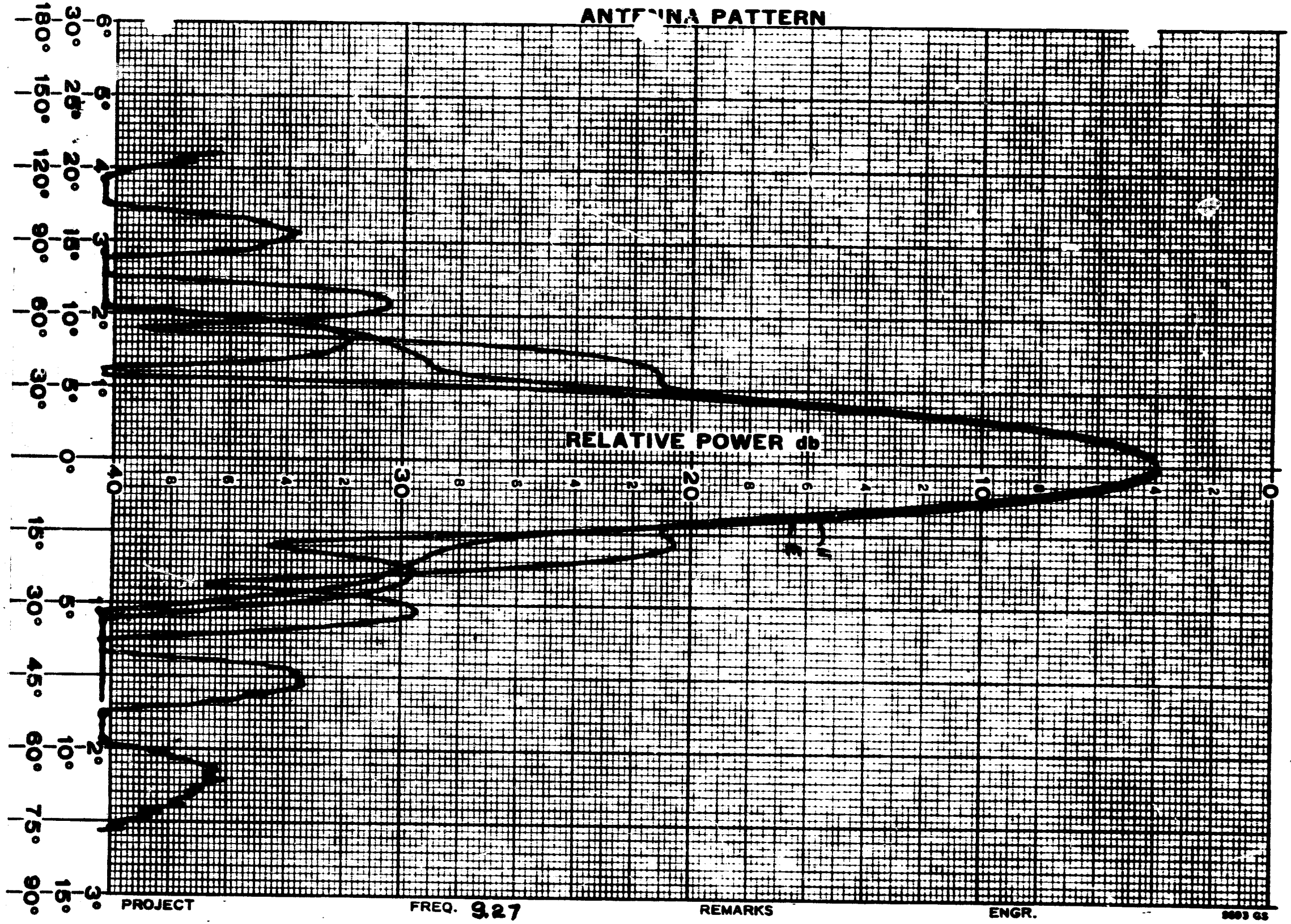
REMARKS

ENGR.

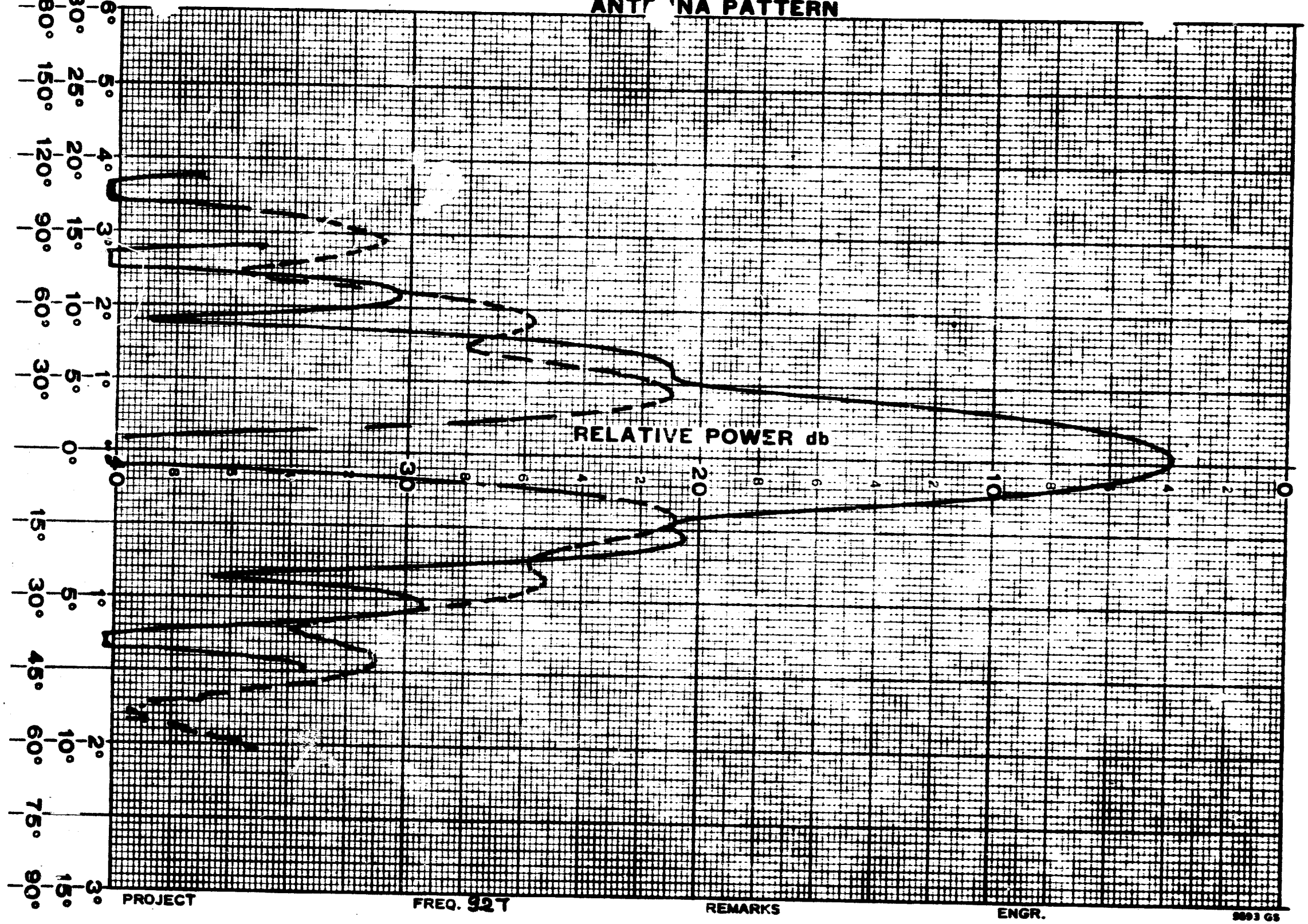
DATE 12/8/58

9003 65


ANTENNA PATTERN
RELATIVE POWER db
180° 30° 6°
150° 25° 5°
120° 20° 4°
90° 15° 3°
60° 10° 2°
30° 5° 1°
0° 0°
15° 3°
30° 6°
45° 8°
60° 10°
75° 12°
90° 15°
30 dB 6 4 2
20 dB 6 4 2
10 dB 6 4 2
0
PROJECT
FREQ. 8.552
PLANE 45°
REMARKS
ENGR.
DATE 12/3/68


ANTENNA PATTERN
RELATIVE POWER db
40
30
20
10
0
180° 30° 6°
150° 25° 5°
120° 20° 4
90° 15° 3
60° 10° 2°
30° 5° 1°
0°
15°
30° 5°
45°
60° 10° 2°
75°
90° 15° 3°
PROJECT
FREQ. 9.27
PLANE
REMARKS
ENGR.
DATE 12/3/60
3003 GS

ANTENNA PATTERN



PROJECT

FREQ. 927

PLANE 45°

REMARKS

ENGR.

DATE 12/3/68

3893 GS

APPENDIX IV - B

RECTANGULAR MULTIMODE HORN
DIAGONAL FED
ORTHOGONAL LINEAR PATTERN

ANTENNA PATTERN

RELATIVE POWER db

PROJECT

FREQ. 7687

PLANE E H 45°

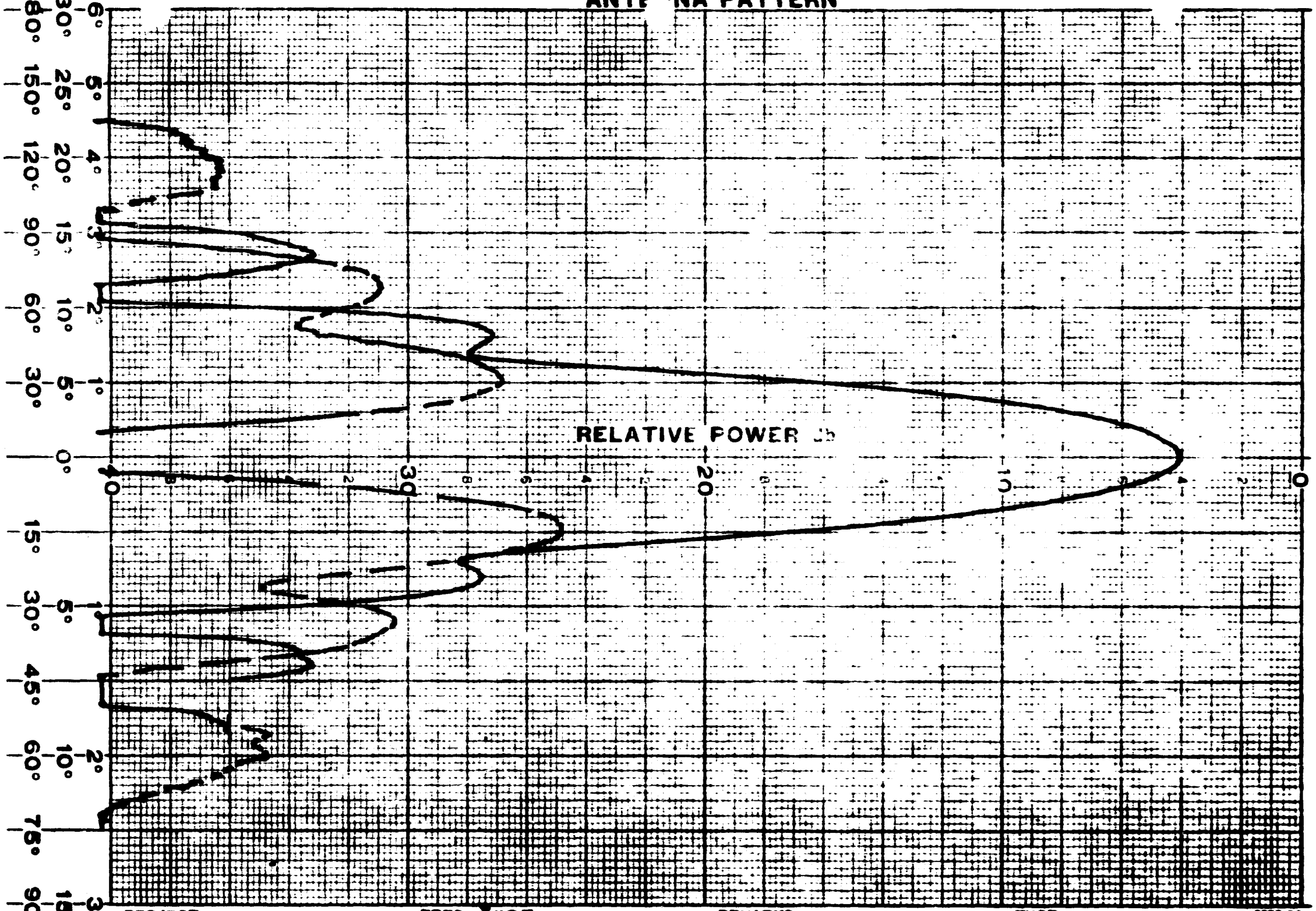
REMARKS ORTHOGONAL LINEAR

ENGR.

DATE 12/3/68

9693 GS

ANTENNA PATTERN



PROJECT

FREQ. 7.48 T

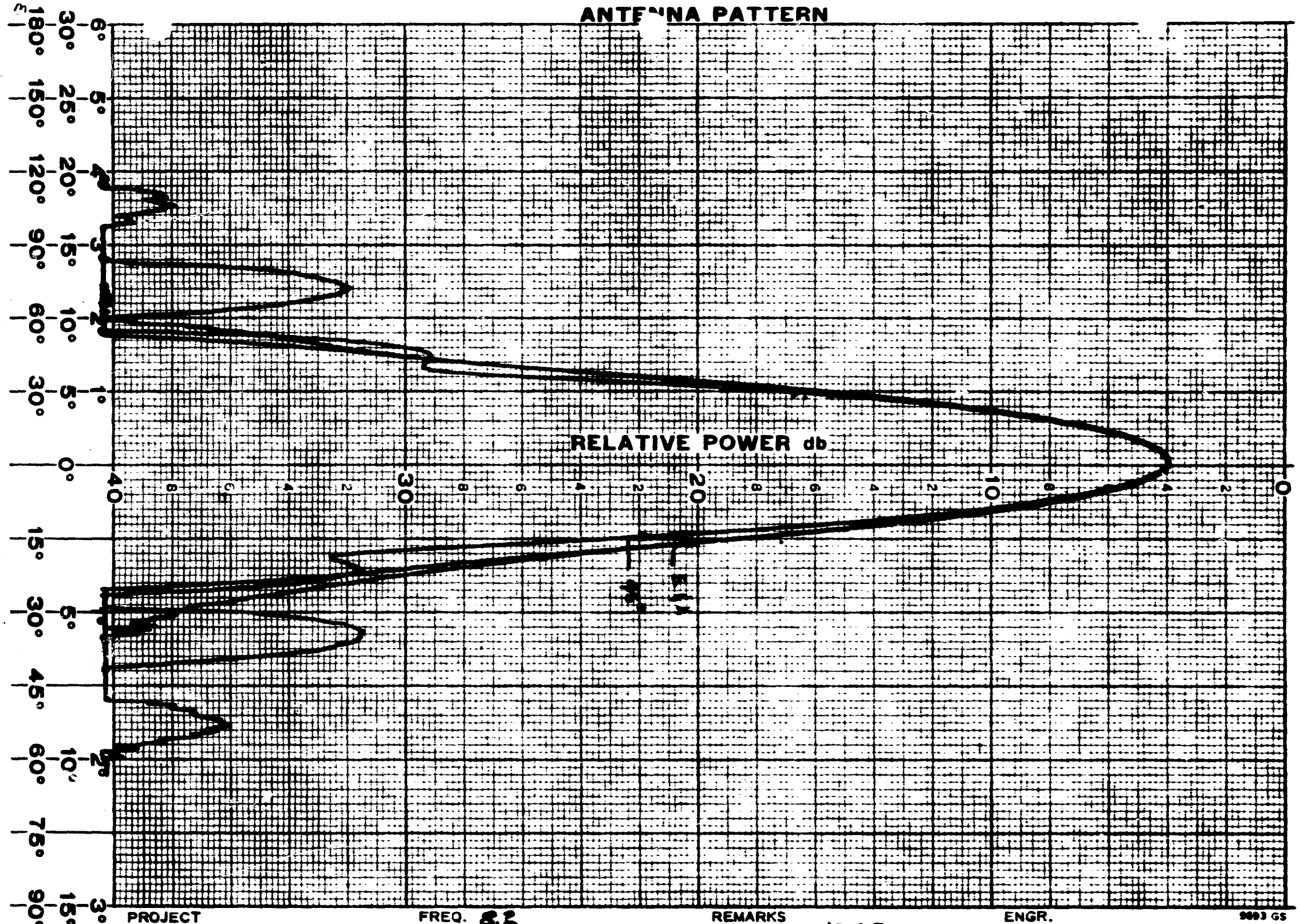
REMARKS
OR TWO ORTHOGONAL LINEAR

ENGR.

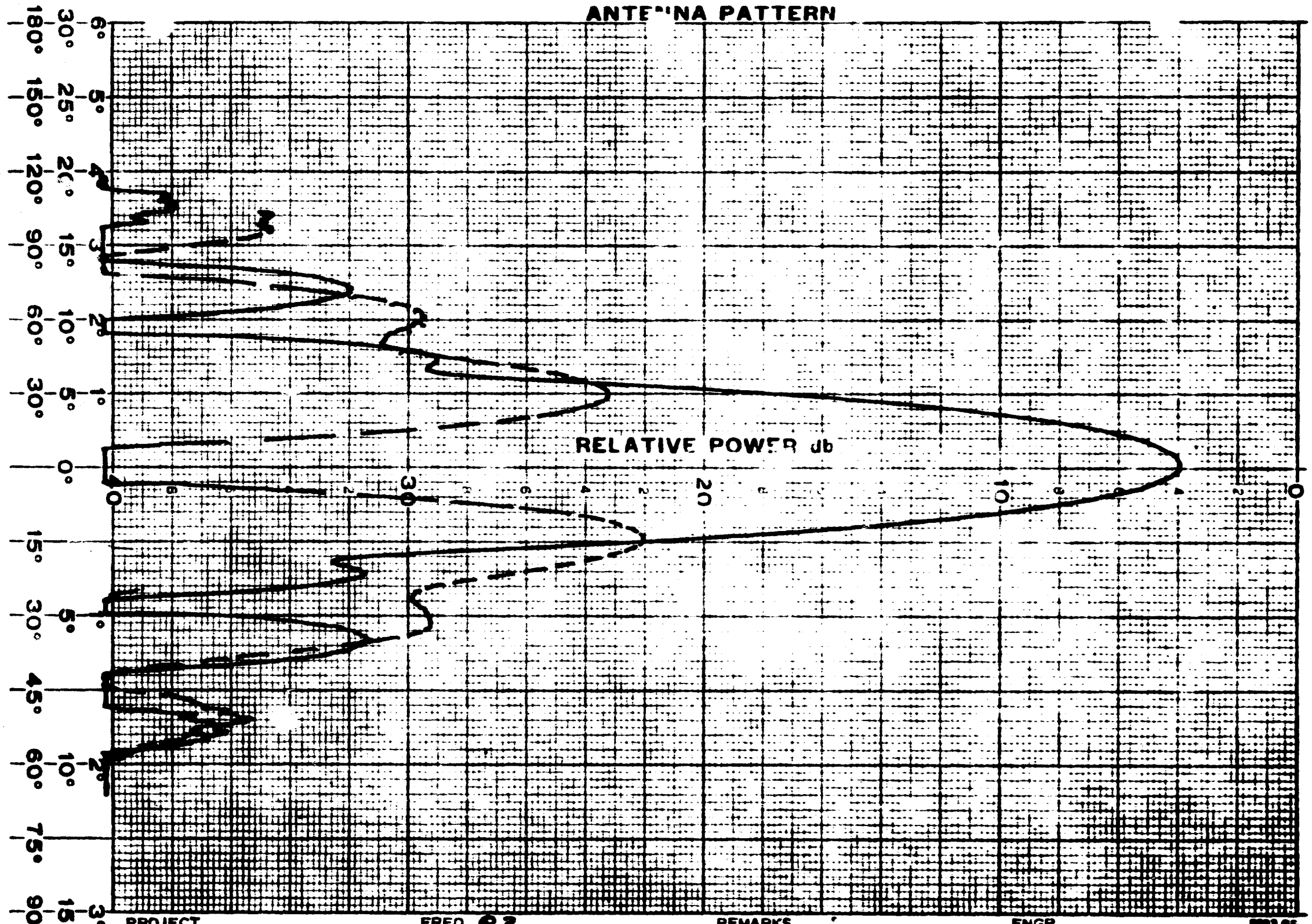
PLANE 45°

DATE 12/3/68

8003 GS


ANTENNA PATTERN
RELATIVE POWER db
E
H
180° 150° 120° 90° 60° 30° 0°
30° 25° 20° 15° 10° 5° 0°
6° 5° 4° 3° 2° 1° 0°
40 30 20 10 0
15° 30° 45° 60° 75° 90°
5° 10° 15°
PROJECT
FREQ. 8.2
PLANE E H 45
REMARKS
ORTHOGONAL LINEAR
ENGR.
DATE 12/3/60
9883 GS

ANTENNA PATTERN



PROJECT

FREQ. 8.2

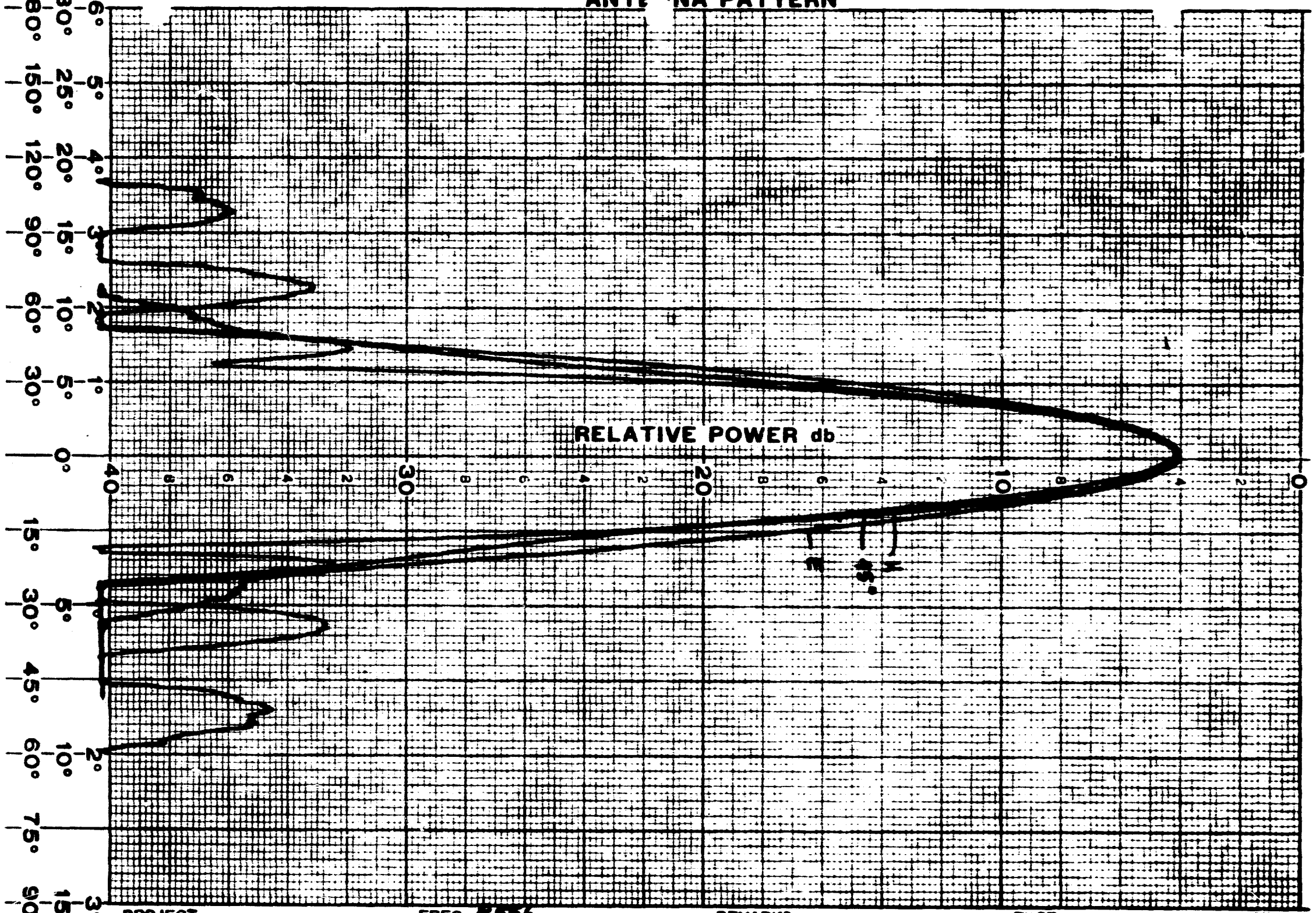
REMARKS ORTHOGONAL LINEAR

ENGR.

PLANE 45°

DATE 12/13/68

ANTENNA PATTERN



PROJECT

FREQ. 8556

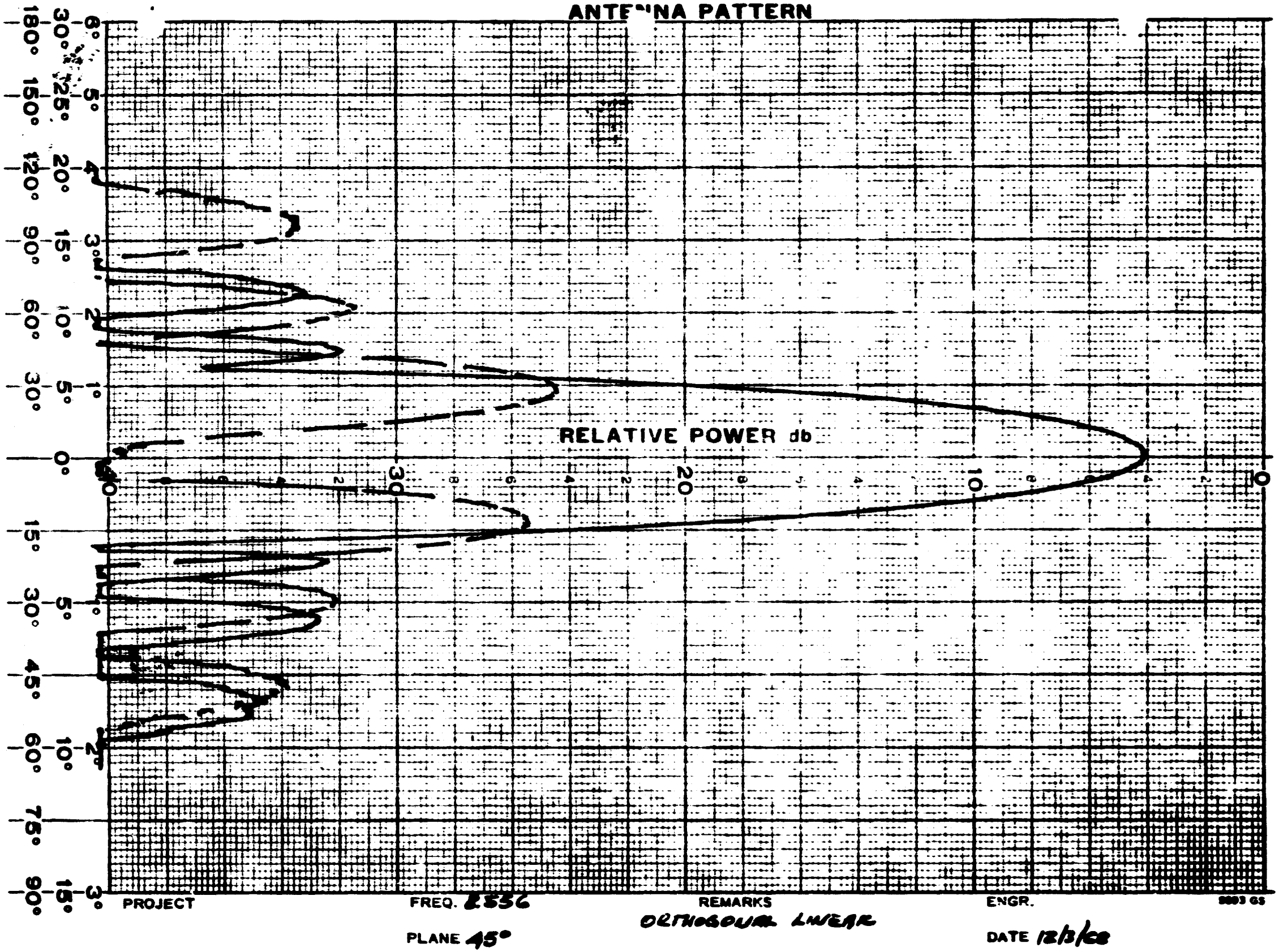
REMARKS ORTHOGONAL LINEAR

ENGR.

PLANE E H 45

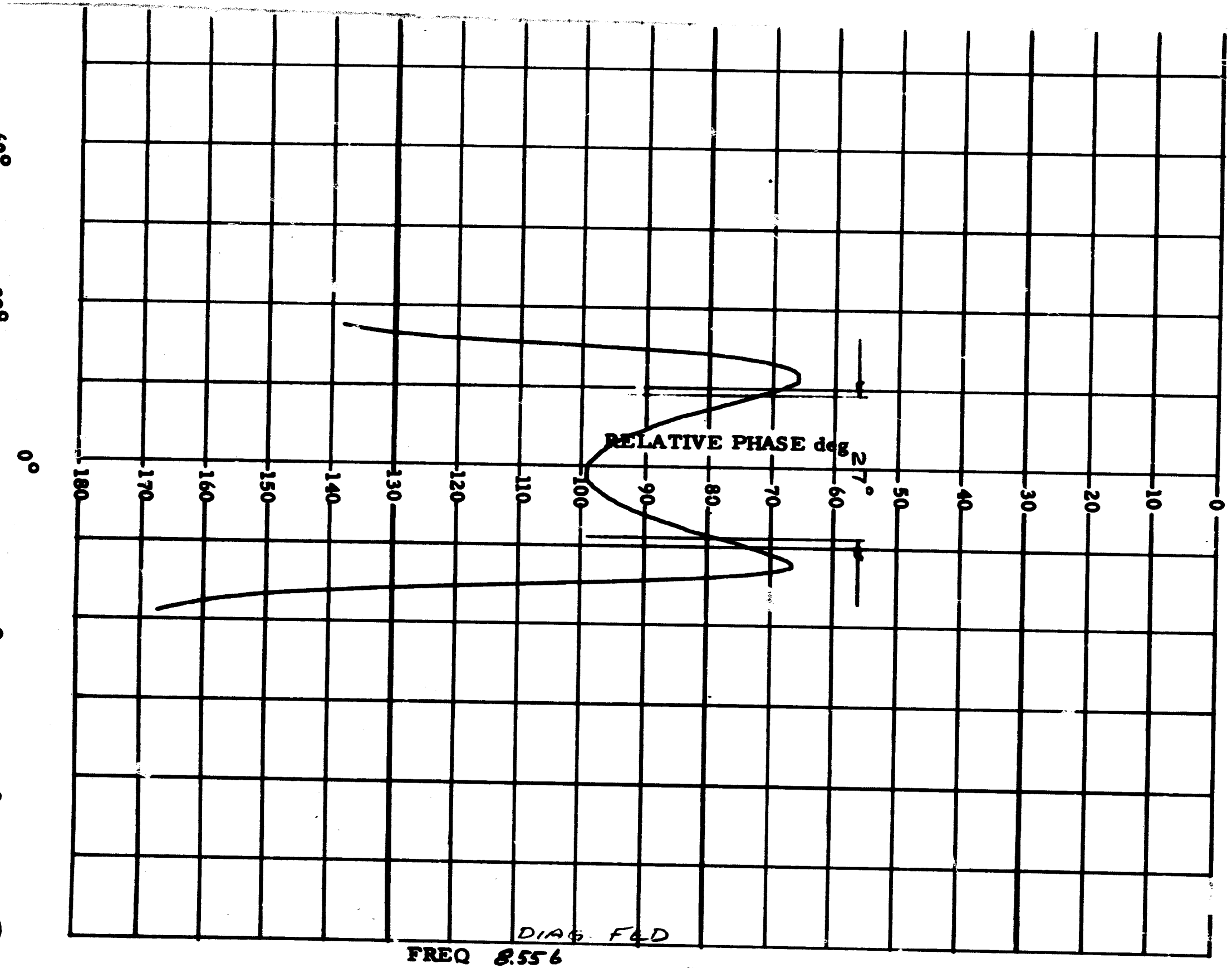
DATE 12/3/68

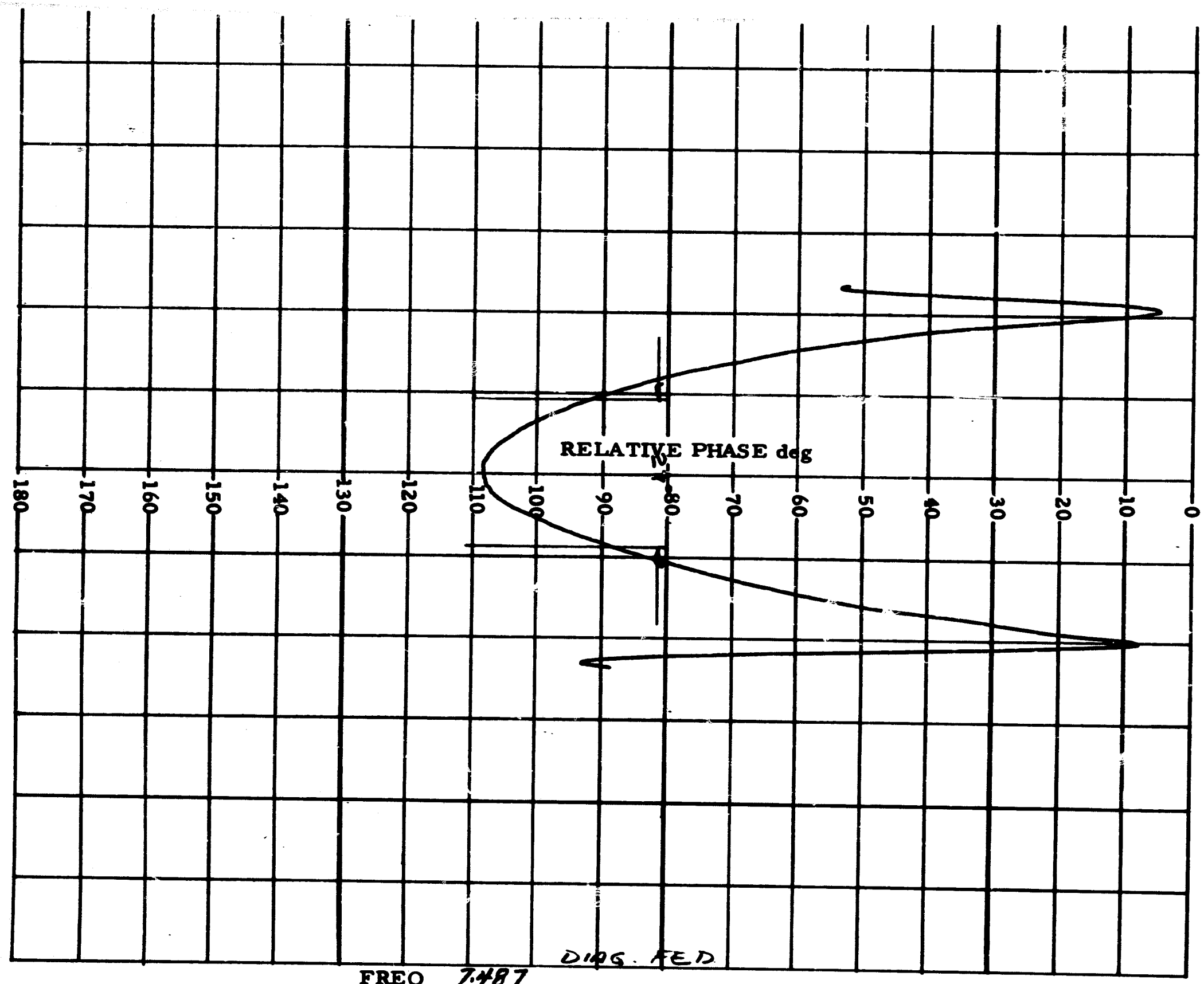
8803 GS


ANTENNA PATTERN
RELATIVE POWER db
180° 150° 120° 90° 60° 30° 0°
30° 25° 20° 15° 10° 5° 0°
15° 30° 45° 60° 75° 90°
8° 5° 4° 3° 2° 1° 0° 2° 3°
30 20 10 0
PROJECT
FREQ. 2536
REMARKS
ORTHOGONAL LINEAR
ENGR.
PLANE 45°
DATE 12/3/68
8003 GS

APPENDIX IV - C

RECTANGULAR MULTIMODE HORN
DIAGONAL FED
PHASE PATTERNS


60°
30°
0°
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
RELATIVE PHASE deg
27°
30°
60°
90°
DIAG F&D
FREQ 8.556
PLANE E
CL - 2½
DATE 12/5/65

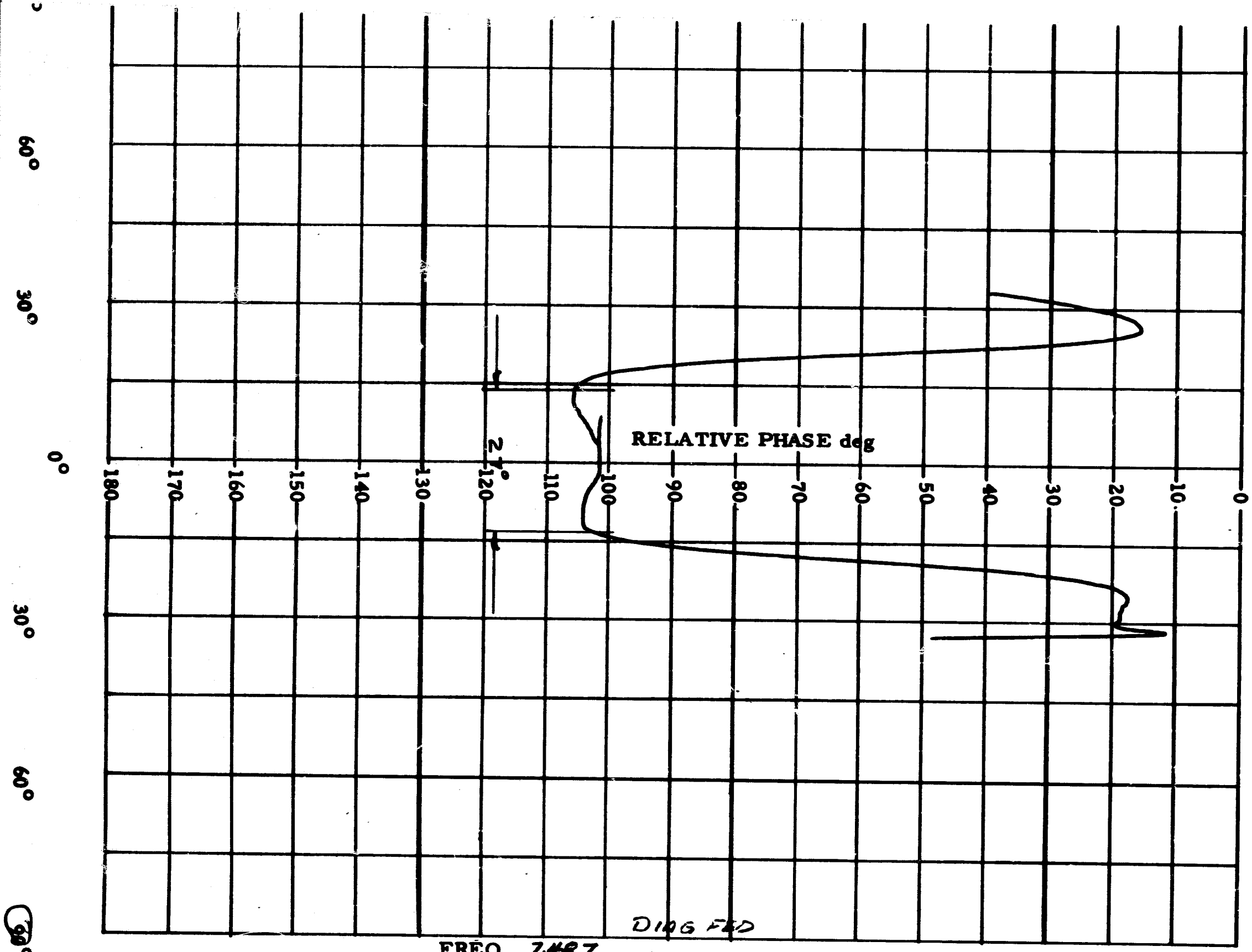


DIAG. FED

FREQ 7.487

PLANE E CR-2½

DATE 12/5/68

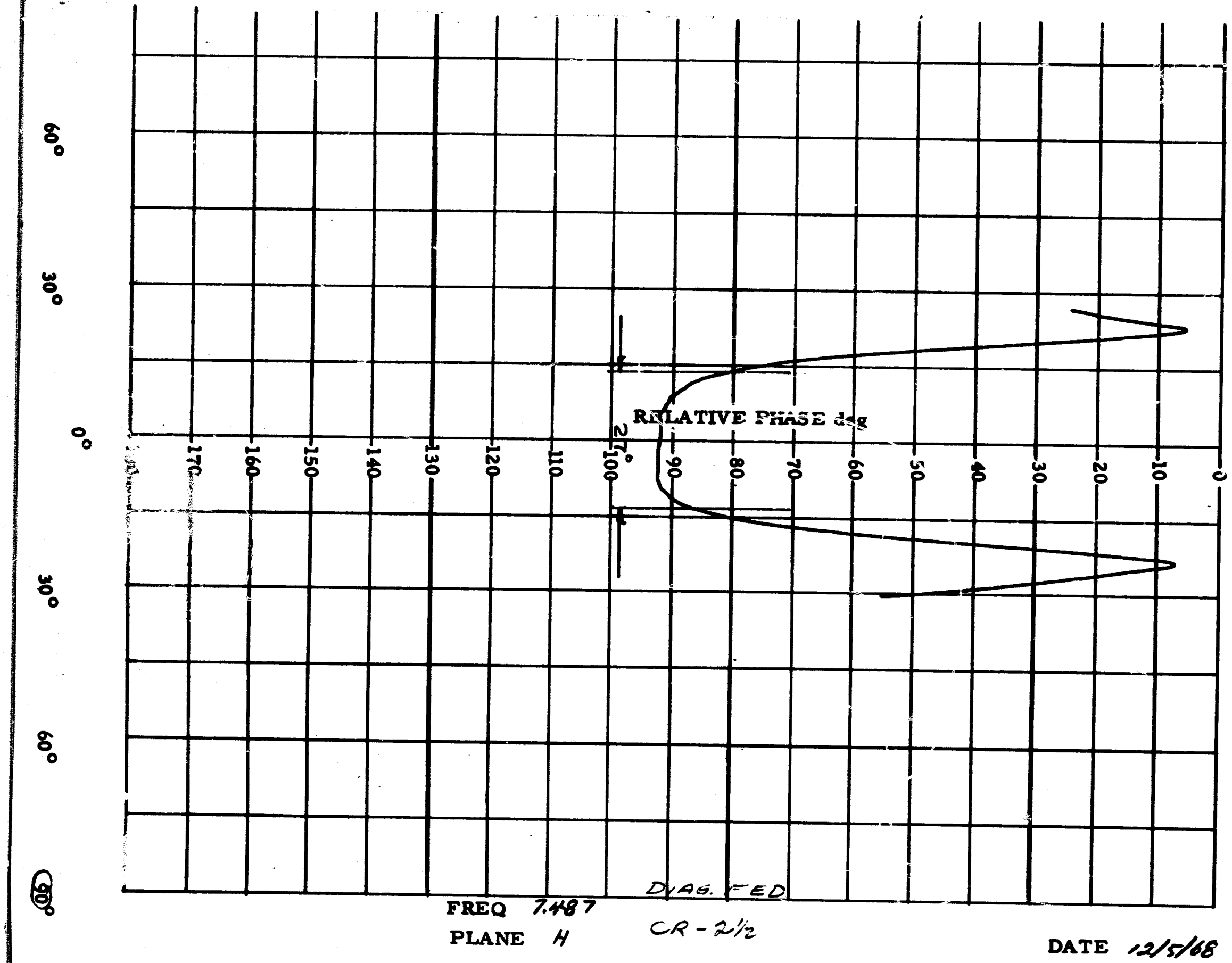


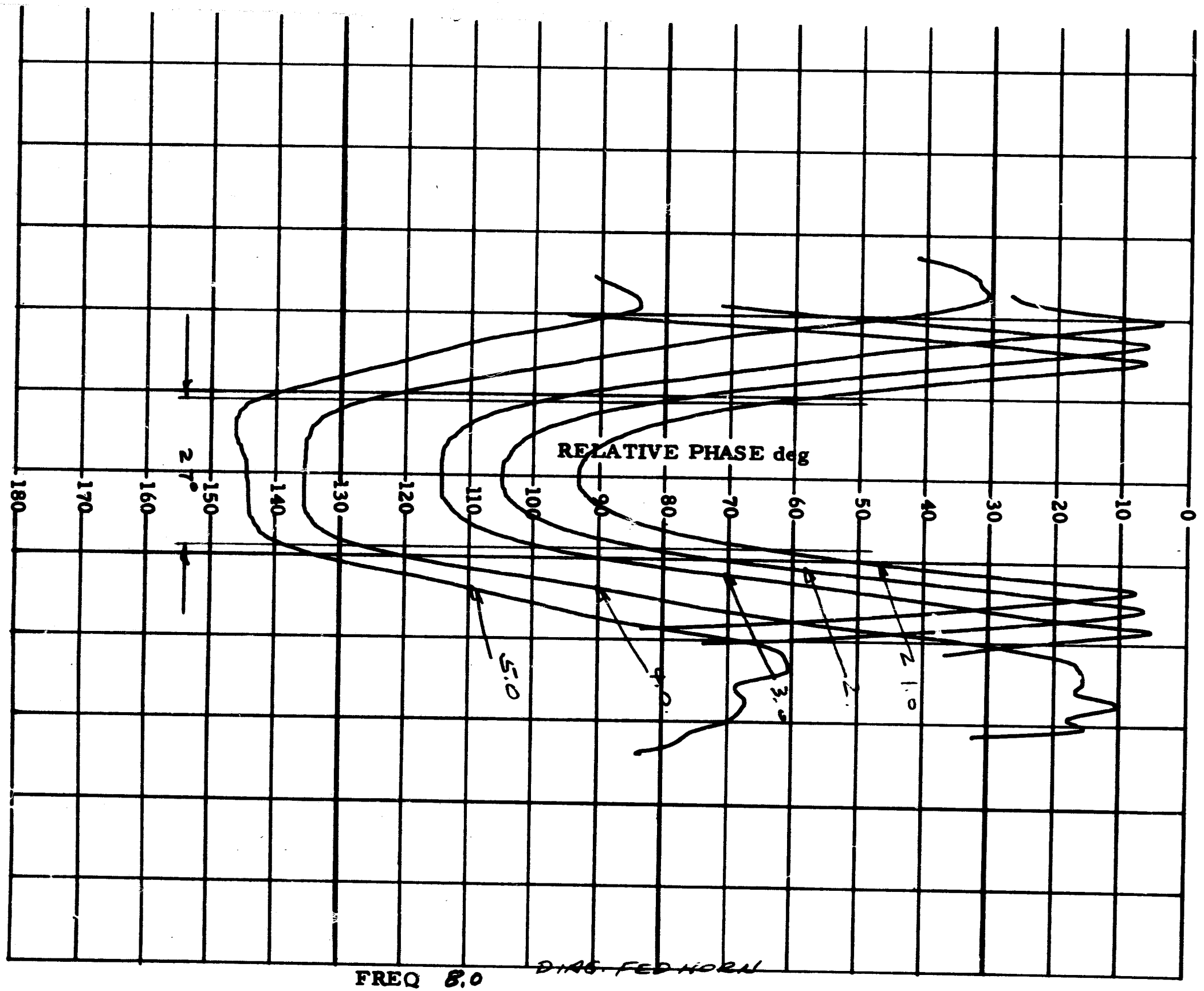
DIOG FED

FREQ 7.487

PLANE 45° CR = -2½

DATE 12/5/66

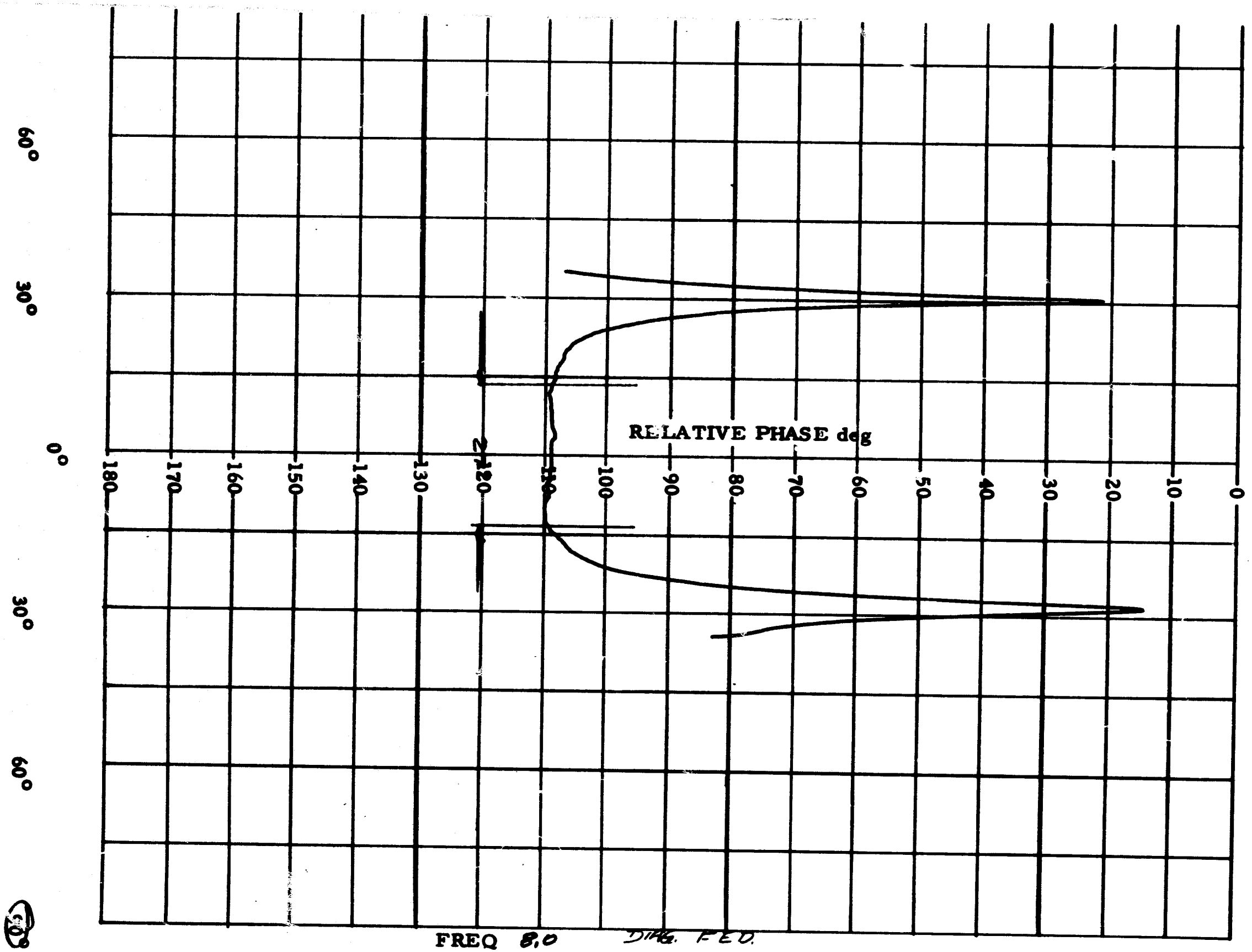

60°
30°
0°
RELATIVE PHASE deg
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
270°
30°
60°
90°
DIAG. FED
FREQ 7.487
PLANE H
CR - 2½
DATE 12/5/68



FREQ 8.0 DIAG. FED HORN

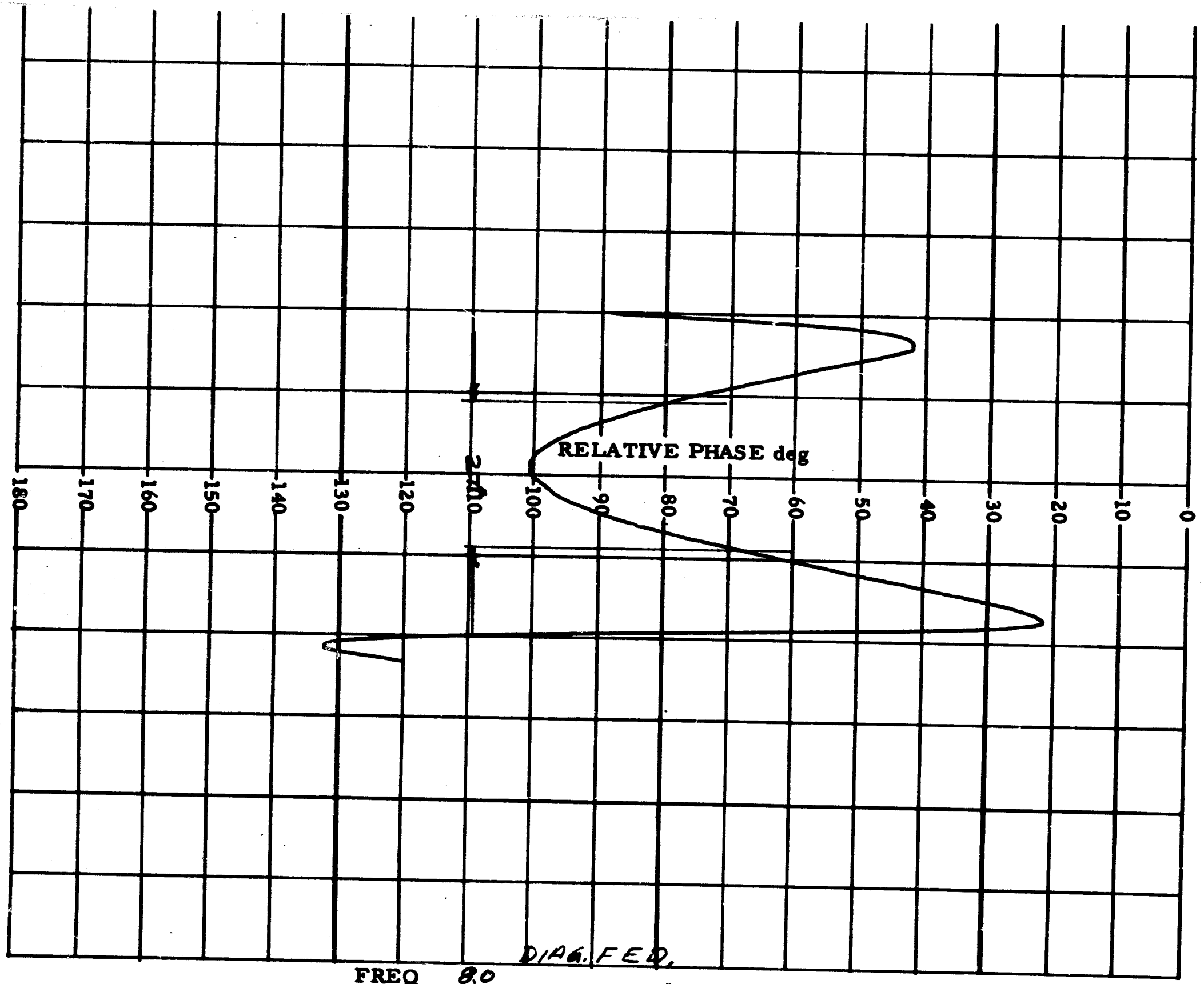
PLANE H CR AS MACKED BEHIND APERTURE

DATE 12/5/68



FREQ 8.0 DIAG. FED.

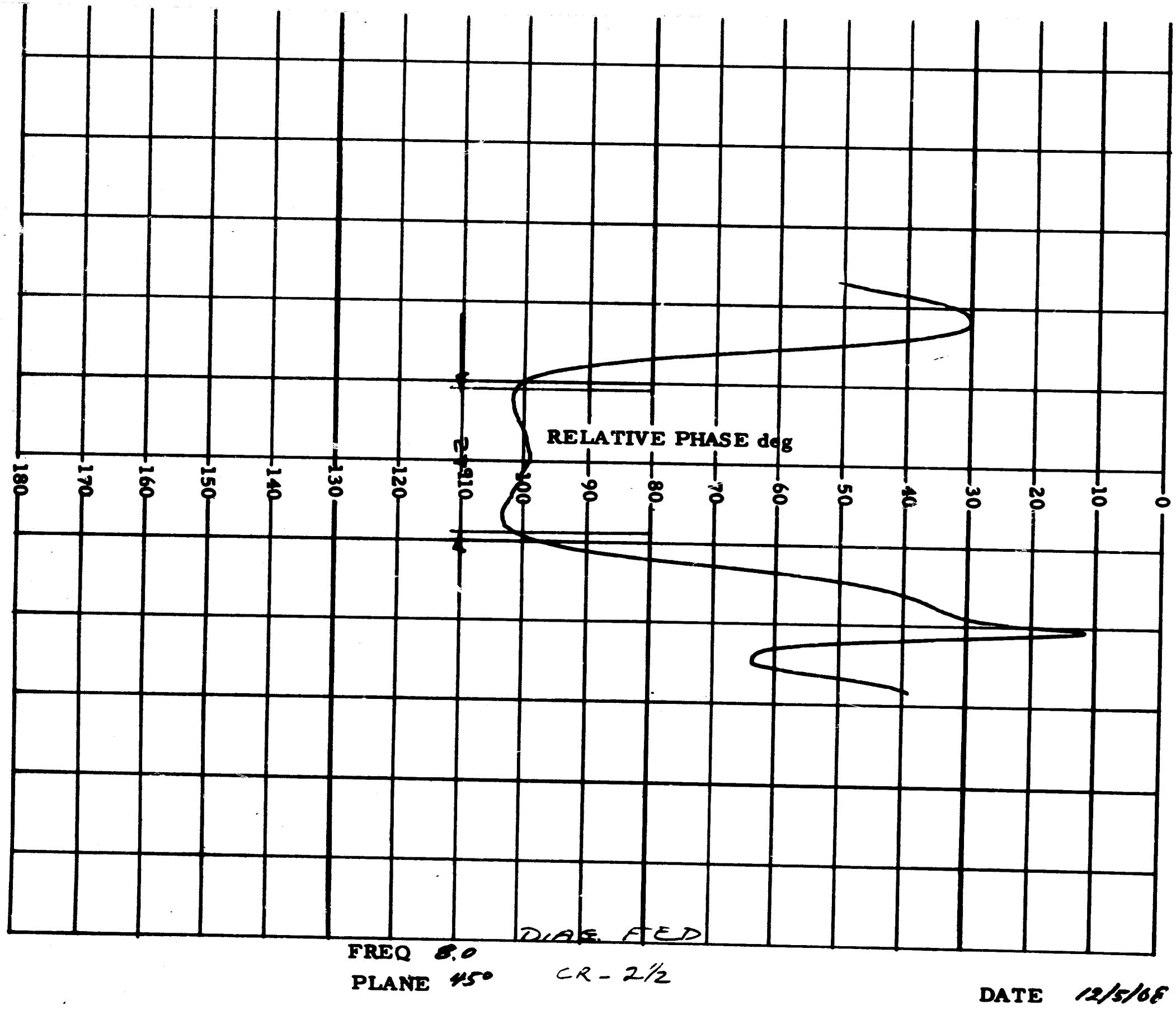
PLANE E CR 1.0" INFRONT OF APERTURE DATE 12/5/68

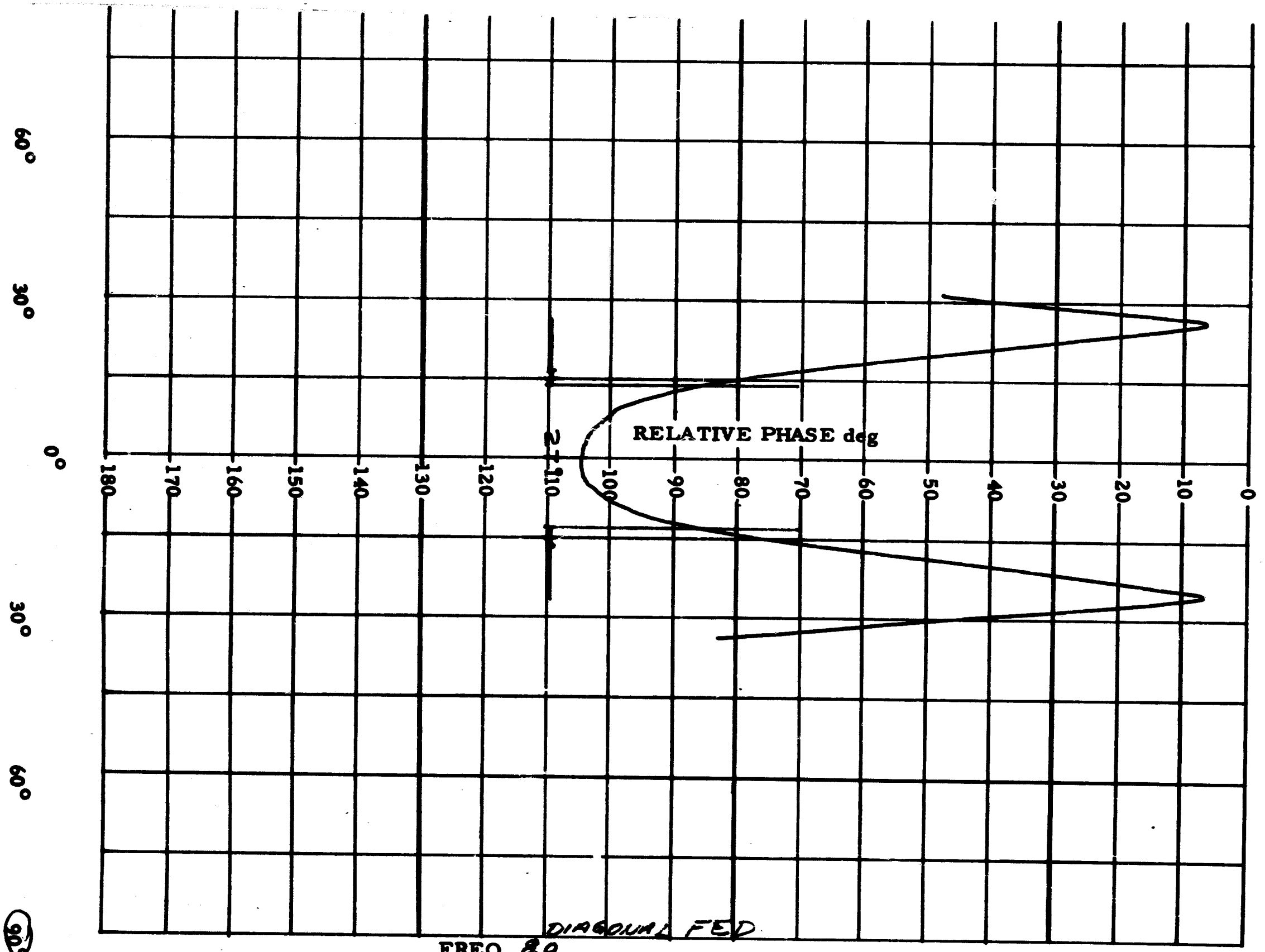


FREQ 8.0 DIAG. FED.

PLANE E CR - 2½"

DATE 12/5/66

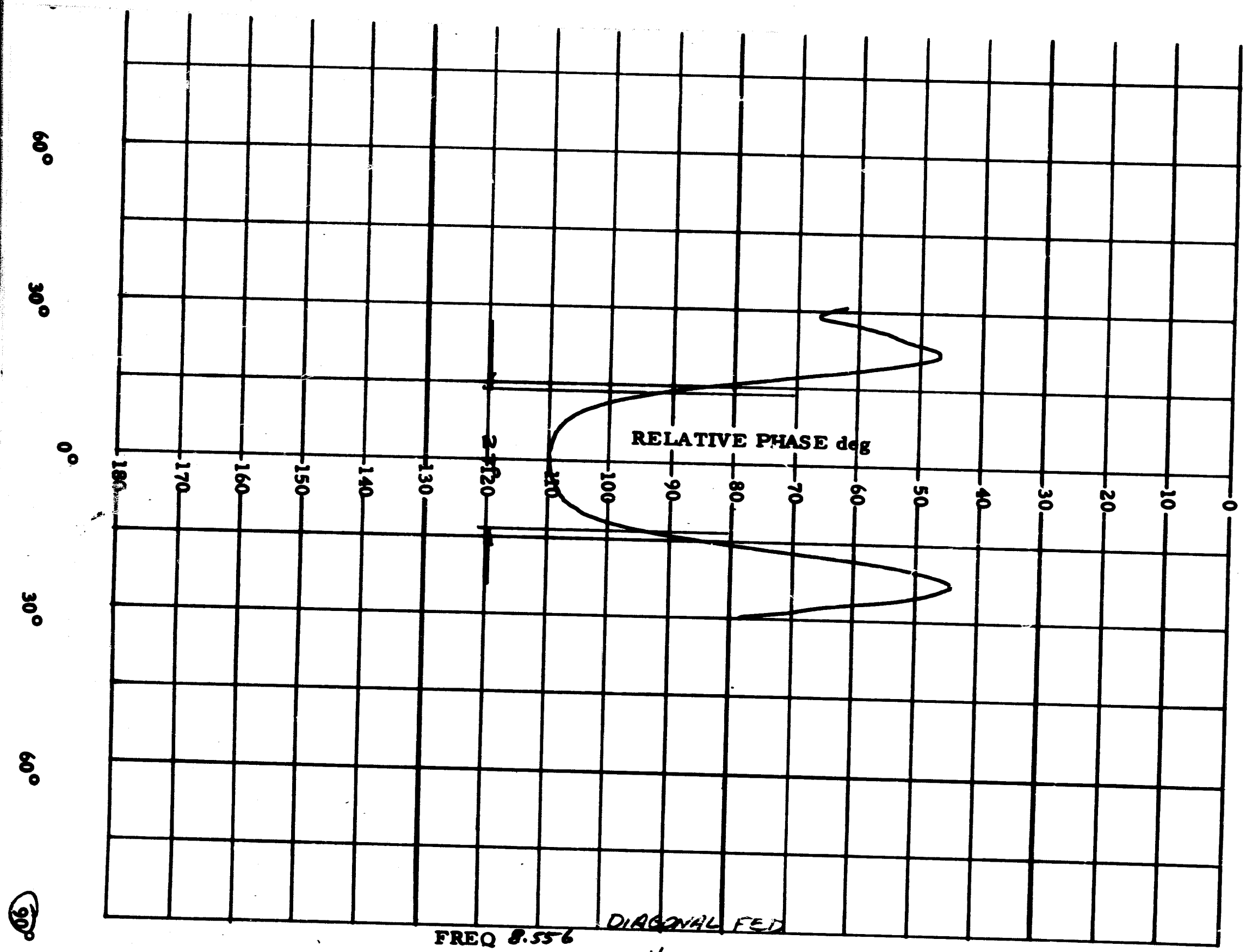

60°
30°
0°
RELATIVE PHASE deg
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
30°
60°
90°
DIAG. FED
FREQ 8.0
PLANE 45°
CR - 2½
DATE 12/5/66



FREQ 8.0 DIAGONAL FED

PLANE H CR - 2½

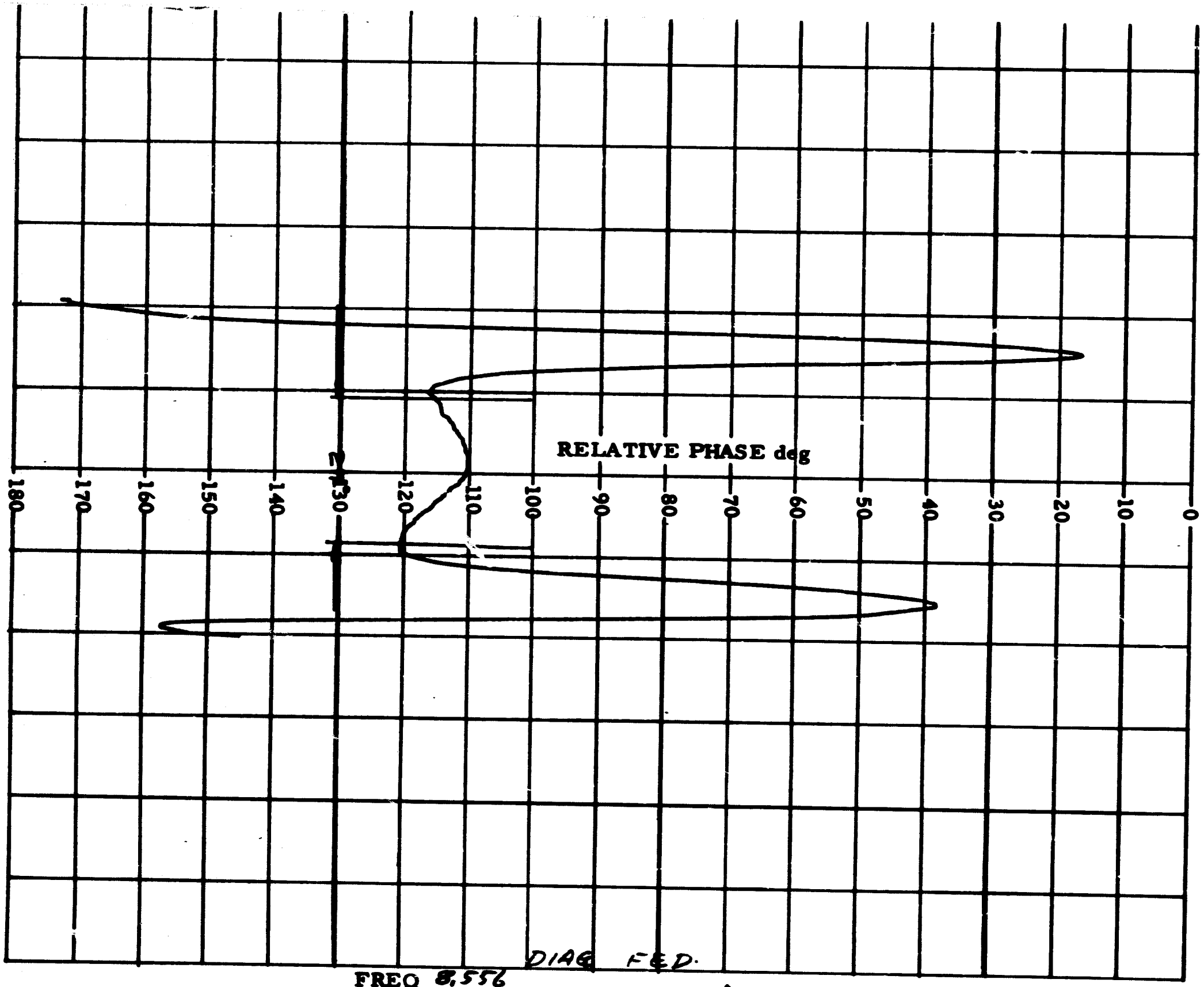
DATE 12/5/66



FREQ 8.556

PLANE H CR-2½

DATE 12/5/68



DIAG FED.

FREQ 8.556

PLANE #5° CR - 2½°

DATE 12/5/68

APPENDIX IV - D

RECTANGULAR MULTIMODE HORN - DIAG. FED COMPUTER EFFICIENCY DATA

Legend

PSI	-	Polar Angle
ETA	-	Total Aperture Efficiency
ETS	-	Spillover Efficiency
ETI	-	Illumination Efficiency
ETX	-	Cross Polarization Efficiency
ETP	-	Phase Error Efficiency
ETB	-	Blockage Efficiency
E	-	E-Plane Pattern (dB)
EP	-	E-Plane Phase (deg)
H	-	H-Plane Pattern (dB)
HP	-	H-Plane Phase (deg)

JPL RECT FEED DIAG FED 6.82 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 15
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.002	0.002	0.991	1.000	1.000	1.000	0.0	0.0	0.1	0.0
1.00	0.009	0.009	0.997	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.50	0.019	0.019	0.999	1.000	1.000	1.000	0.1	0.0	0.2	0.0
2.00	0.034	0.034	0.999	1.000	1.000	1.000	0.1	0.0	0.3	0.0
2.50	0.053	0.053	0.999	1.000	1.000	1.000	0.2	0.0	0.3	0.0
3.00	0.075	0.075	1.000	1.000	1.000	1.000	0.2	0.0	0.4	0.0
3.50	0.101	0.101	1.000	1.000	1.000	1.000	0.3	0.0	0.6	0.0
4.00	0.130	0.130	0.999	1.000	1.000	1.000	0.5	0.0	0.8	0.0
4.50	0.162	0.162	0.999	1.000	1.000	1.000	0.6	0.0	1.0	0.0
5.00	0.196	0.196	0.999	1.000	1.000	1.000	0.7	0.0	1.2	0.0
5.50	0.232	0.232	0.998	1.000	1.000	1.000	0.9	0.0	1.4	0.0
6.00	0.270	0.270	0.998	1.000	1.000	1.000	1.0	0.0	1.6	0.0
6.50	0.309	0.310	0.997	0.999	1.000	1.000	1.2	0.0	2.0	0.0
7.00	0.348	0.349	0.996	0.999	1.000	1.000	1.5	0.0	2.3	0.0
7.50	0.386	0.389	0.995	0.999	1.000	1.000	1.7	0.0	2.7	0.0
8.00	0.425	0.428	0.993	0.999	1.000	1.000	2.0	0.0	3.1	0.0
8.50	0.463	0.467	0.991	0.999	1.000	1.000	2.2	0.0	3.4	0.0
9.00	0.500	0.506	0.989	0.998	1.000	1.000	2.5	0.0	3.8	0.0
9.50	0.535	0.544	0.986	0.998	1.000	1.000	2.8	0.0	4.3	0.0
10.00	0.569	0.580	0.983	0.998	1.000	1.000	3.2	0.0	4.7	0.0
10.50	0.601	0.615	0.979	0.997	1.000	1.000	3.5	0.0	5.2	0.0
11.00	0.631	0.649	0.975	0.997	1.000	1.000	3.8	0.0	5.7	0.0
11.50	0.659	0.681	0.971	0.997	1.000	1.000	4.2	0.0	6.1	0.0
12.00	0.685	0.712	0.966	0.996	1.000	1.000	4.5	0.0	6.6	0.0
12.50	0.708	0.741	0.960	0.996	1.000	1.000	5.0	0.0	7.2	0.0
13.00	0.728	0.767	0.954	0.995	1.000	1.000	5.5	0.0	7.9	0.0
13.50	0.745	0.791	0.946	0.995	1.000	1.000	5.9	0.0	8.5	0.0
14.00	0.759	0.813	0.938	0.994	1.000	1.000	6.4	0.0	9.2	0.0
14.50	0.770	0.833	0.929	0.994	1.000	1.000	6.9	0.0	9.8	0.0
15.00	0.778	0.852	0.920	0.993	1.000	1.000	7.4	0.0	10.5	0.0
15.50	0.785	0.869	0.910	0.993	1.000	1.000	7.9	0.0	11.2	0.0
16.00	0.789	0.884	0.899	0.992	1.000	1.000	8.4	0.0	11.9	0.0
16.50	0.790	0.898	0.888	0.992	1.000	1.000	8.9	0.0	12.5	0.0
17.00	0.791	0.910	0.876	0.991	1.000	1.000	9.4	0.0	13.2	0.0
17.50	0.789	0.922	0.864	0.991	1.000	1.000	9.9	0.0	13.9	0.0
18.00	0.786	0.932	0.851	0.990	1.000	1.000	10.4	0.0	14.6	0.0
18.50	0.781	0.941	0.838	0.990	1.000	1.000	11.1	[illegible]	15.4	0.0
19.00	0.774	0.949	0.824	0.990	1.000	1.000	11.8	[illegible]	16.1	0.0
19.50	0.766	0.956	0.810	0.989	1.000	1.000	12.5	0.0	16.9	0.0
20.00	0.756	0.962	0.795	0.989	1.000	1.000	13.3	0.0	17.7	0.0
20.50	0.746	0.967	0.780	0.989	1.000	1.000	14.0	0.0	18.4	0.0
21.00	0.734	0.971	0.764	0.988	1.000	1.000	[illegible]7	0.0	19.2	0.0
21.50	0.721	0.975	0.748	0.988	1.000	1.000	[illegible]6	0.0	19.8	0.0
22.00	0.708	0.979	0.732	0.988	1.000	1.000	[illegible]4	0.0	20.3	0.0
22.50	0.694	0.981	0.716	0.988	1.000	1.000	17.[illegible]	0.0	20.9	0.0
23.00	0.680	0.984	0.700	0.988	1.000	1.000	18.2	0.0	21.5	0.0
23.50	0.666	0.986	0.683	0.988	1.000	1.000	19.0	0.0	22.0	0.0

FINAL JPL CONICAL FEED E & H PLANE 8.6 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 18
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.013	0.013	0.997	1.000	1.000	1.000	0.2	0.0	0.1	0.0
1.50	0.028	0.028	0.999	1.000	1.000	1.000	0.3	0.0	0.2	0.0
2.00	0.049	0.049	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.50	0.076	0.076	0.999	1.000	1.000	1.000	0.4	0.0	0.3	0.0
3.00	0.108	0.108	0.999	1.000	1.000	1.000	0.5	0.0	0.4	0.0
3.50	0.144	0.144	0.999	1.000	1.000	1.000	0.8	0.0	0.6	0.0
4.00	0.184	0.184	0.999	1.000	1.000	1.000	1.1	0.0	0.8	0.0
4.50	0.227	0.227	0.998	1.000	1.000	1.000	1.3	0.0	1.0	0.0
5.00	0.272	0.272	0.998	1.000	1.000	1.000	1.6	0.0	1.2	0.0
5.50	0.318	0.319	0.997	1.000	1.000	1.000	1.9	0.0	1.4	0.0
6.00	0.367	0.368	0.996	1.000	1.000	1.000	2.2	0.0	1.6	0.0
6.50	0.415	0.418	0.994	1.000	1.000	1.000	2.7	0.0	1.9	0.0
7.00	0.463	0.467	0.992	0.999	1.000	1.000	3.1	0.0	2.3	0.0
7.50	0.509	0.515	0.990	0.999	1.000	1.000	3.6	0.0	2.6	0.0
8.00	0.553	0.561	0.987	0.999	1.000	1.000	4.1	0.0	2.9	0.0
8.50	0.596	0.607	0.983	0.999	1.000	1.000	4.5	0.0	3.3	0.0
9.00	0.636	0.651	0.980	0.998	1.000	1.000	5.0	0.0	3.6	0.0
9.50	0.674	0.692	0.975	0.998	1.000	1.000	5.7	0.0	4.1	0.0
10.00	0.706	0.730	0.969	0.998	1.000	1.000	6.5	0.0	4.7	0.0
10.50	0.733	0.765	0.962	0.997	1.000	1.000	7.2	0.0	5.2	0.0
11.00	0.756	0.796	0.953	0.997	1.000	1.000	8.0	0.0	5.7	0.0
11.50	0.775	0.824	0.944	0.996	1.000	1.000	8.7	0.0	6.3	0.0
12.00	0.790	0.850	0.934	0.996	1.000	1.000	9.5	0.0	6.8	0.0
12.50	0.801	0.873	0.922	0.995	1.000	1.000	10.5	0.0	7.5	0.0
13.00	0.807	0.893	0.909	0.995	1.000	1.000	11.5	0.0	8.3	0.0
13.50	0.809	0.910	0.895	0.994	1.000	1.000	12.5	0.0	9.0	0.0
14.00	0.807	0.924	0.879	0.993	1.000	1.000	13.6	0.0	9.7	0.0
14.50	0.802	0.936	0.862	0.993	1.000	1.000	14.6	0.0	10.5	0.0
15.00	0.794	0.947	0.845	0.992	1.000	1.000	15.6	0.0	11.2	0.0
15.50	0.783	0.956	0.826	0.992	1.000	1.000	16.9	0.0	12.2	0.0
16.00	0.770	0.963	0.806	0.991	1.000	1.000	18.3	0.0	13.2	0.0
16.50	0.754	0.969	0.785	0.991	1.000	1.000	19.6	0.0	14.1	0.0
17.00	0.737	0.974	0.764	0.991	1.000	1.000	20.9	0.0	15.1	0.0
17.50	0.718	0.977	0.742	0.990	1.000	1.000	22.3	0.0	16.1	0.0
18.00	0.698	0.980	0.719	0.990	1.000	1.000	23.6	0.0	17.1	0.0
18.50	0.678	0.983	0.697	0.990	1.000	1.000	24.7	0.0	18.3	0.0
19.00	0.657	0.985	0.675	0.989	1.000	1.000	25.8	0.0	19.5	0.0
19.50	0.636	0.986	0.652	0.989	1.000	1.000	26.9	0.0	20.7	0.0
20.00	0.615	0.987	0.630	0.989	1.000	1.000	28.1	0.0	22.0	0.0
20.50	0.595	0.988	0.609	0.989	1.000	1.000	29.2	0.0	23.2	0.0
21.00	0.574	0.989	0.587	0.989	1.000	1.000	30.3	0.0	24.4	0.0
21.50	0.555	0.989	0.567	0.989	1.000	1.000	31.1	0.0	25.0	0.0
22.00	0.536	0.990	0.547	0.989	1.000	1.000	32.0	0.0	25.6	0.0
22.50	0.518	0.990	0.529	0.989	1.000	1.000	32.8	0.0	26.2	0.0
23.00	0.500	0.991	0.511	0.989	1.000	1.000	33.7	0.0	26.9	0.0
23.50	0.483	0.991	0.493	0.989	1.000	1.000	34.5	0.0	27.5	0.0
24.00	0.467	0.991	0.477	0.989	1.000	1.000	35.4	0.0	28.1	0.0
24.50	0.452	0.991	0.461	0.989	1.000	1.000	37.2	0.0	28.1	0.0

FINAL JPL CONICAL FEED E & H PLANE 8.0 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 16
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.012	0.012	0.997	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.50	0.027	0.027	0.999	1.000	1.000	1.000	0.2	0.0	0.2	0.0
2.00	0.047	0.047	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.50	0.073	0.073	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
3.00	0.104	0.104	0.999	1.000	1.000	1.000	0.4	0.0	0.4	0.0
3.50	0.139	0.139	0.999	1.000	1.000	1.000	0.6	0.0	0.6	0.0
4.00	0.178	0.178	0.999	1.000	1.000	1.000	0.9	0.0	0.8	0.0
4.50	0.220	0.220	0.999	1.000	1.000	1.000	1.1	0.0	1.0	0.0
5.00	0.264	0.264	0.998	1.000	1.000	1.000	1.4	0.0	1.2	0.0
5.50	0.310	0.311	0.997	1.000	1.000	1.000	1.6	0.0	1.4	0.0
6.00	0.358	0.359	0.996	1.000	1.000	1.000	1.9	0.0	1.6	0.0
6.50	0.406	0.408	0.995	1.000	1.000	1.000	2.3	0.0	1.9	0.0
7.00	0.454	0.457	0.993	1.000	1.000	1.000	2.7	0.0	2.3	0.0
7.50	0.500	0.505	0.991	1.000	1.000	1.000	3.1	0.0	2.6	0.0
8.00	0.545	0.551	0.988	1.000	1.000	1.000	3.6	0.0	3.0	0.0
8.50	0.588	0.597	0.985	1.000	1.000	1.000	4.0	0.0	3.3	0.0
9.00	0.629	0.641	0.981	1.000	1.000	1.000	4.4	0.0	3.7	0.0
9.50	0.667	0.683	0.977	1.000	1.000	1.000	5.0	0.0	4.3	0.0
10.00	0.701	0.721	0.972	0.999	1.000	1.000	5.6	0.0	4.8	0.0
10.50	0.730	0.757	0.965	0.999	1.000	1.000	6.2	0.0	5.4	0.0
11.00	0.755	0.789	0.958	0.999	1.000	1.000	6.8	0.0	6.0	0.0
11.50	0.777	0.819	0.949	0.999	1.000	1.000	7.4	0.0	6.5	0.0
12.00	0.795	0.846	0.940	0.999	1.000	1.000	8.0	0.0	7.1	0.0
12.50	0.809	0.870	0.930	0.999	1.000	1.000	8.8	0.0	7.8	0.0
13.00	0.818	0.891	0.918	0.999	1.000	1.000	9.7	0.0	8.5	0.0
13.50	0.823	0.910	0.905	0.999	1.000	1.000	10.5	0.0	9.2	0.0
14.00	0.824	0.925	0.891	0.999	1.000	1.000	11.4	0.0	10.0	0.0
14.50	0.822	0.939	0.876	0.999	1.000	1.000	12.2	0.0	10.7	0.0
15.00	0.817	0.951	0.861	0.999	1.000	1.000	13.1	0.0	11.4	0.0
15.50	0.809	0.961	0.843	0.999	1.000	1.000	14.3	0.0	12.5	0.0
16.00	0.798	0.969	0.825	0.999	1.000	1.000	15.5	0.0	13.6	0.0
16.50	0.784	0.975	0.805	0.998	1.000	1.000	16.6	0.0	14.6	0.0
17.00	0.767	0.980	0.784	0.998	1.000	1.000	17.8	0.0	15.7	0.0
17.50	0.749	0.984	0.762	0.998	1.000	1.000	19.0	0.0	16.8	0.0
18.00	0.730	0.987	0.740	0.998	1.000	1.000	20.2	0.0	17.9	0.0
18.50	0.709	0.990	0.718	0.998	1.000	1.000	21.6	0.0	19.3	0.0
19.00	0.687	0.992	0.694	0.998	1.000	1.000	23.0	0.0	20.8	0.0
19.50	0.665	0.993	0.671	0.998	1.000	1.000	24.4	0.0	22.2	0.0
20.00	0.643	0.994	0.648	0.998	1.000	1.000	25.8	0.0	23.7	0.0
20.50	0.620	0.995	0.625	0.998	1.000	1.000	27.2	0.0	25.1	0.0
21.00	0.598	0.995	0.602	0.998	1.000	1.000	28.6	0.0	26.6	0.0
21.50	0.577	0.996	0.581	0.998	1.000	1.000	29.5	0.0	27.3	0.0
22.00	0.556	0.996	0.560	0.998	1.000	1.000	30.4	0.0	28.1	0.0
22.50	0.537	0.996	0.540	0.998	1.000	1.000	31.3	0.0	28.8	0.0
23.00	0.518	0.996	0.520	0.998	1.000	1.000	32.2	0.0	29.5	0.0
23.50	0.500	0.997	0.502	0.998	1.000	1.000	33.1	0.0	30.3	0.0
24.00	0.482	0.997	0.485	0.998	1.000	1.000	34.0	0.0	31.0	0.0
24.50	0.466	0.997	0.468	0.998	1.000	1.000	36.0	0.0	30.9	0.0

FINAL JPL CONICAL FEED E & H PLANE 9.0 GHZ

B-9A

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 16
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.013	0.013	0.997	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.50	0.029	0.029	0.999	1.000	1.000	1.000	0.2	0.0	0.2	0.0
2.00	0.052	0.052	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.50	0.080	0.080	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
3.00	0.114	0.114	0.999	1.000	1.000	1.000	0.4	0.0	0.4	0.0
3.50	0.153	0.153	0.999	1.000	1.000	1.000	0.6	0.0	0.6	0.0
4.00	0.195	0.195	0.999	1.000	1.000	1.000	0.9	0.0	0.9	0.0
4.50	0.240	0.241	0.998	1.000	1.000	1.000	1.1	0.0	1.1	0.0
5.00	0.288	0.288	0.998	1.000	1.000	1.000	1.4	0.0	1.4	0.0
5.50	0.337	0.338	0.997	1.000	1.000	1.000	1.6	0.0	1.6	0.0
6.00	0.388	0.390	0.996	1.000	1.000	1.000	1.9	0.0	1.9	0.0
6.50	0.439	0.441	0.994	1.000	1.000	1.000	2.3	0.0	2.3	0.0
7.00	0.488	0.492	0.992	1.000	1.000	1.000	2.8	0.0	2.8	0.0
7.50	0.535	0.541	0.989	1.000	1.000	1.000	3.2	0.0	3.2	0.0
8.00	0.580	0.589	0.985	1.000	1.000	1.000	3.6	0.0	3.6	0.0
8.50	0.623	0.634	0.981	1.000	1.000	1.000	4.1	0.0	4.1	0.0
9.00	0.663	0.678	0.977	1.000	1.000	1.000	4.5	0.0	4.5	0.0
9.50	0.699	0.719	0.972	1.000	1.000	1.000	5.1	0.0	5.1	0.0
10.00	0.730	0.757	0.965	1.000	1.000	1.000	5.7	0.0	5.8	0.0
10.50	0.757	0.791	0.957	1.000	1.000	1.000	6.3	0.0	6.4	0.0
11.00	0.779	0.821	0.948	1.000	1.000	1.000	7.0	0.0	7.1	0.0
11.50	0.797	0.849	0.938	1.000	1.000	1.000	7.6	0.0	7.7	0.0
12.00	0.811	0.874	0.928	1.000	1.000	1.000	8.2	0.0	8.4	0.0
12.50	0.821	0.896	0.916	1.000	1.000	1.000	9.0	0.0	9.3	0.0
13.00	0.826	0.915	0.902	1.000	1.000	1.000	9.9	0.0	10.2	0.0
13.50	0.826	0.931	0.887	1.000	1.000	1.000	10.7	0.0	11.0	0.0
14.00	0.823	0.945	0.871	1.000	1.000	1.000	11.6	0.0	11.9	0.0
14.50	0.816	0.956	0.854	1.000	1.000	1.000	12.4	0.0	12.8	0.0
15.00	0.807	0.966	0.836	1.000	1.000	1.000	13.3	0.0	13.7	0.0
15.50	0.795	0.974	0.816	1.000	1.000	1.000	14.4	0.0	15.2	0.0
16.00	0.779	0.980	0.795	1.000	1.000	1.000	15.6	0.0	16.7	0.0
16.50	0.761	0.984	0.773	1.000	1.000	1.000	16.7	0.0	18.2	0.0
17.00	0.740	0.988	0.750	1.000	1.000	1.000	17.9	0.0	19.7	0.0
17.50	0.719	0.990	0.726	1.000	1.000	1.000	19.0	0.0	21.2	0.0
18.00	0.696	0.993	0.702	1.000	1.000	1.000	20.2	0.0	22.7	0.0
18.50	0.673	0.994	0.677	1.000	1.000	1.000	21.9	0.0	24.9	0.0
19.00	0.649	0.995	0.652	1.000	1.000	1.000	23.7	0.0	27.1	0.0
19.50	0.624	0.996	0.627	1.000	1.000	1.000	25.4	0.0	29.3	0.0
20.00	0.600	0.996	0.602	1.000	1.000	1.000	27.1	0.0	31.6	0.0
20.50	0.576	0.996	0.578	1.000	1.000	1.000	28.9	0.0	33.8	0.0
21.00	0.552	0.997	0.554	1.000	1.000	1.000	30.6	0.0	36.0	0.0
21.50	0.530	0.997	0.532	1.000	1.000	1.000	34.3	0.0	35.0	0.0
22.00	0.508	0.997	0.510	1.000	1.000	1.000	38.1	0.0	34.0	0.0
22.50	0.488	0.997	0.490	1.000	1.000	1.000	41.8	0.0	33.0	0.0
23.00	0.469	0.997	0.470	1.000	1.000	1.000	45.5	0.0	32.0	0.0
23.50	0.451	0.997	0.452	1.000	1.000	1.000	49.3	0.0	31.0	0.0
24.00	0.434	0.997	0.436	1.000	1.000	1.000	53.0	0.0	30.0	0.0
24.50	0.419	0.997	0.420	0.999	1.000	1.000	51.8	0.0	30.2	0.0

FINAL JPL CONICAL FEED E & H PLANE 9.164 GHZ

41A

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 16
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.004	0.004	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.014	0.014	0.997	1.000	1.000	1.000	0.1	0.0	0.2	0.0
1.50	0.031	0.031	0.999	1.000	1.000	1.000	0.2	0.0	0.3	0.0
2.00	0.055	0.055	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.50	0.085	0.085	0.999	1.000	1.000	1.000	0.3	0.0	0.4	0.0
3.00	0.121	0.121	0.999	1.000	1.000	1.000	0.4	0.0	0.5	0.0
3.50	0.161	0.162	0.999	1.000	1.000	1.000	0.6	0.0	0.8	0.0
4.00	0.206	0.206	0.999	1.000	1.000	1.000	0.9	0.0	1.0	0.0
4.50	0.253	0.253	0.998	1.000	1.000	1.000	1.1	0.0	1.3	0.0
5.00	0.302	0.303	0.997	1.000	1.000	1.000	1.4	0.0	1.6	0.0
5.50	0.354	0.355	0.996	1.000	1.000	1.000	1.6	0.0	1.8	0.0
6.00	0.407	0.409	0.995	1.000	1.000	1.000	1.9	0.0	2.1	0.0
6.50	0.459	0.462	0.994	1.000	1.000	1.000	2.3	0.0	2.6	0.0
7.00	0.510	0.515	0.991	1.000	1.000	1.000	2.7	0.0	3.1	0.0
7.50	0.558	0.565	0.988	1.000	1.000	1.000	3.1	0.0	3.6	0.0
8.00	0.604	0.614	0.984	1.000	1.000	1.000	3.6	0.0	4.1	0.0
8.50	0.646	0.660	0.980	1.000	1.000	1.000	4.0	0.0	4.6	0.0
9.00	0.686	0.704	0.975	1.000	1.000	1.000	4.4	0.0	5.1	0.0
9.50	0.722	0.745	0.969	1.000	1.000	1.000	5.0	0.0	5.9	0.0
10.00	0.751	0.782	0.961	0.999	1.000	1.000	5.7	0.0	6.7	0.0
10.50	0.775	0.815	0.952	0.999	1.000	1.000	6.3	0.0	7.5	0.0
11.00	0.794	0.844	0.942	0.999	1.000	1.000	6.9	0.0	8.3	0.0
11.50	0.809	0.870	0.930	0.999	1.000	1.000	7.6	0.0	9.1	0.0
12.00	0.819	0.893	0.918	0.999	1.000	1.000	8.2	0.0	9.9	0.0
12.50	0.824	0.913	0.904	0.999	1.000	1.000	9.1	0.0	11.0	0.0
13.00	0.824	0.930	0.888	0.998	1.000	1.000	10.0	0.0	12.1	0.0
13.50	0.819	0.943	0.870	0.998	1.000	1.000	10.9	0.0	13.2	0.0
14.00	0.811	0.955	0.851	0.998	1.000	1.000	11.8	0.0	14.3	0.0
14.50	0.800	0.964	0.831	0.998	1.000	1.000	12.7	0.0	15.4	0.0
15.00	0.786	0.972	0.811	0.998	1.000	1.000	13.6	0.0	16.5	0.0
15.50	0.768	0.978	0.788	0.997	1.000	1.000	14.8	0.0	19.7	0.0
16.00	0.746	0.982	0.763	0.997	1.000	1.000	16.1	0.0	23.0	0.0
16.50	0.722	0.985	0.736	0.997	1.000	1.000	17.3	0.0	26.2	0.0
17.00	0.696	0.987	0.708	0.996	1.000	1.000	18.5	0.0	29.5	0.0
17.50	0.669	0.988	0.680	0.996	1.000	1.000	19.8	0.0	32.7	0.0
18.00	0.643	0.989	0.653	0.995	1.000	1.000	21.0	0.0	36.0	0.0
18.50	0.617	0.990	0.626	0.995	1.000	1.000	23.1	0.0	34.7	0.0
19.00	0.592	0.991	0.600	0.995	1.000	1.000	25.2	0.0	33.3	0.0
19.50	0.568	0.991	0.576	0.995	1.000	1.000	27.3	0.0	32.0	0.0
20.00	0.545	0.992	0.552	0.995	1.000	1.000	29.5	0.0	30.7	0.0
20.50	0.523	0.992	0.530	0.995	1.000	1.000	31.6	0.0	29.3	0.0
21.00	0.503	0.992	0.510	0.995	1.000	1.000	33.7	0.0	28.0	0.0
21.50	0.484	0.992	0.491	0.995	1.000	1.000	36.9	0.0	27.5	0.0
22.00	0.467	0.993	0.473	0.995	1.000	1.000	40.1	0.0	26.9	0.0
22.50	0.450	0.993	0.456	0.995	1.000	1.000	43.3	0.0	26.4	0.0
23.00	0.434	0.993	0.440	0.995	1.000	1.000	46.6	0.0	25.9	0.0
23.50	0.420	0.994	0.425	0.994	1.000	1.000	49.8	0.0	25.3	0.0
24.00	0.407	0.994	0.411	0.994	1.000	1.000	53.0	0.0	24.8	0.0
24.50	0.394	0.995	0.398	0.994	1.000	1.000	51.8	0.0	25.1	0.0

FINAL JPL CONICAL FEED E & H PLANE 9.2 GHZ

INPUT DATA ANC CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 16
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.004	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.014	0.014	0.997	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.50	0.031	0.031	0.999	1.000	1.000	1.000	0.2	0.0	0.2	0.0
2.00	0.055	0.055	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.50	0.085	0.085	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
3.00	0.121	0.121	0.999	1.000	1.000	1.000	0.4	0.0	0.4	0.0
3.50	0.162	0.162	0.999	1.000	1.000	1.000	0.6	0.0	0.7	0.0
4.00	0.206	0.206	0.999	1.000	1.000	1.000	0.9	0.0	1.0	0.0
4.50	0.254	0.254	0.998	1.000	1.000	1.000	1.1	0.0	1.2	0.0
5.00	0.303	0.304	0.998	1.000	1.000	1.000	1.3	0.0	1.5	0.0
5.50	0.355	0.356	0.997	1.000	1.000	1.000	1.6	0.0	1.8	0.0
6.00	0.408	0.410	0.995	1.000	1.000	1.000	1.8	0.0	2.1	0.0
6.50	0.461	0.464	0.994	1.000	1.000	1.000	2.2	0.0	2.6	0.0
7.00	0.512	0.516	0.991	1.000	1.000	1.000	2.6	0.0	3.1	0.0
7.50	0.560	0.567	0.988	1.000	1.000	1.000	3.0	0.0	3.6	0.0
8.00	0.605	0.615	0.984	1.000	1.000	1.000	3.5	0.0	4.2	0.0
8.50	0.648	0.662	0.979	1.000	1.000	1.000	3.9	0.0	4.7	0.0
9.00	0.687	0.706	0.974	0.999	1.000	1.000	4.3	0.0	5.2	0.0
9.50	0.722	0.747	0.968	0.999	1.000	1.000	4.9	0.0	6.0	0.0
10.00	0.751	0.783	0.960	0.999	1.000	1.000	5.6	0.0	6.8	0.0
10.50	0.775	0.815	0.951	0.999	1.000	1.000	6.2	0.0	7.6	0.0
11.00	0.793	0.844	0.941	0.999	1.000	1.000	6.9	0.0	8.4	0.0
11.50	0.807	0.870	0.929	0.999	1.000	1.000	7.5	0.0	9.2	0.0
12.00	0.817	0.893	0.916	0.998	1.000	1.000	8.2	0.0	10.0	0.0
12.50	0.821	0.912	0.902	0.998	1.000	1.000	9.0	0.0	11.3	0.0
13.00	0.820	0.928	0.885	0.998	1.000	1.000	9.9	0.0	12.5	0.0
13.50	0.815	0.942	0.867	0.997	1.000	1.000	10.7	0.0	13.8	0.0
14.00	0.805	0.953	0.848	0.997	1.000	1.000	11.6	0.0	15.1	0.0
14.50	0.793	0.962	0.827	0.997	1.000	1.000	12.4	0.0	16.3	0.0
15.00	0.778	0.969	0.806	0.996	1.000	1.000	13.3	0.0	17.6	0.0
15.50	0.760	0.975	0.783	0.996	1.000	1.000	14.5	0.0	20.3	0.0
16.00	0.739	0.979	0.758	0.996	1.000	1.000	15.6	0.0	22.9	0.0
16.50	0.716	0.982	0.732	0.995	1.000	1.000	16.8	0.0	25.6	0.0
17.00	0.691	0.985	0.706	0.995	1.000	1.000	18.0	0.0	28.3	0.0
17.50	0.666	0.987	0.679	0.994	1.000	1.000	19.1	0.0	30.9	0.0
18.00	0.641	0.988	0.653	0.994	1.000	1.000	20.3	0.0	33.6	0.0
18.50	0.617	0.989	0.628	0.993	1.000	1.000	22.2	0.0	32.2	0.0
19.00	0.593	0.990	0.603	0.993	1.000	1.000	24.0	0.0	30.9	0.0
19.50	0.570	0.990	0.579	0.993	1.000	1.000	25.9	0.0	29.5	0.0
20.00	0.548	0.991	0.557	0.993	1.000	1.000	27.8	0.0	28.1	0.0
20.50	0.528	0.991	0.537	0.993	1.000	1.000	29.6	0.0	26.8	0.0
21.00	0.510	0.992	0.517	0.993	1.000	1.000	31.5	0.0	25.4	0.0
21.50	0.492	0.992	0.499	0.993	1.000	1.000	35.1	0.0	25.2	0.0
22.00	0.475	0.993	0.482	0.993	1.000	1.000	38.7	0.0	25.1	0.0
22.50	0.459	0.993	0.465	0.993	1.000	1.000	42.2	0.0	24.9	0.0
23.00	0.443	0.994	0.450	0.993	1.000	1.000	45.8	0.0	24.8	0.0
23.50	0.429	0.994	0.435	0.993	1.000	1.000	49.4	0.0	24.6	0.0
24.00	0.416	0.995	0.421	0.992	1.000	1.000	53.0	0.0	24.5	0.0
24.50	0.403	0.995	0.408	0.992	1.000	1.000	51.8	0.0	25.0	0.0

FINAL JPL CONICAL FEED E & H PLANE 9.4 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCRENENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 18
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.013	0.013	0.997	1.000	1.000	1.000	0.2	0.0	0.2	0.0
1.50	0.030	0.030	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.00	0.052	0.052	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.50	0.081	0.081	0.999	1.000	1.000	1.000	0.4	0.0	0.4	0.0
3.00	0.115	0.115	0.999	1.000	1.000	1.000	0.5	0.0	0.5	0.0
3.50	0.153	0.153	0.999	1.000	1.000	1.000	0.7	0.0	0.8	0.0
4.00	0.195	0.195	0.999	1.000	1.000	1.000	0.9	0.0	1.1	0.0
4.50	0.240	0.240	0.998	1.000	1.000	1.000	1.1	0.0	1.4	0.0
5.00	0.286	0.287	0.997	1.000	1.000	1.000	1.4	0.0	1.7	0.0
5.50	0.335	0.336	0.996	1.000	1.000	1.000	1.6	0.0	2.0	0.0
6.00	0.385	0.387	0.995	1.000	1.000	1.000	1.8	0.0	2.3	0.0
6.50	0.435	0.438	0.994	1.000	1.000	1.000	2.2	0.0	2.8	0.0
7.00	0.483	0.488	0.991	1.000	1.000	1.000	2.5	0.0	3.3	0.0
7.50	0.529	0.536	0.988	0.999	1.000	1.000	2.9	0.0	3.8	0.0
8.00	0.573	0.583	0.985	0.999	1.000	1.000	3.3	0.0	4.4	0.0
8.50	0.615	0.628	0.980	0.999	1.000	1.000	3.6	0.0	4.9	0.0
9.00	0.654	0.671	0.976	0.999	1.000	1.000	4.0	0.0	5.4	0.0
9.50	0.689	0.711	0.970	0.998	1.000	1.000	4.6	0.0	6.2	0.0
10.00	0.719	0.748	0.963	0.998	1.000	1.000	5.1	0.0	7.1	0.0
10.50	0.743	0.780	0.955	0.997	1.000	1.000	5.7	0.0	7.9	0.0
11.00	0.763	0.810	0.945	0.997	1.000	1.000	6.3	0.0	8.7	0.0
11.50	0.778	0.836	0.934	0.996	1.000	1.000	6.8	0.0	9.6	0.0
12.00	0.790	0.860	0.922	0.996	1.000	1.000	7.4	0.0	10.4	0.0
12.50	0.797	0.880	0.909	0.995	1.000	1.000	8.1	0.0	11.7	0.0
13.00	0.799	0.898	0.894	0.994	1.000	1.000	8.8	0.0	12.9	0.0
13.50	0.797	0.913	0.878	0.993	1.000	1.000	9.4	0.0	14.2	0.0
14.00	0.791	0.926	0.861	0.992	1.000	1.000	10.1	0.0	15.5	0.0
14.50	0.783	0.937	0.843	0.991	1.000	1.000	10.8	0.0	16.7	0.0
15.00	0.772	0.947	0.823	0.990	1.000	1.000	11.5	0.0	18.0	0.0
15.50	0.759	0.955	0.804	0.989	1.000	1.000	12.5	0.0	19.1	0.0
16.00	0.744	0.961	0.783	0.989	1.000	1.000	13.6	0.0	20.3	0.0
16.50	0.727	0.966	0.761	0.988	1.000	1.000	14.6	0.0	21.4	0.0
17.00	0.709	0.971	0.740	0.988	1.000	1.000	15.6	0.0	22.6	0.0
17.50	0.690	0.974	0.717	0.987	1.000	1.000	16.7	0.0	23.7	0.0
18.00	0.670	0.977	0.695	0.987	1.000	1.000	17.7	0.0	24.9	0.0
18.50	0.651	0.979	0.673	0.987	1.000	1.000	19.0	0.0	24.5	0.0
19.00	0.631	0.981	0.652	0.987	1.000	1.000	20.4	0.0	24.1	0.0
19.50	0.612	0.982	0.632	0.987	1.000	1.000	21.7	0.0	23.7	0.0
20.00	0.594	0.984	0.612	0.987	1.000	1.000	23.1	0.0	23.4	0.0
20.50	0.577	0.985	0.593	0.987	1.000	1.000	24.4	0.0	23.0	0.0
21.00	0.560	0.986	0.576	0.987	1.000	1.000	25.8	0.0	22.6	0.0
21.50	0.544	0.987	0.558	0.987	1.000	1.000	27.0	0.0	22.8	0.0
22.00	0.528	0.988	0.542	0.987	1.000	1.000	28.2	0.0	22.9	0.0
22.50	0.514	0.989	0.526	0.986	1.000	1.000	29.3	0.0	23.1	0.0
23.00	0.499	0.990	0.511	0.986	1.000	1.000	30.5	0.0	23.3	0.0
23.50	0.485	0.991	0.497	0.986	1.000	1.000	31.7	0.0	23.4	0.0
24.00	0.472	0.992	0.483	0.986	1.000	1.000	32.9	0.0	23.6	0.0
24.50	0.459	0.992	0.469	0.986	1.000	1.000	32.7	0.0	24.2	0.0

FINAL JPL CONICAL FEED E & H PLANE 9.562 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 18
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.013	0.013	0.997	1.000	1.000	1.000	0.1	0.0	0.2	0.0
1.50	0.028	0.028	0.999	1.000	1.000	1.000	0.1	0.0	0.3	0.0
2.00	0.049	0.049	0.999	1.000	1.000	1.000	0.2	0.0	0.3	0.0
2.50	0.076	0.076	0.999	1.000	1.000	1.000	0.2	0.0	0.4	0.0
3.00	0.109	0.109	0.999	1.000	1.000	1.000	0.3	0.0	0.5	0.0
3.50	0.146	0.146	0.999	1.000	1.000	1.000	0.5	0.0	0.8	0.0
4.00	0.186	0.186	0.999	1.000	1.000	1.000	0.7	0.0	1.1	0.0
4.50	0.229	0.229	0.998	1.000	1.000	1.000	0.9	0.0	1.4	0.0
5.00	0.274	0.274	0.998	1.000	1.000	1.000	1.1	0.0	1.7	0.0
5.50	0.321	0.322	0.997	0.999	1.000	1.000	1.3	0.0	2.0	0.0
6.00	0.369	0.371	0.996	0.999	1.000	1.000	1.5	0.0	2.3	0.0
6.50	0.418	0.420	0.994	0.999	1.000	1.000	1.8	0.0	2.8	0.0
7.00	0.464	0.469	0.992	0.999	1.000	1.000	2.2	0.0	3.4	0.0
7.50	0.509	0.516	0.989	0.998	1.000	1.000	2.5	0.0	3.9	0.0
8.00	0.552	0.561	0.985	0.998	1.000	1.000	2.9	0.0	4.4	0.0
8.50	0.592	0.605	0.981	0.998	1.000	1.000	3.2	0.0	5.0	0.0
9.00	0.630	0.647	0.977	0.997	1.000	1.000	3.6	0.0	5.5	0.0
9.50	0.665	0.687	0.971	0.996	1.000	1.000	4.1	0.0	6.3	0.0
10.00	0.694	0.723	0.965	0.996	1.000	1.000	4.6	0.0	7.2	0.0
10.50	0.719	0.755	0.957	0.995	1.000	1.000	5.1	0.0	8.0	0.0
11.00	0.739	0.785	0.947	0.994	1.000	1.000	5.7	0.0	8.8	0.0
11.50	0.756	0.812	0.937	0.993	1.000	1.000	6.2	0.0	9.7	0.0
12.00	0.769	0.836	0.926	0.992	1.000	1.000	6.7	0.0	10.5	0.0
12.50	0.777	0.858	0.914	0.991	1.000	1.000	7.3	0.0	11.7	0.0
13.00	0.781	0.877	0.900	0.990	1.000	1.000	8.0	0.0	12.9	0.0
13.50	0.782	0.893	0.885	0.989	1.000	1.000	8.6	0.0	14.1	0.0
14.00	0.779	0.907	0.869	0.987	1.000	1.000	9.2	0.0	15.3	0.0
14.50	0.773	0.920	0.852	0.986	1.000	1.000	9.9	0.0	16.5	0.0
15.00	0.765	0.930	0.835	0.985	1.000	1.000	10.5	0.0	17.7	0.0
15.50	0.755	0.940	0.817	0.984	1.000	1.000	11.4	0.0	18.6	0.0
16.00	0.743	0.948	0.798	0.983	1.000	1.000	12.3	0.0	19.4	0.0
16.50	0.729	0.954	0.779	0.982	1.000	1.000	13.1	0.0	20.3	0.0
17.00	0.715	0.960	0.759	0.981	1.000	1.000	14.0	0.0	21.2	0.0
17.50	0.699	0.964	0.739	0.981	1.000	1.000	14.9	0.0	22.0	0.0
18.00	0.683	0.968	0.719	0.980	1.000	1.000	15.8	0.0	22.9	0.0
18.50	0.666	0.972	0.700	0.980	1.000	1.000	16.8	0.0	22.7	0.0
19.00	0.650	0.974	0.681	0.980	1.000	1.000	17.8	0.0	22.5	0.0
19.50	0.634	0.977	0.662	0.980	1.000	1.000	18.8	0.0	22.3	0.0
20.00	0.618	0.979	0.644	0.980	1.000	1.000	19.8	0.0	22.2	0.0
20.50	0.603	0.981	0.627	0.980	1.000	1.000	20.8	0.0	22.0	0.0
21.00	0.588	0.983	0.611	0.980	1.000	1.000	21.8	0.0	21.8	0.0
21.50	0.573	0.985	0.594	0.980	1.000	1.000	23.0	0.0	22.1	0.0
22.00	0.559	0.986	0.579	0.980	1.000	1.000	24.3	0.0	22.4	0.0
22.50	0.544	0.987	0.563	0.980	1.000	1.000	25.5	0.0	22.7	0.0
23.00	0.530	0.988	0.548	0.980	1.000	1.000	26.7	0.0	23.1	0.0
23.50	0.516	0.989	0.533	0.980	1.000	1.000	28.0	0.0	23.4	0.0
24.00	0.503	0.990	0.518	0.980	1.000	1.000	29.2	0.0	23.7	0.0
24.50	0.489	0.991	0.504	0.980	1.000	1.000	29.0	0.0	24.4	0.0

FINAL JPL CONICAL FEED E & H PLANE 9.8 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 20
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.004	0.004	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.015	0.015	0.997	1.000	1.000	1.000	0.2	0.0	0.2	0.0
1.50	0.034	0.034	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.00	0.059	0.059	0.999	1.000	1.000	1.000	0.4	0.0	0.3	0.0
2.50	0.092	0.092	0.999	1.000	1.000	1.000	0.5	0.0	0.4	0.0
3.00	0.130	0.130	0.999	1.000	1.000	1.000	0.6	0.0	0.5	0.0
3.50	0.173	0.174	0.999	1.000	1.000	1.000	0.9	0.0	0.8	0.0
4.00	0.220	0.220	0.999	1.000	1.000	1.000	1.2	0.0	1.1	0.0
4.50	0.269	0.270	0.998	1.000	1.000	1.000	1.5	0.0	1.4	0.0
5.00	0.320	0.321	0.997	1.000	1.000	1.000	1.8	0.0	1.7	0.0
5.50	0.373	0.375	0.995	1.000	1.000	1.000	2.1	0.0	2.0	0.0
6.00	0.426	0.429	0.994	1.000	1.000	1.000	2.4	0.0	2.3	0.0
6.50	0.479	0.483	0.991	1.000	1.000	1.000	2.9	0.0	2.8	0.0
7.00	0.528	0.534	0.988	1.000	1.000	1.000	3.4	0.0	3.4	0.0
7.50	0.574	0.583	0.984	1.000	1.000	1.000	3.9	0.0	3.9	0.0
8.00	0.616	0.630	0.979	1.000	1.000	1.000	4.4	0.0	4.5	0.0
8.50	0.655	0.673	0.973	1.000	1.000	1.000	4.9	0.0	5.0	0.0
9.00	0.691	0.714	0.967	1.000	1.000	1.000	5.4	0.0	5.6	0.0
9.50	0.721	0.752	0.959	1.000	1.000	1.000	6.1	0.0	6.4	0.0
10.00	0.745	0.785	0.950	1.000	1.000	1.000	6.9	0.0	7.3	0.0
10.50	0.764	0.814	0.939	1.000	1.000	1.000	7.6	0.0	8.1	0.0
11.00	0.777	0.839	0.926	1.000	1.000	1.000	8.3	0.0	8.9	0.0
11.50	0.785	0.861	0.912	1.000	1.000	1.000	9.1	0.0	9.8	0.0
12.00	0.790	0.880	0.898	1.000	1.000	1.000	9.8	0.0	10.6	0.0
12.50	0.790	0.897	0.882	1.000	1.000	1.000	10.5	0.0	11.3	0.0
13.00	0.787	0.911	0.864	1.000	1.000	1.000	11.2	0.0	13.0	0.0
13.50	0.780	0.922	0.846	0.999	1.000	1.000	11.9	0.0	14.2	0.0
14.00	0.770	0.932	0.826	0.999	1.000	1.000	12.6	0.0	15.5	0.0
14.50	0.757	0.941	0.806	0.999	1.000	1.000	13.3	0.0	16.7	0.0
15.00	0.743	0.948	0.785	0.999	1.000	1.000	14.0	0.0	17.9	0.0
15.50	0.728	0.954	0.764	0.998	1.000	1.000	15.1	0.0	18.6	0.0
16.00	0.711	0.959	0.743	0.998	1.000	1.000	16.1	0.0	19.3	0.0
16.50	0.694	0.963	0.722	0.998	1.000	1.000	17.2	0.0	19.9	0.0
17.00	0.676	0.966	0.701	0.998	1.000	1.000	18.3	0.0	20.6	0.0
17.50	0.658	0.969	0.680	0.998	1.000	1.000	19.3	0.0	21.3	0.0
18.00	0.639	0.971	0.659	0.998	1.000	1.000	20.4	0.0	22.0	0.0
18.50	0.621	0.973	0.639	0.998	1.000	1.000	21.5	0.0	22.0	0.0
19.00	0.603	0.975	0.620	0.998	1.000	1.000	22.6	0.0	21.9	0.0
19.50	0.586	0.977	0.601	0.998	1.000	1.000	23.6	0.0	21.9	0.0
20.00	0.570	0.979	0.584	0.998	1.000	1.000	24.7	0.0	21.9	0.0
20.50	0.554	0.980	0.567	0.998	1.000	1.000	25.8	0.0	21.8	0.0
21.00	0.540	0.981	0.551	0.998	1.000	1.000	26.9	0.0	21.8	0.0
21.50	0.525	0.983	0.535	0.998	1.000	1.000	28.0	0.0	22.1	0.0
22.00	0.511	0.984	0.521	0.998	1.000	1.000	29.2	0.0	22.5	0.0
22.50	0.497	0.985	0.506	0.997	1.000	1.000	30.3	0.0	22.8	0.0
23.00	0.484	0.986	0.492	0.997	1.000	1.000	31.4	0.0	23.1	0.0
23.50	0.471	0.987	0.478	0.997	1.000	1.000	32.6	0.0	23.5	0.0
24.00	0.458	0.988	0.465	0.997	1.000	1.000	33.7	0.0	23.8	0.0
24.50	0.446	0.989	0.453	0.997	1.000	1.000	32.9	0.0	24.7	0.0

FINAL JPL CONICAL FEED E & H PLANE 10.0 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 18
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.004	0.004	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.015	0.015	0.997	1.000	1.000	1.000	0.2	0.0	0.2	0.0
1.50	0.032	0.032	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.00	0.057	0.057	0.999	1.000	1.000	1.000	0.3	0.0	0.4	0.0
2.50	0.088	0.088	0.999	1.000	1.000	1.000	0.4	0.0	0.5	0.0
3.00	0.124	0.124	0.999	1.000	1.000	1.000	0.5	0.0	0.6	0.0
3.50	0.166	0.166	0.999	1.000	1.000	1.000	0.8	0.0	0.9	0.0
4.00	0.211	0.211	0.999	1.000	1.000	1.000	1.0	0.0	1.2	0.0
4.50	0.258	0.259	0.998	1.000	1.000	1.000	1.3	0.0	1.5	0.0
5.00	0.308	0.309	0.997	1.000	1.000	1.000	1.6	0.0	1.8	0.0
5.50	0.359	0.361	0.996	1.000	1.000	1.000	1.8	0.0	2.1	0.0
6.00	0.411	0.414	0.994	1.000	1.000	1.000	2.1	0.0	2.4	0.0
6.50	0.463	0.467	0.992	1.000	1.000	1.000	2.5	0.0	2.9	0.0
7.00	0.512	0.518	0.989	1.000	1.000	1.000	3.0	0.0	3.5	0.0
7.50	0.558	0.566	0.986	1.000	1.000	1.000	3.4	0.0	4.0	0.0
8.00	0.601	0.613	0.981	1.000	1.000	1.000	3.9	0.0	4.6	0.0
8.50	0.641	0.657	0.976	1.000	1.000	1.000	4.3	0.0	5.1	0.0
9.00	0.677	0.698	0.970	0.999	1.000	1.000	4.8	0.0	5.7	0.0
9.50	0.709	0.737	0.963	0.999	1.000	1.000	5.4	0.0	6.5	0.0
10.00	0.735	0.771	0.954	0.999	1.000	1.000	6.1	0.0	7.4	0.0
10.50	0.755	0.801	0.944	0.999	1.000	1.000	6.7	0.0	8.2	0.0
11.00	0.771	0.828	0.933	0.999	1.000	1.000	7.4	0.0	9.1	0.0
11.50	0.782	0.851	0.920	0.998	1.000	1.000	8.0	0.0	9.9	0.0
12.00	0.789	0.872	0.907	0.998	1.000	1.000	8.7	0.0	10.8	0.0
12.50	0.792	0.890	0.892	0.998	1.000	1.000	9.5	0.0	11.7	0.0
13.00	0.791	0.906	0.876	0.998	1.000	1.000	10.3	0.0	12.7	0.0
13.50	0.787	0.919	0.859	0.997	1.000	1.000	11.1	0.0	13.6	0.0
14.00	0.780	0.930	0.841	0.997	1.000	1.000	11.9	0.0	14.5	0.0
14.50	0.770	0.940	0.822	0.997	1.000	1.000	12.7	0.0	15.5	0.0
15.00	0.759	0.948	0.803	0.997	1.000	1.000	13.5	0.0	16.4	0.0
15.50	0.746	0.955	0.783	0.997	1.000	1.000	14.8	0.0	16.9	0.0
16.00	0.731	0.961	0.763	0.997	1.000	1.000	16.0	0.0	17.4	0.0
16.50	0.715	0.965	0.743	0.997	1.000	1.000	17.3	0.0	17.8	0.0
17.00	0.698	0.969	0.723	0.997	1.000	1.000	18.6	0.0	18.3	0.0
17.50	0.680	0.972	0.702	0.997	1.000	1.000	19.8	0.0	18.8	0.0
18.00	0.663	0.975	0.682	0.997	1.000	1.000	21.1	0.0	19.3	0.0
18.50	0.645	0.978	0.662	0.997	1.000	1.000	22.5	0.0	19.5	0.0
19.00	0.627	0.980	0.643	0.997	1.000	1.000	23.8	0.0	19.8	0.0
19.50	0.610	0.982	0.624	0.996	1.000	1.000	25.2	0.0	20.0	0.0
20.00	0.593	0.984	0.605	0.996	1.000	1.000	26.6	0.0	20.3	0.0
20.50	0.577	0.985	0.588	0.996	1.000	1.000	27.9	0.0	20.5	0.0
21.00	0.561	0.987	0.571	0.996	1.000	1.000	29.3	0.0	20.8	0.0
21.50	0.545	0.988	0.554	0.996	1.000	1.000	30.3	0.0	21.3	0.0
22.00	0.530	0.989	0.538	0.995	1.000	1.000	31.4	0.0	21.9	0.0
22.50	0.515	0.990	0.522	0.995	1.000	1.000	32.4	0.0	22.4	0.0
23.00	0.500	0.991	0.507	0.995	1.000	1.000	33.4	0.0	23.0	0.0
23.50	0.486	0.992	0.493	0.995	1.000	1.000	34.5	0.0	23.5	0.0
24.00	0.472	0.993	0.478	0.995	1.000	1.000	35.5	0.0	24.1	0.0
24.50	0.459	0.994	0.465	0.994	1.000	1.000	35.0	0.0	25.1	0.0

FINAL JPL CONICAL FEED E & H PLANE 10.2 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 24
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.013	0.013	0.997	1.000	1.000	1.000	0.2	0.0	0.2	0.0
1.50	0.029	0.029	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.00	0.051	0.051	0.999	1.000	1.000	1.000	0.3	0.0	0.4	0.0
2.50	0.079	0.079	0.999	1.000	1.000	1.000	0.4	0.0	0.5	0.0
3.00	0.112	0.112	0.999	1.000	1.000	1.000	0.5	0.0	0.6	0.0
3.50	0.149	0.150	0.999	1.000	1.000	1.000	0.7	0.0	0.9	0.0
4.00	0.190	0.190	0.999	1.000	1.000	1.000	1.0	0.0	1.2	0.0
4.50	0.233	0.233	0.998	1.000	1.000	1.000	1.2	0.0	1.5	0.0
5.00	0.277	0.278	0.997	1.000	1.000	1.000	1.5	0.0	1.9	0.0
5.50	0.324	0.325	0.996	1.000	1.000	1.000	1.7	0.0	2.2	0.0
6.00	0.371	0.373	0.994	1.000	1.000	1.000	2.0	0.0	2.5	0.0
6.50	0.418	0.421	0.992	1.000	1.000	1.000	2.4	0.0	3.0	0.0
7.00	0.463	0.468	0.990	1.000	1.000	1.000	2.8	0.0	3.5	0.0
7.50	0.506	0.513	0.986	0.999	1.000	1.000	3.1	0.0	4.0	0.0
8.00	0.546	0.557	0.983	0.999	1.000	1.000	3.5	0.0	4.6	0.0
8.50	0.585	0.598	0.978	0.999	1.000	1.000	3.9	0.0	5.1	0.0
9.00	0.621	0.639	0.973	0.999	1.000	1.000	4.3	0.0	5.6	0.0
9.50	0.653	0.676	0.968	0.998	1.000	1.000	4.8	0.0	6.4	0.0
10.00	0.681	0.711	0.960	0.998	1.000	1.000	5.3	0.0	7.2	0.0
10.50	0.704	0.742	0.952	0.997	1.000	1.000	5.8	0.0	8.0	0.0
11.00	0.724	0.770	0.943	0.997	1.000	1.000	6.3	0.0	8.9	0.0
11.50	0.739	0.796	0.933	0.996	1.000	1.000	6.8	0.0	9.7	0.0
12.00	0.752	0.819	0.922	0.995	1.000	1.000	7.3	0.0	10.5	0.0
12.50	0.760	0.840	0.910	0.995	1.000	1.000	7.8	0.0	11.6	0.0
13.00	0.765	0.859	0.897	0.994	1.000	1.000	8.3	0.0	12.7	0.0
13.50	0.767	0.875	0.883	0.993	1.000	1.000	8.8	0.0	13.8	0.0
14.00	0.766	0.890	0.868	0.991	1.000	1.000	9.3	0.0	15.0	0.0
14.50	0.763	0.903	0.853	0.990	1.000	1.000	9.8	0.0	16.1	0.0
15.00	0.758	0.915	0.837	0.989	1.000	1.000	10.3	0.0	17.2	0.0
15.50	0.750	0.926	0.821	0.987	1.000	1.000	11.1	0.0	18.1	0.0
16.00	0.741	0.935	0.804	0.986	1.000	1.000	12.0	0.0	19.0	0.0
16.50	0.730	0.942	0.786	0.985	1.000	1.000	12.8	0.0	19.9	0.0
17.00	0.717	0.949	0.768	0.984	1.000	1.000	13.6	0.0	20.9	0.0
17.50	0.703	0.954	0.749	0.984	1.000	1.000	14.5	0.0	21.8	0.0
18.00	0.688	0.959	0.730	0.983	1.000	1.000	15.3	0.0	22.7	0.0
18.50	0.673	0.962	0.711	0.983	1.000	1.000	16.5	0.0	23.0	0.0
19.00	0.656	0.965	0.692	0.983	1.000	1.000	17.8	0.0	23.3	0.0
19.50	0.640	0.968	0.673	0.982	1.000	1.000	19.0	0.0	23.6	0.0
20.00	0.623	0.970	0.654	0.982	1.000	1.000	20.2	0.0	24.0	0.0
20.50	0.606	0.971	0.635	0.982	1.000	1.000	21.5	0.0	24.3	0.0
21.00	0.589	0.973	0.616	0.982	1.000	1.000	22.7	0.0	24.6	0.0
21.50	0.572	0.974	0.598	0.982	1.000	1.000	23.0	0.0	25.2	0.0
22.00	0.556	0.975	0.581	0.982	1.000	1.000	23.4	0.0	25.8	0.0
22.50	0.541	0.976	0.564	0.982	1.000	1.000	23.7	0.0	26.4	0.0
23.00	0.526	0.977	0.548	0.982	1.000	1.000	24.1	0.0	27.0	0.0
23.50	0.512	0.978	0.533	0.982	1.000	1.000	24.4	0.0	27.6	0.0
24.00	0.498	0.979	0.518	0.982	1.000	1.000	24.8	0.0	28.2	0.0
24.50	0.485	0.979	0.504	0.982	1.000	1.000	24.4	0.0	29.1	0.0

FINAL JPL CONICAL FFED E & H PLANE 10.359 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCKEMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 20
IC1= 1 IC2= 2 IC3= 1 IC4= 1

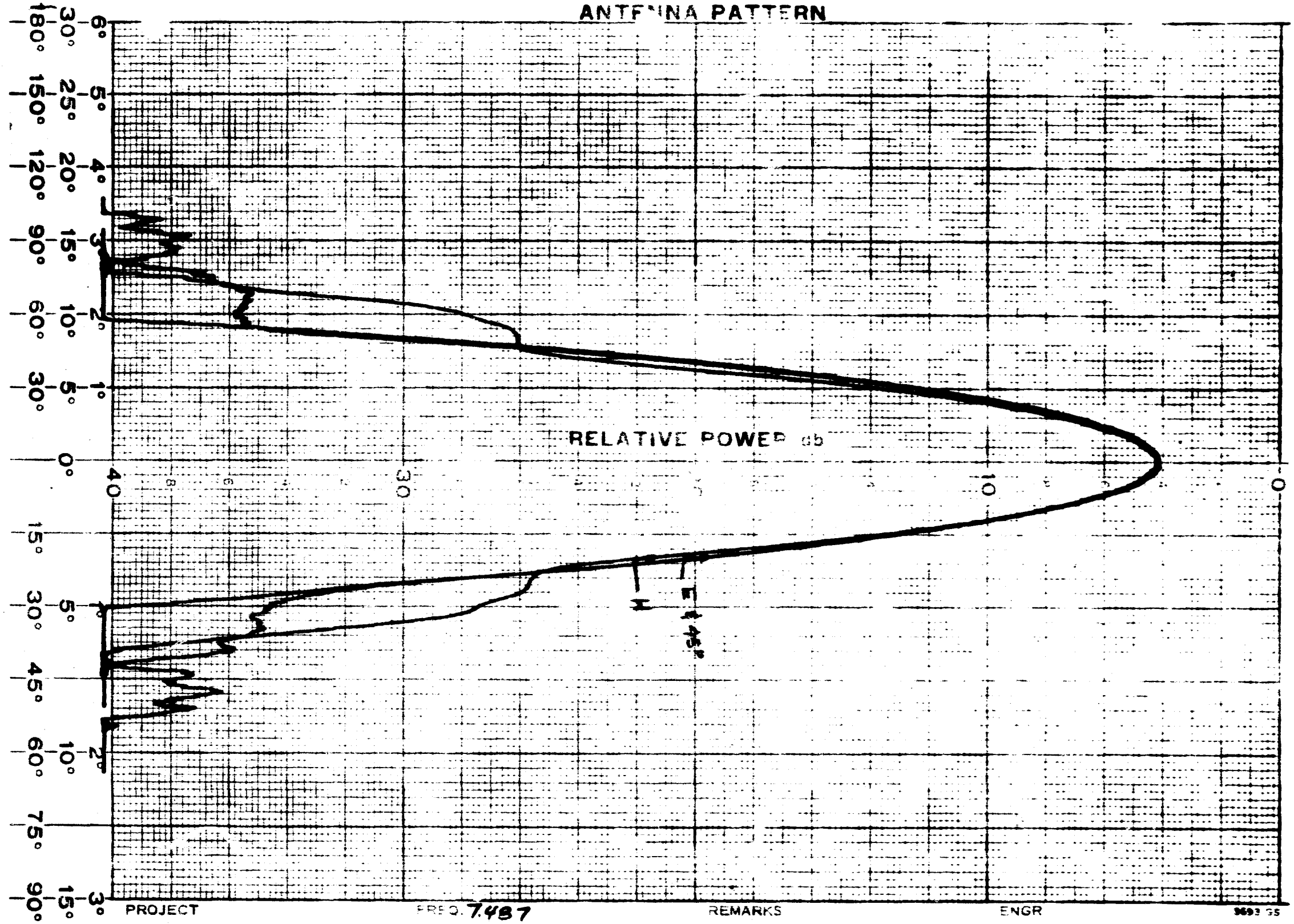
ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	FTI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.004	0.004	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.017	0.017	0.997	1.000	1.000	1.000	0.2	0.0	0.2	0.0
1.50	0.037	0.037	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.00	0.065	0.065	0.999	1.000	1.000	1.000	0.3	0.0	0.4	0.0
2.50	0.100	0.100	0.999	1.000	1.000	1.000	0.4	0.0	0.5	0.0
3.00	0.142	0.142	0.999	1.000	1.000	1.000	0.5	0.0	0.6	0.0
3.50	0.189	0.189	0.999	1.000	1.000	1.000	0.9	0.0	0.9	0.0
4.00	0.239	0.239	0.998	1.000	1.000	1.000	1.3	0.0	1.3	0.0
4.50	0.290	0.291	0.997	1.000	1.000	1.000	1.7	0.0	1.6	0.0
5.00	0.343	0.345	0.995	1.000	1.000	1.000	2.1	0.0	1.9	0.0
5.50	0.396	0.399	0.993	1.000	1.000	1.000	2.5	0.0	2.3	0.0
6.00	0.449	0.453	0.991	1.000	1.000	1.000	2.9	0.0	2.6	0.0
6.50	0.501	0.507	0.988	1.000	1.000	1.000	3.5	0.0	3.1	0.0
7.00	0.548	0.557	0.984	1.000	1.000	1.000	4.0	0.0	3.7	0.0
7.50	0.592	0.605	0.979	1.000	1.000	1.000	4.6	0.0	4.2	0.0
8.00	0.632	0.650	0.973	1.000	1.000	1.000	5.2	0.0	4.8	0.0
8.50	0.669	0.692	0.966	1.000	1.000	1.000	5.7	0.0	5.3	0.0
9.00	0.701	0.732	0.958	1.000	1.000	1.000	6.3	0.0	5.9	0.0
9.50	0.728	0.767	0.950	1.000	1.000	1.000	7.0	0.0	6.8	0.0
10.00	0.749	0.798	0.939	1.000	1.000	1.000	7.7	0.0	7.7	0.0
10.50	0.764	0.825	0.927	1.000	1.000	1.000	8.4	0.0	8.6	0.0
11.00	0.774	0.848	0.913	1.000	1.000	1.000	9.2	0.0	9.6	0.0
11.50	0.780	0.869	0.898	1.000	1.000	1.000	9.9	0.0	10.5	0.0
12.00	0.781	0.886	0.882	1.000	1.000	1.000	10.6	0.0	11.4	0.0
12.50	0.779	0.901	0.865	1.000	1.000	1.000	11.3	0.0	12.5	0.0
13.00	0.773	0.914	0.847	1.000	1.000	1.000	12.1	0.0	13.7	0.0
13.50	0.765	0.924	0.827	1.000	1.000	1.000	12.8	0.0	14.8	0.0
14.00	0.753	0.933	0.807	0.999	1.000	1.000	13.6	0.0	15.9	0.0
14.50	0.740	0.941	0.787	0.999	1.000	1.000	14.3	0.0	17.1	0.0
15.00	0.725	0.947	0.766	0.999	1.000	1.000	15.1	0.0	18.2	0.0
15.50	0.709	0.953	0.745	0.999	1.000	1.000	16.1	0.0	19.0	0.0
16.00	0.692	0.957	0.724	0.999	1.000	1.000	17.1	0.0	19.8	0.0
16.50	0.674	0.961	0.702	0.999	1.000	1.000	18.1	0.0	20.6	0.0
17.00	0.656	0.964	0.681	0.999	1.000	1.000	19.2	0.0	21.5	0.0
17.50	0.637	0.966	0.660	0.999	1.000	1.000	20.2	0.0	22.3	0.0
18.00	0.618	0.969	0.639	0.999	1.000	1.000	21.2	0.0	23.1	0.0
18.50	0.600	0.970	0.619	0.999	1.000	1.000	22.2	0.0	23.3	0.0
19.00	0.582	0.972	0.600	0.999	1.000	1.000	23.2	0.0	23.6	0.0
19.50	0.565	0.973	0.581	0.999	1.000	1.000	24.1	0.0	23.8	0.0
20.00	0.548	0.975	0.563	0.999	1.000	1.000	25.1	0.0	24.1	0.0
20.50	0.532	0.976	0.546	0.999	1.000	1.000	26.1	0.0	24.3	0.0
21.00	0.516	0.977	0.529	0.999	1.000	1.000	27.1	0.0	24.6	0.0
21.50	0.501	0.978	0.513	0.999	1.000	1.000	26.6	0.0	25.2	0.0
22.00	0.487	0.978	0.498	0.999	1.000	1.000	26.2	0.0	25.9	0.0
22.50	0.474	0.979	0.484	0.999	1.000	1.000	25.7	0.0	26.5	0.0
23.00	0.461	0.980	0.471	0.999	1.000	1.000	25.3	0.0	27.1	0.0
23.50	0.450	0.981	0.459	0.999	1.000	1.000	24.8	0.0	27.8	0.0
24.00	0.439	0.982	0.448	0.998	1.000	1.000	24.4	0.0	28.4	0.0
24.50	0.429	0.983	0.437	0.998	1.000	1.000	24.3	0.0	29.5	0.0

APPENDIX III - A

RECTANGULAR MULTIMODE HORN
LINEAR POLARIZED PATTERNS

ANTENNA PATTERN



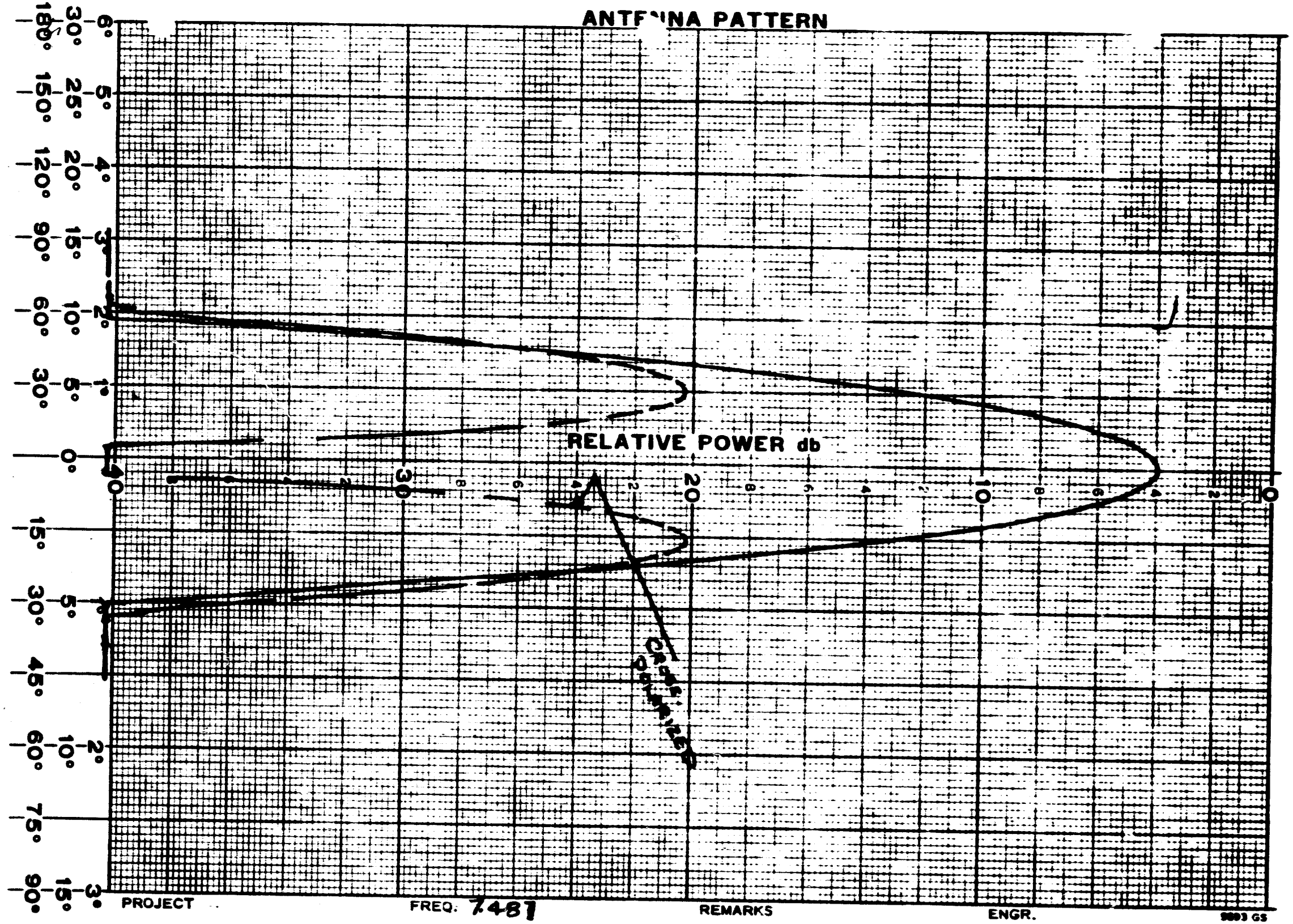
PROJECT FREQ. 7.487 REMARKS ENGR

PLANE E H 45

12/4/68

9693 35

ANTENNA PATTERN



PROJECT

FREQ. 7481

PLANE 45°

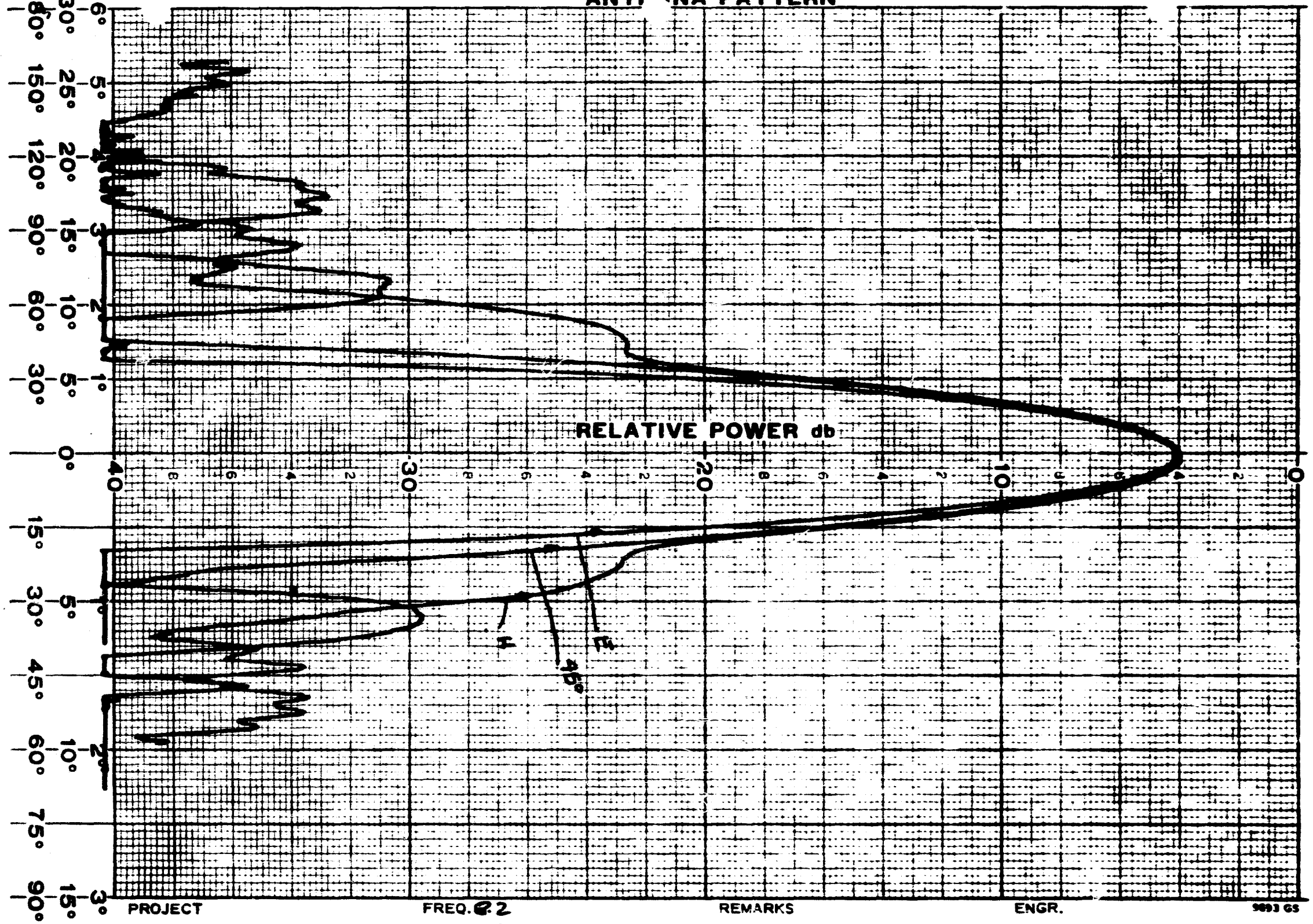
REMARKS

ENGR.

DATE 12/4/68

9893 GS

ANTENNA PATTERN



PROJECT

FREQ. 2

PLANE E 45

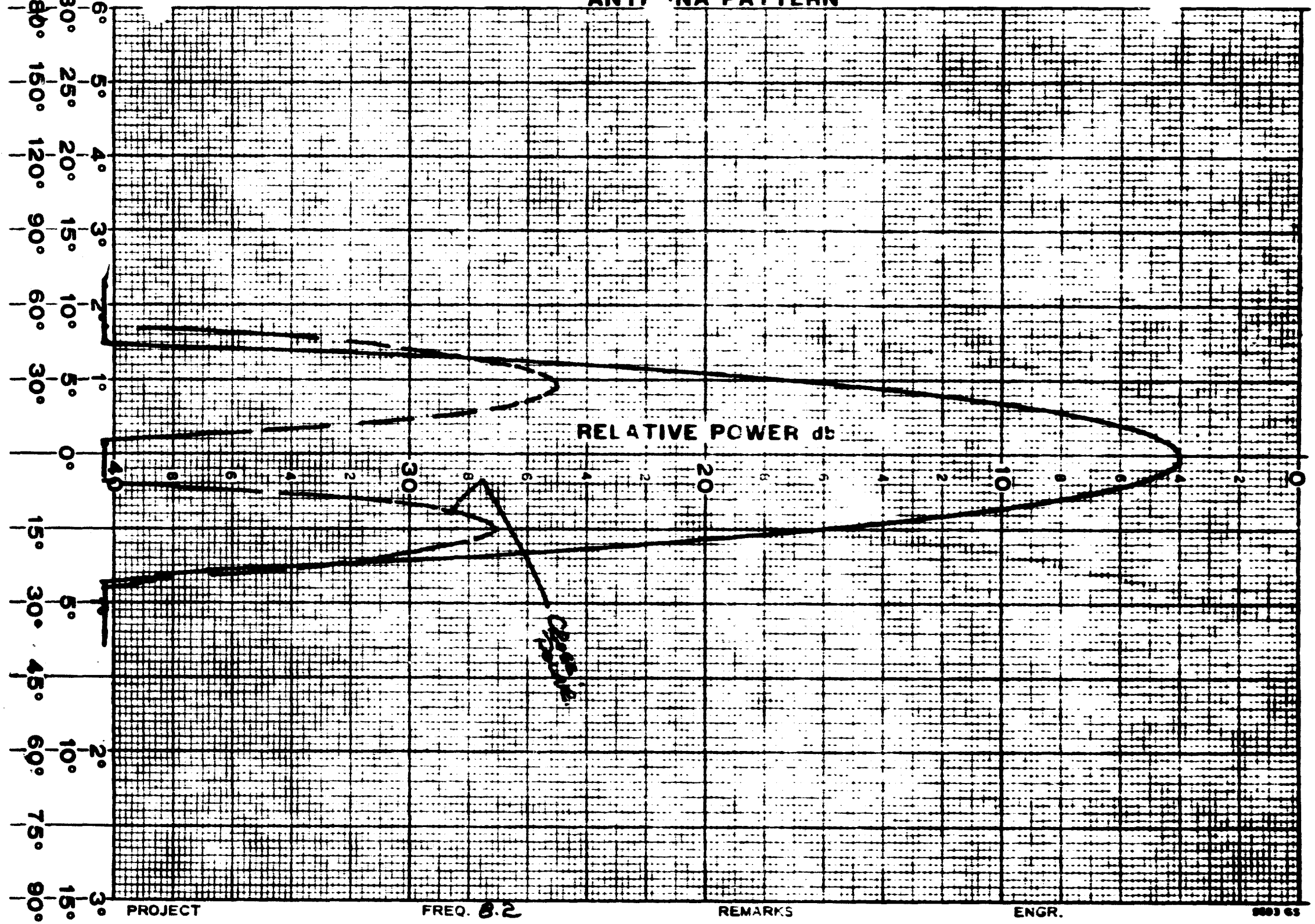
REMARKS

ENGR.

DATE 12/4/68

9893 GS

ANTENNA PATTERN



PROJECT

FREQ. 8.2

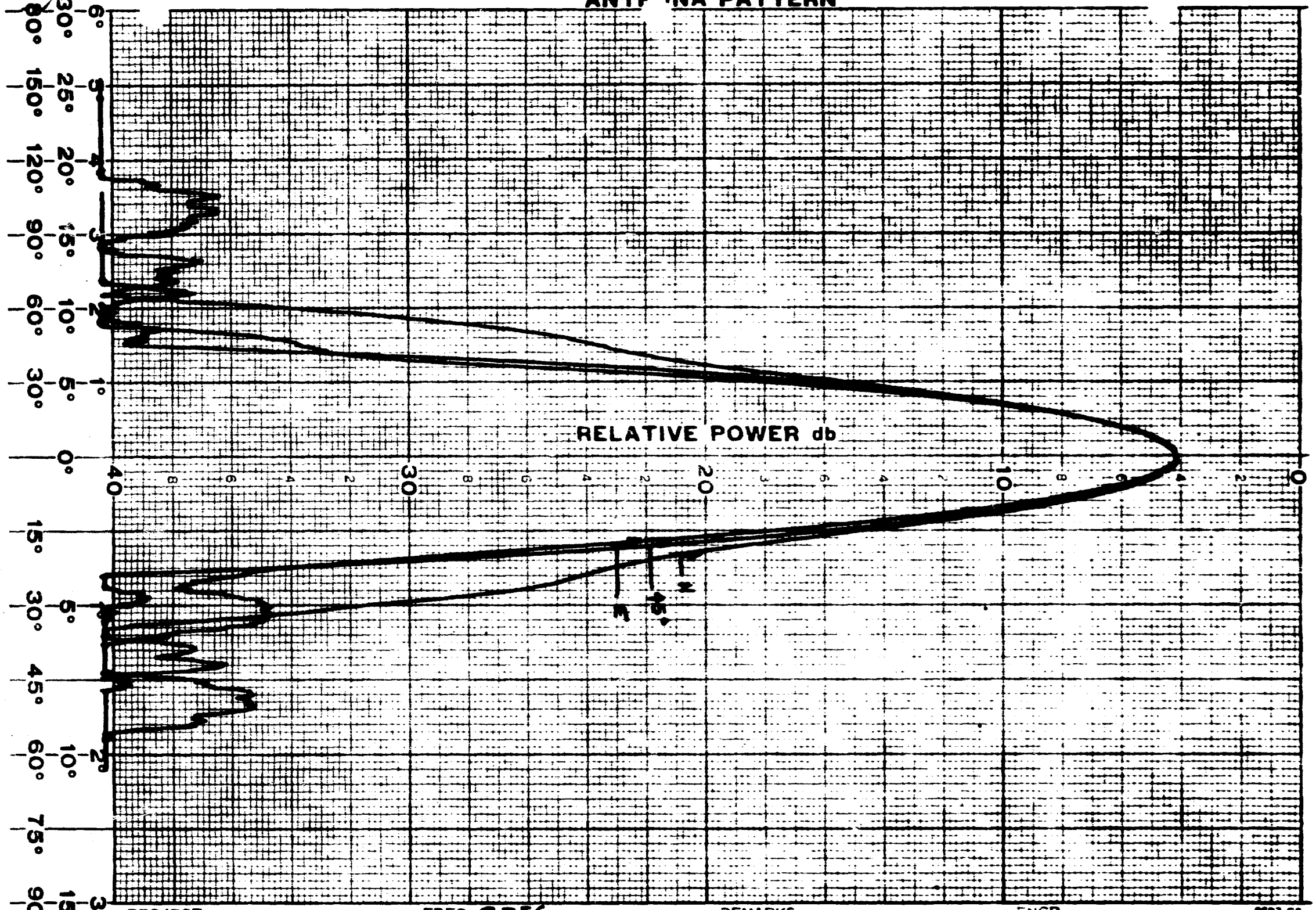
REMARKS

ENGR.

PLANE 45°

DATE 12/4/68

ANTENNA PATTERN



PROJECT

FREQ. 8.356

PLANE E H 45°

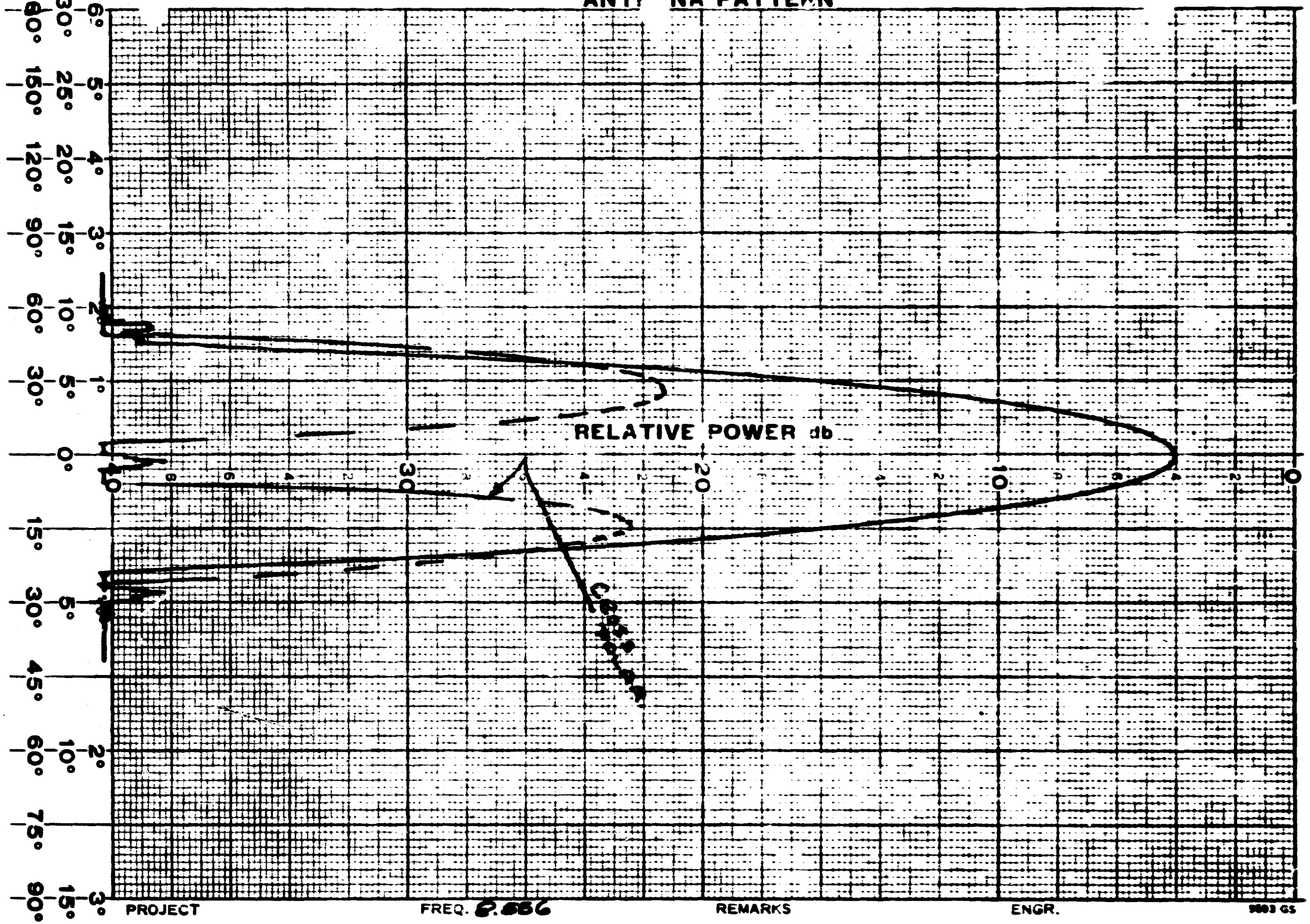
REMARKS

ENGR.

DATE 12/4/68

9803 GS

ANTENNA PATTERN



PROJECT

FREQ. 6.656

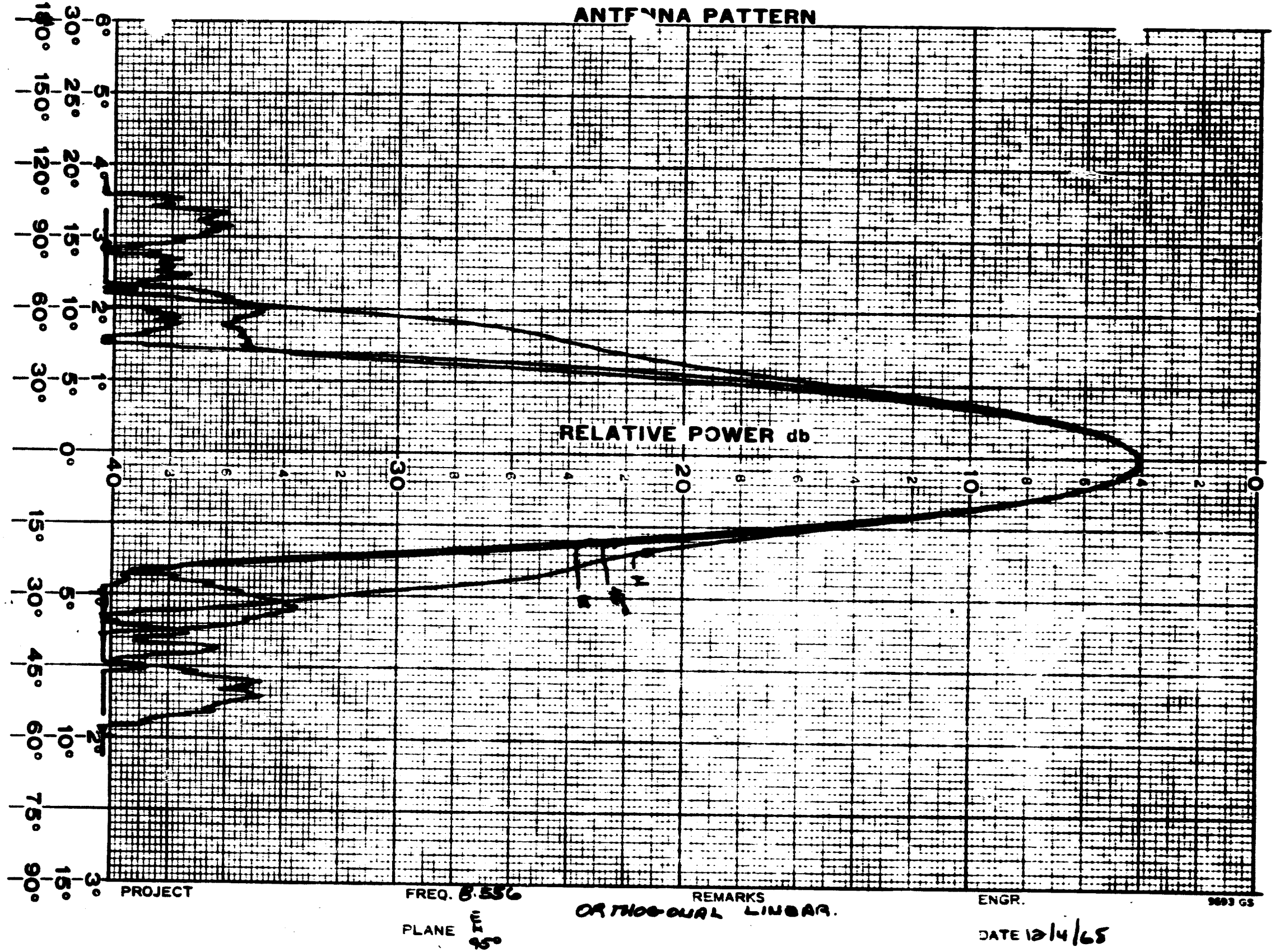
REMARKS

ENGR.

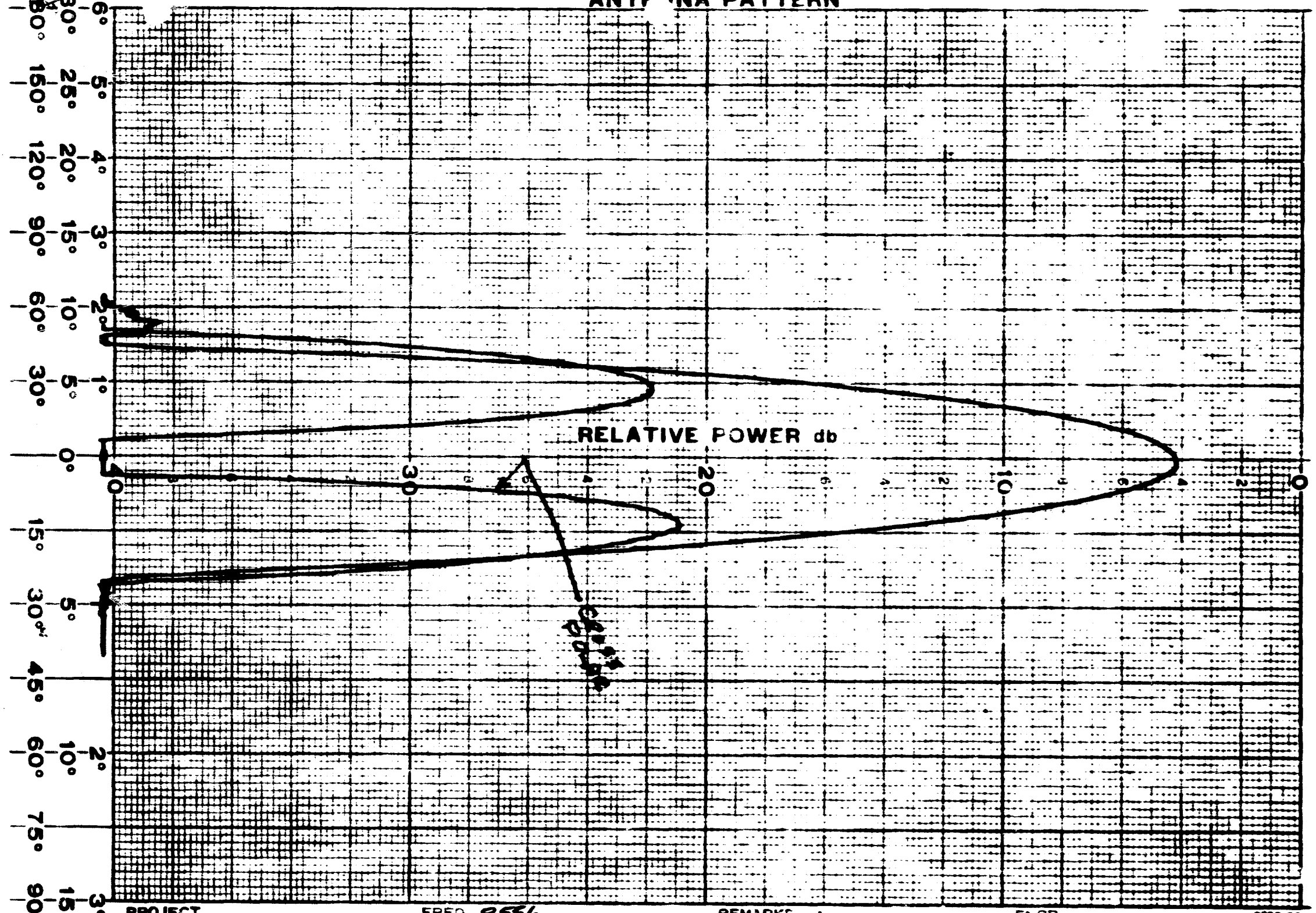
9003 GS

PLANE 45°

DATE 12/4/68


ANTENNA PATTERN
RELATIVE POWER db
40
30
20
10
0
180°
150°
120°
90°
60°
30°
0°
15°
30°
45°
60°
75°
90°
6°
5°
4°
3°
2°
1°
25°
20°
15°
10°
5°
3°
2°
PROJECT
FREQ. 8.556
PLANE E-H 45°
REMARKS
ORTHOGONAL LINEAR.
ENGR.
DATE 12/14/65
9693 GS

ANTENNA PATTERN



PROJECT

FREQ. 8.556

REMARKS ORTHOGONAL LINEAR

ENGR.

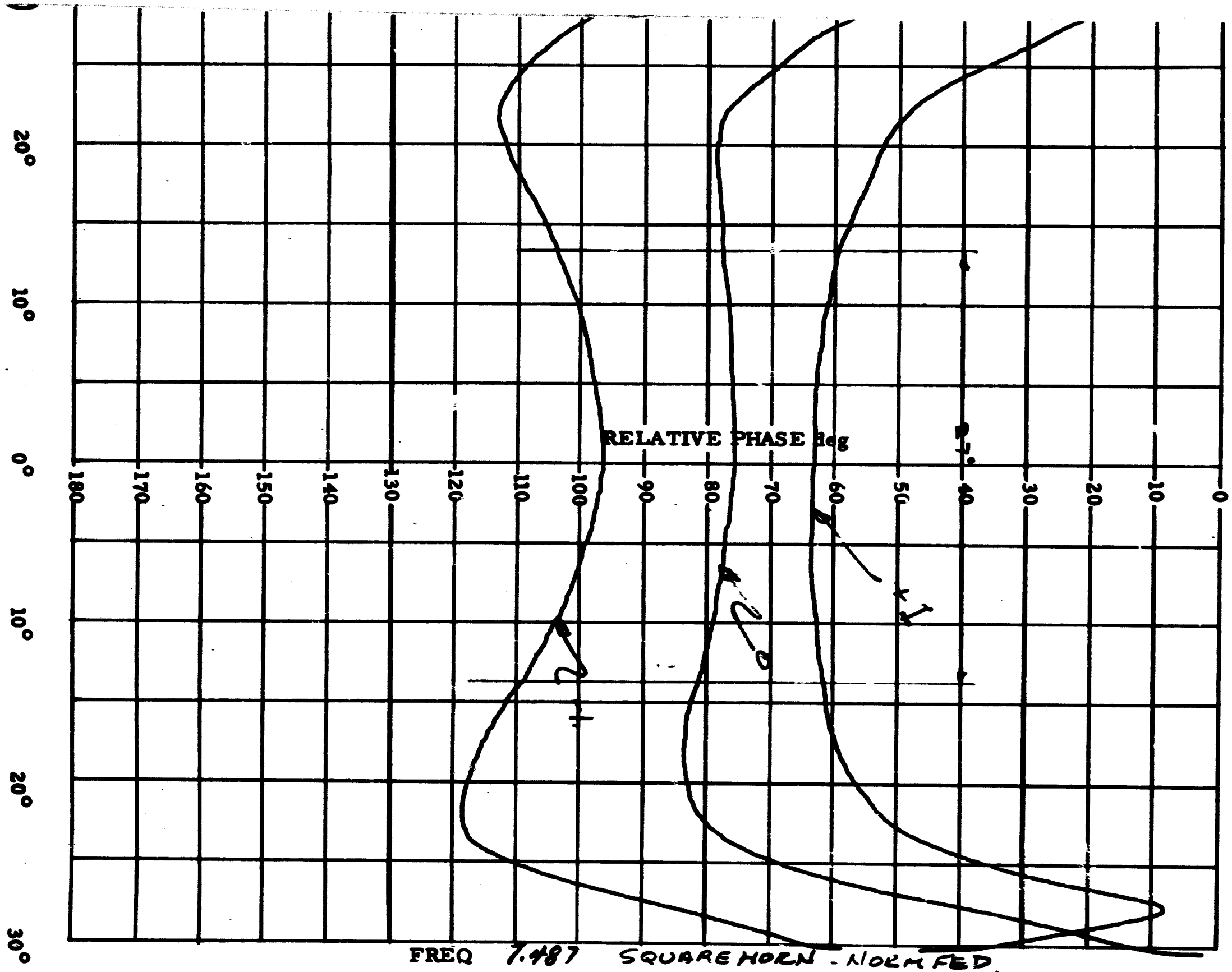
PLANE 45°

DATE 12/4/68

3003 GS

APPENDIX III - B

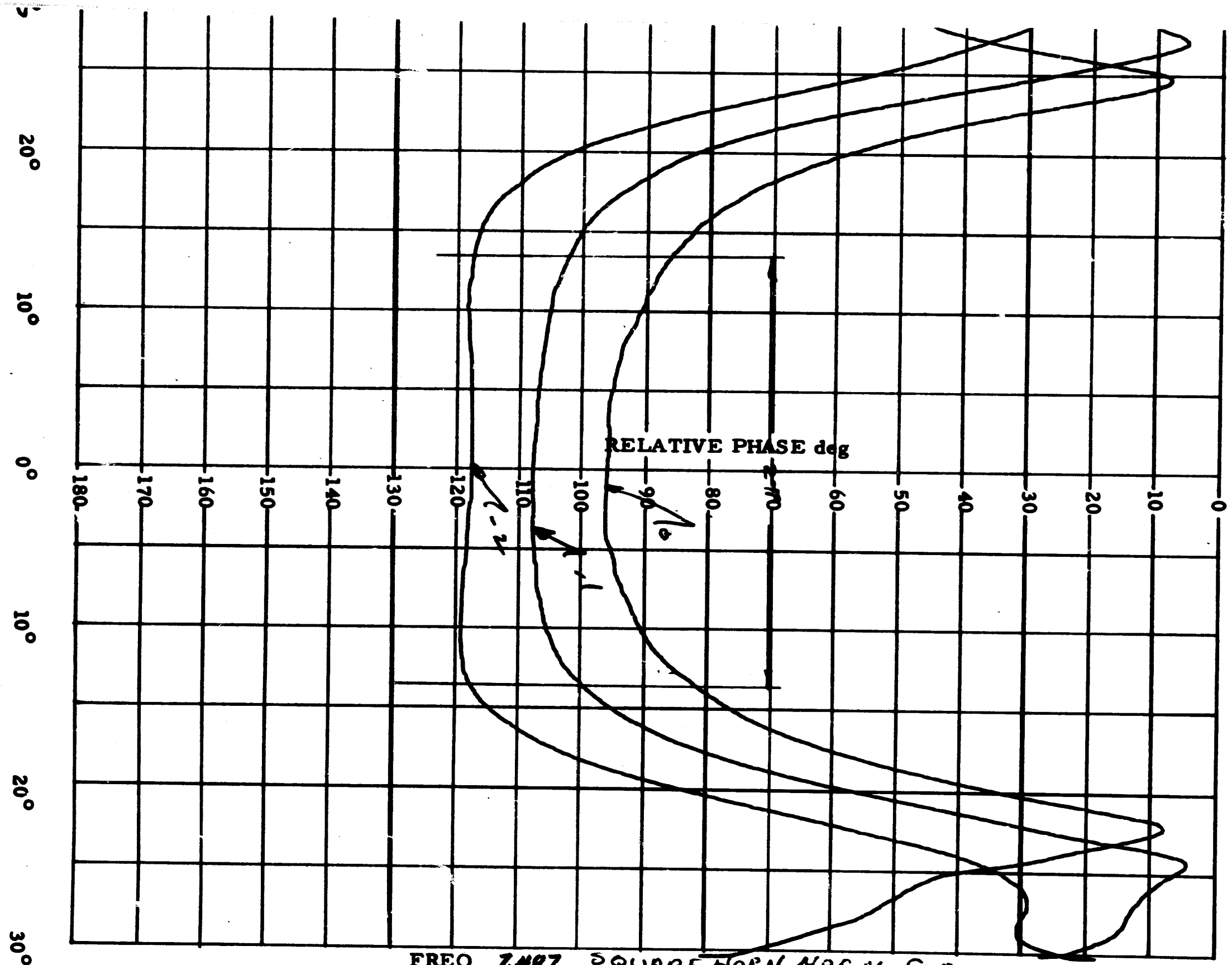
RECTANGULAR MULTIMODE HORN FED ON PRINCIPAL PLANE PHASE PATTERNS

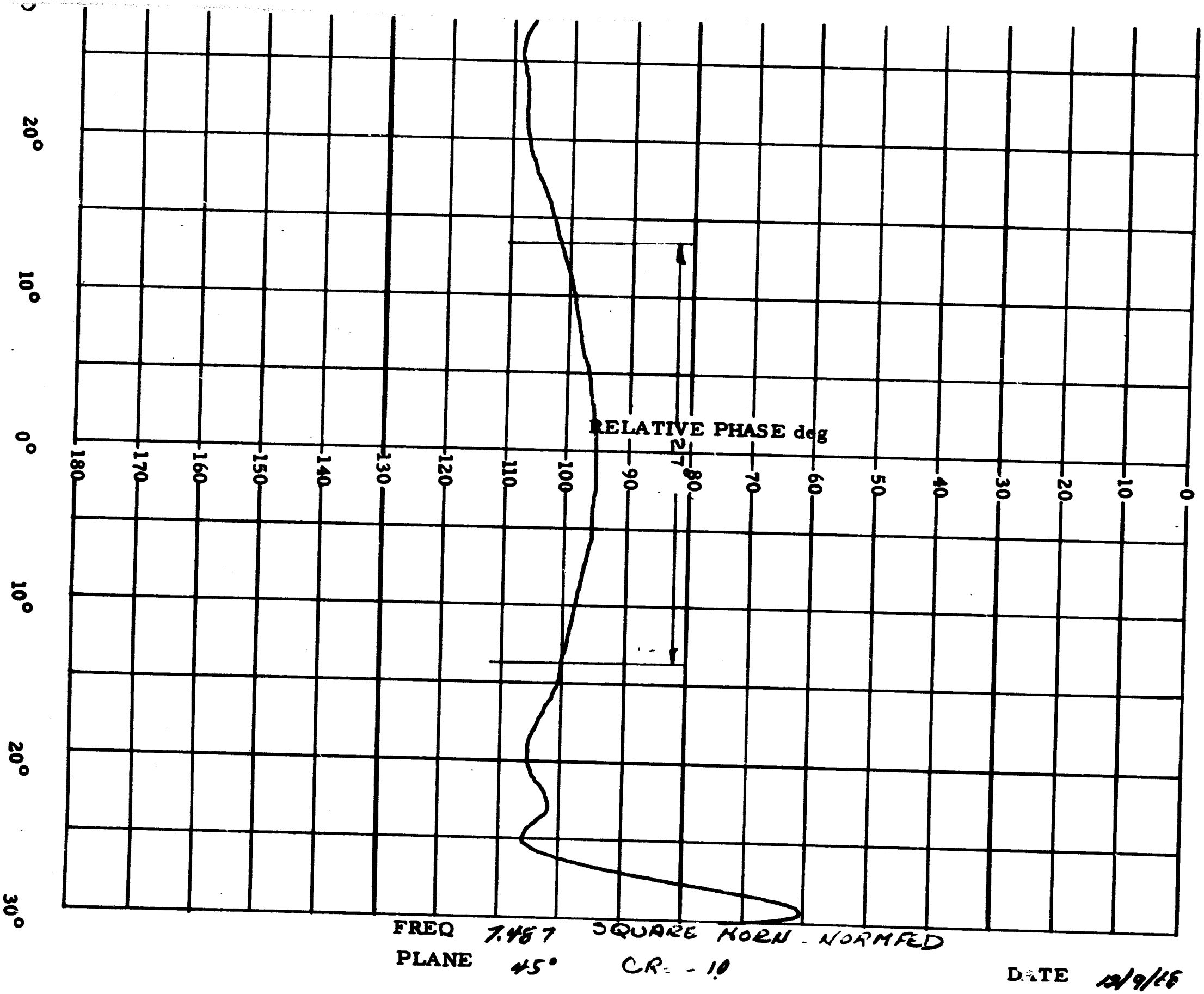


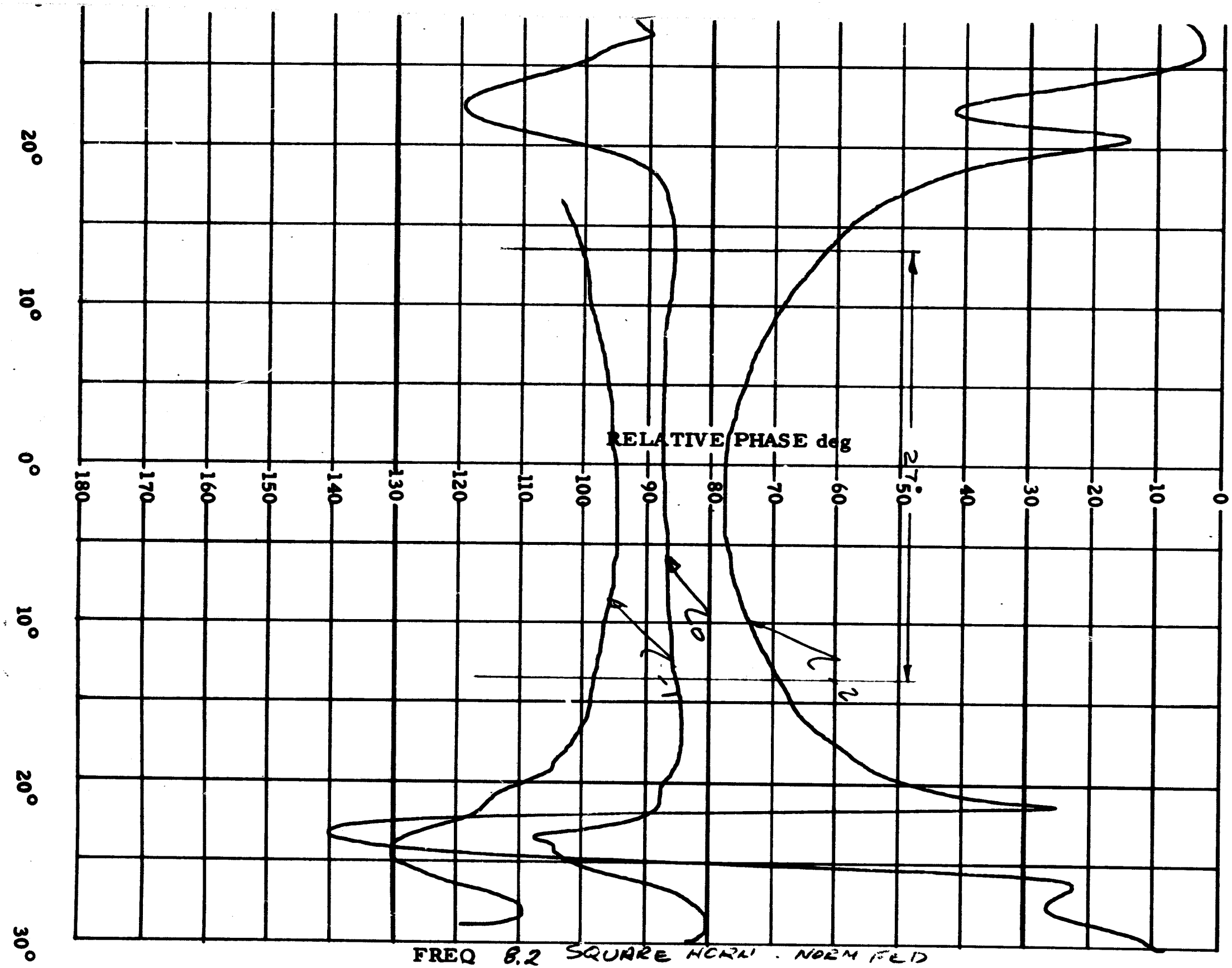
FREQ 7.487 SQUARE HORN - NORMFED.

PLANE E CR AS MARKED ⊕ IN FRONT OF APERTURE

DATE 12/9/66


RELATIVE PHASE deg
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
0° 10° 20° 30°
FREQ 7.487 SQUARE HORN NORMALIZED
PLANE H CK AS MARKED
DATE 12/9/66

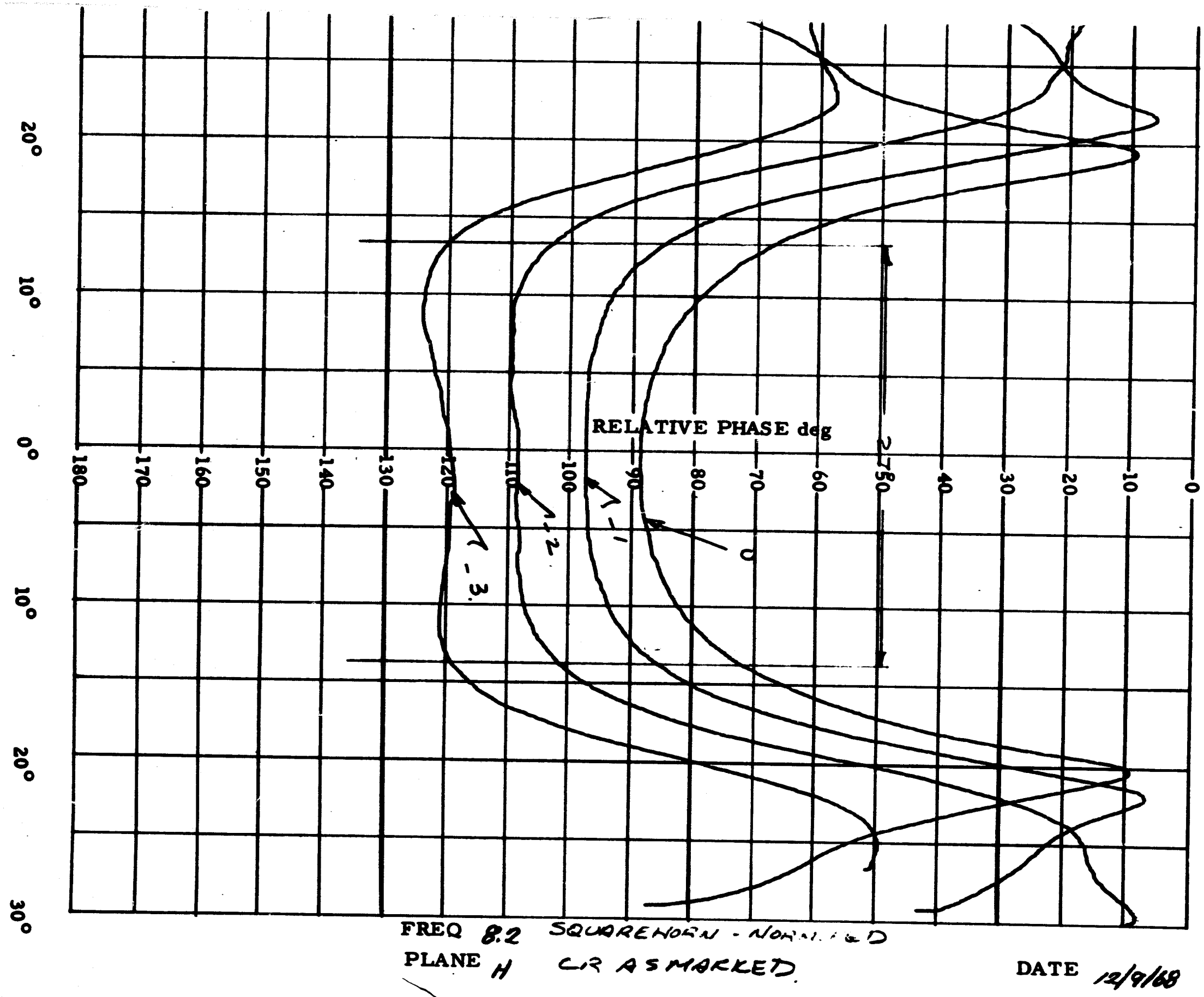

RELATIVE PHASE deg
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0°
10°
20°
10°
20°
30°
FREQ 7.467 SQUARE HORN - NORMED
PLANE 45° CR - 10
DATE 12/9/46

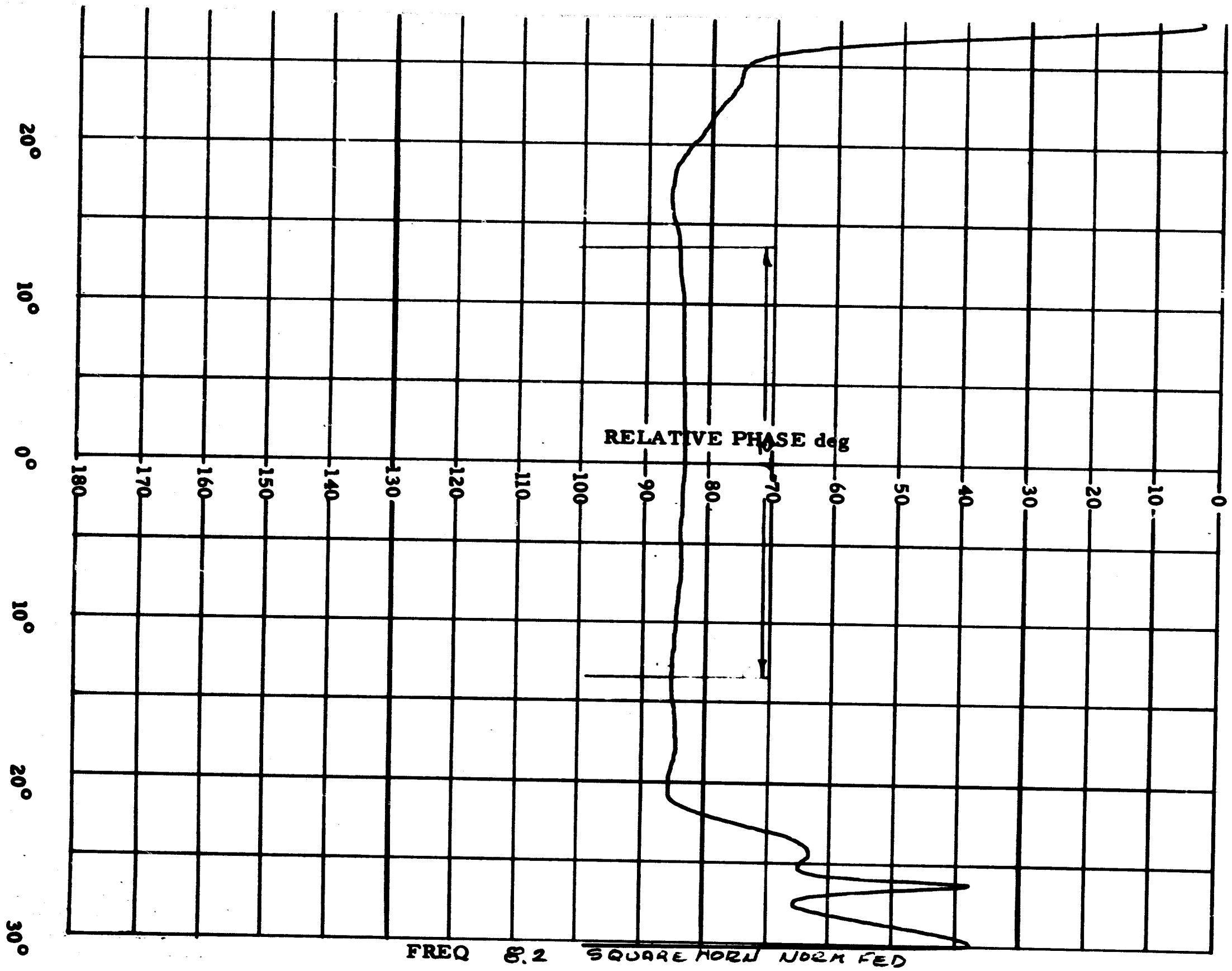


FREQ 8.2 SQUARE HORN . NORMFLD

PLANE E CR AS MARKED

DATE 12/9/68


0°
10°
20°
30°
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
RELATIVE PHASE deg
1 - 1
1 - 2
1 - 3
FREQ 8.2 SQUARE HORN - NORMALIZED
PLANE H CR AS MARKED
DATE 12/9/68



FREQ 8.2 SQUARE HORN NORM FED

PLANE 45° CR:-1

DATE 12/9/65

APPENDIX III - C

RECTANGULAR MULTIMODE HORN COMPUTER EFFICIENCY DATA

Legend

PSI	-	Polar Angle
ETA	-	Total Aperture Efficiency
ETS	-	Spillover Efficiency
ETI	-	Illumination Efficiency
ETX	-	Cross Polarization Efficiency
ETP	-	Phase Error Efficiency
ETB	-	Blockage Efficiency
E	-	E-Plane Pattern (dB)
EP	-	E-Plane Phase (deg)
H	-	H-Plane Pattern (dB)
HP	-	H-Plane Phase (deg)

JPL RECT FEED PRIN FED 7.4 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= C.5CCCC
END VALUE OF THETA= 9C.CCCCC
SIGN OF INPUT DATA= -1.CCCCC
BLOCKAGE= C.C
NUMBER OF INPUT VALUES READ IN OR CALC= 19
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.5C	C.CC2	C.CC2	C.991	1.CCC	1.CCC	1.CCC	C.1	0.0	0.1	0.0
1.0C	0.CC8	C.CC8	C.997	1.CCC	1.CCC	1.CCC	0.1	0.0	0.1	0.0
1.5C	0.C17	C.C17	C.999	1.CCC	1.CCC	1.CCC	0.2	0.0	0.2	0.0
2.CC	C.C3C	C.C3C	C.999	1.CCC	1.CCC	1.CCC	0.3	0.0	0.3	0.0
2.5C	C.C47	0.C47	C.999	1.CCC	1.CCC	1.CCC	C.3	0.0	0.3	0.0
3.CC	C.C6E	C.C6E	C.999	1.CCC	1.CCC	1.CCC	C.4	0.0	0.4	0.0
3.5C	C.C8S	C.C8S	C.999	1.CCC	1.CCC	1.CCC	0.5	0.0	0.6	0.0
4.CC	0.115	C.115	C.999	1.CCC	1.CCC	1.CCC	0.7	0.0	0.7	0.0
4.5C	C.143	C.143	C.999	1.CCC	1.CCC	1.CCC	C.8	0.0	0.9	0.0
5.CC	0.173	C.173	C.999	1.CCC	1.CCC	1.CCC	C.9	0.0	1.1	0.0
5.5C	C.2C5	C.2C5	C.999	1.CCC	1.CCC	1.CCC	1.1	0.0	1.2	0.0
6.CC	0.239	C.239	C.998	1.CCC	1.CCC	1.CCC	1.2	0.0	1.4	0.0
6.5C	0.274	C.274	C.998	1.CCC	1.CCC	1.CCC	1.4	0.0	1.7	0.0
7.CC	0.3C9	C.31C	C.997	1.CCC	1.CCC	1.CCC	1.7	0.0	2.0	0.0
7.5C	0.344	C.346	C.995	1.CCC	1.CCC	1.CCC	1.9	0.0	2.3	0.0
8.CC	C.380	C.382	C.994	1.CCC	1.CCC	1.CCC	2.1	0.0	2.7	0.0
8.5C	C.415	C.418	C.992	1.CCC	1.CCC	1.CCC	2.4	0.0	3.0	0.0
9.CC	C.450	C.454	C.991	1.CCC	1.CCC	1.CCC	2.6	0.0	3.3	0.0
9.5C	0.483	C.489	C.988	1.CCC	1.CCC	1.CCC	2.9	0.0	3.7	0.0
10.CC	0.516	C.524	C.9EE	C.999	1.CCC	1.CCC	3.2	0.0	4.1	0.0
10.5C	0.547	C.557	C.983	C.999	1.CCC	1.CCC	3.5	0.0	4.5	0.0
11.CC	0.57E	C.5E9	C.979	C.999	1.CCC	1.CCC	3.9	0.0	5.0	0.0
11.5C	C.6C3	C.619	C.975	C.999	1.CCC	1.CCC	4.2	0.0	5.4	0.0
12.CC	0.629	C.649	C.971	0.999	1.CCC	1.CCC	4.5	0.0	5.8	0.0
12.5C	0.653	C.677	C.9EE	C.999	1.CCC	1.CCC	4.8	0.0	6.4	0.0
13.CC	C.674	C.7C3	C.961	C.998	1.CCC	1.CCC	5.2	0.0	7.0	0.0
13.5C	C.693	C.727	C.955	C.998	1.CCC	1.CCC	5.5	0.0	7.6	0.0
14.CC	C.71C	C.75C	C.949	C.997	1.CCC	1.CCC	5.9	0.0	8.3	0.0
14.5C	C.724	C.772	C.941	C.997	1.CCC	1.CCC	6.2	0.0	8.9	0.0
15.CC	0.737	C.792	C.934	C.996	1.CCC	1.CCC	6.6	0.0	9.5	0.0
15.5C	C.747	C.81C	C.92E	C.996	1.CCC	1.CCC	7.C	0.0	10.2	0.0
16.CC	C.755	C.827	C.917	C.995	1.CCC	1.CCC	7.4	0.0	11.0	0.0
16.5C	C.76C	C.843	C.9C7	C.995	1.CCC	1.CCC	7.8	0.0	11.7	0.0
17.CC	0.764	C.857	C.8E7	C.994	1.CCC	1.CCC	8.3	0.0	12.4	0.0
17.5C	0.766	C.87C	C.8E7	C.993	1.CCC	1.CCC	8.7	0.0	13.2	0.0
18.CC	C.766	C.8E2	C.876	C.992	1.CCC	1.CCC	9.1	0.0	13.9	0.0
18.5C	C.765	C.892	C.865	C.992	1.CCC	1.CCC	9.7	0.0	14.7	0.0
19.CC	0.762	C.9C2	C.852	C.991	1.CCC	1.CCC	10.2	0.0	15.6	0.0
19.5C	C.757	C.91C	C.84C	C.990	1.CCC	1.CCC	10.8	0.0	16.4	0.0
20.CC	0.751	C.918	C.82E	C.989	1.CCC	1.CCC	11.4	0.0	17.2	0.0
20.5C	0.743	C.925	C.813	C.9E9	1.CCC	1.CCC	11.9	0.0	18.1	0.0
21.CC	0.734	C.93C	C.799	C.988	1.CCC	1.CCC	12.5	0.0	18.9	0.0
21.5C	0.725	C.936	C.784	C.9E8	1.CCC	1.CCC	13.2	0.0	19.3	0.0
22.CC	0.715	C.94C	C.77C	C.9E7	1.CCC	1.CCC	13.9	0.0	19.7	0.0

JPL RECT FEED PRIN.FED 7.487 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= C.5CCCC
END VALUE OF THETA= 9C.CCCCC
SIGN OF INPUT DATA= -1.CCCCC
BLOCKAGE= C.C
NUMBER OF INPUT VALUES READ IN OR CALC= 19
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.5C	C.CC2	C.CC2	C.991	1.CCC	1.CCC	1.00C	C.1	0.0	C.1	0.0
1.0C	C.CC9	C.CC9	C.997	1.C00	1.CCC	1.00C	0.1	0.0	0.1	0.0
1.5C	C.C2C	C.02C	C.999	1.C00	1.CCC	1.CCC	C.1	0.0	0.2	0.0
2.0C	C.C3E	C.C3E	C.999	1.CCC	1.CCC	1.0CC	C.2	0.0	0.3	0.0
2.5C	C.C5S	C.C5S	C.999	1.000	1.0CC	1.00C	0.2	0.0	0.3	0.0
3.0C	C.C7S	C.C7S	C.999	1.CCC	1.CCC	1.C0C	C.3	0.0	C.4	0.0
3.5C	C.1C6	C.1C6	C.999	1.CCC	1.CCC	1.00C	0.5	0.0	0.6	0.0
4.0C	C.13E	C.13E	C.999	1.C00	1.CCC	1.CCC	0.7	0.0	0.7	0.0
4.5C	C.16E	C.16E	C.999	1.CC0	1.CCC	1.0CC	C.8	0.0	0.9	0.0
5.0C	C.2C3	C.2C4	C.999	1.C0C	1.C0C	1.000	1.C	0.0	1.1	0.0
5.5C	C.24C	C.241	C.998	1.C00	1.CCC	1.00C	1.2	0.0	1.2	0.0
6.0C	0.279	C.28C	C.99E	1.CCC	1.CCC	1.00C	1.4	0.0	1.4	0.0
6.5C	0.319	C.32C	C.997	1.CCC	1.CCC	1.000	1.7	0.0	1.7	0.0
7.0C	C.359	C.361	C.996	1.C00	1.CCC	1.CCC	2.C	0.0	2.0	0.0
7.5C	0.399	C.4C1	C.994	1.C0C	1.CCC	1.00C	2.3	0.0	2.3	0.0
8.0C	0.439	C.442	C.993	1.C00	1.0CC	1.000	2.6	0.0	2.6	0.0
8.5C	0.478	C.482	C.991	1.C00	1.0CC	1.C0C	2.9	0.0	2.9	0.0
9.0C	0.516	C.522	C.988	1.C00	1.CCC	1.0CC	3.2	0.0	3.2	0.0
9.5C	0.553	C.561	C.986	1.C00	1.0CC	1.C0C	3.6	0.0	3.6	0.0
10.00	C.587	C.59E	C.982	1.0CC	1.CCC	1.00C	4.C	0.0	4.1	0.0
10.5C	C.62C	C.633	0.979	1.C0C	1.CCC	1.00C	4.4	0.0	4.5	0.0
11.0C	C.65C	C.667	C.974	1.C00	1.CCC	1.00C	4.8	0.0	4.9	0.0
11.5C	0.678	C.69S	C.969	1.CC0	1.CCC	1.C0C	5.2	0.0	5.4	0.0
12.CC	C.7C3	C.73C	C.964	1.CCC	1.CCC	1.00C	5.6	0.0	5.8	0.0
12.5C	C.72E	C.75E	C.95E	1.CCC	1.CCC	1.00C	6.2	0.0	6.4	0.0
13.CC	C.745	C.783	C.951	1.C0C	1.CCC	1.0CC	6.7	0.0	7.1	0.0
13.5C	0.76C	C.80E	C.943	1.C0C	1.0CC	1.00C	7.3	0.0	7.7	0.0
14.CC	C.773	C.827	C.934	1.C0C	1.0CC	1.000	7.9	0.0	8.3	0.0
14.5C	0.782	C.84E	C.924	1.C0C	1.CCC	1.0CC	8.4	0.0	9.0	0.0
15.0C	C.789	C.863	C.914	1.CCC	1.0CC	1.000	9.0	0.0	9.6	0.0
15.5C	C.793	C.87E	C.9C2	1.C00	1.CCC	1.00C	9.6	0.0	10.3	0.0
16.CC	C.794	C.892	C.89C	1.C00	1.CCC	1.0CC	10.2	0.0	11.0	0.0
16.5C	C.793	C.9C4	C.87E	1.C00	1.0CC	1.000	10.8	0.0	11.7	0.0
17.CC	C.79C	C.914	C.8E4	1.C0C	1.0CC	1.00C	11.5	0.0	12.4	0.0
17.5C	C.785	C.924	C.85C	1.C0C	1.CCC	1.0CC	12.1	0.0	13.1	0.0
18.00	0.779	C.932	0.83E	1.CCC	1.0CC	1.000	12.7	0.0	13.8	0.0
18.5C	C.771	C.939	C.821	1.000	1.CCC	1.00C	13.6	0.0	14.7	0.0
19.0C	0.761	C.945	C.8C5	1.C00	1.CCC	1.0CC	14.5	0.0	15.5	0.0
19.5C	0.749	C.95C	0.785	1.CCC	1.0CC	1.000	15.4	0.0	16.4	0.0
20.CC	C.73E	C.954	C.771	1.C00	1.0CC	1.00C	16.3	0.0	17.3	0.0
20.5C	C.722	C.958	C.754	1.C0C	1.0CC	1.0CC	17.2	0.0	18.1	0.0
21.00	0.7C7	C.961	C.73E	1.C00	1.C0C	1.00C	18.1	0.0	19.0	0.0
21.5C	0.692	C.963	C.718	1.C00	1.00C	1.000	19.2	0.0	19.4	0.0
22.00	C.67E	C.965	C.7CC	1.C00	1.0CC	1.0CC	20.3	0.0	19.8	0.0

JPL RECT FEEC PRIN FEC 7.6 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= C.5COCC
END VALUE OF THETA= 9C.CCCCC
SIGN OF INPUT DATA= -1.CCCCC
BLOCKAGE= C.C
NUMBER OF INPUT VALUES READ IN OR CALC= 19
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.5C	0.CC3	C.CC3	C.991	1.CCC	1.CCC	1.CCC	C.1	0.0	0.1	0.0
1.0C	C.C1C	C.C1C	C.997	1.CCC	1.CCC	1.00C	0.2	0.0	0.2	0.0
1.5C	C.C22	C.C22	C.999	1.CCC	1.CCC	1.CCC	0.3	0.0	0.3	0.0
2.0C	C.C39	C.C39	C.999	1.COC	1.CCC	1.CCC	C.3	0.0	0.3	0.0
2.5C	C.C6C	C.C6C	C.999	1.CCC	1.CCC	1.CCC	C.4	C.0	0.4	0.0
3.0C	C.C8E	C.C8E	C.999	1.CCC	1.CCC	1.0CC	0.5	C.0	0.5	0.0
3.50	0.115	C.115	C.999	1.CCC	1.CCC	1.0CC	C.7	C.0	0.7	0.0
4.0C	C.147	C.147	C.999	1.CCC	1.CCC	1.0CC	C.9	0.0	0.9	0.0
4.5C	C.182	C.182	C.999	1.CCC	1.CCC	1.0CC	1.0	0.0	1.1	0.0
5.0C	C.219	C.22C	C.998	1.CCC	1.CCC	1.CCC	1.2	0.0	1.3	0.0
5.5C	0.25E	C.259	C.998	1.CCC	1.CCC	1.0CC	1.4	0.0	1.5	0.0
6.0C	C.299	C.30C	C.997	1.COC	1.CCC	1.0CC	1.6	0.0	1.7	0.0
6.5C	0.341	C.343	C.996	1.CCC	1.CCC	1.CCC	1.9	0.0	2.0	0.0
7.0C	0.383	C.385	C.995	1.CCC	1.CCC	1.000	2.3	0.0	2.3	0.0
7.5C	0.424	C.427	C.993	1.COC	1.CCC	1.00C	2.6	0.0	2.6	0.0
8.00	C.465	C.469	C.991	1.COC	1.CCC	1.CCC	2.9	0.0	3.0	0.0
8.5C	C.505	C.511	C.989	1.COC	1.CCC	1.COC	3.3	0.0	3.3	0.0
9.CC	C.544	C.551	C.986	1.COO	1.CCC	1.00C	3.6	0.0	3.6	0.0
9.5C	0.581	C.591	C.983	1.CCC	1.CCC	1.CCC	4.1	0.0	4.1	0.0
10.00	C.614	C.62E	C.979	1.COC	1.CCC	1.00C	4.5	C.0	4.6	0.0
10.5C	C.64E	C.663	C.974	1.CCC	1.CCC	1.COO	5.C	0.0	5.0	0.0
11.0C	0.674	C.695	C.969	1.CCC	1.CCC	1.CCC	5.5	0.0	5.5	0.0
11.5C	C.699	C.72E	C.963	1.00C	1.CCC	1.0CC	5.9	0.0	6.C	0.0
12.0C	C.722	C.755	C.957	1.CCC	1.0CC	1.0CC	6.4	0.0	6.5	0.0
12.50	C.742	C.781	C.949	1.CCC	1.CCC	1.0CC	7.C	0.0	7.1	0.0
13.0C	C.75E	C.8C5	C.941	1.COC	1.CCC	1.0CC	7.7	0.0	7.7	0.0
13.5C	C.77C	C.827	C.931	1.CCC	1.CCC	1.CCC	8.3	0.0	8.3	0.0
14.0C	0.779	C.84E	C.921	1.COC	1.CCC	1.CCC	E.9	0.0	9.0	0.0
14.5C	C.78E	C.E63	C.91C	1.00C	1.CCC	1.00C	9.6	0.0	9.6	0.0
15.00	C.789	C.87E	C.E9E	1.CCC	1.COC	1.0CC	10.2	0.0	10.2	0.0
15.5C	C.79C	C.8E2	C.EEE	1.COC	1.CCC	1.00C	10.9	0.0	10.9	0.0
16.0C	C.79E	C.9C4	C.E73	1.COC	1.CCC	1.00C	11.6	0.0	11.7	0.0
16.50	C.795	C.915	C.E5E	1.CCC	1.CCC	1.CCC	12.3	0.0	12.4	0.0
17.0C	0.779	C.924	C.844	1.COC	1.CCC	1.0CC	13.C	0.0	13.1	0.0
17.5C	0.772	C.932	C.E2E	1.COC	1.CCC	1.00C	13.7	0.0	13.9	0.0
18.0C	C.763	C.939	C.E13	1.CCC	1.COC	1.0CC	14.4	0.0	14.6	0.0
18.5C	0.752	C.945	C.7FE	1.CCC	1.CCC	1.CCC	15.2	0.0	15.5	0.0
19.0C	C.74C	C.95C	C.78C	1.0CC	1.CCC	1.000	16.0	0.0	16.4	0.0
19.5C	C.727	C.954	C.762	1.COC	1.0CC	1.00C	16.7	0.0	17.3	0.0
20.0C	0.713	C.957	C.745	1.CCC	1.CCC	1.0CC	17.5	0.0	18.3	0.0
20.5C	0.69E	C.96C	C.727	1.00C	1.CCC	1.00C	18.3	0.0	19.2	0.0
21.00	0.6E3	C.963	C.7C9	1.COC	1.0CC	1.CCC	19.1	0.0	20.1	0.0
21.50	0.667	C.965	C.691	1.0CC	1.CCC	1.0CC	19.9	0.0	20.4	0.0
22.00	C.652	C.967	C.674	1.COO	1.CCC	1.00C	20.8	0.0	20.6	0.0

JPL RECT FEED PRIN FED 7.8 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= C.5COCC
END VALUE OF THETA= 9C.COCCC
SIGN OF INPUT DATA= -1.CCCCC
BLOCKAGE= C.C
NUMBER OF INPUT VALUES READ IN OR CALC= 19
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.5C	C.CC2	C.CC2	C.991	1.CCC	1.CCC	1.CCC	C.1	0.0	0.1	0.0
1.CC	C.CC9	C.CC9	C.997	1.COC	1.CCC	1.OCC	0.1	0.0	0.1	0.0
1.5C	C.C19	C.C19	C.999	1.CCC	1.CCC	1.OOC	0.2	0.0	0.1	0.0
2.0C	0.C34	C.C34	C.999	1.CCC	1.CCC	1.CCC	C.3	0.0	0.2	0.0
2.5C	C.C52	C.C52	C.999	1.CCC	1.CCC	1.OOC	0.3	0.0	0.2	0.0
3.0C	C.C74	C.C74	C.999	1.COC	1.CCC	1.CCC	0.4	0.0	0.3	0.0
3.5C	C.1CC	C.10C	C.999	1.COO	1.CCC	1.OCC	0.5	0.0	0.5	0.0
4.0C	0.12E	C.12E	C.999	1.CCO	1.CCC	1.OOC	C.7	0.0	0.7	0.0
4.5C	C.15S	C.15S	C.999	1.OOO	1.CCC	1.OCC	0.8	0.0	0.9	0.0
5.CC	0.1S2	C.1S2	C.999	1.CCC	1.OCC	1.OCC	1.C	0.0	1.1	0.0
5.5C	0.227	C.22E	C.99E	1.COC	1.CCC	1.OOC	1.1	0.0	1.3	0.0
6.CC	C.264	C.26S	C.99E	1.COO	1.CCC	1.OOC	1.3	0.0	1.5	0.0
6.5C	0.3C2	C.3C3	C.997	1.CCC	1.CCC	1.CCC	1.5	0.0	1.8	0.0
7.0C	C.340	C.341	C.99E	1.OOO	1.CCC	1.OOC	1.8	0.0	2.2	0.0
7.5C	C.37E	C.38C	C.994	1.COO	1.CCC	1.OOC	2.C	0.0	2.5	0.0
8.0C	0.415	C.41S	C.993	1.COC	1.CCC	1.OCC	2.3	0.0	2.8	0.0
8.5C	C.453	C.457	C.991	1.CCC	1.CCC	1.OOC	2.5	C.0	3.2	0.0
9.0C	C.48S	C.49S	C.98S	1.COO	1.CCC	1.OCC	2.8	0.0	3.5	0.0
9.5C	C.525	C.533	C.98E	1.CCC	1.CCC	1.CCC	3.1	0.0	3.9	0.0
10.CC	C.55S	C.56S	C.983	0.999	1.CCC	1.OCC	3.5	C.0	4.4	0.0
10.5C	C.59C	C.6C3	C.98C	C.999	1.CCC	1.CCC	3.8	0.0	4.8	0.0
11.0C	0.62C	0.63E	C.97E	C.999	1.CCC	1.OOC	4.1	0.0	5.3	0.0
11.5C	C.64E	C.66E	C.972	0.999	1.CCC	1.OOC	4.5	0.0	5.7	0.0
12.0C	0.674	C.69E	C.967	C.999	1.OOC	1.OOC	4.8	0.0	6.2	0.0
12.5C	C.69E	C.727	C.961	C.99E	1.CCC	1.CCC	5.3	0.0	6.9	0.0
13.0C	C.71E	C.753	C.995	C.998	1.CCC	1.OOC	5.7	0.0	7.6	0.0
13.5C	C.734	C.77E	C.94E	C.998	1.OOC	1.OOC	6.2	0.0	8.3	0.0
14.0C	C.74E	C.79E	C.939	C.997	1.CCC	1.OOC	6.7	0.0	9.C	0.0
14.5C	C.759	C.81E	C.930	C.997	1.CCC	1.OOC	7.1	0.0	9.7	0.0
15.0C	C.767	C.83E	C.921	C.997	1.CCC	1.CCC	7.6	0.0	10.4	0.0
15.5C	0.773	C.852	C.91C	C.996	1.OCC	1.OOC	8.C	0.0	11.2	0.0
16.CC	C.77E	C.867	C.899	C.996	1.OCC	1.OOC	8.5	0.0	12.0	0.0
16.5C	0.77E	C.8EC	C.88E	C.995	1.CCC	1.OOC	8.9	0.0	12.8	0.0
17.0C	C.777	C.893	C.87E	C.994	1.CCC	1.OOC	9.4	0.0	13.6	0.0
17.5C	0.775	C.904	0.8E3	C.994	1.OCC	1.OOO	9.8	0.0	14.4	0.0
18.0C	C.772	C.914	C.851	C.993	1.COC	1.OOC	10.3	0.0	15.2	0.0
18.5C	C.767	C.923	C.837	C.993	1.OCC	1.COC	10.9	0.0	16.0	0.0
19.00	C.76C	C.931	C.823	C.992	1.OOC	1.OOC	11.5	0.0	16.9	0.0
19.5C	C.752	C.93E	C.8C9	C.991	1.OOC	1.OCC	12.C	0.0	17.7	0.0
20.00	C.743	C.944	C.795	C.991	1.OCC	1.CCC	12.6	0.0	18.5	0.0
20.5C	C.733	C.949	C.780	C.990	1.OCC	1.COC	13.2	0.0	19.4	0.0
21.0C	C.722	C.954	C.765	C.990	1.OOC	1.OOC	13.8	0.0	20.2	0.0
21.5C	0.711	C.95E	C.750	0.989	1.OCC	1.OOC	14.5	0.0	20.4	0.0
22.0C	C.695	C.962	0.734	C.989	1.OOC	1.OOC	15.3	0.0	20.7	0.0

JPL RECT FEED PRINTED 8.C GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= C.5CCCC
END VALUE OF THETA= 5C.CCCCC
SIGN OF INPUT DATA= -1.COCOC
BLOCKAGE= C.C
NUMBER OF INPUT VALUES READ IN OR CALC= 15
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.5C	C.CC3	C.CC3	C.991	1.COC	1.CCC	1.CCC	0.1	C.0	0.1	0.0
1.0C	0.C11	C.C11	C.997	1.COC	1.CCC	1.CCC	C.2	0.0	0.2	0.0
1.5C	0.C24	C.C24	C.995	1.COC	1.CCC	1.CCC	C.3	0.0	0.3	0.0
2.CC	C.C41	C.041	C.995	1.CCC	1.CCC	1.CCC	0.3	0.0	0.3	0.0
2.5C	0.C64	C.C64	C.995	1.COC	1.CCC	1.CCC	C.4	0.0	0.4	0.0
3.0C	0.C91	C.C91	C.995	1.COC	1.CCC	1.CCC	C.5	C.C	0.5	0.0
3.5C	C.122	C.122	C.995	1.CCC	1.CCC	1.CCC	C.7	0.0	0.7	0.0
4.CO	0.155	C.155	C.995	1.CCC	1.CCC	1.COC	1.C	0.0	0.9	0.0
4.5C	0.191	C.192	C.99E	1.COC	1.CCC	1.COC	1.2	0.0	1.1	0.0
5.0C	C.229	C.23C	C.99E	1.COO	1.CCC	1.CCC	1.5	0.0	1.4	0.0
5.5C	C.269	C.27C	C.997	1.CCC	1.CCC	1.CCC	1.7	0.0	1.6	0.0
6.00	C.31C	C.311	C.99E	1.COC	1.CCC	1.CCC	2.C	0.0	1.8	0.0
6.5C	C.352	C.354	C.995	1.CCO	1.COC	1.CCC	2.3	0.0	2.2	0.0
7.0C	0.393	C.395	C.993	1.CCC	1.CCC	1.CCC	2.7	0.0	2.6	0.0
7.50	0.433	C.437	C.991	1.COC	1.CCC	1.CCC	3.C	0.0	3.0	0.0
8.CO	0.471	C.477	C.988	1.COC	1.CCC	1.CCC	3.3	0.0	3.4	0.0
8.50	C.5C9	C.517	C.985	1.CCC	1.CCC	1.CCC	3.7	0.C	3.8	0.0
9.CC	C.545	C.555	C.982	1.COC	1.CCC	1.CCC	4.C	0.0	4.2	0.0
9.50	C.579	C.593	C.978	1.COC	1.CCC	1.CCC	4.4	0.0	4.7	0.0
10.0C	C.611	C.62E	C.973	1.CCC	1.CCC	1.CCC	4.8	0.C	5.2	0.0
10.50	C.64C	C.661	C.96E	1.COO	1.CCC	1.COC	5.2	0.0	5.7	0.0
11.00	C.667	C.693	C.962	1.CCC	1.CCC	1.CCC	5.7	0.0	6.2	0.0
11.5C	C.691	C.722	C.956	1.COO	1.CCC	1.CCC	6.1	0.0	6.7	0.0
12.00	0.712	C.750	C.95C	1.COC	1.CCC	1.CCC	6.5	0.0	7.2	0.0
12.5C	0.731	C.77E	C.942	1.CCC	1.CCC	1.CCC	7.1	0.0	7.9	0.0
13.00	0.745	C.79E	C.934	1.COC	1.CCC	1.CCC	7.7	0.0	8.6	0.0
13.50	0.756	C.81S	C.924	1.COC	1.CCC	1.CCC	8.3	0.0	9.3	0.0
14.0C	C.764	C.837	C.913	1.COC	1.CCC	1.CCC	8.9	0.0	10.1	0.0
14.50	0.765	C.853	C.902	0.999	1.CCC	1.CCC	9.5	0.0	10.8	0.0
15.00	0.771	C.86E	C.889	C.999	1.CCC	1.CCC	10.1	0.0	11.5	0 0
15.5C	C.771	C.881	C.87E	C.999	1.CCC	1.CCC	10.7	0.0	12.3	0.0
16.00	0.765	C.892	C.863	C.999	1.CCC	1.CCC	11.3	0.0	13.1	0.0
16.50	C.764	C.902	0.848	C.999	1.CCC	1.CCC	11.9	0.0	13.9	0.0
17.0C	0.75E	C.911	C.833	C.999	1.CCC	1.CCC	12.6	0.0	14.7	0.0
17.50	0.75C	C.918	C.81E	C.999	1.CCC	1.CCC	13.2	0.0	15.5	0.0
18.CO	0.741	C.925	C.8C2	C.999	1.CCC	1.COC	13.8	0.0	16.3	0.0
18.5C	C.731	C.931	C.78E	C.999	1.CCC	1.COC	14.5	0.0	16.9	0.0
19.0C	0.72C	C.93E	C.77C	C.998	1.CCC	1.COC	15.3	0.0	17.6	0.0
19.50	0.7C8	C.941	0.754	C.998	1.CCC	1.CCC	16.C	0.0	18.2	0.0
20.00	0.695	C.944	C.737	C.998	1.CCC	1.CCC	16.7	0.0	18.8	0.0
20.50	C.682	C.94E	C.721	C.998	1.CCC	1.CCC	17.5	C.0	19.5	0.0
21.00	C.669	C.951	C.7C4	C.998	1.CCC	1.COC	18.2	0.0	20.1	0.0
21.50	0.655	C.954	C.6EE	C.998	1.CCC	1.COC	19.C	0.0	20.2	0.0
22.00	C.642	C.956	C.673	C.998	1.CCC	1.CCC	19.9	0.0	20.3	0.0

JPL RECT FEEC PRIM FED 8.2 GHZ

INPUT CATA ANC CCNTRCLS FOR MAIN

THETA INCREMENT= C.5COCC
ENC VALUE CF THETA= 5C.COCOC
SIGN CF INPUT CATA= -1.CCCCO
BLCCKAGE= C.C
NUMBER CF INPUT VALUES READ IN OR CALC= 15
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.5C	C.CC3	C.CC3	C.991	1.COC	1.CCC	1.CCC	C.1	0.0	0.1	0.0
1.0C	0.C13	C.C13	C.997	1.COC	1.CCC	1.0CC	C.2	0.0	0.1	0.0
1.50	0.C29	C.C29	C.999	1.COC	1.CCC	1.0CC	C.3	0.C	0.2	0.0
2.0C	C.C51	C.C51	C.999	1.CCC	1.CCC	1.0CC	0.5	0.0	0.3	0.0
2.5C	C.C79	0.C79	C.999	1.CCC	1.CCC	1.0CC	C.6	0.0	0.3	0.0
3.00	C.112	C.112	C.999	1.0CC	1.CCC	1.CCC	C.7	0.0	0.4	0.0
3.50	C.149	C.149	C.999	1.CCO	1.0CC	1.CCC	1.C	0.0	0.6	0.0
4.0C	C.189	C.19C	C.999	1.COC	1.CCC	1.CCC	1.3	0.0	0.9	0.0
4.50	C.232	C.233	C.998	1.COC	1.CCC	1.COC	1.6	0.0	1.1	0.0
5.0C	C.277	C.27E	C.997	C.999	1.0CC	1.CCC	2.0	0.0	1.3	0.0
5.50	0.324	C.325	C.996	0.999	1.CCC	1.CCC	2.3	0.0	1.6	0.0
6.00	0.371	C.374	C.995	0.999	1.CCC	1.00C	2.6	0.0	1.8	0.0
6.5C	0.419	C.422	C.993	0.999	1.CCC	1.CCC	3.1	0.0	2.2	0.0
7.00	0.464	C.469	C.990	0.999	1.CCC	1.CCC	3.6	0.C	2.6	0.0
7.50	C.507	C.515	C.987	C.999	1.0CC	1.0CC	4.1	0.0	3.0	0.0
8.00	0.548	C.53E	C.983	C.998	1.CCC	1.00C	4.6	0.0	3.5	0.0
8.5C	0.58E	C.60C	C.97E	C.998	1.CCC	1.0CC	5.1	0.0	3.9	0.0
9.0C	C.622	C.641	C.973	C.998	1.00C	1.00C	5.6	0.0	4.3	0.0
9.5C	C.654	C.67E	C.96E	0.998	1.CCC	1.00C	6.3	0.0	4.9	0.0
10.00	0.682	C.712	C.960	C.998	1.CCC	1.0CC	7.1	0.0	5.5	0.0
10.50	C.704	C.742	C.952	C.997	1.00C	1.00C	7.8	0.0	6.1	0.0
11.0C	C.723	C.77C	C.942	C.997	1.CCC	1.00C	8.5	0.0	6.7	0.0
11.50	0.73E	C.795	C.931	C.997	1.CCC	1.0CC	9.3	0.0	7.3	0.0
12.0C	0.749	C.817	C.92C	C.996	1.00C	1.CCC	10.0	0.0	7.9	0.0
12.5C	0.75E	C.83E	C.9C7	C.996	1.CCC	1.00C	11.1	0.0	8.7	0.0
13.00	0.75E	C.853	C.893	C.996	1.CCC	1.00C	12.2	0.0	9.4	0.0
13.5C	C.756	C.867	C.87E	C.995	1.CCC	1.00C	13.3	0.0	10.2	0.0
14.CC	0.751	C.879	C.855	C.995	1.CCC	1.00C	14.5	0.0	11.0	0.0
14.50	0.743	C.889	C.841	C.995	1.CCC	1.00C	15.6	0.0	11.7	0.0
15.0C	0.733	C.897	C.822	C.994	1.00C	1.00C	16.7	0.0	12.5	0.0
15.50	0.721	C.904	C.8C2	C.994	1.CCC	1.00C	18.2	0.0	13.2	0.0
16.00	0.7CE	C.91C	C.781	0.993	1.CCC	1.00C	19.6	0.0	14.0	0.0
16.50	C.691	C.915	C.76C	C.993	1.00C	1.COC	21.1	0.0	14.7	0.0
17.0C	0.674	C.919	C.739	C.992	1.CCC	1.00C	22.6	0.0	15.4	0.0
17.5C	C.657	C.923	C.718	C.992	1.0CC	1.00C	24.0	0.0	16.2	0.0
18.00	C.639	C.926	C.696	C.991	1.COC	1.00C	25.5	0.0	16.9	0.0
18.5C	0.621	C.929	0.675	0.991	1.CCC	1.00C	27.9	0.0	17.1	0.0
19.0C	C.604	C.931	0.655	C.990	1.CCC	1.CCC	30.3	0.0	17.4	0.0
19.50	C.587	C.933	0.635	C.989	1.CCC	1.00C	32.7	0.0	17.6	0.0
20.00	0.57C	C.936	C.61E	0.988	1.CCC	1.00C	35.2	0.0	17.8	0.0
20.50	C.554	C.938	0.59E	C.988	1.CCC	1.CCC	37.6	0.0	18.1	0.0
21.00	0.53S	C.94C	C.581	0.987	1.CCC	1.00C	40.C	0.0	18.3	0.0
21.50	0.524	C.942	C.564	C.986	1.00C	1.0C0	40.C	0.0	18.4	0.0
22.00	0.511	C.944	C.545	C.985	1.CCC	1.00C	40.0	0.0	18.6	0.0

JPL PECT FEEC PRIM FED 8.4 GHZ

INPUT CATA ANC CONTRCLS FOR MAIN

THETA INCREMENT= C.5COCC
ENC VALUE CF THETA= 5C.CCCCC
SIGN CF INPUT CATA= -1.COCCC
BLCCKAGE= C.C
NUMBEB CF INPUT VALUES READ IN OR CALC= 15
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEEC EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.5C	C.CC3	C.CC3	C.991	1.COC	1.CCC	1.OCC	C.1	C.C	0.1	0.0
1.0C	0.C12	C.C12	C.997	1.COC	1.CCC	1.OCC	0.2	0.0	0.2	0.0
1.50	0.C27	C.C27	C.995	1.COC	1.CCC	1.CCC	C.3	0.C	0.3	0.0
2.0C	0.C48	C.C4E	C.999	1.CCC	1.CCC	1.COC	C.4	C.0	0.4	0.0
2.5C	0.C73	C.C73	C.999	1.COC	1.CCC	1.CCC	0.5	0.0	0.5	0.0
3.00	C.1C4	C.1C4	C.999	1.CCC	1.CCC	1.OCC	C.6	0.C	0.6	0.0
3.50	C.139	C.135	C.999	1.COC	1.COC	1.COC	C.9	0.0	0.9	0.0
4.CC	0.17E	C.17E	C.999	1.COC	1.CCC	1.CCC	1.1	0.0	1.1	0.0
4.50	0.21E	C.217	C.99E	1.COC	1.CCC	1.OCC	1.4	0.C	1.4	0.0
5.00	0.25E	C.255	0.997	1.COC	1.CCC	1.OOC	1.7	0.0	1.7	0.0
5.5C	0.3C2	C.303	C.99E	1.CCC	1.CCC	1.CCC	1.9	0.0	1.9	0.0
6.00	0.34E	C.34E	C.999	1.COC	1.OCC	1.OCO	2.2	0.0	2.2	0.0
6.5C	0.391	C.393	C.993	1.OOC	1.CCC	1.OCC	2.6	0.0	2.6	0.0
7.0C	0.434	C.43E	C.991	1.COC	1.CCC	1.CCC	3.0	0.0	3.0	0.0
7.50	0.47E	0.482	C.98E	1.COC	1.CCC	1.OOC	3.4	0.C	3.4	0.0
8.00	C.51E	C.524	C.985	1.COO	1.CCC	1.OCC	3.9	0.C	3.8	0.0
8.50	C.554	C.565	C.981	1.CCC	1.CCC	1.COC	4.3	0.0	4.2	0.0
9.00	0.591	C.6C5	C.977	1.COC	1.CCC	1.OCC	4.7	C.0	4.6	0.0
9.5C	0.624	C.642	C.972	1.OOC	1.CCC	1.OCC	5.3	0.0	5.2	0.0
10.00	0.653	C.677	C.96E	1.COC	1.CCC	1.CCC	6.C	0.0	5.7	0.0
10.50	0.679	0.70E	C.95E	1.CCC	1.CCC	1.OOC	6.6	0.0	6.3	0.0
11.0C	C.70C	C.737	C.95C	1.COO	1.CCC	1.CCC	7.2	0.0	6.9	0.0
11.50	0.71E	C.763	C.941	1.CCC	1.CCC	1.CCC	7.9	0.0	7.4	0.0
12.00	0.733	C.78E	C.932	1.OCC	1.CCC	1.OOO	E.5	C.C	8.0	0.0
12.5C	C.743	C.8C8	C.921	1.OOO	1.CCC	1.OOO	9.4	0.0	8.7	0.0
13.00	C.75C	C.82E	C.9CE	1.CCC	1.CCC	1.OOC	1C.4	0.0	9.3	0.0
13.50	0.753	C.842	C.895	1.CCC	1.CCC	1.OOC	11.3	0.0	10.0	0.0
14.0C	0.753	C.856	C.88C	1.OOC	1.CCC	1.OCC	12.2	0.C	10.7	0.0
14.50	0.745	C.867	C.864	1.CCC	1.CCC	1.CCC	13.2	0.0	11.3	0.0
15.00	C.744	C.87E	C.848	C.999	1.CCC	1.CCC	14.1	0.0	12.0	0.0
15.5C	C.737	C.887	C.831	C.999	1.COC	1.COC	15.C	0.0	12.5	0.0
16.0C	0.728	C.895	C.814	C.995	1.CCC	1.CCC	16.C	0.C	13.0	0.0
16.50	0.718	C.9C2	C.797	0.995	1.CCC	1.OOC	16.9	0.0	13.5	0.0
17.00	C.7C7	C.9CE	C.78C	C.998	1.CCC	1.CCC	17.9	0.0	14.0	0.0
17.50	0.695	C.914	C.762	C.99E	1.CCC	1.OOC	18.8	0.0	14.5	0.0
18.00	0.683	C.919	C.745	C.998	1.CCC	1.OOC	19.8	0.0	15.0	0.0
18.5C	0.671	C.923	C.72E	C.997	1.CCC	1.OCC	20.7	0.0	15.3	0.0
19.00	0.65E	C.92E	C.712	C.997	1.CCC	1.OOC	21.5	0.0	15.6	0.0
19.50	0.64E	C.932	C.69E	C.997	1.CCC	1.OOC	22.4	0.0	15.8	0.0
20.00	0.634	C.935	C.68C	C.996	1.OCC	1.OOC	23.3	0.0	16.1	0.0
20.50	C.621	C.939	C.665	C.996	1.CCC	1.OOC	24.1	0.0	16.4	0.0
21.00	0.61C	C.942	C.65C	0.995	1.CCC	1.COC	25.C	0.0	16.7	0.0
21.50	0.598	C.945	C.63E	0.995	1.CCC	1.OOC	25.8	0.0	17.0	0.0
22.00	0.58E	C.948	C.622	C.994	1.CCC	1.OCO	26.7	0.0	17.3	0.0

JPL RECT FEED PRIM FED 8.55G GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= C.5COCC
END VALUE OF THETA= 9C.CCCCC
SIGN OF INPUT DATA= -1.CCCCC
BLOCKAGE= C.C
NUMBER OF INPUT VALUES READ IN OR CALC= 19
IC1= 1 IC2= 2 IC3= 1 IC4= 1

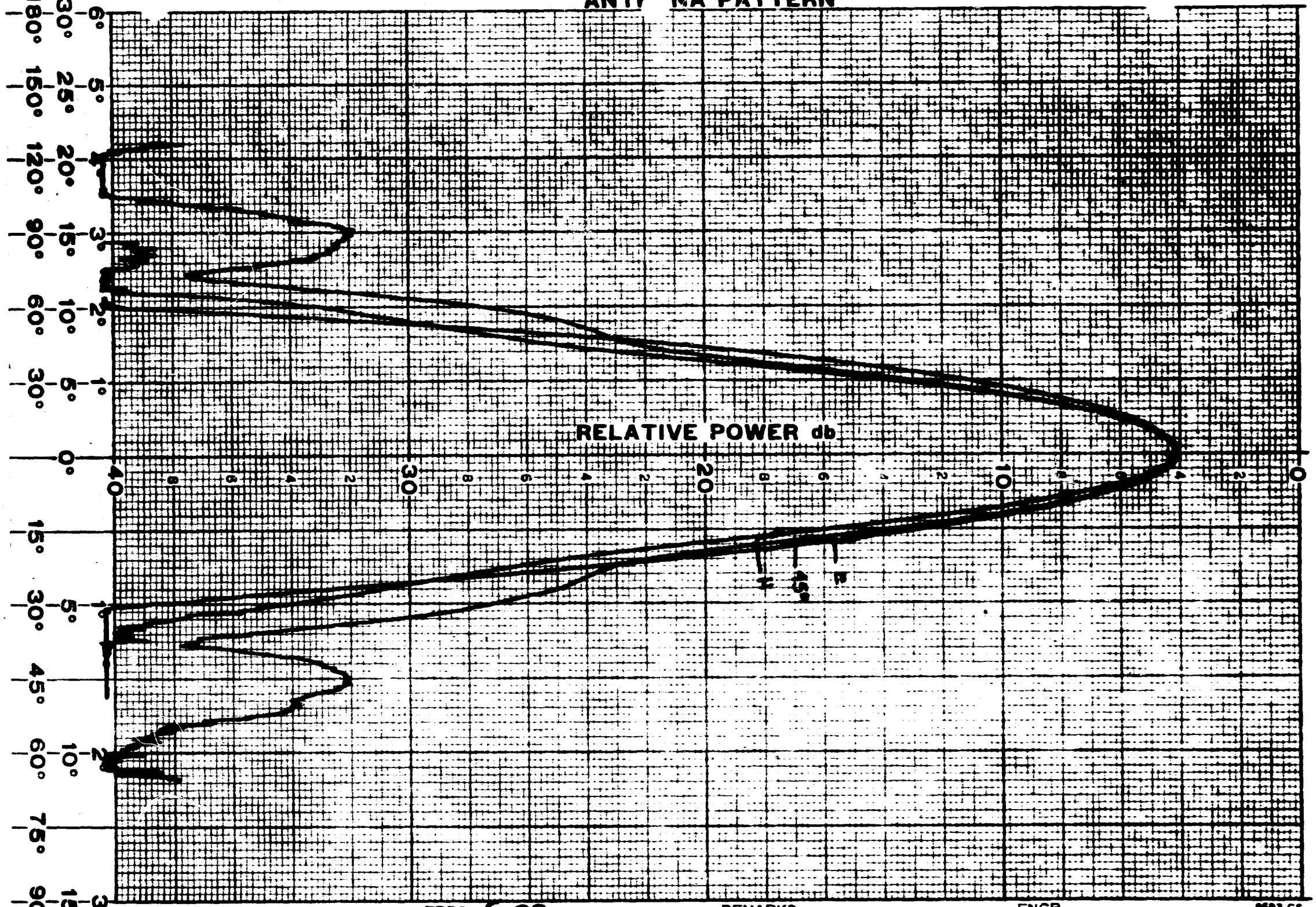
ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.5C	0.CC3	C.CC3	C.991	1.CCC	1.CCC	1.00C	C.1	0.0	C.1	0.0
1.0C	0.C12	C.012	C.997	1.COC	1.CCC	1.0CC	0.2	0.C	0.2	0.0
1.5C	0.C2E	C.C2E	C.999	1.COC	1.0CC	1.CCC	C.3	0.C	0.3	0.0
2.CC	0.C4E	C.C4S	C.999	1.CCC	1.CCC	1.0CC	C.4	0.0	0.3	0.0
2.5C	0.C75	C.C75	C.999	1.CCC	1.CCC	1.CCC	0.5	0.0	0.4	0.0
3.0C	C.1CE	C.1CE	C.999	1.COC	1.CCC	1.CCC	C.6	0.0	0.5	0.0
3.5C	0.142	C.142	C.999	1.CCC	1.CCC	1.00C	C.9	0.0	0.8	0.0
4.0C	C.18C	C.18C	C.999	1.CCC	1.CCC	1.00C	1.2	0.0	1.0	0.0
4.5C	0.221	C.221	C.998	1.COC	1.CCC	1.00C	1.4	0.0	1.3	0.0
5.0C	C.263	C.264	0.997	1.CCC	1.CCC	1.CCC	1.7	0.0	1.6	0.0
5.5C	0.307	C.3C9	C.996	1.CCC	1.CCC	1.00C	2.C	0.0	1.8	0.0
6.0C	C.352	C.354	C.995	1.COO	1.CCC	1.00C	2.3	0.0	2.1	0.0
6.5C	C.39E	C.4CC	C.993	1.CCC	1.CCC	1.0CC	2.7	0.0	2.5	0.0
7.00	0.441	C.44E	C.99C	1.COC	1.CCC	1.COO	3.1	C.0	2.9	0.0
7.5C	C.484	C.49C	C.988	1.CCC	1.CCC	1.0CC	3.5	0.0	3.3	0.0
8.00	0.524	C.533	C.984	1.CCC	1.CCC	1.CCC	4.C	0.0	3.7	0.0
8.50	0.563	C.574	C.98C	1.COC	1.CCC	1.00C	4.4	C.0	4.1	0.0
9.0C	C.6CC	C.615	C.976	1.COC	1.CCC	1.00C	4.8	0.0	4.5	0.0
9.50	C.634	C.653	C.971	1.CCC	1.CCC	1.00C	5.5	0.0	5.0	0.0
10.00	0.663	0.687	C.965	1.CCC	1.CCC	1.00C	6.1	0.0	5.6	0.0
10.5C	C.68S	C.719	C.958	1.COO	1.CCC	1.00C	6.8	0.0	6.1	0.0
11.00	C.71C	C.74E	C.95C	1.CCC	1.0CC	1.CCC	7.5	0.0	6.6	0.0
11.5C	C.72S	C.775	C.941	1.0CC	1.CCC	1.0CC	8.1	0.0	7.2	0.0
12.00	C.744	C.79S	C.931	1.COC	1.CCC	1.000	8.8	0.0	7.7	0.0
12.5C	C.75S	C.821	C.92C	C.999	1.0CC	1.CCC	9.7	0.0	8.3	0.0
13.00	0.762	C.84C	C.9CE	C.999	1.CCC	1.COC	10.5	C.0	9.0	0.0
13.5C	C.76E	C.856	C.895	C.999	1.CCC	1.00C	11.4	0.0	9.6	0.0
14.00	0.76E	C.871	C.881	C.999	1.CCC	1.CCC	12.3	0.C	10.3	0.0
14.5C	0.764	C.883	C.86E	C.999	1.CCC	1.000	13.1	0.0	10.9	0.0
15.0C	C.76C	C.89S	C.85O	C.999	1.0CC	1.00C	14.0	0.0	11.6	0.0
15.50	0.753	C.9C4	C.834	C.99E	1.CCC	1.00C	14.9	0.0	12.2	0.0
16.0C	0.745	C.913	C.818	C.998	1.CCC	1.00C	15.9	0.0	12.8	0.0
16.5C	C.735	C.92C	C.8C1	C.998	1.CCC	1.0CC	16.8	0.0	13.3	0.0
17.00	C.725	C.927	C.784	C.998	1.CCC	1.00C	17.7	0.0	13.9	0.0
17.50	C.713	C.933	C.76E	C.997	1.CCC	1.00C	18.7	0.0	14.5	0.0
18.0C	C.7CC	C.93E	C.749	C.997	1.CCC	1.00C	19.6	0.0	15.1	0.0
18.5C	0.687	C.942	C.731	C.997	1.CCC	1.00C	20.8	0.0	15.6	0.0
19.00	C.673	C.946	C.714	C.996	1.CCC	1.00C	22.0	0.0	16.1	0.0
19.5C	C.65E	C.95C	C.696	C.996	1.CCC	1.CCC	23.2	0.0	16.6	0.0
20.00	C.644	C.953	C.679	C.996	1.CCC	1.00C	24.4	0.0	17.2	0.0
20.50	0.629	C.955	C.662	0.995	1.CCC	1.00C	25.6	0.0	17.7	0.0
21.00	0.614	C.95E	0.645	C.995	1.COC	1.000	26.8	0.0	18.2	0.0
21.50	C.599	C.96C	C.62E	C.994	1.CCC	1.00C	27.7	0.0	18.5	0.0
22.00	0.585	C.962	C.612	0.994	1.CCC	1.00C	28.6	0.0	18.9	0.0

APPENDIX IV - A

RECTANGULAR MULTIMODE HORN
DIAGONAL FED
LINEAR POLARIZED PATTERNS

ANTENNA PATTERN



PROJECT

FREQ. 6.82

PLANE E H 45°

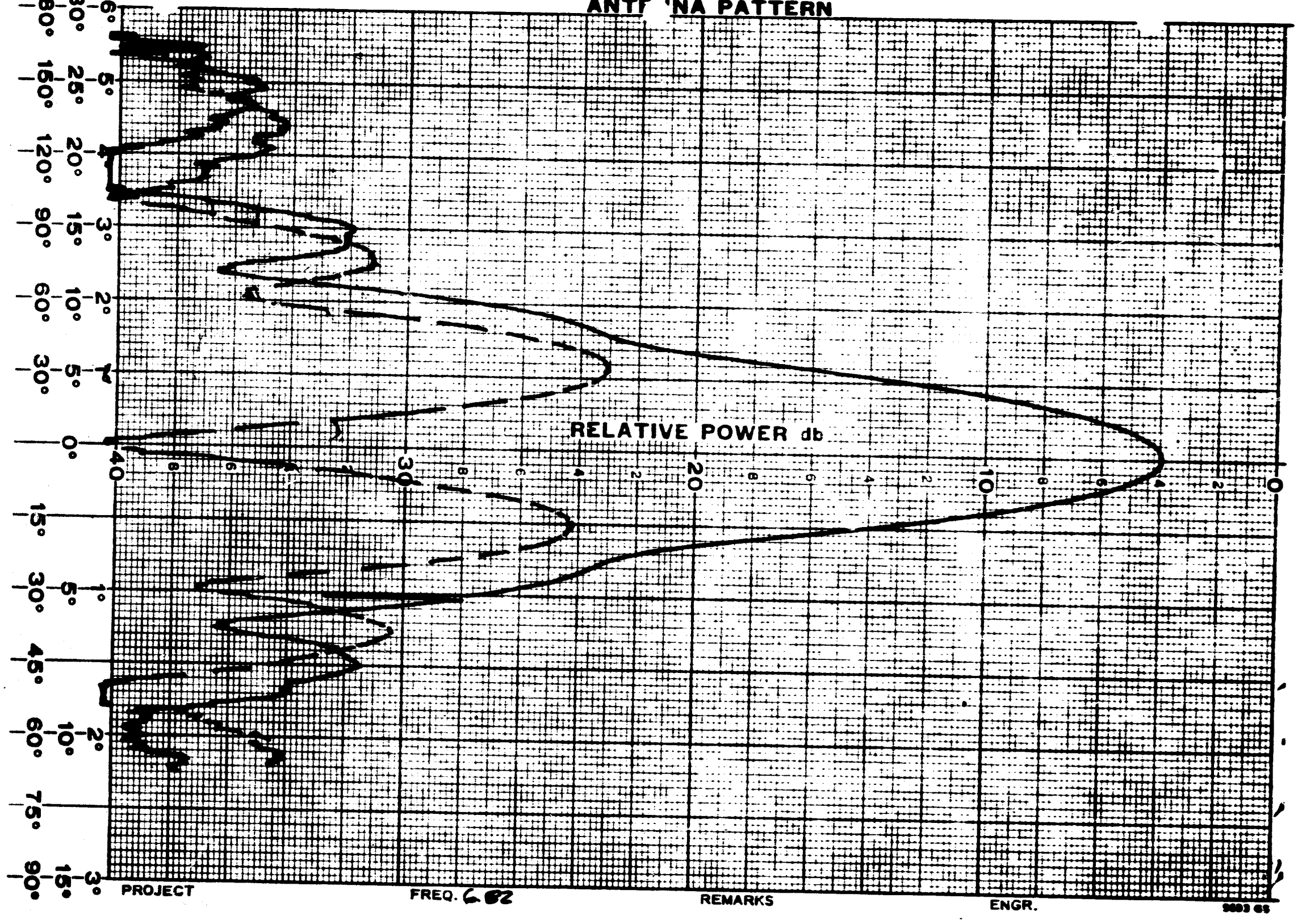
REMARKS

ENGR.

DATE 12/3/68

9683 GS

ANTENNA PATTERN



PROJECT

FREQ. 6.82

PLANE 45°

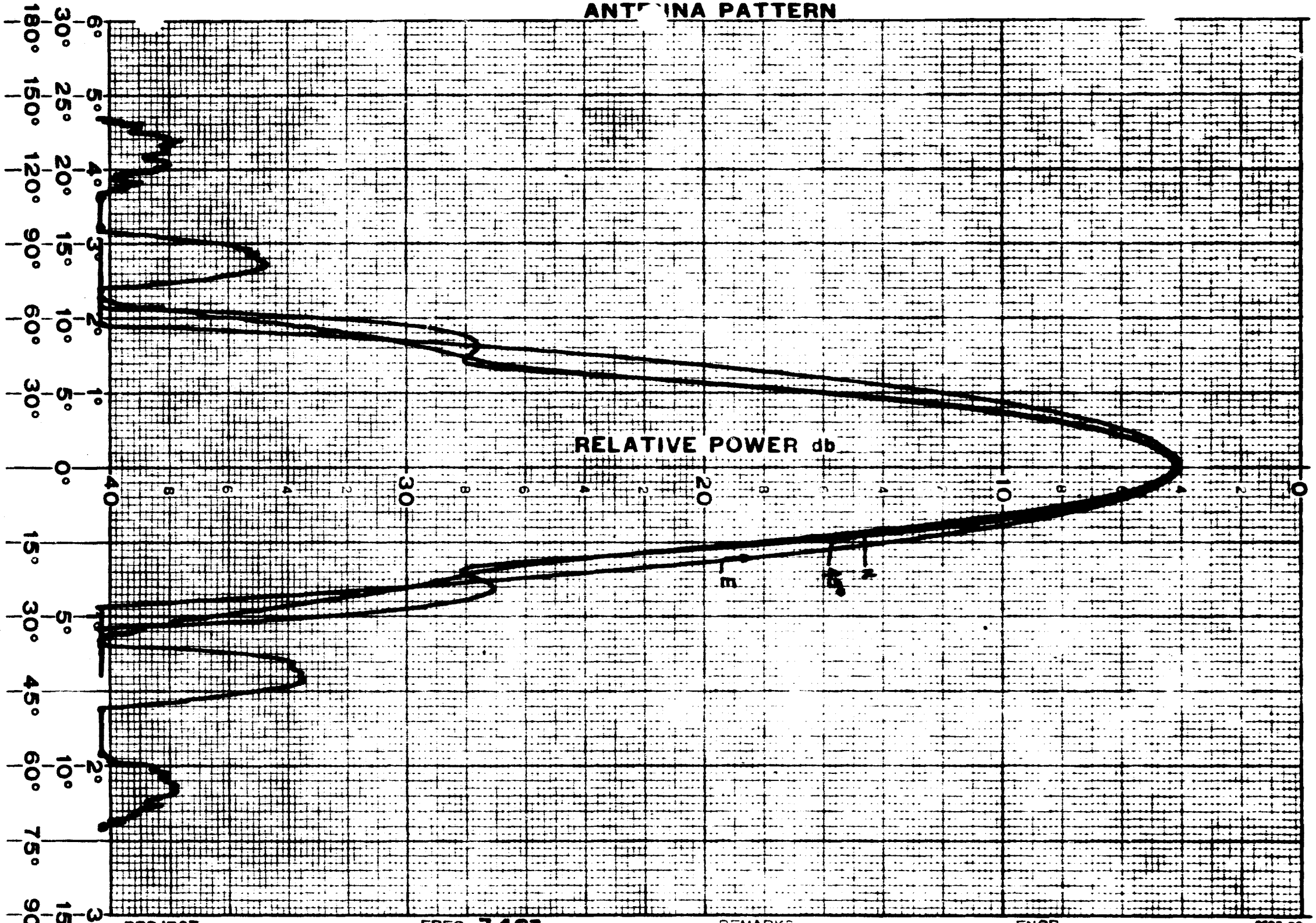
REMARKS

ENGR.

DATE 12/8/62

9883 65

ANTENNA PATTERN



PROJECT

FREQ. 7.487

PLANE E H 45

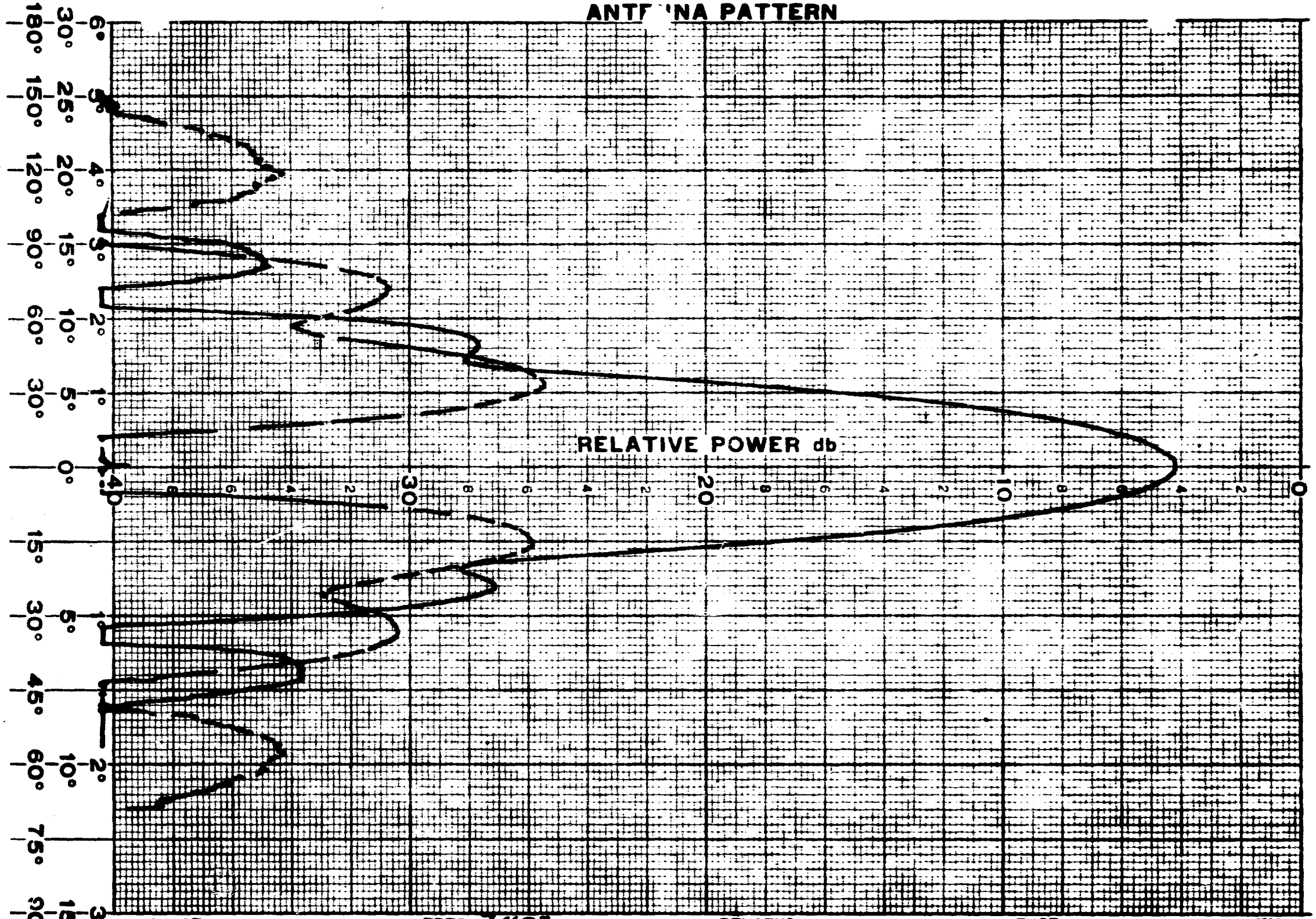
REMARKS

ENGR.

DATE 12/5/60

9003 GS

ANTENNA PATTERN



PROJECT

FREQ. 7.407

REMARKS

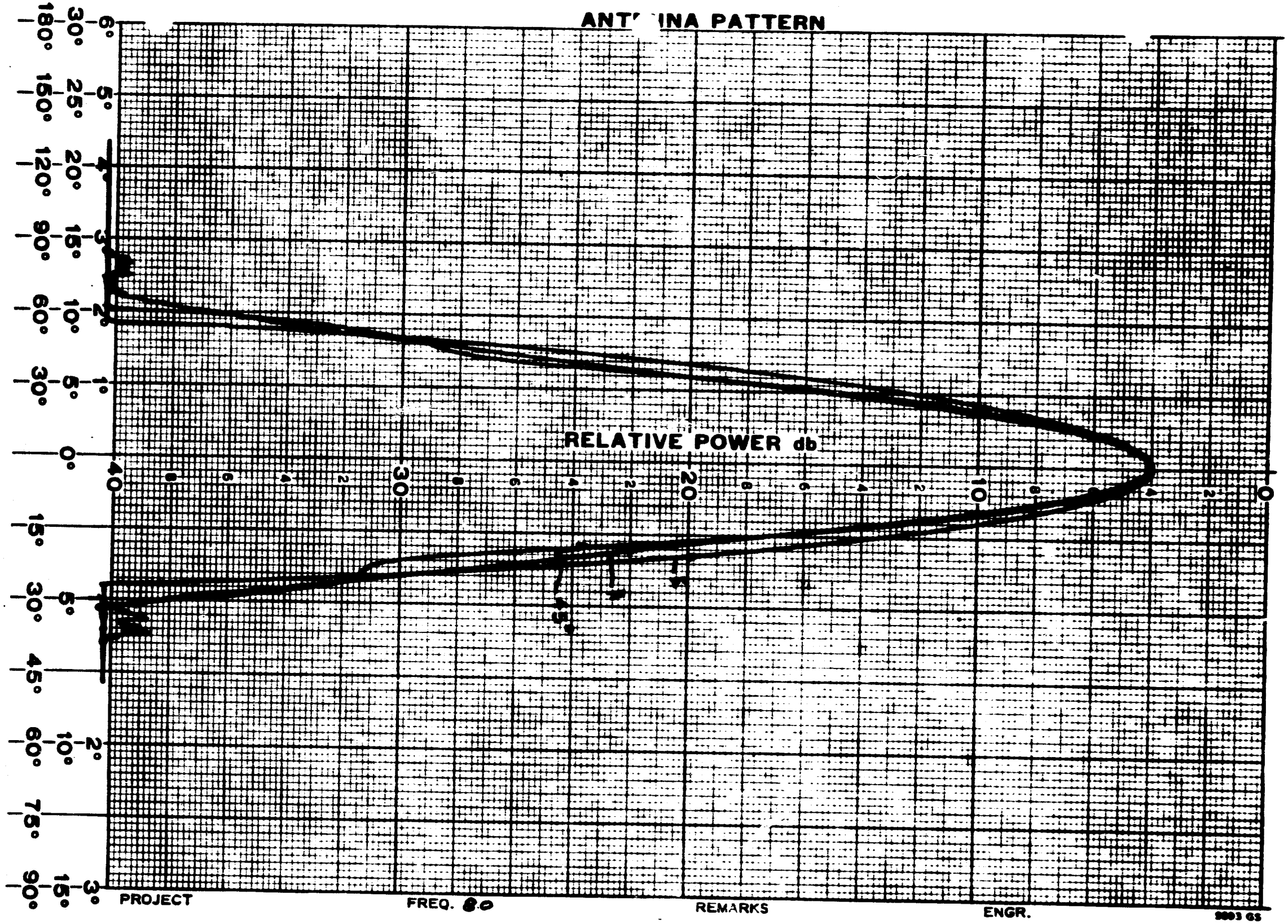
ENGR.

PLANE 45°

DATE 12/3/63

9003 GS

ANTENNA PATTERN



PROJECT

FREQ. 8.0

PLANE E Horiz

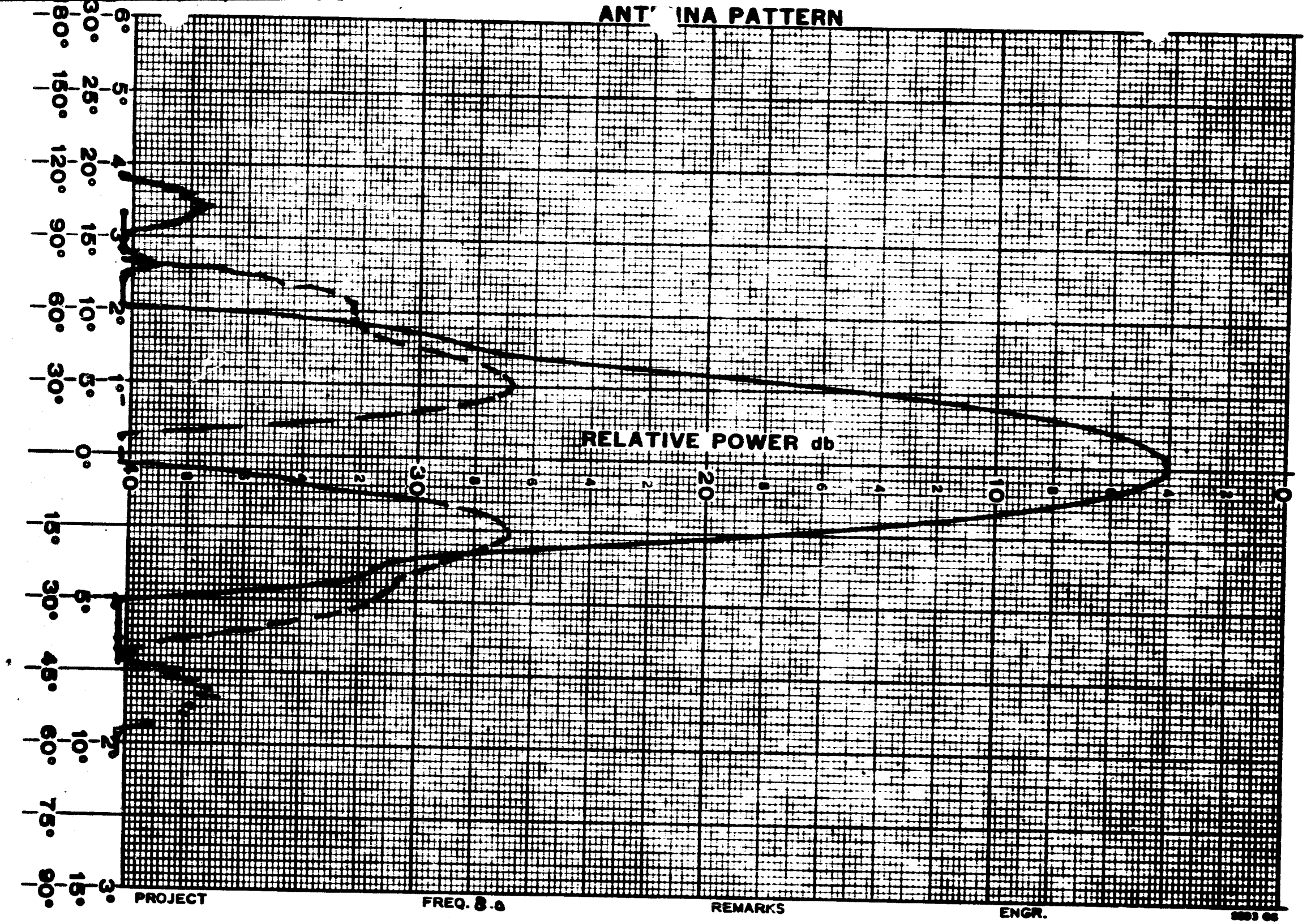
REMARKS

ENGR.

DATE 12/3/68

3803 6S

ANT[illegible]INA PATTERN



PROJECT

FREQ. 8.0

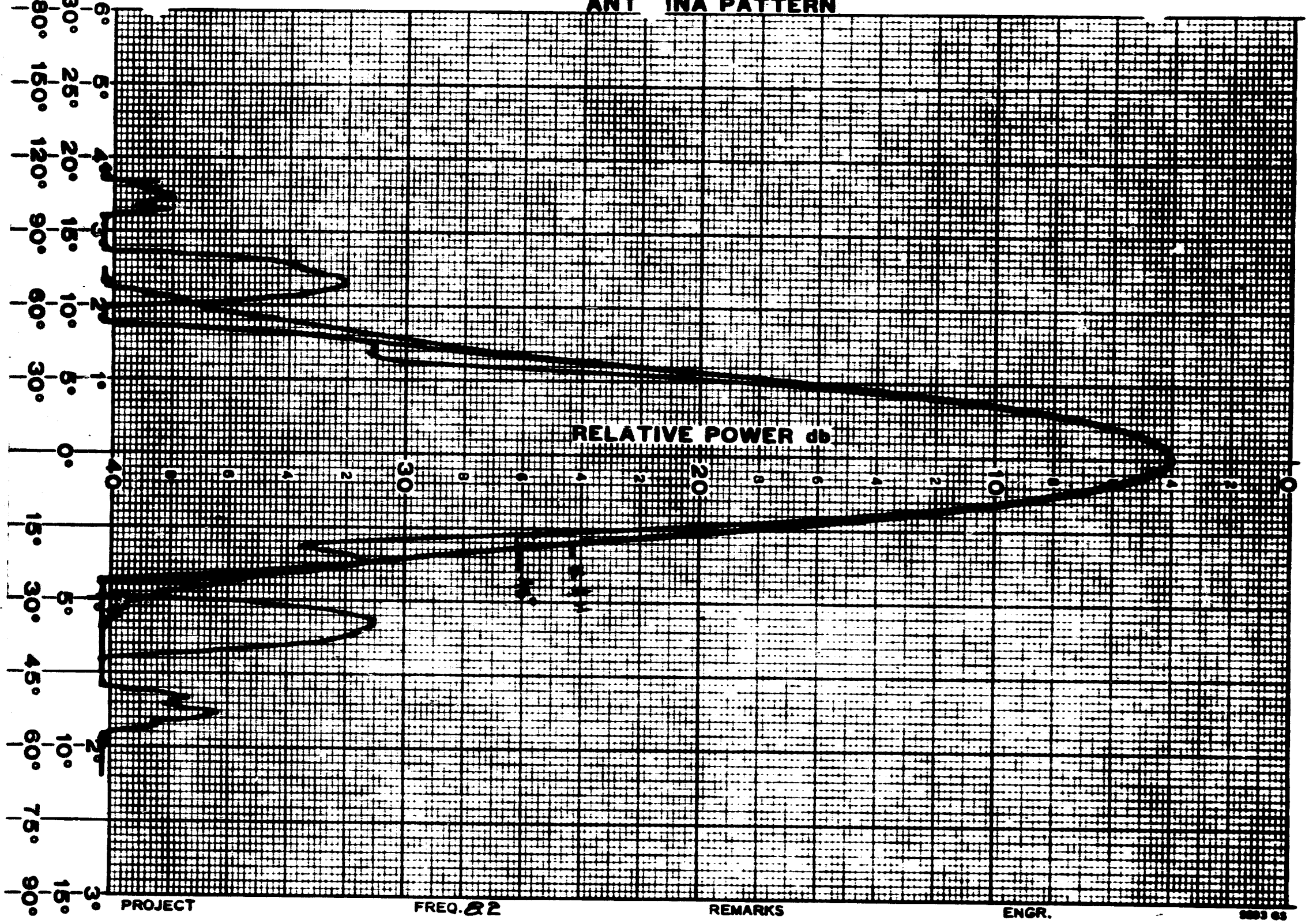
REMARKS

ENGR.

PLANE 45°

DATE 12/3/60

ANTENNA PATTERN



PROJECT

FREQ. 82

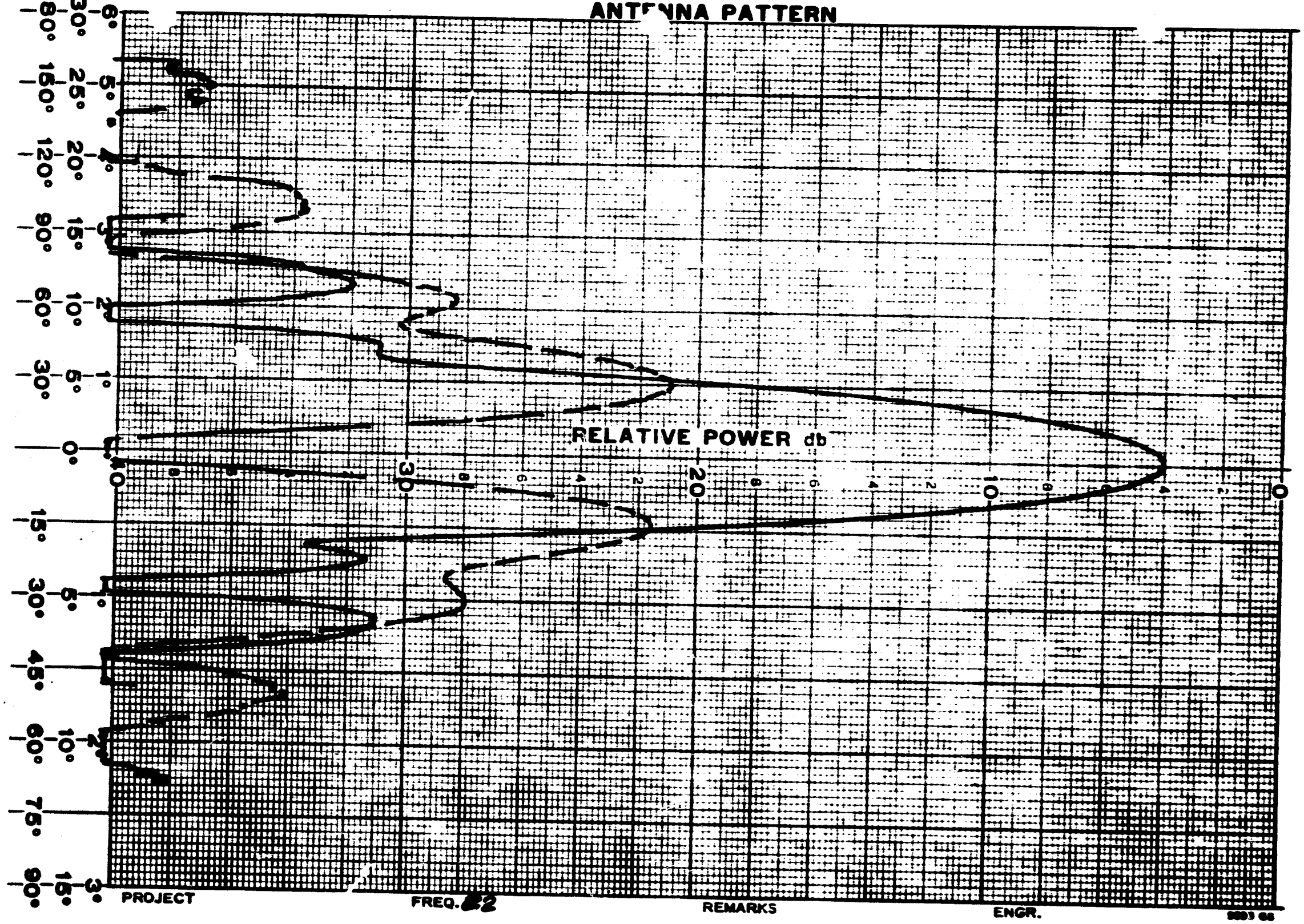
PLANE E 45°

REMARKS

ENGR.

DATE 12/3/68

ANTENNA PATTERN



PROJECT

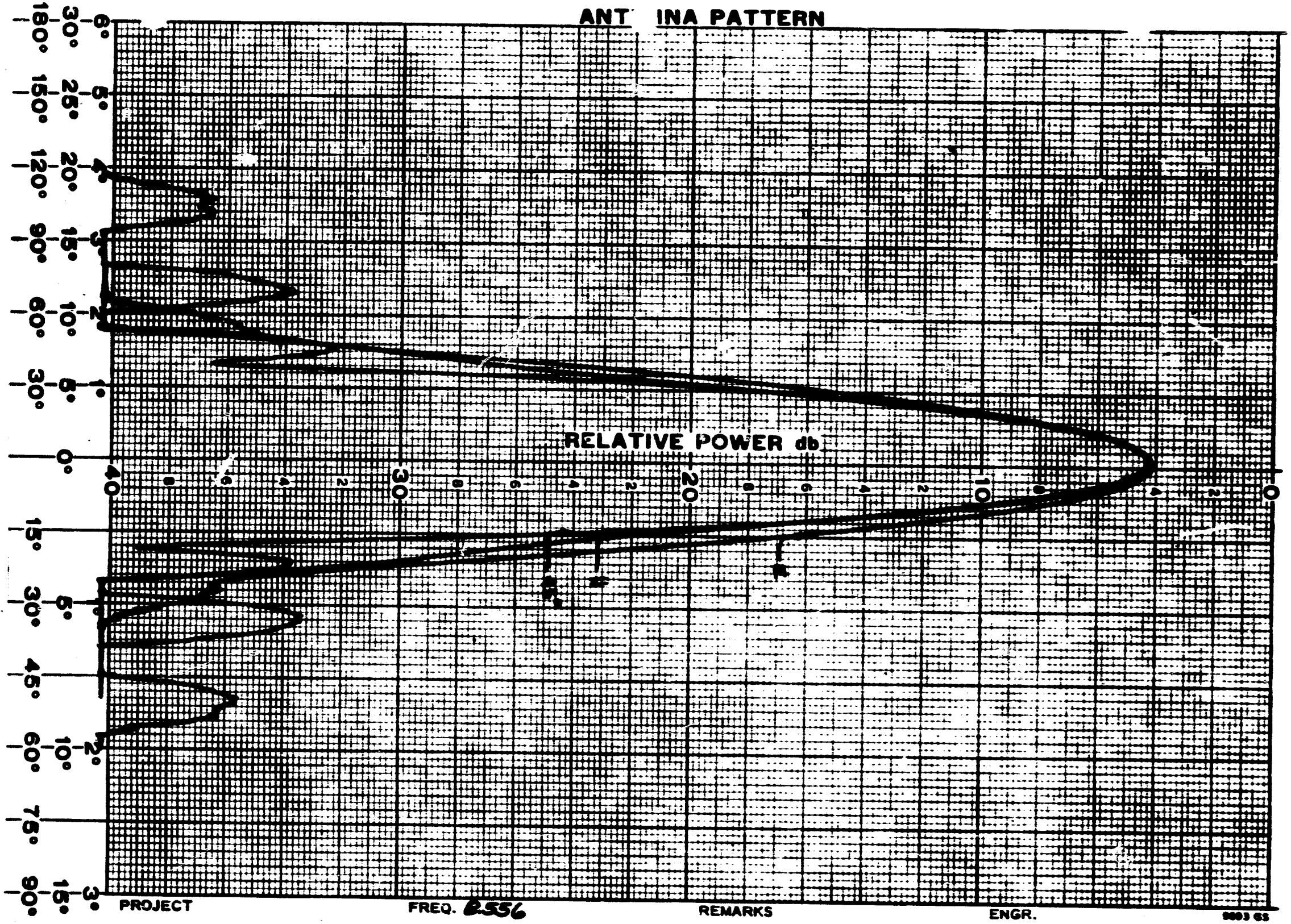
FREQ. 32

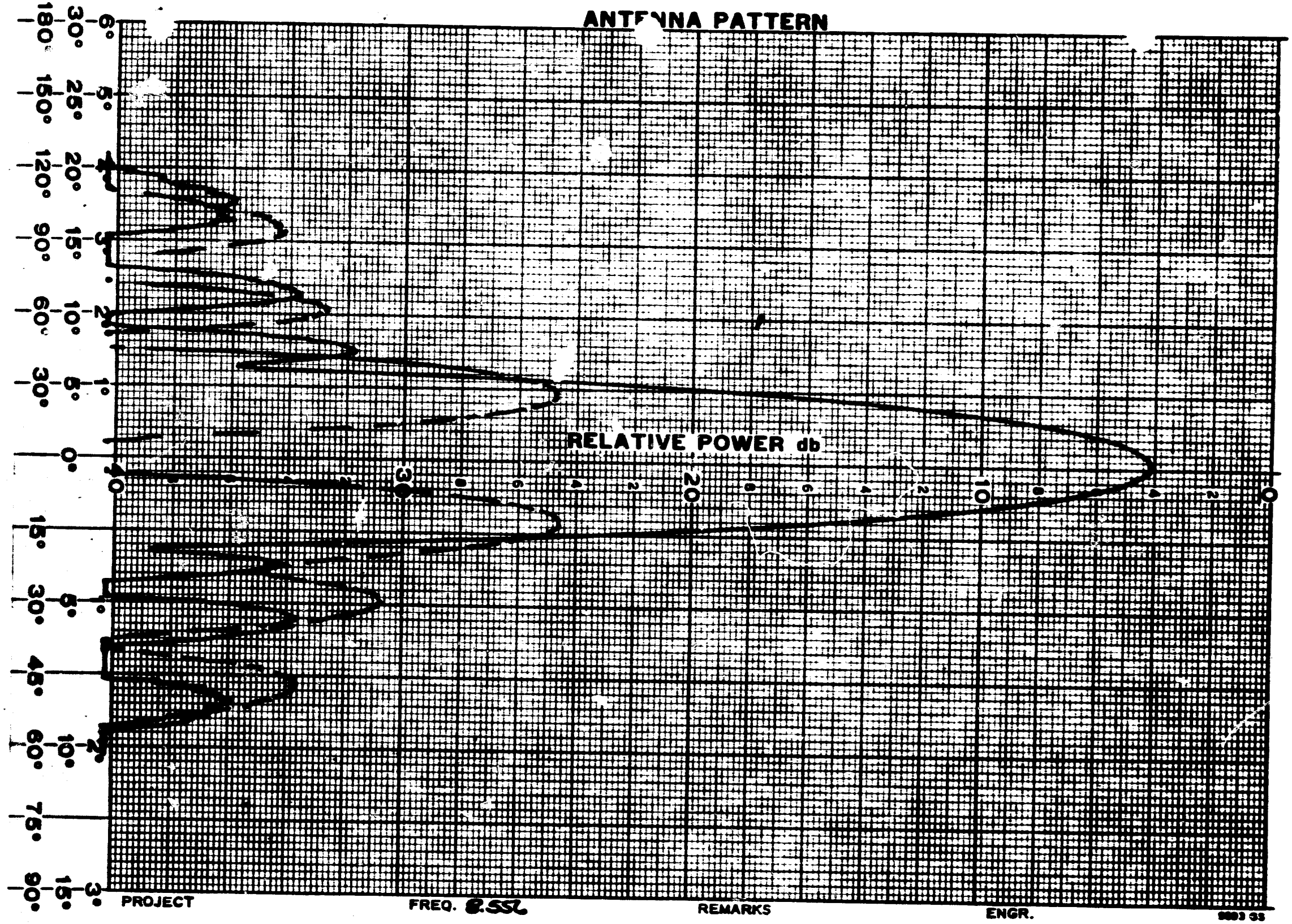
PLANE 45°

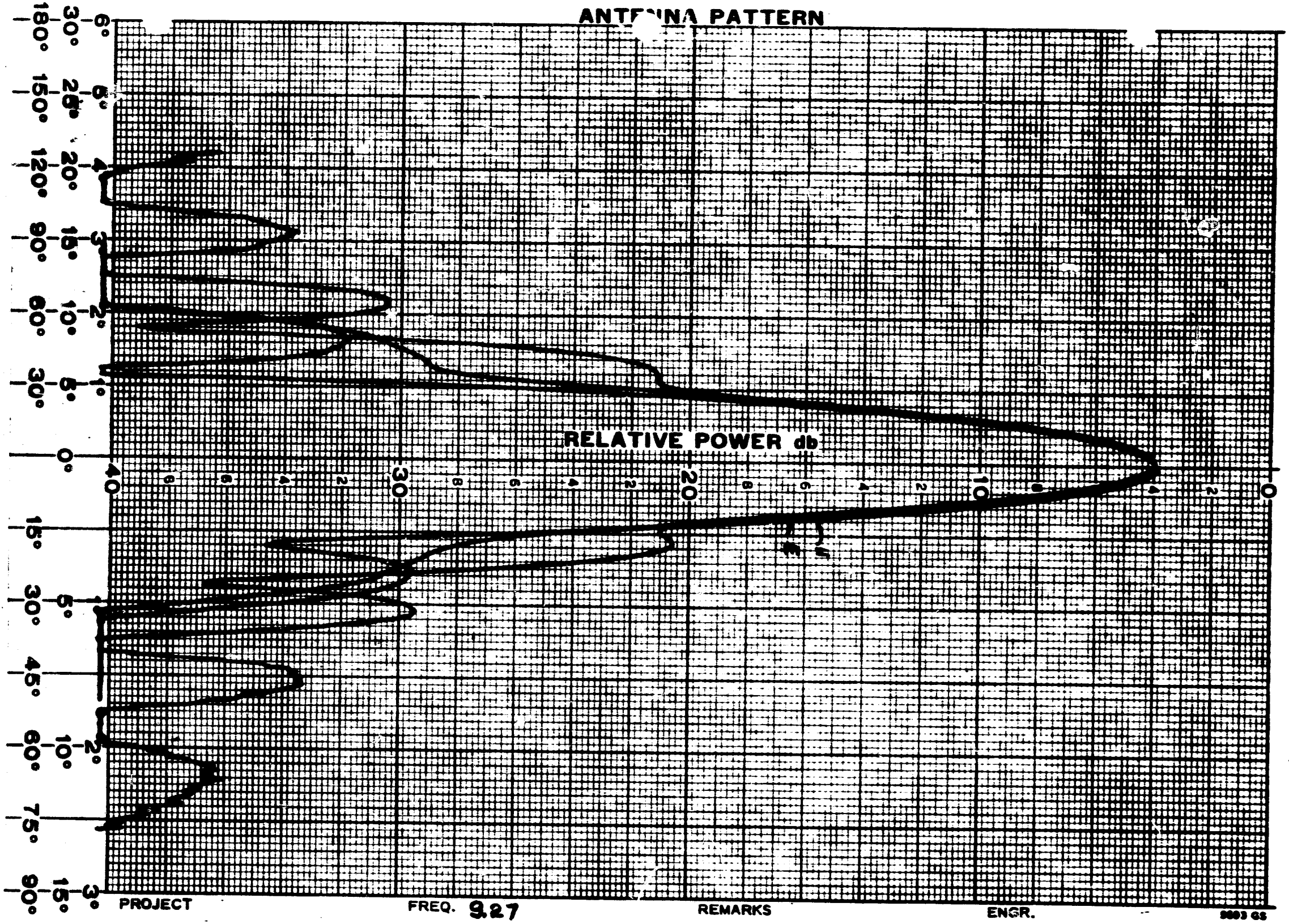
REMARKS

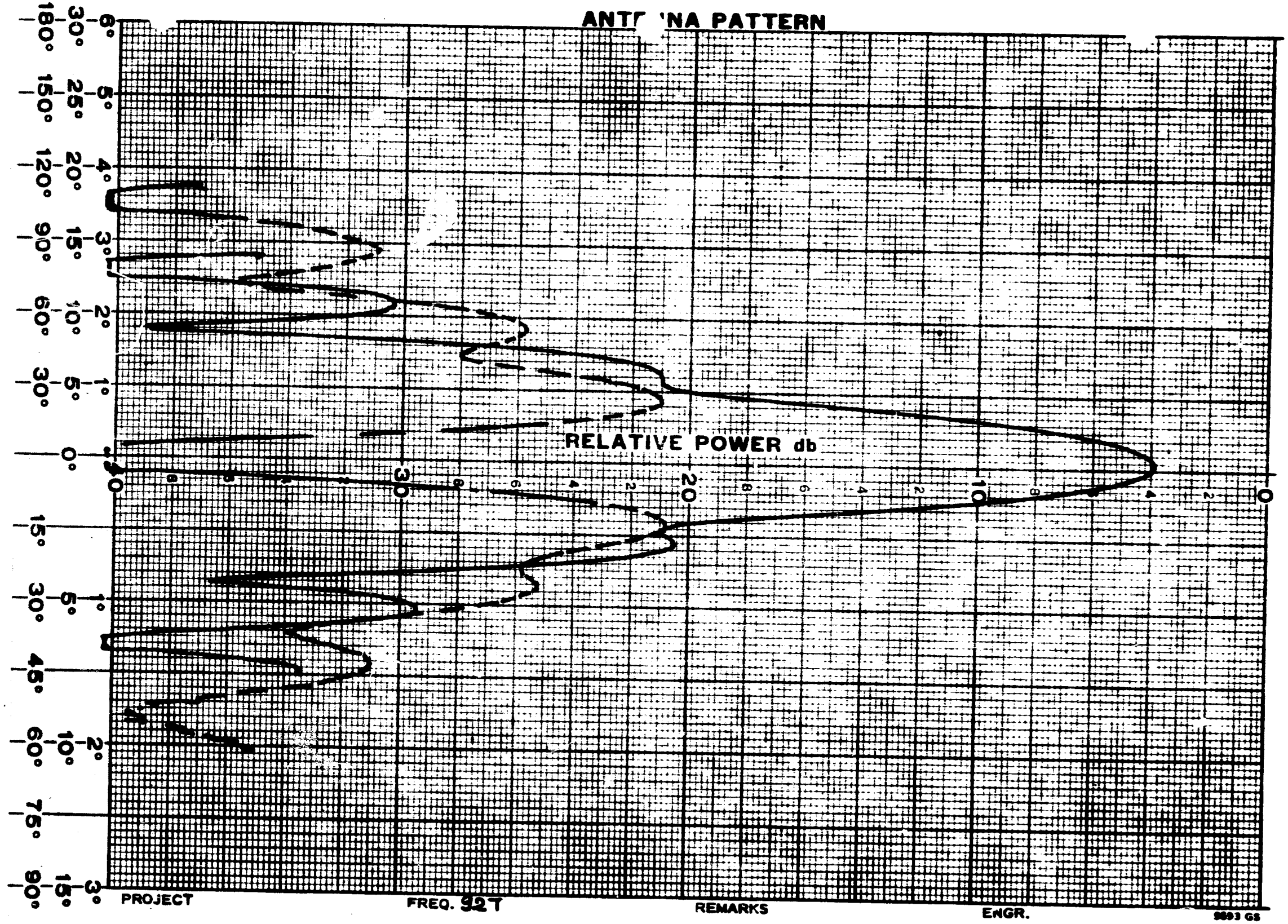
ENGR.

DATE 2/3/58


ANT INA PATTERN
RELATIVE POWER db
180° 30° 6°
150° 25° 5°
120° 20° 4
90° 15° 3
60° 10° 2
30° 5° 1
0°
15°
30°
45°
60°
75°
90°
40 30 20 10 0
PROJECT
FREQ. 8556
REMARKS
ENGR.
PLANE E H 45°
DATE 12/8/58


ANTENNA PATTERN
RELATIVE POWER db
180°
150°
120°
90°
60°
30°
0°
30°
25°
20°
15°
10°
5°
0°
15°
30°
45°
60°
75°
90°
40
30
20
10
0
6
4
2
0
PROJECT
FREQ. 8.552
PLANE 45°
REMARKS
ENGR.
DATE 12/3/68


ANTENNA PATTERN
RELATIVE POWER db
40
30
20
10
0
180° 30° 6°
150° 25° 5°
120° 20° 4
90° 15° 3
60° 10° 2°
30° 5° 1°
0°
15° 30° 5°
45° 60° 10°
75° 90° 15°
105° 120° 20°
135° 150° 25°
165° 180° 30°
PROJECT
FREQ. 9.27
PLANE
REMARKS
ENGR.
DATE 12/3/60
5003 GS


ANTENNA PATTERN
RELATIVE POWER db
180° 30° 6°
150° 25° 5°
120° 20° 4°
90° 15° 3°
60° 10° 2°
30° 5° 1°
0°
30
20
10
0
PROJECT
FREQ. 927
PLANE 45°
REMARKS
ENGR.
DATE 12/3/62
9893 GS

APPENDIX IV - B

RECTANGULAR MULTIMODE HORN
DIAGONAL FED
ORTHOGONAL LINEAR PATTERN

ANTENNA PATTERN

RELATIVE POWER db

PROJECT

FREQ. 7487

PLANE E H 45°

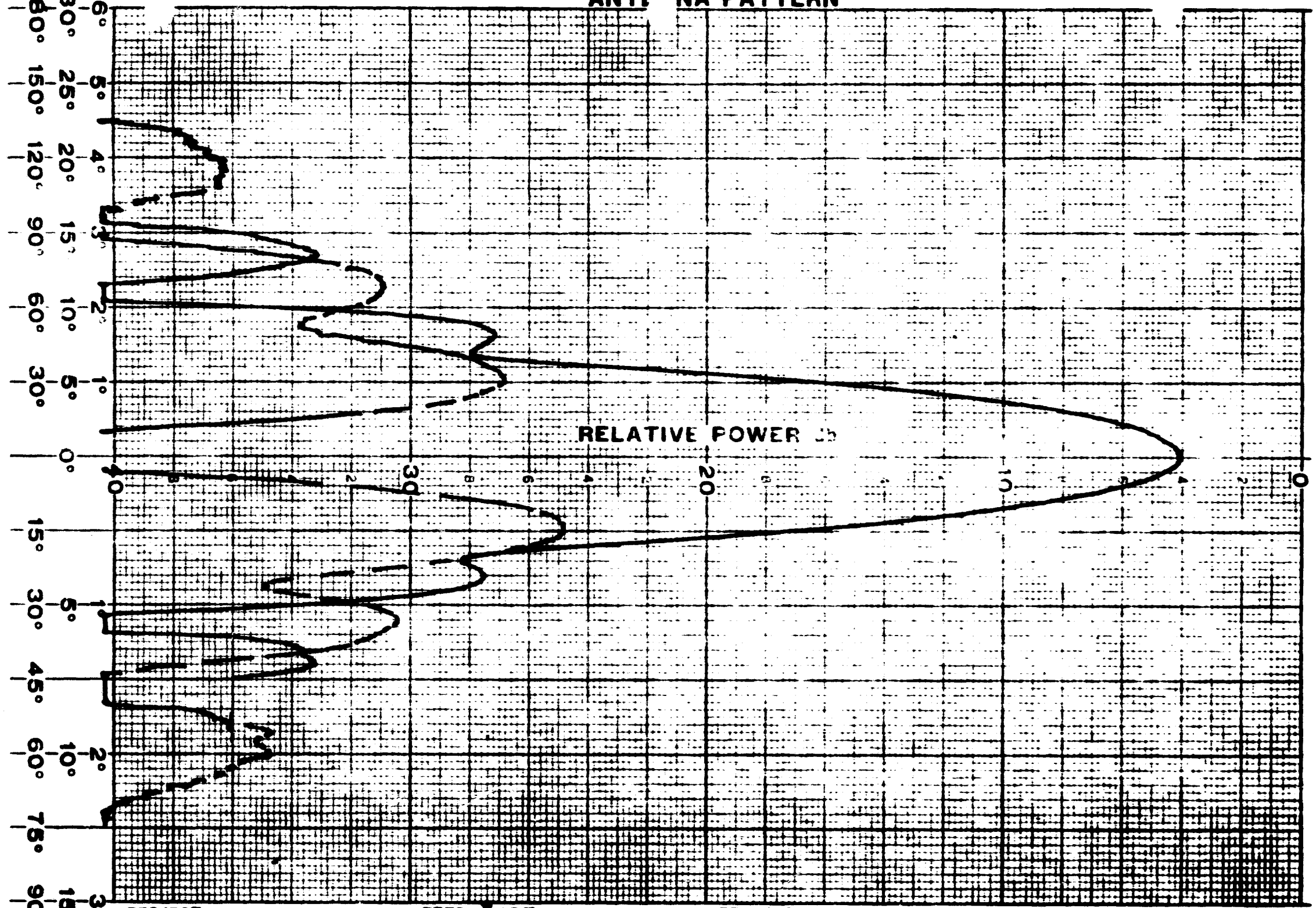
REMARKS ORTHOGONAL LINEAR

ENGR.

DATE 12/3/68

9693 GS

ANTENNA PATTERN



PROJECT

FREQ. 7.48 T

REMARKS
ORTHOGONAL LINEAR

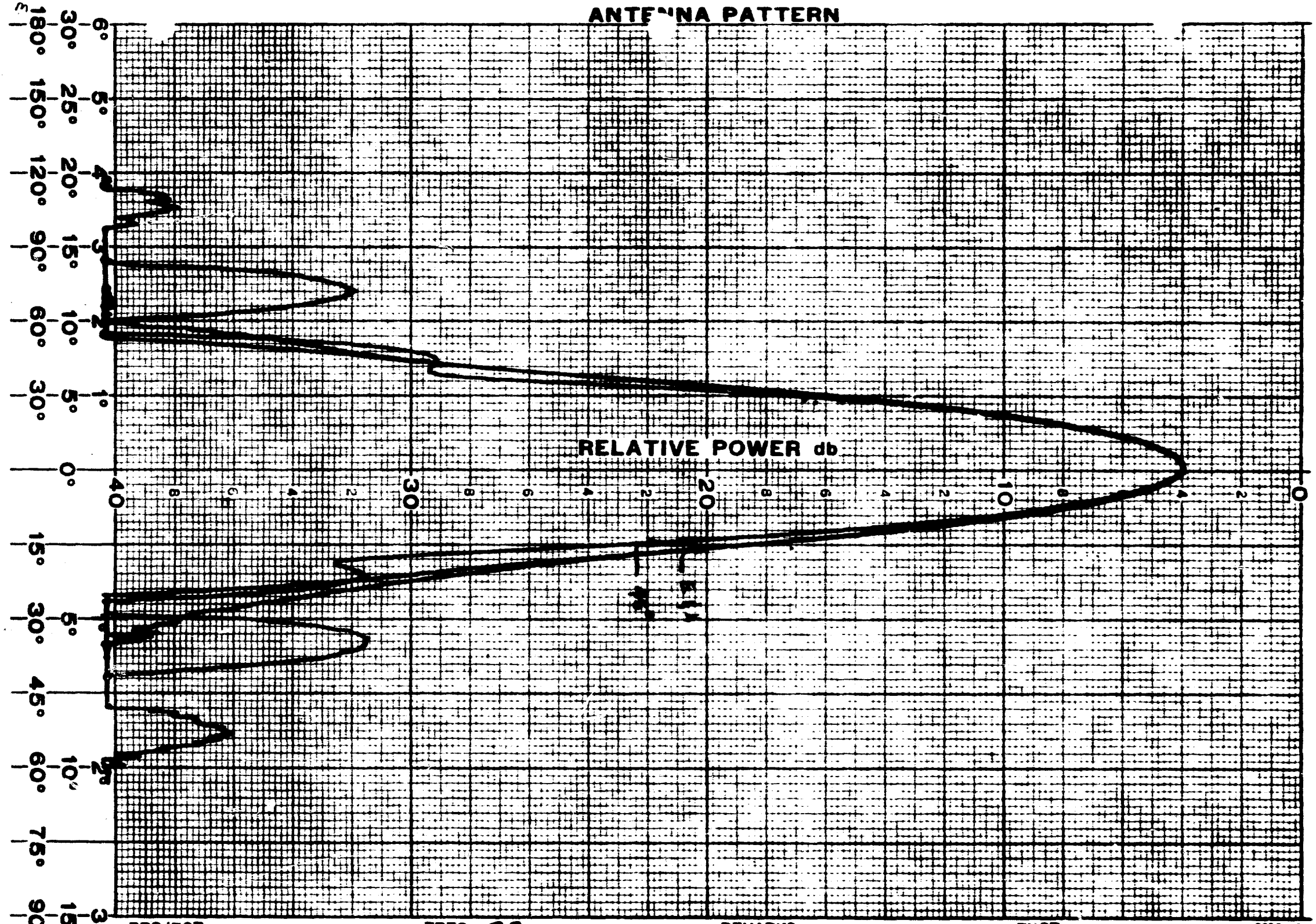
ENGR.

PLANE 45°

DATE 12/3/68

8003 GS

ANTENNA PATTERN



PROJECT

FREQ. 8.2

PLANE E H 45

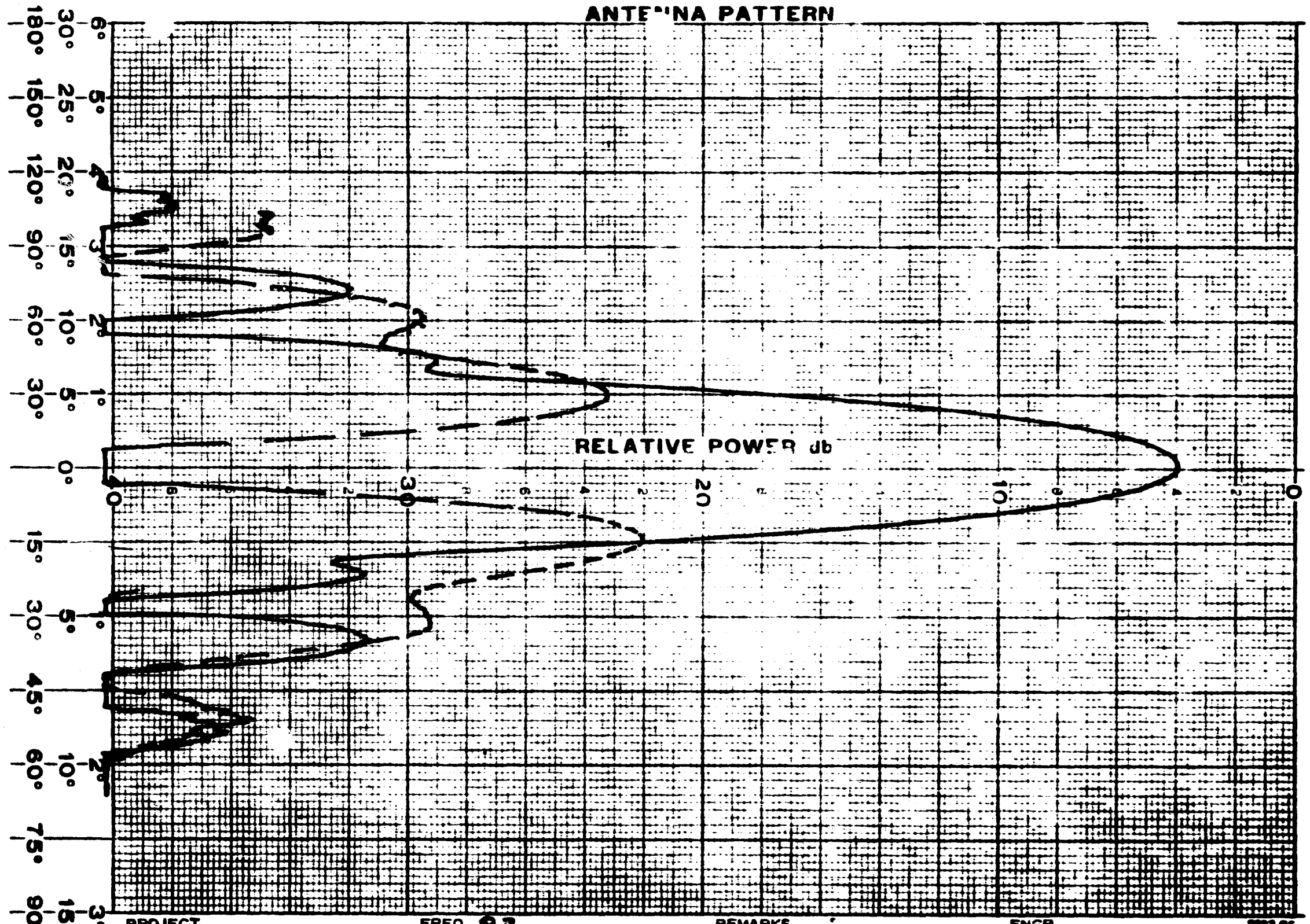
REMARKS
ORTHOGONAL LINEAR

ENGR.

DATE 12/3/68

9893 GS

ANTENNA PATTERN



PROJECT

FREQ. 8.2

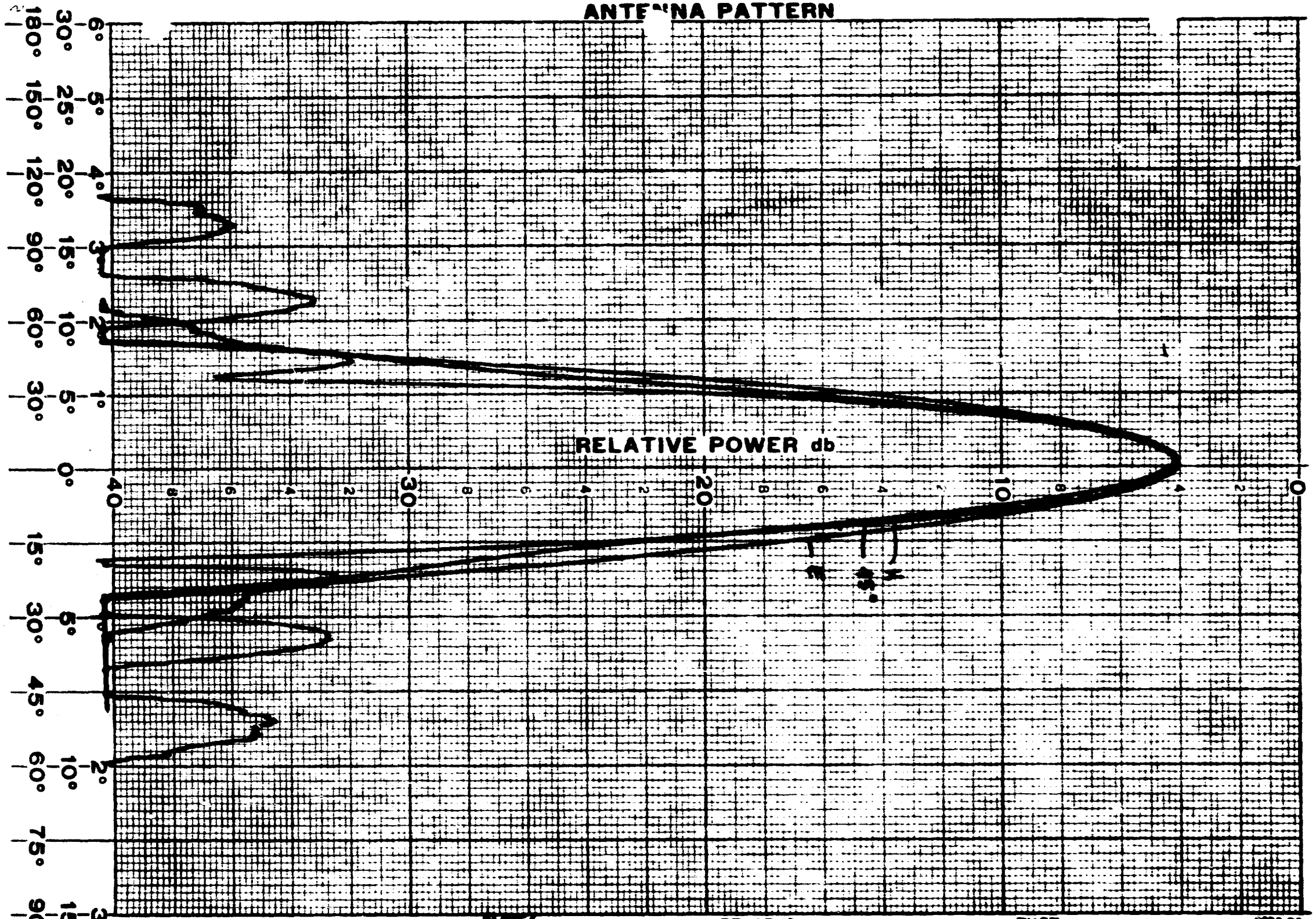
REMARKS
ORTHOGONAL LINEAR

ENGR.

PLANE 45°

DATE 12/3/68

ANTENNA PATTERN



PROJECT

FREQ. 8.356

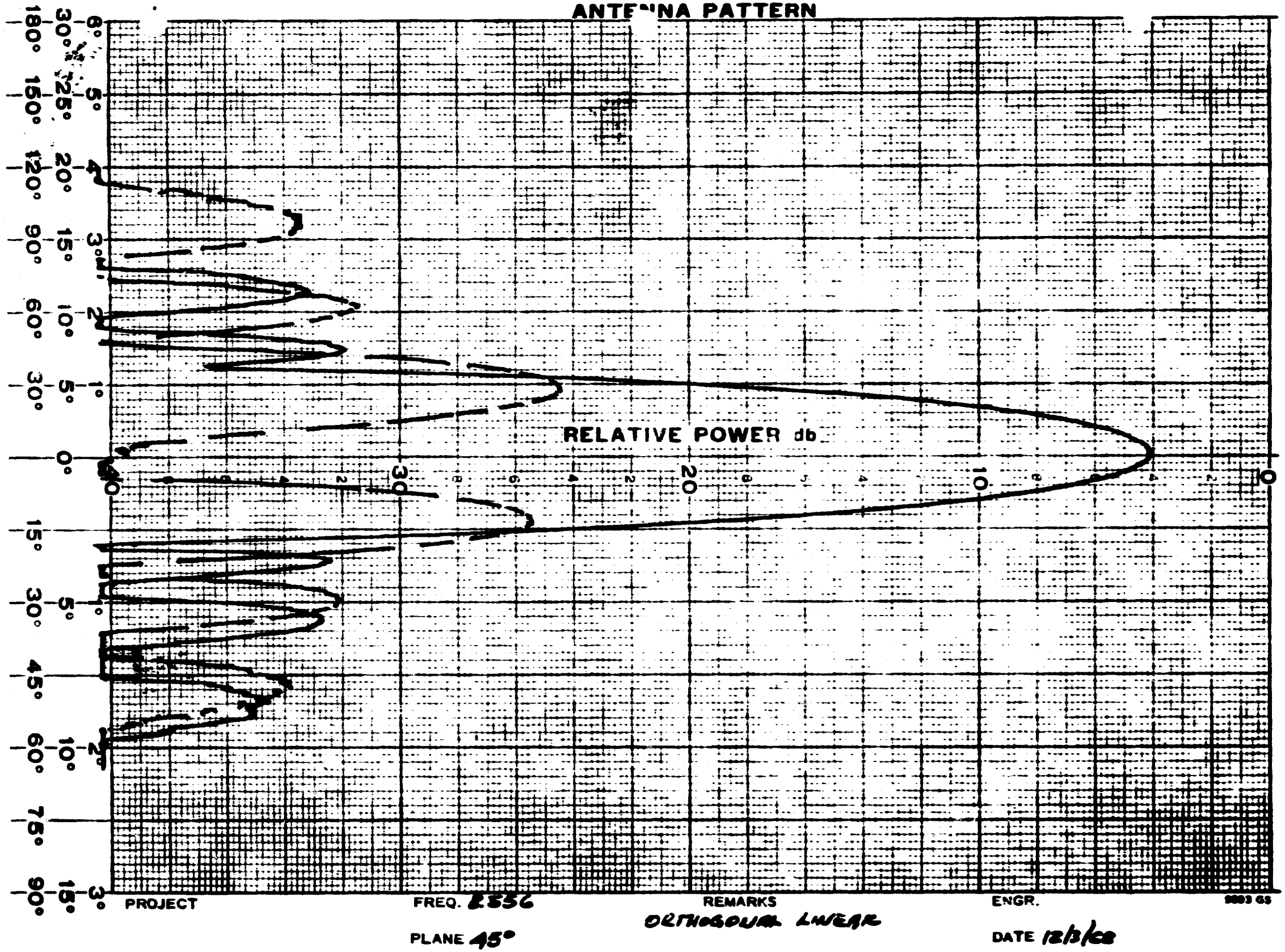
PLANE E H 45

REMARKS
ORTHOGONAL LINEAR

ENGR.

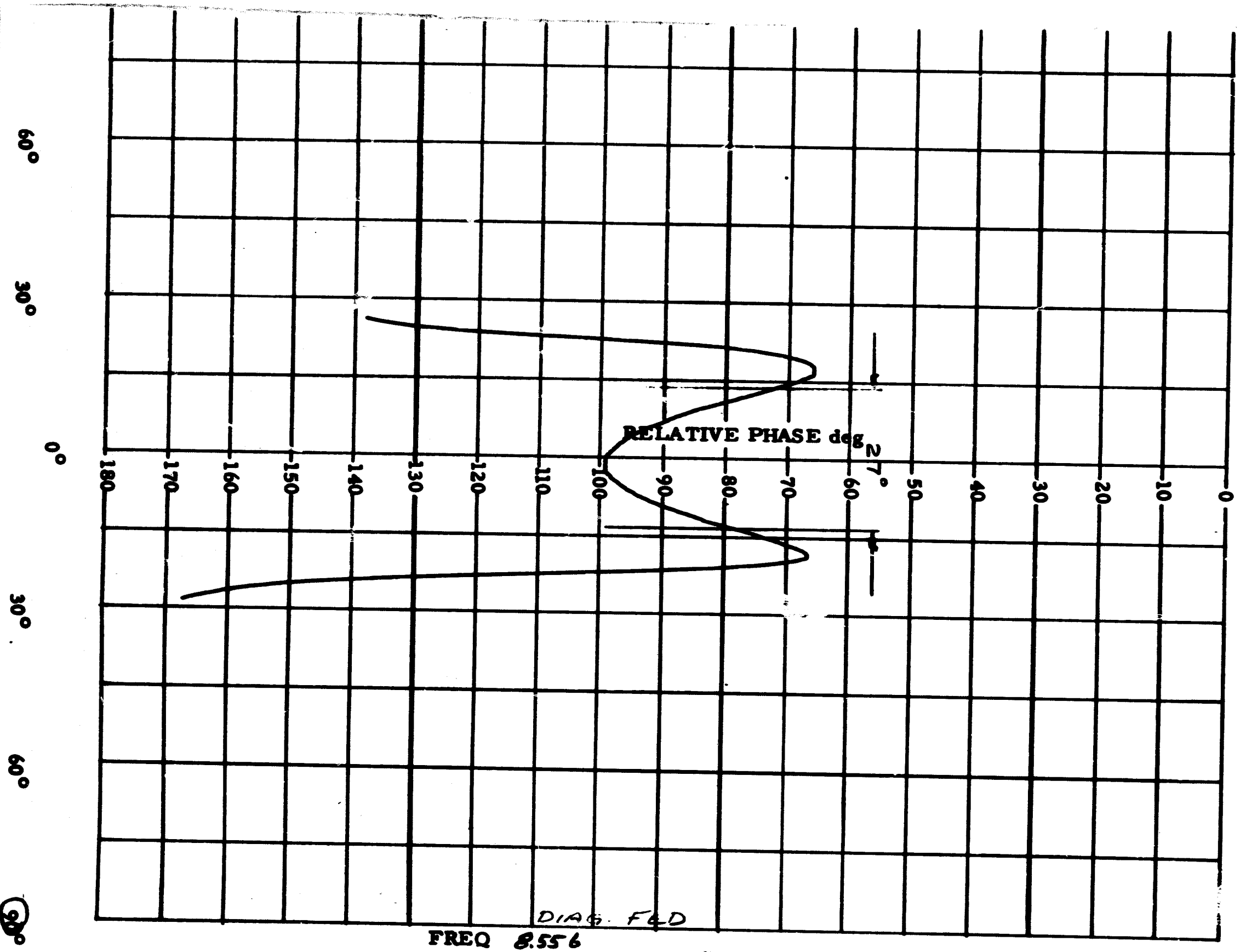
DATE 12/3/68

8803 GS


ANTENNA PATTERN
RELATIVE POWER db
180° 150° 120° 90° 60° 30° 0°
30° 25° 20° 15° 10° 5° 0°
6° 5° 4° 3° 2° 1° 0°
15° 30° 45° 60° 75° 90°
5° 10° 15° 20°
3 2 1 0
30 20 10 0
PROJECT
FREQ. 2556
REMARKS
ORTHOGONAL LINEAR
ENGR.
PLANE 45°
DATE 12/3/68

APPENDIX IV - C

RECTANGULAR MULTIMODE HORN
DIAGONAL FED
PHASE PATTERNS

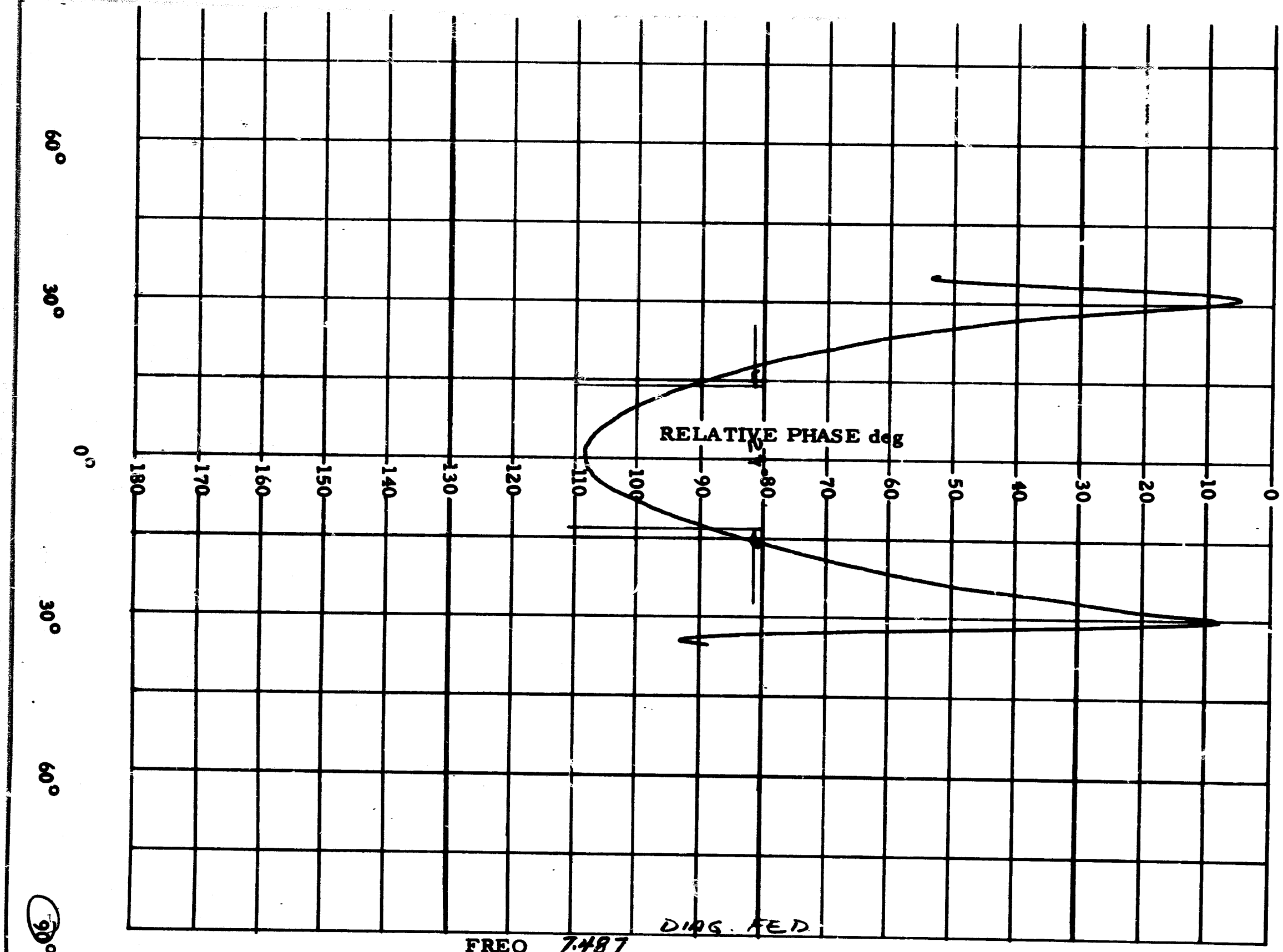


DIAG. FED

FREQ 8.556

PLANE E CR-2½

DATE 12/5/65

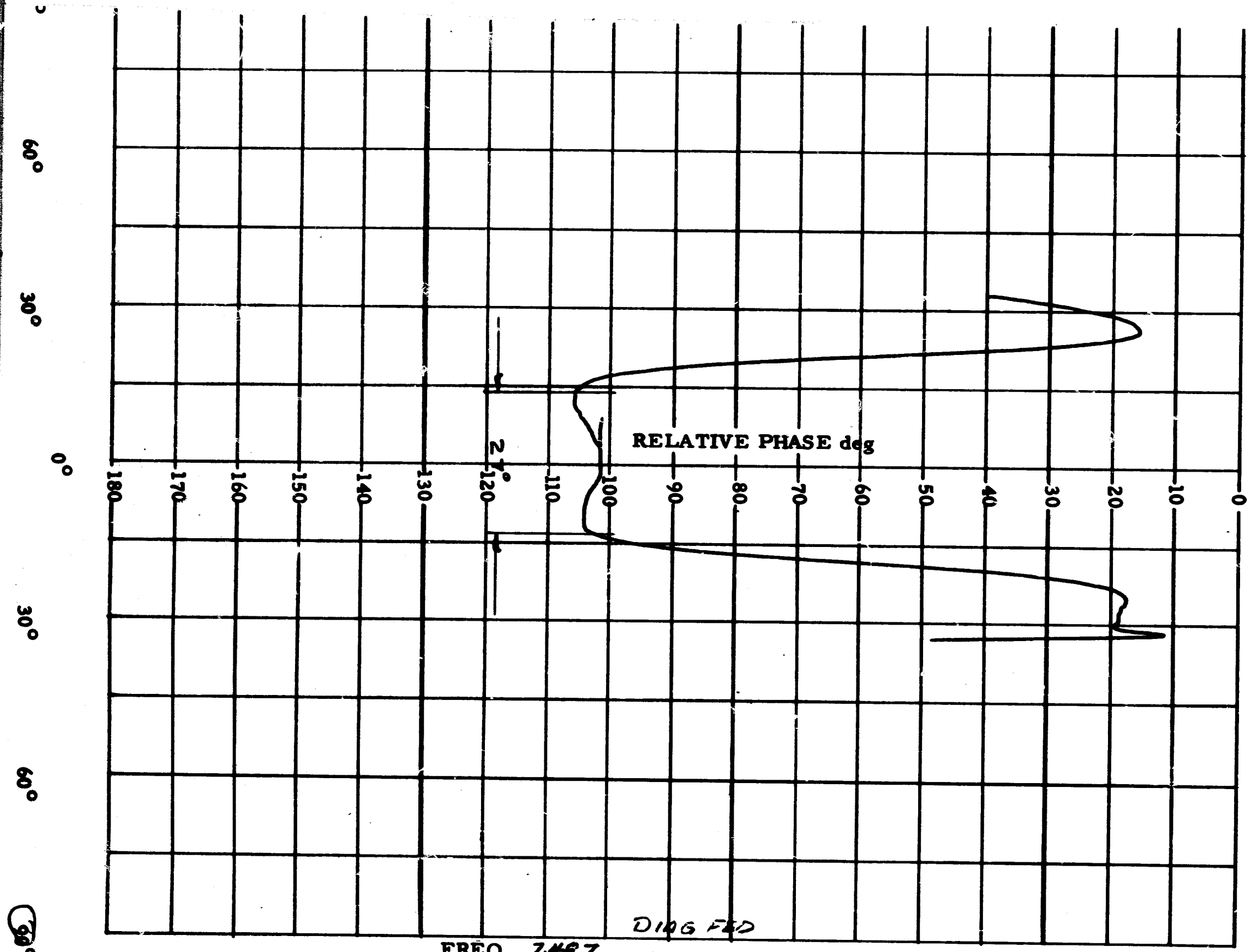


DIPS. FED

FREQ 7.487

PLANE E CL-2½

DATE 12/5/68



DIOG FED

FREQ 7.487

PLANE 45° CR = - 2½

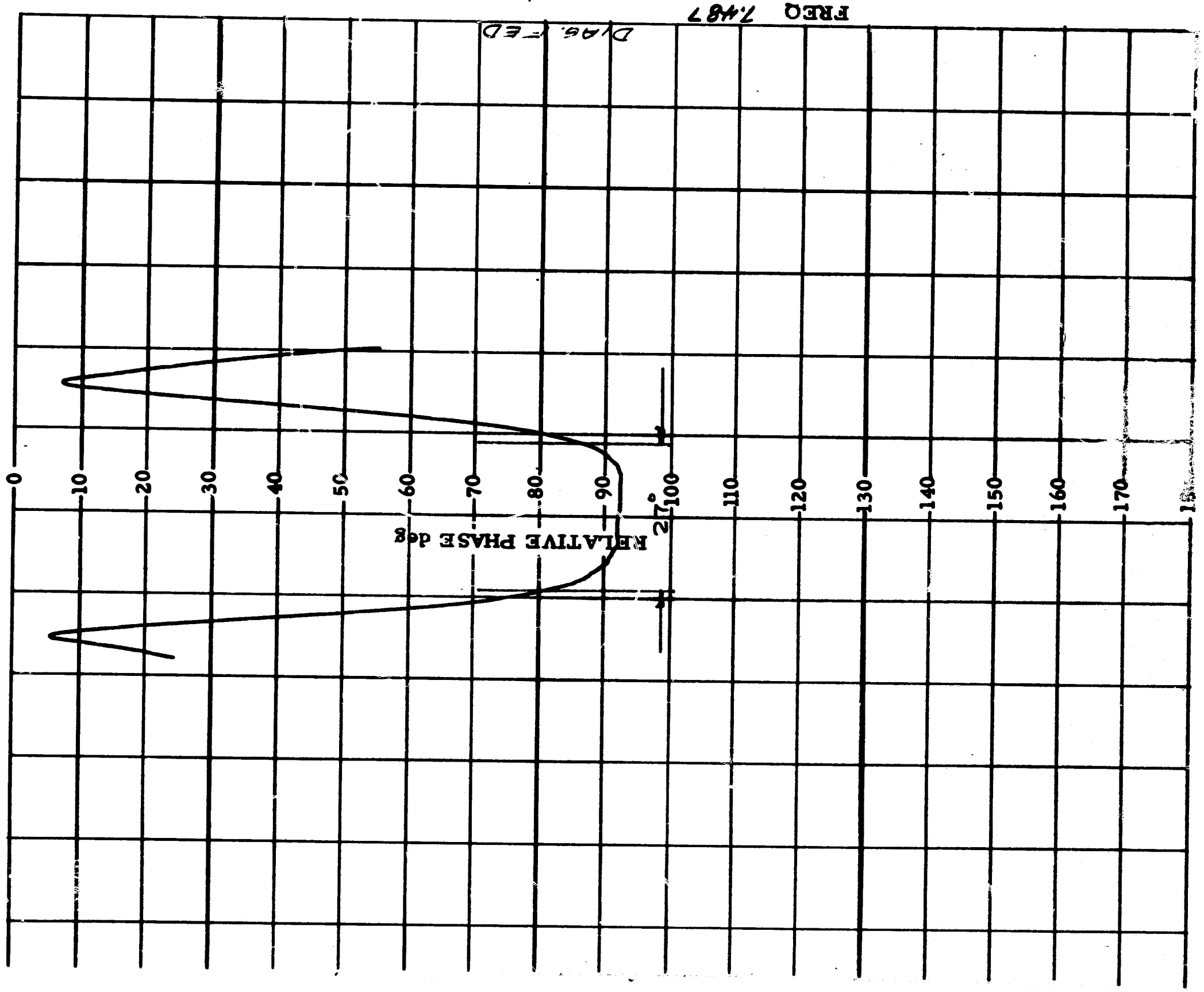
DATE 12/5/66

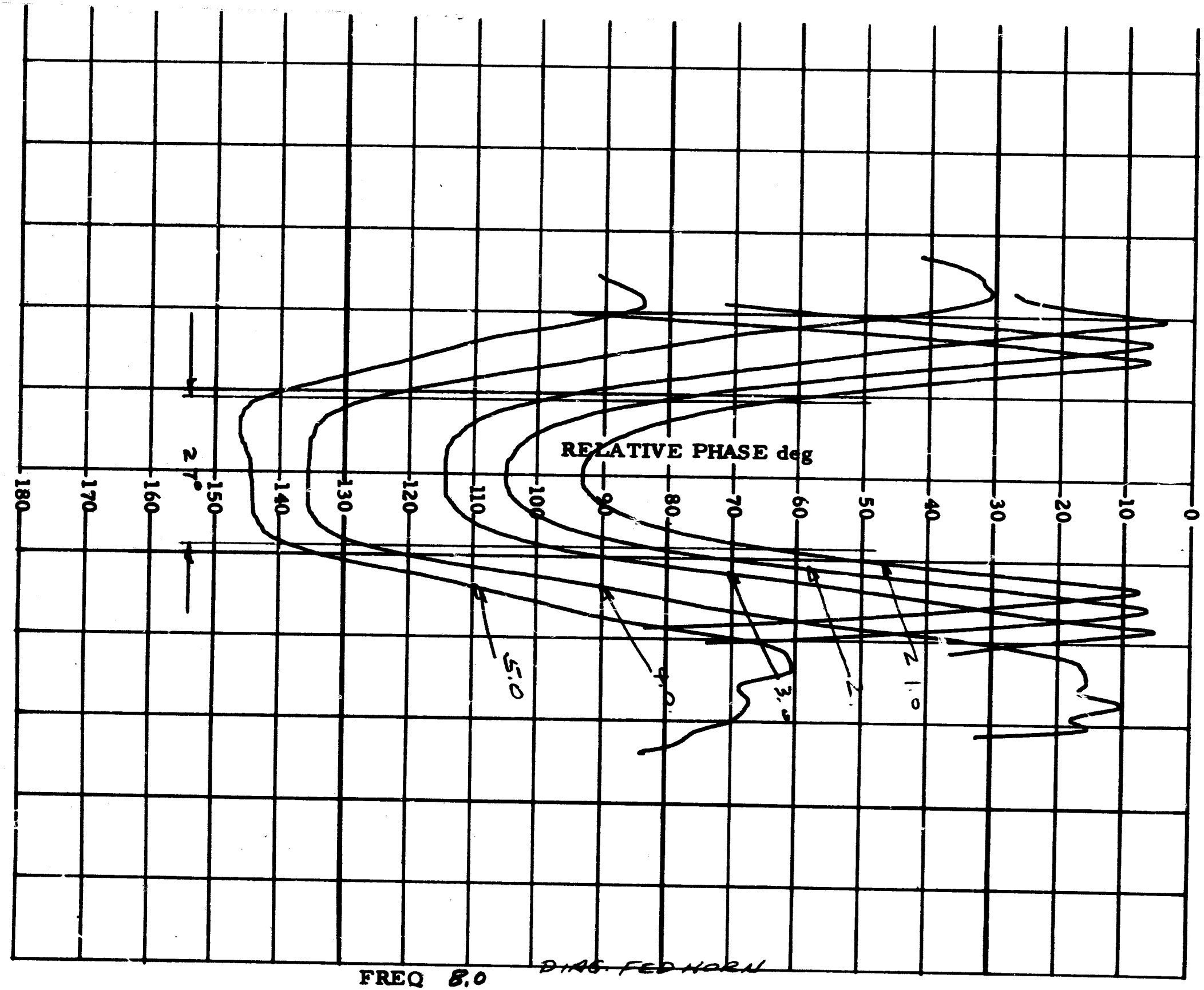
DATE 12/5/68

FREQ 7.487
PLANE H

CR - 2½

DIAS. FED

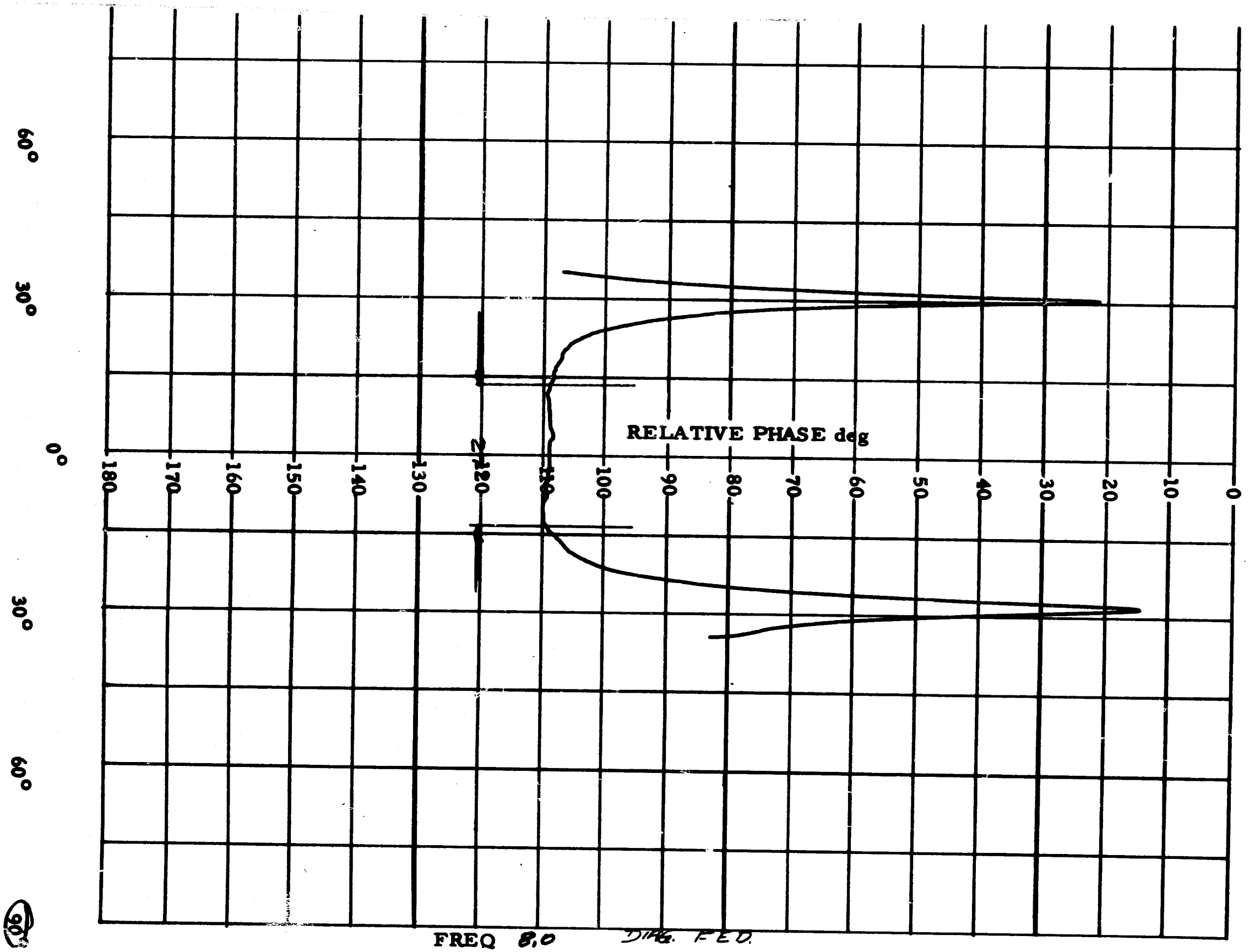




FREQ 8.0 DIAG. FED HORN

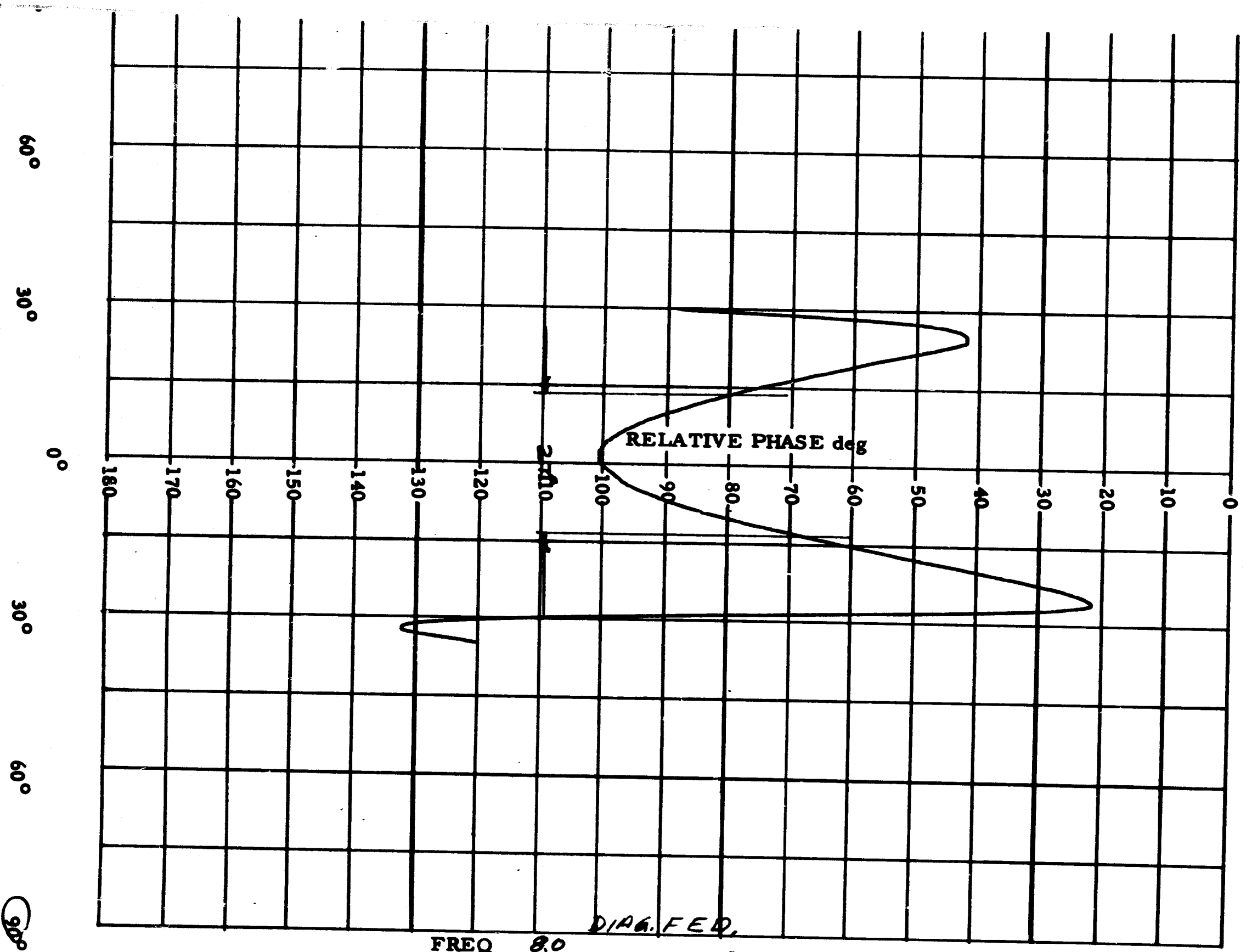
PLANE H CR AS MARKED BEHIND APERTURE

DATE 12/5/68



FREQ 8.0 DIRG. F.E.D.

PLANE E CR 1.0" INFRONT OF H-ENVIRE DATE 12/5/65

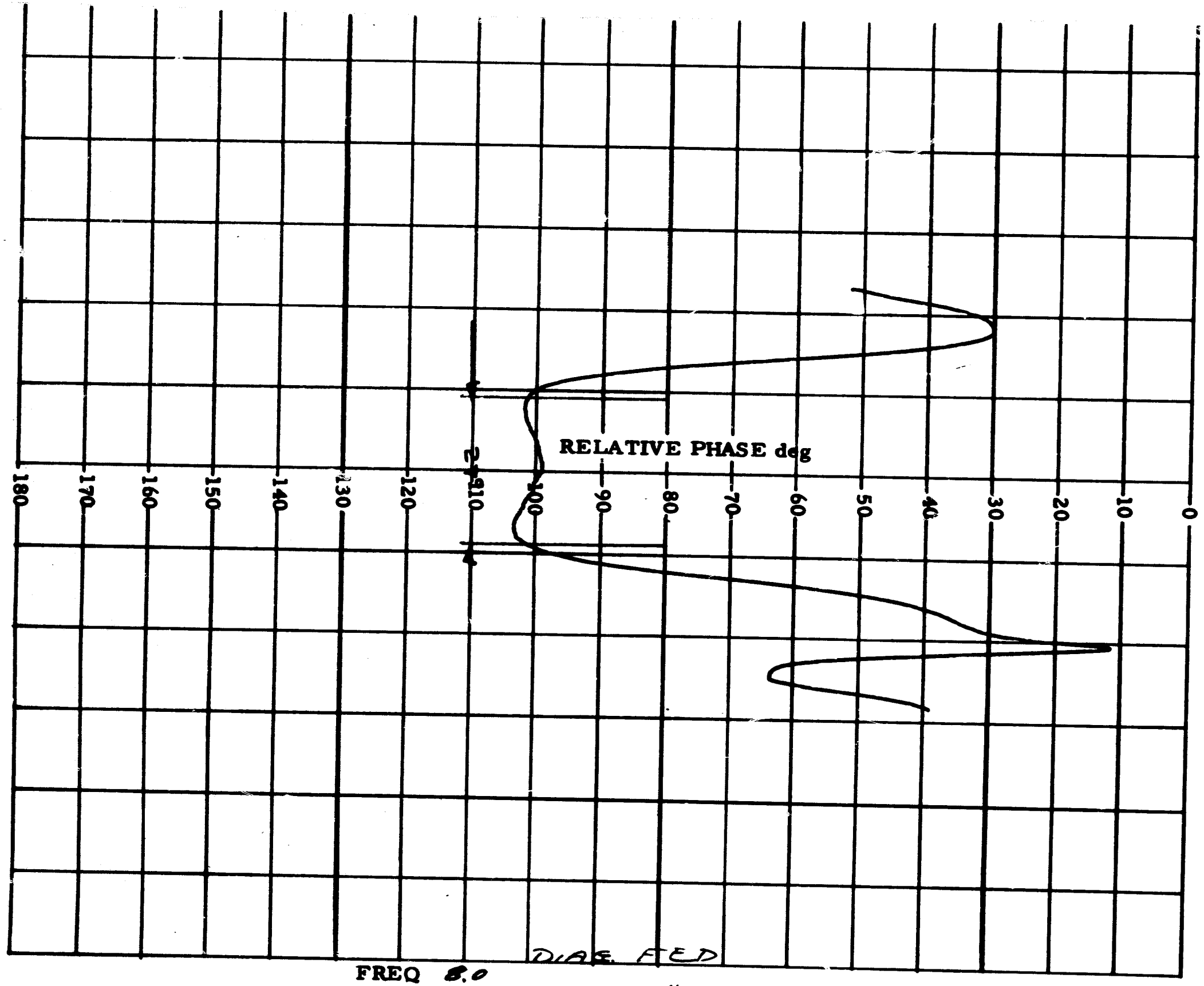


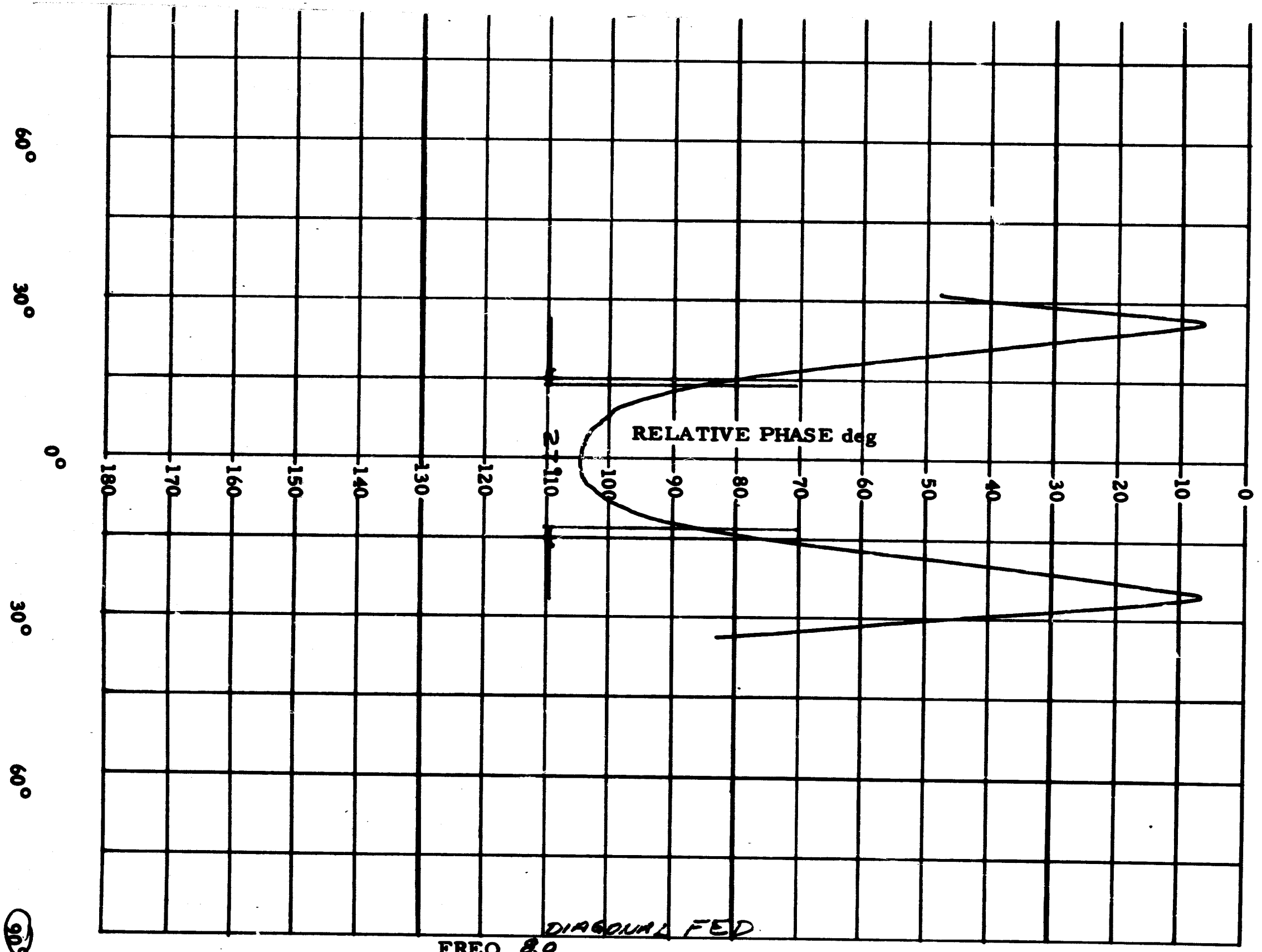
DIAG. FED.

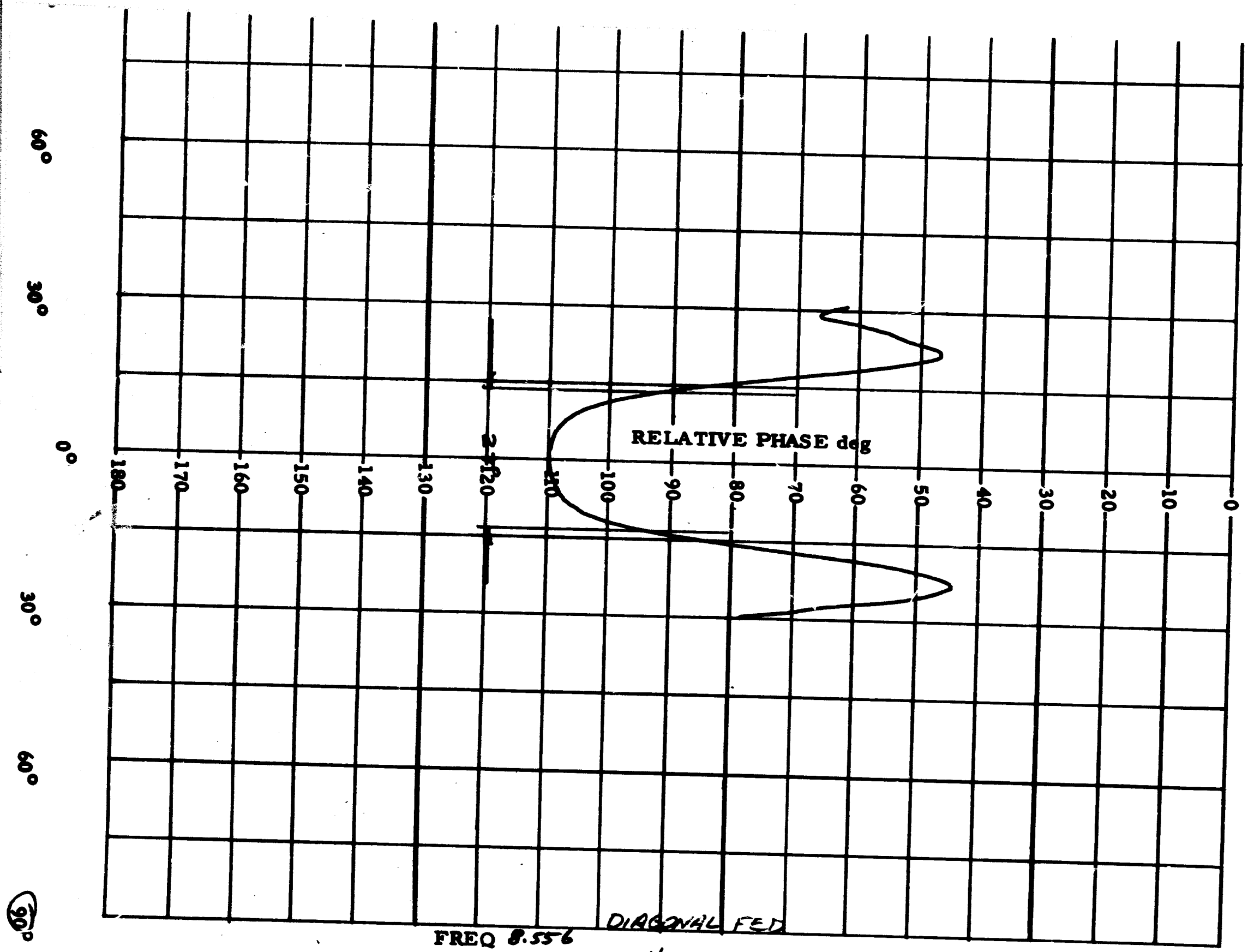
FREQ 8.0

PLANE E CR - 2½"

DATE 12/5/66


RELATIVE PHASE deg
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
60°
30°
0°
30°
60°
90°
DIAG. FED
FREQ 8.0
PLANE 45°
CR - 2½
DATE 12/5/66


RELATIVE PHASE deg
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0°
30°
60°
90°
30°
60°
DIAGONAL FED
FREQ 8.0
PLANE H
CR - 2½
DATE 12/5/68



DIAGONAL FED

FREQ 8.556

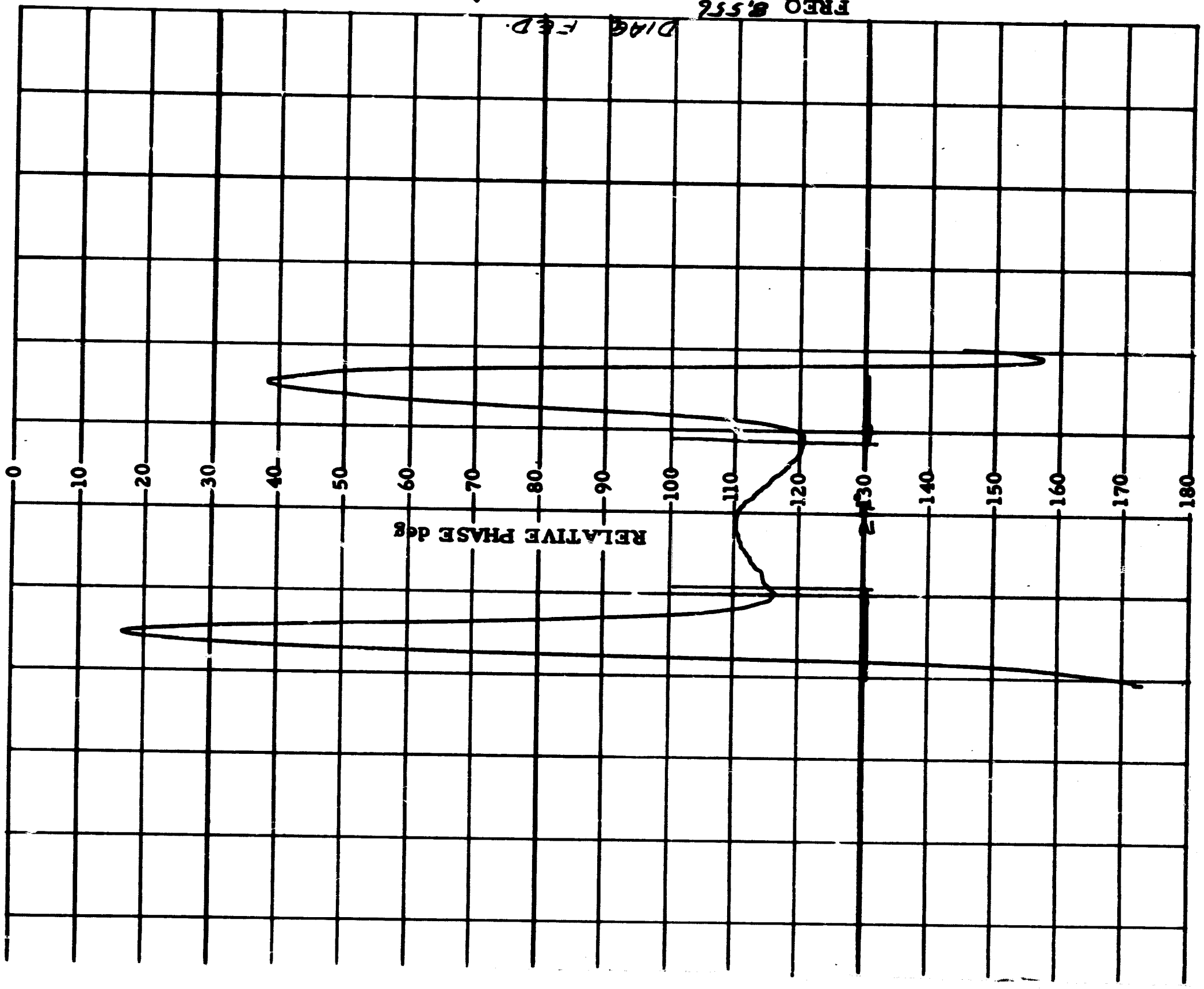
PLANE H CR-2½

DATE 12/5/68

DATE 14/5/68

PLANE #5° CR - 2 &.

FREQ 8,552 DIAG. FEED.



APPENDIX IV - D

RECTANGULAR MULTIMODE HORN - DIAG. FED COMPUTER EFFICIENCY DATA

Legend

PSI	-	Polar Angle
ETA	-	Total Aperture Efficiency
ETS	-	Spillover Efficiency
ETI	-	Illumination Efficiency
ETX	-	Cross Polarization Efficiency
ETP	-	Phase Error Efficiency
ETB	-	Blockage Efficiency
E	-	E-Plane Pattern (dB)
EP	-	E-Plane Phase (deg)
H	-	H-Plane Pattern (dB)
HP	-	H-Plane Phase (deg)

JPL RECT FEED DIAG FED 6.82 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 15
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.002	0.002	0.991	1.000	1.000	1.000	0.0	0.0	0.1	0.0
1.00	0.009	0.009	0.997	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.50	0.019	0.019	0.999	1.000	1.000	1.000	0.1	0.0	0.2	0.0
2.00	0.034	0.034	0.999	1.000	1.000	1.000	0.1	0.0	0.3	0.0
2.50	0.053	0.053	0.999	1.000	1.000	1.000	0.2	0.0	0.3	0.0
3.00	0.075	0.075	1.000	1.000	1.000	1.000	0.2	0.0	0.4	0.0
3.50	0.101	0.101	1.000	1.000	1.000	1.000	0.3	0.0	0.6	0.0
4.00	0.130	0.130	0.999	1.000	1.000	1.000	0.5	0.0	0.8	0.0
4.50	0.162	0.162	0.999	1.000	1.000	1.000	0.6	0.0	1.0	0.0
5.00	0.196	0.196	0.999	1.000	1.000	1.000	0.7	0.0	1.2	0.0
5.50	0.232	0.232	0.998	1.000	1.000	1.000	0.9	0.0	1.4	0.0
6.00	0.270	0.270	0.998	1.000	1.000	1.000	1.0	0.0	1.6	0.0
6.50	0.309	0.310	0.997	0.999	1.000	1.000	1.2	0.0	2.0	0.0
7.00	0.348	0.349	0.996	0.999	1.000	1.000	1.5	0.0	2.3	0.0
7.50	0.386	0.389	0.995	0.999	1.000	1.000	1.7	0.0	2.7	0.0
8.00	0.425	0.428	0.993	0.999	1.000	1.000	2.0	0.0	3.1	0.0
8.50	0.463	0.467	0.991	0.999	1.000	1.000	2.2	0.0	3.4	0.0
9.00	0.500	0.506	0.989	0.998	1.000	1.000	2.5	0.0	3.8	0.0
9.50	0.535	0.544	0.986	0.998	1.000	1.000	2.8	0.0	4.3	0.0
10.00	0.569	0.580	0.983	0.998	1.000	1.000	3.2	0.0	4.7	0.0
10.50	0.601	0.615	0.979	0.997	1.000	1.000	3.5	0.0	5.2	0.0
11.00	0.631	0.649	0.975	0.997	1.000	1.000	3.8	0.0	5.7	0.0
11.50	0.659	0.681	0.971	0.997	1.000	1.000	4.2	0.0	6.1	0.0
12.00	0.685	0.712	0.966	0.996	1.000	1.000	4.5	0.0	6.6	0.0
12.50	0.708	0.741	0.960	0.996	1.000	1.000	5.0	0.0	7.2	0.0
13.00	0.728	0.767	0.954	0.995	1.000	1.000	5.5	0.0	7.9	0.0
13.50	0.745	0.791	0.946	0.995	1.000	1.000	5.9	0.0	8.5	0.0
14.00	0.759	0.813	0.938	0.994	1.000	1.000	6.4	0.0	9.2	0.0
14.50	0.770	0.833	0.929	0.994	1.000	1.000	6.9	0.0	9.8	0.0
15.00	0.778	0.852	0.920	0.993	1.000	1.000	7.4	0.0	10.5	0.0
15.50	0.785	0.869	0.910	0.993	1.000	1.000	7.9	0.0	11.2	0.0
16.00	0.789	0.884	0.899	0.992	1.000	1.000	8.4	0.0	11.9	0.0
16.50	0.790	0.898	0.888	0.992	1.000	1.000	8.9	0.0	12.5	0.0
17.00	0.791	0.910	0.876	0.991	1.000	1.000	9.4	0.0	13.2	0.0
17.50	0.789	0.922	0.864	0.991	1.000	1.000	9.9	0.0	13.9	0.0
18.00	0.786	0.932	0.851	0.990	1.000	1.000	10.4	0.0	14.6	0.0
18.50	0.781	0.941	0.838	0.990	1.000	1.000	11.1	0.0	15.4	0.0
19.00	0.774	0.949	0.824	0.990	1.000	1.000	11.8	0.0	16.1	0.0
19.50	0.766	0.956	0.810	0.989	1.000	1.000	12.5	0.0	16.9	0.0
20.00	0.756	0.962	0.795	0.989	1.000	1.000	13.3	0.0	17.7	0.0
20.50	0.746	0.967	0.780	0.989	1.000	1.000	14.0	0.0	18.4	0.0
21.00	0.734	0.971	0.764	0.988	1.000	1.000	14.8	0.0	19.2	0.0
21.50	0.721	0.975	0.748	0.988	1.000	1.000	15.6	0.0	19.8	0.0
22.00	0.708	0.979	0.732	0.988	1.000	1.000	16.4	0.0	20.3	0.0
22.50	0.694	0.981	0.716	0.988	1.000	1.000	17.3	0.0	20.9	0.0
23.00	0.680	0.984	0.700	0.988	1.000	1.000	18.2	0.0	21.5	0.0
23.50	0.666	0.986	0.683	0.988	1.000	1.000	19.0	0.0	22.0	0.0

JPL RECT FEED DIAG FED 7.00 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
ENC VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 17
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.002	0.002	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.009	0.009	0.997	1.000	1.000	1.000	0.1	0.0	0.2	0.0
1.50	0.020	0.020	0.999	1.000	1.000	1.000	0.1	0.0	0.3	0.0
2.00	0.036	0.036	0.999	1.000	1.000	1.000	0.2	0.0	0.3	0.0
2.50	0.055	0.055	0.999	1.000	1.000	1.000	0.2	0.0	0.4	0.0
3.00	0.079	0.079	0.999	1.000	1.000	1.000	0.3	0.0	0.5	0.0
3.50	0.106	0.106	0.999	1.000	1.000	1.000	0.4	0.0	0.7	0.0
4.00	0.136	0.136	0.999	1.000	1.000	1.000	0.6	0.0	0.9	0.0
4.50	0.168	0.168	0.999	1.000	1.000	1.000	0.7	0.0	1.1	0.0
5.00	0.203	0.203	0.999	1.000	1.000	1.000	0.9	0.0	1.3	0.0
5.50	0.240	0.240	0.998	1.000	1.000	1.000	1.0	0.0	1.5	0.0
6.00	0.279	0.279	0.998	1.000	1.000	1.000	1.2	0.0	1.7	0.0
6.50	0.318	0.320	0.997	1.000	1.000	1.000	1.4	0.0	2.1	0.0
7.00	0.358	0.360	0.996	0.999	1.000	1.000	1.7	0.0	2.5	0.0
7.50	0.398	0.400	0.994	0.999	1.000	1.000	1.9	0.0	2.8	0.0
8.00	0.436	0.440	0.992	0.999	1.000	1.000	2.2	0.0	3.2	0.0
8.50	0.475	0.480	0.990	0.999	1.000	1.000	2.4	0.0	3.6	0.0
9.00	0.512	0.519	0.988	0.999	1.000	1.000	2.7	0.0	4.0	0.0
9.50	0.548	0.557	0.985	0.998	1.000	1.000	3.1	0.0	4.5	0.0
10.00	0.581	0.594	0.981	0.998	1.000	1.000	3.5	0.0	5.1	0.0
10.50	0.612	0.628	0.977	0.997	1.000	1.000	3.8	0.0	5.6	0.0
11.00	0.640	0.660	0.972	0.997	1.000	1.000	4.2	0.0	6.1	0.0
11.50	0.666	0.691	0.967	0.997	1.000	1.000	4.6	0.0	6.7	0.0
12.00	0.689	0.720	0.961	0.996	1.000	1.000	5.0	0.0	7.2	0.0
12.50	0.710	0.747	0.954	0.996	1.000	1.000	5.4	0.0	7.8	0.0
13.00	0.728	0.772	0.947	0.995	1.000	1.000	5.9	0.0	8.5	0.0
13.50	0.743	0.795	0.939	0.995	1.000	1.000	6.3	0.0	9.1	0.0
14.00	0.755	0.817	0.931	0.994	1.000	1.000	6.7	0.0	9.7	0.0
14.50	0.766	0.836	0.921	0.994	1.000	1.000	7.2	0.0	10.4	0.0
15.00	0.774	0.854	0.912	0.993	1.000	1.000	7.6	0.0	11.0	0.0
15.50	0.780	0.871	0.902	0.992	1.000	1.000	8.1	0.0	11.7	0.0
16.00	0.783	0.886	0.891	0.992	1.000	1.000	8.7	0.0	12.4	0.0
16.50	0.784	0.899	0.879	0.991	1.000	1.000	9.2	0.0	13.1	0.0
17.00	0.783	0.911	0.867	0.991	1.000	1.000	9.8	0.0	13.9	0.0
17.50	0.780	0.922	0.855	0.990	1.000	1.000	10.3	0.0	14.6	0.0
18.00	0.776	0.932	0.842	0.990	1.000	1.000	10.9	0.0	15.3	0.0
18.50	0.770	0.940	0.828	0.989	1.000	1.000	11.6	0.0	16.0	0.0
19.00	0.763	0.948	0.814	0.989	1.000	1.000	12.3	0.0	16.8	0.0
19.50	0.754	0.954	0.799	0.989	1.000	1.000	12.9	0.0	17.5	0.0
20.00	0.744	0.960	0.784	0.988	1.000	1.000	13.6	0.0	18.3	0.0
20.50	0.733	0.965	0.769	0.988	1.000	1.000	14.3	0.0	19.0	0.0
21.00	0.721	0.969	0.753	0.988	1.000	1.000	15.0	0.0	19.8	0.0
21.50	0.709	0.973	0.738	0.988	1.000	1.000	15.8	0.0	20.3	0.0
22.00	0.696	0.976	0.722	0.987	1.000	1.000	16.6	0.0	20.8	0.0
22.50	0.682	0.979	0.706	0.987	1.000	1.000	17.4	0.0	21.3	0.0
23.00	0.669	0.981	0.690	0.987	1.000	1.000	18.2	0.0	21.8	0.0
23.50	0.655	0.984	0.675	0.987	1.000	1.000	19.0	0.0	22.3	0.0

JPL RFCT FEED DIAG FED 7.20 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 18
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.002	0.002	0.991	1.000	1.000	1.000	0.0	0.0	0.1	0.0
1.00	0.008	0.008	0.997	1.000	1.000	1.000	0.1	0.0	0.2	0.0
1.50	0.017	0.017	0.999	1.000	1.000	1.000	0.1	0.0	0.3	0.0
2.00	0.030	0.030	0.999	1.000	1.000	1.000	0.1	0.0	0.3	0.0
2.50	0.047	0.047	0.999	1.000	1.000	1.000	0.2	0.0	0.4	0.0
3.00	0.067	0.067	0.999	1.000	1.000	1.000	0.2	0.0	0.5	0.0
3.50	0.090	0.090	1.000	1.000	1.000	1.000	0.3	0.0	0.7	0.0
4.00	0.115	0.115	0.999	1.000	1.000	1.000	0.4	0.0	0.9	0.0
4.50	0.143	0.144	0.999	1.000	1.000	1.000	0.5	0.0	1.1	0.0
5.00	0.173	0.174	0.999	0.999	1.000	1.000	0.7	0.0	1.3	0.0
5.50	0.206	0.206	0.998	0.999	1.000	1.000	0.8	0.0	1.5	0.0
6.00	0.239	0.240	0.998	0.999	1.000	1.000	0.9	0.0	1.7	0.0
6.50	0.274	0.275	0.997	0.999	1.000	1.000	1.0	0.0	2.1	0.0
7.00	0.310	0.311	0.997	0.999	1.000	1.000	1.2	0.0	2.5	0.0
7.50	0.345	0.348	0.995	0.998	1.000	1.000	1.3	0.0	2.8	0.0
8.00	0.381	0.385	0.994	0.997	1.000	1.000	1.5	0.0	3.2	0.0
8.50	0.417	0.422	0.993	0.997	1.000	1.000	1.6	0.0	3.6	0.0
9.00	0.453	0.459	0.991	0.996	1.000	1.000	1.8	0.0	4.0	0.0
9.50	0.487	0.495	0.989	0.995	1.000	1.000	2.1	0.0	4.5	0.0
10.00	0.520	0.531	0.986	0.994	1.000	1.000	2.4	0.0	5.1	0.0
10.50	0.551	0.565	0.983	0.993	1.000	1.000	2.6	0.0	5.6	0.0
11.00	0.580	0.598	0.980	0.991	1.000	1.000	2.9	0.0	6.1	0.0
11.50	0.608	0.629	0.976	0.990	1.000	1.000	3.2	0.0	6.7	0.0
12.00	0.633	0.659	0.971	0.989	1.000	1.000	3.5	0.0	7.2	0.0
12.50	0.656	0.688	0.966	0.987	1.000	1.000	3.9	0.0	7.9	0.0
13.00	0.677	0.715	0.960	0.986	1.000	1.000	4.2	0.0	8.6	0.0
13.50	0.695	0.740	0.954	0.984	1.000	1.000	4.6	0.0	9.3	0.0
14.00	0.711	0.764	0.947	0.983	1.000	1.000	5.0	0.0	10.0	0.0
14.50	0.724	0.786	0.939	0.981	1.000	1.000	5.3	0.0	10.7	0.0
15.00	0.735	0.806	0.931	0.979	1.000	1.000	5.7	0.0	11.4	0.0
15.50	0.744	0.825	0.923	0.977	1.000	1.000	6.1	0.0	12.1	0.0
16.00	0.752	0.843	0.914	0.976	1.000	1.000	6.5	0.0	12.9	0.0
16.50	0.757	0.860	0.904	0.974	1.000	1.000	6.8	0.0	13.6	0.0
17.00	0.761	0.875	0.894	0.972	1.000	1.000	7.2	0.0	14.4	0.0
17.50	0.763	0.889	0.884	0.970	1.000	1.000	7.6	0.0	15.1	0.0
18.00	0.763	0.903	0.873	0.969	1.000	1.000	8.0	0.0	15.9	0.0
18.50	0.762	0.915	0.862	0.967	1.000	1.000	8.6	0.0	16.6	0.0
19.00	0.760	0.925	0.850	0.965	1.000	1.000	9.2	0.0	17.4	0.0
19.50	0.755	0.935	0.838	0.964	1.000	1.000	9.8	0.0	18.1	0.0
20.00	0.749	0.943	0.825	0.963	1.000	1.000	10.5	0.0	18.8	0.0
20.50	0.742	0.951	0.812	0.962	1.000	1.000	11.1	0.0	19.6	0.0
21.00	0.734	0.957	0.798	0.961	1.000	1.000	11.7	0.0	20.3	0.0
21.50	0.725	0.963	0.784	0.960	1.000	1.000	12.4	0.0	20.8	0.0
22.00	0.715	0.968	0.769	0.960	1.000	1.000	13.2	0.0	21.4	0.0
22.50	0.704	0.972	0.755	0.959	1.000	1.000	13.9	0.0	21.9	0.0
23.00	0.692	0.976	0.740	0.959	1.000	1.000	14.7	0.0	22.5	0.0

JPL RECT FEED DIAG FED 7.487 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 17
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.0	0.0
1.00	0.010	0.010	0.997	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.50	0.023	0.023	0.999	1.000	1.000	1.000	0.1	0.0	0.1	0.0
2.00	0.040	0.040	0.999	1.000	1.000	1.000	0.2	0.0	0.1	0.0
2.50	0.062	0.063	0.999	1.000	1.000	1.000	0.2	0.0	0.2	0.0
3.00	0.089	0.089	1.000	1.000	1.000	1.000	0.3	0.0	0.2	0.0
3.50	0.120	0.120	1.000	1.000	1.000	1.000	0.4	0.0	0.5	0.0
4.00	0.154	0.154	0.999	1.000	1.000	1.000	0.6	0.0	0.8	0.0
4.50	0.190	0.190	0.999	1.000	1.000	1.000	0.7	0.0	1.1	0.0
5.00	0.229	0.229	0.998	1.000	1.000	1.000	0.9	0.0	1.4	0.0
5.50	0.269	0.270	0.997	1.000	1.000	1.000	1.0	0.0	1.7	0.0
6.00	0.311	0.312	0.997	1.000	1.000	1.000	1.2	0.0	2.0	0.0
6.50	0.353	0.355	0.995	0.999	1.000	1.000	1.5	0.0	2.4	0.0
7.00	0.395	0.398	0.994	0.999	1.000	1.000	1.8	0.0	2.8	0.0
7.50	0.436	0.440	0.992	0.999	1.000	1.000	2.1	0.0	3.2	0.0
8.00	0.476	0.482	0.989	0.998	1.000	1.000	2.4	0.0	3.7	0.0
8.50	0.515	0.523	0.986	0.998	1.000	1.000	2.7	0.0	4.1	0.0
9.00	0.552	0.563	0.983	0.998	1.000	1.000	3.0	0.0	4.5	0.0
9.50	0.588	0.601	0.980	0.997	1.000	1.000	3.4	0.0	5.1	0.0
10.00	0.620	0.638	0.975	0.997	1.000	1.000	3.8	0.0	5.6	0.0
10.50	0.650	0.672	0.970	0.997	1.000	1.000	4.2	0.0	6.2	0.0
11.00	0.676	0.704	0.964	0.996	1.000	1.000	4.7	0.0	6.8	0.0
11.50	0.700	0.734	0.958	0.996	1.000	1.000	5.1	0.0	7.3	0.0
12.00	0.722	0.763	0.951	0.995	1.000	1.000	5.5	0.0	7.9	0.0
12.50	0.740	0.789	0.943	0.995	1.000	1.000	6.0	0.0	8.7	0.0
13.00	0.755	0.812	0.934	0.994	1.000	1.000	6.5	0.0	9.4	0.0
13.50	0.766	0.834	0.925	0.993	1.000	1.000	7.0	0.0	10.2	0.0
14.00	0.775	0.853	0.914	0.993	1.000	1.000	7.5	0.0	11.0	0.0
14.50	0.780	0.871	0.903	0.992	1.000	1.000	8.0	0.0	11.7	0.0
15.00	0.784	0.887	0.892	0.991	1.000	1.000	8.5	0.0	12.5	0.0
15.50	0.785	0.901	0.879	0.991	1.000	1.000	9.1	0.0	13.3	0.0
16.00	0.783	0.914	0.866	0.990	1.000	1.000	9.7	0.0	14.1	0.0
16.50	0.780	0.925	0.852	0.990	1.000	1.000	10.3	0.0	14.9	0.0
17.00	0.775	0.935	0.838	0.989	1.000	1.000	10.9	0.0	15.8	0.0
17.50	0.768	0.943	0.823	0.988	1.000	1.000	11.5	0.0	16.6	0.0
18.00	0.759	0.951	0.808	0.988	1.000	1.000	12.1	0.0	17.4	0.0
18.50	0.750	0.958	0.793	0.987	1.000	1.000	12.9	0.0	18.2	0.0
19.00	0.739	0.964	0.776	0.987	1.000	1.000	13.7	0.0	18.9	0.0
19.50	0.726	0.969	0.760	0.987	1.000	1.000	14.5	0.0	19.7	0.0
20.00	0.713	0.973	0.743	0.986	1.000	1.000	15.4	0.0	20.5	0.0
20.50	0.699	0.976	0.726	0.986	1.000	1.000	16.2	0.0	21.2	0.0
21.00	0.685	0.979	0.709	0.986	1.000	1.000	17.0	0.0	22.0	0.0
21.50	0.670	0.982	0.692	0.986	1.000	1.000	17.9	0.0	22.4	0.0
22.00	0.654	0.984	0.675	0.986	1.000	1.000	18.9	0.0	22.9	0.0
22.50	0.639	0.986	0.658	0.986	1.000	1.000	19.8	0.0	23.3	0.0
23.00	0.624	0.988	0.641	0.986	1.000	1.000	20.8	0.0	23.7	0.0
23.50	0.609	0.989	0.624	0.986	1.000	1.000	21.7	0.0	24.2	0.0

JPL RECT FEED DIAG FED 7.60 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 15
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.010	0.010	0.997	1.000	1.000	1.000	0.2	0.0	0.1	0.0
1.50	0.023	0.023	0.999	1.000	1.000	1.000	0.3	0.0	0.2	0.0
2.00	0.040	0.040	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.50	0.062	0.062	0.999	1.000	1.000	1.000	0.4	0.0	0.3	0.0
3.00	0.088	0.088	0.999	1.000	1.000	1.000	0.5	0.0	0.4	0.0
3.50	0.117	0.117	0.999	1.000	1.000	1.000	0.8	0.0	0.6	0.0
4.00	0.149	0.150	0.999	1.000	1.000	1.000	1.2	0.0	0.8	0.0
4.50	0.183	0.184	0.998	1.000	1.000	1.000	1.5	0.0	1.0	0.0
5.00	0.219	0.220	0.997	1.000	1.000	1.000	1.8	0.0	1.3	0.0
5.50	0.256	0.257	0.996	1.000	1.000	1.000	2.2	0.0	1.5	0.0
6.00	0.294	0.295	0.995	0.999	1.000	1.000	2.5	0.0	1.7	0.0
6.50	0.332	0.334	0.993	0.999	1.000	1.000	2.7	0.0	2.1	0.0
7.00	0.370	0.373	0.991	0.999	1.000	1.000	2.8	0.0	2.6	0.0
7.50	0.408	0.412	0.989	0.999	1.000	1.000	3.0	0.0	3.0	0.0
8.00	0.445	0.451	0.987	0.999	1.000	1.000	3.2	0.0	3.5	0.0
8.50	0.482	0.490	0.985	0.999	1.000	1.000	3.3	0.0	3.9	0.0
9.00	0.518	0.528	0.982	0.999	1.000	1.000	3.5	0.0	4.4	0.0
9.50	0.552	0.565	0.979	0.999	1.000	1.000	3.9	0.0	5.0	0.0
10.00	0.583	0.599	0.975	0.999	1.000	1.000	4.4	0.0	5.6	0.0
10.50	0.611	0.631	0.970	0.999	1.000	1.000	4.8	0.0	6.2	0.0
11.00	0.637	0.661	0.964	0.998	1.000	1.000	5.2	0.0	6.8	0.0
11.50	0.659	0.690	0.957	0.998	1.000	1.000	5.7	0.0	7.4	0.0
12.00	0.679	0.716	0.950	0.998	1.000	1.000	6.1	0.0	8.0	0.0
12.50	0.695	0.739	0.942	0.997	1.000	1.000	6.7	0.0	8.9	0.0
13.00	0.707	0.760	0.932	0.997	1.000	1.000	7.3	0.0	9.7	0.0
13.50	0.716	0.779	0.922	0.997	1.000	1.000	7.9	0.0	10.6	0.0
14.00	0.721	0.795	0.910	0.996	1.000	1.000	8.5	0.0	11.5	0.0
14.50	0.723	0.810	0.897	0.996	1.000	1.000	9.1	0.0	12.3	0.0
15.00	0.723	0.823	0.883	0.995	1.000	1.000	9.7	0.0	13.2	0.0
15.50	0.723	0.835	0.870	0.995	1.000	1.000	9.7	0.0	13.2	0.0
16.00	0.724	0.847	0.859	0.994	1.000	1.000	9.7	0.0	13.2	0.0
16.50	0.726	0.860	0.849	0.994	1.000	1.000	9.7	0.0	13.2	0.0
17.00	0.729	0.874	0.841	0.993	1.000	1.000	9.7	0.0	13.2	0.0
17.50	0.734	0.888	0.833	0.993	1.000	1.000	9.7	0.0	13.2	0.0
18.00	0.740	0.902	0.827	0.992	1.000	1.000	9.7	0.0	13.2	0.0
18.50	0.747	0.916	0.822	0.992	1.000	1.000	9.7	0.0	13.2	0.0
19.00	0.754	0.931	0.817	0.991	1.000	1.000	9.7	0.0	13.2	0.0
19.50	0.762	0.946	0.813	0.991	1.000	1.000	9.7	0.0	13.2	0.0
20.00	0.772	0.962	0.810	0.990	1.000	1.000	9.7	0.0	13.2	0.0
20.50	0.782	0.978	0.807	0.990	1.000	1.000	9.7	0.0	13.2	0.0
21.00	0.776	0.986	0.795	0.990	1.000	1.000	18.9	0.0	23.0	0.0
21.50	0.755	0.988	0.773	0.990	1.000	1.000	19.8	0.0	23.4	0.0
22.00	0.734	0.989	0.750	0.990	1.000	1.000	20.8	0.0	23.8	0.0
22.50	0.714	0.991	0.728	0.990	1.000	1.000	21.7	0.0	24.2	0.0
23.00	0.694	0.992	0.707	0.990	1.000	1.000	22.6	0.0	24.6	0.0
23.50	0.675	0.993	0.687	0.990	1.000	1.000	23.6	0.0	25.0	0.0

JPL RECT FEED DIAG FED 7.80 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 15
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.011	0.011	0.997	1.000	1.000	1.000	0.1	0.0	0.2	0.0
1.50	0.024	0.024	0.999	1.000	1.000	1.000	0.1	0.0	0.3	0.0
2.00	0.043	0.043	0.999	1.000	1.000	1.000	0.2	0.0	0.3	0.0
2.50	0.066	0.066	0.999	1.000	1.000	1.000	0.2	0.0	0.4	0.0
3.00	0.094	0.094	0.999	1.000	1.000	1.000	0.3	0.0	0.5	0.0
3.50	0.126	0.126	0.999	1.000	1.000	1.000	0.5	0.0	0.7	0.0
4.00	0.161	0.161	0.999	1.000	1.000	1.000	0.7	0.0	1.0	0.0
4.50	0.199	0.199	0.999	1.000	1.000	1.000	0.8	0.0	1.2	0.0
5.00	0.239	0.240	0.998	1.000	1.000	1.000	1.0	0.0	1.5	0.0
5.50	0.282	0.282	0.997	1.000	1.000	1.000	1.2	0.0	1.7	0.0
6.00	0.326	0.327	0.997	1.000	1.000	1.000	1.4	0.0	2.0	0.0
6.50	0.370	0.372	0.995	0.999	1.000	1.000	1.7	0.0	2.4	0.0
7.00	0.414	0.416	0.994	0.999	1.000	1.000	2.0	0.0	2.9	0.0
7.50	0.456	0.460	0.992	0.999	1.000	1.000	2.3	0.0	3.3	0.0
8.00	0.498	0.504	0.989	0.999	1.000	1.000	2.7	0.0	3.7	0.0
8.50	0.538	0.546	0.986	0.999	1.000	1.000	3.0	0.0	4.2	0.0
9.00	0.576	0.587	0.983	0.998	1.000	1.000	3.3	0.0	4.6	0.0
9.50	0.612	0.626	0.979	0.998	1.000	1.000	3.7	0.0	5.2	0.0
10.00	0.645	0.663	0.974	0.998	1.000	1.000	4.2	0.0	5.8	0.0
10.50	0.674	0.698	0.968	0.997	1.000	1.000	4.6	0.0	6.3	0.0
11.00	0.700	0.730	0.962	0.997	1.000	1.000	5.1	0.0	6.9	0.0
11.50	0.723	0.760	0.955	0.997	1.000	1.000	5.5	0.0	7.5	0.0
12.00	0.744	0.788	0.947	0.996	1.000	1.000	6.0	0.0	8.1	0.0
12.50	0.761	0.813	0.939	0.996	1.000	1.000	6.6	0.0	8.9	0.0
13.00	0.773	0.836	0.929	0.996	1.000	1.000	7.2	0.0	9.7	0.0
13.50	0.782	0.856	0.918	0.995	1.000	1.000	7.7	0.0	10.5	0.0
14.00	0.788	0.874	0.906	0.995	1.000	1.000	8.3	0.0	11.4	0.0
14.50	0.791	0.890	0.894	0.994	1.000	1.000	8.9	0.0	12.2	0.0
15.00	0.791	0.904	0.880	0.994	1.000	1.000	9.5	0.0	13.0	0.0
15.50	0.789	0.917	0.866	0.993	1.000	1.000	10.2	0.0	13.7	0.0
16.00	0.785	0.928	0.852	0.993	1.000	1.000	10.9	0.0	14.5	0.0
16.50	0.779	0.938	0.837	0.993	1.000	1.000	11.6	0.0	15.2	0.0
17.00	0.771	0.946	0.821	0.992	1.000	1.000	12.3	0.0	15.9	0.0
17.50	0.761	0.953	0.805	0.992	1.000	1.000	13.0	0.0	16.7	0.0
18.00	0.751	0.960	0.788	0.992	1.000	1.000	13.7	0.0	17.4	0.0
18.50	0.739	0.965	0.772	0.992	1.000	1.000	14.6	0.0	18.0	0.0
19.00	0.726	0.970	0.755	0.992	1.000	1.000	15.6	0.0	18.5	0.0
19.50	0.712	0.974	0.737	0.992	1.000	1.000	16.5	0.0	19.1	0.0
20.00	0.698	0.977	0.720	0.991	1.000	1.000	17.5	0.0	19.7	0.0
20.50	0.683	0.980	0.702	0.991	1.000	1.000	18.4	0.0	20.2	0.0
21.00	0.667	0.983	0.685	0.991	1.000	1.000	19.4	0.0	20.8	0.0
21.50	0.652	0.985	0.668	0.991	1.000	1.000	20.6	0.0	21.2	0.0
22.00	0.636	0.987	0.650	0.992	1.000	1.000	21.8	0.0	21.6	0.0
22.50	0.620	0.988	0.633	0.992	1.000	1.000	23.0	0.0	21.9	0.0
23.00	0.605	0.989	0.616	0.992	1.000	1.000	24.3	0.0	22.3	0.0
23.50	0.589	0.990	0.600	0.992	1.000	1.000	25.5	0.0	22.7	0.0
24.00	0.573	0.991	0.583	0.991	1.000	1.000	26.7	0.0	23.1	0.0

JPL RECT FEED DIAG FED 8.00 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 15
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.010	0.010	0.997	1.000	1.000	1.000	0.1	0.0	0.2	0.0
1.50	0.022	0.022	0.999	1.000	1.000	1.000	0.1	0.0	0.3	0.0
2.00	0.039	0.039	0.999	1.000	1.000	1.000	0.2	0.0	0.3	0.0
2.50	0.061	0.061	0.999	1.000	1.000	1.000	0.2	0.0	0.4	0.0
3.00	0.087	0.087	0.999	1.000	1.000	1.000	0.3	0.0	0.5	0.0
3.50	0.117	0.117	0.999	1.000	1.000	1.000	0.5	0.0	0.7	0.0
4.00	0.149	0.149	0.999	1.000	1.000	1.000	0.6	0.0	1.0	0.0
4.50	0.185	0.185	0.999	1.000	1.000	1.000	0.8	0.0	1.2	0.0
5.00	0.222	0.223	0.998	1.000	1.000	1.000	1.0	0.0	1.5	0.0
5.50	0.261	0.262	0.998	1.000	1.000	1.000	1.1	0.0	1.7	0.0
6.00	0.303	0.304	0.997	0.999	1.000	1.000	1.3	0.0	2.0	0.0
6.50	0.344	0.346	0.996	0.999	1.000	1.000	1.6	0.0	2.4	0.0
7.00	0.386	0.388	0.994	0.999	1.000	1.000	1.9	0.0	2.8	0.0
7.50	0.426	0.430	0.992	0.999	1.000	1.000	2.1	0.0	3.2	0.0
8.00	0.466	0.471	0.990	0.999	1.000	1.000	2.4	0.0	3.7	0.0
8.50	0.505	0.512	0.987	0.998	1.000	1.000	2.7	0.0	4.1	0.0
9.00	0.542	0.552	0.984	0.998	1.000	1.000	3.0	0.0	4.5	0.0
9.50	0.578	0.590	0.981	0.997	1.000	1.000	3.4	0.0	5.0	0.0
10.00	0.611	0.627	0.977	0.997	1.000	1.000	3.8	0.0	5.5	0.0
10.50	0.641	0.661	0.972	0.997	1.000	1.000	4.2	0.0	6.1	0.0
11.00	0.668	0.694	0.967	0.996	1.000	1.000	4.7	0.0	6.6	0.0
11.50	0.693	0.725	0.961	0.996	1.000	1.000	5.1	0.0	7.1	0.0
12.00	0.716	0.753	0.954	0.996	1.000	1.000	5.5	0.0	7.6	0.0
12.50	0.735	0.780	0.947	0.995	1.000	1.000	6.0	0.0	8.3	0.0
13.00	0.751	0.804	0.939	0.995	1.000	1.000	6.5	0.0	9.0	0.0
13.50	0.764	0.826	0.930	0.994	1.000	1.000	7.0	0.0	9.7	0.0
14.00	0.774	0.846	0.920	0.994	1.000	1.000	7.6	0.0	10.4	0.0
14.50	0.781	0.864	0.909	0.994	1.000	1.000	8.1	0.0	11.1	0.0
15.00	0.786	0.881	0.898	0.993	1.000	1.000	8.6	0.0	11.8	0.0
15.50	0.788	0.895	0.886	0.993	1.000	1.000	9.2	0.0	12.5	0.0
16.00	0.788	0.909	0.874	0.992	1.000	1.000	9.8	0.0	13.1	0.0
16.50	0.786	0.920	0.861	0.992	1.000	1.000	10.3	0.0	13.8	0.0
17.00	0.783	0.931	0.848	0.992	1.000	1.000	10.9	0.0	14.5	0.0
17.50	0.778	0.941	0.834	0.991	1.000	1.000	11.5	0.0	15.1	0.0
18.00	0.772	0.949	0.820	0.991	1.000	1.000	12.1	0.0	15.8	0.0
18.50	0.764	0.957	0.806	0.991	1.000	1.000	12.9	0.0	16.4	0.0
19.00	0.754	0.963	0.791	0.991	1.000	1.000	13.7	0.0	17.1	0.0
19.50	0.744	0.968	0.775	0.990	1.000	1.000	14.5	0.0	17.7	0.0
20.00	0.732	0.973	0.760	0.990	1.000	1.000	15.4	0.0	18.4	0.0
20.50	0.720	0.977	0.744	0.990	1.000	1.000	16.2	0.0	19.0	0.0
21.00	0.706	0.981	0.727	0.990	1.000	1.000	17.0	0.0	19.7	0.0
21.50	0.692	0.984	0.711	0.990	1.000	1.000	18.0	0.0	20.4	0.0
22.00	0.678	0.986	0.694	0.990	1.000	1.000	19.1	0.0	21.0	0.0
22.50	0.663	0.988	0.677	0.990	1.000	1.000	20.1	0.0	21.7	0.0
23.00	0.647	0.990	0.660	0.990	1.000	1.000	21.1	0.0	22.4	0.0
23.50	0.632	0.991	0.644	0.990	1.000	1.000	22.2	0.0	23.0	0.0

JPL RECT FEED DIAG FED 8.20 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 15
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.013	0.013	0.997	1.000	1.000	1.000	0.1	0.0	0.2	0.0
1.50	0.028	0.028	0.999	1.000	1.000	1.000	0.2	0.0	0.3	0.0
2.00	0.050	0.050	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.50	0.077	0.077	0.999	1.000	1.000	1.000	0.3	0.0	0.4	0.0
3.00	0.110	0.110	0.999	1.000	1.000	1.000	0.4	0.0	0.5	0.0
3.50	0.147	0.147	0.999	1.000	1.000	1.000	0.6	0.0	0.8	0.0
4.00	0.187	0.187	0.999	1.000	1.000	1.000	0.9	0.0	1.1	0.0
4.50	0.230	0.230	0.998	1.000	1.000	1.000	1.1	0.0	1.3	0.0
5.00	0.275	0.276	0.997	1.000	1.000	1.000	1.3	0.0	1.6	0.0
5.50	0.322	0.323	0.996	1.000	1.000	1.000	1.6	0.0	1.9	0.0
6.00	0.370	0.372	0.995	1.000	1.000	1.000	1.8	0.0	2.2	0.0
6.50	0.418	0.421	0.994	1.000	1.000	1.000	2.2	0.0	2.6	0.0
7.00	0.464	0.469	0.991	1.000	1.000	1.000	2.6	0.0	3.1	0.0
7.50	0.509	0.515	0.988	1.000	1.000	1.000	3.0	0.0	3.5	0.0
8.00	0.552	0.560	0.985	1.000	1.000	1.000	3.5	0.0	3.9	0.0
8.50	0.593	0.604	0.981	1.000	1.000	1.000	3.9	0.0	4.4	0.0
9.00	0.631	0.646	0.977	1.000	1.000	1.000	4.3	0.0	4.8	0.0
9.50	0.666	0.686	0.972	1.000	1.000	1.000	4.9	0.0	5.4	0.0
10.00	0.696	0.722	0.965	1.000	1.000	1.000	5.5	0.0	6.0	0.0
10.50	0.723	0.755	0.958	1.000	1.000	1.000	6.0	0.0	6.6	0.0
11.00	0.745	0.785	0.950	0.999	1.000	1.000	6.6	0.0	7.3	0.0
11.50	0.764	0.813	0.940	0.999	1.000	1.000	7.2	0.0	7.9	0.0
12.00	0.779	0.838	0.931	0.999	1.000	1.000	7.8	0.0	8.5	0.0
12.50	0.791	0.860	0.919	0.999	1.000	1.000	8.6	0.0	9.3	0.0
13.00	0.797	0.880	0.907	0.999	1.000	1.000	9.4	0.0	10.1	0.0
13.50	0.800	0.896	0.893	0.999	1.000	1.000	10.1	0.0	10.9	0.0
14.00	0.800	0.911	0.879	0.999	1.000	1.000	10.9	0.0	11.7	0.0
14.50	0.796	0.923	0.863	0.999	1.000	1.000	11.7	0.0	12.5	0.0
15.00	0.790	0.934	0.847	0.999	1.000	1.000	12.5	0.0	13.3	0.0
15.50	0.782	0.943	0.830	0.999	1.000	1.000	13.3	0.0	14.0	0.0
16.00	0.772	0.951	0.812	0.999	1.000	1.000	14.1	0.0	14.8	0.0
16.50	0.760	0.958	0.794	0.999	1.000	1.000	14.9	0.0	15.5	0.0
17.00	0.747	0.964	0.776	0.999	1.000	1.000	15.8	0.0	16.3	0.0
17.50	0.734	0.969	0.757	0.999	1.000	1.000	16.6	0.0	17.0	0.0
18.00	0.719	0.973	0.739	0.999	1.000	1.000	17.4	0.0	17.8	0.0
18.50	0.703	0.977	0.720	0.999	1.000	1.000	18.3	0.0	18.6	0.0
19.00	0.687	0.980	0.702	0.999	1.000	1.000	19.3	0.0	19.4	0.0
19.50	0.671	0.983	0.683	0.999	1.000	1.000	20.2	0.0	20.2	0.0
20.00	0.654	0.985	0.664	0.999	1.000	1.000	21.1	0.0	21.0	0.0
20.50	0.637	0.987	0.646	0.999	1.000	1.000	22.1	0.0	21.8	0.0
21.00	0.620	0.988	0.627	0.999	1.000	1.000	23.0	0.0	22.6	0.0
21.50	0.603	0.990	0.609	0.999	1.000	1.000	23.8	0.0	23.4	0.0
22.00	0.586	0.991	0.591	0.999	1.000	1.000	24.7	0.0	24.2	0.0
22.50	0.569	0.992	0.574	0.999	1.000	1.000	25.5	0.0	25.0	0.0
23.00	0.553	0.993	0.557	0.999	1.000	1.000	26.4	0.0	25.8	0.0
23.50	0.536	0.993	0.540	0.999	1.000	1.000	27.2	0.0	26.6	0.0

JPL RECT FEED DIAG FED 8.40 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 14
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.014	0.014	0.997	1.000	1.000	1.000	0.2	0.0	0.2	0.0
1.50	0.030	0.030	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.00	0.053	0.053	0.999	1.000	1.000	1.000	0.3	0.0	0.4	0.0
2.50	0.082	0.082	0.999	1.000	1.000	1.000	0.4	0.0	0.5	0.0
3.00	0.116	0.116	0.999	1.000	1.000	1.000	0.5	0.0	0.6	0.0
3.50	0.155	0.155	0.999	1.000	1.000	1.000	0.7	0.0	0.9	0.0
4.00	0.196	0.197	0.999	1.000	1.000	1.000	1.0	0.0	1.2	0.0
4.50	0.241	0.241	0.998	1.000	1.000	1.000	1.2	0.0	1.5	0.0
5.00	0.287	0.288	0.997	1.000	1.000	1.000	1.5	0.0	1.9	0.0
5.50	0.334	0.336	0.996	1.000	1.000	1.000	1.7	0.0	2.2	0.0
6.00	0.383	0.385	0.994	1.000	1.000	1.000	2.0	0.0	2.5	0.0
6.50	0.432	0.435	0.992	1.000	1.000	1.000	2.4	0.0	3.0	0.0
7.00	0.478	0.483	0.990	1.000	1.000	1.000	2.8	0.0	3.5	0.0
7.50	0.523	0.530	0.987	0.999	1.000	1.000	3.2	0.0	3.9	0.0
8.00	0.565	0.576	0.983	0.999	1.000	1.000	3.6	0.0	4.4	0.0
8.50	0.606	0.619	0.978	0.999	1.000	1.000	4.0	0.0	4.9	0.0
9.00	0.643	0.661	0.974	0.999	1.000	1.000	4.4	0.0	5.4	0.0
9.50	0.677	0.700	0.968	0.999	1.000	1.000	4.9	0.0	6.1	0.0
10.00	0.707	0.737	0.962	0.999	1.000	1.000	5.5	0.0	6.7	0.0
10.50	0.733	0.770	0.954	0.999	1.000	1.000	6.0	0.0	7.3	0.0
11.00	0.755	0.800	0.945	0.998	1.000	1.000	6.6	0.0	8.0	0.0
11.50	0.773	0.827	0.936	0.998	1.000	1.000	7.1	0.0	8.6	0.0
12.00	0.788	0.853	0.926	0.998	1.000	1.000	7.7	0.0	9.3	0.0
12.50	0.798	0.875	0.915	0.998	1.000	1.000	8.5	0.0	10.2	0.0
13.00	0.804	0.894	0.902	0.998	1.000	1.000	9.4	0.0	11.1	0.0
13.50	0.805	0.910	0.887	0.998	1.000	1.000	10.2	0.0	12.0	0.0
14.00	0.802	0.923	0.871	0.997	1.000	1.000	11.1	0.0	13.0	0.0
14.50	0.796	0.935	0.854	0.997	1.000	1.000	11.9	0.0	13.9	0.0
15.00	0.787	0.944	0.836	0.997	1.000	1.000	12.8	0.0	14.8	0.0
15.50	0.776	0.953	0.817	0.997	1.000	1.000	13.6	0.0	15.6	0.0
16.00	0.764	0.960	0.799	0.997	1.000	1.000	14.5	0.0	16.4	0.0
16.50	0.750	0.966	0.779	0.997	1.000	1.000	15.3	0.0	17.1	0.0
17.00	0.735	0.971	0.760	0.997	1.000	1.000	16.2	0.0	17.9	0.0
17.50	0.720	0.975	0.740	0.997	1.000	1.000	17.0	0.0	18.7	0.0
18.00	0.703	0.979	0.721	0.997	1.000	1.000	17.9	0.0	19.5	0.0
18.50	0.686	0.982	0.701	0.997	1.000	1.000	19.1	0.0	20.2	0.0
19.00	0.669	0.984	0.682	0.997	1.000	1.000	20.2	0.0	20.9	0.0
19.50	0.651	0.986	0.662	0.997	1.000	1.000	21.4	0.0	21.5	0.0
20.00	0.633	0.988	0.643	0.997	1.000	1.000	22.6	0.0	22.2	0.0
20.50	0.615	0.990	0.624	0.997	1.000	1.000	23.7	0.0	22.9	0.0
21.00	0.597	0.991	0.605	0.997	1.000	1.000	24.9	0.0	23.6	0.0
21.50	0.580	0.992	0.586	0.997	1.000	1.000	26.3	0.0	24.2	0.0
22.00	0.562	0.993	0.568	0.997	1.000	1.000	27.6	0.0	24.8	0.0
22.50	0.545	0.993	0.550	0.997	1.000	1.000	29.0	0.0	25.4	0.0
23.00	0.528	0.994	0.533	0.997	1.000	1.000	30.4	0.0	26.1	0.0
23.50	0.511	0.994	0.516	0.997	1.000	1.000	31.7	0.0	26.7	0.0

JPL RECT FEED DIAG FED 8.556 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 15
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.003	0.003	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.013	0.013	0.997	1.000	1.000	1.000	0.2	0.0	0.2	0.0
1.50	0.030	0.030	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.00	0.052	0.052	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.50	0.080	0.080	0.999	1.000	1.000	1.000	0.4	0.0	0.4	0.0
3.00	0.114	0.114	0.999	1.000	1.000	1.000	0.5	0.0	0.5	0.0
3.50	0.152	0.152	0.999	1.000	1.000	1.000	0.7	0.0	0.8	0.0
4.00	0.193	0.193	0.999	1.000	1.000	1.000	1.0	0.0	1.1	0.0
4.50	0.237	0.237	0.998	1.000	1.000	1.000	1.2	0.0	1.4	0.0
5.00	0.282	0.283	0.997	1.000	1.000	1.000	1.5	0.0	1.8	0.0
5.50	0.329	0.331	0.996	1.000	1.000	1.000	1.7	0.0	2.1	0.0
6.00	0.377	0.380	0.994	1.000	1.000	1.000	2.0	0.0	2.4	0.0
6.50	0.425	0.428	0.992	1.000	1.000	1.000	2.4	0.0	2.9	0.0
7.00	0.471	0.476	0.990	1.000	1.000	1.000	2.9	0.0	3.4	0.0
7.50	0.516	0.523	0.987	1.000	1.000	1.000	3.1	0.0	3.8	0.0
8.00	0.558	0.568	0.983	1.000	1.000	1.000	3.5	0.0	4.3	0.0
8.50	0.598	0.611	0.979	0.999	1.000	1.000	3.9	0.0	4.8	0.0
9.00	0.636	0.653	0.974	0.999	1.000	1.000	4.3	0.0	5.3	0.0
9.50	0.670	0.692	0.969	0.999	1.000	1.000	4.9	0.0	6.0	0.0
10.00	0.699	0.727	0.962	0.999	1.000	1.000	5.4	0.0	6.7	0.0
10.50	0.724	0.760	0.954	0.999	1.000	1.000	6.0	0.0	7.4	0.0
11.00	0.745	0.789	0.945	0.998	1.000	1.000	6.6	0.0	8.1	0.0
11.50	0.762	0.816	0.936	0.998	1.000	1.000	7.1	0.0	8.8	0.0
12.00	0.776	0.840	0.925	0.998	1.000	1.000	7.7	0.0	9.5	0.0
12.50	0.785	0.862	0.913	0.998	1.000	1.000	8.4	0.0	10.4	0.0
13.00	0.791	0.880	0.900	0.998	1.000	1.000	9.1	0.0	11.3	0.0
13.50	0.793	0.897	0.886	0.997	1.000	1.000	9.7	0.0	12.1	0.0
14.00	0.791	0.911	0.871	0.997	1.000	1.000	10.4	0.0	13.0	0.0
14.50	0.788	0.923	0.856	0.997	1.000	1.000	11.1	0.0	13.9	0.0
15.00	0.781	0.934	0.839	0.996	1.000	1.000	11.8	0.0	14.8	0.0
15.50	0.773	0.943	0.822	0.996	1.000	1.000	12.6	0.0	15.6	0.0
16.00	0.763	0.951	0.805	0.996	1.000	1.000	13.4	0.0	16.4	0.0
16.50	0.751	0.958	0.787	0.996	1.000	1.000	14.1	0.0	17.2	0.0
17.00	0.738	0.964	0.769	0.996	1.000	1.000	14.9	0.0	18.0	0.0
17.50	0.724	0.969	0.751	0.996	1.000	1.000	15.7	0.0	18.8	0.0
18.00	0.710	0.974	0.732	0.995	1.000	1.000	16.5	0.0	19.6	0.0
18.50	0.694	0.977	0.714	0.995	1.000	1.000	17.5	0.0	20.3	0.0
19.00	0.678	0.981	0.695	0.995	1.000	1.000	18.5	0.0	20.9	0.0
19.50	0.662	0.983	0.676	0.995	1.000	1.000	19.4	0.0	21.6	0.0
20.00	0.645	0.985	0.658	0.995	1.000	1.000	20.4	0.0	22.3	0.0
20.50	0.628	0.987	0.640	0.995	1.000	1.000	21.4	0.0	22.9	0.0
21.00	0.612	0.989	0.622	0.995	1.000	1.000	22.4	0.0	23.6	0.0
21.50	0.595	0.990	0.604	0.995	1.000	1.000	23.4	0.0	24.3	0.0
22.00	0.578	0.991	0.586	0.995	1.000	1.000	24.5	0.0	25.0	0.0
22.50	0.561	0.992	0.569	0.995	1.000	1.000	25.5	0.0	25.7	0.0
23.00	0.545	0.993	0.552	0.995	1.000	1.000	26.6	0.0	26.4	0.0
23.50	0.529	0.993	0.535	0.995	1.000	1.000	27.6	0.0	27.1	0.0

JPL RECT FEED DIAG FED 8.80 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 16
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.004	0.004	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.016	0.016	0.997	1.000	1.000	1.000	0.2	0.0	0.2	0.0
1.50	0.035	0.035	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.00	0.061	0.061	0.999	1.000	1.000	1.000	0.5	0.0	0.4	0.0
2.50	0.094	0.094	0.999	1.000	1.000	1.000	0.6	0.0	0.5	0.0
3.00	0.133	0.133	0.999	1.000	1.000	1.000	0.7	0.0	0.6	0.0
3.50	0.177	0.177	0.999	1.000	1.000	1.000	1.1	0.0	0.9	0.0
4.00	0.223	0.224	0.998	1.000	1.000	1.000	1.5	0.0	1.3	0.0
4.50	0.272	0.272	0.997	1.000	1.000	1.000	1.8	0.0	1.6	0.0
5.00	0.321	0.322	0.995	1.000	1.000	1.000	2.2	0.0	1.9	0.0
5.50	0.371	0.373	0.993	1.000	1.000	1.000	2.6	0.0	2.3	0.0
6.00	0.421	0.425	0.991	1.000	1.000	1.000	3.0	0.0	2.6	0.0
6.50	0.469	0.475	0.988	1.000	1.000	1.000	3.6	0.0	3.1	0.0
7.00	0.514	0.522	0.984	1.000	1.000	1.000	4.3	0.0	3.6	0.0
7.50	0.554	0.567	0.978	1.000	1.000	1.000	4.9	0.0	4.1	0.0
8.00	0.591	0.609	0.972	0.999	1.000	1.000	5.6	0.0	4.7	0.0
8.50	0.624	0.647	0.965	0.999	1.000	1.000	6.2	0.0	5.2	0.0
9.00	0.654	0.683	0.957	0.999	1.000	1.000	6.9	0.0	5.7	0.0
9.50	0.678	0.716	0.948	0.999	1.000	1.000	7.7	0.0	6.4	0.0
10.00	0.698	0.745	0.938	0.999	1.000	1.000	8.5	0.0	7.1	0.0
10.50	0.713	0.771	0.926	0.999	1.000	1.000	9.3	0.0	7.8	0.0
11.00	0.723	0.793	0.913	0.998	1.000	1.000	10.1	0.0	8.6	0.0
11.50	0.730	0.813	0.899	0.998	1.000	1.000	10.9	0.0	9.3	0.0
12.00	0.733	0.831	0.884	0.998	1.000	1.000	11.7	0.0	10.0	0.0
12.50	0.733	0.846	0.868	0.998	1.000	1.000	12.3	0.0	10.9	0.0
13.00	0.730	0.859	0.851	0.998	1.000	1.000	13.0	0.0	11.9	0.0
13.50	0.724	0.870	0.834	0.998	1.000	1.000	13.6	0.0	12.8	0.0
14.00	0.716	0.880	0.816	0.998	1.000	1.000	14.3	0.0	13.8	0.0
14.50	0.707	0.888	0.798	0.998	1.000	1.000	14.9	0.0	14.7	0.0
15.00	0.696	0.895	0.779	0.998	1.000	1.000	15.6	0.0	15.7	0.0
15.50	0.685	0.902	0.761	0.998	1.000	1.000	15.6	0.0	15.7	0.0
16.00	0.676	0.909	0.745	0.998	1.000	1.000	15.6	0.0	15.7	0.0
16.50	0.669	0.916	0.732	0.998	1.000	1.000	15.6	0.0	15.7	0.0
17.00	0.663	0.923	0.719	0.998	1.000	1.000	15.6	0.0	15.7	0.0
17.50	0.658	0.931	0.708	0.998	1.000	1.000	15.6	0.0	15.7	0.0
18.00	0.655	0.939	0.699	0.998	1.000	1.000	15.6	0.0	15.7	0.0
18.50	0.653	0.947	0.691	0.998	1.000	1.000	15.6	0.0	15.7	0.0
19.00	0.651	0.955	0.683	0.998	1.000	1.000	15.6	0.0	15.7	0.0
19.50	0.651	0.963	0.677	0.998	1.000	1.000	15.6	0.0	15.7	0.0
20.00	0.651	0.972	0.671	0.998	1.000	1.000	15.6	0.0	15.7	0.0
20.50	0.652	0.981	0.666	0.998	1.000	1.000	15.6	0.0	15.7	0.0
21.00	0.644	0.986	0.655	0.998	1.000	1.000	20.4	0.0	27.3	0.0
21.50	0.626	0.987	0.636	0.998	1.000	1.000	22.9	0.0	28.6	0.0
22.00	0.607	0.988	0.616	0.998	1.000	1.000	25.4	0.0	29.9	0.0
22.50	0.587	0.988	0.595	0.998	1.000	1.000	27.9	0.0	31.1	0.0
23.00	0.567	0.989	0.575	0.998	1.000	1.000	30.5	0.0	32.4	0.0
23.50	0.547	0.989	0.554	0.998	1.000	1.000	33.0	0.0	33.7	0.0

JPL RECT FEED DIAG FED 9.00 GHZ

INPUT DATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 15
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.005	0.005	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.018	0.018	0.997	1.000	1.000	1.000	0.2	0.0	0.2	0.0
1.50	0.041	0.041	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.00	0.072	0.072	0.999	1.000	1.000	1.000	0.4	0.0	0.4	0.0
2.50	0.110	0.110	0.999	1.000	1.000	1.000	0.5	0.0	0.5	0.0
3.00	0.156	0.156	0.999	1.000	1.000	1.000	0.6	0.0	0.6	0.0
3.50	0.208	0.208	0.999	1.000	1.000	1.000	1.0	0.0	0.9	0.0
4.00	0.262	0.262	0.998	1.000	1.000	1.000	1.4	0.0	1.3	0.0
4.50	0.318	0.319	0.997	1.000	1.000	1.000	1.8	0.0	1.6	0.0
5.00	0.375	0.377	0.995	1.000	1.000	1.000	2.2	0.0	2.0	0.0
5.50	0.433	0.436	0.993	1.000	1.000	1.000	2.6	0.0	2.3	0.0
6.00	0.491	0.495	0.990	1.000	1.000	1.000	3.0	0.0	2.7	0.0
6.50	0.546	0.553	0.987	1.000	1.000	1.000	3.7	0.0	3.2	0.0
7.00	0.596	0.607	0.982	1.000	1.000	1.000	4.4	0.0	3.8	0.0
7.50	0.641	0.657	0.976	1.000	1.000	1.000	5.1	0.0	4.3	0.0
8.00	0.681	0.703	0.969	1.000	1.000	1.000	5.8	0.0	4.9	0.0
8.50	0.717	0.746	0.961	0.999	1.000	1.000	6.5	0.0	5.4	0.0
9.00	0.747	0.785	0.953	0.999	1.000	1.000	7.2	0.0	6.0	0.0
9.50	0.771	0.820	0.942	0.999	1.000	1.000	8.3	0.0	6.9	0.0
10.00	0.787	0.849	0.929	0.999	1.000	1.000	9.4	0.0	7.8	0.0
10.50	0.796	0.873	0.913	0.999	1.000	1.000	10.5	0.0	8.7	0.0
11.00	0.799	0.894	0.896	0.998	1.000	1.000	11.6	0.0	9.6	0.0
11.50	0.797	0.911	0.877	0.998	1.000	1.000	12.7	0.0	10.5	0.0
12.00	0.791	0.925	0.857	0.998	1.000	1.000	13.8	0.0	11.4	0.0
12.50	0.780	0.936	0.835	0.998	1.000	1.000	15.5	0.0	12.4	0.0
13.00	0.764	0.945	0.811	0.997	1.000	1.000	17.3	0.0	13.5	0.0
13.50	0.746	0.952	0.786	0.997	1.000	1.000	19.0	0.0	14.5	0.0
14.00	0.725	0.958	0.759	0.997	1.000	1.000	20.7	0.0	15.6	0.0
14.50	0.702	0.962	0.733	0.996	1.000	1.000	22.5	0.0	16.6	0.0
15.00	0.679	0.965	0.706	0.996	1.000	1.000	24.2	0.0	17.7	0.0
15.50	0.655	0.968	0.680	0.996	1.000	1.000	24.9	0.0	18.9	0.0
16.00	0.631	0.970	0.654	0.995	1.000	1.000	25.6	0.0	20.0	0.0
16.50	0.608	0.972	0.629	0.995	1.000	1.000	26.3	0.0	21.2	0.0
17.00	0.586	0.973	0.605	0.995	1.000	1.000	27.0	0.0	22.4	0.0
17.50	0.564	0.974	0.582	0.995	1.000	1.000	27.7	0.0	23.5	0.0
18.00	0.543	0.975	0.559	0.995	1.000	1.000	28.4	0.0	24.7	0.0
18.50	0.522	0.976	0.538	0.995	1.000	1.000	27.9	0.0	25.8	0.0
19.00	0.503	0.976	0.518	0.995	1.000	1.000	27.5	0.0	27.0	0.0
19.50	0.485	0.977	0.499	0.995	1.000	1.000	27.0	0.0	28.1	0.0
20.00	0.469	0.978	0.482	0.995	1.000	1.000	26.6	0.0	29.2	0.0
20.50	0.453	0.978	0.465	0.995	1.000	1.000	26.1	0.0	30.4	0.0
21.00	0.438	0.979	0.450	0.995	1.000	1.000	25.7	0.0	31.5	0.0
21.50	0.425	0.980	0.436	0.995	1.000	1.000	25.7	0.0	31.6	0.0
22.00	0.412	0.980	0.422	0.995	1.000	1.000	25.6	0.0	31.7	0.0
22.50	0.400	0.981	0.410	0.995	1.000	1.000	25.6	0.0	31.8	0.0
23.00	0.389	0.982	0.398	0.995	1.000	1.000	25.6	0.0	31.9	0.0
23.50	0.379	0.983	0.388	0.995	1.000	1.000	25.5	0.0	32.0	0.0

JPL RECT FFED DIAG FED 9.27 GHZ

INPUT CATA AND CONTROLS FOR MAIN

THETA INCREMENT= 0.50000
END VALUE OF THETA= 90.00000
SIGN OF INPUT DATA= -1.00000
BLOCKAGE= 0.0
NUMBER OF INPUT VALUES READ IN OR CALC= 15
IC1= 1 IC2= 2 IC3= 1 IC4= 1

ANTENNA FEED EFFICIENCY

PSI	ETA	ETS	ETI	ETX	ETP	ETB	E	EP	H	HP
0.50	0.005	0.005	0.991	1.000	1.000	1.000	0.1	0.0	0.1	0.0
1.00	0.018	0.018	0.997	1.000	1.000	1.000	0.2	0.0	0.2	0.0
1.50	0.040	0.041	0.999	1.000	1.000	1.000	0.3	0.0	0.3	0.0
2.00	0.071	0.071	0.999	1.000	1.000	1.000	0.3	0.0	0.5	0.0
2.50	0.109	0.109	0.999	1.000	1.000	1.000	0.4	0.0	0.6	0.0
3.00	0.155	0.155	0.999	1.000	1.000	1.000	0.5	0.0	0.7	0.0
3.50	0.206	0.206	0.999	1.000	1.000	1.000	0.9	0.0	1.1	0.0
4.00	0.260	0.260	0.998	1.000	1.000	1.000	1.2	0.0	1.5	0.0
4.50	0.315	0.316	0.997	1.000	1.000	1.000	1.6	0.0	1.8	0.0
5.00	0.372	0.374	0.995	1.000	1.000	1.000	2.0	0.0	2.2	0.0
5.50	0.429	0.433	0.993	1.000	1.000	1.000	2.3	0.0	2.6	0.0
6.00	0.486	0.491	0.990	1.000	1.000	1.000	2.7	0.0	3.0	0.0
6.50	0.541	0.548	0.987	1.000	1.000	1.000	3.3	0.0	3.6	0.0
7.00	0.591	0.601	0.982	1.000	1.000	1.000	3.9	0.0	4.3	0.0
7.50	0.635	0.651	0.976	1.000	1.000	1.000	4.5	0.0	4.9	0.0
8.00	0.675	0.697	0.969	1.000	1.000	1.000	5.1	0.0	5.6	0.0
8.50	0.710	0.739	0.961	1.000	1.000	1.000	5.7	0.0	6.2	0.0
9.00	0.740	0.778	0.952	1.000	1.000	1.000	6.3	0.0	6.9	0.0
9.50	0.765	0.812	0.942	1.000	1.000	1.000	7.3	0.0	7.8	0.0
10.00	0.781	0.841	0.929	1.000	1.000	1.000	8.2	0.0	8.7	0.0
10.50	0.791	0.866	0.914	1.000	1.000	1.000	9.2	0.0	9.6	0.0
11.00	0.796	0.887	0.898	1.000	1.000	1.000	10.2	0.0	10.5	0.0
11.50	0.795	0.904	0.880	1.000	1.000	1.000	11.1	0.0	11.4	0.0
12.00	0.791	0.919	0.861	1.000	1.000	1.000	12.1	0.0	12.3	0.0
12.50	0.782	0.931	0.840	1.000	1.000	1.000	13.5	0.0	13.4	0.0
13.00	0.768	0.940	0.817	1.000	1.000	1.000	14.9	0.0	14.5	0.0
13.50	0.751	0.948	0.793	1.000	1.000	1.000	16.3	0.0	15.6	0.0
14.00	0.732	0.953	0.768	1.000	1.000	1.000	17.8	0.0	16.8	0.0
14.50	0.711	0.958	0.742	1.000	1.000	1.000	19.2	0.0	17.9	0.0
15.00	0.688	0.961	0.716	1.000	1.000	1.000	20.6	0.0	19.0	0.0
15.50	0.665	0.964	0.690	1.000	1.000	1.000	22.3	0.0	19.7	0.0
16.00	0.642	0.966	0.665	0.999	1.000	1.000	24.0	0.0	20.5	0.0
16.50	0.618	0.968	0.639	0.999	1.000	1.000	25.7	0.0	21.2	0.0
17.00	0.596	0.969	0.615	0.999	1.000	1.000	27.5	0.0	22.0	0.0
17.50	0.573	0.970	0.591	0.999	1.000	1.000	29.2	0.0	22.7	0.0
18.00	0.551	0.971	0.568	0.999	1.000	1.000	30.9	0.0	23.5	0.0
18.50	0.531	0.972	0.547	0.999	1.000	1.000	30.3	0.0	23.7	0.0
19.00	0.512	0.973	0.527	0.999	1.000	1.000	29.8	0.0	23.9	0.0
19.50	0.495	0.974	0.509	0.999	1.000	1.000	29.2	0.0	24.1	0.0
20.00	0.479	0.975	0.492	0.999	1.000	1.000	28.7	0.0	24.4	0.0
20.50	0.464	0.976	0.477	0.999	1.000	1.000	28.1	0.0	24.6	0.0
21.00	0.451	0.977	0.462	0.999	1.000	1.000	27.6	0.0	24.8	0.0
21.50	0.439	0.978	0.449	0.999	1.000	1.000	27.3	0.0	25.0	0.0
22.00	0.427	0.979	0.437	0.999	1.000	1.000	27.0	0.0	25.2	0.0
22.50	0.417	0.980	0.426	0.999	1.000	1.000	26.6	0.0	25.3	0.0
23.00	0.407	0.981	0.416	0.999	1.000	1.000	26.3	0.0	25.5	0.0
23.50	0.398	0.982	0.406	0.999	1.000	1.000	26.0	0.0	25.7	0.0