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WILLOUGHBY & VOSS

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FCC FORM 302, SECTIONS III

**SECTION III - LICENSE APPLICATION ENGINEERING DATA**

Name of Applicant  
ABC, Inc.

PURPOSE OF AUTHORIZATION APPLIED FOR: (check one)

- Station License                       Direct Measurement of Power

**1. Facilities authorized in construction permit**

Call Sign	File No. of Construction Permit (if applicable)	Frequency (kHz)	Hours of Operation	Power in kilowatts	
				Night	Day
KMIC	DNA	1590	Unlimited	5.00	5.00

**2. Station location**

State <span style="margin-left: 100px;">Texas</span>	City or Town <span style="margin-left: 100px;">Houston</span>
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**3. Transmitter location**

State <span style="margin-left: 40px;">Texas</span>	County <span style="margin-left: 40px;">Harris</span>	City or Town <span style="margin-left: 40px;">Houston</span>	Street address (or other identification) <span style="margin-left: 40px;">4210 Creekmont Rd.</span>
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**4. Main studio location**

State <span style="margin-left: 40px;">Texas</span>	County <span style="margin-left: 40px;">Harris</span>	City or Town <span style="margin-left: 40px;">Houston</span>	Street address (or other identification) <span style="margin-left: 40px;">3050 Post Oak Rd.</span>
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**5. Remote control point location (specify only if authorized directional antenna)**

State <span style="margin-left: 40px;">Texas</span>	County <span style="margin-left: 40px;">Harris</span>	City or Town <span style="margin-left: 40px;">Houston</span>	Street address (or other identification) <span style="margin-left: 40px;">3050 Post Oak Rd.</span>
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6. Has type-approved stereo generating equipment been installed?                       Yes       No

7. Does the sampling system meet the requirements of 47 C.F.R. Section 73.68?                       Yes       No

Not Applicable

Attach as an Exhibit a detailed description of the sampling system as installed.

Exhibit No. A-1, #8
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**8. Operating constants:**

RF common point or antenna current (in amperes) without modulation for night system <span style="margin-left: 100px;">10.40</span>	RF common point or antenna current (in amperes) without modulation for day system <span style="margin-left: 100px;">7.10</span>
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Measured antenna or common point resistance (in ohms) at operating frequency Night <span style="margin-left: 100px;">50.0</span> Day <span style="margin-left: 100px;">100.0</span>	Measured antenna or common point reactance (in ohms) at operating frequency Night <span style="margin-left: 100px;">-j5.0 *</span> Day <span style="margin-left: 100px;">+j206.5</span>
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**Antenna indications for directional operation**

Towers	Antenna monitor Phase reading(s) in degrees		Antenna monitor sample current ratio(s)		Antenna base currents	
	Night	Day	Night	Day	Night	Day
	1 (NE)	0.0	0.0	100.0	100.0	4.40
2 (SE)	-8.0	---	111.5	---	4.80	---
3 (NW)	+92.0	---	90.0	---	3.98	---
4 (SW)	+105.0	---	106.0	---	4.60	---

Manufacturer and type of antenna monitor: Potomac Instruments AM-19D

\* small amount of capacitive reactance to eliminate the reflected power as seen at the transmitter output terminal. FCC 302-AM (Page 4)  
August 1995

9. Description of antenna system (If directional antenna is used, the information requested below should be given for each element of the array. Use separate sheets if necessary.)

Type Radiator	Overall height in meters of radiator above base insulator, or above base, if grounded.	Overall height in meters above ground (without obstruction lighting)	Overall height in meters above ground (include obstruction lighting)	If antenna is either top loaded or sectionalized, describe fully in an Exhibit.
4- vertical guyed, steel, uniform x-sect towers.	56.4	57.3	unlighted 57.3	Exhibit No. DNA

Excitation  Series  Shunt

Geographic coordinates to nearest second. For directional antenna give coordinates of center of array. For single vertical radiator give tower location.

North Latitude	29 °	50 '	38.5 "	West Longitude	95 °	26 '	51 "
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If not fully described above, attach as an Exhibit further details and dimensions including any other antenna mounted on tower and associated isolation circuits.

Exhibit No.  
A-1, #9

Also, if necessary for a complete description, attach as an Exhibit a sketch of the details and dimensions of ground system.

Exhibit No.  
A-1, #7

10. In what respect, if any, does the apparatus constructed differ from that described in the application for construction permit or in the permit?

Does not apply.

11. Give reasons for the change in antenna or common point resistance.

1. Replacement of the ground system.
2. Installation of detuning networks on the unused towers during non-directional operation.

I certify that I represent the applicant in the capacity indicated below and that I have examined the foregoing statement of technical information and that it is true to the best of my knowledge and belief.

Name (Please Print or Type) Lyndon H. Willoughby	Signature (check appropriate box below) <i>Lyndon H. Willoughby</i>
Address (include ZIP Code) Willoughby & Voss P.O. Box 701190 San Antonio, TX 78270-1190	Date February 29, 2000
	Telephone No. (Include Area Code) 210-525-1111

Technical Director

Registered Professional Engineer

Chief Operator

Technical Consultant

Other (specify)

TECHNICAL STATEMENT

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## WILLOUGHBY & VOSS

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TECHNICAL STATEMENT IN SUPPORT OF  
KMIC(AM) RADIO, 1590 kHz, 5.0 kW, DA-N  
HOUSTON, TEXAS  
FULL PROOF OF PERFORMANCE  
FEBRUARY, 2000

### INTRODUCTION

The firm of Willoughby & Voss has been retained by ABC, Inc., to prepare this statement, on behalf of AM station KMIC, Houston, Texas. This statement and the attached exhibits, constitute an Antenna Full Proof of Performance in support of authority for Direct Measurement of Power.

Normally the antenna system rehabilitation undertaken by KMIC requires the filing of a Partial Proof of Performance but, inasmuch as, the last Full Proof of Performance was completed twenty-six years ago in 1973 and due to the urbanization of the entire area surrounding the KMIC antenna site, it was determined that a Full Proof of Performance was in order.

### FACILITIES

The instant filing is in response to a rehabilitation of the KMIC 1590 kHz facility. Under a previous licensee, the site had become overgrown with brush and trees (some 12 inches in diameter), the sample system was in question, as was the ground system.

ABC, Inc., replaced all tower guy wires and guy anchors. New transmission lines and sample lines were installed. The old ground system was pulled out and a completely new ground system was installed. The towers were painted, new tower base fences were constructed and new series-parallel resonant detuning networks were installed on the unused towers during non-directional operation. In addition, a new solid-state transmitter was installed.

KMIC RADIO  
TECHNICAL STATEMENT

Approximately 0.5 mile from the KMIC array is the Trico Communications Tower. This tower supports numerous cellphone, PCS, and communication antennae. The tower is approximately 350 feet tall (near a half-wave @ 1590 kHz), it is base insulated and the guy wires are broken up by insulators. This tower was erected in the late 1980's and was the subject of numerous detuning schemes. The present configuration includes upper and lower sets of outrigged skirts with a motor-driven detuning network located at the top of each set of skirt wires. A sampling point and the motor controls are located in a small building at the base of the tower.

As part of this rehabilitation project, the detuning condition of this tower was determined. The skirt wires were sheathed with insulation tubes where potential for contact with antenna support hardware existed. And the detuning system was adjusted to minimize re-radiation.

The antenna system was tuned to comply with the requirements of the KMIC Augmented Standard Pattern. Since this tuning resulted in slightly different parameters, it is requested that an FCC Form 352 (Standard Broadcast Station License) be issued to specify these new operating parameters.

#### FIELD STRENGTH MEASUREMENTS

While the KMIC system was operating in the non-directional mode (Tower #1) the antenna base impedance was measured as described in Exhibit F.

Based on the measured antenna resistance (100.0 $\Omega$ ), the proper antenna base current for 5.0 kW, was calculated and set at 7.10 amperes. This current was maintained while non-directional field strength measurements were made at appropriate intervals between the distances of 0.0 and 40 kilometers. The nighttime directional common point impedance was measured in accordance with the methods described in Exhibit F.

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## WILLOUGHBY & VOSS

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The directional common point current was calculated and set at 10.4 amperes. This common point current was maintained while field strength measurements were made along the same radials, at the same locations (beyond 3.2 kilometers) which were measured in the Non-D mode.

Analysis of the data was conducted using logarithmic ratios of the directional readings divided by the Non-D reading on a point to point basis, then multiplying the anti-log of the radial average log ratio by the analyzed non-directional inverse distance field (IDF) to establish the directional IDF.

It is believed that study of the attached data will show that the KMIC directional antenna is operating within its authorized Augmented Standard Pattern.

A summary page immediately proceeds the individual radial tabulations. This summary page shows the ND-IDF, the Anti-Log of DA-Average log Ratio, the 2000 DA-Night IDF and the Augmented Standard Pattern Maximum IDF.

All measurements were made by the undersigned, Brian Andrews, Wayne Shuffet and James Schroder, each using a Potomac Instruments model FIM-41 meter. The KMIC meter Ser.#1661 was factory calibrated 1-28-98, meter #463 was factory calibrated 2-25-98 and meter #2019 was factory calibrated 8-30-99.

All meters were compared prior to the commencement of measuring and all three meters read identical signal strengths.

### FIELD STRENGTH ANAMOLIES

It will be noted that some of the measurements are above the inverse distance field line and there is noticable "scatter" in the plotted data. There are numerous communications/PCS/cell towers within the KMIC measurements area. The urbanization has resulted in powerlines that virtually blanket the entire measurement area.

KMIC RADIO  
TECHNICAL STATEMENT

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Re-radiation from some of the communications towers was documented, however as demonstrated, the array has been successfully adjusted without detuning treatment of the offending towers. It is believed that some of the anomalous data is the result of these towers and the powerlines.

Since the re-radiation is somewhat localized about the offending structures, detuning was determined to be inappropriate due to adding substantially to the completion time and further, detuning equipment would represent an ongoing maintenance "headache", for only limited localized benefit. The attached data verifies that the array is performing as required.

### MONITOR POINTS

The monitor points are described and pictured in Exhibit E, and the requested maximum value for each monitor point is stated at the end of the point description. In addition, a map showing the route to the points is included.

### CERTIFICATION

Lyndon H. Willoughby, the undersigned certifies and attests, under penalty of perjury, that:

1. He has been engaged in broadcast technology since 1964.
2. He has held a valid First Class Radiotelephone Operators License since 1967, and that his presently held document, number P1-8-14307, is valid for life.
3. His credentials are contained in other filings and are a matter of record with the Federal Communications Commission.
4. He is the owner of the firm of Willoughby & Voss, which has offices in San Antonio, Texas.
5. He made the R.F. Impedance and field strength measurements as well as the field strength measurement analysis contained in this document. He is familiar with the proper and normally accepted procedures for making such measurements and analysis.
6. Willoughby & Voss has been retained by ABC, Inc., to prepare the attached report.

KMIC RADIO  
TECHNICAL STATEMENT



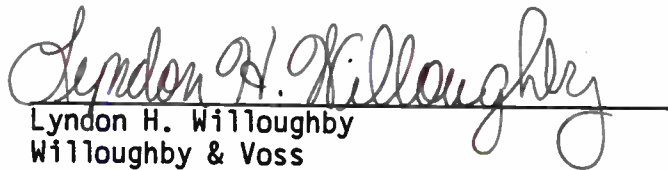
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7. The above statements and all statements contained in the attached material are true of his own knowledge and belief, and as to such statements made on belief, he believes them to be true.

February 29, 2000

  
Lyndon H. Willoughby  
Willoughby & Voss

Technical Consultant to:  
ABC, Inc. (KMIC)

KMIC RADIO  
TECHNICAL STATEMENT

EXHIBIT A  
ANTENNA SYSTEM & SITE RELATED EXHIBITS

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WILLOUGHBY & VOSS

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KMIC, HOUSTON, TEXAS  
1590 kHz, 5.0 kW DA-N

DESCRIPTION OF ANTENNA SYSTEM

1. Element and Type: Four towers are base insulated, series-fed, uniform cross-section, guyed, steel towers.
2. Height of Elements: All four towers = 56.4m (107.7').
3. Overall Height of Elements: All four towers = 57.3m AGL.
4. Orientation and spacing of the antenna array: With Tower #1 as reference, Tower #2 (SE) is spaced 203.4' on a bearing of 230.5°T, Tower #3 (NW) is spaced 90.3' on a bearing of 319.8°T, Tower #4 (SW) is spaced 222.2' on a bearing of 265.2°T.

5. Directional Array Theoretical Design Parameters:

	<u>T #1</u>	<u>T #2</u>	<u>T #3</u>	<u>T #4</u>
Phasing (degrees)	0.0°	+5.0°	+104°	+107°
Field Ratios	1.0	1.0	1.0	1.0
	0	203.4	90	222.2
	0	230.5	319.8	256.2
	107.5	107.5	107.5	107.5

6. Directional Array Operating Specifications:

	<u>T #1</u>	<u>T #2</u>	<u>T #3</u>	<u>T #4</u>
*Phase Indications	0.0°	-8.0°**	+92°	+105°
*Sample Current Ratios	100	111.5	90.0	106
Base Current Ratios	1.000	1.090	0.904	1.045

\* As indicated by the Potomac Instruments AM-19D, Antenna Monitor.  
\*\* true phase is +2.0° but a -10° delay is part of the sample circuit.

7. Ground System Specifications: At all towers, 120 equally spaced wires 56.4 meters long are buried 8 to 12 inches deep. A four inch copper strap runs from the base of each tower to the transmitter building. A 24' by 24' copper screen mat is located about the base of each tower. All components are electrically bonded.

KMIC RADIO  
EXHIBIT A-1

8. Antenna Sample System:

The sampling system employed at KMIC, complies with the specifications of §73.68 of the FCC Rules.

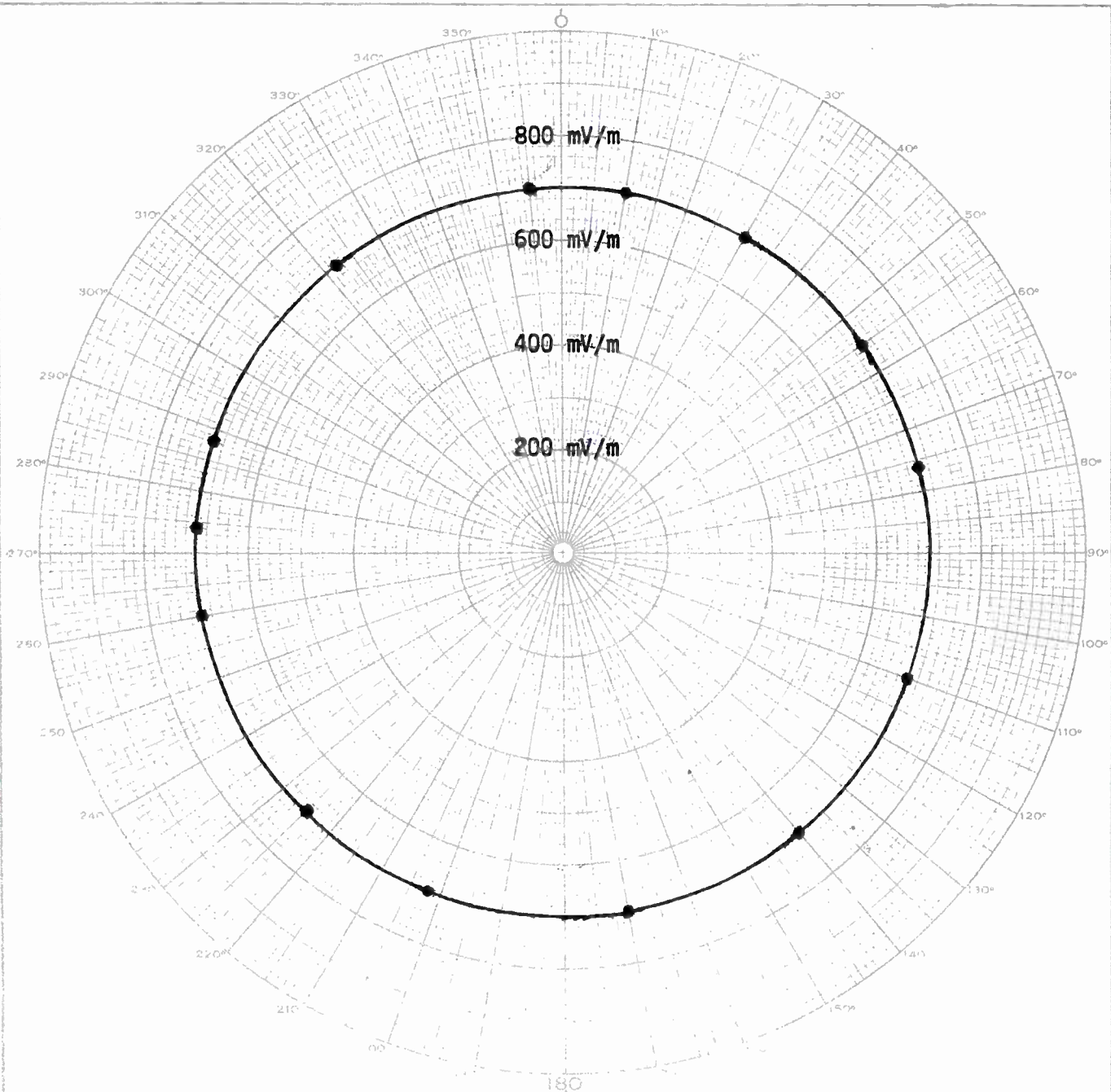
The system employs Delta Electronics toroidal current transformers. The output of each TCT is fed to the Potomac Instruments Model AM-19D antenna monitor by coaxial cable. This cable is solid outer and inner conductor, jacketed, foam dielectric, phase-stabilized sampling line. The sampling lines were trimmed to be of equal electrical length by adding specifically cut, short pieces of RG-58. The Tower #2 pigtail is 10' long and is used to shift the "indicated" phase away from zero (where some ambiguity exists). The true Tower #2 phase is +2.0° but is indicated as -8.0°.

The sampling line lengths were confirmed by electrical resonance measurement (on site) and found to have less than one degree of difference. Any excess sample line from the towers are subject to the same environmental conditions and buried in a pit behind the transmitter building.

9. Attachment to Towers:

Towers #2, 3 and 4 are connected to detuning networks during Daytime Non-directional operation. Each network consists of a series and parallel resonant circuit which isolates the unused towers thus preventing reradiation. There are no other circuits or equipment attached to any of the four towers.

EXHIBIT B  
HORIZONTAL PLANE RADIATION PATTERNS



NON-DIRECTIONAL RMS = 700 mV/m  
@ ONE KILOMETER

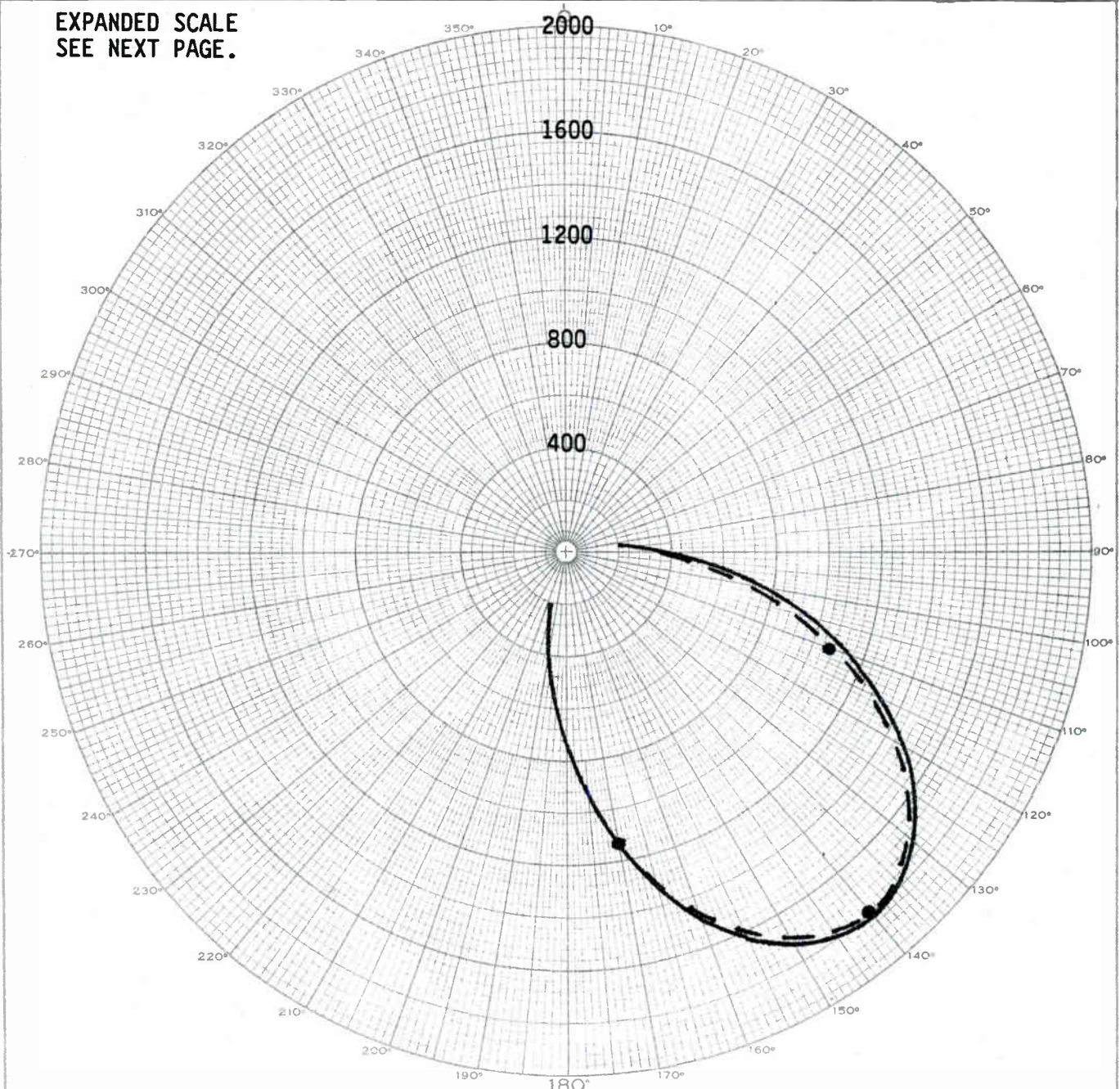
KMIC, 1590 kHz, HOUSTON, TEXAS

3  
4 1  
2  
G = 107.7

TOWER #1  
5.0 kW NON-DIRECTIONAL  
HORIZONTAL PLANE RADIATION

EXHIBIT B-1

EXPANDED SCALE  
SEE NEXT PAGE.



DA-NIGHT RMS = 705 mV/m  
@ ONE KILOMETER

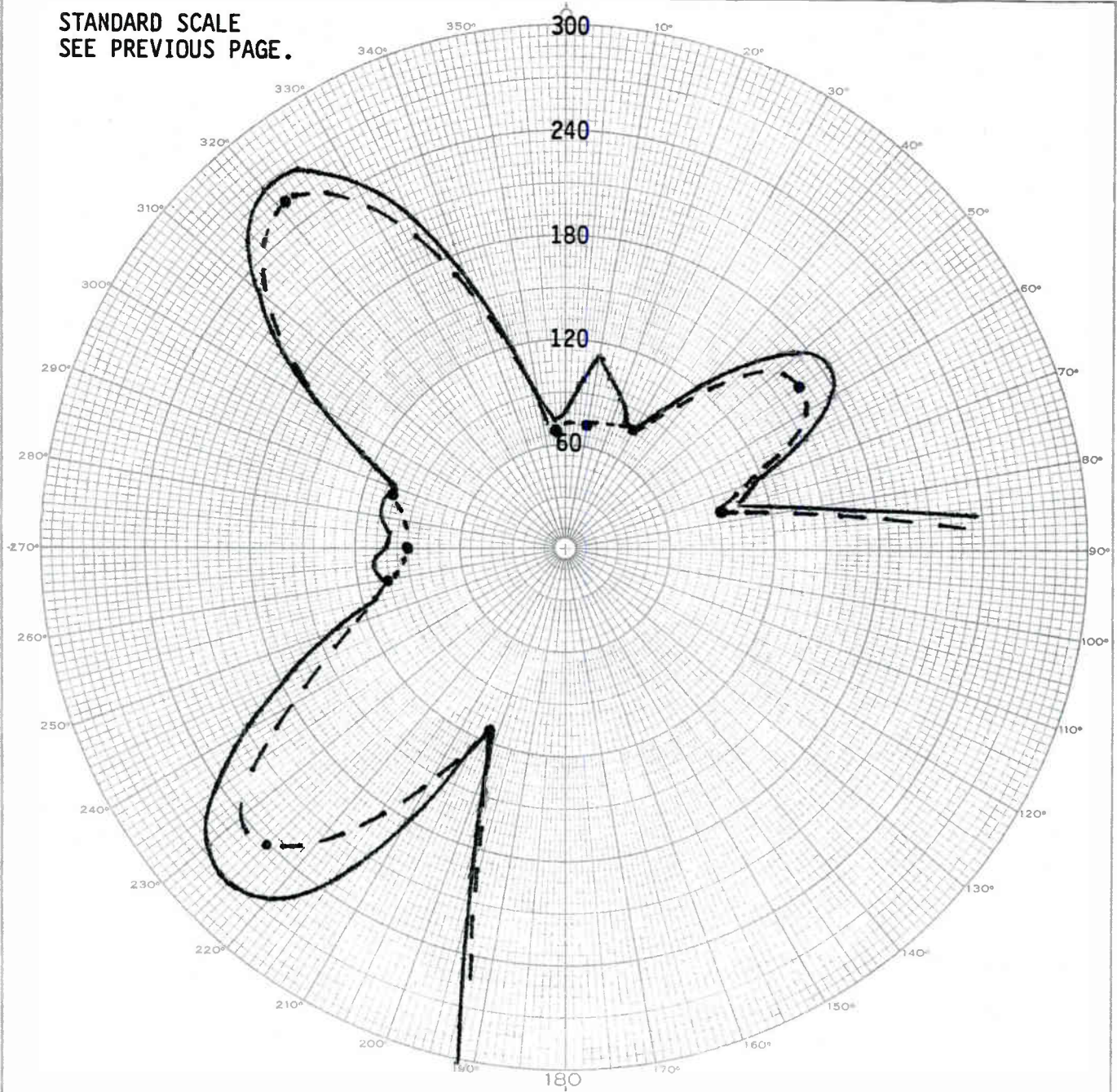
\_\_\_\_\_ STD. PAT.

-----MSRD. PAT.

KMIC, 1590 kHz, HOUSTON, TEXAS

<p>3</p> <p>4      1</p> <p>2</p> <p>G = 107.7°</p>	<p>5.0 kW DA-NIGHT HORIZONTAL PLANE RADIATION</p>	<p>T1 1.0/ 0°</p> <p>T2 1.0/ 5°</p> <p>T3 1.0/104°</p> <p>T4 1.0/107°</p>
		<p>EXHIBIT B-2</p>

STANDARD SCALE  
SEE PREVIOUS PAGE.



DA-NIGHT RMS = 705 mV/m  
@ ONE KILOMETER

————— STD. PAT.

-----MSRD. PAT.

KMIC, 1590 kHz, HOUSTON, TEXAS

<p>3 4      1 2 G = 107.7°</p>	<p>5.0 kW DA-NIGHT HORIZONTAL PLANE RADIATION</p>	<p>T1 1.0/ 0° T2 1.0/ 5° T3 1.0/104° T4 1.0/107°</p>
		<p>EXHIBIT B-2B</p>



EXHIBIT C  
FIELD STRENGTH MEASUREMENTS  
& ANALYSIS

WILLOUGHBY & VOSS

KMIC RADIAL MEASUREMENT DATES & TIMES

RADIAL DEG. TRUE	CLOSE-IN 2000	NON-D 2000	DA-N 2000
10°	1-29, 1056-1135	2-2, 1245-1618	2-8, 1031-1620
30°	1-29, 1154-1244	2-3, 0900-1139	2-8, 1422-1518 & 2-9, 0900-1011
55°	1-29, 1256-1352	2-3, 1233-1520	2-9, 1426-1620
76°	1-28, 1400-1439	2-4, 0900-1215	2-9, 1200-1403
110°	1-30, 0915-0955	2-2, 0900-1300	2-7, 0902-1226
140°	1-30, 1003-1058	2-2, 1300-1415 & 2-3, 1318-1400	2-7, 1251-1553
170°	1-30, 1113-1228	2-3, 0909-1205	2-8, 0902-1225
202°	1-31, 0915-1037	2-3, 1330-1610 & 2-4, 0915-0955	2-8, 1327-1612 & 2-9, 1052-1109
225°	1-30, 0915-1100	2-2, 1239-1309 & 2-3, 0900-1316	2-9, 1239-1616
260°	1-30, 1115-1330	2-2, 0900-1358	2-8, 0900-1457 & 2-9, 0900-1144
274°	1-26, 0855-0952	1-26, 0955-1400	2-7, 0900-1132
288°	1-26, 1440-1535	1-27, 0915-1300	2-7, 1231-1525
322°	1-28, 0915-1200	1-27, 1331-1442 & 1-28, 1200-1345	2-7, 1335-1415 & 2-8, 1159-1348
355°	1-29, 0930-1045	2-2, 0859-1215	2-8, 0859-1121

KMIC RADIO  
MEASUREMENT DATES

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WILLOUGHBY & VOSS

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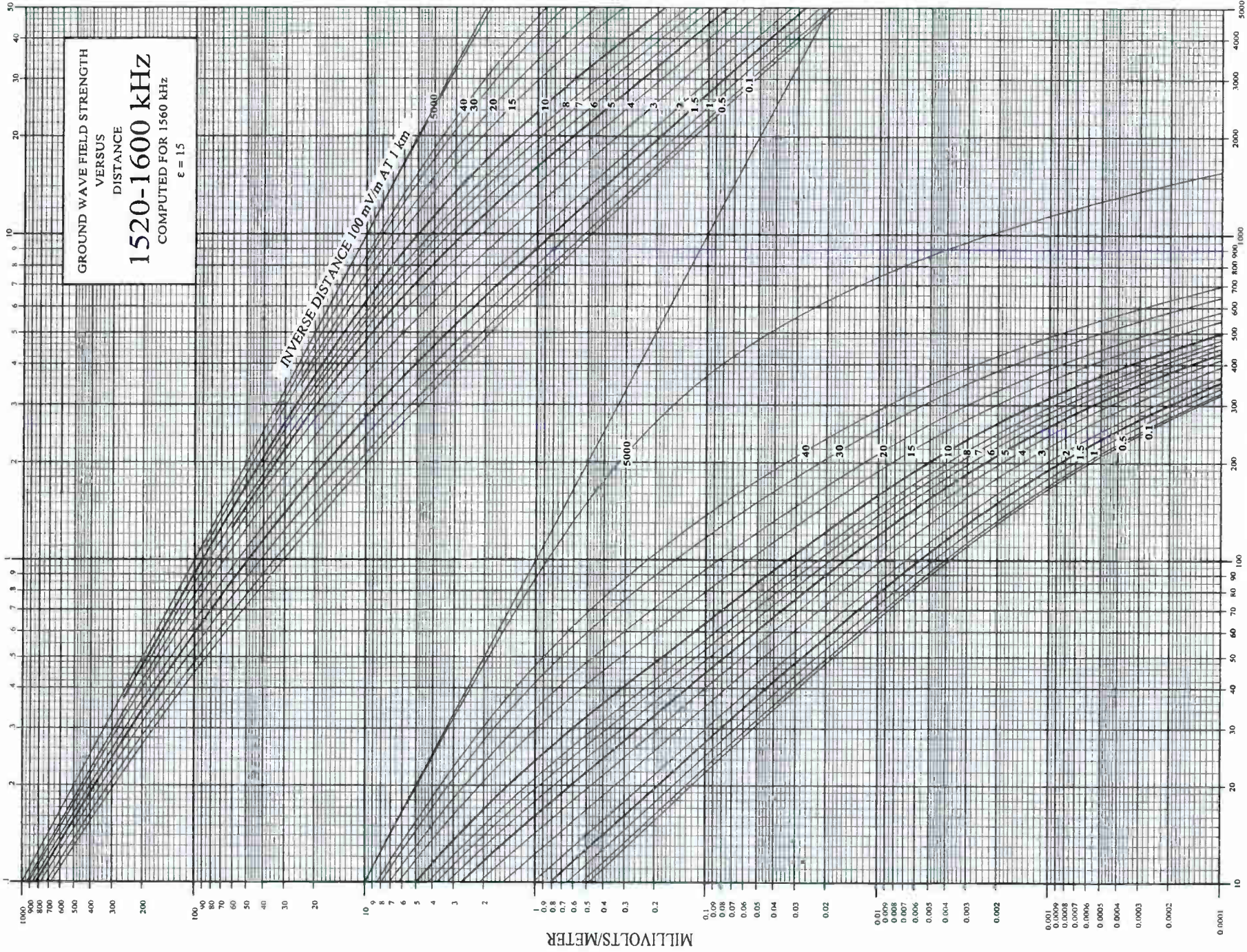
SUMMARY TABLE OF UNATTENUATED FIELD STRENGTHS  
FEBRUARY, 2000

RADIAL	NON-D IDF mV/m	DA-AVG. RATIO	MSRD. DA-N IDF mV/m	STD.PAT MAX. mV/m
10° CP	700	0.1030	72.10	104.13
30°	700	0.1138	79.66	81.06
55° CP	700	0.2329	163.03	185.14
76° CP	700	0.1319	92.33	108.77
110°	700	1.5340	1073.8	1140.38
140°	700	2.5650	1795.5	1817.79
170°	700	1.6350	1144.5	1146.90
202°	700	0.1647	115.29	117.23
225° CP	700	0.3451	241.57	273.71
260°	700	0.1504	105.28	106.66
274° CP	700	0.1286	90.02	101.50
288°	700	0.1491	104.37	106.50
322°	700	0.3638	254.66	267.15
355°	700	0.0979	68.53	74.01

All field strengths are stated in mV/m at One Kilometer.

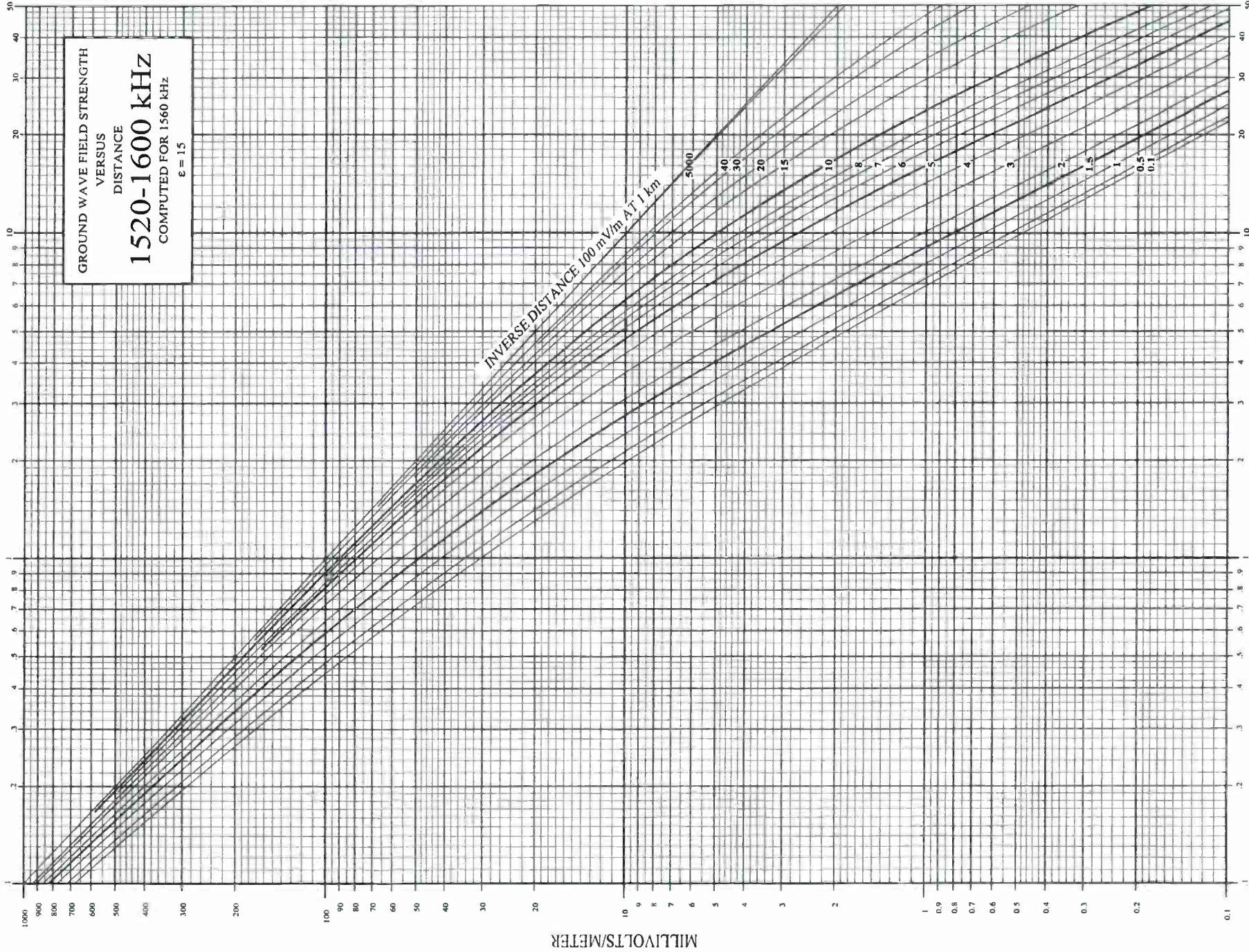
ALL INVERSE DISTANCE FIELDS ARE WITHIN THE STANDARD PATTERN.

KILOMETERS FROM ANTENNA



KILOMETERS FROM ANTENNA  
GRAPH 19

KILOMETERS FROM ANTENNA



KILOMETERS FROM ANTENNA  
GRAPH 19-A

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KMIC CLOSE-IN MEASUREMENTS at 10.0 degrees True

Point Number	Distance (km)	Msrd Field
		Non-DA (mV/m)
1	0.23	3100
2	0.26	2700
3	0.43	1610
4	0.84	820.
5	1.11	640.
6	1.58	340.
7	1.80	195.
8	2.14	185.
9	2.25	135.
10	2.54	160.
11	2.98	105.
12	3.12	145.

KMIC RADIO  
EXHIBIT C-1-A

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WILLOUGHBY & VOSS

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KMIC RADIATION ANALYSIS at 10.0 degrees True

	Point Number	Distance (km)	Measured Field		Log Ratio (DA/ND)
			Non-DA (mV/m)	DA-N (mV/m)	
MP	13	3.36	205.	29.0	-0.8494
	14	3.75	185.	22.0	-0.9247
	15	4.36	160.	17.0	-0.9737
	16	4.96	140.	13.0	-1.0322
	17	5.47	125.	7.00	-1.2518
	18	6.76	76.0	6.00	-1.1027
	19	7.98	45.0	5.50	-0.9128
	20	11.44	17.5	2.60	-0.8281
	21	13.98	22.0	2.40	-0.9622
	22	14.85	18.2	2.20	-0.9176
	23	15.56	14.8	1.80	-0.9150
	24	18.73	5.90	.800	-0.8678
	25	20.00	5.50	.580	-0.9769
	26	20.53	4.50	.380	-1.0734
	27	21.21	4.20	.400	-1.0212
	28	22.69	3.10	.290	-1.0290
	29	25.02	2.90	.250	-1.0645
	30	25.26	1.90	.089	-1.3294
	31	25.74	3.00	.300	-1.0000
	32	26.55	2.50	.280	-0.9508
	33	27.06	2.75	.330	-0.9208
	34	29.57	2.10	.290	-0.8598
	35	30.73	1.75	.200	-0.9420

Average Log Ratio: -0.9872  
Antilog: .1030

Nondirectional Analyzed Field Strength (mV/m): 700.00

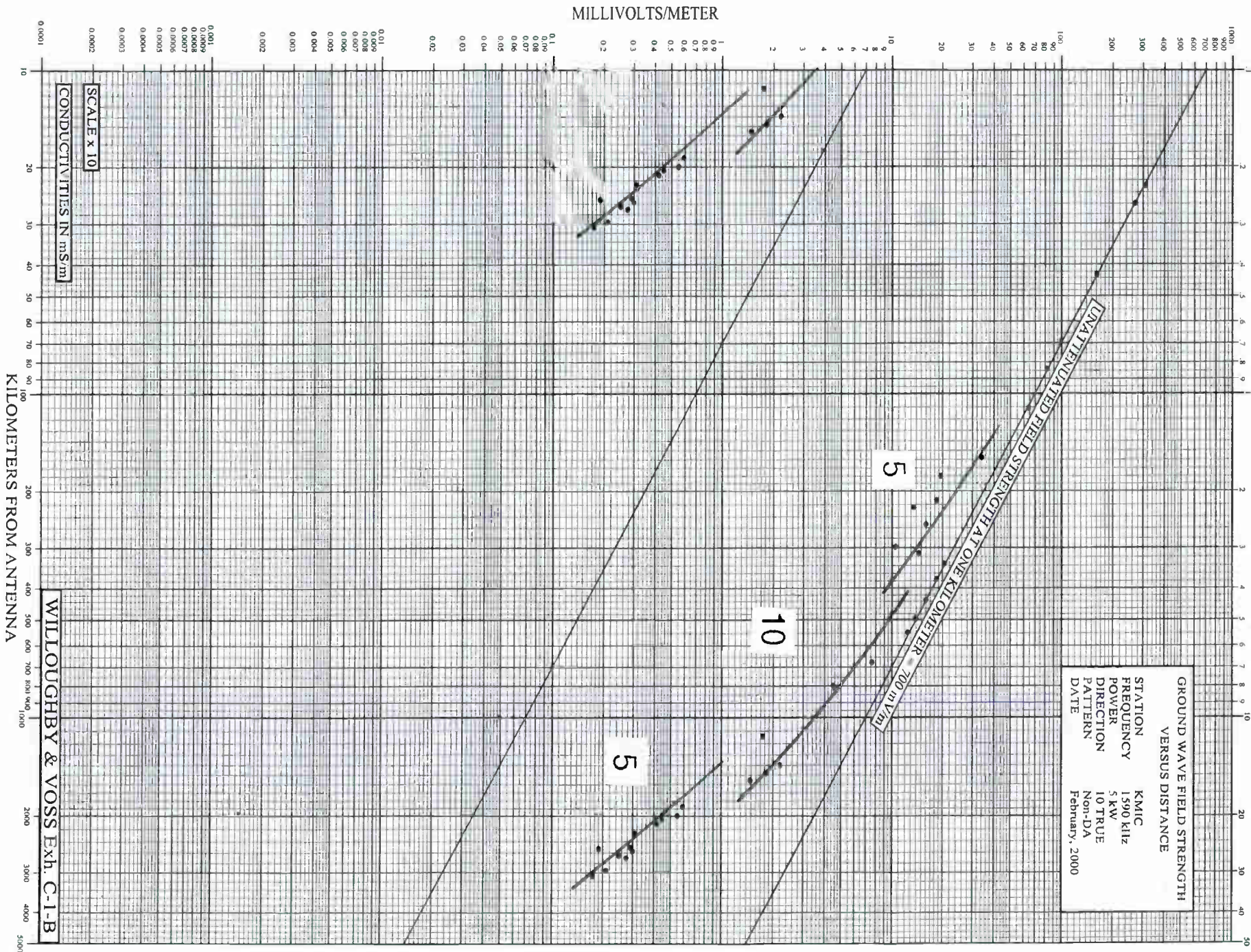
DA-NIGHT Analyzed Field Strength (mV/m): 72.10

Augmented Standard Pattern Maximum (mV/m): 104.13

KILOMETERS FROM ANTENNA

GROUND WAVE FIELD STRENGTH  
VERSUS DISTANCE

STATION	KMIC
FREQUENCY	1590 kHz
POWER	5 kW
DIRECTION	10 TRUE
PATTERN	Non-DA
DATE	February, 2000



MILLIVOLTS/METER

KILOMETERS FROM ANTENNA

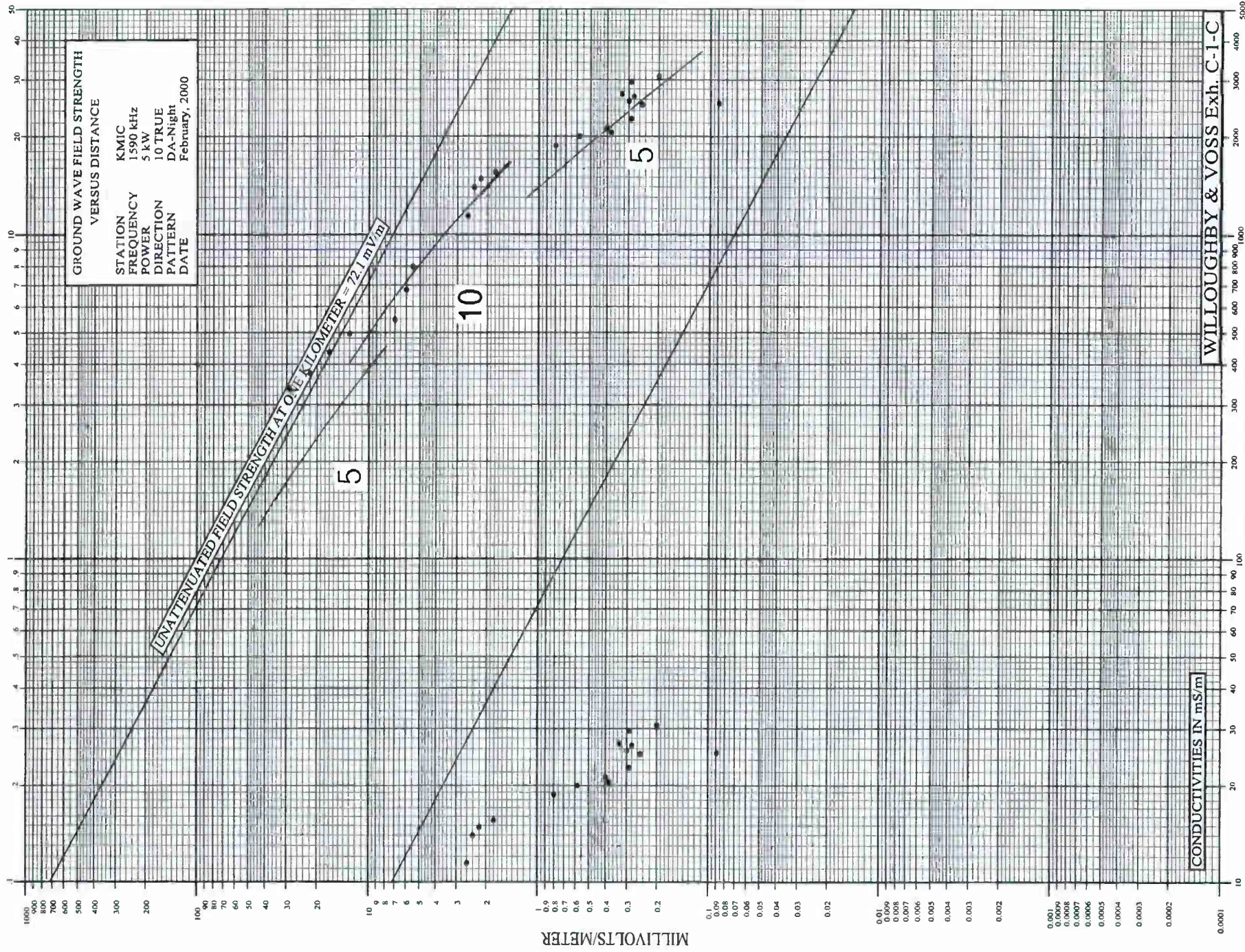
SCALE x 10  
CONDUCTIVITIES IN mS/m

0.0001  
0.0002  
0.0003  
0.0004  
0.0005  
0.0006  
0.0007  
0.0008  
0.0009  
0.001  
0.002  
0.003  
0.004  
0.005  
0.006  
0.007  
0.008  
0.01  
0.02  
0.03  
0.04  
0.05  
0.06  
0.07  
0.08  
0.1  
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0.3  
0.4  
0.5  
0.6  
0.7  
0.8  
0.9  
1  
2  
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70  
80  
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400  
500  
600  
700  
800  
900  
1000

WILLOUGHBY & VOSS Ex. C-1-B



KILOMETERS FROM ANTENNA



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KMIC CLOSE-IN MEASUREMENTS at 30.0 degrees True

Point Number	Distance (km)	Msrd Field
		Non-DA (mV/m)
1	0.26	2700
2	0.31	2250
3	0.47	1500
4	0.85	820.
5	0.98	710.
6	1.30	350.
7	1.74	380.
8	2.03	120.
9	2.08	135.
10	2.12	130.
11	2.28	180.
12	2.48	170.
13	2.67	60.0
14	2.88	125.
15	3.20	200.

KMIC RADIO  
EXHIBIT C-2-A

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KMIC RADIATION ANALYSIS at 30.0 degrees True

Point Number	Distance (km)	Measured Field		Log Ratio (DA/ND)
		Non-DA (mV/m)	DA-N (mV/m)	
16	3.36	210.	21.0	-1.0000
18	4.31	90.0	15.0	-0.7782
19	4.84	42.0	10.0	-0.6232
20	5.25	70.0	12.0	-0.7659
21	5.55	60.0	10.0	-0.7782
22	5.99	56.0	10.0	-0.7482
23	6.32	50.0	8.00	-0.7959
24	6.97	28.0	4.00	-0.8451
25	7.51	24.0	3.20	-0.8751
26	7.76	22.0	2.20	-1.0000
27	8.30	30.0	5.00	-0.7782
28	9.25	22.0	3.40	-0.8109
29	10.10	20.0	3.00	-0.8239
30	10.80	18.5	2.60	-0.8522
31	11.20	15.0	1.90	-0.8973
32	12.00	19.5	1.95	-1.0000
33	12.70	13.0	2.00	-0.8129
34	13.20	14.5	1.90	-0.8826
35	13.60	13.5	1.80	-0.8751
36	15.40	7.90	.800	-0.9945
37	16.20	12.0	1.20	-1.0000
38	21.70	11.0	1.00	-1.0414
39	23.10	10.0	.550	-1.2596
40	31.90	1.50	.084	-1.2518
41	33.80	1.00	.062	-1.2076
42	35.10	.900	.013	-1.8403

Average Log Ratio: -0.9438  
 Antilog: .1138

Nondirectional Analyzed Field Strength (mV/m): 700.00

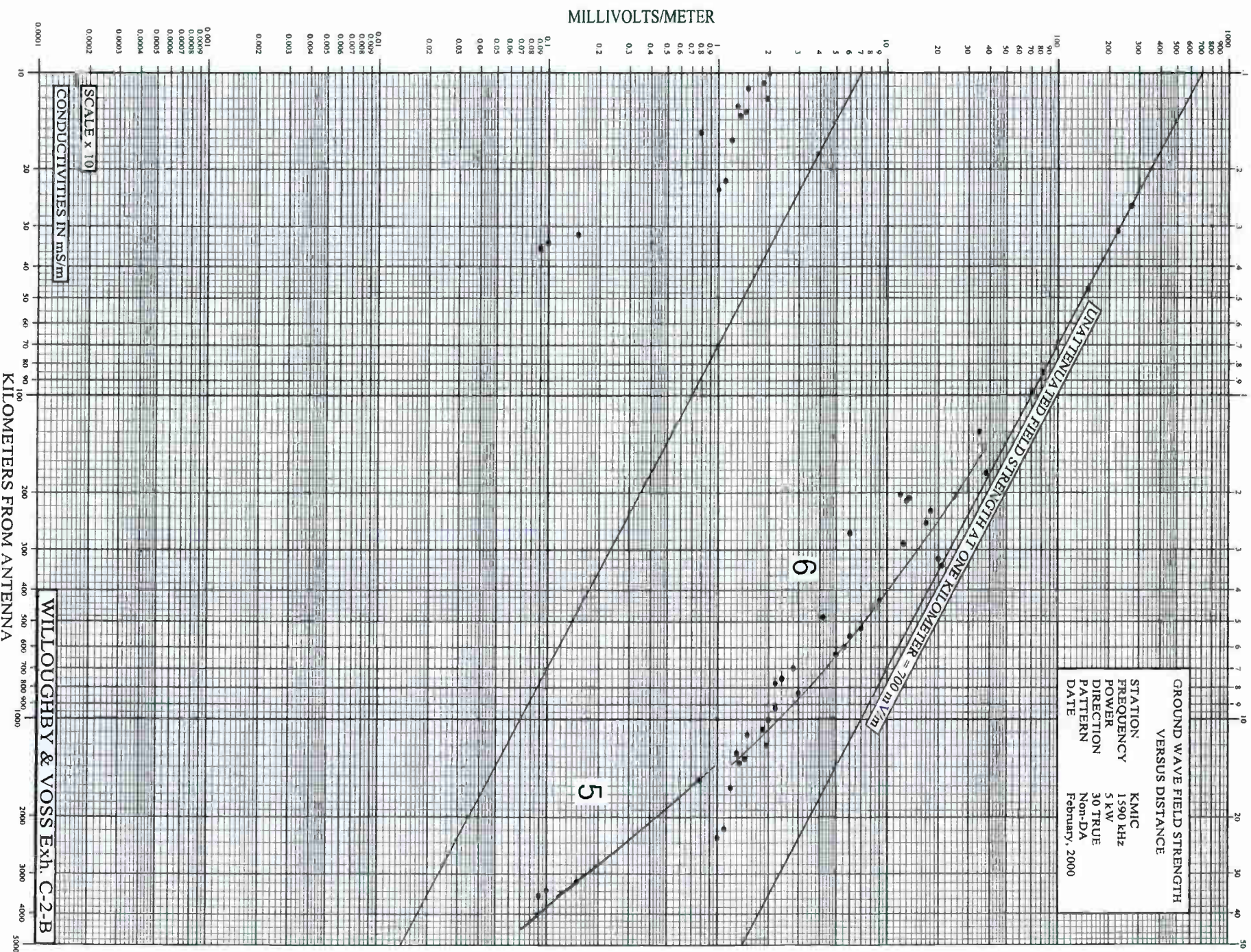
DA-NIGHT Analyzed Field Strength (mV/m): 79.70

Augmented Standard Pattern Maximum (mV/m): 81.06

KILOMETERS FROM ANTENNA

GROUND WAVE FIELD STRENGTH  
VERSUS DISTANCE

STATION	KMIC
FREQUENCY	1590 KHz
POWER	5 KW
DIRECTION	30 TRUE
PATTERN	Non-DA
DATE	February, 2000



MILLIVOLTS/METER

SCALE x 10  
CONDUCTIVITIES IN mS/m

WILLOUGHBY & VOSS Exh. C-2-B  
KILOMETERS FROM ANTENNA

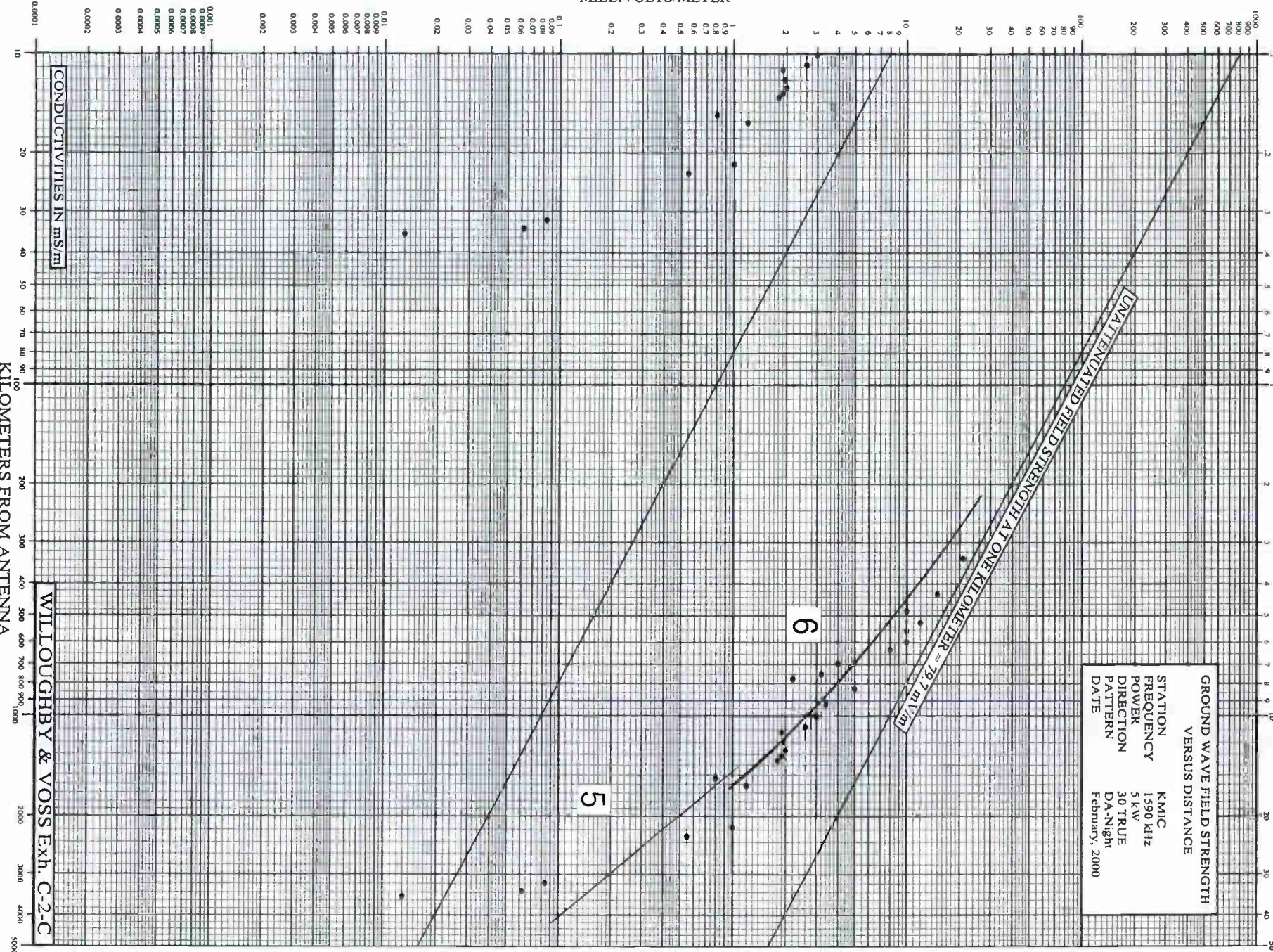
KILOMETERS FROM ANTENNA

GROUND WAVE FIELD STRENGTH  
VERSUS WAVE DISTANCE

STATION	KMIC
FREQUENCY	1590 kHz
POWER	5 kW
DIRECTION	30 TRUE
PATTERN	DA-Night
DATE	February, 2000

UNATTENUATED FIELD STRENGTH AT ONE KILOMETER = 79.7 mV/m

MILLIVOLTS/METER



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WILLOUGHBY & VOSS

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KMIC CLOSE-IN MEASUREMENTS at 55.0 degrees True

Point Number	Distance (km)	Msrd Field
		Non-DA (mV/m)
1	0.43	1650
2	0.49	1400
3	0.56	1250
4	0.69	1000
5	1.21	575.
6	1.32	530.
7	1.45	480.
8	1.53	350.
9	1.98	250.
10	2.11	190.
11	2.19	190.
12	2.56	140.
13	2.62	160.
14	2.69	150.
15	2.83	140.
16	2.86	140.
17	2.99	115.
18	3.04	140.
19	3.15	115.

KMIC RADIO  
EXHIBIT C-3-A

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WILLOUGHBY & VOSS

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KMIC RADIATION ANALYSIS at 55.0 degrees True

	Point Number	Distance (km)	Measured Field		Log Ratio (DA/ND)
			Non-DA (mV/m)	DA-N (mV/m)	
MP	14	2.69	150.	35.0	-0.6320
	20	3.46	208.	55.0	-0.5777
	21	4.15	99.0	26.0	-0.5807
	22	4.97	88.0	23.1	-0.5809
	23	5.55	35.0	9.30	-0.5756
	24	6.29	27.0	11.0	-0.3900
	25	7.18	38.0	10.0	-0.5798
	26	7.55	34.0	9.20	-0.5677
	27	8.09	22.0	6.00	-0.5643
	28	8.83	20.0	7.00	-0.4559
	29	9.49	16.0	4.00	-0.6021
	30	10.40	15.0	4.60	-0.5133
	31	11.10	8.90	2.90	-0.4870
	32	11.90	6.50	2.90	-0.3505
	33	13.20	11.5	2.60	-0.6457
	34	15.70	8.50	1.30	-0.8155
	35	16.50	7.50	.900	-0.9208
	36	17.50	4.40	.750	-0.7684
	37	20.60	5.00	.370	-1.1308
	38	21.50	5.50	.500	-1.0414
	39	23.60	3.40	.780	-0.6394
	40	27.80	2.00	.550	-0.5607
	41	28.60	1.90	.500	-0.5798
	42	29.60	2.90	.750	-0.5873
	43	30.10	2.80	.600	-0.6690
	44	34.10	1.30	.300	-0.6368

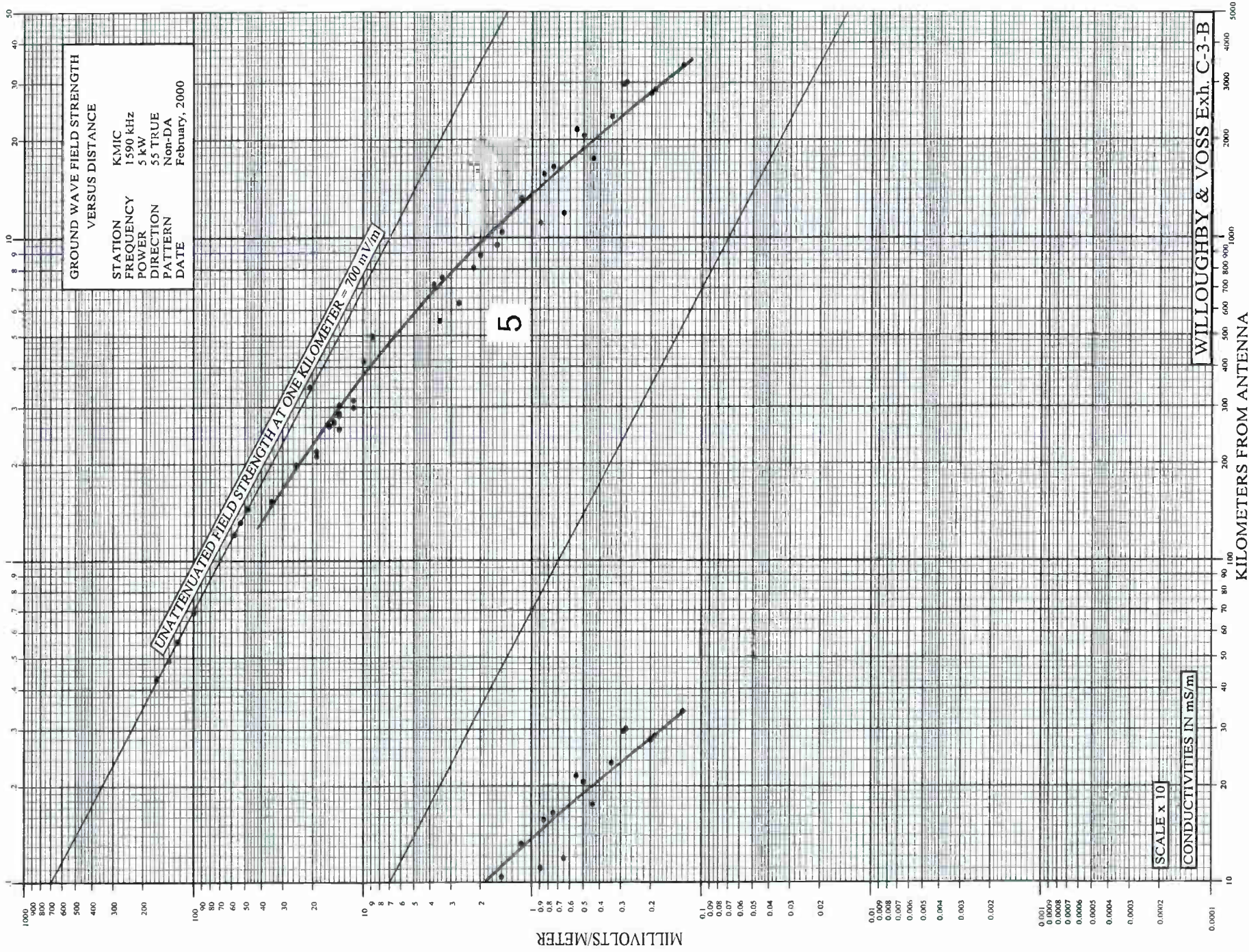
Average Log Ratio: -0.6328  
 Antilog: .2329

Nondirectional Analyzed Field Strength (mV/m): 700.00

DA-NIGHT Analyzed Field Strength (mV/m): 163.00

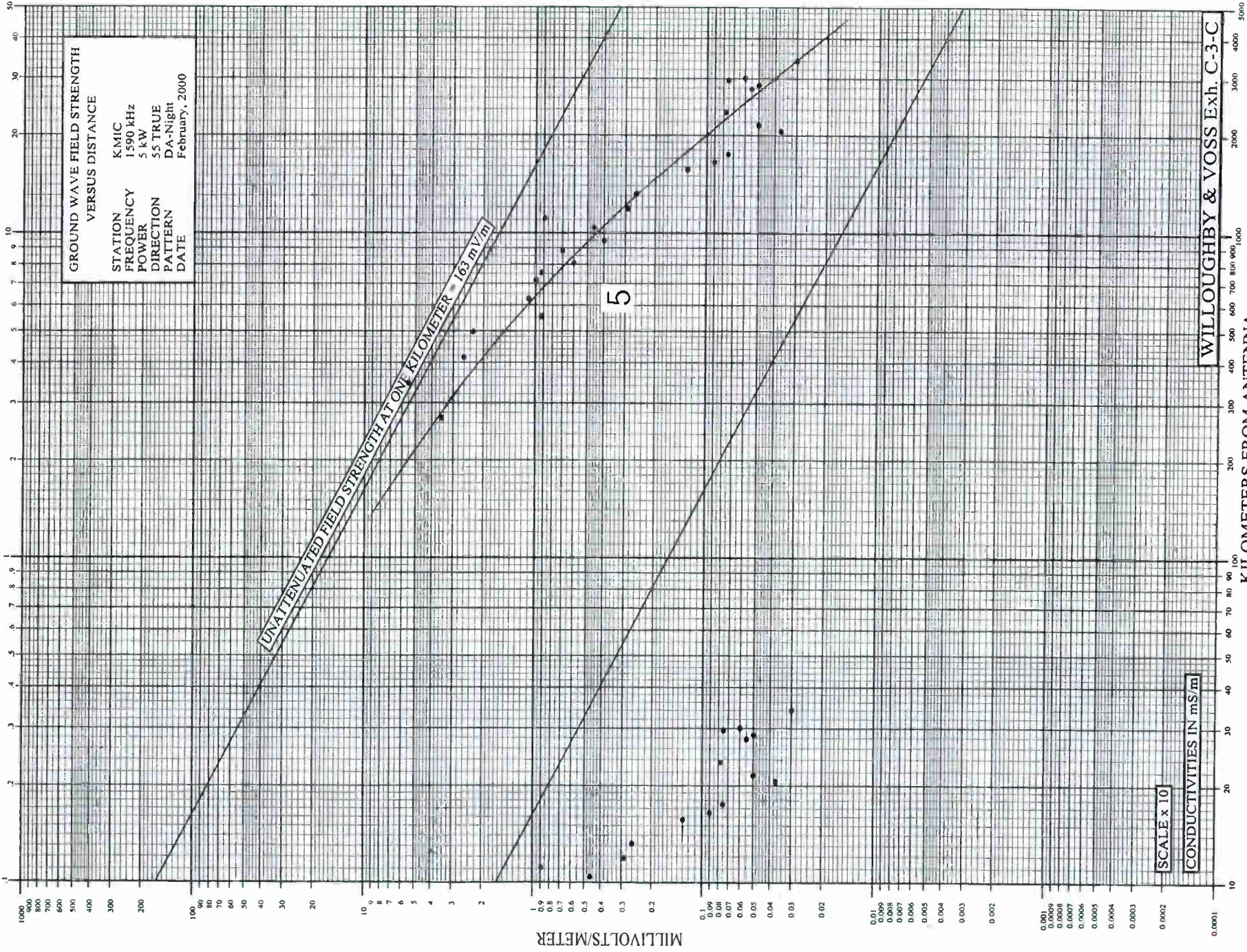
Augmented Standard Pattern Maximum (mV/m): 185.14

KILOMETERS FROM ANTENNA





KILOMETERS FROM ANTENNA



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WILLOUGHBY & VOSS

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KMIC CLOSE-IN MEASUREMENTS at 76.0 degrees True

Point Number	Distance (km)	Msrd Field
		Non-DA (mV/m)
1	0.58	1180
2	0.80	875.
3	1.11	630.
4	1.45	480.
5	1.71	345.
6	1.88	340.
7	2.17	140.
8	2.48	245.
9	2.67	200.
10	2.98	165.
11	3.23	150.

KMIC RADIO  
EXHIBIT C-4-A

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WILLOUGHBY & VOSS

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KMIC RADIATION ANALYSIS at 76.0 degrees True

	Point Number	Distance (km)	Measured Field		Log Ratio (DA/ND)
			Non-DA (mV/m)	DA-N (mV/m)	
MP	12	3.31	140.	30.0	-0.6690
	13	3.81	210.	18.0	-1.0669
	14	4.41	80.0	12.0	-0.8239
	15	4.86	140.	15.0	-0.9700
	16	5.31	75.0	16.0	-0.6709
	17	5.66	65.0	12.0	-0.7337
	18	5.95	55.0	8.80	-0.7959
	19	6.42	85.0	3.80	-1.3496
	20	6.82	60.0	11.0	-0.7368
	21	7.22	38.0	3.80	-1.0000
	22	7.50	38.0	5.10	-0.8722
	23	7.98	45.0	9.00	-0.6990
	24	8.37	43.0	10.0	-0.6335
	25	9.11	35.0	3.70	-0.9759
	26	9.43	37.0	3.40	-1.0367
	27	9.75	38.0	6.30	-0.7804
	28	10.80	31.0	5.10	-0.7838
	29	11.30	28.0	4.60	-0.7844
	30	12.20	25.0	1.50	-1.2218
	31	12.60	22.0	2.60	-0.9274
	32	12.90	20.0	3.70	-0.7328
	33	13.60	15.0	4.25	-0.5477
	34	14.30	5.50	1.25	-0.6435
	35	14.70	12.5	1.25	-1.0000
	36	15.40	21.0	1.60	-1.1181
	37	16.00	10.0	1.30	-0.8861
	38	16.50	9.60	1.90	-0.7035
	39	19.00	7.20	.780	-0.9652
	40	21.70	5.50	.700	-0.8953
	41	23.60	4.50	.600	-0.8751
	42	29.00	3.60	.300	-1.0792
	43	30.00	3.40	.300	-1.0544
	44	30.60	2.70	.300	-0.9542
	45	31.50	2.20	.260	-0.9274

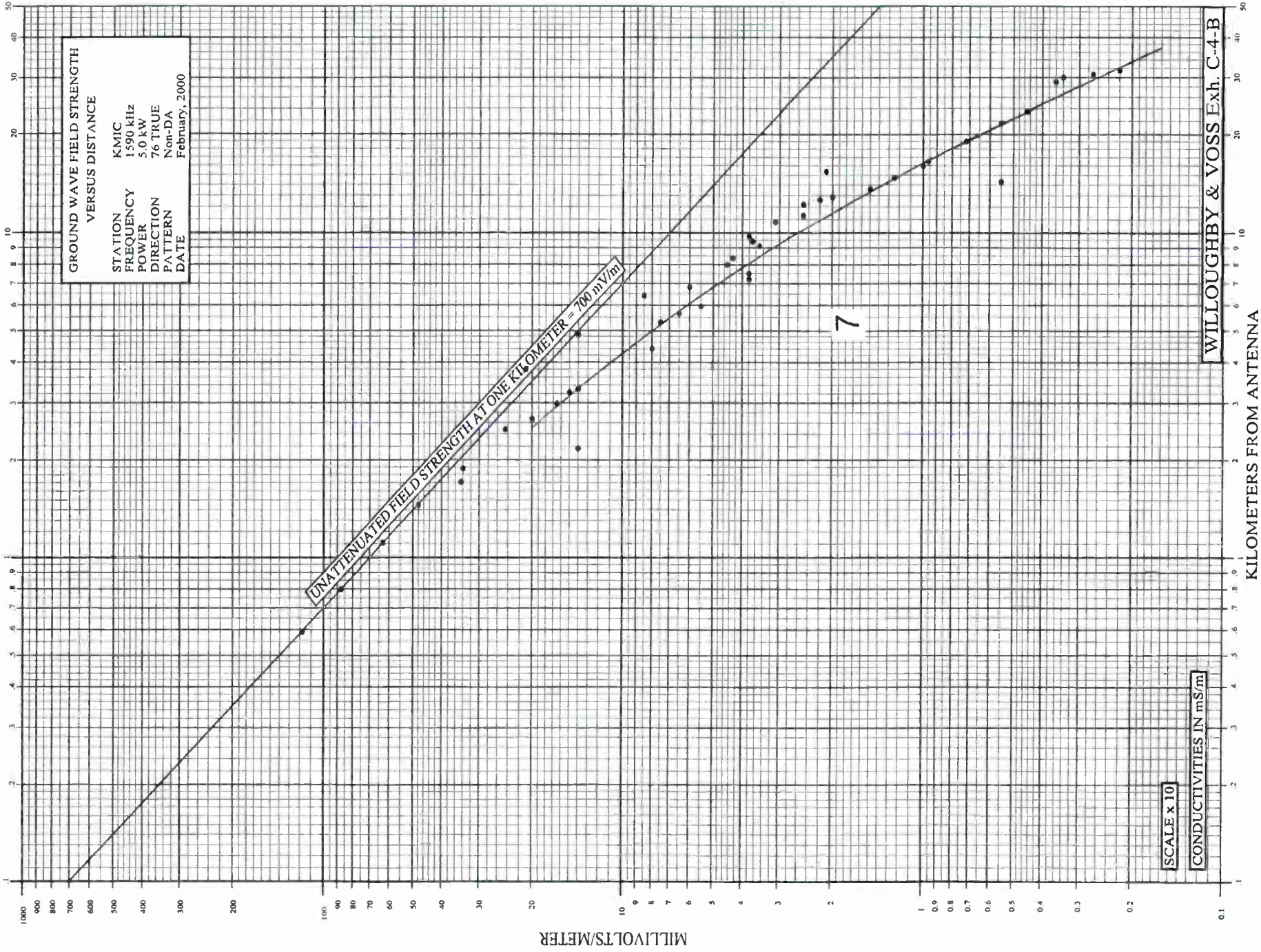
Average Log Ratio: -0.8798  
Antilog: .1319

Nondirectional Analyzed Field Strength (mV/m): 700.00

DA-NIGHT Analyzed Field Strength (mV/m): 92.30

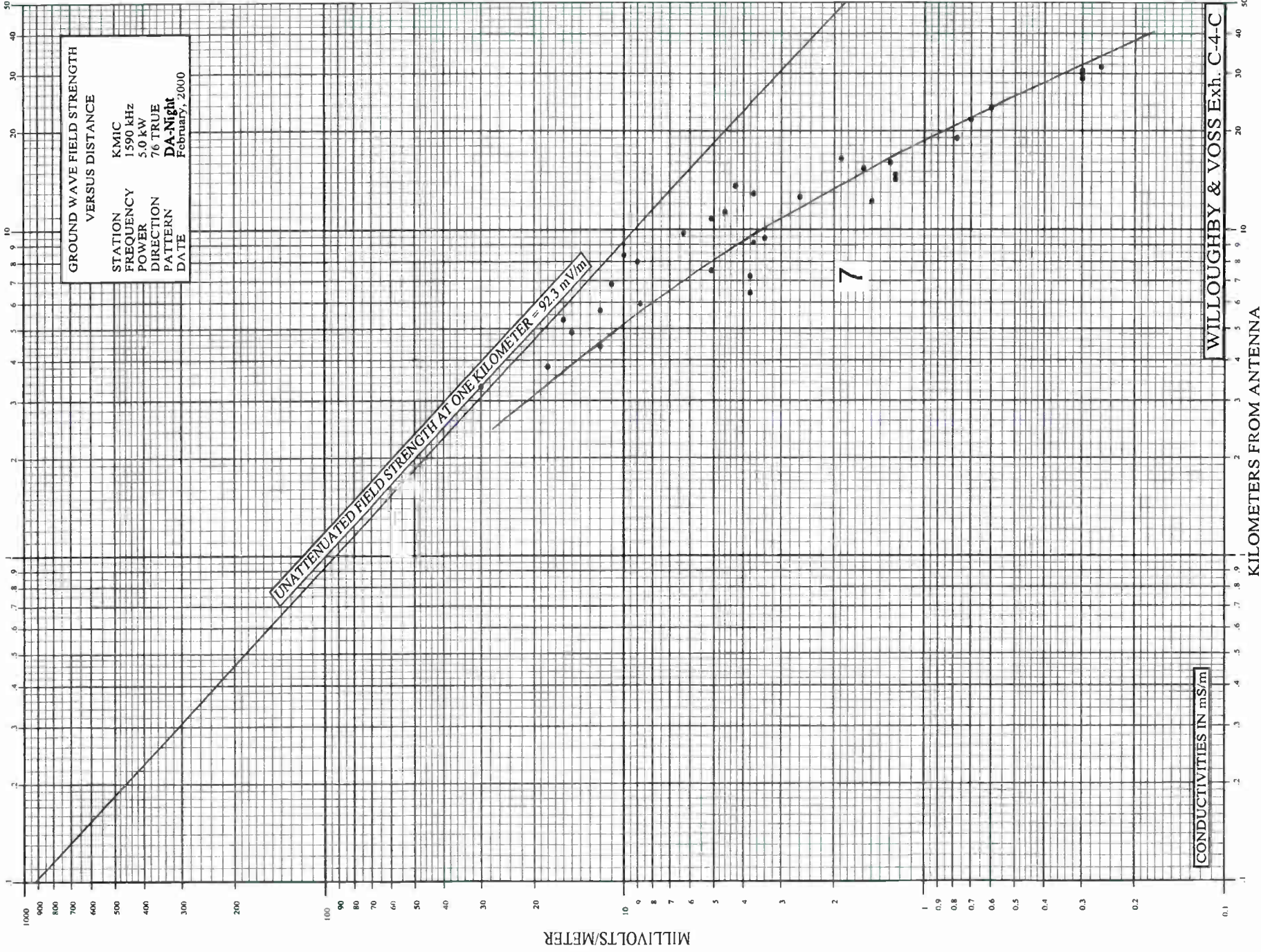
Augmented Standard Pattern Maximum (mV/m): 108.77

KILOMETERS FROM ANTENNA



KILOMETERS FROM ANTENNA

KILOMETERS FROM ANTENNA



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WILLOUGHBY & VOSS

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KMIC CLOSE-IN MEASUREMENTS at 110.0 degrees True

Point Number	Distance (km)	Msrd Field
		Non-DA (mV/m)
1	0.60	1180
2	0.65	1080
3	1.06	340.
4	1.50	340.
5	1.58	340.
6	1.81	300.
7	1.86	295.
8	1.97	270.
9	2.20	265.
10	2.24	260.
11	2.33	255.
12	2.56	210.
13	2.63	165.
14	2.83	245.
15	3.01	230.
16	3.30	185.

KMIC RADIO  
EXHIBIT C-5-A

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WILLOUGHBY & VOSS

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KMIC RADIATION ANALYSIS at 110.0 degrees True

Point Number	Distance (km)	Measured Field		Log Ratio (DA/ND)
		Non-DA (mV/m)	DA-N (mV/m)	
17	3.46	180.	290.	0.2071
18	3.80	170.	270.	0.2009
19	4.31	150.	360.	0.3802
20	4.62	130.	96.0	-0.1317
21	4.99	140.	220.	0.1963
22	5.39	130.	210.	0.2083
23	5.73	100.	155.	0.1903
24	6.11	85.0	135.	0.2009
25	6.56	70.0	114.	0.2118
26	7.92	88.0	135.	0.1859
27	8.46	83.0	130.	0.1949
28	9.11	61.0	100.	0.2147
29	10.40	54.0	88.0	0.2121
30	11.20	50.0	80.0	0.2041
31	12.50	33.0	54.0	0.2139
32	13.30	46.0	70.0	0.1823
33	14.10	23.0	35.0	0.1823
34	14.80	27.0	44.0	0.2121
35	15.40	41.0	63.0	0.1866
36	16.30	29.0	45.0	0.1908
37	16.80	28.0	42.0	0.1761
38	17.70	24.0	36.0	0.1761
39	18.70	19.0	30.0	0.1984
40	19.20	29.0	44.0	0.1811
41	20.20	23.0	32.0	0.1434
42	20.70	23.0	30.0	0.1154
43	21.60	16.0	26.0	0.2109
44	22.90	16.0	25.0	0.1938
45	24.40	16.0	24.0	0.1761
46	25.70	7.60	11.5	0.1799
47	30.10	6.80	10.0	0.1675

Average Log Ratio: 0.1859  
Antilog: 1.534

Nondirectional Analyzed Field Strength (mV/m): 700.00

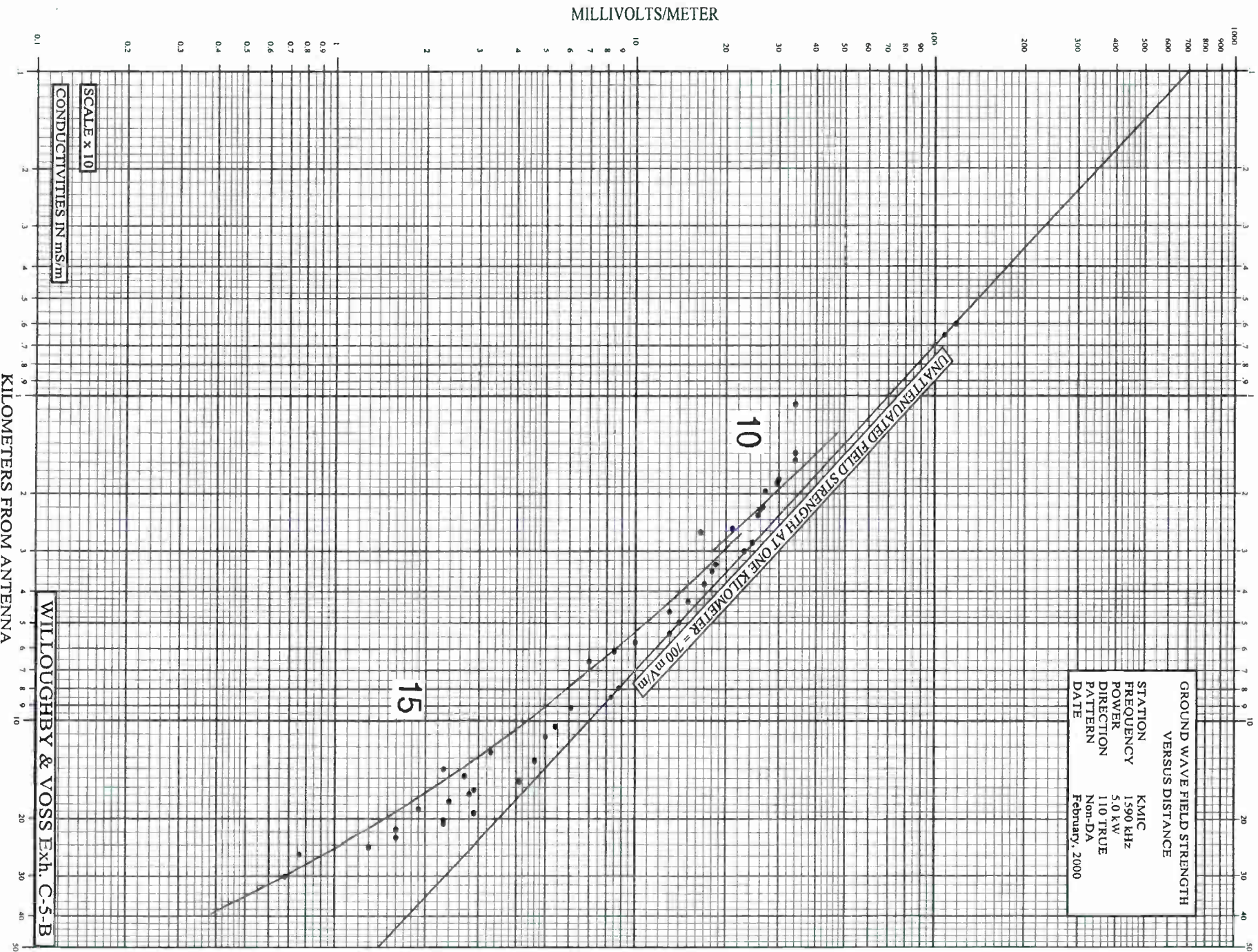
DA-NIGHT Analyzed Field Strength (mV/m): 1074.00

Augmented Standard Pattern Maximum (mV/m): 1140.38

KILOMETERS FROM ANTENNA

GROUND WAVE FIELD STRENGTH  
VERSUS DISTANCE

STATION	KMIC
FREQUENCY	1590 kHz
POWER	5.0 kW
DIRECTION	110 TRUE
PATTERN	Non-DA
DATE	February, 2000



MILLIVOLTS/METER

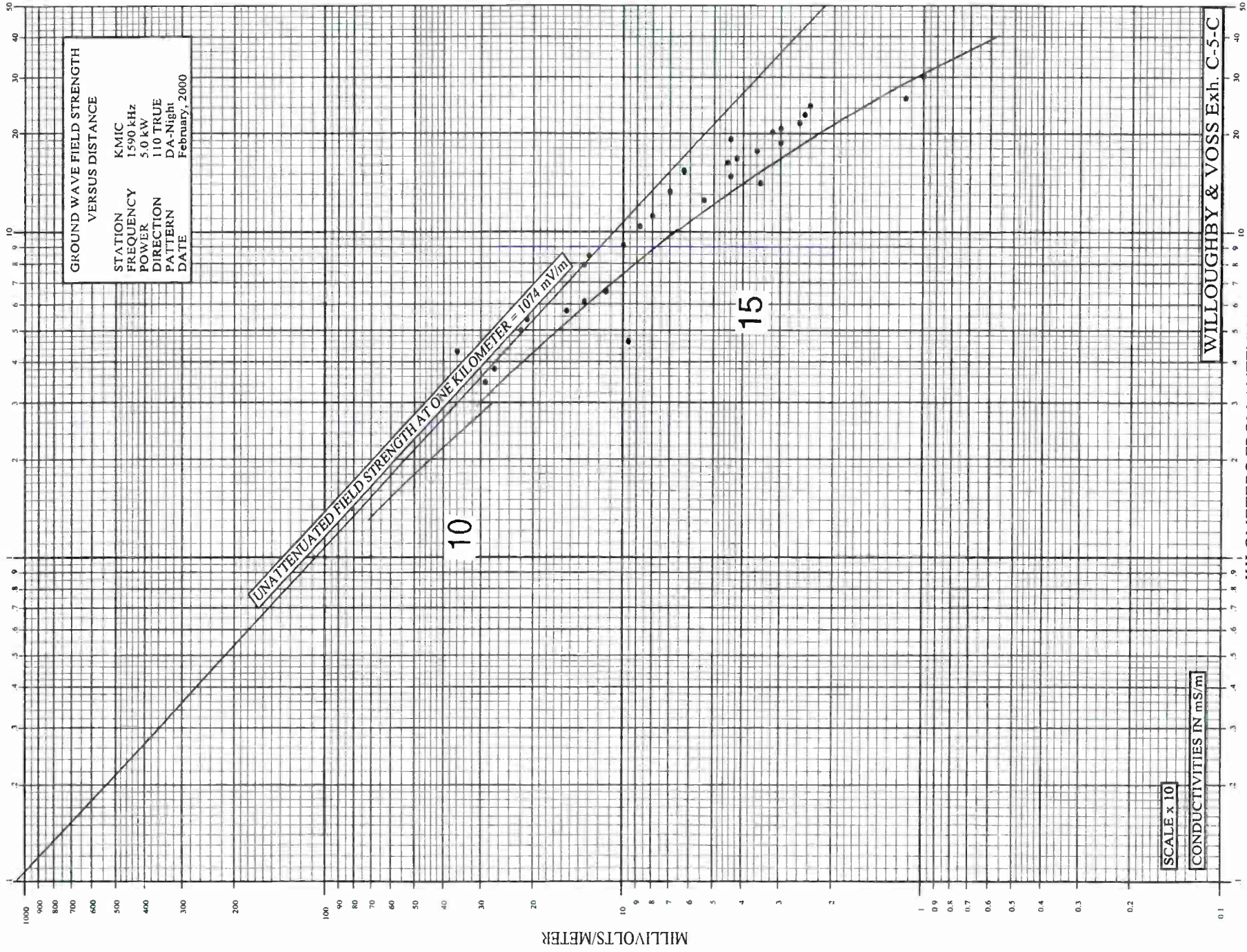
SCALE x 10  
CONDUCTIVITIES IN ms/m

KILOMETERS FROM ANTENNA

WILLOUGHBY & VOSS Exh. C-5-B



KILOMETERS FROM ANTENNA



KILOMETERS FROM ANTENNA

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WILLOUGHBY & VOSS

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KMIC CLOSE-IN MEASUREMENTS at 140.0 degrees True

Point Number	Distance (km)	Msrd Field
		Non-DA (mV/m)
1	0.30	2300
2	0.48	1400
3	0.81	870.
4	0.99	640.
5	1.05	620.
6	1.17	580.
7	1.29	490.
8	1.37	460.
9	1.52	450.
10	1.69	410.
11	1.71	410.
12	1.83	370.
13	1.93	270.
14	2.04	320.
15	2.13	300.
16	2.32	275.
17	2.54	245.
18	2.67	230.
19	2.78	185.
20	3.09	195.
21	3.20	195.

KMIC RADIO  
EXHIBIT C-6-A

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WILLOUGHBY & VOSS

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KMIC RADIATION ANALYSIS at 140.0 degrees True

Point Number	Distance (km)	Measured Field		Log Ratio (DA/ND)
		Non-DA (mV/m)	DA-N (mV/m)	
22	3.39	160.	420.	0.4191
23	3.91	170.	520.	0.4856
24	4.42	120.	270.	0.3522
25	4.99	99.0	270.	0.4357
26	5.39	88.0	270.	0.4869
27	5.84	82.0	180.	0.3415
28	6.28	52.0	160.	0.4881
29	6.68	48.0	150.	0.4949
30	7.14	68.0	190.	0.4462
31	7.72	45.0	100.	0.3468
32	8.39	24.0	80.0	0.5229
33	8.91	35.0	84.0	0.3802
34	9.36	17.0	56.0	0.5177
35	9.87	22.0	47.0	0.3297
36	10.30	11.0	43.0	0.5921
37	10.70	22.0	52.0	0.3736
38	11.20	28.0	70.0	0.3979
39	11.90	24.0	64.0	0.4260
40	12.30	6.80	20.4	0.4771
41	12.90	1.50	4.00	0.4260
42	13.40	1.20	3.10	0.4122
43	13.60	7.80	20.2	0.4133
44	14.40	5.20	13.5	0.4143
45	15.30	9.00	26.0	0.4607
46	16.00	4.90	14.7	0.4771
47	17.30	10.0	25.5	0.4065
48	17.90	5.80	16.0	0.4407
49	18.50	8.00	21.0	0.4191
50	19.30	15.0	40.0	0.4260
51	20.20	13.0	30.0	0.3632
52	21.00	14.0	30.0	0.3310
53	21.70	12.0	28.0	0.3680
54	22.50	11.0	25.0	0.3565
55	23.20	15.0	34.0	0.3554
56	23.80	13.0	30.0	0.3632
57	24.40	12.0	25.0	0.3188
58	25.00	11.0	25.0	0.3565
59	25.90	10.0	22.0	0.3424
60	26.80	10.0	26.0	0.4150
61	27.70	9.20	21.0	0.3584
62	28.60	6.40	14.0	0.3399
63	29.40	6.40	14.0	0.3399
64	30.00	5.40	13.5	0.3979
65	30.90	9.00	22.5	0.3979
66	31.60	8.00	20.0	0.3979

KMIC RADIO  
EXHIBIT C-6-A

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WILLOUGHBY & VOSS

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Average Log Ratio: 0.4092  
Antilog: 2.565

Nondirectional Analyzed Field Strength (mV/m): 700.00

DA-NIGHT Analyzed Field Strength (mV/m): 1796.00

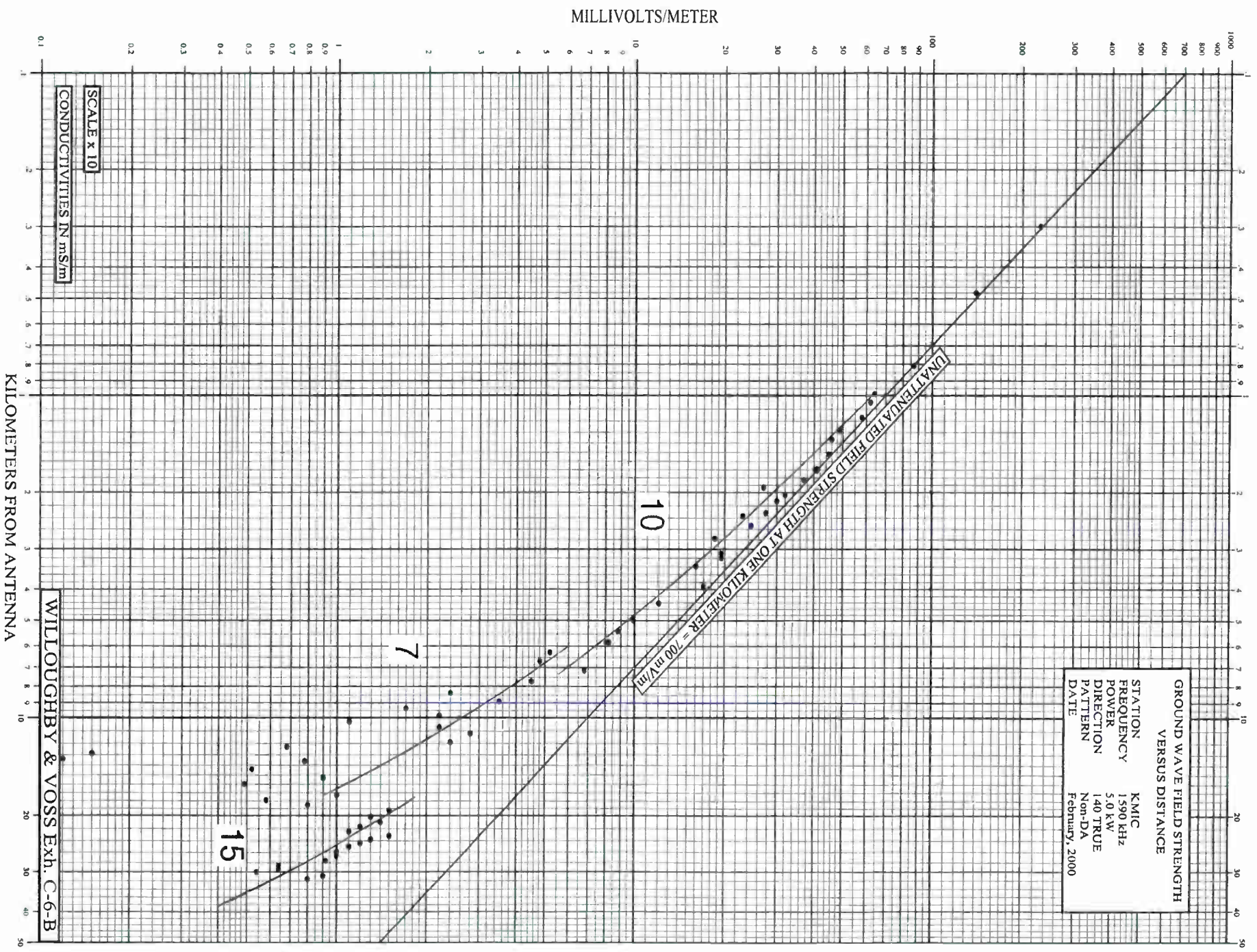
Augmented Standard Pattern Maximum (mV/m): 1817.79

KMIC RADIO  
EXHIBIT C-6-A

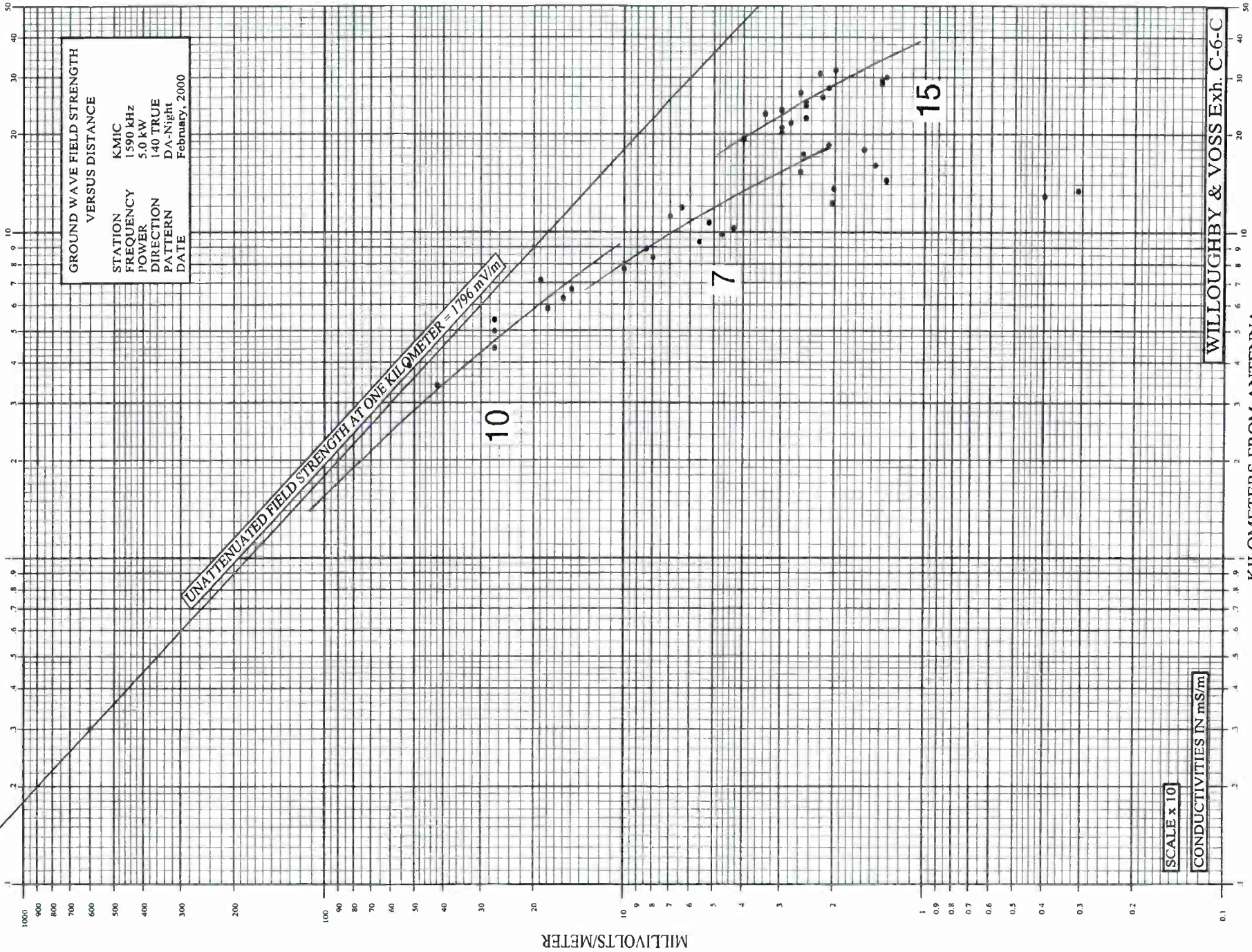
KILOMETERS FROM ANTENNA

GROUND WAVE FIELD STRENGTH  
VERSUS DISTANCE

STATION	KMIC
FREQUENCY	1590 kHz
POWER	5.0 kW
DIRECTION	140 TRUE
PATTERN	Non-DA
DATE	February, 2000



KILOMETERS FROM ANTENNA



KILOMETERS FROM ANTENNA

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WILLOUGHBY & VOSS

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KMIC CLOSE-IN MEASUREMENTS at 170.0 degrees True

Point Number	Distance (km)	Msr'd Field Non-DA (mV/m)
1	0.23	3100
2	0.37	1900
3	0.71	1000
4	0.80	860.
5	0.90	760.
6	0.99	700.
7	1.09	490.
8	1.30	460.
9	1.42	470.
10	1.51	400.
11	1.59	280.
12	1.69	250.
13	1.79	360.
14	1.88	320.
15	1.96	300.
16	2.06	250.
17	2.15	230.
18	2.24	200.
19	2.34	215.
20	2.43	190.
21	2.53	175.
22	2.61	170.
23	2.67	215.
24	2.86	145.
25	3.06	230.

KMIC RADIO  
EXHIBIT C-7-A

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WILLOUGHBY & VOSS

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KMIC RADIATION ANALYSIS at 170.0 degrees True

Point Number	Distance (km)	Measured Field		Log Ratio (DA/ND)
		Non-DA (mV/m)	DA-N (mV/m)	
26	3.64	100.	160.	0.2041
27	3.75	180.	290.	0.2071
28	4.25	92.0	150.	0.2123
29	4.75	88.0	140.	0.2016
30	5.16	99.0	160.	0.2085
31	5.73	62.0	100.	0.2076
32	6.18	59.0	95.0	0.2069
33	6.82	58.0	94.0	0.2097
34	7.24	48.0	81.0	0.2272
35	7.61	34.0	54.0	0.2009
36	8.67	25.0	40.0	0.2041
37	10.10	20.0	32.0	0.2041
38	10.70	18.0	29.0	0.2071
39	11.20	19.0	30.0	0.1984
40	11.90	18.0	29.0	0.2071
41	12.70	12.0	18.0	0.1761
42	13.50	9.80	15.0	0.1849
43	14.10	8.80	14.0	0.2016
44	14.70	11.0	17.0	0.1891
45	15.40	10.0	16.0	0.2041
46	16.00	11.0	17.0	0.1891
47	16.60	7.40	12.0	0.2099
48	17.50	5.80	9.30	0.2051
49	18.30	8.40	13.0	0.1897
50	19.60	6.60	10.6	0.2058
51	21.00	5.20	24.0	0.6642
52	23.50	4.30	6.60	0.1861
53	24.00	3.30	5.30	0.2058
54	25.30	4.20	6.50	0.1897
55	26.20	3.80	5.80	0.1836
56	27.60	3.20	5.00	0.1938
57	29.90	2.60	4.00	0.1871
58	32.40	2.20	3.60	0.2139
59	34.00	1.70	2.60	0.1845
60	37.70	2.20	3.50	0.2016

Average Log Ratio: 0.2135  
Antilog: 1.635

Nondirectional Analyzed Field Strength (mV/m): 700.00

DA-NIGHT Analyzed Field Strength (mV/m): 1144.00

Augmented Standard Pattern Maximum (mV/m): 1146.90

KMIC RADIO  
EXHIBIT C-7-A

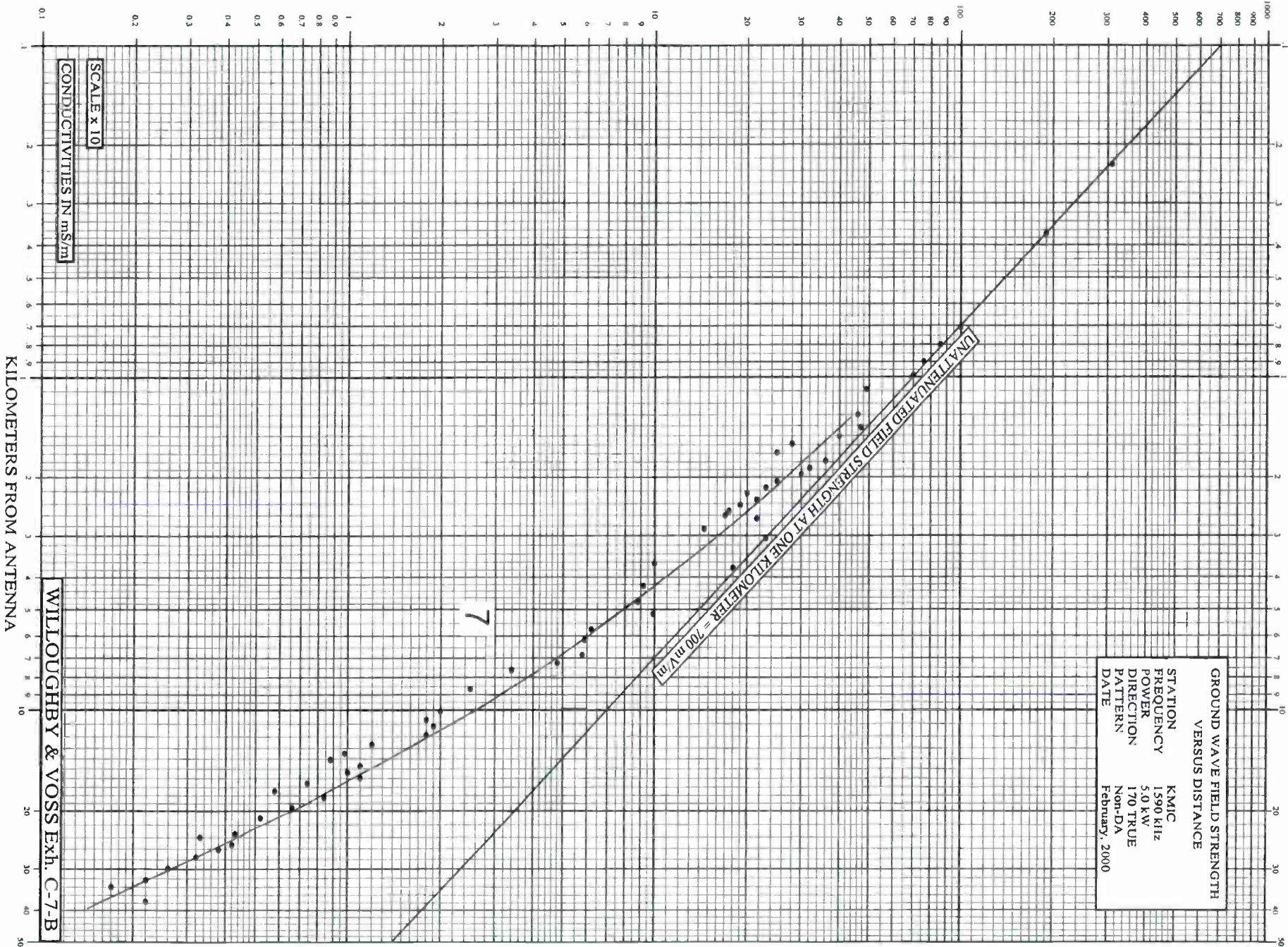


KILOMETERS FROM ANTENNA

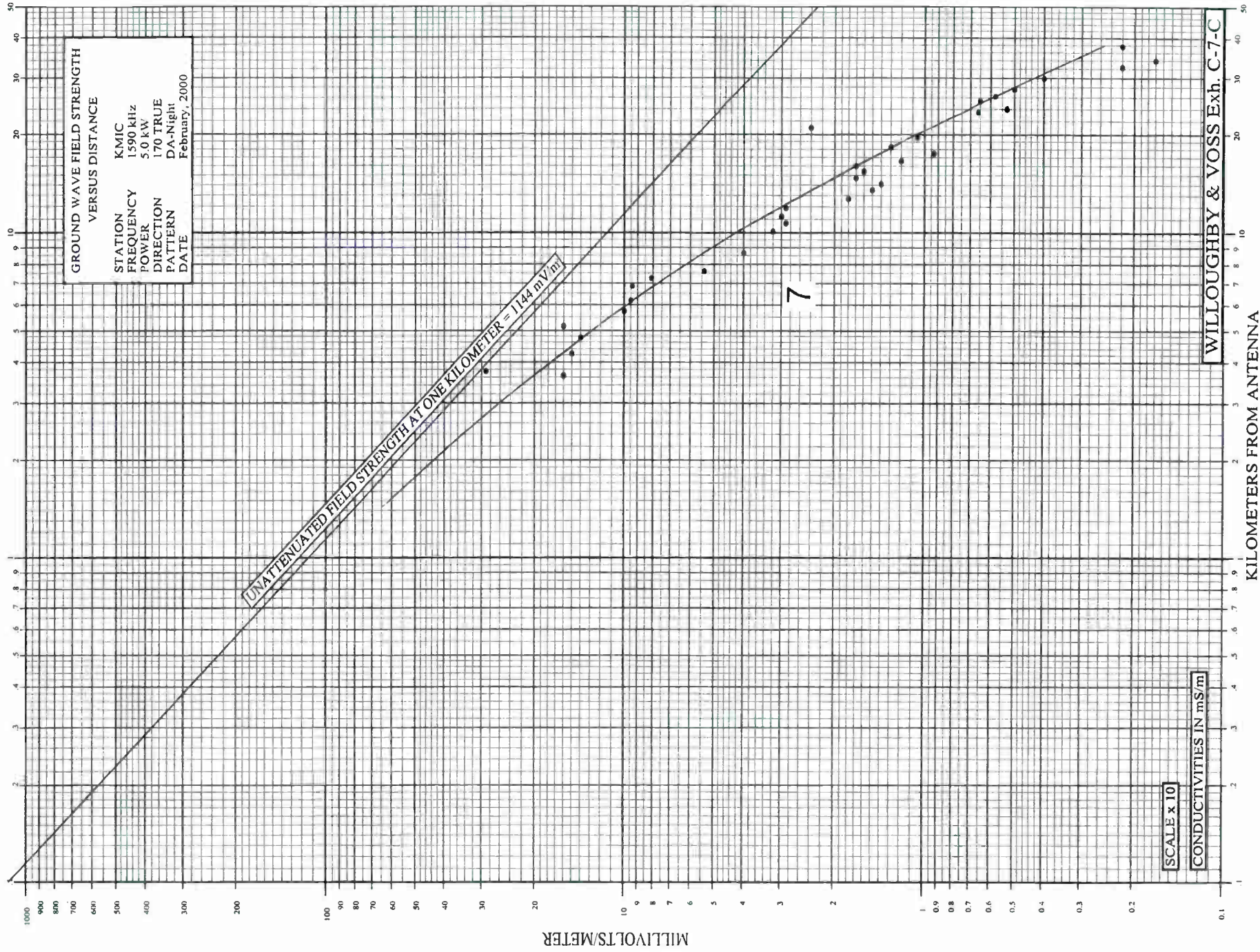
GROUND WAVE FIELD STRENGTH  
VERSUS DISTANCE

STATION	KMIC
FREQUENCY	1590 kHz
POWER	5.0 kW
DIRECTION	170 TRUE
PATTERN	Non-DA
DATE	February, 2000

MILLIVOLTS/METER



KILOMETERS FROM ANTENNA



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WILLOUGHBY & VOSS

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KMIC CLOSE-IN MEASUREMENTS at 202.0 degrees True

Point Number	Distance (km)	Msrd Field
		Non-DA (mV/m)
1	0.23	3000
2	0.39	1750
3	0.58	1200
4	0.87	800.
5	0.90	775.
6	0.97	725.
7	1.08	650.
8	1.17	600.
9	1.23	560.
10	1.41	500.
11	1.61	435.
12	1.68	415.
13	1.77	390.
14	1.84	380.
15	1.91	350.
16	1.97	300.
17	2.01	285.
18	2.05	275.
19	2.09	250.
20	2.55	210.
21	2.66	200.
22	2.84	135.
23	2.94	160.
24	3.06	230.
25	3.46	200.

KMIC RADIO  
EXHIBIT C-8-A

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WILLOUGHBY & VOSS

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KMIC RADIATION ANALYSIS at 202.0 degrees True

Point Number	Distance (km)	Measured Field		Log Ratio (DA/ND)
		Non-DA (mV/m)	DA-N (mV/m)	
26	3.64	160.	48.0	-0.5229
27	4.02	92.0	27.0	-0.5324
28	4.47	92.0	23.0	-0.6021
29	4.94	100.	17.0	-0.7696
30	5.25	90.0	22.0	-0.6118
32	6.23	68.0	20.0	-0.5315
33	6.71	64.0	22.0	-0.4638
34	7.39	52.0	14.2	-0.5637
36	8.33	58.0	14.0	-0.6173
37	9.19	25.0	6.00	-0.6198
38	9.94	24.0	5.00	-0.6812
39	10.60	19.0	3.90	-0.6877
40	11.20	24.0	4.70	-0.7081
41	11.80	22.0	4.00	-0.7404
42	12.40	17.0	3.20	-0.7253
43	12.90	11.0	3.00	-0.5643
44	13.50	19.0	4.70	-0.6067
45	14.20	18.0	4.50	-0.6021
46	15.40	11.0	1.00	-1.0414
47	16.20	11.0	1.00	-1.0414
48	17.40	8.20	.820	-1.0000
49	18.40	8.80	.880	-1.0000
50	19.10	6.20	.800	-0.8893
51	19.80	4.80	.480	-1.0000
52	20.70	4.80	.400	-1.0792
56	23.50	4.40	.600	-0.8653
57	24.20	4.00	.400	-1.0000
58	25.00	3.80	.600	-0.8016
59	25.90	5.40	.200	-1.4314
60	27.80	1.90	.400	-0.6767
61	30.00	3.20	.750	-0.6301
63	34.80	2.80	.250	-1.0492
64	36.00	2.10	.220	-0.9798
65	37.60	1.30	.130	-1.0000

Average Log Ratio: -0.7834  
Antilog: .1647

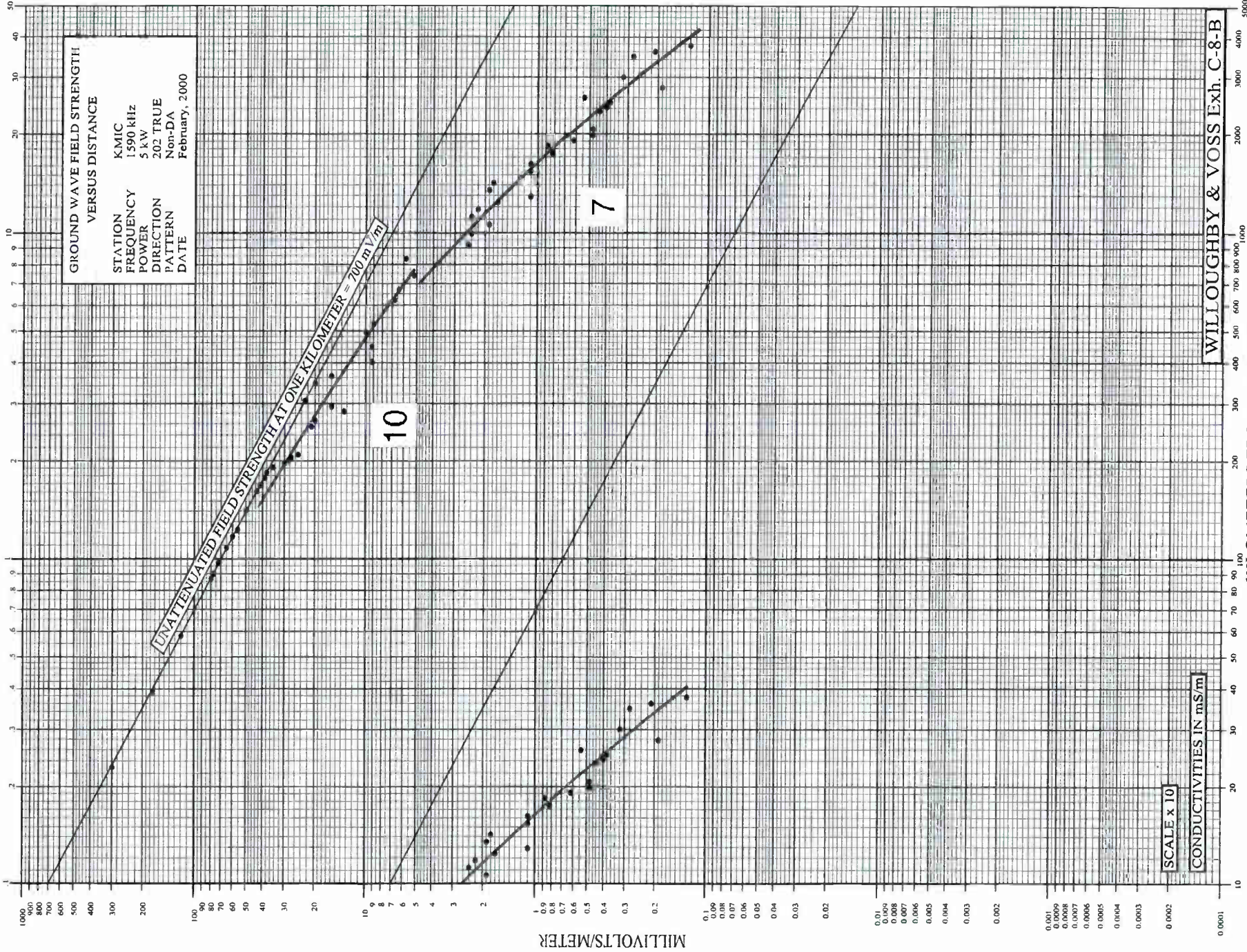
Nondirectional Analyzed Field Strength (mV/m): 700.00

DA-NIGHT Analyzed Field Strength (mV/m): 115.00

Augmented Standard Pattern Maximum (mV/m): 117.23

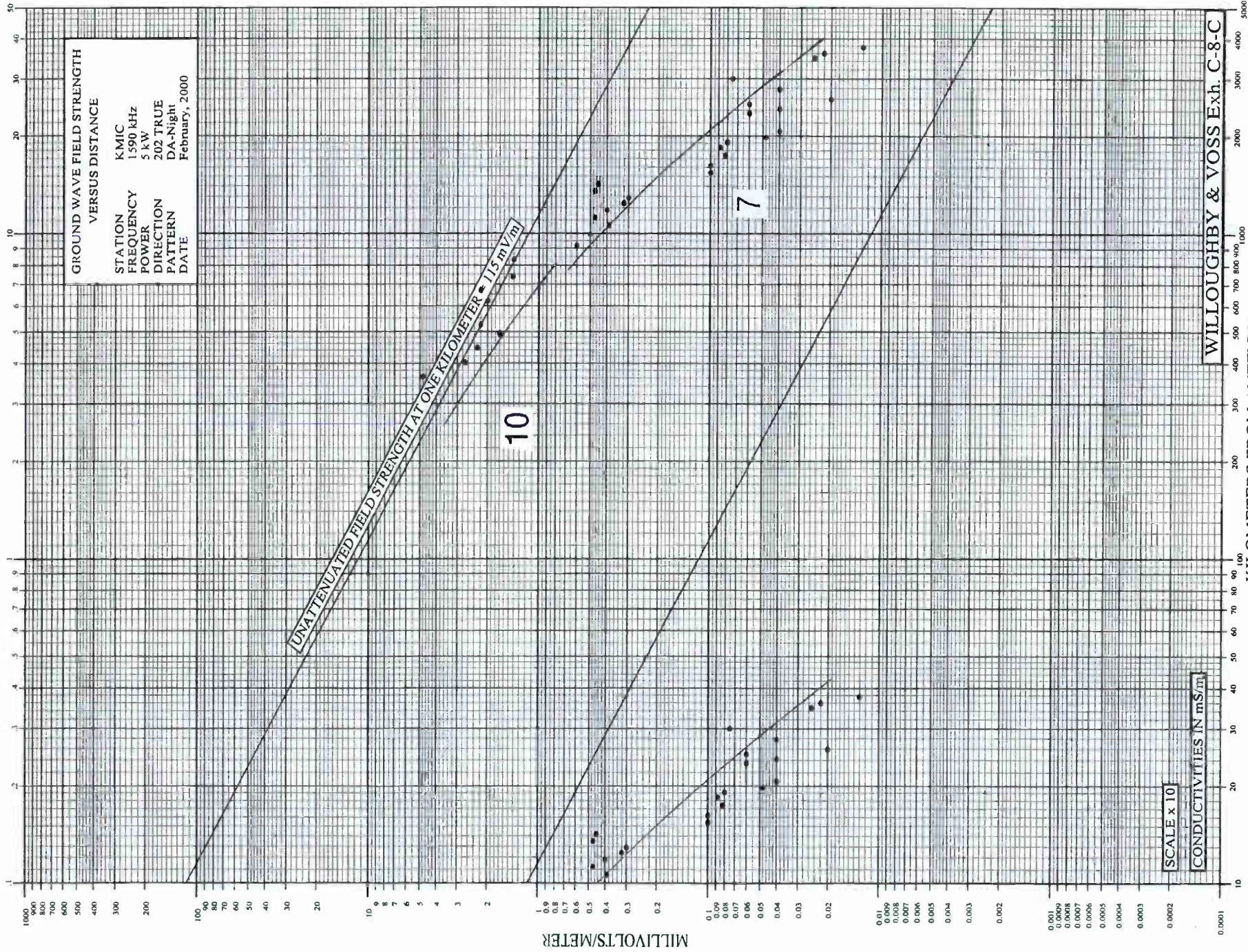
KMIC RADIO  
EXHIBIT C-8-A

KILOMETERS FROM ANTENNA



WILLOUGHBY & VOSS Exh. C-8-B

KILOMETERS FROM ANTENNA



KILOMETERS FROM ANTENNA

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WILLOUGHBY & VOSS

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KMIC CLOSE-IN MEASUREMENTS at 225.0 degrees True

Point Number	Distance (km)	Msrd Field Non-DA (mV/m)
1	0.29	2400
2	0.53	1300
3	0.68	1000
4	0.72	950.
5	0.85	600.
6	0.98	516.
7	1.16	390.
8	1.30	312.
9	1.42	265.
10	1.46	248.
11	1.58	250.
12	1.67	235.
13	1.74	270.
14	1.82	219.
15	1.89	223.
16	2.00	215.
17	2.08	340.
18	2.38	275.
19	2.69	250.
20	2.93	235.

KMIC RADIO  
EXHIBIT C-9-A

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WILLOUGHBY & VOSS

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KMIC RADIATION ANALYSIS at 225.0 degrees True

	Point Number	Distance (km)	Measured Field		Log Ratio (DA/ND)
			Non-DA (mV/m)	DA-N (mV/m)	
MP	15	1.89	223.	130.	-0.2344
	21	3.14	198.	84.5	-0.3698
	22	3.54	100.	31.6	-0.5003
	23	3.91	86.0	31.5	-0.4362
	24	4.26	78.0	32.5	-0.3802
	25	4.68	92.0	39.0	-0.3727
	26	5.31	81.0	26.5	-0.4852
	27	5.65	66.0	33.0	-0.3010
	28	6.02	60.0	29.2	-0.3128
	29	6.45	51.0	23.2	-0.3421
	30	6.85	46.5	21.8	-0.3290
	31	7.22	60.5	19.5	-0.4917
	32	7.77	64.0	23.2	-0.4407
	33	8.43	54.5	20.0	-0.4354
	34	8.87	48.0	14.6	-0.5169
	35	9.43	18.0	10.5	-0.2341
	36	10.00	27.0	7.60	-0.5506
	37	10.50	24.5	7.95	-0.4888
	38	11.10	22.2	9.60	-0.3641
	39	11.40	24.5	9.30	-0.4207
	40	11.90	17.5	5.98	-0.4663
	41	12.30	16.2	3.20	-0.7044
	42	12.70	12.0	2.32	-0.7137
	43	13.10	17.5	6.00	-0.4649
	44	13.40	14.8	4.85	-0.4845
	45	13.80	11.2	2.88	-0.5898
	46	14.30	9.80	2.32	-0.6257
	47	15.20	5.90	2.40	-0.3906
	48	15.80	4.65	1.66	-0.4473
	49	16.30	6.70	2.28	-0.4681
	50	17.00	7.10	2.72	-0.4167
	51	17.50	5.00	3.20	-0.1938
	52	18.20	4.30	1.96	-0.3412
	53	19.90	5.90	1.62	-0.5613
	54	20.30	3.80	1.38	-0.4399
	55	20.90	4.15	1.14	-0.5611
	56	21.80	5.95	1.55	-0.5842
	57	22.40	4.10	1.12	-0.5636
	58	22.90	4.45	1.31	-0.5311
	59	23.60	4.51	1.48	-0.4839
	60	25.50	4.05	1.26	-0.5071
	61	26.80	5.10	1.32	-0.5870
	62	27.70	3.32	1.18	-0.4493

KMIC RADIO  
EXHIBIT C-9-A



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WILLOUGHBY & VOSS

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63	28.90	3.20	1.12	-0.4559
64	31.60	2.82	.790	-0.5526
65	34.20	2.85	.620	-0.6625

Average Log Ratio: -0.4620

Antilog: .3451

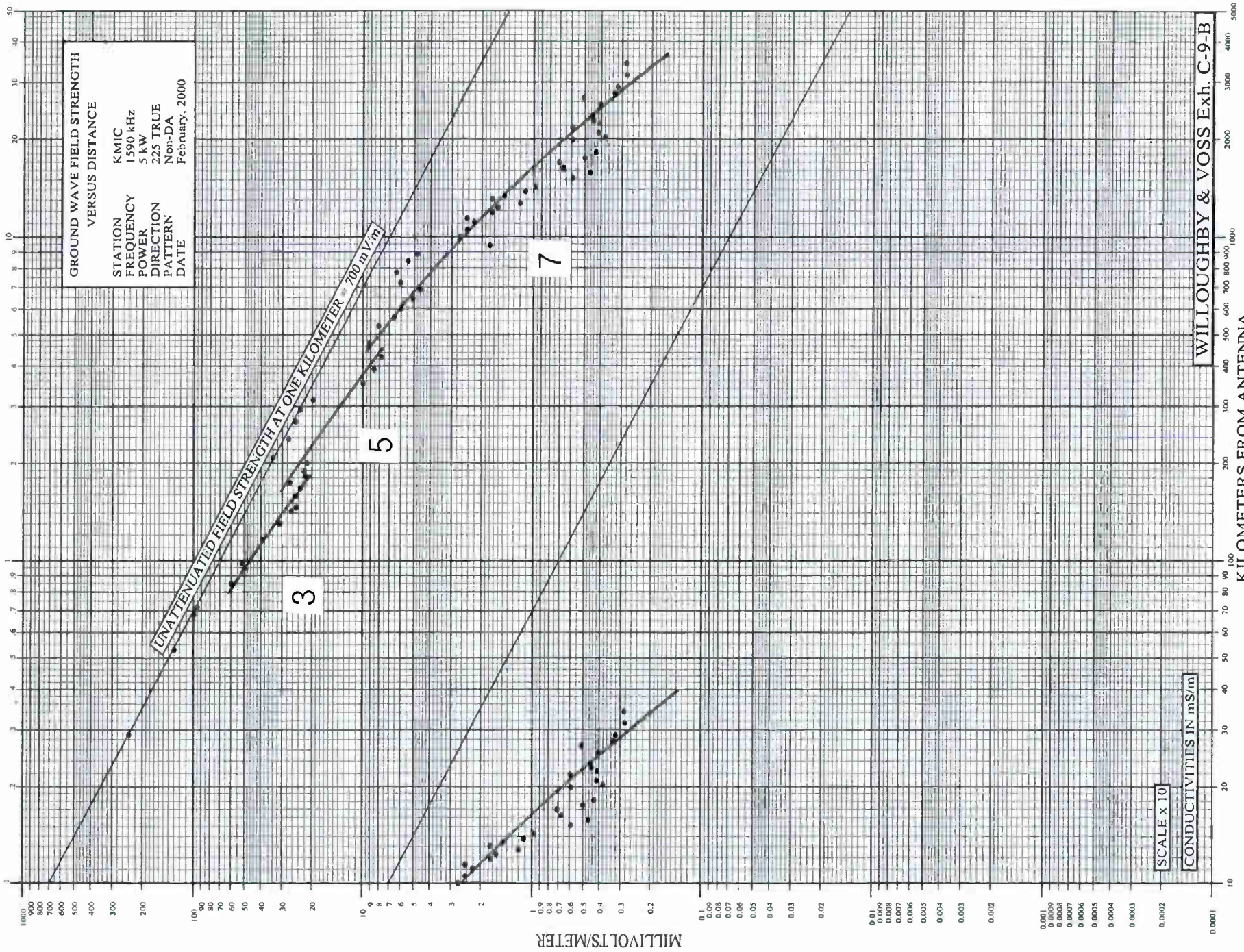
Nondirectional Analyzed Field Strength (mV/m): 700.00

DA-NIGHT Analyzed Field Strength (mV/m): 242.00

Augmented Standard Pattern Maximum (mV/m): 273.71

KMIC RADIO  
EXHIBIT C-9-A

KILOMETERS FROM ANTENNA



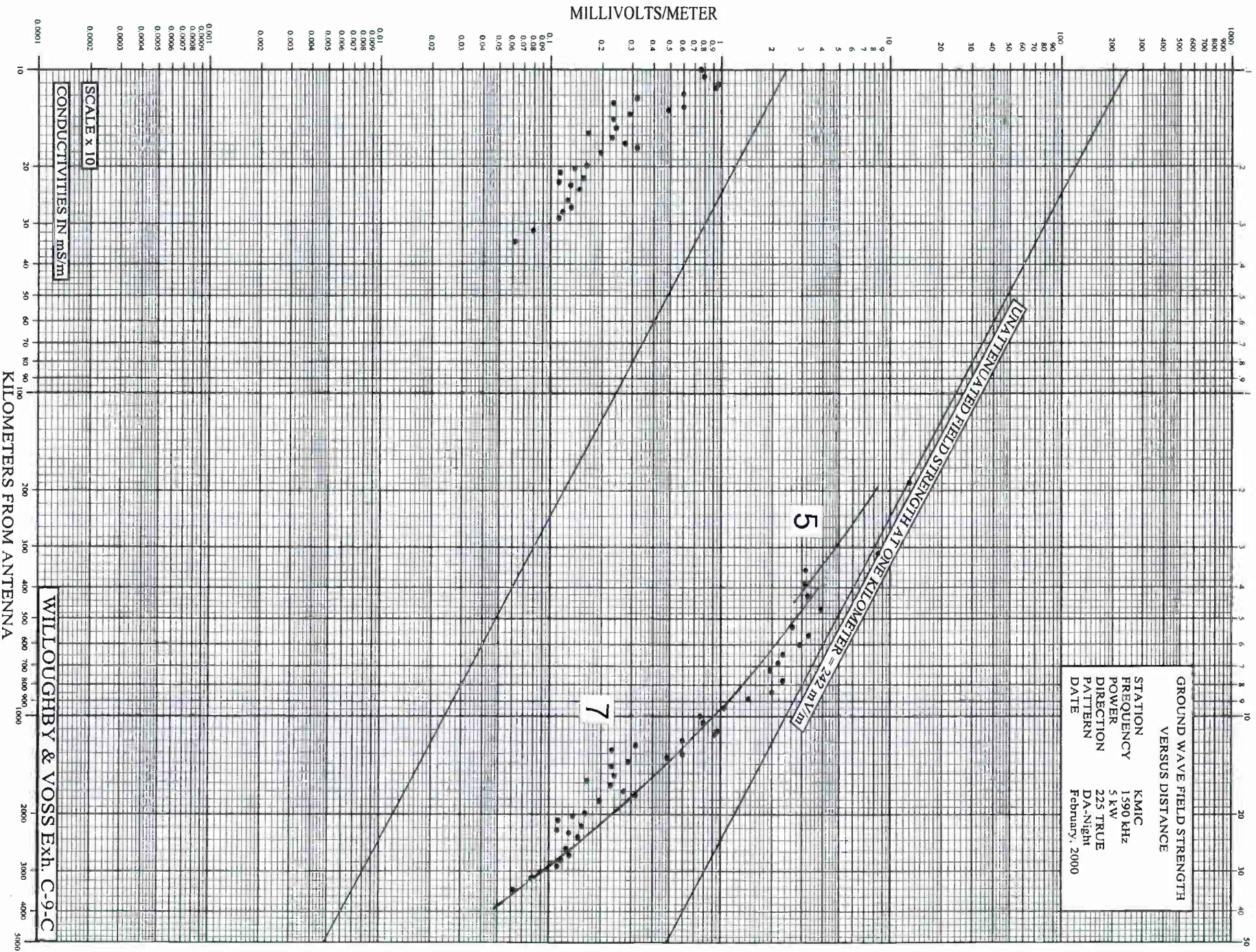
MILLIVOLTS/METER

KILOMETERS FROM ANTENNA

KILOMETERS FROM ANTENNA

GROUND WAVE FIELD STRENGTH  
VERSUS DISTANCE

STATION	KMIC
FREQUENCY	1590 KHz
POWER	5 kW
DIRECTION	225 TRUE
PATTERN	DA-Night
DATE	February, 2000



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WILLOUGHBY & VOSS

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KMIC CLOSE-IN MEASUREMENTS at 260.0 degrees True

Point Number	Distance (km)	Msrd Field
		Non-DA (mV/m)
1	0.39	1800
2	0.44	1600
3	0.68	990.
4	0.74	900.
5	0.95	700.
6	1.01	710.
7	1.22	310.
8	1.29	400.
9	1.43	400.
10	1.51	460.
11	1.66	300.
12	1.72	320.
13	1.86	165.
14	1.93	165.
15	2.04	165.
16	2.12	84.
17	2.28	118.
18	2.43	122.
19	2.53	111.
20	2.69	120.

KMIC RADIO  
EXHIBIT C-10-A

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WILLOUGHBY & VOSS

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KMIC RADIATION ANALYSIS at 260.0 degrees True

Point Number	Distance (km)	Measured Field		Log Ratio (DA/ND)
		Non-DA (mV/m)	DA-N (mV/m)	
21	2.98	176.	29.2	-0.7801
22	3.49	137.	11.9	-1.0612
23	4.05	110.	12.2	-0.9550
24	4.41	89.0	13.5	-0.8191
25	4.67	46.0	9.50	-0.6850
26	4.99	62.5	9.00	-0.8416
27	5.71	70.0	13.0	-0.7312
28	6.66	54.5	5.10	-1.0288
29	6.87	64.0	9.40	-0.8331
30	7.26	48.0	4.90	-0.9910
31	7.69	47.5	4.20	-1.0534
32	8.21	39.5	3.45	-1.0588
33	8.38	33.5	1.88	-1.2509
34	9.54	32.0	3.65	-0.9429
35	10.40	36.2	5.02	-0.8580
36	12.00	17.2	3.42	-0.7015
37	16.10	13.8	1.90	-0.8611
38	19.40	5.70	.930	-0.7874
39	23.20	3.00	.700	-0.6320
40	24.00	4.20	.800	-0.7202
41	25.10	2.22	.380	-0.7666
42	26.70	3.05	.700	-0.6392
43	27.80	1.60	.360	-0.6478
44	28.90	2.08	.660	-0.4985
45	29.80	2.70	.690	-0.5925
46	30.70	2.85	.610	-0.6695
47	34.70	2.90	.380	-0.8826
48	35.60	4.40	.528	-0.9208
49	36.70	4.10	.735	-0.7465
50	37.80	2.18	.325	-0.8266
51	40.10	2.12	.400	-0.7243

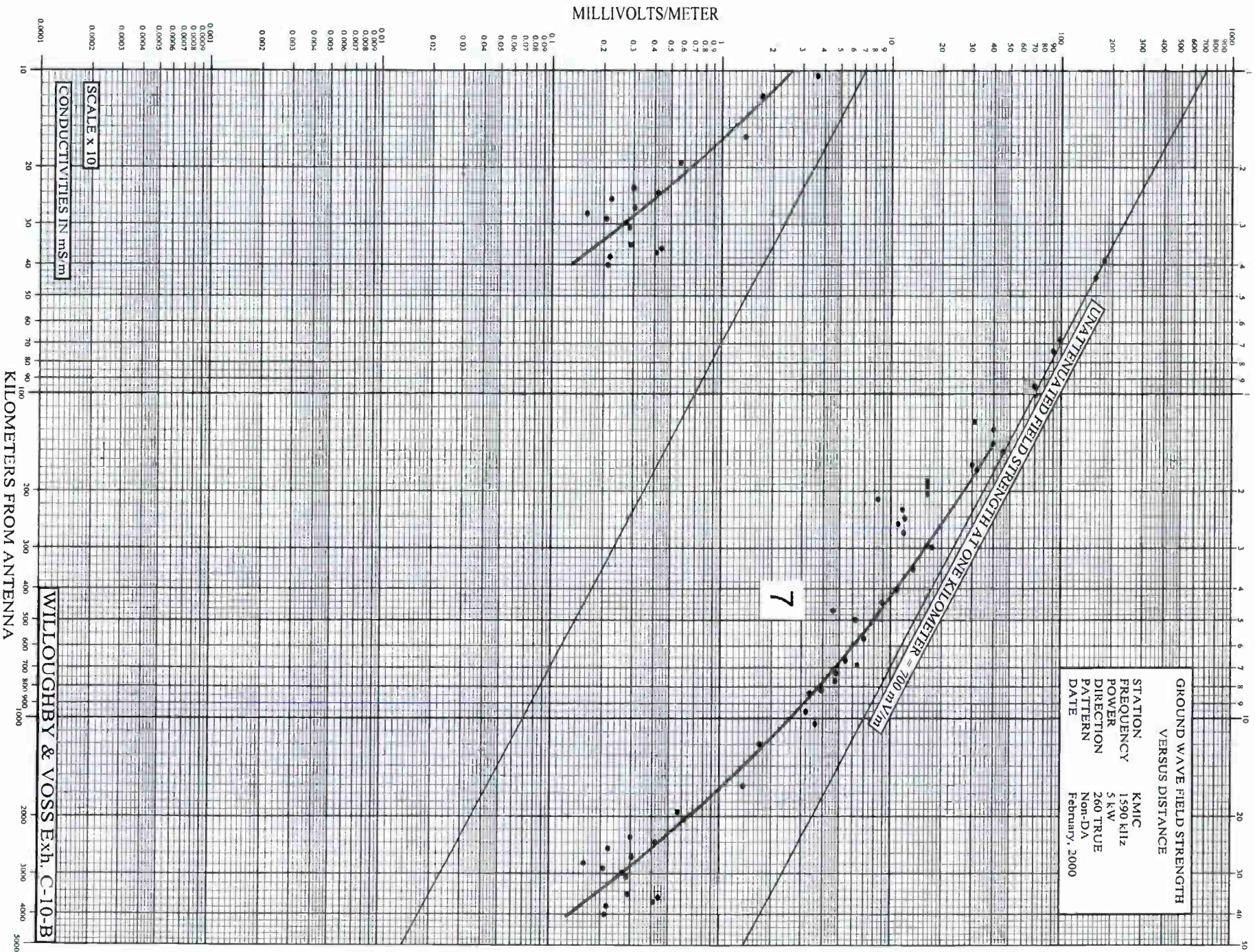
Average Log Ratio: -0.8228  
Antilog: .1504

Nondirectional Analyzed Field Strength (mV/m): 700.00

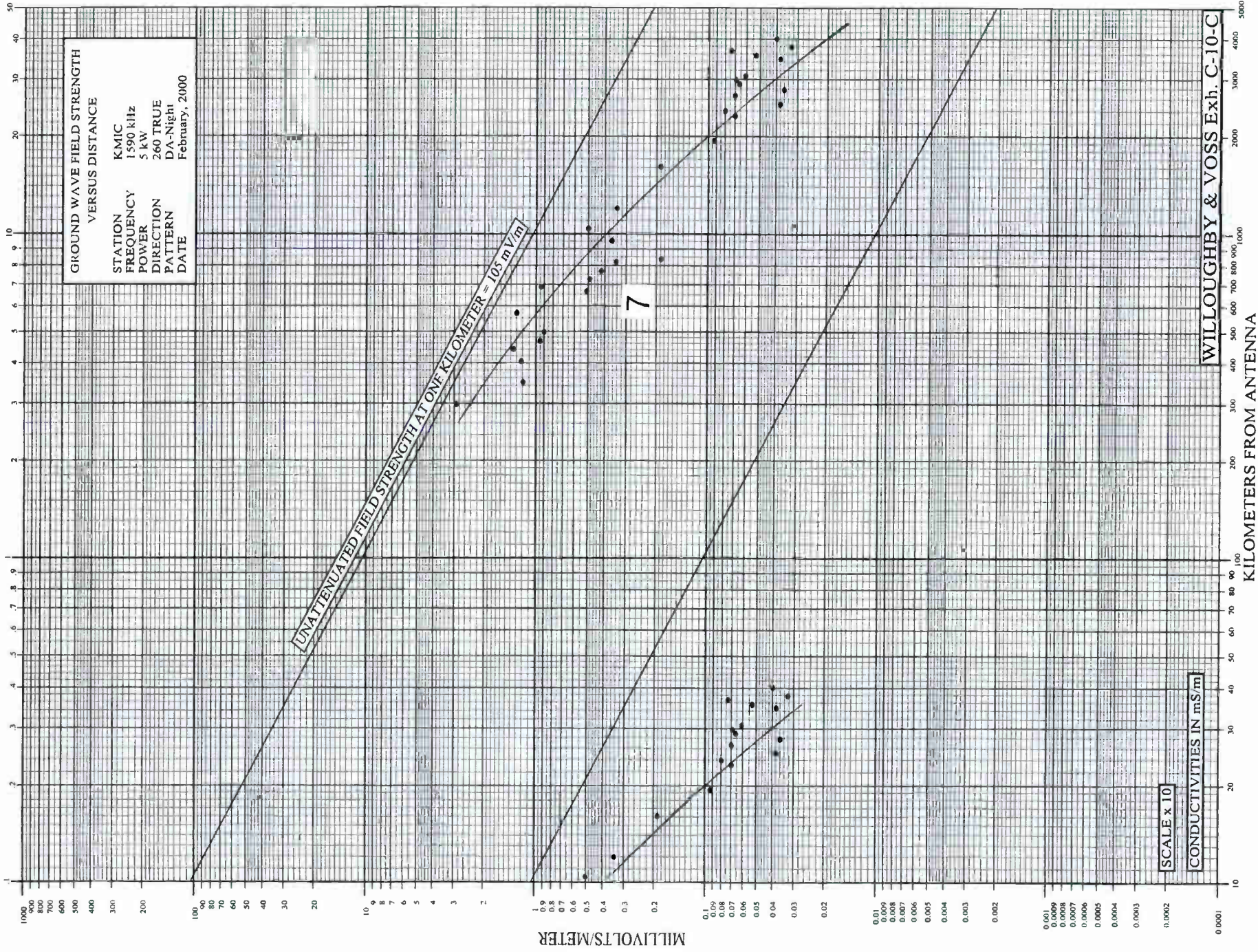
DA-NIGHT Analyzed Field Strength (mV/m): 105.00

Augmented Standard Pattern Maximum (mV/m): 106.66

KILOMETERS FROM ANTENNA



KILOMETERS FROM ANTENNA



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WILLOUGHBY & VOSS

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KMIC CLOSE-IN MEASUREMENTS at 274.0 degrees True

Point Number	Distance (km)	Msr'd Field Non-DA (mV/m)
1	0.14	4000
2	0.30	2200
3	0.50	1400
4	0.73	960.
5	0.98	700.
6	1.01	580.
7	1.06	520.
8	1.13	480.
9	1.32	530.
10	1.60	440.
11	1.72	405.
12	1.95	290.
13	2.33	280.
14	2.37	260.
15	2.48	240.
16	2.56	220.
17	2.72	185.
18	2.82	160.
19	2.97	115.
20	3.17	170.

KMIC RADIO  
EXHIBIT C-11-A



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WILLOUGHBY & VOSS

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KMIC RADIATION ANALYSIS at 274.0 degrees True

	Point Number	Distance (km)	Measured Field		Log Ratio (DA/ND)
			Non-DA (mV/m)	DA-N (mV/m)	
MP	21	3.38	120.	25.0	-0.6812
	22	3.59	115.	31.2	-0.5665
	23	3.99	110.	23.0	-0.6797
	24	4.62	105.	22.0	-0.6788
	25	5.63	32.0	8.40	-0.5809
	26	5.95	41.0	5.00	-0.9138
	27	6.44	62.0	7.20	-0.9351
	28	6.93	81.0	10.0	-0.9085
	29	7.40	82.0	8.20	-1.0000
	30	7.64	40.0	6.20	-0.8097
	31	8.09	45.0	6.80	-0.8207
	32	8.64	23.5	1.40	-1.2249
	33	9.06	34.0	4.40	-0.8880
	34	9.40	20.0	2.30	-0.9393
	35	10.10	23.5	2.40	-0.9909
	36	10.60	20.0	2.60	-0.8861
	37	11.00	19.0	1.90	-1.0000
	38	11.80	20.0	2.10	-0.9788
	39	12.50	27.0	2.80	-0.9842
	40	12.90	15.5	2.00	-0.8893
	41	13.90	16.0	1.80	-0.9488
	42	15.40	15.0	2.00	-0.8751
	43	17.90	7.80	1.00	-0.8921
	44	18.60	8.00	.840	-0.9788
	45	19.10	7.20	1.00	-0.8573
	46	22.70	5.50	.570	-0.9845
	47	23.70	5.80	.590	-0.9926
	48	24.50	5.80	.800	-0.8603
	49	29.90	3.30	.500	-0.8195
	50	31.50	3.30	.330	-1.0000
	51	33.20	3.10	.410	-0.8786
	52	34.80	2.30	.250	-0.9638
	53	36.40	2.50	.280	-0.9508
	54	38.00	1.40	.190	-0.8674
	55	39.60	2.25	.250	-0.9542

Average Log Ratio: -0.8909  
Antilog: .1286

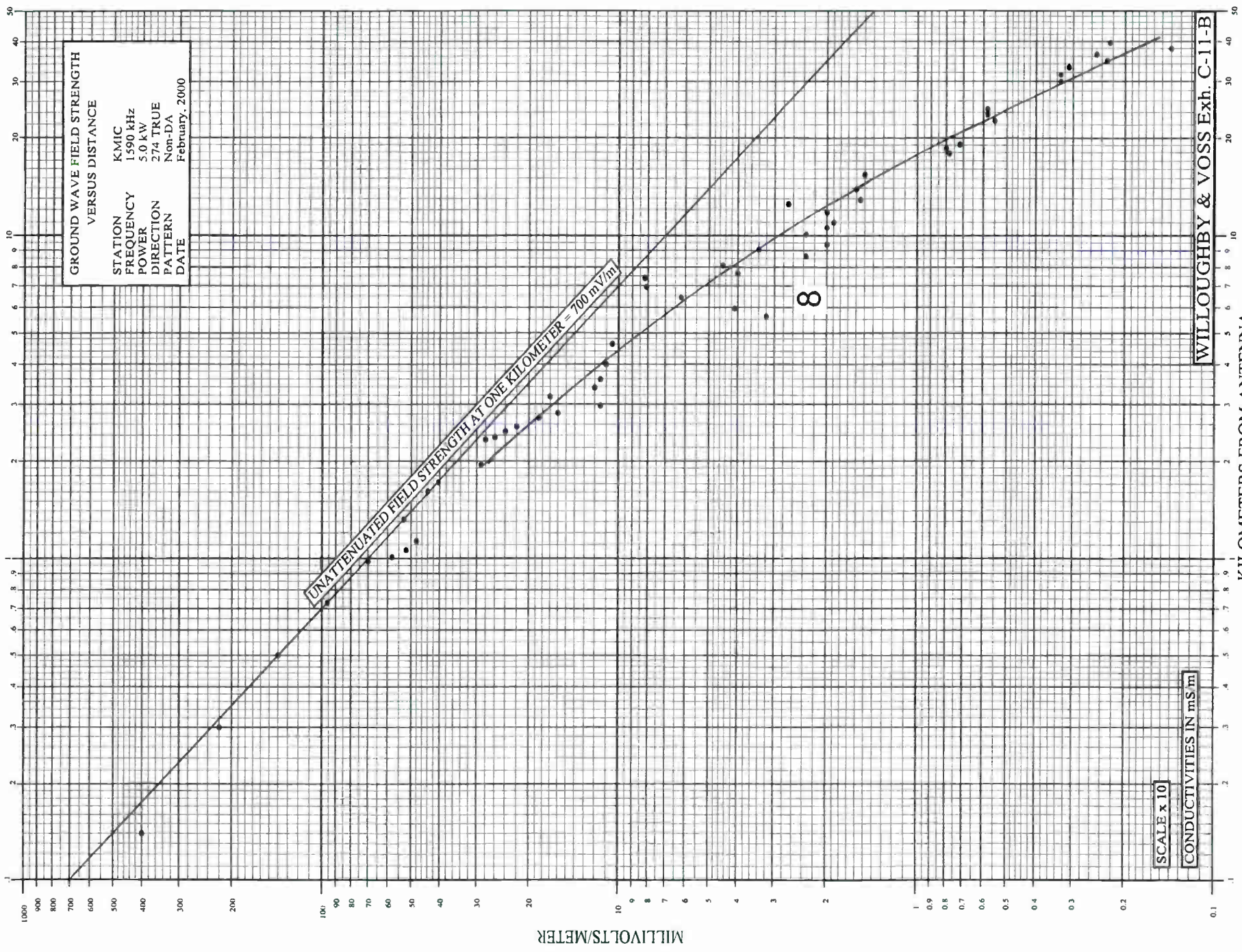
Nondirectional Analyzed Field Strength (mV/m): 700.00

DA-NIGHT Analyzed Field Strength (mV/m): 90.00

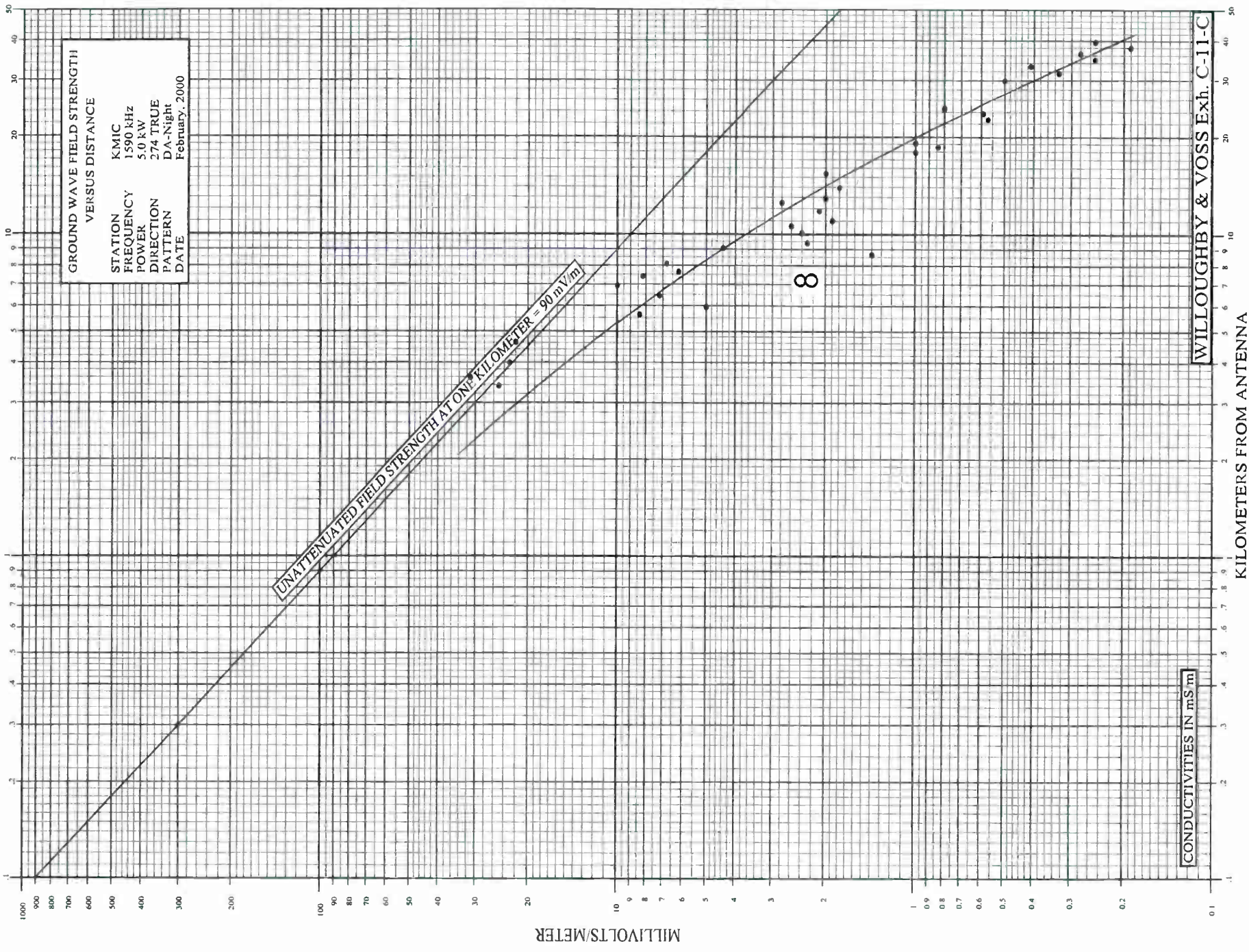
Augmented Standard Pattern Maximum (mV/m): 101.50

KMIC RADIO  
EXHIBIT C-11-A

KILOMETERS FROM ANTENNA



KILOMETERS FROM ANTENNA



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WILLOUGHBY & VOSS

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KMIC CLOSE-IN MEASUREMENTS at 288.0 degrees True

Point Number	Distance (km)	Msrd Field
		Non-DA (mV/m)
1	0.16	3000
2	0.32	2200
3	0.40	1750
4	0.48	1450
5	0.56	1220
6	0.68	1000
7	0.76	930.
8	1.08	400.
9	1.11	380.
10	1.14	360.
11	1.24	255.
12	1.43	360.
13	1.58	420.
14	1.64	340.
15	1.74	290.
16	1.87	345.
17	1.95	165.
18	2.48	240.
19	2.53	280.
20	2.57	265.
21	2.70	250.

KMIC RADIO  
EXHIBIT C-12-A

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WILLOUGHBY & VOSS

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KMIC RADIATION ANALYSIS at 288.0 degrees True

Point Number	Distance (km)	Measured Field		Log Ratio (DA/ND)
		Non-DA (mV/m)	DA-N (mV/m)	
22	3.62	205.		
23	4.14	130.	20.0	-0.8129
24	4.38	92.0	14.0	-0.8177
25	4.55	110.	16.5	-0.8239
26	4.94	95.0	14.4	-0.8194
27	5.86	78.0		
28	6.37	62.0	8.50	-0.8630
29	6.84	105.	14.0	-0.8751
30	7.39	50.0	7.50	-0.8239
31	9.06	40.0	6.20	-0.8097
32	9.40	32.0	5.90	-0.7343
33	9.90	36.0		
34	11.38	25.0		
35	11.60	27.0		
36	12.60	21.5	4.00	-0.7304
37	13.20	19.0	2.80	-0.8316
38	14.10	11.5	1.90	-0.7819
39	14.30	15.0	2.40	-0.7959
40	14.90	12.0	2.00	-0.7782
41	15.40	11.2	1.70	-0.8188
42	17.50	19.8	2.20	-0.9542
43	18.80	13.5	2.40	-0.7501
44	19.50	12.5	1.90	-0.8182
45	20.30	9.40		
46	21.10	10.5		
47	22.40	7.90	1.20	-0.8184
48	24.20	7.00	1.00	-0.8451
49	26.40	5.30	.800	-0.8212
50	27.30	4.70	.580	-0.9087
51	28.00	4.90	.600	-0.9120
52	29.80	4.50	.600	-0.8751
53	30.60	4.20	.600	-0.8451

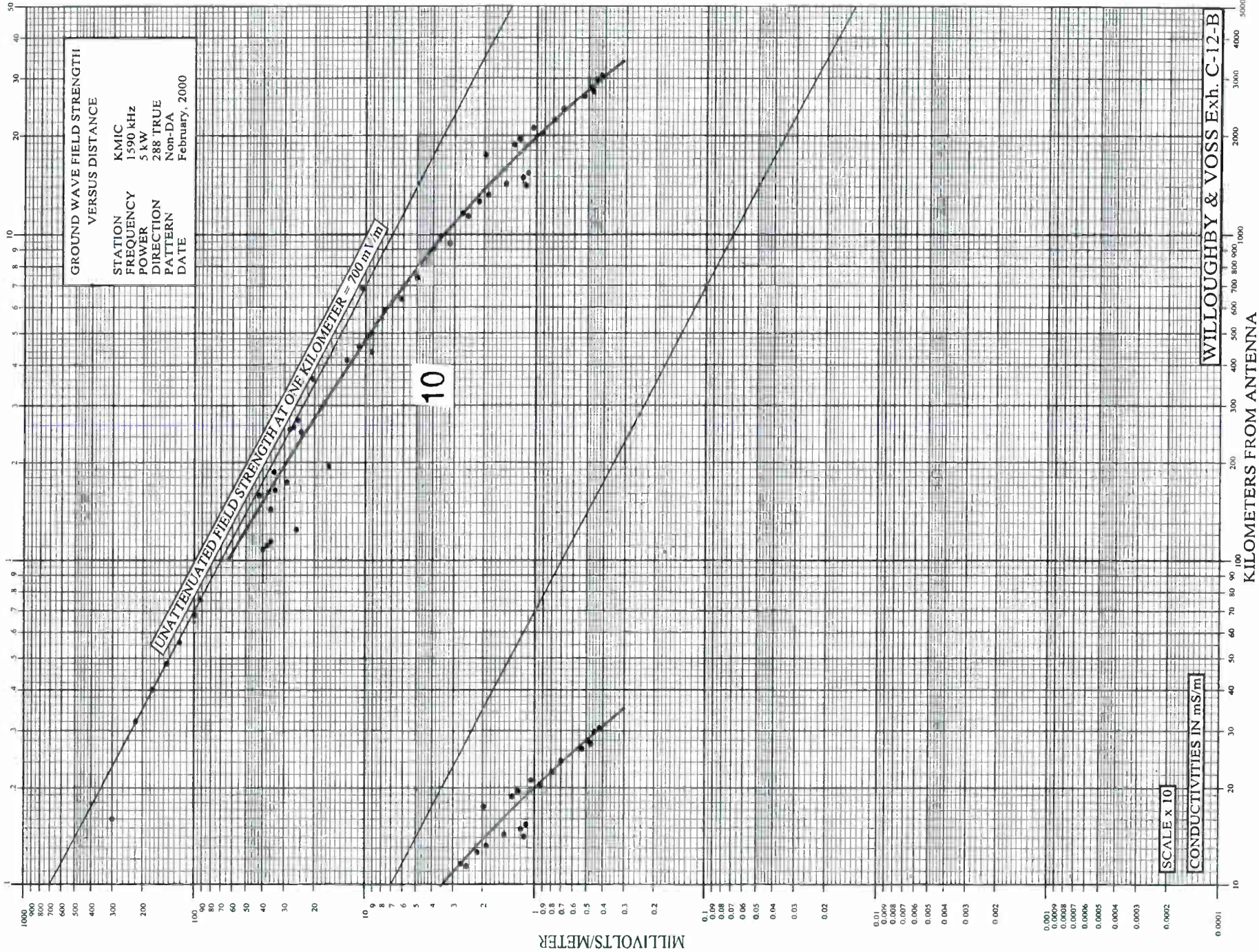
Average Log Ratio: -0.8266  
Antilog: .1491

Nondirectional Analyzed Field Strength (mV/m): 700.00

DA-NIGHT Analyzed Field Strength (mV/m): 104.00

Augmented Standard Pattern Maximum (mV/m): 106.50

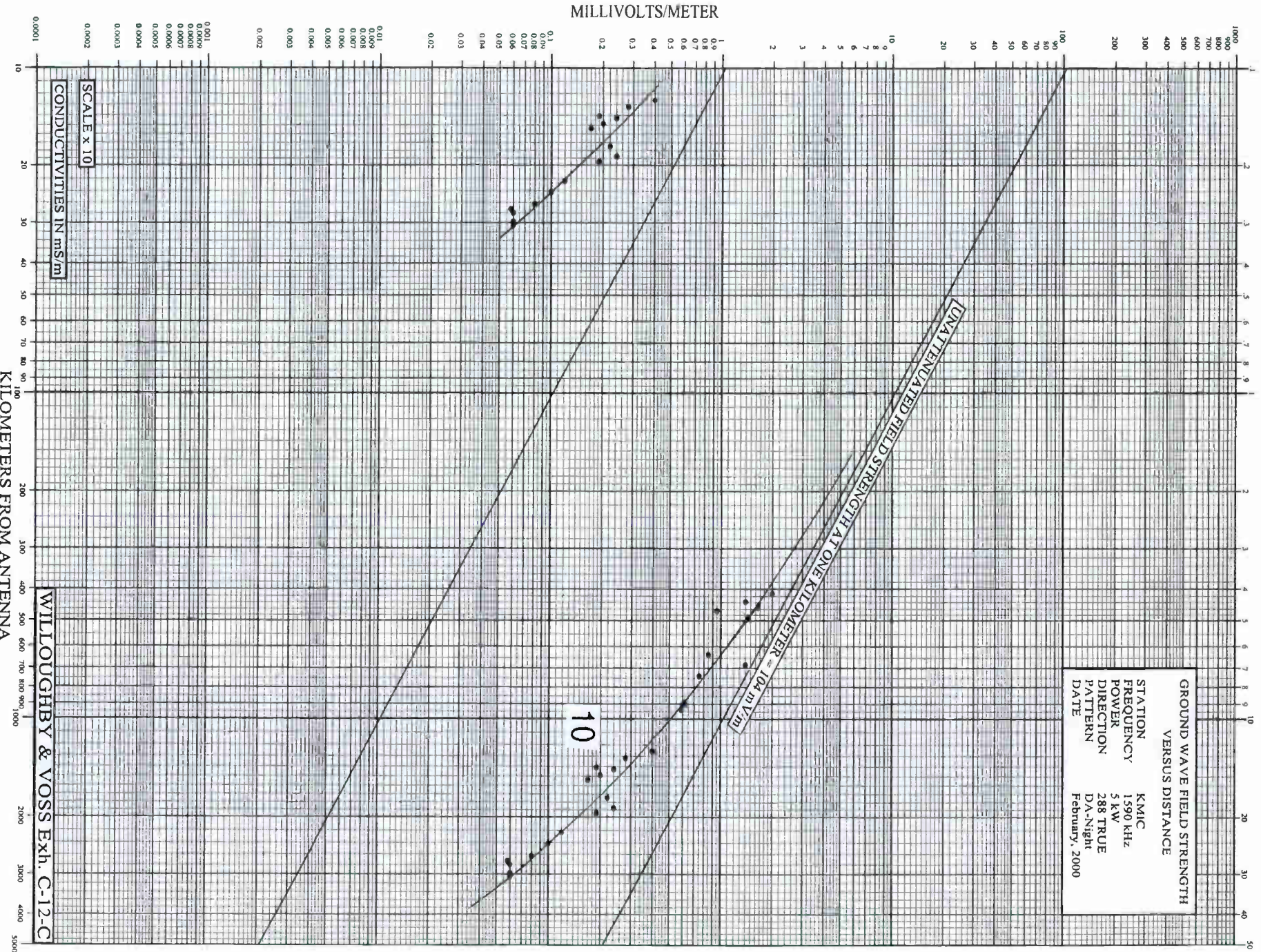
KILOMETERS FROM ANTENNA



KILOMETERS FROM ANTENNA

GROUND WAVE FIELD STRENGTH  
VERSUS DISTANCE

STATION KMIC  
FREQUENCY 1590 KHZ  
POWER 5 KW  
DIRECTION 288 TRUE  
PATTERN DA-Night  
DATE February, 2000



MILLIVOLTS/METER

SCALE x 10  
CONDUCTIVITIES IN mS/m

KILOMETERS FROM ANTENNA

WILLOUGHBY & VOSS Ex. C-12-C

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WILLOUGHBY & VOSS

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KMIC CLOSE-IN MEASUREMENTS at 322.0 degrees True

Point Number	Distance (km)	Msr'd Field Non-DA (mV/m)
1	0.23	2800
2	0.27	2500
3	0.31	2250
4	0.59	960.
5	0.99	690.
6	1.06	480.
7	1.40	480.
8	1.71	400.
9	1.91	360.
10	2.06	300.
11	2.17	280.
12	2.67	190.
13	2.75	200.
14	2.90	220.
15	3.01	230.
16	3.06	200.

KMIC RADIO  
EXHIBIT C-13-A



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WILLOUGHBY & VOSS

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KMIC RADIATION ANALYSIS at 322.0 degrees True

Point Number	Distance (km)	Measured Field		Log Ratio (DA/ND)
		Non-DA (mV/m)	DA-N (mV/m)	
17	3.35	200.	75.0	-0.4260
18	4.02	120.	42.5	-0.4508
19	4.83	92.0	34.0	-0.4323
20	7.48	88.0	32.5	-0.4326
21	7.77	65.0	26.5	-0.3897
22	8.29	38.0	14.0	-0.4337
23	11.42	41.0	15.0	-0.4367
24	15.20	7.50	2.50	-0.4771
25	16.00	12.0	4.50	-0.4260
26	17.10	8.80	3.00	-0.4674
27	18.00	8.00	3.20	-0.3979
28	19.00	7.00	3.00	-0.3680
29	21.51	5.00	1.55	-0.5086
30	23.80	3.55	1.35	-0.4199
31	24.90	2.75	.950	-0.4616
32	28.20	1.85	.650	-0.4543
33	29.10	1.75	.710	-0.3918
34	30.80	1.65	.600	-0.4393
35	31.70	1.45	.500	-0.4624
36	33.30	1.85	.610	-0.4818
37	34.80	1.25	.410	-0.4841
38	36.50	.700	.280	-0.3979
39	38.10	.520	.180	-0.4607

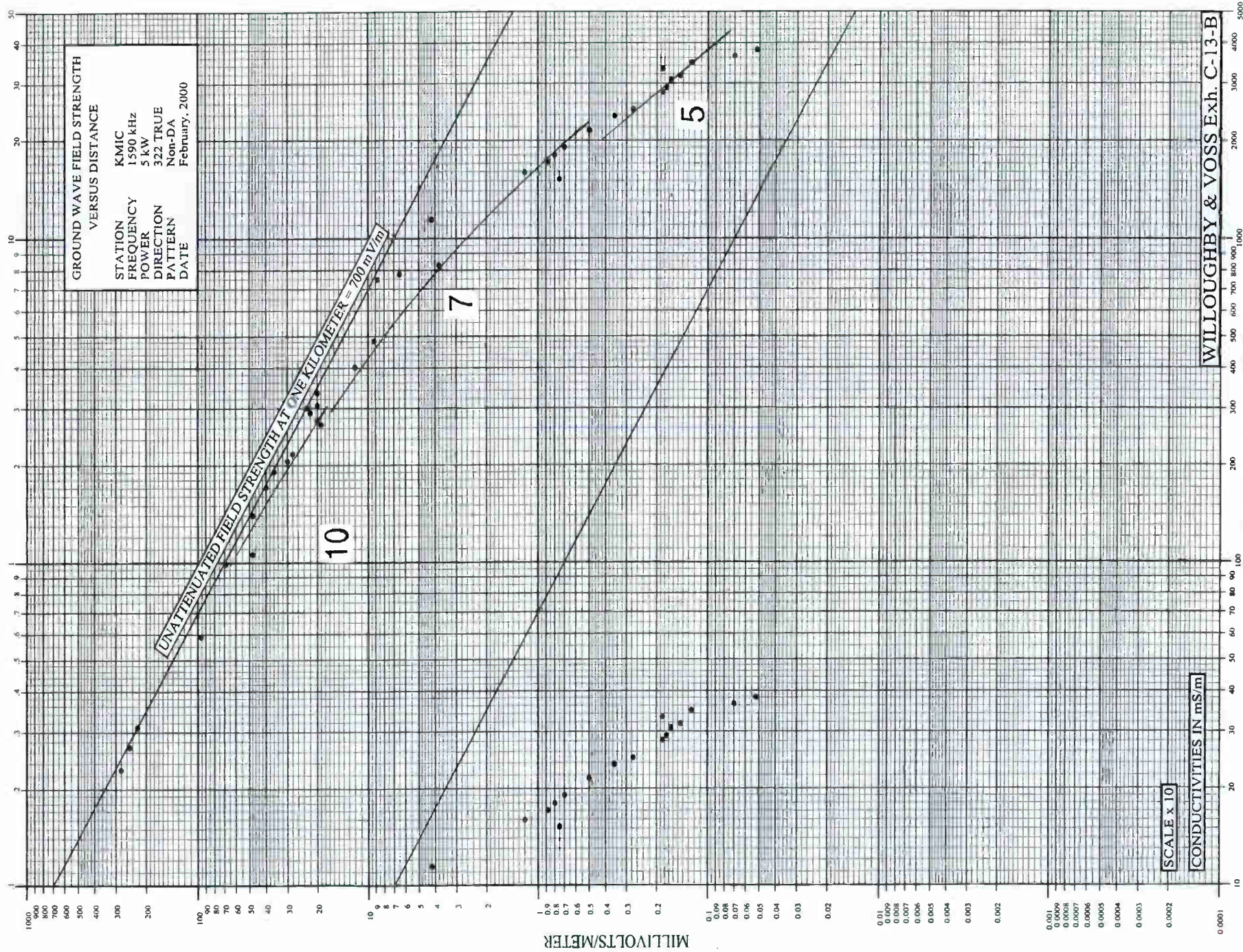
Average Log Ratio: -0.4392  
Antilog: .3638

Nondirectional Analyzed Field Strength (mV/m): 700.00

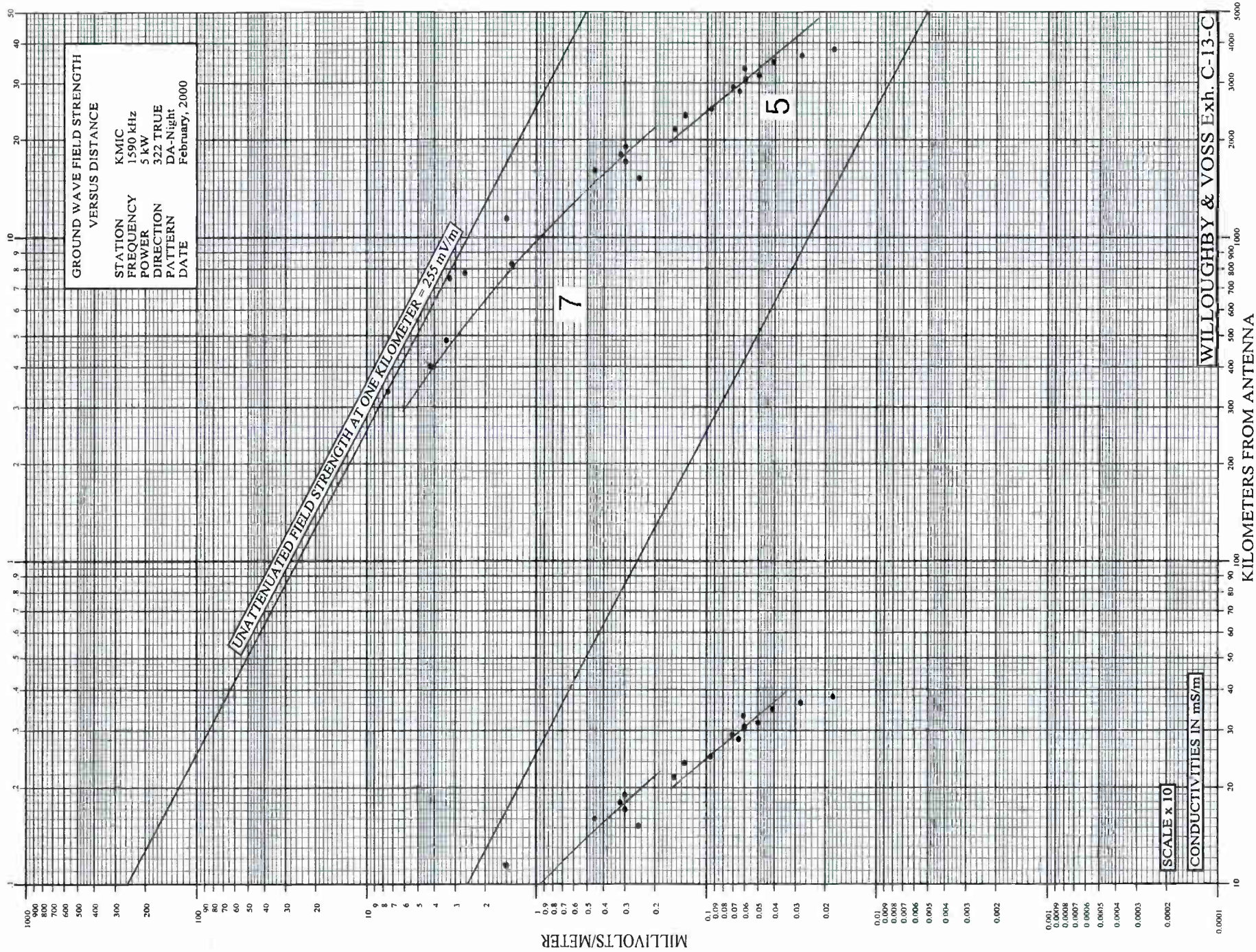
DA-NIGHT Analyzed Field Strength (mV/m): 255.00

Augmented Standard Pattern Maximum (mV/m): 267.15

KILOMETERS FROM ANTENNA



KILOMETERS FROM ANTENNA



WILLOUGHBY & VOSS Exh. C-13-C

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WILLOUGHBY & VOSS

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KMIC CLOSE-IN MEASUREMENTS at 355.0 degrees True

Point Number	Distance (km)	Msr'd Field Non-DA (mV/m)
1	0.22	3200
2	0.26	2700
3	0.41	1700
4	0.79	850.
5	1.13	600.
6	1.36	500.
7	1.45	475.
8	1.54	440.
9	1.64	420.
10	1.75	400.
11	1.83	380.
12	1.91	360.
13	2.00	350.
14	2.09	335.
15	2.17	320.
16	2.33	300.
17	2.43	285.
18	2.53	276.
19	2.64	265.
20	2.74	255.
21	2.83	248.
22	2.93	240.
23	3.19	220.

KMIC RADIO  
EXHIBIT C-14-A

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WILLOUGHBY & VOSS

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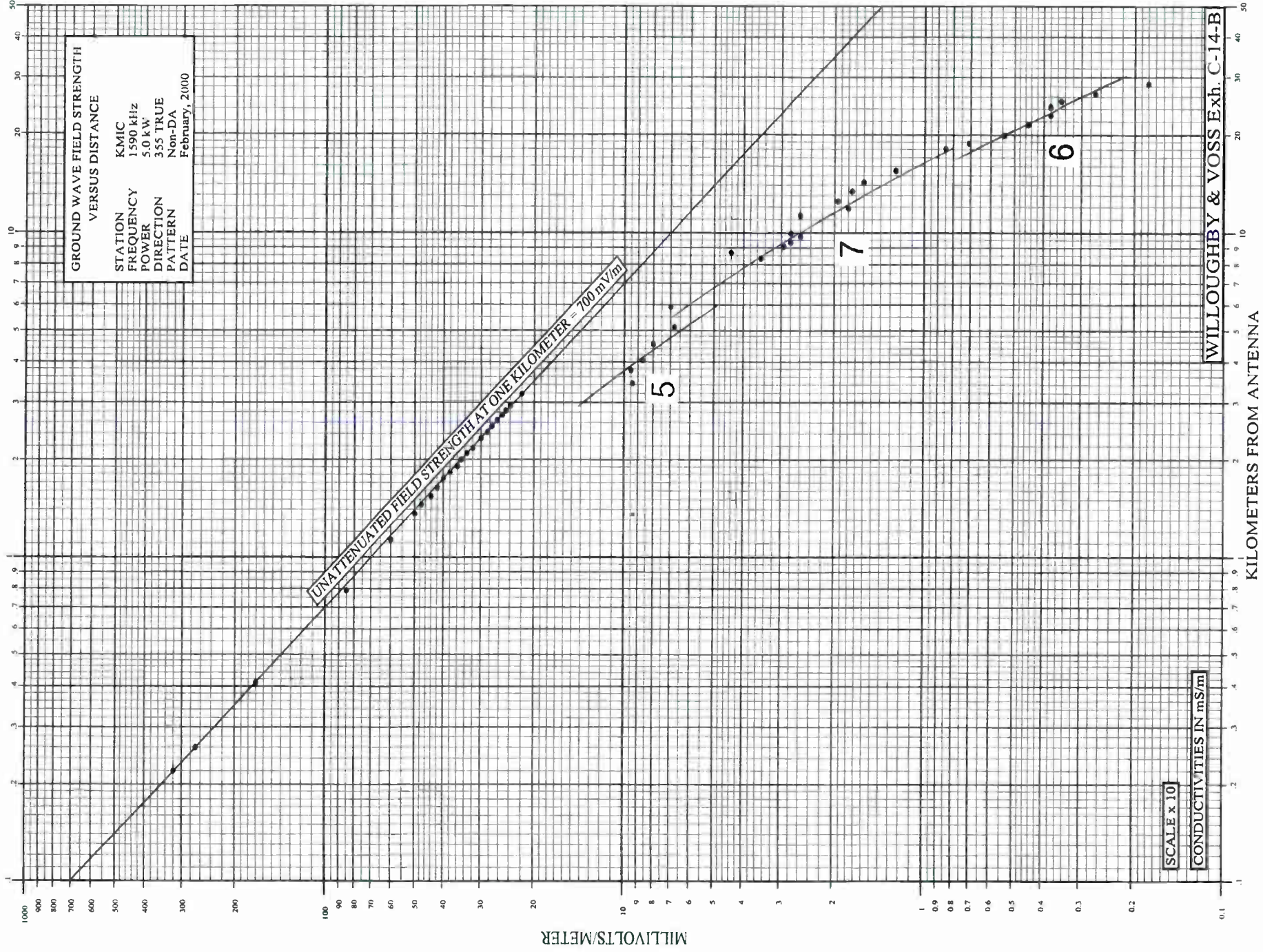
KMIC RADIATION ANALYSIS at 355.0 degrees True

Point Number	Distance (km)	Measured Field		Log Ratio (DA/ND)
		Non-DA (mV/m)	DA-N (mV/m)	
24	3.44	94.0	9.20	-1.0093
25	3.77	95.0	14.0	-0.8316
26	4.05	87.0	11.0	-0.8981
27	4.54	80.0	3.00	-1.4260
28	5.12	68.0	7.50	-0.9574
29	5.91	70.0	8.00	-0.9420
30	8.35	35.0	3.50	-1.0000
31	8.69	44.0	2.20	-1.3010
32	9.09	29.5	3.00	-0.9927
33	9.36	28.0	7.50	-0.5721
34	9.75	26.0	2.40	-1.0348
35	10.02	28.0	1.70	-1.2167
36	11.28	26.0	2.80	-0.9678
37	11.91	18.0	2.20	-0.9128
38	12.50	19.5	2.00	-0.9890
39	13.40	17.5	1.60	-1.0389
40	14.30	16.0	1.60	-1.0000
41	15.50	12.5	1.20	-1.0177
42	18.10	8.50	.780	-1.0373
43	18.80	7.10	1.00	-0.8513
44	19.90	5.40	.650	-0.9195
45	21.50	4.50	.450	-1.0000
46	23.00	3.80	.300	-1.1027
47	24.30	3.80	.320	-1.0746
48	25.20	3.50	.270	-1.1127
49	26.50	2.70	.220	-1.0889
50	28.50	1.80	.200	-0.9542

Average Log Ratio: -1.0092  
 Antilog: .0979

Nondirectional Analyzed Field Strength (mV/m): 700.00  
 DA-NIGHT Analyzed Field Strength (mV/m): 68.50  
 Augmented Standard Pattern Maximum (mV/m): 74.01

KILOMETERS FROM ANTENNA



KILOMETERS FROM ANTENNA

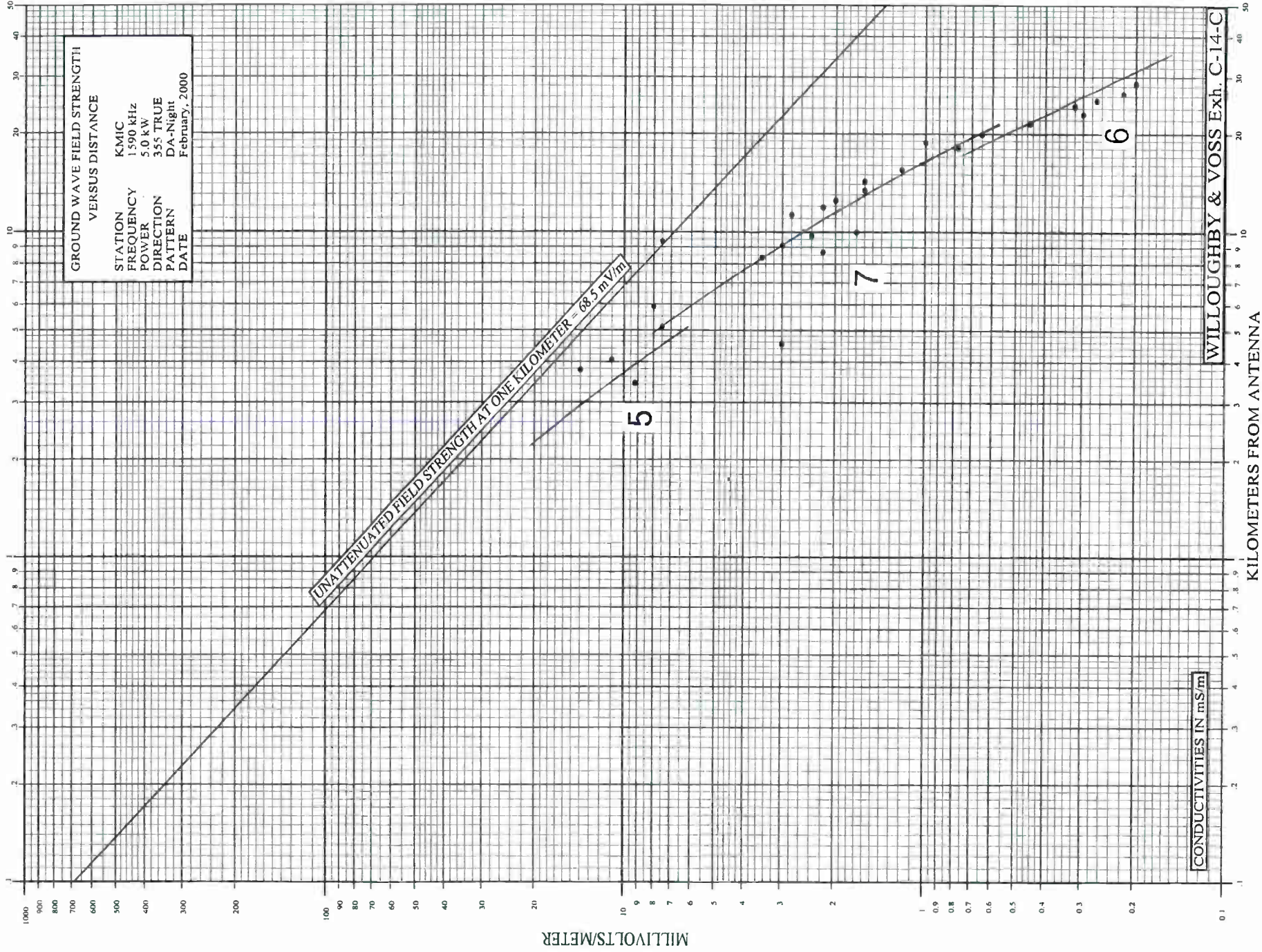
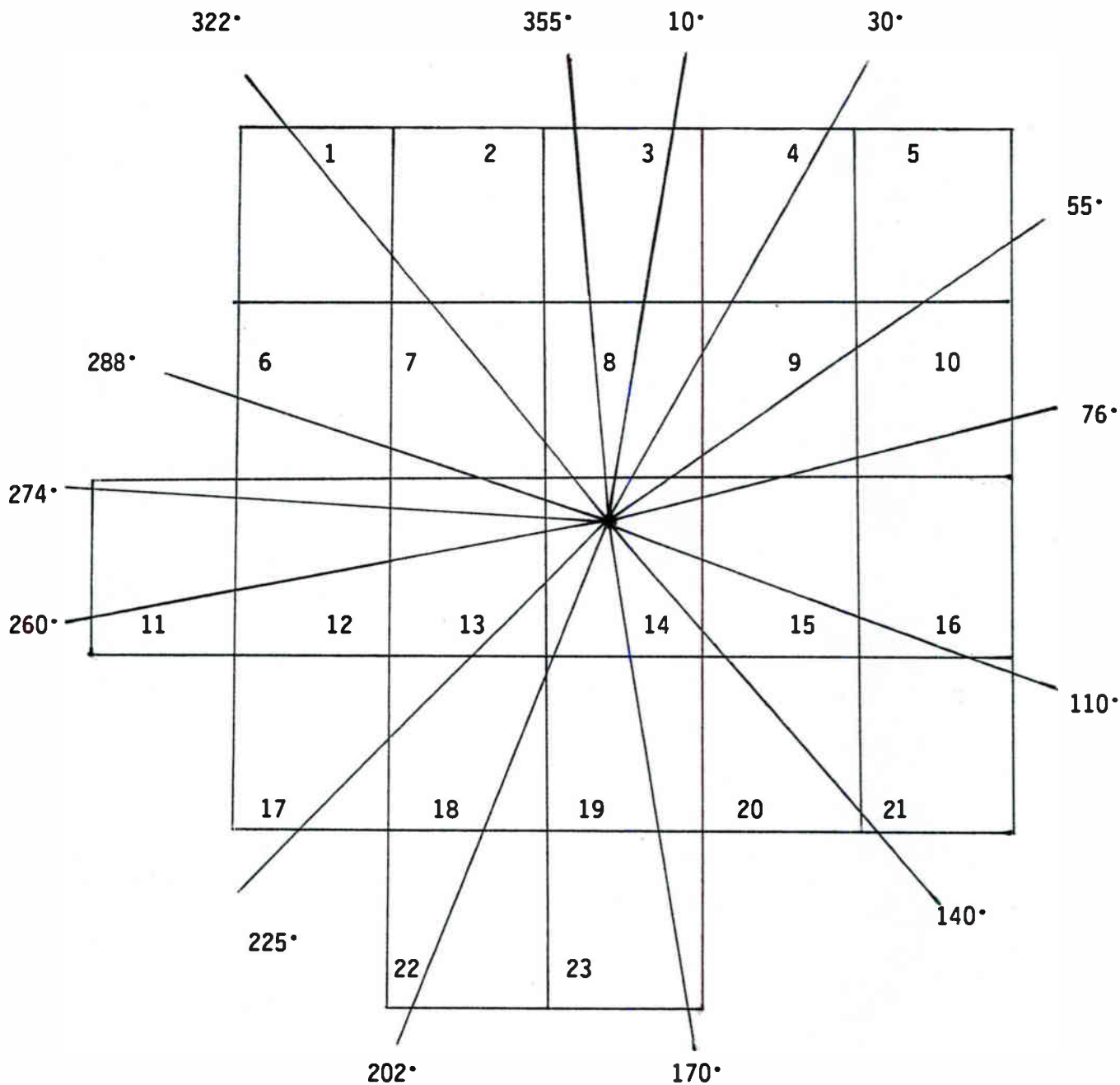


EXHIBIT D  
MEASUREMENT LOCATION MAPS



WILLOUGHBY & VOSS



KMIC RADIO  
EXHIBIT D

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WILLOUGHBY & VOSS

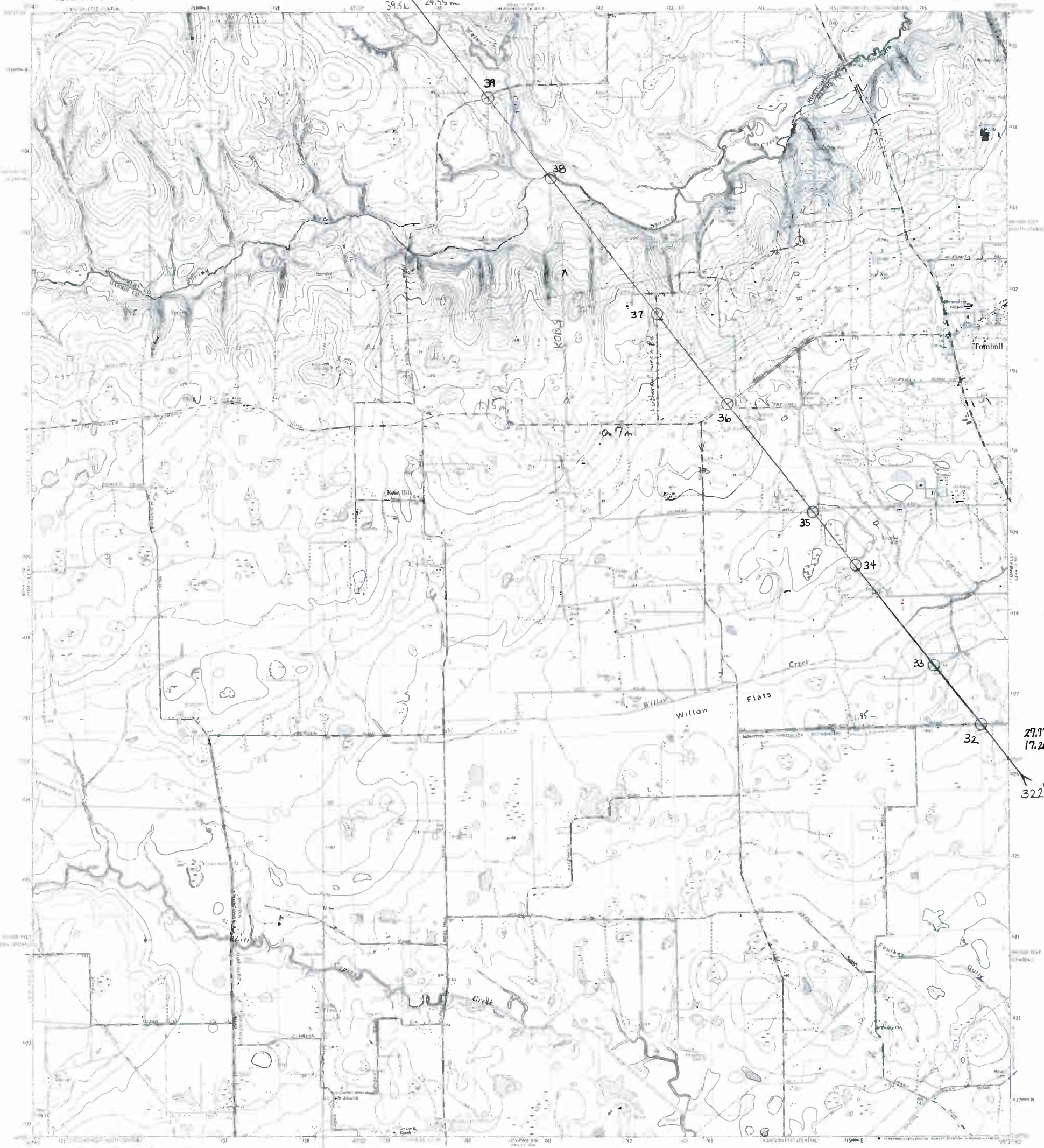
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MAP INDEX LIST

- |                   |                     |
|-------------------|---------------------|
| 1. Rose Hill      | 13. Hedwig Village  |
| 2. Tomball        | 14. Houston Heights |
| 3. Spring         | 15. Settegast       |
| 4. Maedan         | 16. Jacinto City    |
| 5. Moonshine Hill | 17. Clodine         |
| 6. Cypress        | 18. Alief           |
| 7. Satsuma        | 19. Bellaire        |
| 8. Aldine         | 20. Park Place      |
| 9. Humble         | 21. Pasadena        |
| 10. Harmaston     | 22. Missouri City   |
| 11. Katy          | 23. Almeda          |
| 12. Addicks       |                     |

322°  
39.5 km  
24.55 mi

322°  
27.77 km  
17.26 mi



Map compiled, edited, and published by the Geological Survey

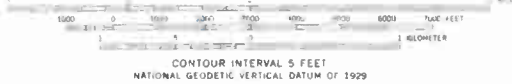
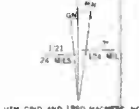
SCALE 1:24,000

ROAD CLASSIFICATION

**KMIC - 1590 kHz - HOUSTON, TEXAS**

MAP # **1**

**WILLOUGHBY & VOSS**  
BROADCAST TECHNICAL CONSULTANTS  
SAN ANTONIO, TEXAS



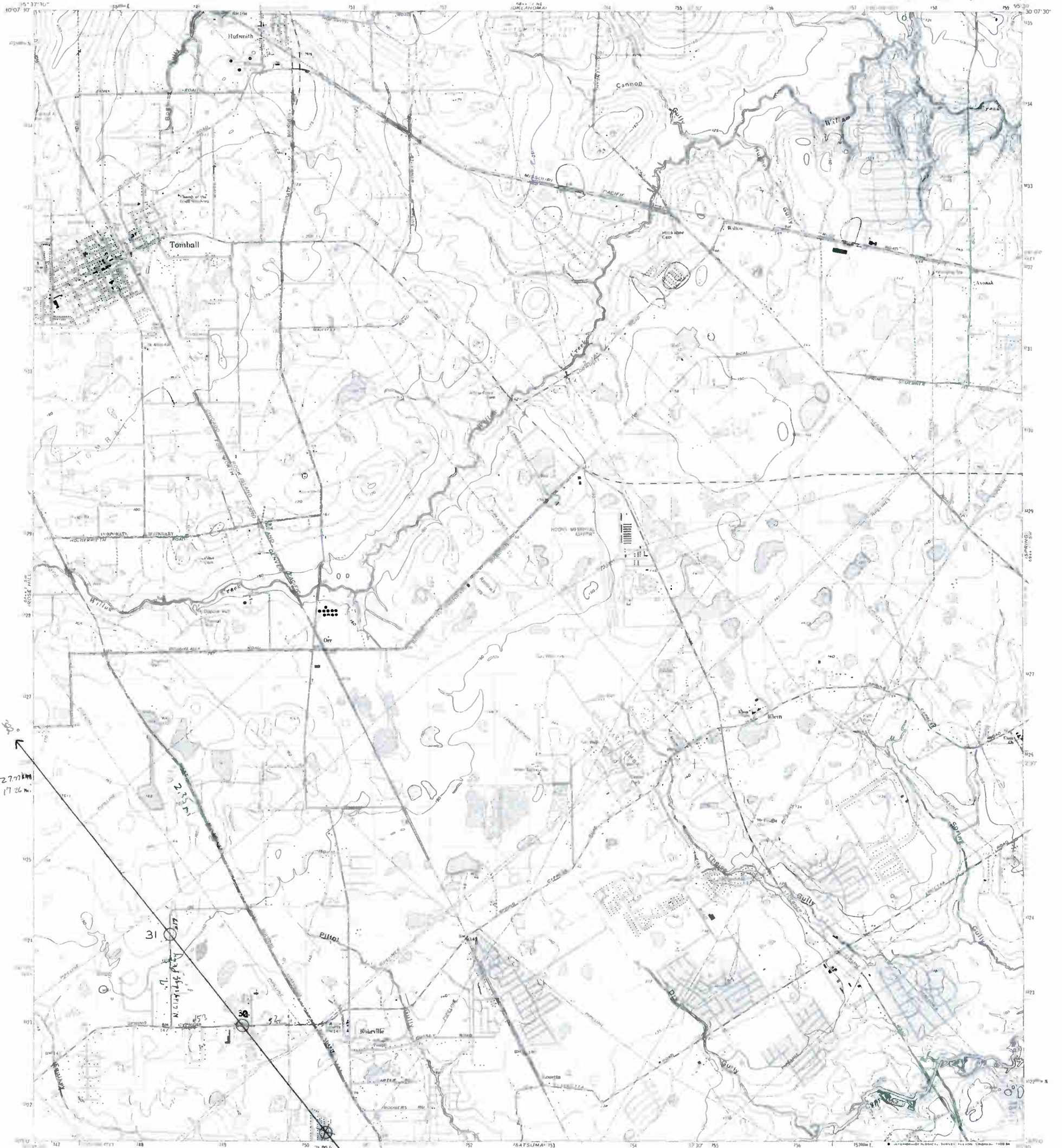
23 meters east as shown by dashed corner ticks

Revisions shown in purple and woodblock compiled from aerial photographs taken 1977 and other source data. This information not field checked. Map edited 1980.

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225 OR RESTON, VIRGINIA 22092. A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST.

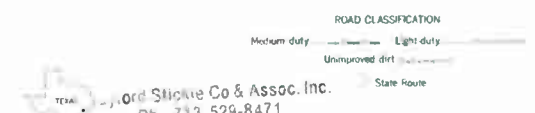
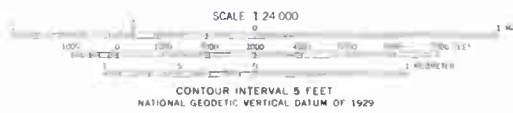
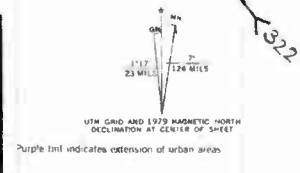
Stickle Co & Assoc. Inc.  
Ph: 713-529-8171  
Fax: 713-529-2926  
www.stickle.com

ROSE HILL, TEX  
1962  
PHOTOREVISED 1980  
DMA 8844 II SW - SERIES V&C



Mapped, edited, and published by the Geological Survey

**KMIC - 1590 kHz - HOUSTON, TEXAS**  
**MAP # 2**  
WILLOUGHBY & VOSS  
BROADCAST TECHNICAL CONSULTANTS  
SAN ANTONIO, TEXAS



Ord Stickle Co & Assoc. Inc.  
Ph 713-529-8471  
Fbx 713-529-2625  
WEB ADDRESS: WWW.GSTICKLE.COM

TOMBALL, TEX.  
1962  
PHOTOREVISED 1979  
DMA 5844 11 2E SERIES VIII

Aerial photographs taken 1977 and other source data  
This information not field checked. Map edited 1979

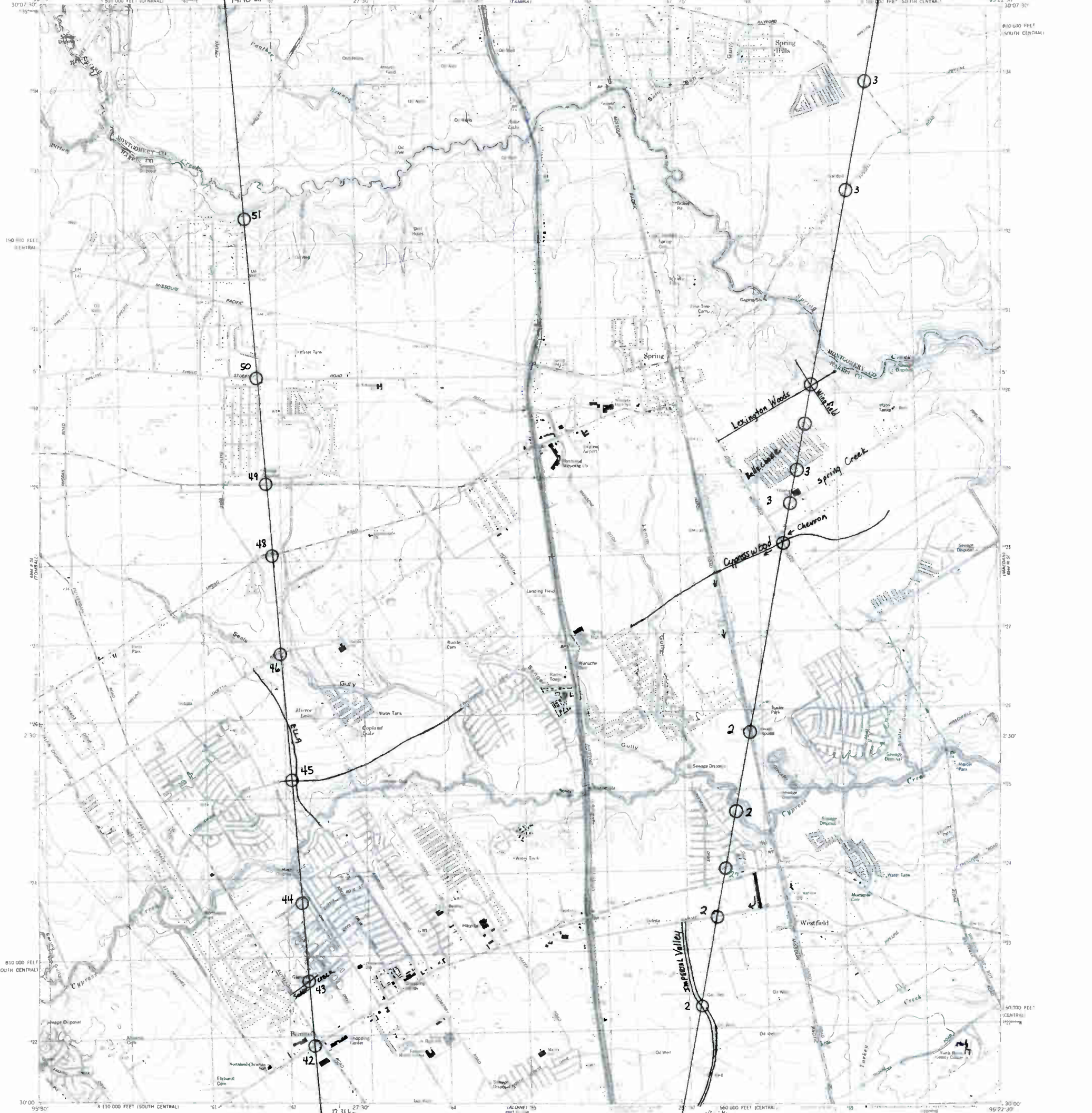
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A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

355°

10°

31.22 km  
19.40 mi

31.58 km  
19.63 mi



Mapped, edited, and published by the Geological Survey

**KMIC - 1590 kHz - HOUSTON, TEXAS**  
**MAP # 3**

**WILLOUGHBY & VOSS**  
BROADCAST TECHNICAL CONSULTANTS  
SAN ANTONIO, TEXAS

355°

17.31 km  
10.74 mi

SCALE 1:24,000

CONTOUR INTERVAL 5 FEET  
NATIONAL GEODESIC VERTICAL DATUM OF 1929

10°

560,000 FEET (CENTRAL)  
17.1 km  
10.6 mi

FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80275, OR RESTON, VIRGINIA 22092  
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

3095-122

SPRING, TEX.  
N3000 W9522 5/5

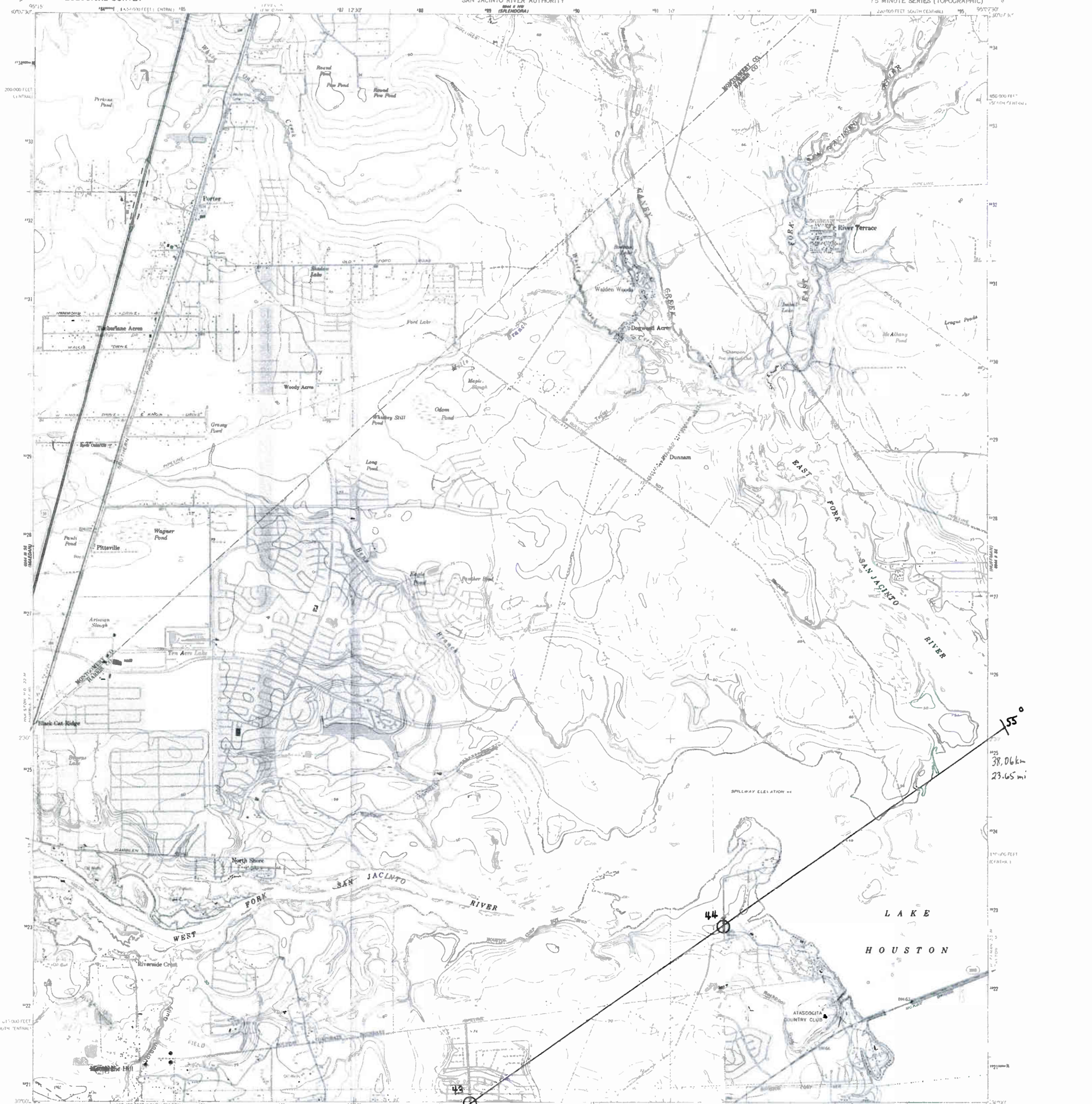
1962

017 5944 11 5W - SERIES V862

Red tint indicates areas in which only landmark buildings are shown

Portion of this map lies within a subsidence area  
Containing based on 1973 adjustment of vertical control



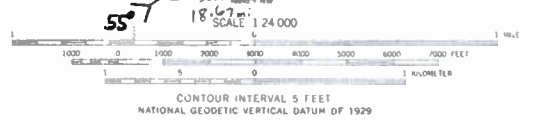
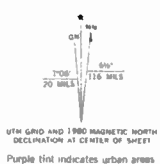


Mapped, edited, and published by the Geological Survey

**KMIC - 1590 kHz - HOUSTON, TEXAS**

**MAP # 5**

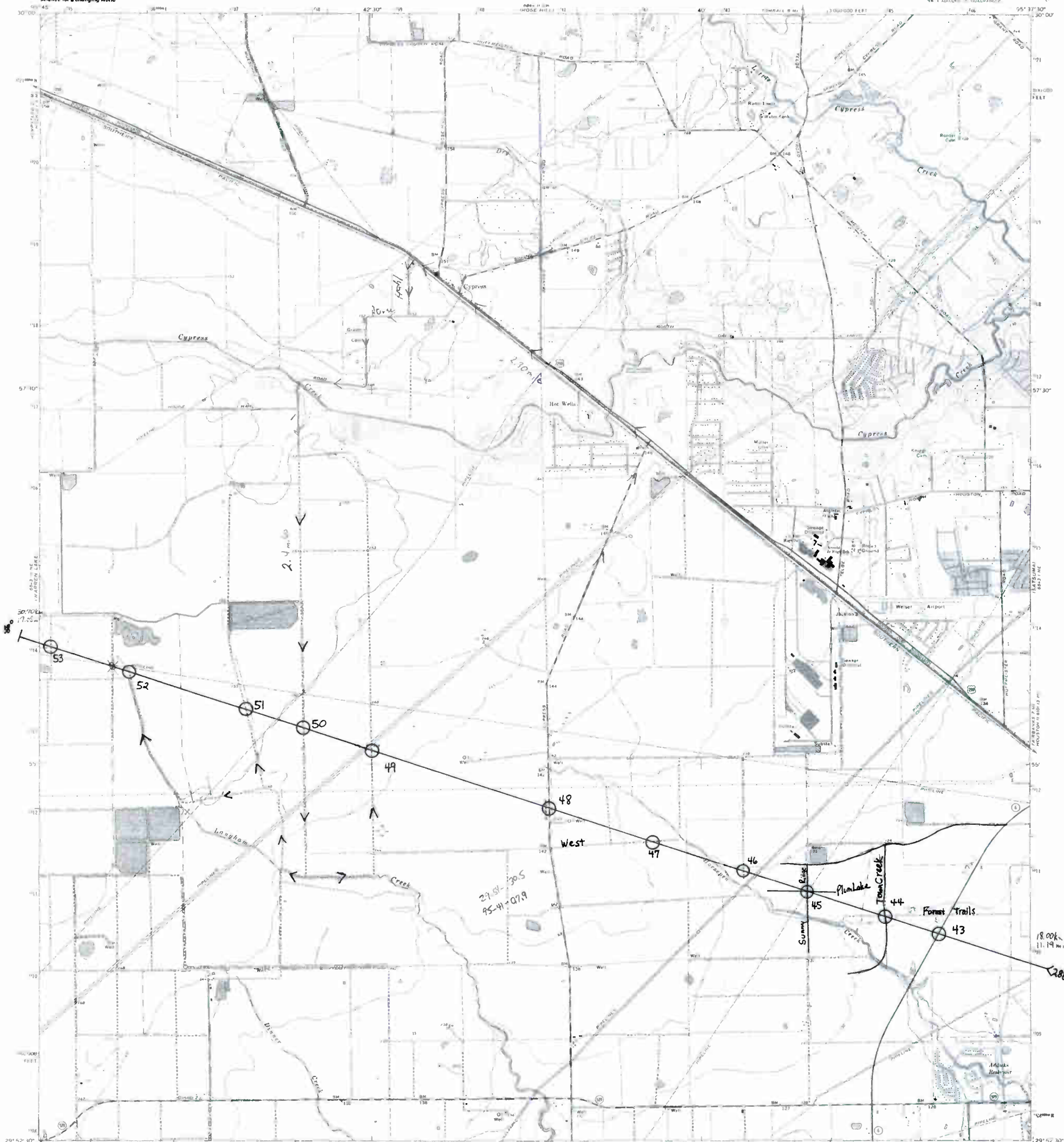
WILLOUGHBY & VOSS  
BROADCAST TECHNICAL CONSULTANTS  
SAN ANTONIO, TEXAS



THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS  
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A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST



MOONSHINE HILL, TEX.  
N3000-W950/5/7.5  
1961  
PHOTO REVISSED 1980  
DMA 0944 II SW-822182 1982



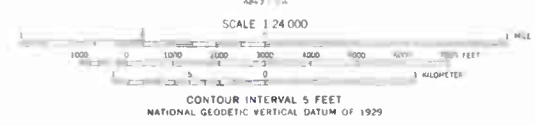
Mapped, edited, and published by the Geological Survey

**KMIC - 1590 kHz - HOUSTON, TEXAS**  
**MAP # 6**

WILLOUGHBY & VOSS  
BROADCAST TECHNICAL CONSULTANTS  
SAN ANTONIO, TEXAS

23 meters east as shown by dashed corner ticks

UTM GRID AND 1980 MAGNETIC NORTH  
INDICATION AT CENTER OF SHEET  
shown in purple compiled from aerial photographs  
7 and other source data. This information not  
red. Map edited 1980  
Purple tint indicates extension of urban areas



THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS  
FOR SALE BY U.S. GEOLOGICAL SURVEY, P.O. BOX 25288, DENVER, COLORADO 80225  
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST



QUADRANGLE LOCATION

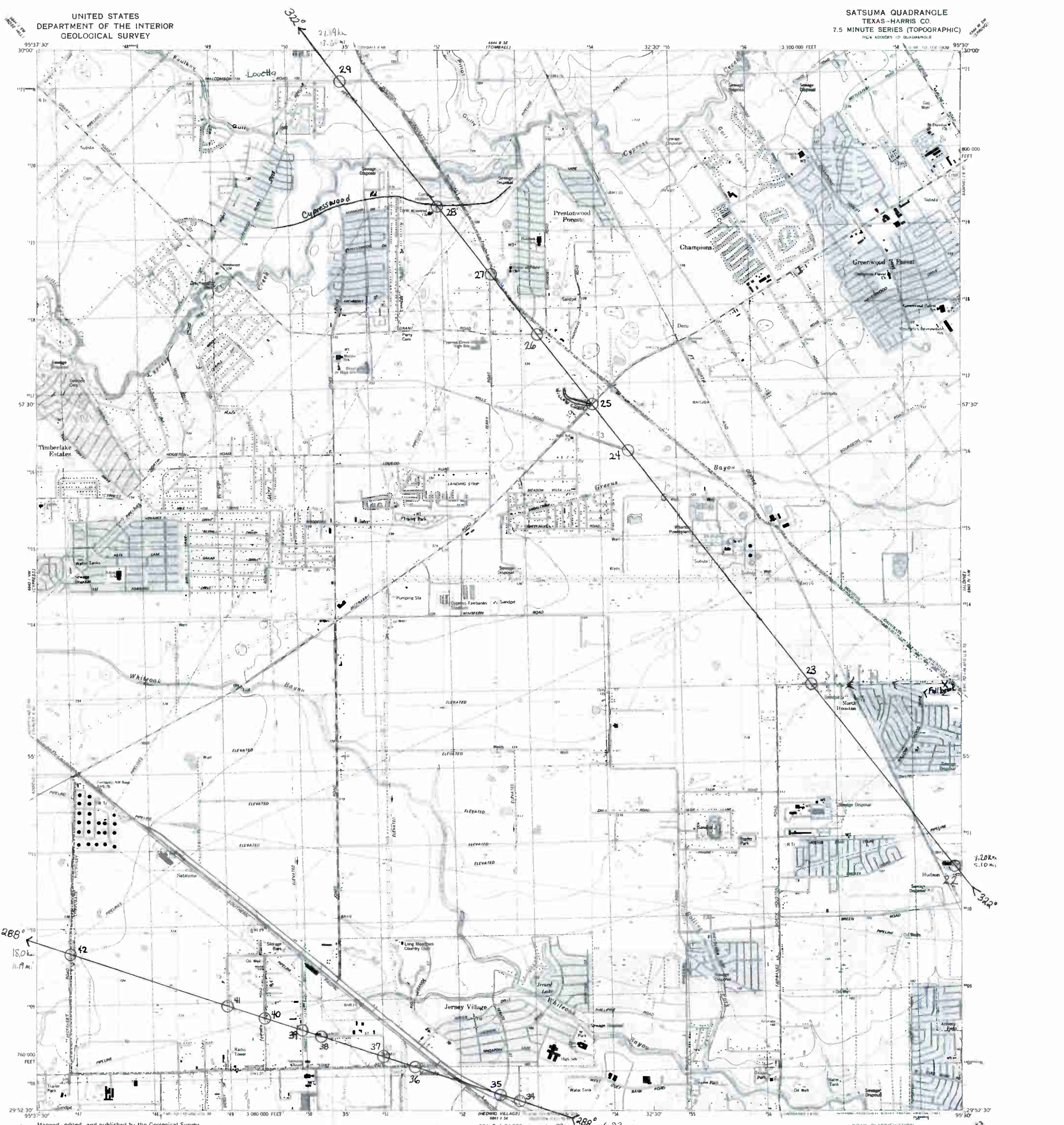
ROAD CLASSIFICATION

Primary highway hard surface	Light duty road hard or improved surface
Secondary highway, hard surface	Unimproved road
Interstate Route	U S Route
	State Route

CYPRESS, TEX.  
WITH CORRECTIONS TO QUADRANGLE  
N2952 5-W9537 5/7 5  
1970  
PHOTOREVISED 1980  
DMA 4945 1 1/4 - SERIES 4942

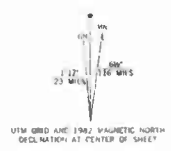






Mapped, edited, and published by the Geological Survey

**KMIC - 1590 kHz - HOUSTON, TEXAS**  
**MAP # 7**  
WILLOUGHBY & VOSS  
BROADCAST TECHNICAL CONSULTANTS  
SAN ANTONIO, TEXAS



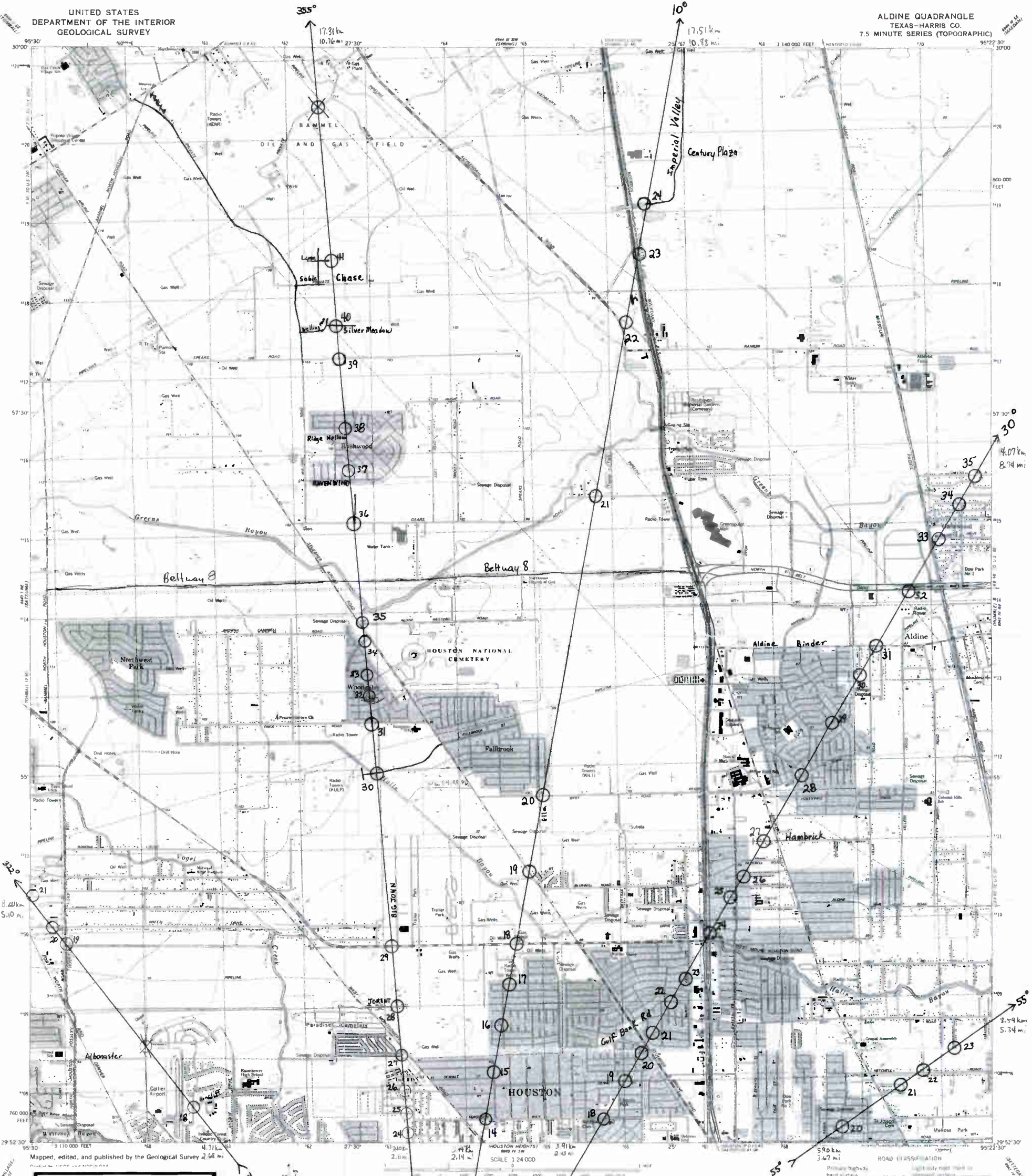
SCALE 1:24,000  
CONTOUR INTERVAL 5 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

**ROAD CLASSIFICATION**  
Primary highway hard surface  
Secondary highway hard surface  
Interstate Route  
U. S. Route  
Light duty road hard or improved surface  
Unimproved road  
State Route



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A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

SATSUMA, TEX.  
HEAT ADDED TO QUADRANGLE  
N7952 5 W95307 5  
1982  
DMA 643 1 NE SERIES V82



**KMIC - 1590 kHz - HOUSTON, TEXAS**  
**MAP # 8**  
WILLOUGHBY & VOSS  
BROADCAST TECHNICAL CONSULTANTS  
SAN ANTONIO, TEXAS

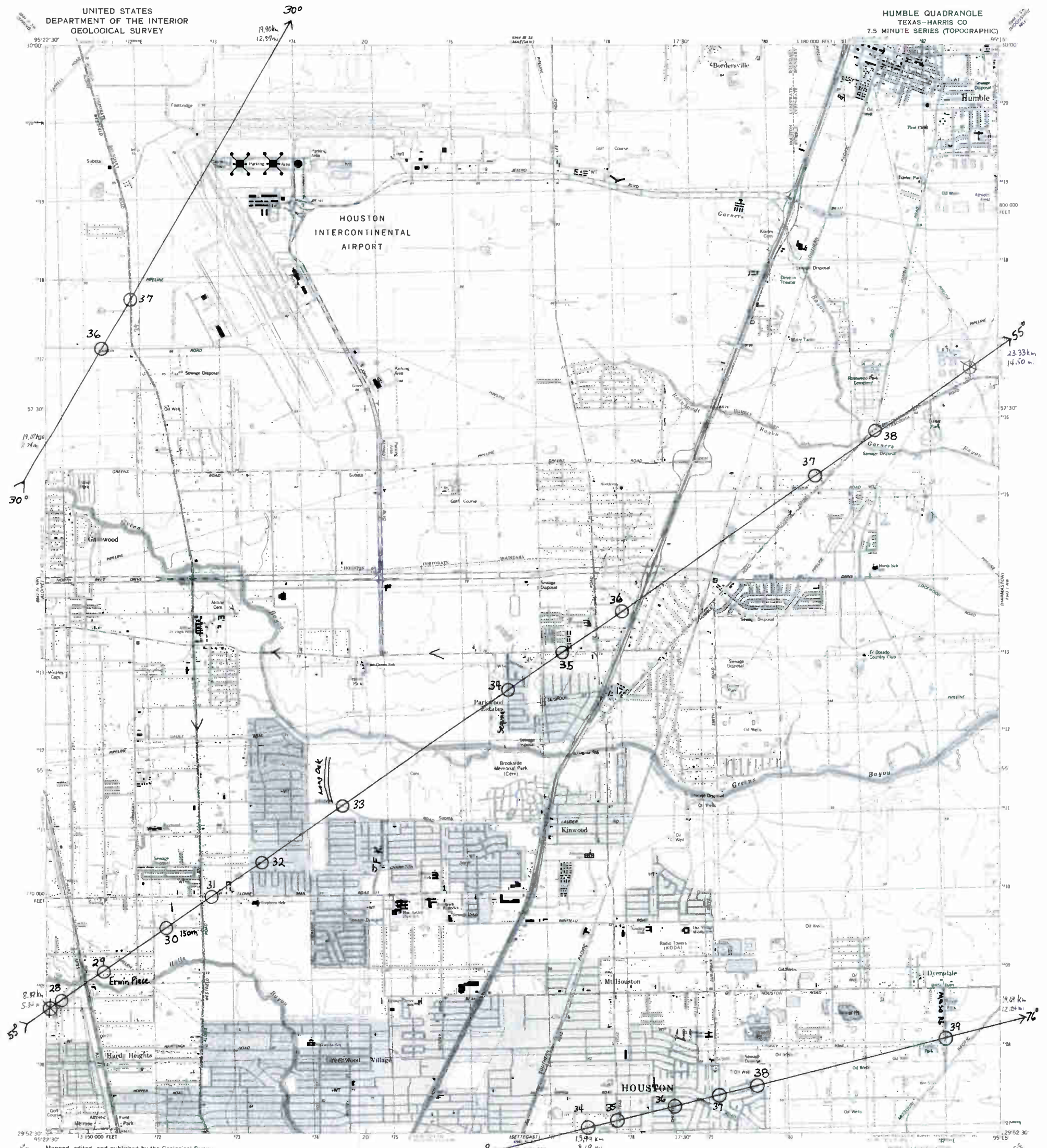
UTM GRID AND 1982 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

THIS MAP COMPLIES WITH MAP ACCURACY STANDARDS  
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2995-433

ALDINE, TEX.  
N2952.5-W9522.5/7.5  
1982





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KMIC - 1590 kHz - HOUSTON, TEXAS

MAP # 9

WILLOUGHBY & VOSS  
BROADCAST TECHNICAL CONSULTANTS  
SAN ANTONIO, TEXAS

A portion of this map lies within a subsidence area  
Contouring based on 1973 adjustment of vertical control

CONTOUR INTERVAL 5 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

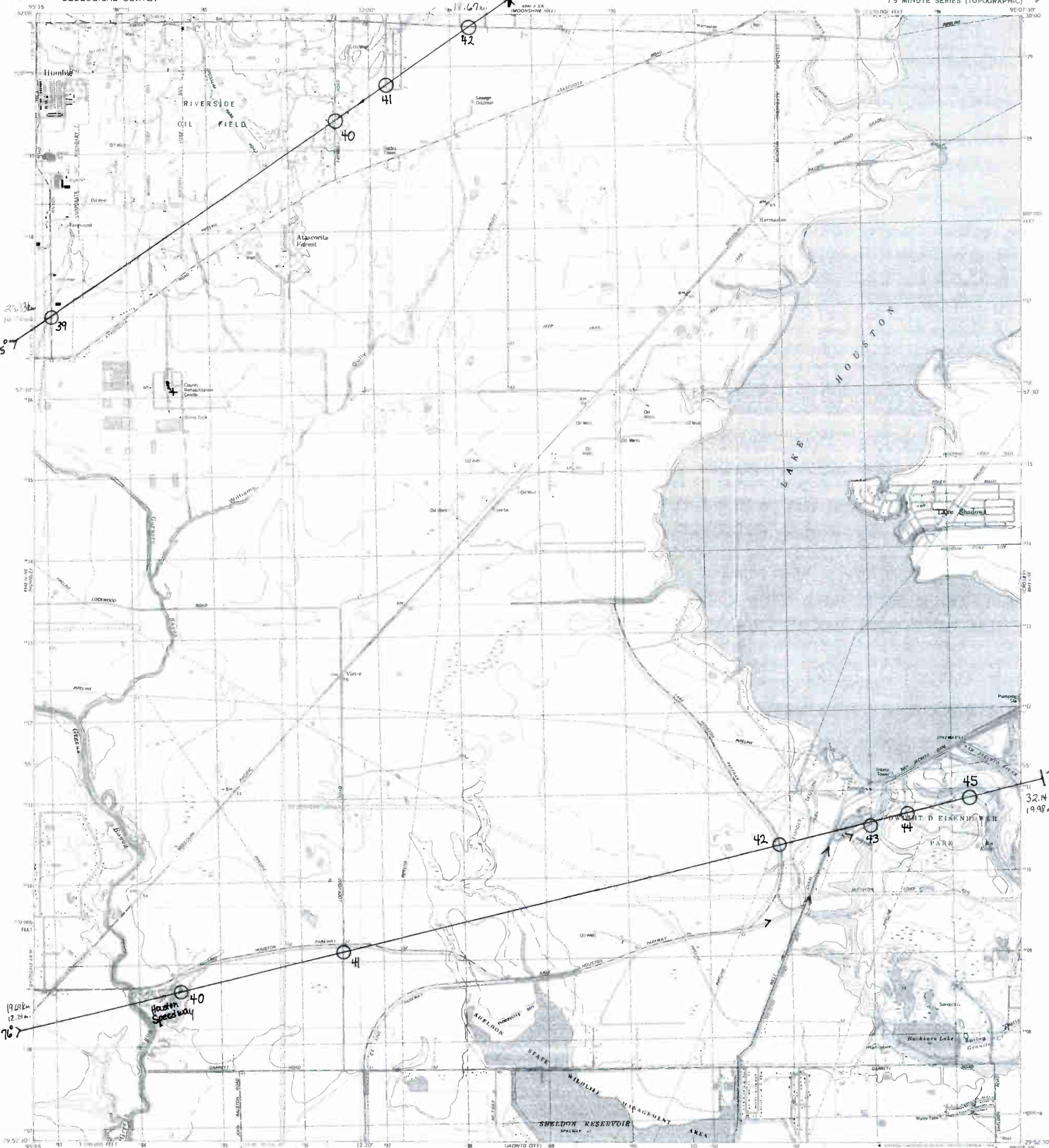
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2995-434

HUMBLE, TEX.  
N2952 5 19515/7 5

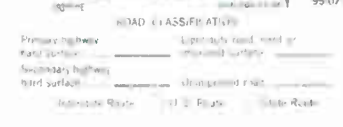
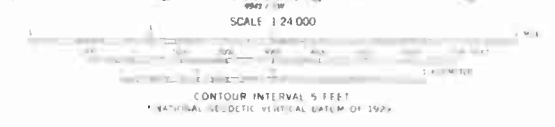
1962

DMA 6943 IV NE SERIES V862



Mapped, edited, and published by the Geological Survey

**KMIC - 1590 kHz - HOUSTON, TEXAS**  
**MAP # 10**  
**WILLOUGHBY & VOSS**  
BROADCAST TECHNICAL CONSULTANTS  
SAN ANTONIO, TEXAS



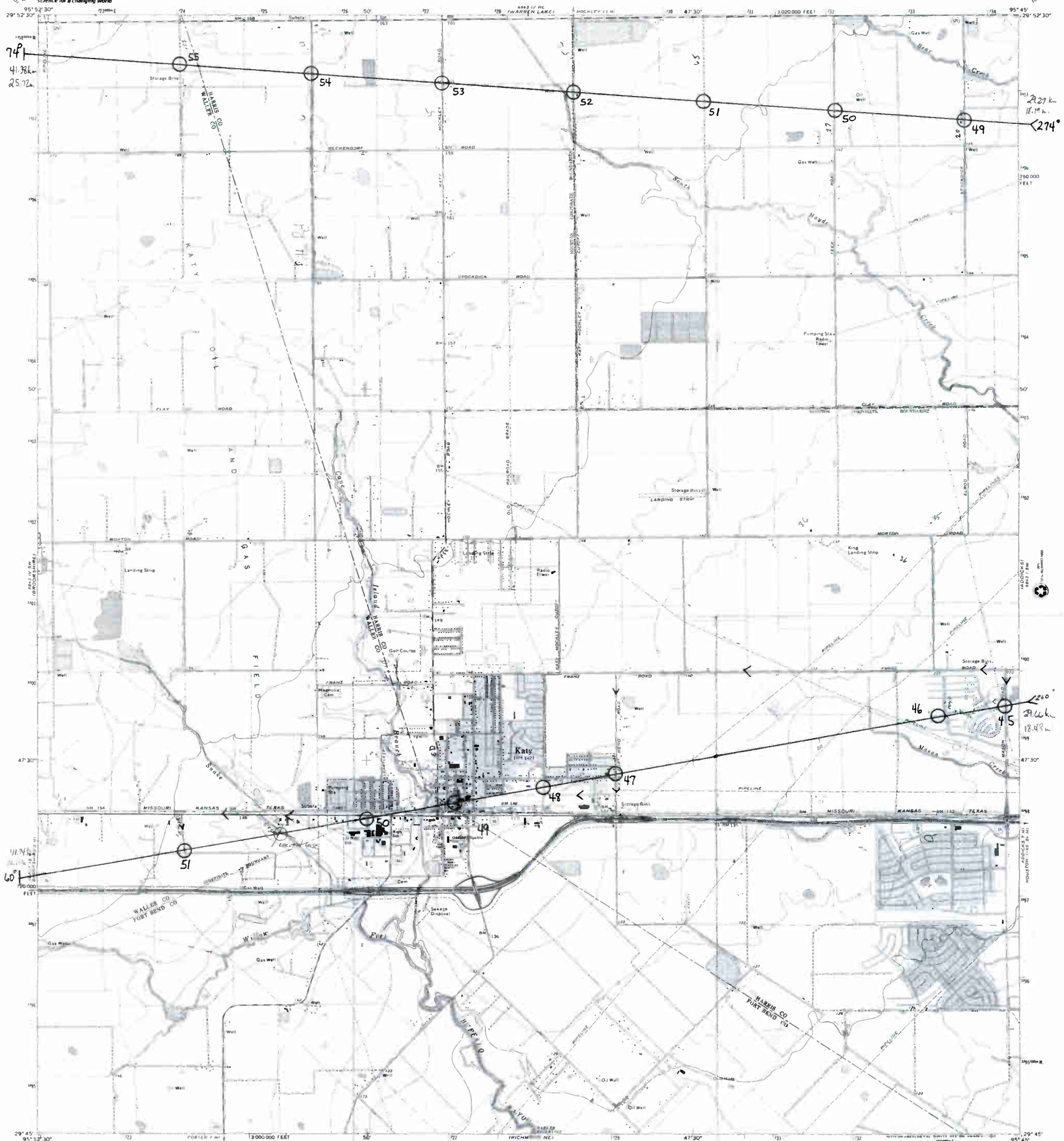
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A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

2995-443

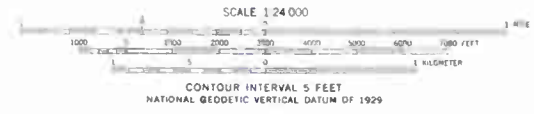
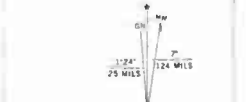
HARMASTON, TEX.  
N2952 5 W9507 5/7 5

1982

DMA 6943 I HW SERIES 5682



**KMIC - 1590 kHz - HOUSTON, TEXAS**  
**MAP # 11**  
 WILLOUGHBY & VOSS  
 BROADCAST TECHNICAL CONSULTANTS  
 SAN ANTONIO, TEXAS



To place on the predicted North American Datum 1983  
 move the projection lines 20 meters south and  
 23 meters east as shown by dashed corner ticks

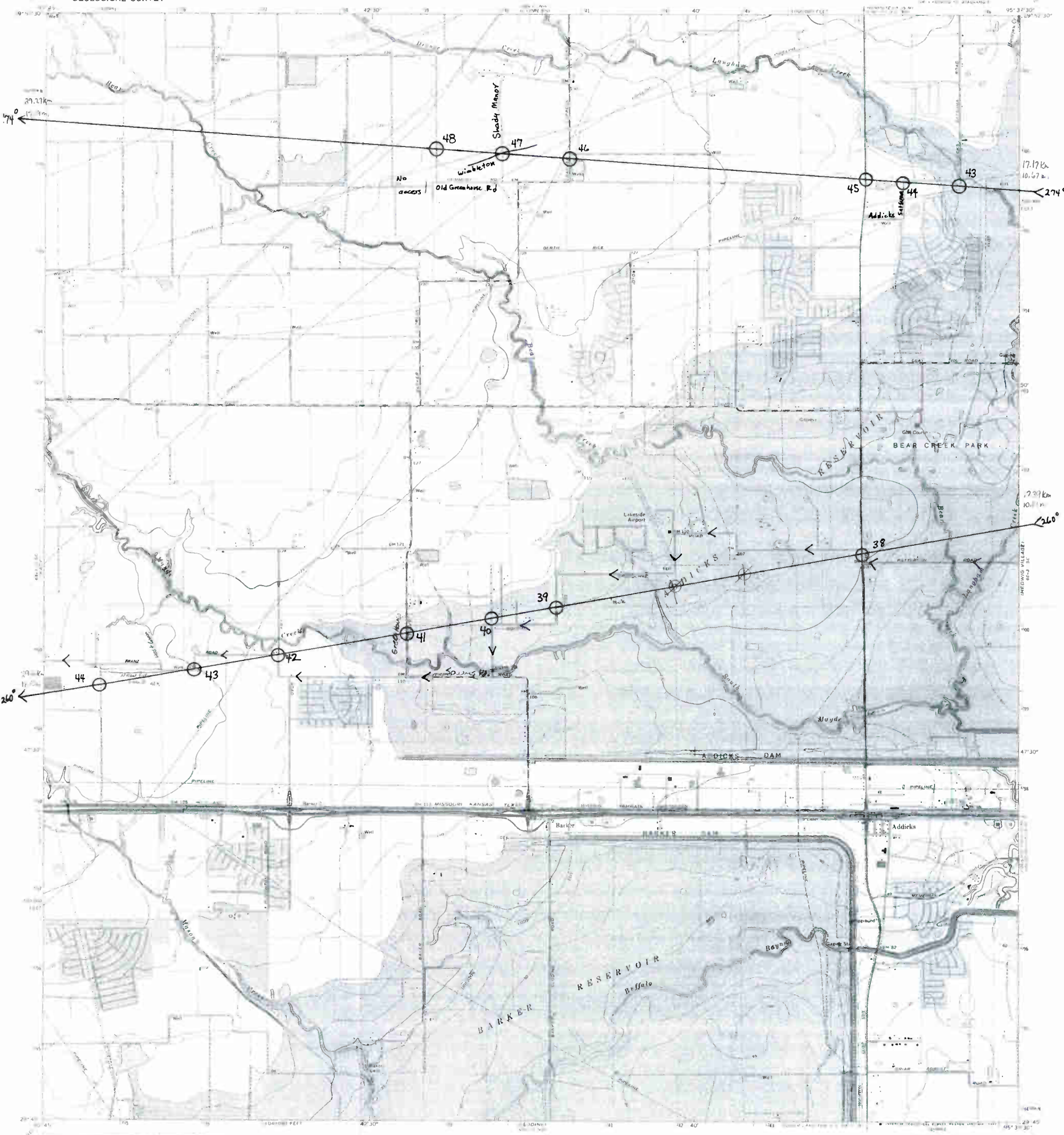
**ROAD CLASSIFICATION**

Primary highway	Light duty road / hard or improved surface
Secondary highway	Unimproved road
Interstate Route	U.S. Route
State Route	

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 Ph 713-524-8471  
 Fax 713-529-2625  
 WEB Address www.GStickle.com  
 2996-331

KATY, TEX.  
 N2945-W9545/7.5  
 1971  
 PHOTO REVISION 1980  
 DMA 6943 IV 6E-SERIES V482

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 1977 and other source data. This information not  
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**KMIC - 1590 kHz - HOUSTON, TEXAS**  
**MAP # 12**  
WILLOUGHBY & VOSS  
BROADCAST TECHNICAL CONSULTANTS  
SAN ANTONIO, TEXAS



SCALE 1:24,000  
CONTOUR INTERVAL 5 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

To place on the predicted North American Datum 1983  
move the projection lines 20 meters south and  
23 meters east as shown by dashed corner ticks



**ROAD CLASSIFICATION**  
Primary highway  
Hard surface  
Secondary highway  
Hard surface  
Unimproved road  
Interstate Route  
U.S. Route  
State Route

**ADDICKS, TEX.**  
29095-06-1F-021

visions shown in purple compiled from aerial photographs  
in 1977 and other source data. This information not  
field checked. Map printed 1980.  
Purple tint indicates extension of urban areas

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2995-342

1970  
PHOTOREVISED 1980  
DMA DATA BY SERIES 1980

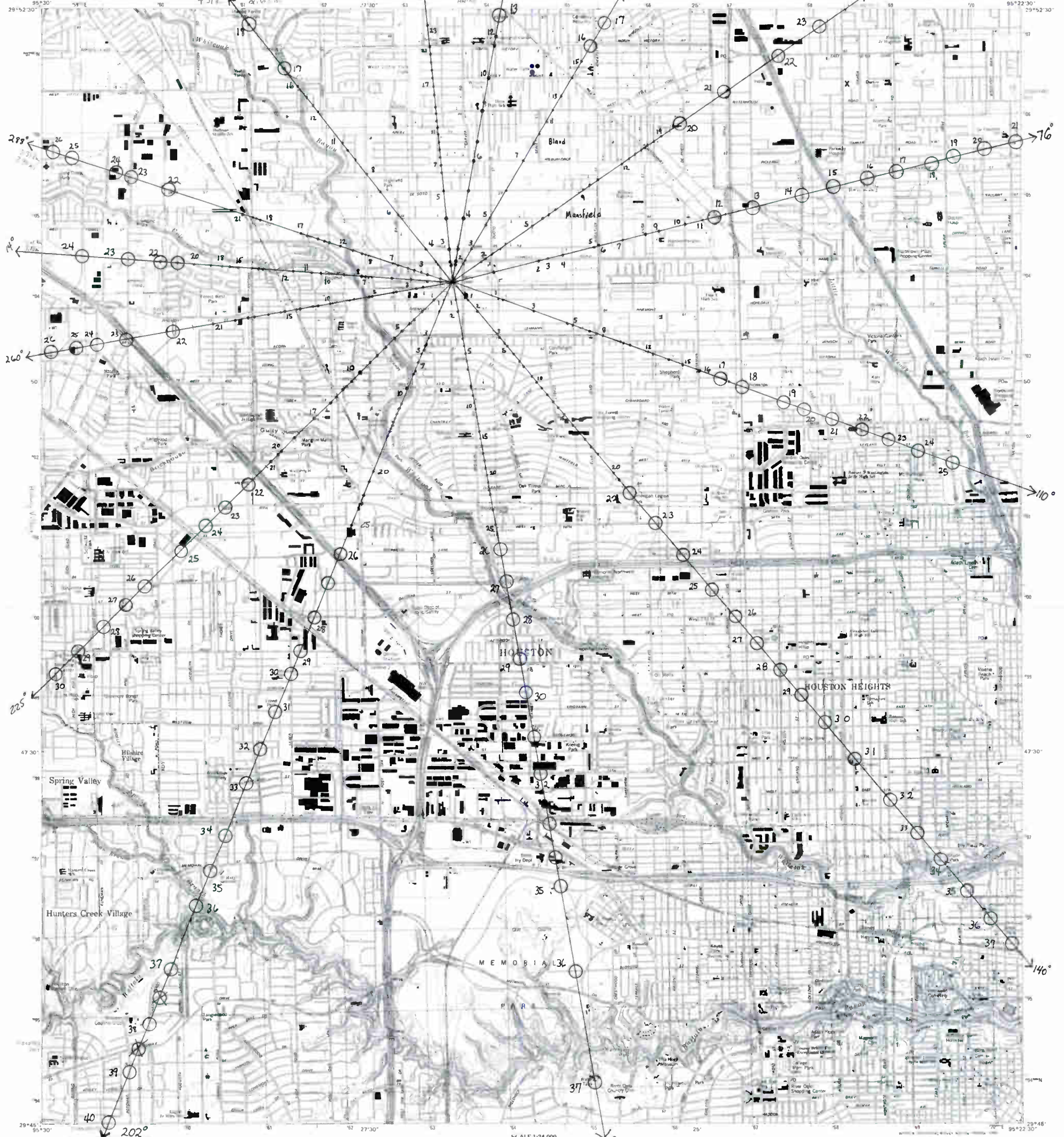




U.S. DEPARTMENT OF THE INTERIOR  
U.S. GEOLOGICAL SURVEY

322°

HOUSTON HEIGHTS QUADRANGLE  
TEXAS-HARRIS CO.  
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Produced by the United States Geological Survey

**KMIC - 1590 kHz - HOUSTON, TEXAS**  
**MAP # 14**

WILLOUGHBY & VOSS  
BROADCAST TECHNICAL CONSULTANTS  
SAN ANTONIO, TEXAS



SCALE 1:24 000

CONTOUR INTERVAL 5 FEET  
NATIONAL GEODESIC SURVEY VERTICAL DATUM OF 1929  
TO CONVERT FROM FEET TO METERS, MULTIPLY BY 0.3048

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ROAD CLASSIFICATION

Primary highway	Light duty road, hard or improved surface
Hard surface	Secondary highway
Hard surface	Unimproved road
Interstate Route	U.S. Route
	State Route

URBAN/RAILROAD LOCATION

1	2	3
4	5	6
7	8	9

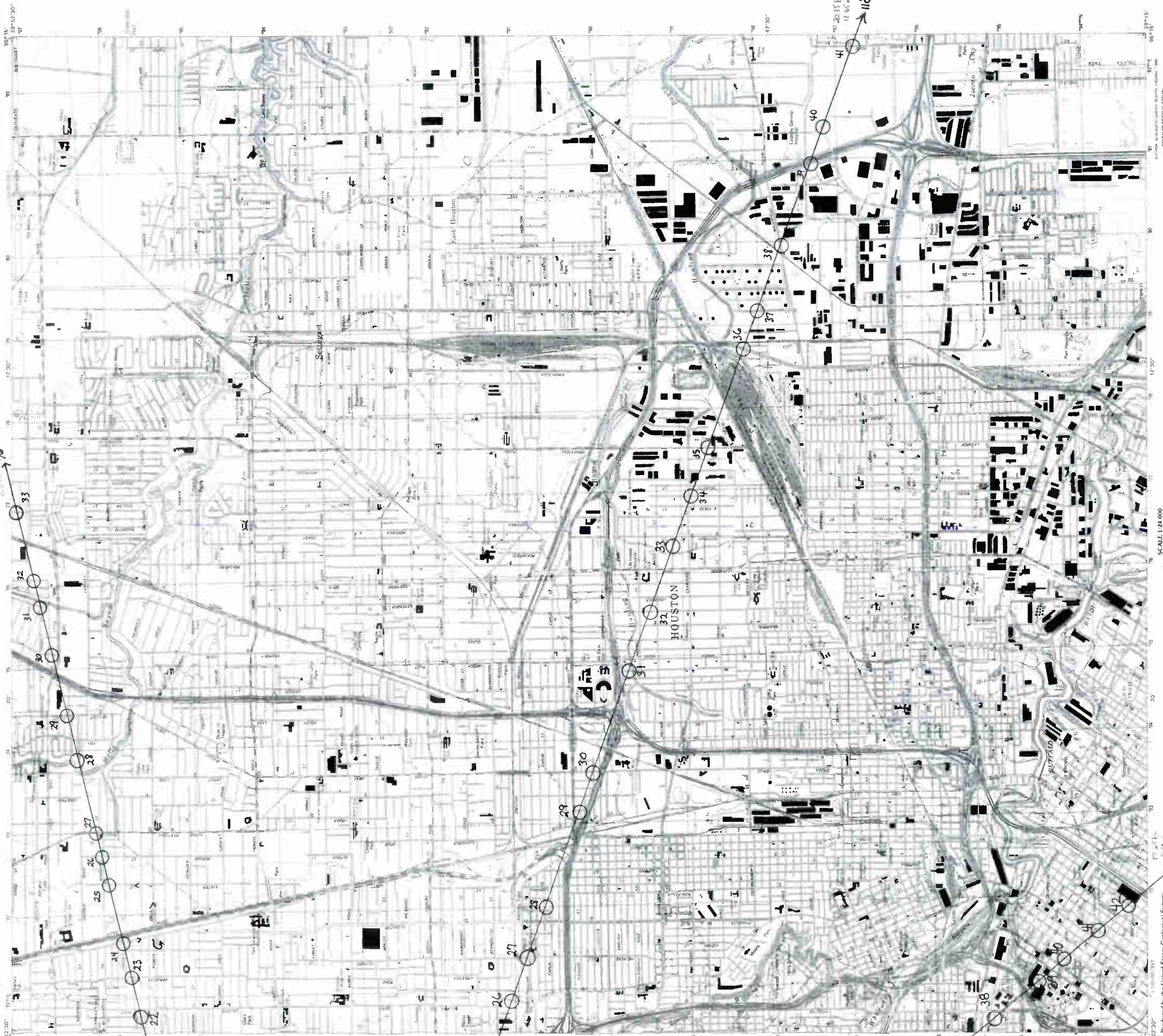
1. Home  
2. School  
3. Hospital  
4. Shopping Center  
5. Synagogue  
6. Air  
7. Barber  
8. Post Office  
9. Park

HOUSTON HEIGHTS, TX  
1995



NIMA 6943 IV 5A SERIES V882





95°22'30" 95°15' 95°10' 95°5' 95°0' 94°55' 94°50' 94°45' 94°40' 94°35' 94°30' 94°25' 94°20' 94°15' 94°10' 94°5' 94°0' 93°55' 93°50' 93°45' 93°40' 93°35' 93°30' 93°25' 93°20' 93°15' 93°10' 93°5' 93°0' 92°55' 92°50' 92°45' 92°40' 92°35' 92°30' 92°25' 92°20' 92°15' 92°10' 92°5' 92°0' 91°55' 91°50' 91°45' 91°40' 91°35' 91°30' 91°25' 91°20' 91°15' 91°10' 91°5' 91°0' 90°55' 90°50' 90°45' 90°40' 90°35' 90°30' 90°25' 90°20' 90°15' 90°10' 90°5' 90°0' 89°55' 89°50' 89°45' 89°40' 89°35' 89°30' 89°25' 89°20' 89°15' 89°10' 89°5' 89°0' 88°55' 88°50' 88°45' 88°40' 88°35' 88°30' 88°25' 88°20' 88°15' 88°10' 88°5' 88°0' 87°55' 87°50' 87°45' 87°40' 87°35' 87°30' 87°25' 87°20' 87°15' 87°10' 87°5' 87°0' 86°55' 86°50' 86°45' 86°40' 86°35' 86°30' 86°25' 86°20' 86°15' 86°10' 86°5' 86°0' 85°55' 85°50' 85°45' 85°40' 85°35' 85°30' 85°25' 85°20' 85°15' 85°10' 85°5' 85°0' 84°55' 84°50' 84°45' 84°40' 84°35' 84°30' 84°25' 84°20' 84°15' 84°10' 84°5' 84°0' 83°55' 83°50' 83°45' 83°40' 83°35' 83°30' 83°25' 83°20' 83°15' 83°10' 83°5' 83°0' 82°55' 82°50' 82°45' 82°40' 82°35' 82°30' 82°25' 82°20' 82°15' 82°10' 82°5' 82°0' 81°55' 81°50' 81°45' 81°40' 81°35' 81°30' 81°25' 81°20' 81°15' 81°10' 81°5' 81°0' 80°55' 80°50' 80°45' 80°40' 80°35' 80°30' 80°25' 80°20' 80°15' 80°10' 80°5' 80°0' 79°55' 79°50' 79°45' 79°40' 79°35' 79°30' 79°25' 79°20' 79°15' 79°10' 79°5' 79°0' 78°55' 78°50' 78°45' 78°40' 78°35' 78°30' 78°25' 78°20' 78°15' 78°10' 78°5' 78°0' 77°55' 77°50' 77°45' 77°40' 77°35' 77°30' 77°25' 77°20' 77°15' 77°10' 77°5' 77°0' 76°55' 76°50' 76°45' 76°40' 76°35' 76°30' 76°25' 76°20' 76°15' 76°10' 76°5' 76°0' 75°55' 75°50' 75°45' 75°40' 75°35' 75°30' 75°25' 75°20' 75°15' 75°10' 75°5' 75°0' 74°55' 74°50' 74°45' 74°40' 74°35' 74°30' 74°25' 74°20' 74°15' 74°10' 74°5' 74°0' 73°55' 73°50' 73°45' 73°40' 73°35' 73°30' 73°25' 73°20' 73°15' 73°10' 73°5' 73°0' 72°55' 72°50' 72°45' 72°40' 72°35' 72°30' 72°25' 72°20' 72°15' 72°10' 72°5' 72°0' 71°55' 71°50' 71°45' 71°40' 71°35' 71°30' 71°25' 71°20' 71°15' 71°10' 71°5' 71°0' 70°55' 70°50' 70°45' 70°40' 70°35' 70°30' 70°25' 70°20' 70°15' 70°10' 70°5' 70°0' 69°55' 69°50' 69°45' 69°40' 69°35' 69°30' 69°25' 69°20' 69°15' 69°10' 69°5' 69°0' 68°55' 68°50' 68°45' 68°40' 68°35' 68°30' 68°25' 68°20' 68°15' 68°10' 68°5' 68°0' 67°55' 67°50' 67°45' 67°40' 67°35' 67°30' 67°25' 67°20' 67°15' 67°10' 67°5' 67°0' 66°55' 66°50' 66°45' 66°40' 66°35' 66°30' 66°25' 66°20' 66°15' 66°10' 66°5' 66°0' 65°55' 65°50' 65°45' 65°40' 65°35' 65°30' 65°25' 65°20' 65°15' 65°10' 65°5' 65°0' 64°55' 64°50' 64°45' 64°40' 64°35' 64°30' 64°25' 64°20' 64°15' 64°10' 64°5' 64°0' 63°55' 63°50' 63°45' 63°40' 63°35' 63°30' 63°25' 63°20' 63°15' 63°10' 63°5' 63°0' 62°55' 62°50' 62°45' 62°40' 62°35' 62°30' 62°25' 62°20' 62°15' 62°10' 62°5' 62°0' 61°55' 61°50' 61°45' 61°40' 61°35' 61°30' 61°25' 61°20' 61°15' 61°10' 61°5' 61°0' 60°55' 60°50' 60°45' 60°40' 60°35' 60°30' 60°25' 60°20' 60°15' 60°10' 60°5' 60°0' 59°55' 59°50' 59°45' 59°40' 59°35' 59°30' 59°25' 59°20' 59°15' 59°10' 59°5' 59°0' 58°55' 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46°40' 46°35' 46°30' 46°25' 46°20' 46°15' 46°10' 46°5' 46°0' 45°55' 45°50' 45°45' 45°40' 45°35' 45°30' 45°25' 45°20' 45°15' 45°10' 45°5' 45°0' 44°55' 44°50' 44°45' 44°40' 44°35' 44°30' 44°25' 44°20' 44°15' 44°10' 44°5' 44°0' 43°55' 43°50' 43°45' 43°40' 43°35' 43°30' 43°25' 43°20' 43°15' 43°10' 43°5' 43°0' 42°55' 42°50' 42°45' 42°40' 42°35' 42°30' 42°25' 42°20' 42°15' 42°10' 42°5' 42°0' 41°55' 41°50' 41°45' 41°40' 41°35' 41°30' 41°25' 41°20' 41°15' 41°10' 41°5' 41°0' 40°55' 40°50' 40°45' 40°40' 40°35' 40°30' 40°25' 40°20' 40°15' 40°10' 40°5' 40°0' 39°55' 39°50' 39°45' 39°40' 39°35' 39°30' 39°25' 39°20' 39°15' 39°10' 39°5' 39°0' 38°55' 38°50' 38°45' 38°40' 38°35' 38°30' 38°25' 38°20' 38°15' 38°10' 38°5' 38°0' 37°55' 37°50' 37°45' 37°40' 37°35' 37°30' 37°25' 37°20' 37°15' 37°10' 37°5' 37°0' 36°55' 36°50' 36°45' 36°40' 36°35' 36°30' 36°25' 36°20' 36°15' 36°10' 36°5' 36°0' 35°55' 35°50' 35°45' 35°40' 35°35' 35°30' 35°25' 35°20' 35°15' 35°10' 35°5' 35°0' 34°55' 34°50' 34°45' 34°40' 34°35' 34°30' 34°25' 34°20' 34°15' 34°10' 34°5' 34°0' 33°55' 33°50' 33°45' 33°40' 33°35' 33°30' 33°25' 33°20' 33°15' 33°10' 33°5' 33°0' 32°55' 32°50' 32°45' 32°40' 32°35' 32°30' 32°25' 32°20' 32°15' 32°10' 32°5' 32°0' 31°55' 31°50' 31°45' 31°40' 31°35' 31°30' 31°25' 31°20' 31°15' 31°10' 31°5' 31°0' 30°55' 30°50' 30°45' 30°40' 30°35' 30°30' 30°25' 30°20' 30°15' 30°10' 30°5' 30°0' 29°55' 29°50' 29°45' 29°40' 29°35' 29°30' 29°25' 29°20' 29°15' 29°10' 29°5' 29°0' 28°55' 28°50' 28°45' 28°40' 28°35' 28°30' 28°25' 28°20' 28°15' 28°10' 28°5' 28°0' 27°55' 27°50' 27°45' 27°40' 27°35' 27°30' 27°25' 27°20' 27°15' 27°10' 27°5' 27°0' 26°55' 26°50' 26°45' 26°40' 26°35' 26°30' 26°25' 26°20' 26°15' 26°10' 26°5' 26°0' 25°55' 25°50' 25°45' 25°40' 25°35' 25°30' 25°25' 25°20' 25°15' 25°10' 25°5' 25°0' 24°55' 24°50' 24°45' 24°40' 24°35' 24°30' 24°25' 24°20' 24°15' 24°10' 24°5' 24°0' 23°55' 23°50' 23°45' 23°40' 23°35' 23°30' 23°25' 23°20' 23°15' 23°10' 23°5' 23°0' 22°55' 22°50' 22°45' 22°40' 22°35' 22°30' 22°25' 22°20' 22°15' 22°10' 22°5' 22°0' 21°55' 21°50' 21°45' 21°40' 21°35' 21°30' 21°25' 21°20' 21°15' 21°10' 21°5' 21°0' 20°55' 20°50' 20°45' 20°40' 20°35' 20°30' 20°25' 20°20' 20°15' 20°10' 20°5' 20°0' 19°55' 19°50' 19°45' 19°40' 19°35' 19°30' 19°25' 19°20' 19°15' 19°10' 19°5' 19°0' 18°55' 18°50' 18°45' 18°40' 18°35' 18°30' 18°25' 18°20' 18°15' 18°10' 18°5' 18°0' 17°55' 17°50' 17°45' 17°40' 17°35' 17°30' 17°25' 17°20' 17°15' 17°10' 17°5' 17°0' 16°55' 16°50' 16°45' 16°40' 16°35' 16°30' 16°25' 16°20' 16°15' 16°10' 16°5' 16°0' 15°55' 15°50' 15°45' 15°40' 15°35' 15°30' 15°25' 15°20' 15°15' 15°10' 15°5' 15°0' 14°55' 14°50' 14°45' 14°40' 14°35' 14°30' 14°25' 14°20' 14°15' 14°10' 14°5' 14°0' 13°55' 13°50' 13°45' 13°40' 13°35' 13°30' 13°25' 13°20' 13°15' 13°10' 13°5' 13°0' 12°55' 12°50' 12°45' 12°40' 12°35' 12°30' 12°25' 12°20' 12°15' 12°10' 12°5' 12°0' 11°55' 11°50' 11°45' 11°40' 11°35' 11°30' 11°25' 11°20' 11°15' 11°10' 11°5' 11°0' 10°55' 10°50' 10°45' 10°40' 10°35' 10°30' 10°25' 10°20' 10°15' 10°10' 10°5' 10°0' 9°55' 9°50' 9°45' 9°40' 9°35' 9°30' 9°25' 9°20' 9°15' 9°10' 9°5' 9°0' 8°55' 8°50' 8°45' 8°40' 8°35' 8°30' 8°25' 8°20' 8°15' 8°10' 8°5' 8°0' 7°55' 7°50' 7°45' 7°40' 7°35' 7°30' 7°25' 7°20' 7°15' 7°10' 7°5' 7°0' 6°55' 6°50' 6°45' 6°40' 6°35' 6°30' 6°25' 6°20' 6°15' 6°10' 6°5' 6°0' 5°55' 5°50' 5°45' 5°40' 5°35' 5°30' 5°25' 5°20' 5°15' 5°10' 5°5' 5°0' 4°55' 4°50' 4°45' 4°40' 4°35' 4°30' 4°25' 4°20' 4°15' 4°10' 4°5' 4°0' 3°55' 3°50' 3°45' 3°40' 3°35' 3°30' 3°25' 3°20' 3°15' 3°10' 3°5' 3°0' 2°55' 2°50' 2°45' 2°40' 2°35' 2°30' 2°25' 2°20' 2°15' 2°10' 2°5' 2°0' 1°55' 1°50' 1°45' 1°40' 1°35' 1°30' 1°25' 1°20' 1°15' 1°10' 1°5' 1°0' 0°55' 0°50' 0°45' 0°40' 0°35' 0°30' 0°25' 0°20' 0°15' 0°10' 0°5' 0°0'

URBAN/UNINCORPORATED  
2995 431

Primary Highway  
Secondary Highway  
Unimproved Road

Light duty road, hard or  
improved surface  
Unimproved road

U.S. Route  
State Route

Scale: 1:24,000

Contour Interval: 5 Feet  
National Geographic Vertical Datum of 1999  
To Convert From Feet to Meters, Multiply by 0.3048

Produced by the United States Geological Survey  
Using 1995 Survey Control Data and 1997  
North American Datum of 1983 (NAD 83). Projection and  
Datum are the same as the 7.5-minute series. Contour  
lines are shown at 5-foot intervals.

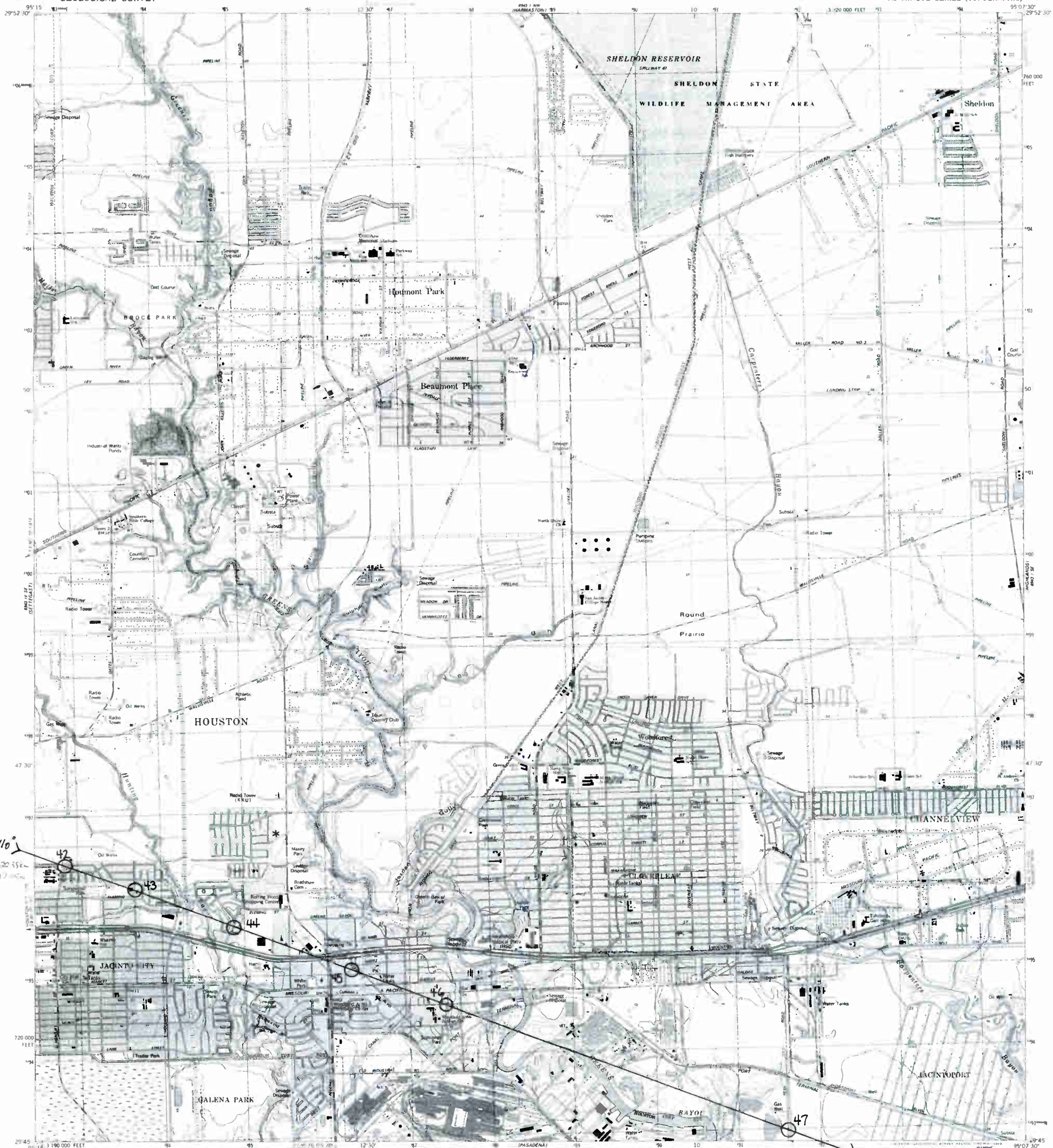
1:24,000

**KMC - 1590 kHz - HOUSTON, TEXAS**  
**MAP # 15**  
WILLOUGHBY & VOSS  
CONSULTANTS  
HOUSTON, TEXAS

FOR SALE BY U.S. GEOLOGICAL SURVEY, P.O. BOX 35886, DENVER, COLORADO 80225  
A COLOR DELIBERATION NUMBER, MAP, AND SYMBOLS IS AVAILABLE ON REQUEST

**SETTEGAST, TX**  
1995  
NIMA 443 IV SE SUBS 44BZ





110°  
30.5 km  
19.96 mi

110°  
30.5 km  
19.96 mi

**KMIC - 1590 kHz - HOUSTON, TEXAS**  
**MAP # 16**  
**WILLOUGHBY & VOSS**  
BROADCAST TECHNICAL CONSULTANTS  
SAN ANTONIO, TEXAS

SCALE 1:24,000  
CONTOUR INTERVAL 5 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION  
Primary highway  
Secondary highway  
Tertiary road  
Light duty road  
Hard surface  
Unimproved road  
Interstate Route  
U.S. Route  
State Route

THIS MAP COMPLES WITH NATIONAL MAP ACCURACY STANDARDS  
FOR SALE BY U.S. GEOLOGICAL SURVEY DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092  
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

2995-442

JACINTO CITY, TEX.  
N2945 W9507 57 5

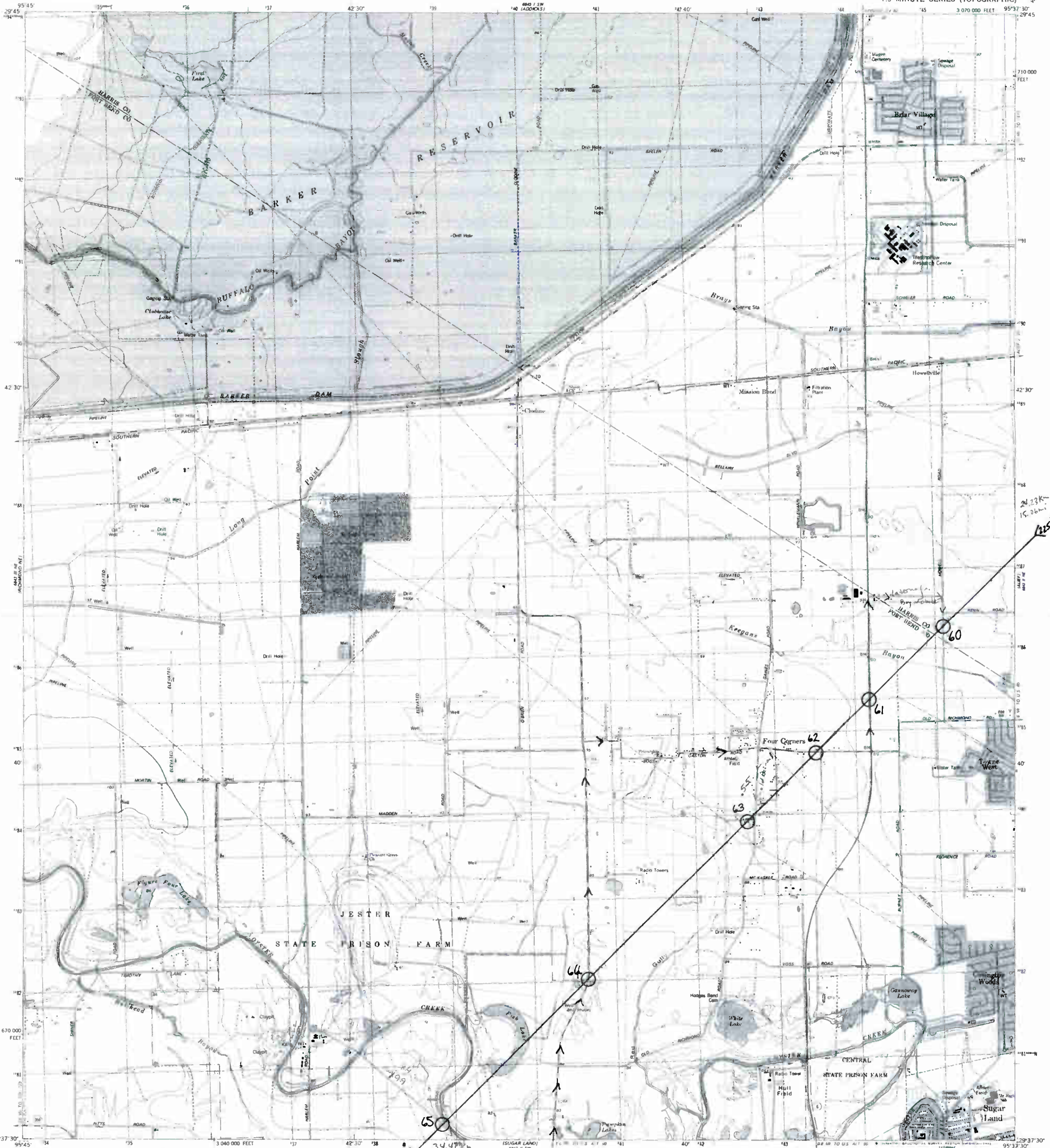
1982  
DMA 6943 1 BW SERIES V82

A portion of this map lies within a subsidence area  
Contouring based on 1973 adjustment of vertical control

There may be private inholdings within the boundaries of  
the National or State Reservations shown on this map

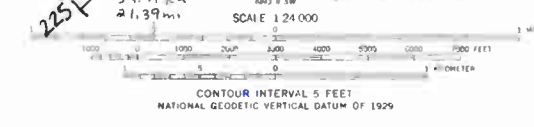
World Radio History





**KMIC - 1590 kHz - HOUSTON, TEXAS**  
**MAP # 17**  
WILLOUGHBY & VOSS  
BROADCAST TECHNICAL CONSULTANTS  
SAN ANTONIO, TEXAS

UTM GRID AND 1987 MAGNETIC NORTH  
DECLINATION ALL CENTER OF SHEET  
Areas covered by dashed light-blue pattern are subject  
to controlled inundation.  
There may be private inholdings within the boundaries of the  
National or State reservations shown on this map.



ROAD CLASSIFICATION

Primary highway hard surface	Light duty road improved surface
Secondary highway hard surface	Unimproved road
Interstate Route	U. S. Route
	State Route

THIS MAP COMPLEIES WITH NATIONAL MAP ACCURACY STANDARDS  
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON VIRGINIA 22092  
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

2995-313

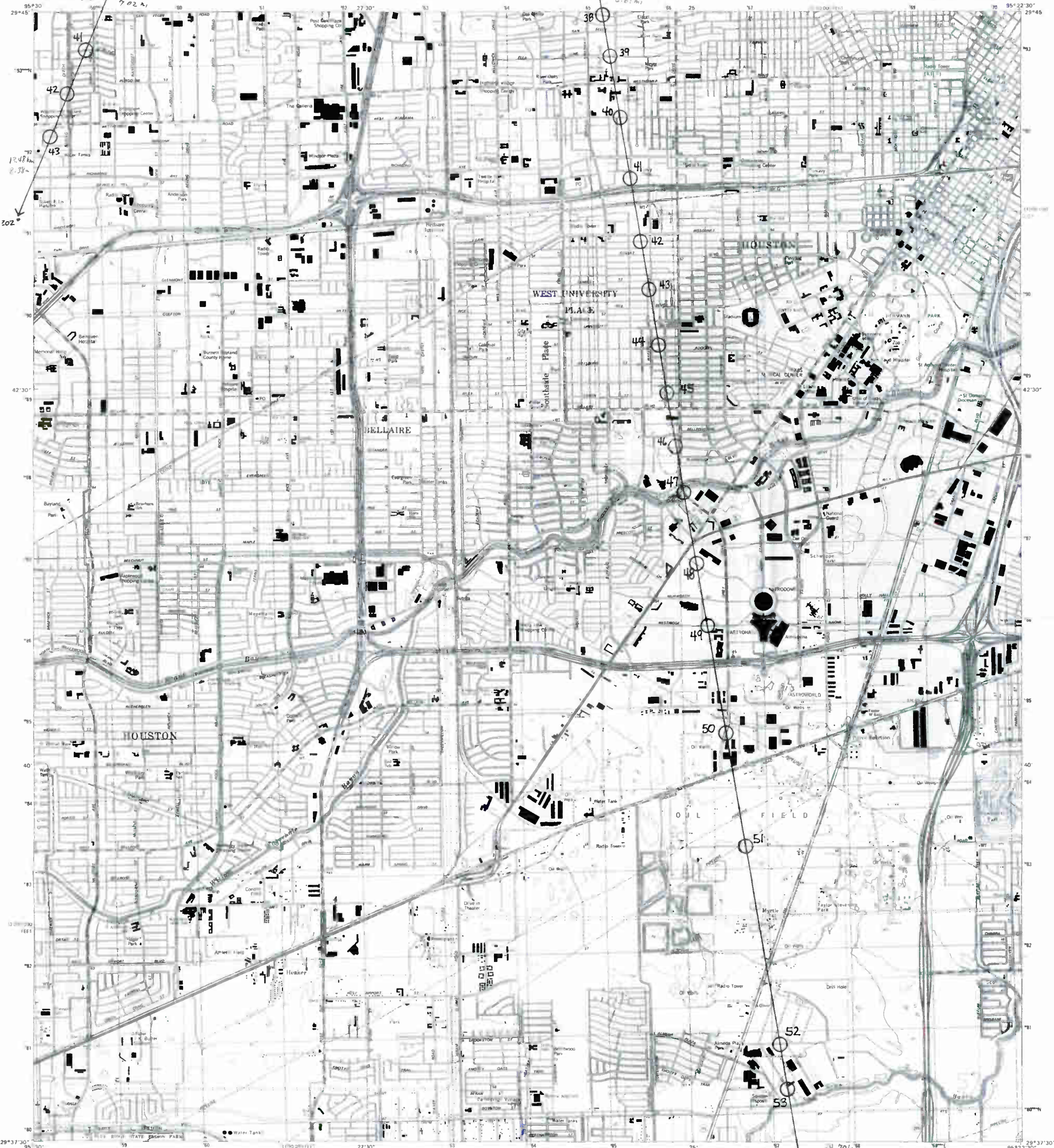
CLODINE, TEX.  
N2937.5-W9537.5/7.5  
1982  
DMA 6843 II NW-SERIES V8R2





U.S. DEPARTMENT OF THE INTERIOR  
U.S. GEOLOGICAL SURVEY

BELLAIRE QUADRANGLE  
TEXAS HARRIS CO.  
7.5-MINUTE SERIES (TOPOGRAPHIC)



**KMIC - 1590 kHz - HOUSTON, TEXAS**  
**MAP # 19**  
WILLOUGHBY & VOSS  
BROADCAST TECHNICAL CONSULTANTS  
SAN ANTONIO, TEXAS

UTM GRID AND 1983 MAGNETIC NORTH DECLINATION AT CENTER OF MAP

CONTOUR INTERVAL 5 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929  
TO CONVERT FROM FEET TO METERS, MULTIPLY BY 0.3048

THIS MAP COMPLETES WITH NATIONAL MAP ACCURACY STANDARDS  
FOR SALE BY U.S. GEOLOGICAL SURVEY OF BROADCASTING SYSTEMS, COLORADO #0225  
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND QUADRANGLES IS AVAILABLE

QUADRANGLE LOCATION  
2995-423

1	2	3
4	5	6
7	8	

ROAD CLASSIFICATION  
Primary highway  
hard surface  
Secondary highway  
hard surface  
Light-duty road, hard or  
unimproved surface  
Unimproved road

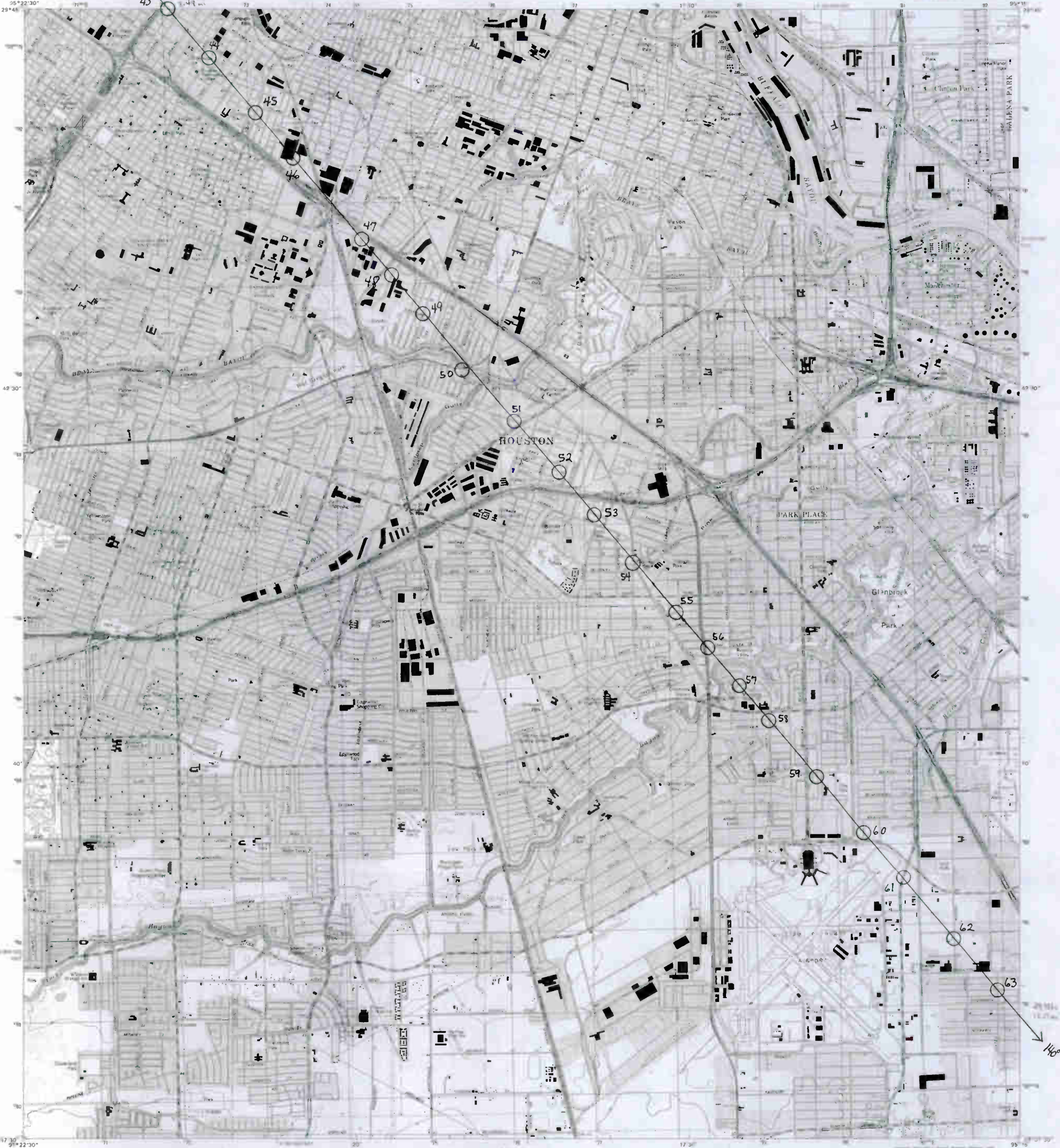
Interstate Route U.S. Route State Route

BELLAIRE, TX  
1995

NMA 4943 IN NW-SR RLS 5/82



9 780607 903423



KMIC - 1590 kHz - HOUSTON, TEXAS  
MAP # 20  
WILLOUGHBY & VOSS  
BROADCAST TECHNICAL CONSULTANTS  
SAN ANTONIO, TEXAS



CONTOUR INTERVAL 5 FEET  
NATIONAL GEODETIC SURVEY DATA IN 1988  
TO CONVERT FEET TO METERS, MULTIPLY BY 0.3048  
NEWSPRINGS IN LEFT CORNER SHOW WATER DATA  
WHERE THE MAIN REFERENCE TO THE APPROPRIATE LINE OF THE WATER  
THE NUMBER OF FEET IS SHOWN

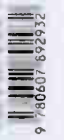
FOR SALE BY U.S. GEOLOGICAL SURVEY, P.O. BOX 22286, DENVER, COLORADO 80225  
NATIONAL CENTER FOR GEOLOGICAL INFORMATION

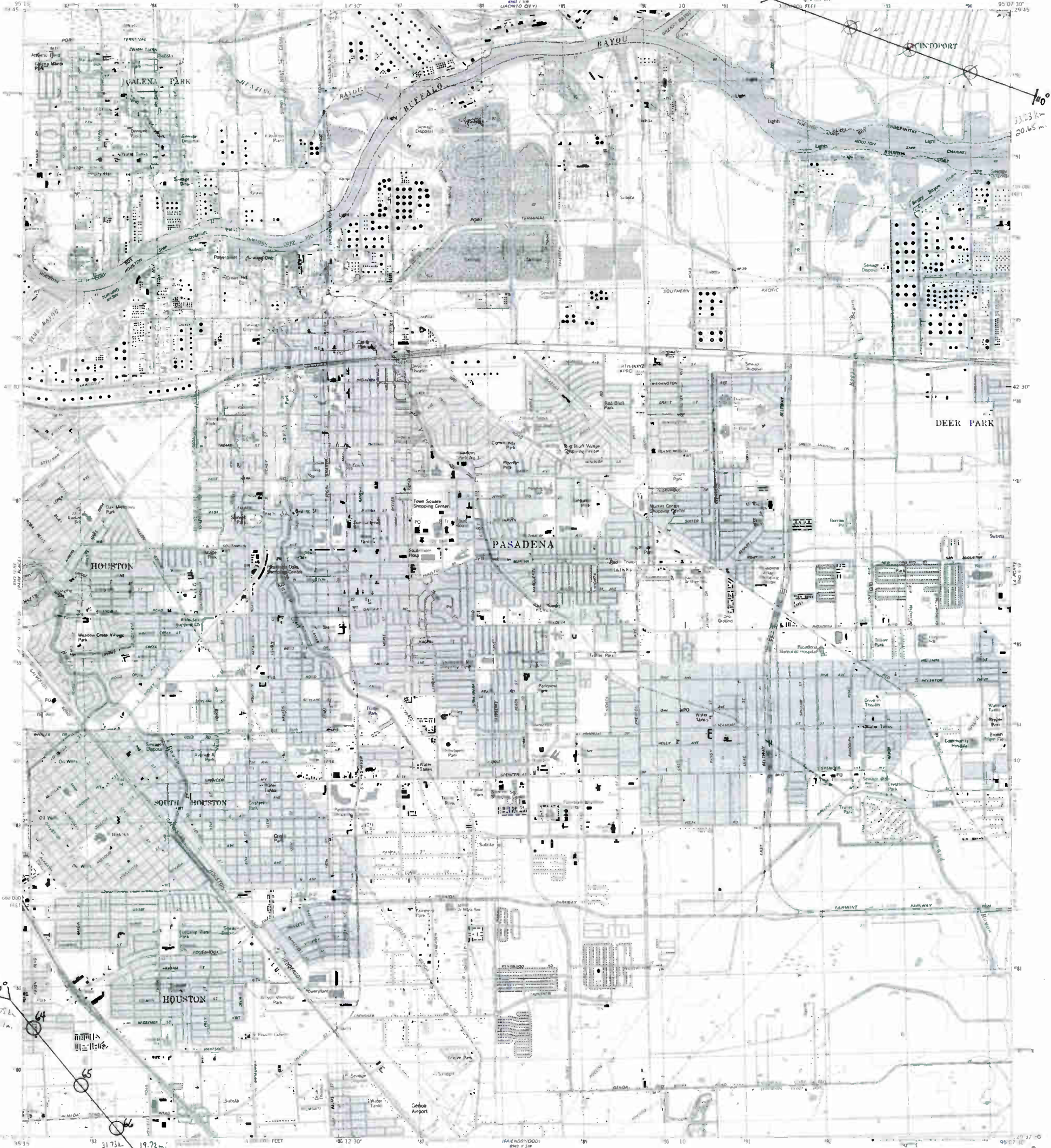
ROAD CLASSIFICATION

Primary highway	Feeder road	Local road
Interstate	State route	County road
U.S. Route	State route	County road

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

PARK PLACE, TX  
1995





29 75 L  
18 1 A  
64  
65  
66

Mapped, edited, and published by the Geological Survey  
Control by USGS and NOS/NOAA

Topography by photogrammetric methods from aerial photographs

KMIC - 1590 kHz - HOUSTON, TEXAS

MAP # 21

WILLOUGHBY & VOSS  
BROADCAST TECHNICAL CONSULTANTS  
SAN ANTONIO, TEXAS

SCALE 1:24,000

CONTOUR INTERVAL 5 FEET  
NATIONAL MESH VERTICAL DATUM OF 1988  
SOUNDINGS IN FEET QUAD LOW WATER DATUM  
SOUNDINGS SHOWN REPRESENT THE APPROXIMATE DEPTH AT MEAN HIGH WATER  
THE MEAN RANGE OF TIDE IS INDICATED

FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092  
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

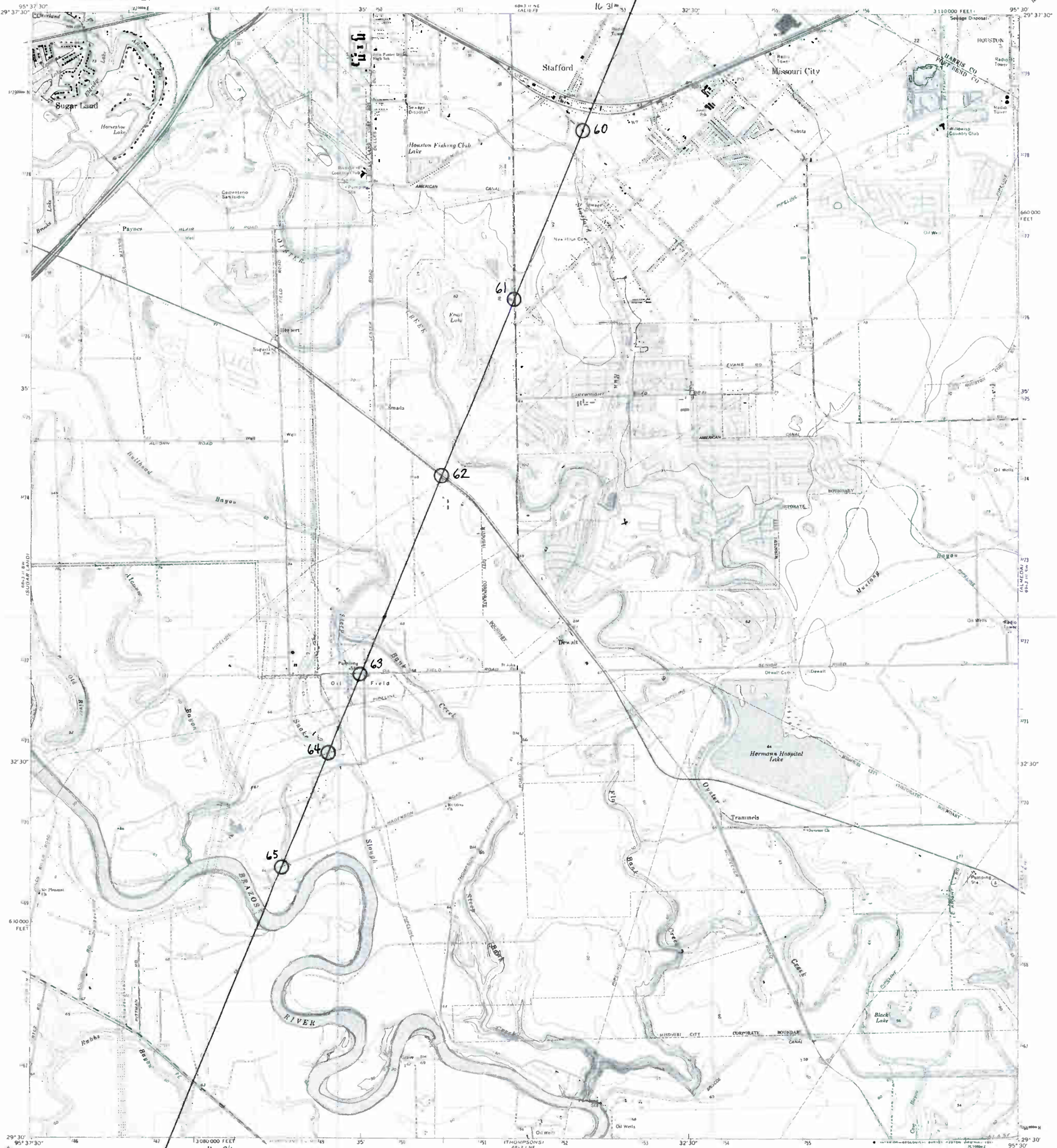
2995-413

PASADENA, TEX.

N2937 5 W9507 5/7 5

1982

DMA 8943 11 N.W. SERIES 7882

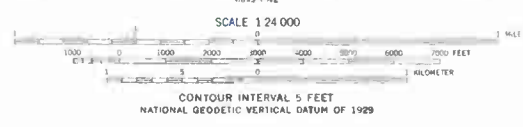


26.24 km  
16.31 mi  
202°

Mapped, edited, and published by the Geological Survey  
Control by USGS and NOS/NDAA  
Planimetry by photogrammetric methods from  
photographs taken 1968 Topography from 1:62,500 scale

**KMIC - 1590 kHz - HOUSTON, TEXAS**  
**MAP # 22**  
WILLOUGHBY & VOSS  
BROADCAST TECHNICAL CONSULTANTS  
SAN ANTONIO, TEXAS

UTM GRID AND 1983 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET  
is shown in purple, compiled from aerial photographs  
777 and other source data This information not  
checked Map edited 1980  
Dotted indicates extension of urban areas



ROAD CLASSIFICATION

Primary highway hard surface	Light duty road hard or improved surface
Secondary highway hard surface	Unimproved road
U.S. Route	State Route



Gaylord Stickle Co. & Assoc. Inc.  
Ph: 713-529-8471  
Fax: 713-529-2625  
WEB Address-www.GStickle.com  
MISSOURI CITY, TEX.  
29095 ES-TF-024  
1970  
PHOTOREVISED 1980  
DMA 8843 B SE SERIES 7882

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS  
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092  
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

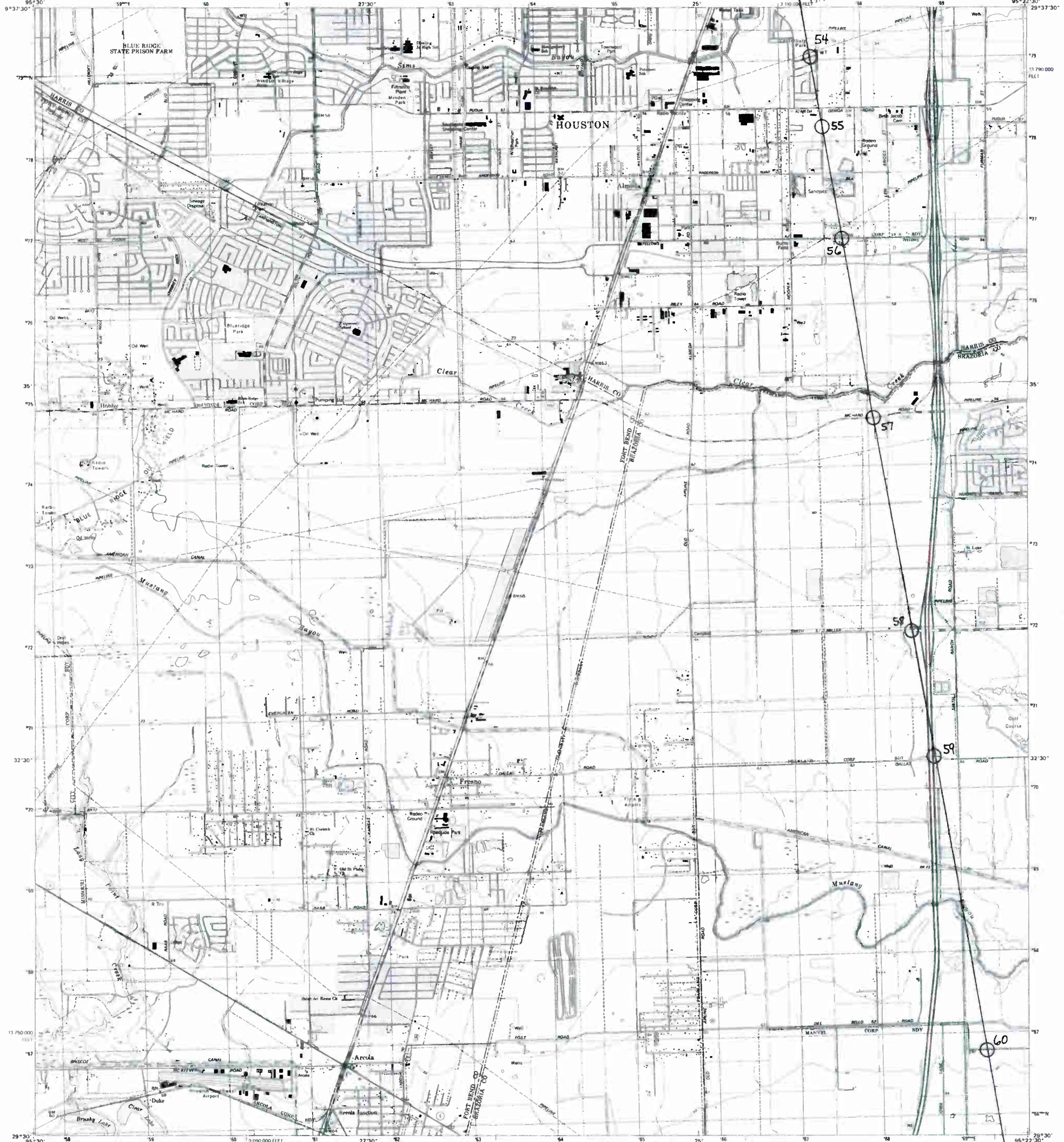




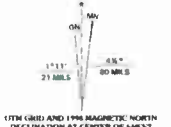
U.S. DEPARTMENT OF THE INTERIOR  
U.S. GEOLOGICAL SURVEY

Belleairc ↑

ALMEDA QUADRANGLE  
TEXAS  
7.5-MINUTE SERIES (TOPOGRAPHIC)



**KM1C - 1590 kHz - HOUSTON, TEXAS**  
**MAP # 23**  
WILLOUGHBY & VOSS  
BROADCAST TECHNICAL CONSULTANTS  
SAN ANTONIO, TEXAS



SCALE 1:24 000  
CONTOUR INTERVAL 5 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1984  
TO CONVERT FROM FEET TO METERS, MULTIPLY BY 0.3048



QUADRANGLE LOCATION  
2995-422

1	2	3
4	5	6
7	8	9

ROAD CLASSIFICATION  
Primary highway  
hard surface  
Light duty road, hard or  
improved surface  
Secondary highway  
hard surface  
Improved road  
Interstate Route  
U.S. Route  
State Route

ALMEDA, TX  
1995

FOR SALE BY U.S. GEOLOGICAL SURVEY, 1015 GUYTON DRIVE, BOULDER, COLORADO 80525



NIMA 6943 III SW-SERIES 1/82

EXHIBIT E  
MONITOR POINT INFORMATION

225° MONITOR POINT



From the transmitter driveway proceed west on Creekmont 0.87 miles to Mangum Street. Turn south (left) and proceed 0.67 miles on Mangum Street to W. 43rd Street. Turn east and proceed east 0.05 mile to Pinion Street. Monitor Point is located 50 feet due North of the southeast corner of the intersection of Pinion and 43rd, approximately 10 feet onto the boulevard median. This is point #15, it is 1.89 km from the array and the requested maximum is 147.0 mV/m.

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### 274° MONITOR POINT



From the 225° Monitor Point proceed west on W. 43rd Street to Antoine Drive. Turn north and proceed 0.5 miles on Antoine Drive to Pinemont Drive. Turn west and proceed 0.6 mile to Arbor Vitae. Turn right and proceed 0.22 mile to Golden Forest, turn left and proceed to Arbor Vitae, turn right and proceed 0.15 mile to Autumn Forest. Turn right on Autumn Forest and proceed to the deadend. Monitor Point is located on north side of street opposite 2603 and 50 feet east of the field gate. This is point #22, it is 3.59 km from the array and the requested maximum is 35.2 mV/m.

KMIC 274° MP  
EXHIBIT E-2

10° MONITOR POINT



From the 274° Monitor Point retrace steps to Pinemont Drive and Antoine Drive. Turn north onto Antoine Drive and proceed 1.75 miles to Victory Street. Turn right and proceed 1.8 miles on Victory to Orebo Street. Turn left and proceed 0.25 mile to Esther Street. Turn right and proceed 0.1 mile. Monitor Point is located on the north side of Esther Street, 60 feet east from Dyer. This is point #13, it is 3.36 km from the array and the requested maximum is 41.9 mV/m.

55° MONITOR POINT

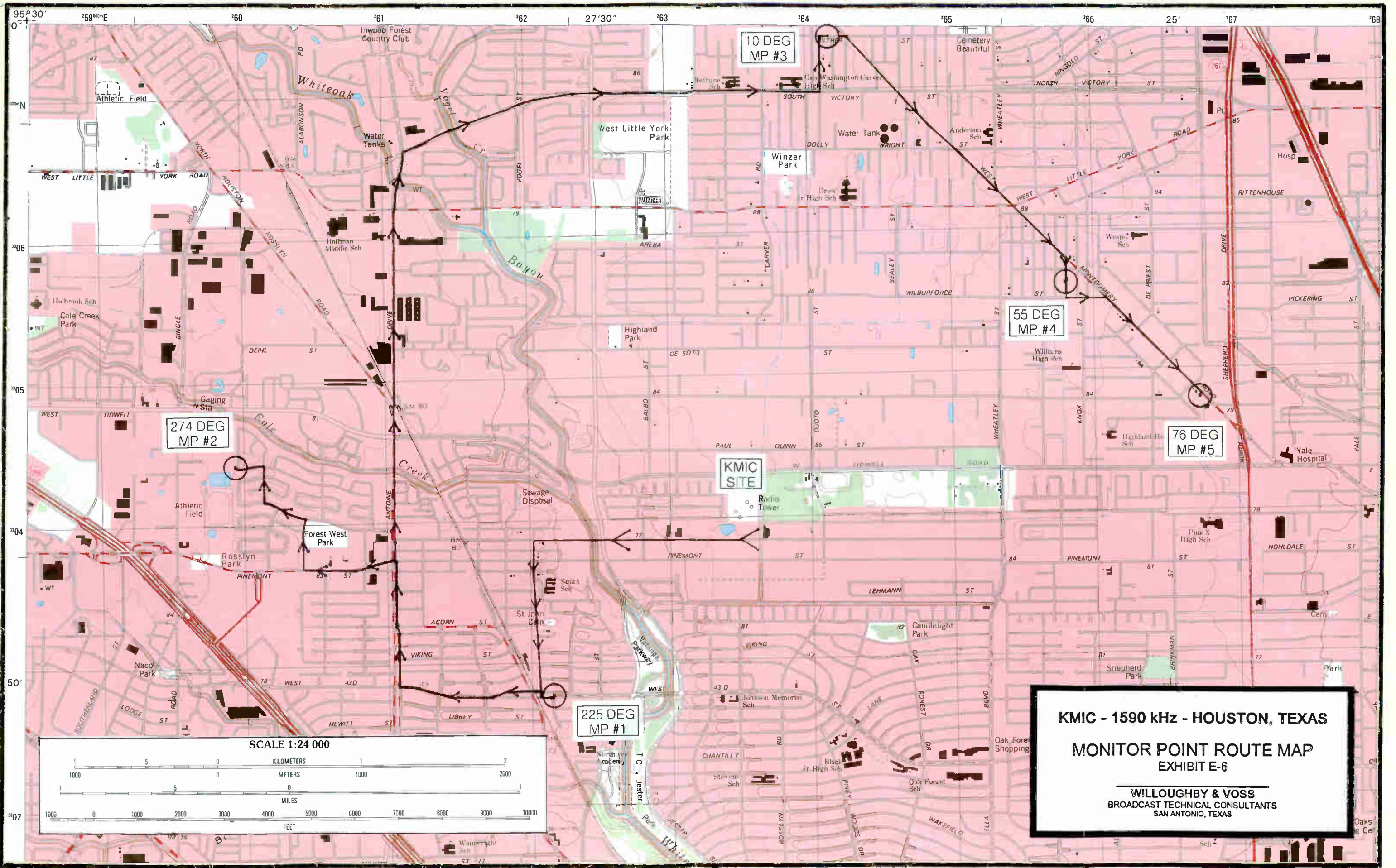


From the 10° Monitor Point proceed east on Esther 0.1 mile to Montgomery Road. Turn right and proceed southeast 1.25 miles on Montgomery to Arabella Street. Turn right and proceed 0.2 mile. Monitor Point is located at the west edge of pavement at the turn-in to vacant lot. This is point #14, it is 2.69 km from the array and the requested maximum is 39.8 mV/m.

76° MONITOR POINT



From the 55° Monitor Point proceed south on Arabella 0.1 mile to Wilburforce Street. Turn left and proceed east 0.23 mile to Montgomery Road. Turn right and proceed 0.6 mile to the vacant wooded lot between 1st Chapel IME Church and Mt. Ararat Baptist Church. Monitor Point is located at the turn-in to a vacant wooded lot, 60 feet west from the Montgomery Street sidewalk. This is point #12, it is 3.31 km from the array and the requested maximum is 35.3 mV/m.



**KMIC - 1590 kHz - HOUSTON, TEXAS**  
**MONITOR POINT ROUTE MAP**  
**EXHIBIT E-6**  
**WILLOUGHBY & VOSS**  
 BROADCAST TECHNICAL CONSULTANTS  
 SAN ANTONIO, TEXAS



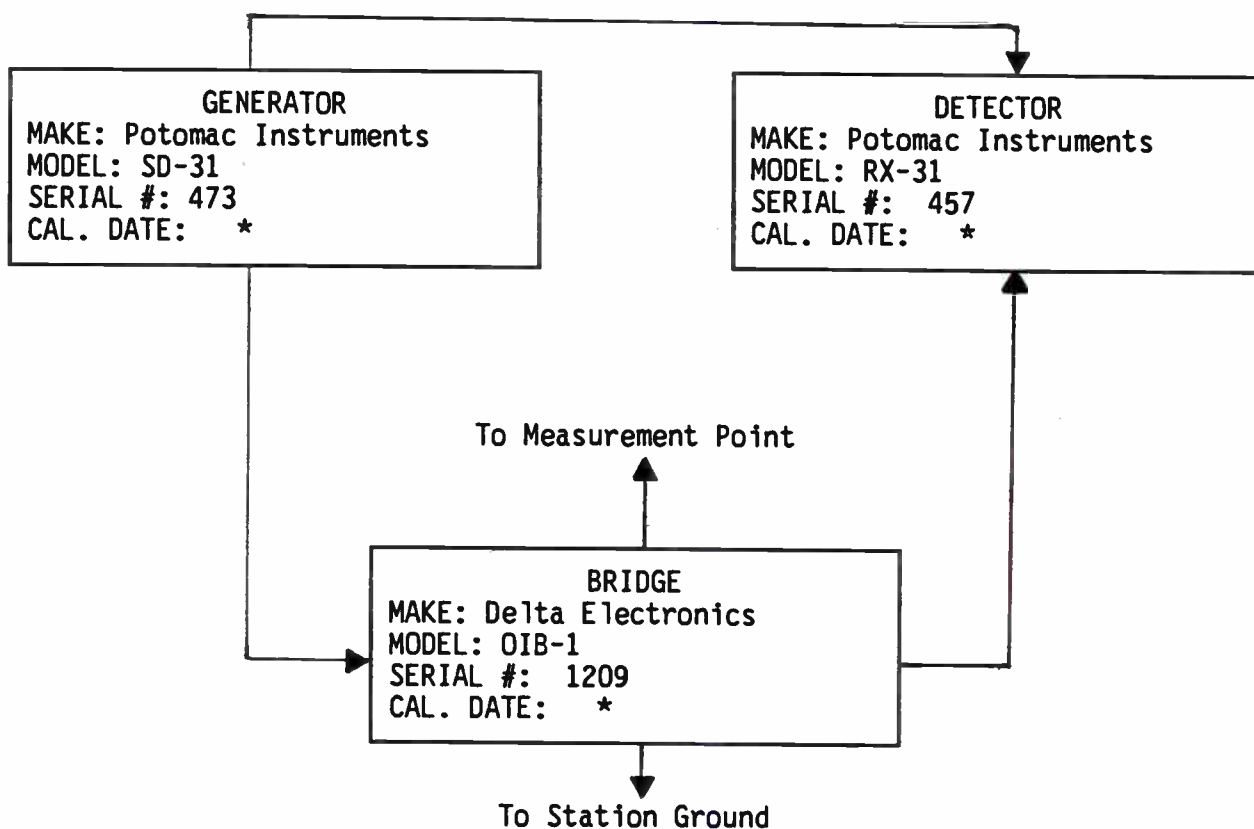
EXHIBIT F  
R.F. IMPEDANCE MEASUREMENTS

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WILLOUGHBY & VOSS

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TEST EQUIPMENT SET-UP



IMPEDANCE MEASUREMENT PROCEDURE

\* Prior to measurements, the equipment was connected together in the manner specified by the manufacturer. The bridge calibration was confirmed by measuring precision resistance and reactance standards. The bridge indications were found to be within 1% and 2% for resistance and reactance respectively. The digitally synthesized frequency generator was calibrated to zero beat with known broadcast stations, and is believed to be accurate within  $\pm 20$  Hertz. These calibration procedures were performed on the job site by the individual making the measurements.

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## WILLOUGHBY & VOSS

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The feed line normally connected to the output terminal of the appropriate r.f. ammeter was connected to the bridge by means of the factory provided lead. The ground lead from the bridge was connected to the station ground. The equipment was operated according to the manufacturers' recommended procedures.

The resistance and reactance values were read from the bridge dials. These readings were corrected for the frequency of measurement in accordance with the manufacturer's specifications.

The corrected measurements are tabulated and graphed and are contained in this report. A diagram showing the point at which these impedance measurements were made is also attached.

Delta Electronics rates the accuracy of the OIB-1 as follows:

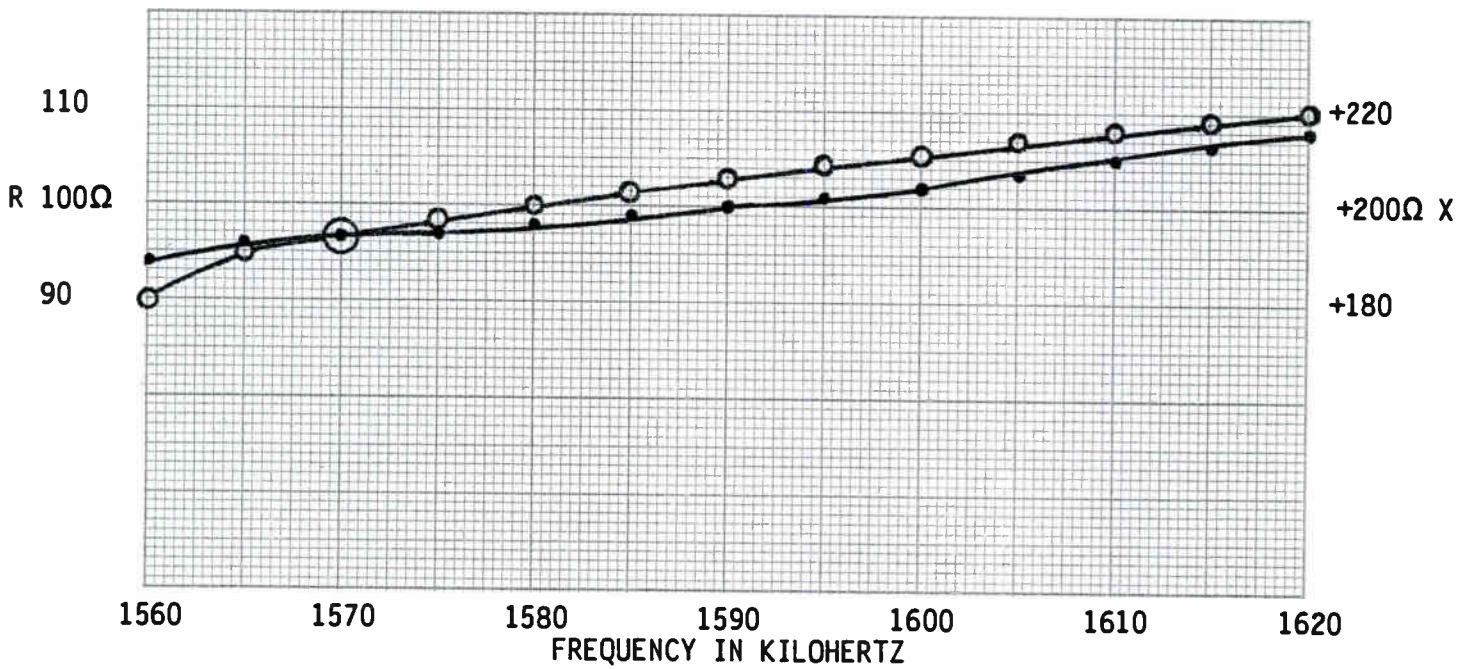
Resistance:  $\pm 2\%$ ,  $1\Omega$

Reactance:  $\pm 2\%$ ,  $1\Omega$

WILLOUGHBY & VOSS

KMIC, HOUSTON, TEXAS  
 TOWER #1 NON-DIRECTIONAL  
 IMPEDANCE MEASUREMENT  
 FEBRUARY 10, 2000

FREQUENCY (KHZ)	RESISTANCE ( $\Omega$ )	REACTANCE ( $\pm j\Omega$ )
1560	94	+180
1565	96	+190
1570	96.5	+194
1575	97	+197
1580	98	+200
1585	99	+203
CARRIER 1590	100	+206
1595	101	+209
1600	102	+211
1605	103.5	+214
1610	105	+216
1615	106.5	+218
1620	108	+220

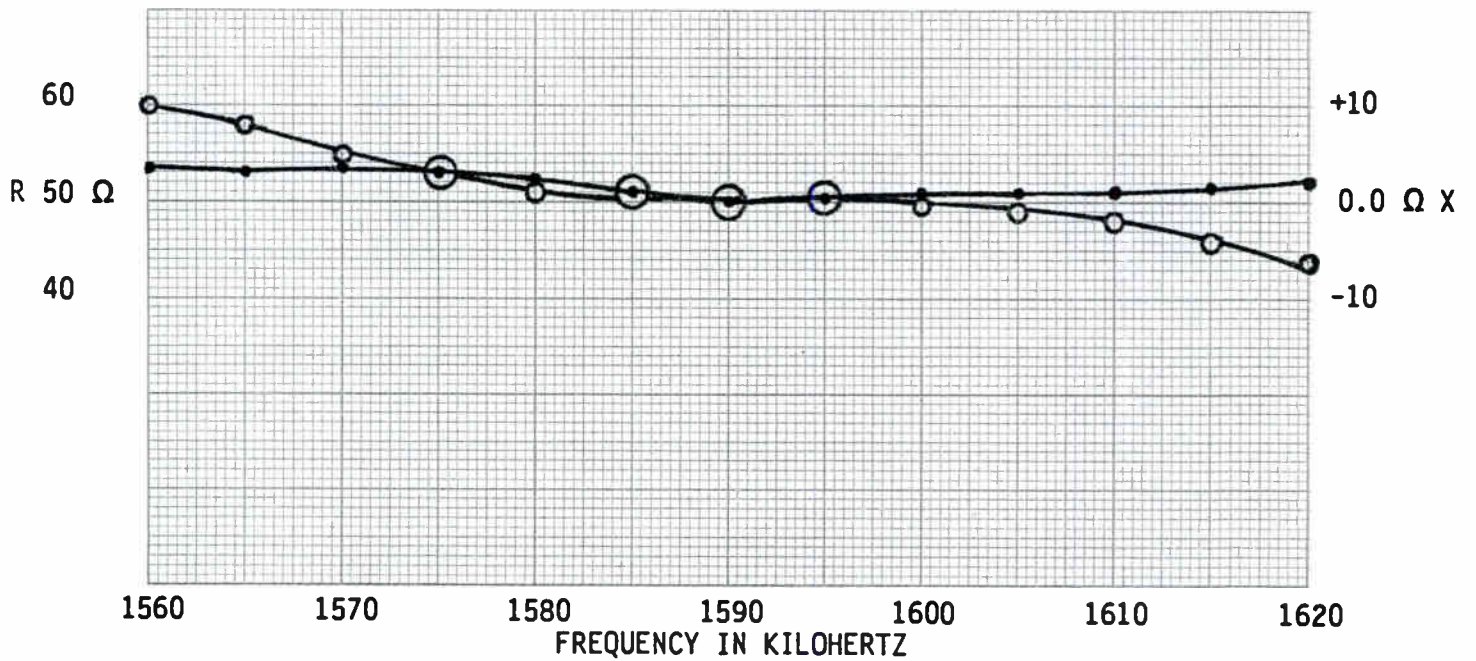


KMIC RADIO  
 EXHIBIT F-2

WILLOUGHBY & VOSS

KMIC, HOUSTON, TEXAS  
 DA-NIGHT COMMON POINT  
 IMPEDANCE MEASUREMENT  
 FEBRUARY 10, 2000

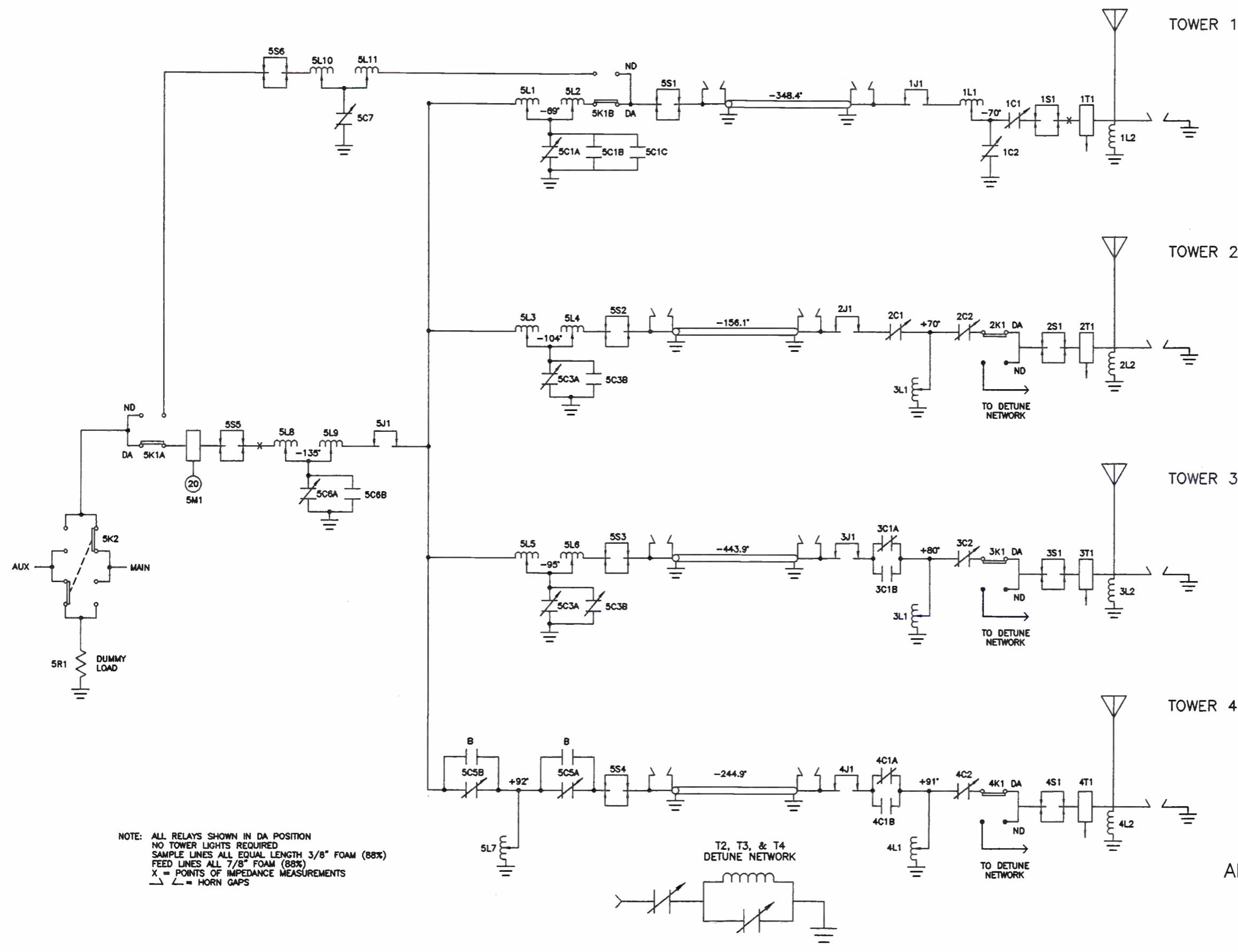
FREQUENCY (KHZ)	RESISTANCE ( $\Omega$ )	REACTANCE ( $\pm j\Omega$ )
1560	53.5	+10
1565	53	+8
1570	53.5	+5
1575	53	+3
1580	52.5	+1
1585	51	+1
CARRIER 1590	50	$\pm 0.0$
1595	50.5	$\pm 0.0$
1600	51	-0.5
1605	51	-1
1610	51	-2
1615	51.5	-4
1620	52	-6



KMIC RADIO  
 EXHIBIT F-3

EXHIBIT G  
SCHEMATIC DIAGRAM

D:\WILLOUGH\2-24-2000



NOTE: ALL RELAYS SHOWN IN DA POSITION  
 NO TOWER LIGHTS REQUIRED  
 SAMPLE LINES ALL EQUAL LENGTH 3/8" FOAM (88%)  
 FEED LINES ALL 7/8" FOAM (88%)  
 X = POINTS OF IMPEDANCE MEASUREMENTS  
 ↗ ↘ = HORN GAPS

ANTENNA SYSTEM SCHEMATIC  
 RADIO STATION KMIC  
 HOUSTON, TEXAS

SCALE: DNA DATE: 2-29-2000