JOHN J. MULLANEY
JOHN H. MULLANEY, P.E. (1994)
ALAN E. GEARING, P.E.
TIMOTHY Z. SAWYER

MULLANEY ENGINEERING, INC.

9049 SHADY GROVE COURT
GAITHERSBURG, MD 20877
301-921-0115 Voice
301-590-9757 Fax
Mullaney@MullEngr.com

ENGINEERING EXHIBIT EE:

AM BROADCAST STATION KIGS
PEREIRA BROADCASTING
HANFORD, CALIFORNIA
620 kHz Class B 1.0 kW-N&D DA-N-U

22 July 2011

FCC FACILITY ID NUMBER 51122

ENGINEERING EXHIBIT
IN SUPPORT OF
AN APPLICATION FOR
MODIFICATION OF LICENSE
TO COVER CHANGES IN THE OPERATION OF
AN EXISTING AM BROADCAST STATION

ENGINEERING EXHIBIT EE:

AM BROADCAST STATION KIGS
PEREIRA BROADCASTING
HANFORD, CALIFORNIA
620 kHz Class B 1.0 kW-N&D DA-N-U

22 July 2011

TABLE OF CONTENTS:

SECTION III - LICENSE APPLICATION ENGINEERING DATA

Name of Applicant

Pereira Broadcasting

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
KIGS	Not applicable	620	Unlimited	1.0	1.0

2. Station location	
State	City or Town
California	Hanford

3. Transmitter location			
State	County	City or Town	Street address (or other identification)
CA	Kings	Hanford	6165 East Lacey Blvd - Hwy 198

4. Main studio location			
State	County	City or Town	Street address (or other identification)
CA	Kings	Hanford	6165 East Lacey Blvd - Hwy 198

5. Remote control point location (specify only if authorized directional antenna)			
State	County	City or Town	Street address (or other identification)
CA	Kings	Hanford	6165 East Lacey Blvd - Hwy 198

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. Narrative Stm.

8. Operating constants:	
RF common point or antenna current (in amperes) without modulation for night system	RF common point or antenna current (in amperes) without modulation for day system
4.65	8.45
Measured antenna or common point resistance (in ohms) at operating frequency Night 50.0 Day 14	Measured antenna or common point reactance (in ohms) at operating frequency Night 0 Day -j65.1

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	-138.0	N/A	0.71	N/A	*	N/A
2	0.0	N/A	1.0	N/A	*	N/A

Manufacturer and type of antenna monitor: Potomac Instruments Model AM-19 (204), Serial # 1388

9. Description of antenna system ((f directional antenna is used, the information requested below should be given for each element of the array. Use separate sheets if necessary.) {TWR #1 ASR #1016446; TWR #2 ASR #1016447}

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.
Base insulated, self supported, tapered cross-section, steel lattice tower	91.3	91.4	92.9	Exhibit No. N/A

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	West Longitude
36 ° 19 ' 35 "	119 ° 33 ' 59 "

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. N/A

Also, if necessary for a complete description, attach as an Exhibit a sketch of the details and dimensions of ground system. Exhibit No. Narrative Stm.

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

See Narrative Statement

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

See Narrative Statement

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)	Signature (check appropriate box below)
Alan E. Gearing, PE	Alan E. Gearing
Address (include ZIP Code)	Date
Mullaney Engineering, Inc. 9049 Shady Grove Court Gaithersburg, MD 20877	22 July 2011 Telephone No. (Include Area Code) [301] 921-0115

☐ Technical Director ☑ Registered Professional Engineer

☐ Chief Operator ☐ Technical Consultant

☐ Other (specify)

DECLARATION

I, Alan E. Gearing, declare and state that I am a graduate electrical engineer with a Bachelor of Science degree in Electrical Engineering from SUNY University at Buffalo, that I am a registered professional engineer in the District of Columbia (since 1979), and that I have provided engineering services in the area of broadcasting and radio communications since 1973. My qualifications as an expert in radio engineering are a matter of record with the Federal Communications Commission. I am a senior engineer with the firm of Mullaney Engineering, Inc., consulting broadcast and radio communications engineers with offices in Gaithersburg, Maryland.

The firm of Mullaney Engineering, Inc., has been retained by PEREIRA BROADCASTING to prepare the instant engineering exhibit in support of: *an Application for Modification of License to Cover Changes in the Operation* of existing Class B AM broadcast station KIGS, licensed to HANFORD, CALIFORNIA (FCC FACILITY ID NUMBER 51122).

All facts contained herein are true of my own knowledge except those stated to be on information and belief, and as to those facts, I believe them to be true. I declare under penalty of perjury that the foregoing is true and correct.

Alan E. Gearing

Alan E. Gearing, P.E.
District of Columbia Number 7406
Executed on the 22nd day of July 2011

ENGINEERING EXHIBIT EE:

AM BROADCAST STATION KIGS
PEREIRA BROADCASTING
HANFORD, CALIFORNIA
620 kHz Class B 1.0 kW-N&D DA-N-U

22 July 2011

NARRATIVE STATEMENT:

I. GENERAL:

This narrative statement has been prepared on behalf of PEREIRA BROADCASTING (hereinafter "Pereira"), licensee of AM Broadcast Station KIGS, 620 kHz, Hanford, California (FCC FACILITY ID NUMBER 51122).

The instant application is being filed to specify new operating parameters subsequent to refurbishment of the KIGS antenna system and readjustment of the nighttime directional array. Details of the modifications that have been made are set forth below. A full proof of performance is being submitted as part of the instant application (containing both nondirectional and nighttime directional measurements) in support of new operating parameters proposed herein. In addition, a companion *Application for Construction Permit* is being submitted to alter the augmentations for the existing KIGS modified nighttime standard pattern.

Also, during the recent work on the KIGS array, it was discovered that the geographic coordinates for the array towers were in error. New FAA "Determinations of No Hazard to Air Navigation" have been obtained for the corrected tower coordinates and the FCC's Antenna Structure Registration (ASR) records for the KIGS towers have been updated to reflect the corrected coordinates and the new FAA determinations. The array center reference coordinates for the KIGS antenna system are being corrected as part the instant application for license. Since the correction is less than ± 3 seconds of latitude and/or longitude, under current FCC Rules [see §73.1690(b)(2)] this correction

can be made as part of an application for license and does not require a construction permit. However, since a companion application for construction permit is being filed to alter the augmentations for the existing KIGS modified nighttime standard pattern, for convenience, details concerning the tower coordinate correction are being submitted as part of that application.

II. ENGINEERING DISCUSSION:

A. Summary of Changes in KIGS Technical Specifications:

The KIGS antenna array was originally constructed and proofed in 1948. That was the last time a full proof of performance was carried out on the array. In 1977 an FM antenna was side-mounted on Tower #2 (NE) of the KIGS directional array. In addition, at that time the array sampling system was updated so as to qualify as an approved system under the FCC Rules. Subsequent to those changes, a partial proof of performance was carried out which demonstrated that the KIGS nighttime directional pattern remained in proper adjustment. The results of that partial proof were submitted to the Commission as part of an *Application for Direct Measurement of Power*. [See FCC File Number BZ-9657.]

The KIGS antenna array has now been extensively refurbished. To wit:

1) The radial ground system has been replaced;
2) The transmission lines and sampling lines have been replaced, as have the control lines and the AC power lines feeding the tower lighting;
3) All cabling to the towers has been buried in conduit;
4) The antenna monitor sampling elements have been changed from tower mounted loops to toroidal current sampling transformers;
5) The nighttime common point circuitry has been reconfigured to produce a nominal 50 + j0 ohm common point impedance;
6) The FM antenna that was side-mounted on Tower #2 has been removed.

Field strength measurements taken subsequent to the various modifications and/or improvements listed above indicated that the KIGS nighttime directional pattern needed to be readjusted. The pattern readjustment has been completed and a full proof of performance has been carried out.

The measured inverse distance field strengths for the readjusted KIGS night pattern are within the authorized KIGS modified standard pattern envelope, except in the directions of the two pattern minima. A companion application for construction permit is being submitted to alter the augmentations for the existing KIGS modified nighttime standard pattern to encompass these measured inverse distance fields.

B. Ground System:

The new ground system matches the licensed ground system parameters. About the base of each tower there are 120 evenly spaced, buried copper wire radials. Each radial extends a nominal distance of 121.9 meters (400'), except where they would otherwise overlap. Where the radials between towers would cross, they have been truncated and bonded to a traverse copper strap. In addition, there is a 14.6m x 14.6m (48' x 48') ground screen under the base of each tower.

C. Antenna Monitor and Sampling System:

The antenna monitor employed is a Potomac Instruments, Inc., Model AM-19 (204), Serial #1388 (FCC Type Approval #3-204). The sampling elements at each tower are Delta Electronics, type TCT-3, shielded toroidal current transformers installed within the antenna tuning unit enclosure at the base of each tower. The sample lines consist of equal lengths of buried, temperature stabilized, foam filled, 3/8" coaxial cable (type FHJ2-50A) manufactured by Andrew Corporation. Short flexible "jumper cables" are used to connect the sample lines to the antenna monitor. The connectors employed are specifically designed for use on this type of cable.

The antenna monitor sampling system as currently configured is thus believed to meet the requirements of the former §73.68 of the FCC Rules. The applicant therefore respectfully requests approval of the new KIGS sampling system

D. Antenna System Adjustment and Measurements:

The radials measured for the current full proof of performance differ from those employed for the original 1948 proof. The measured radials also do not correspond with those specified in the station's current instrument of authorization. The previously employed measurement radials were established based upon FCC policy and practice in place at the time of the original 1948 proof. The measurement radials employed for the current proof were selected so as to meet the requirements of the current version of §73.151 of the Rules. Whereas current practice is to specify field monitoring points only in directions corresponding to theoretical pattern minima; the existing KIGS authorization specifies field monitoring points in four radial directions, even though KIGS employs a simple two-tower directional array with only two pattern minima. In addition to the bearings corresponding to the theoretical pattern minima, field strength measurements have been made along sufficient additional radials to define the shape of the antenna directional pattern, including one through the pattern main lobe. The undersigned believes that the radials employed for current full proof of performance provide a more accurate and reliable indication of the pattern shape than would use of those employed during the 1948 proof.

Measurements were made out to a distance of at least approximately 15 kilometers along each of six radials, with more distant points added to some radials to assist in arriving at an unambiguous analysis. At least seven measurement points along each radial are located within 3 kilometers of the array. The measurements were taken at distance intervals conforming to those specified in §73.186 to the extent that physical conditions allowed. Field strength measurements were made at all reliable points that were safely and readily accessible. Directional pattern measurements were omitted at points close to the antenna where proper formation of the pattern would not be expected.

Daytime nondirectional operation employs the southwest (Number 1) tower with the other tower floating.

A tabulation of antenna operating impedances and indicated operating parameters for both the daytime nondirectional and nighttime directional modes are included herein as Figure 1. The measured field strength data are tabulated in Appendix A. Graphs of the nondirectional and directional field strength data are included as Appendix B and Appendix C, respectively.

All field strength measurements reported herein were taken by Mr. Marvin L. Sawyer, a radio engineer with extensive experience in the taking of AM broadcast station field strength measurements. (See Appendix F for a statement setting forth Mr. Sawyer's qualifications.) The meter employed was an RCA type WX-2D (serial number 1199; last calibration date unknown). The RCA meter was checked against a Potomac Instruments, Inc., type FIM-41 meter (serial number 2050 and last calibrated by the manufacturer February 15, 2007), and found to be in good agreement.

The field strength measurements were analyzed in accordance with the "best fit" method outlined in §73.186. Graph 3-A of §73.184 was utilized to determine the unattenuated fields and conductivity values (See Appendix D herein). As an aid in the analysis of the radial field strength measurement data, the logarithmic average[1] of the field strength along each radial was determined. The radial averages thus determined were multiplied by the corresponding radial nondirectional unattenuated fields to determine the directional unattenuated radiated field strength values. Figure 2 is a summary of measured unattenuated field strength values. Figure 3-A is a polar plot of the measured daytime nondirectional horizontal plane radiation pattern, while Figure 3-B is a polar plot of the measured nighttime directional horizontal plane radiation pattern. (For reference purposes,

[1] The logarithmic average for each radial is the antilogarithm of the mean of the logarithms of the ratios of field strength (directional to nondirectional) for each measurement location along a given radial.

Figure 3-B also shows the nighttime modified standard horizontal plane radiation pattern being proposed in the companion application for construction permit to alter the pattern augmentations.) These Figures demonstrate that the measured nighttime pattern will not exceed the proposed nighttime modified standard radiation pattern in any direction.

E. Monitor Points:

An accessible monitor point has been selected on each of the two radials corresponding to the directions of the minima for the KIGS theoretical nighttime directional pattern. Photographs and descriptions of the monitor points are shown herein as Appendix E. [NOTE: Directions to and maps showing the locations of field monitor points are no longer required and are not being submitted herein.]

F. Direct Measurement of Power:

For the purpose of determining the daytime nondirectional mode operating power, the impedance of tower #1 (SW) was measured with the remaining tower "floating". The common point impedance measurements were made at the input to the phasing equipment. In is no longer required to perform a "sweep" of impedance measurements and only the impedance values at the KIGS carrier frequency of 620 kHz are reported herein. The nondirectional tower base impedance was found to be 14 - j65.1 ohms, while the directional antenna common point impedance was set to a value of 50.0 + j0 ohms. A full description of the method used to make the measurements plus a schematic diagram showing all the information required by §73.54 of the Rules is on file at the station.

G. Radio Frequency Electromagnetic Fields Exposure Considerations:

Operation of AM broadcast station KIGS as described herein will not result in exposure of workers or the general public to levels of radiofrequency electromagnetic fields exceeding guidelines adopted by the Federal Communications Commission. (The current FCC guidelines are based upon

criteria contained in the Nations Council of Radiation Protection and Measurements (NCRP) Report No. 86 (1986) and ANSI/IEEE C95.1-1992.)

This is an existing facility originally constructed in 1948. Other than replacement of the radial wire ground system and burying the transmission lines, sampling lines, and other cabling running between the transmitter buildings and the array towers, no changes have been made to the array physical plant since the station's last license renewal. [See FCC File No. BR-20050721ADK]. That 2005 renewal application contained a technical study demonstrating that the guidelines contained in OET Bulletin No. 65 [edition 97-01] were met.

III. SUMMARY:

AM broadcast station KIGS has completed refurbishment of its antenna system and has carried out a full proof of performance on its readjusted nighttime direction antenna pattern. As documented herein and in the attached FCC Form 302-AM, and when taken in conjunction with the companion *Application for Construction Permit* specifying modified augmentations for its nighttime directional antenna pattern, the KIGS operation is believed to be in total compliance with all pertinent FCC Rules and Regulations.

Alan E. Gearing

Alan E. Gearing, P.E.

Mullaney Engineering, Inc.

APPENDIX A

MEASURED FIELD STRENGTH DATA TABULATIONS

Mullaney Engineering, Inc.

Appendix A (Sheet 1 of 6)

MEASURED FIELD STRENGTH DATA TABULATIONS

51.0 Degree Radial									
Point #	Distance		Daytime Nondirectional			Nighttime Directional			Log Ratio DAD/NDA
	(km)	(mi.)	Date	Time	mV/m	Date	Time	mV/m	
A	0.76	0.47	08-Mar-11	0845	350				
B	0.97	0.60	08-Mar-11	0915	290				
C	1.29	0.80	08-Mar-11	0940	200				
1	1.52	0.94	08-Mar-11	0956	180	13-Feb-11	0932	145	-0.0939
D	1.63	1.01	08-Mar-11	1019	170	18-Apr-11	1009	140	-0.0843
E	2.51	1.56	08-Mar-11	1041	120	18-Apr-11	1027	80	-0.1761
2	2.93	1.82	08-Mar-11	1100	90	13-Feb-11	0951	69	-0.1154
3	4.16	2.59	08-Mar-11	1130	68	13-Feb-11	1014	50	-0.1335
4	7.89	4.90	08-Mar-11	1210	31.5	13-Feb-11	1051	25	-0.1004
5	9.54	5.93	08-Mar-11	1245	28.5	13-Feb-11	1112	20.5	-0.1431
6	10.59	6.58	08-Mar-11	1309	31.0	13-Feb-11	1130	25.0	-0.0934
8	13.00	8.08	08-Mar-11	1329	21.0	13-Feb-11	1155	16.0	-0.1181
9	16.33	10.15	08-Mar-11	1401	16.0	13-Feb-11	1225	12.0	-0.1249
10	16.96	10.54	08-Mar-11	1416	15.0	13-Feb-11	1240	11.0	-0.1347
11	17.54	10.90	08-Mar-11	1433	14.5	13-Feb-11	1251	11.0	-0.1200
12	19.87	12.35	08-Mar-11	1501	13.5	13-Feb-11	1311	9.6	-0.1481
13	20.80	12.93	08-Mar-11	1536	12.0	13-Feb-11	1320	9.2	-0.1154
				Antilog of the Average Log Ratio:					0.7559
			Inverse Field Strength:		310				234

Mullaney Engineering, Inc.

Appendix A (Sheet 2 of 6)

MEASURED FIELD STRENGTH DATA TABULATIONS

115.5 Degree Radial									
Point #	Distance		Daytime Nondirectional			Nighttime Directional			Log Ratio DAD/NDA
	(km)	(mi.)	Date	Time	mV/m	Date	Time	mV/m	
A	0.49	0.30	09-Mar-11	0933	540				
B	0.73	0.45	09-Mar-11	1031	420				
C	1.12	0.70	09-Mar-11	1102	240				
D	1.40	0.87	09-Mar-11	1133	220	19-Apr-11	0850	54	-0.6100
E	1.98	1.23	09-Mar-11	1147	140	19-Apr-11	0905	32	-0.6410
F	2.35	1.46	09-Mar-11	1216	120	19-Apr-11	0924	27	-0.6478
G	2.88	1.79	09-Mar-11	1240	90	19-Apr-11	1020	21	-0.6320
1 - MP	3.77	2.34	09-Mar-11	1330	72.0	19-Apr-11	1041	17.0	-0.6269
2	7.36	4.57	09-Mar-11	1351	32.0	19-Apr-11	1108	9.2	-0.5414
3	9.23	5.74	09-Mar-11	1410	29.5	19-Apr-11	1121	6.4	-0.6636
4	10.48	6.51	09-Mar-11	1421	23.5	19-Apr-11	1131	5.3	-0.6468
5	11.10	6.90	09-Mar-11	1446	16.5	19-Apr-11	1145	5.0	-0.5185
6	11.88	7.38	09-Mar-11	1457	21.0	19-Apr-11	1201	5.0	-0.6232
7	12.91	8.02	09-Mar-11	1510	18.0	19-Apr-11	1211	4.4	-0.6118
8	14.51	9.02	09-Mar-11	1520	17.0	19-Apr-11	1230	3.9	-0.6394
10	16.33	10.15	09-Mar-11	1531	15.0	19-Apr-11	1237	3.5	-0.6320
11	17.22	10.70	09-Mar-11	1540	14.0	19-Apr-11	1251	3.2	-0.6410
12	18.54	11.52	09-Mar-11	1555	13.0	19-Apr-11	1300	3.1	-0.6226
13	19.92	12.38	09-Mar-11	1610	13.5	19-Apr-11	1313	3.1	-0.6390
								Antilog of the Average Log Ratio:	0.2393
			Inverse Field Strength:		290				69.4

Mullaney Engineering, Inc.

Appendix A (Sheet 3 of 6)

MEASURED FIELD STRENGTH DATA TABULATIONS

165.0 Degree Radial									
Point #	Distance		Daytime Nondirectional			Nighttime Directional			Log Ratio DAD/NDA
	(km)	(mi.)	Date	Time	mV/m	Date	Time	mV/m	
A	0.62	0.39	10-Mar-11	0934	490				
1	0.77	0.48	10-Mar-11	0956	300				
B	1.14	0.71	10-Mar-11	1008	200				
C	1.35	0.84	10-Mar-11	1026	210	18-Apr-11	1057	240	0.0580
D	1.93	1.2	10-Mar-11	1037	140	18-Apr-11	1108	160	0.0580
E	2.38	1.48	10-Mar-11	1044	130	18-Apr-11	1130	140	0.0322
2	2.76	1.72	10-Mar-11	1116	98	13-Feb-11	1456	110	0.0502
3	3.18	1.98	10-Mar-11	1135	79	13-Feb-11	1516	90	0.0566
4	3.91	2.43	10-Mar-11	1210	44.0	13-Feb-11	1533	49.0	0.0467
5	6.52	4.05	10-Mar-11	1227	39.5	13-Feb-11	1603	46.0	0.0662
6	6.87	4.27	10-Mar-11	1241	33.5	14-Feb-11	0830	41.0	0.0877
7	11.50	7.15	10-Mar-11	1310	22.0	14-Feb-11	0949	27.0	0.0889
8	13.13	8.16	10-Mar-11	1327	17.0	14-Feb-11	1005	19.0	0.0483
9	14.92	9.27	10-Mar-11	1337	15.5	14-Feb-11	1116	19.0	0.0884
10	16.00	9.94	10-Mar-11	1359	15.0	15-Feb-11	0910	18.0	0.0792
11	18.74	11.65	10-Mar-11	1423	13.0	15-Feb-11	1001	15.0	0.0621
12	19.50	12.12	10-Mar-11	1444	11	15-Feb-11	1045	13.0	0.0726
				Antilog of the Average Log Ratio:					1.1586
			Inverse Field Strength:		290				336

Mullaney Engineering, Inc.

Appendix A (Sheet 4 of 6)

MEASURED FIELD STRENGTH DATA TABULATIONS

231.0 Degree Radial									
Point #	Distance		Daytime Nondirectional			Nighttime Directional			Log Ratio DAD/NDA
	(km)	(mi.)	Date	Time	mV/m	Date	Time	mV/m	
A	0.53	0.33	12-Mar-11	0910	610				
B	0.78	0.48	12-Mar-11	0931	380				
C	0.97	0.6	12-Mar-11	0957	310				
D	1.54	0.96	12-Mar-11	1028	210	18-Apr-11	1151	290	0.1402
1	1.81	1.12	12-Mar-11	1044	150	15-Feb-11	1240	230	0.1856
2	2.25	1.4	12-Mar-11	1110	110	15-Feb-11	1307	180.0	0.2139
E	2.83	1.76	12-Mar-11	1149	95.0	18-Apr-11	0000	145.0	0.1836
3	3.86	2.4	12-Mar-11	1210	61.0	15-Feb-11	1335	98.0	0.2059
4	4.40	2.73	12-Mar-11	1231	60.0	15-Feb-11	1352	94.0	0.1950
5	4.92	3.06	12-Mar-11	1246	42.0	15-Feb-11	1422	63.0	0.1761
6	5.96	3.7	12-Mar-11	1308	45.0	15-Feb-11	1444	73.0	0.2101
7	7.45	4.63	12-Mar-11	1321	32.5	15-Feb-11	1507	51.0	0.1957
8	8.04	5	12-Mar-11	1337	33.5	15-Feb-11	1522	56.0	0.2231
9	10.08	6.26	12-Mar-11	1653	22.0	15-Feb-11	1543	39.0	0.2486
10	12.17	7.56	12-Mar-11	1416	20.5	15-Feb-11	1557	34.0	0.2197
11	12.64	7.86	12-Mar-11	1433	19.0	15-Feb-11	1612	28.0	0.1684
13	14.28	8.9	12-Mar-11	1447	17.0	15-Feb-11	1623	25.0	0.1675
14	15.21	9.5	12-Mar-11	1511	14.0	15-Feb-11	1633	24.0	0.2341
15	16.35	10.2	12-Mar-11	1528	15	15-Feb-11	1653	23	0.1856
								Antilog of the Average Log Ratio:	1.5742
			Inverse Field Strength:		305				480

Mullaney Engineering, Inc.

Appendix A (Sheet 5 of 6)

MEASURED FIELD STRENGTH DATA TABULATIONS

297.0 Degree Radial									
Point #	Distance		Daytime Nondirectional			Nighttime Directional			Log Ratio DAD/NDA
	(km)	(mi.)	Date	Time	mV/m	Date	Time	mV/m	
1	0.46	0.29	13-Mar-11	1104	540				
A	0.68	0.42	13-Mar-11	1205	410				
B	1.28	0.8	13-Mar-11	1221	210				
2	1.58	0.98	13-Mar-11	1232	150	18-Feb-11	0940	200.0	0.1249
C	1.92	1.19	13-Mar-11	1244	130	18-Apr-11	1245	150.0	0.0621
D	2.22	1.38	13-Mar-11	1301	120	18-Apr-11	1304	145.0	0.0822
E	2.49	1.55	13-Mar-11	1310	99.0	18-Apr-11	1316	125.0	0.1013
3	3.37	2.09	13-Mar-11	1334	66.0	18-Feb-11	0958	79.0	0.0781
4	3.99	2.48	13-Mar-11	1345	41.0	18-Feb-11	1020	51.0	0.0948
5	4.31	2.68	13-Mar-11	1400	51.0	18-Feb-11	1032	68.0	0.1249
6	5.80	3.6	13-Mar-11	1418	42.5	18-Feb-11	1045	52.0	0.0876
7	6.46	4.01	13-Mar-11	1429	35.0	18-Feb-11	1111	45.0	0.1091
8	7.01	4.36	13-Mar-11	1440	36.0	18-Feb-11	1145	43.0	0.0772
9	7.60	4.72	13-Mar-11	1453	30.0	18-Feb-11	1213	41.0	0.1357
10	8.17	5.08	13-Mar-11	1501	29.0	18-Feb-11	1245	36.0	0.0939
11	8.84	5.49	13-Mar-11	1518	27.0	18-Feb-11	1330	31.0	0.0600
12	9.64	5.99	13-Mar-11	1535	25.0	18-Feb-11	1340	31.0	0.0934
13	10.65	6.62	13-Mar-11	1530	23.0	18-Feb-11	1356	26.0	0.0532
14	11.14	6.92	13-Mar-11	1601	16.5	18-Feb-11	1417	22.0	0.1249
15	12.45	7.74	13-Mar-11	1611	19	18-Feb-11	1432	23	0.0830
16	14.25	8.86	13-Mar-11	1626	17.5	18-Feb-11	1440	22	0.0994
17	16.06	9.98	13-Mar-11	1705	14	18-Feb-11	1448	18	0.1091
								Antilog of the Average Log Ratio:	1.2430
			Inverse Field Strength:		270				336

Mullaney Engineering, Inc.

Appendix A (Sheet 6 of 6)

MEASURED FIELD STRENGTH DATA TABULATIONS

346.5 Degree Radial									
Point #	Distance		Daytime Nondirectional			Nighttime Directional			Log Ratio DAD/NDA
	(km)	(mi.)	Date	Time	mV/m	Date	Time	mV/m	
A	0.50	0.31	14-Mar-11	1001	510				
B	0.80	0.5	14-Mar-11	1022	330				
C	1.05	0.65	14-Mar-11	1044	250				
D	1.22	0.76	14-Mar-11	1106	230				
1	1.88	1.17	14-Mar-11	1117	150	20-Apr-11	1022	37.0	-0.6079
E	2.30	1.43	14-Mar-11	1140	130	20-Apr-11	1035	30.0	-0.6368
F - MP	2.91	1.81	14-Mar-11	1157	100	20-Apr-11	1101	25.0	-0.6021
G	3.11	1.93	14-Mar-11	1215	90.0	20-Apr-11	1116	20.0	-0.6532
2	3.55	2.21	14-Mar-11	1240	73.0	20-Apr-11	1243	18.5	-0.5962
3	5.21	3.24	14-Mar-11	1255	52.0	20-Apr-11	1255	12.0	-0.6368
4	6.04	3.75	14-Mar-11	1311	35.0	20-Apr-11	1307	9.0	-0.5898
5	6.88	4.3	14-Mar-11	1331	36.0	20-Apr-11	1324	8.4	-0.6320
6	8.57	5.3	14-Mar-11	1349	32.5	20-Apr-11	1337	7.5	-0.6368
7	10.22	6.4	14-Mar-11	1406	23.5	20-Apr-11	1352	5.9	-0.6002
8	11.88	7.4	14-Mar-11	1422	19.5	20-Apr-11	1404	4.9	-0.5998
9	12.75	7.9	14-Mar-11	1434	20.0	20-Apr-11	1423	5.2	-0.5850
10	13.58	8.4	14-Mar-11	1448	16.0	20-Apr-11	1432	4.3	-0.5707
12	16.89	10.5	14-Mar-11	1459	13	20-Apr-11	1448	3.5	-0.5699
13	18.58	11.5	14-Mar-11	1517	12	20-Apr-11	1507	3.2	-0.5740
14	20.23	12.6	14-Mar-11	1533	11	20-Apr-11	1518	3	-0.5643
								Antilog of the Average Log Ratio:	0.2492
			Inverse Field Strength:		285				71.0

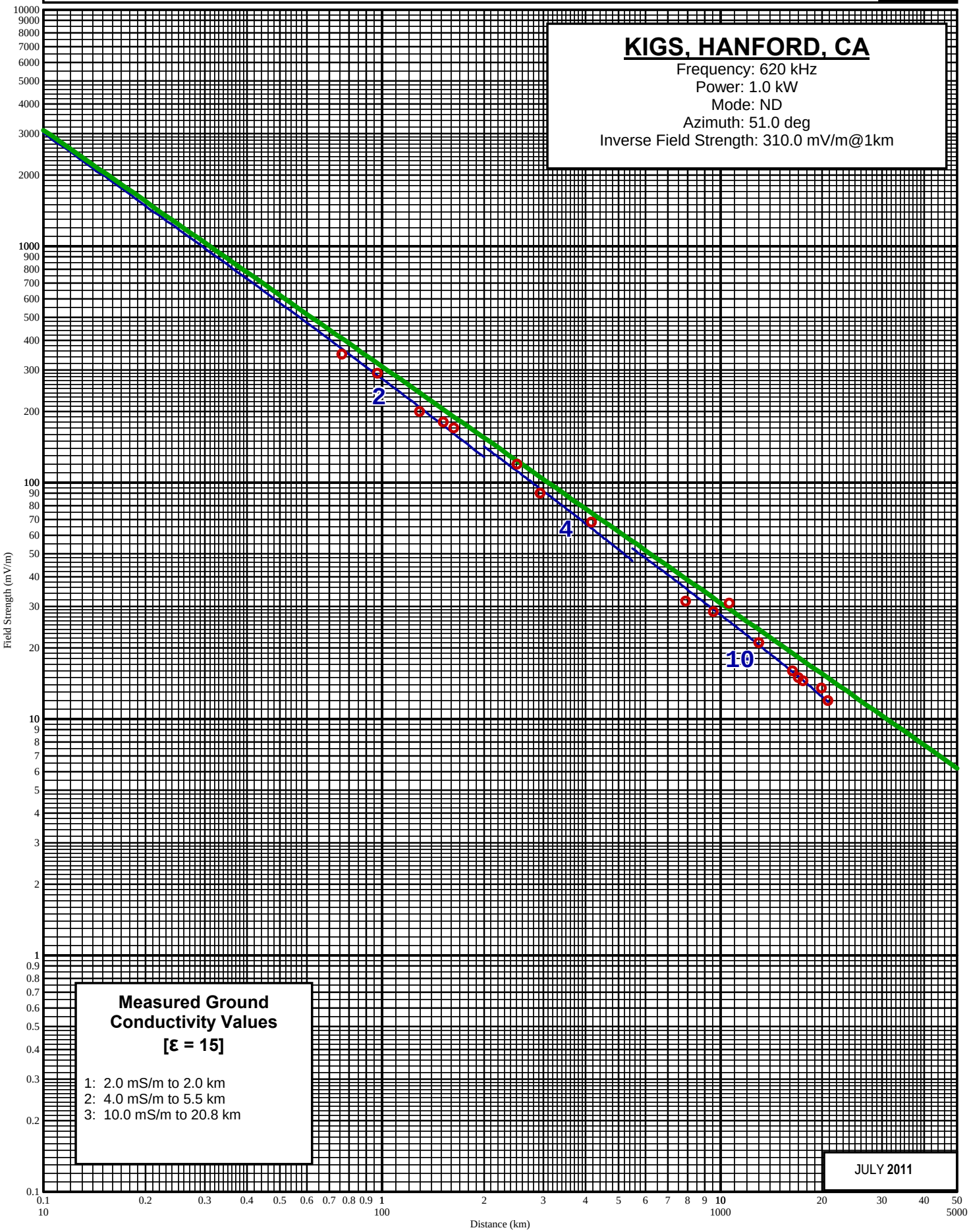
Mullaney Engineering, Inc.

APPENDIX B

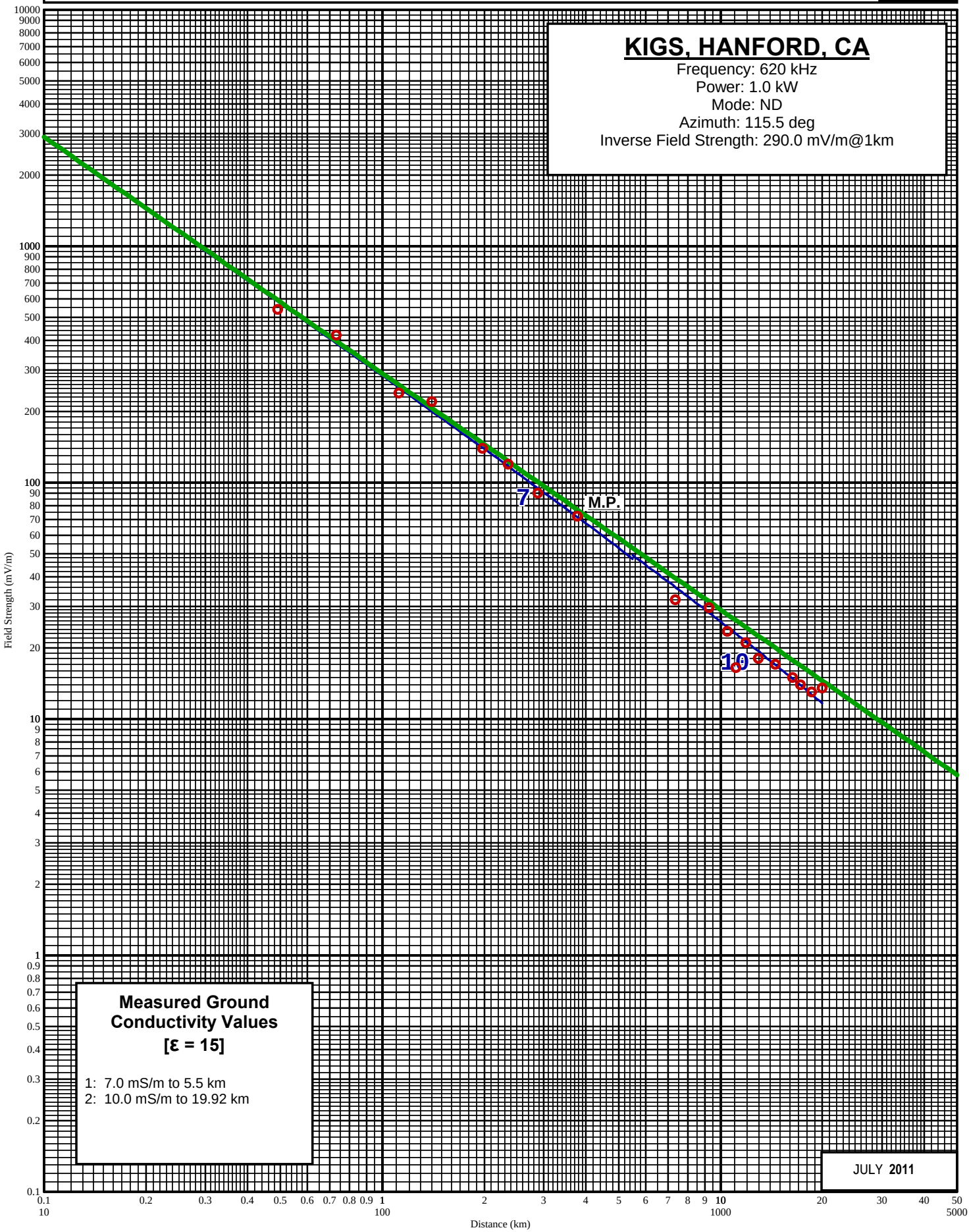
MEASURED DAYTIME NONDIRECTIONAL FIELD STRENGTH GRAPHS

Sheet 1 of 6

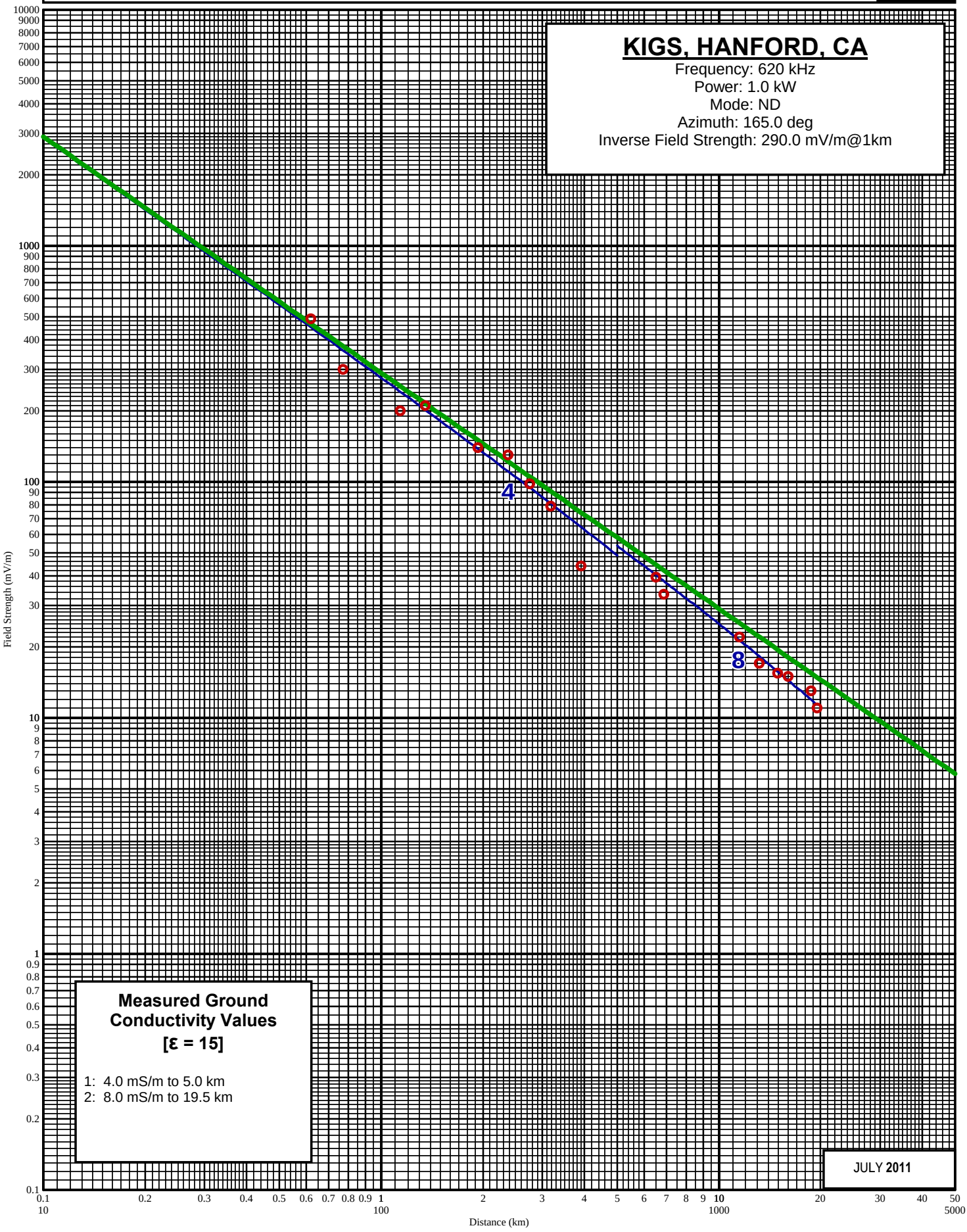
Measured Daytime Nondirectional Field Strength Graphs



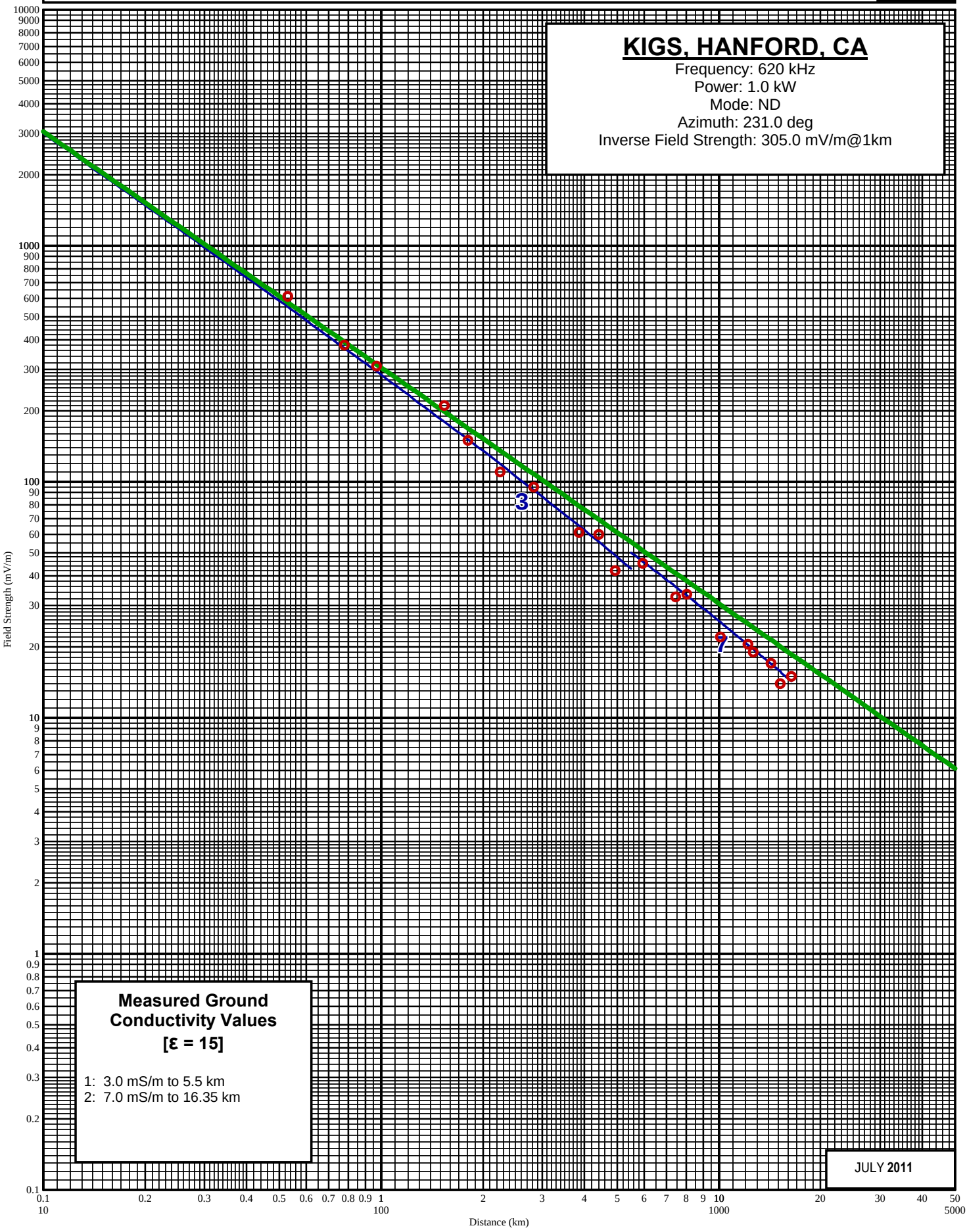
Sheet 2 of 6
Measured Daytime Nondirectional Field Strength Graphs



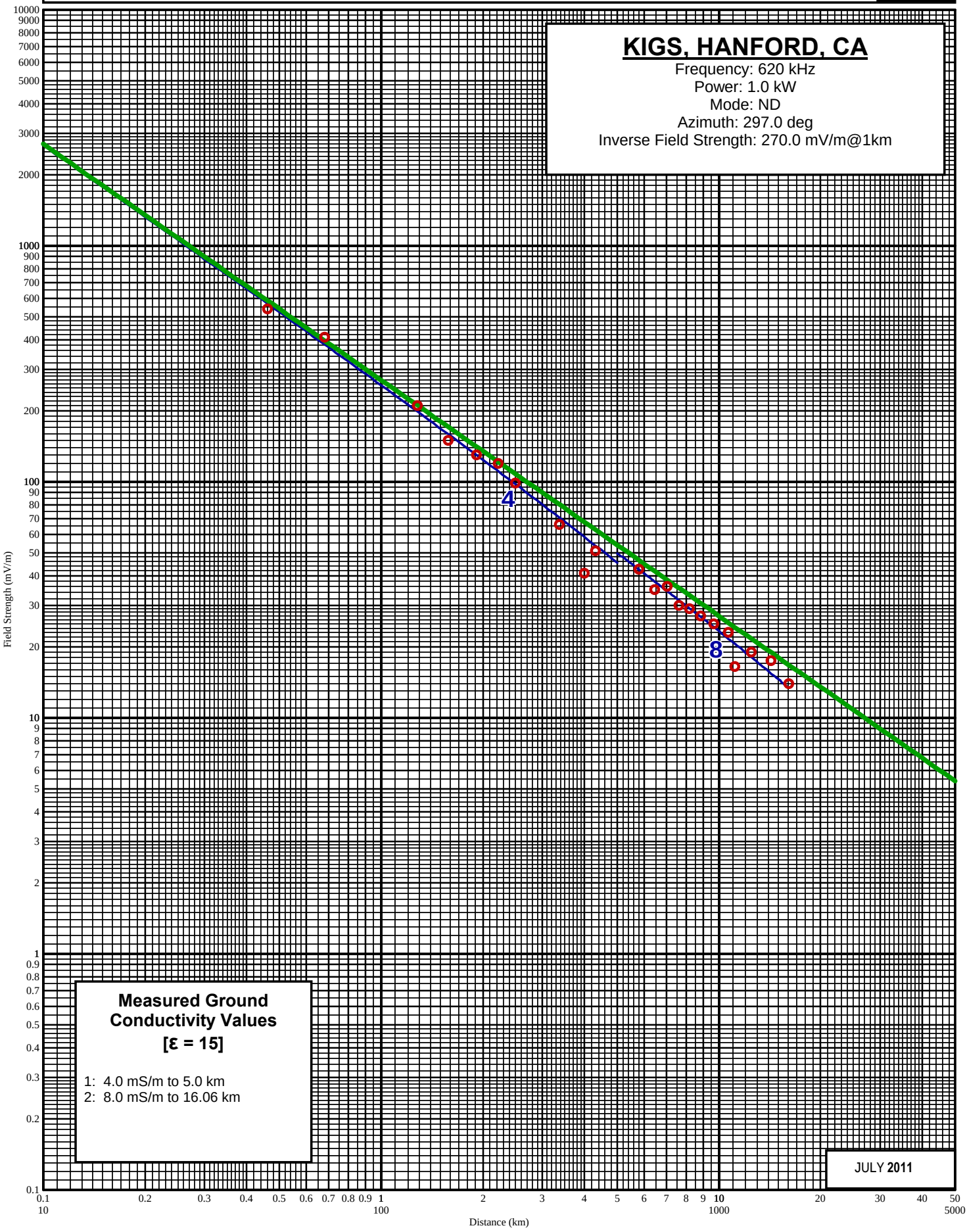
Sheet 3 of 6
Measured Daytime Nondirectional Field Strength Graphs



Sheet 4 of 6
Measured Daytime Nondirectional Field Strength Graphs

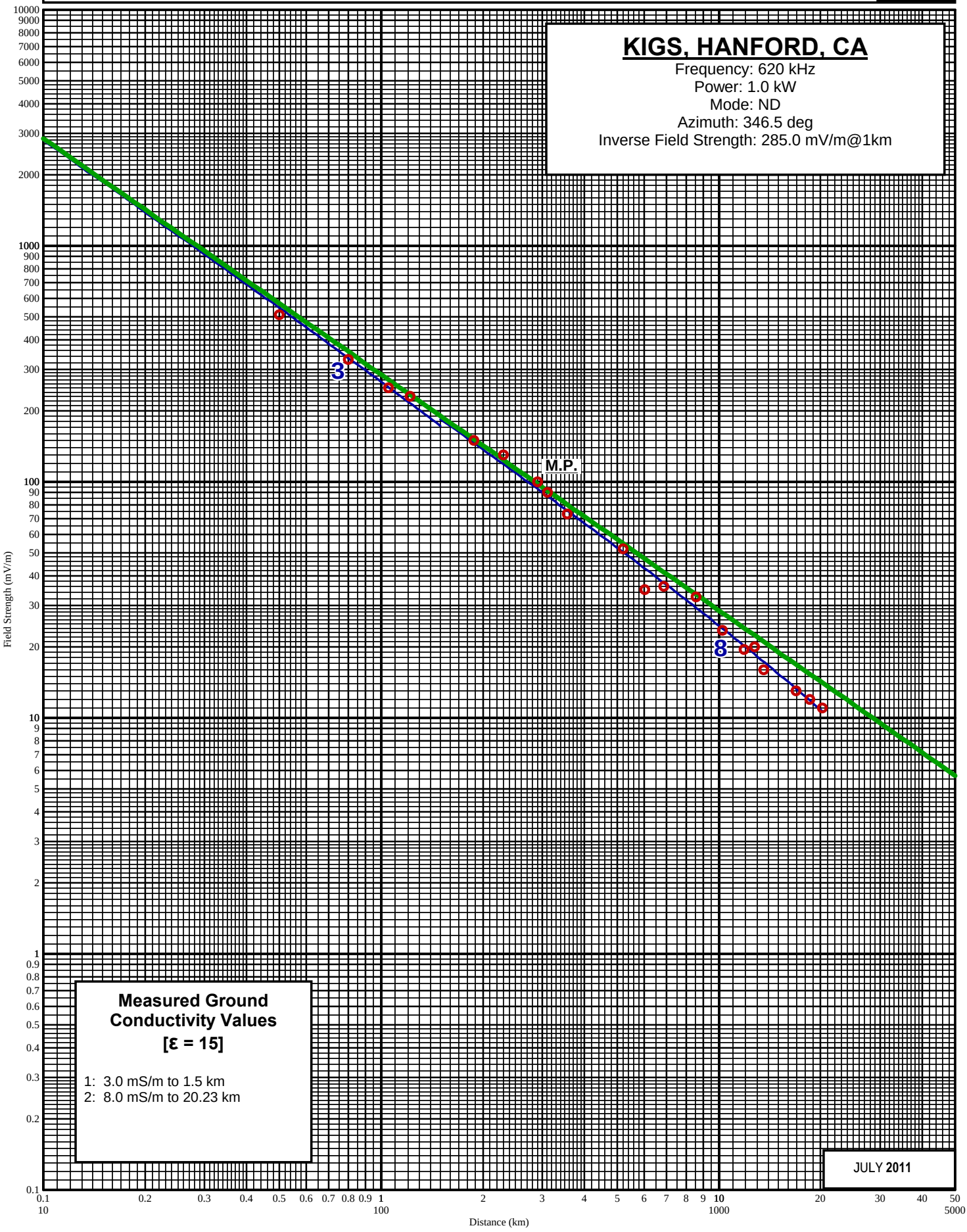


Sheet 5 of 6
Measured Daytime Nondirectional Field Strength Graphs



Sheet 6 of 6

Measured Daytime Nondirectional Field Strength Graphs

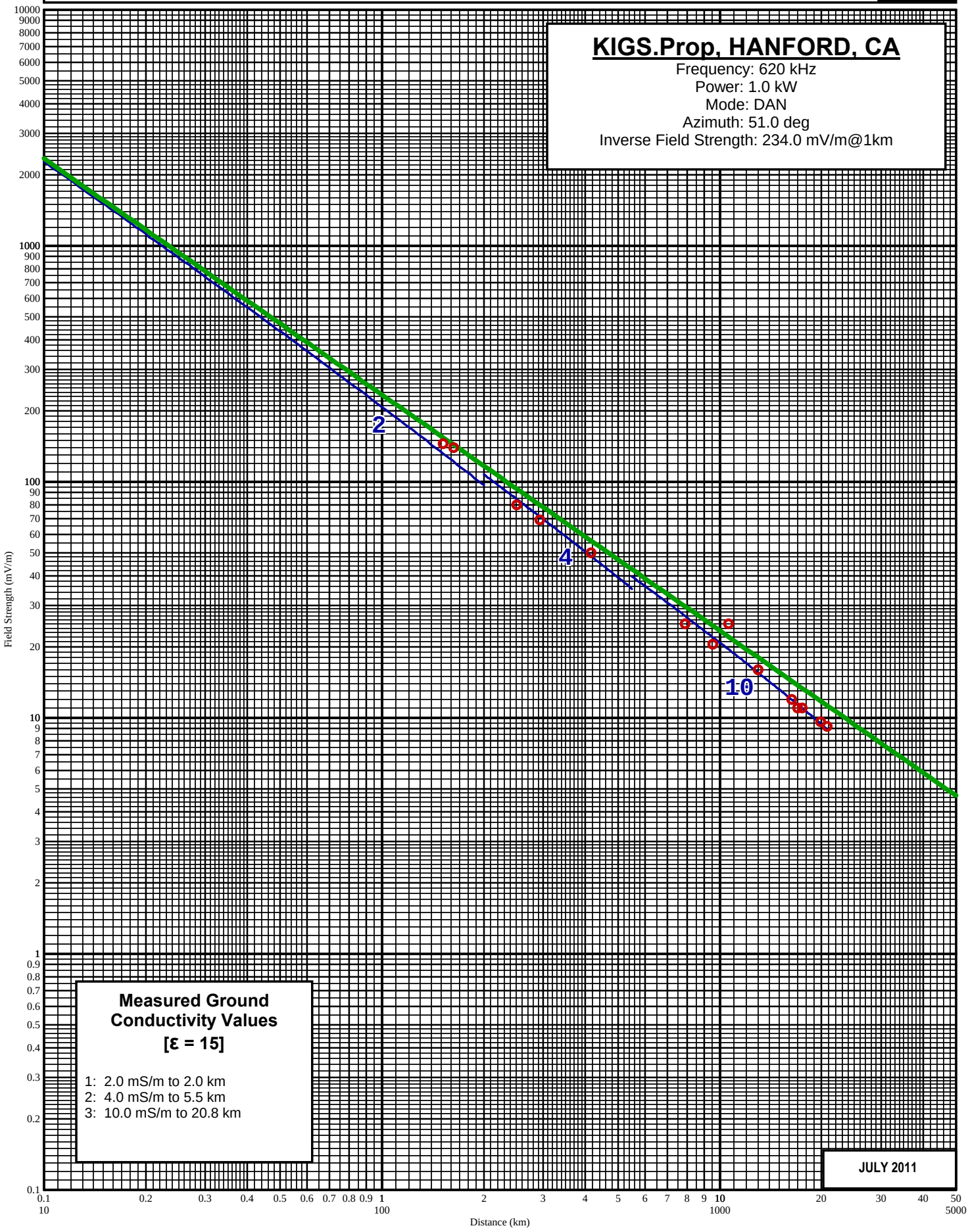


Mullaney Engineering, Inc.

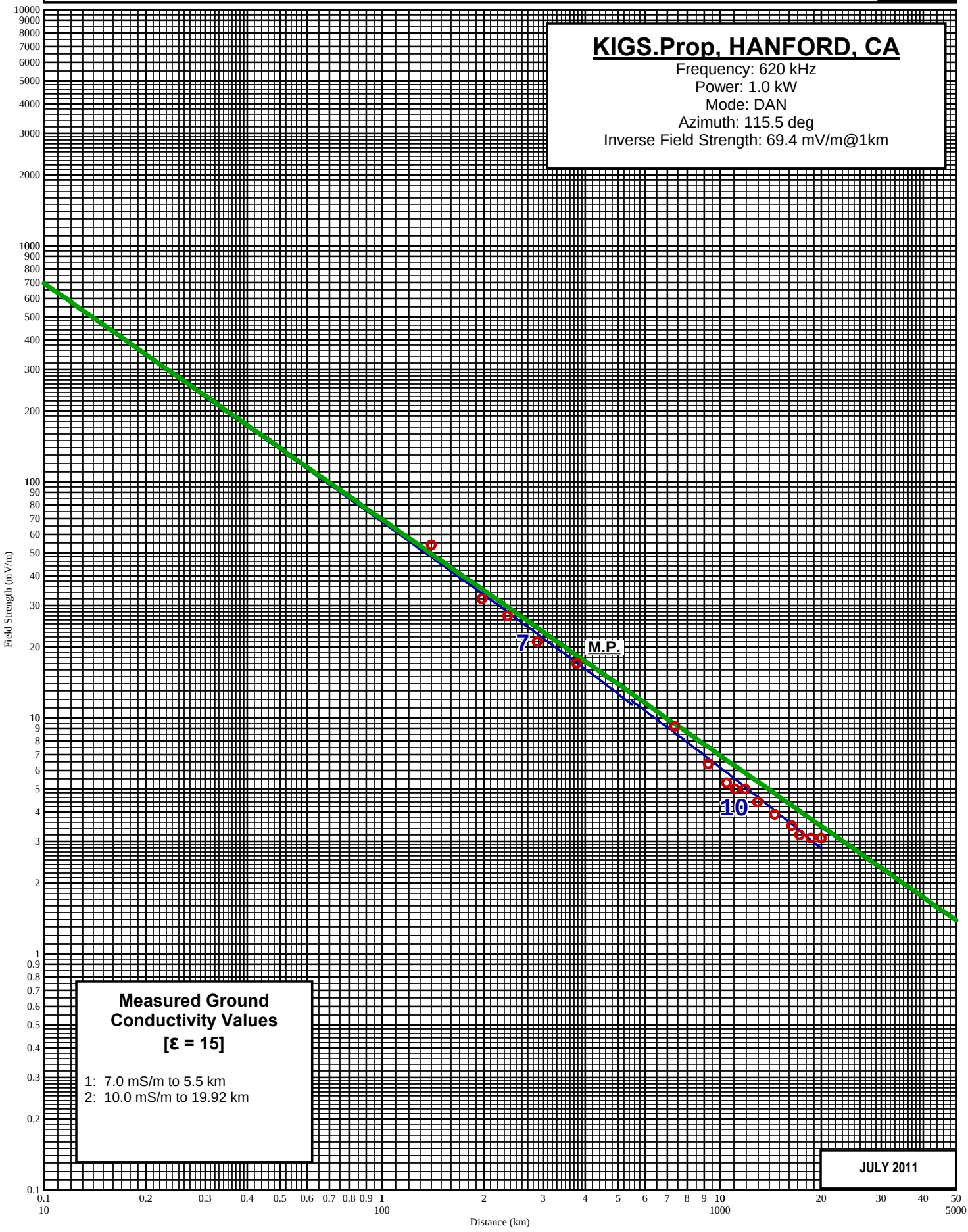
APPENDIX C

MEASURED NIGHTTIME DIRECTIONAL FIELD STRENGTH GRAPHS

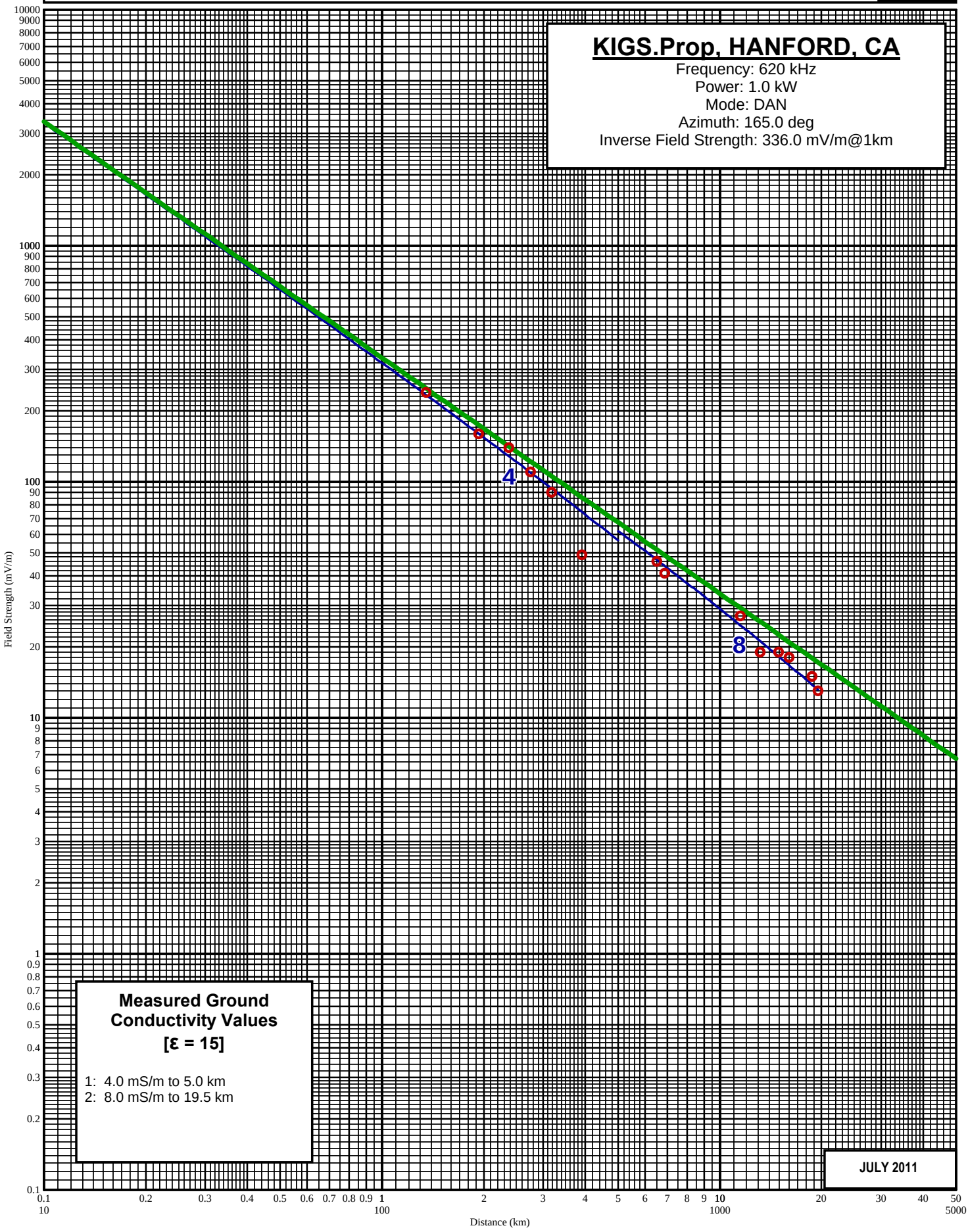
Sheet 1 of 6
Measured Nighttime Directional Field Strength Graphs



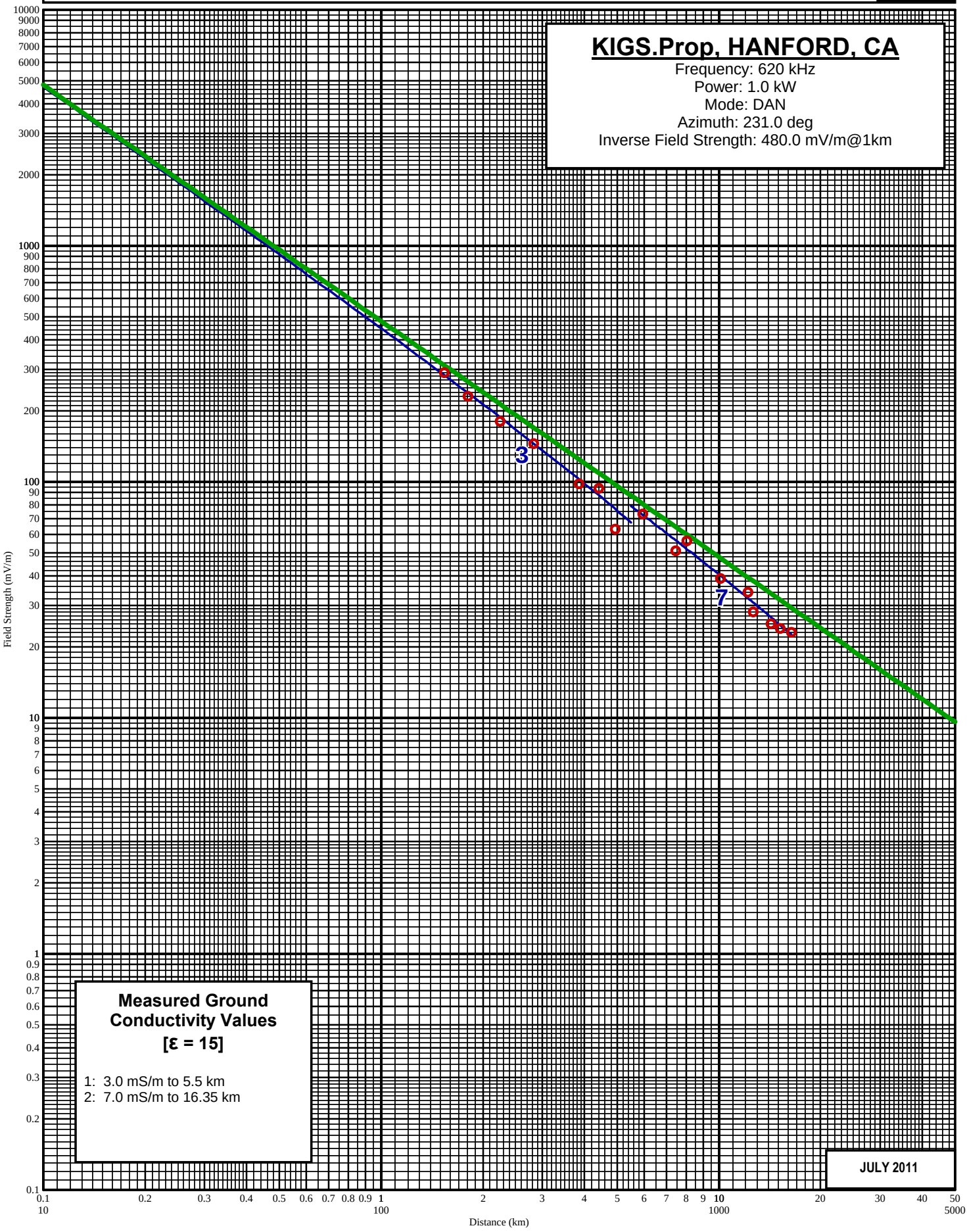
Sheet 2 of 6
Measured Nighttime Directional Field Strength Graphs



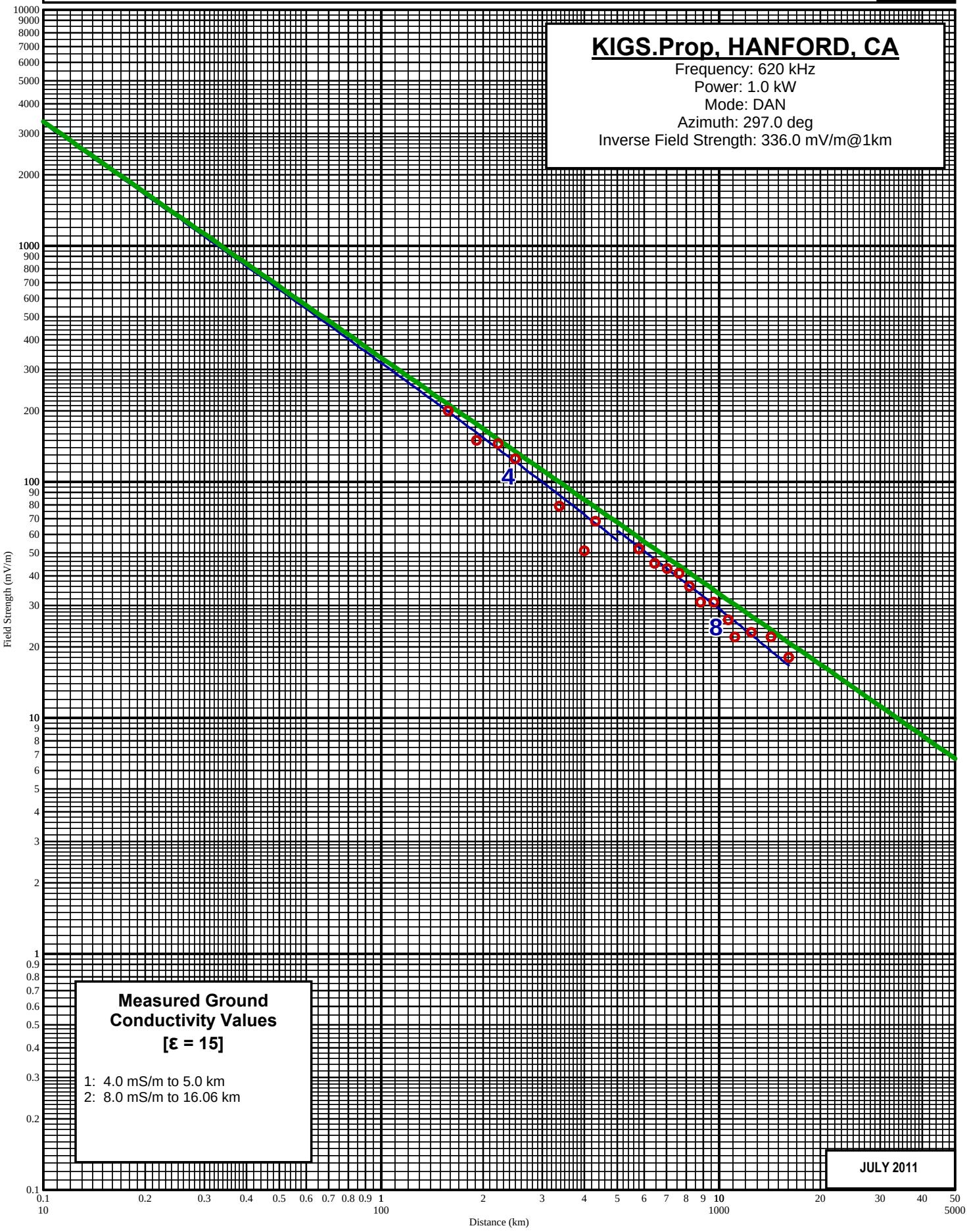
Sheet 3 of 6
Measured Nighttime Directional Field Strength Graphs



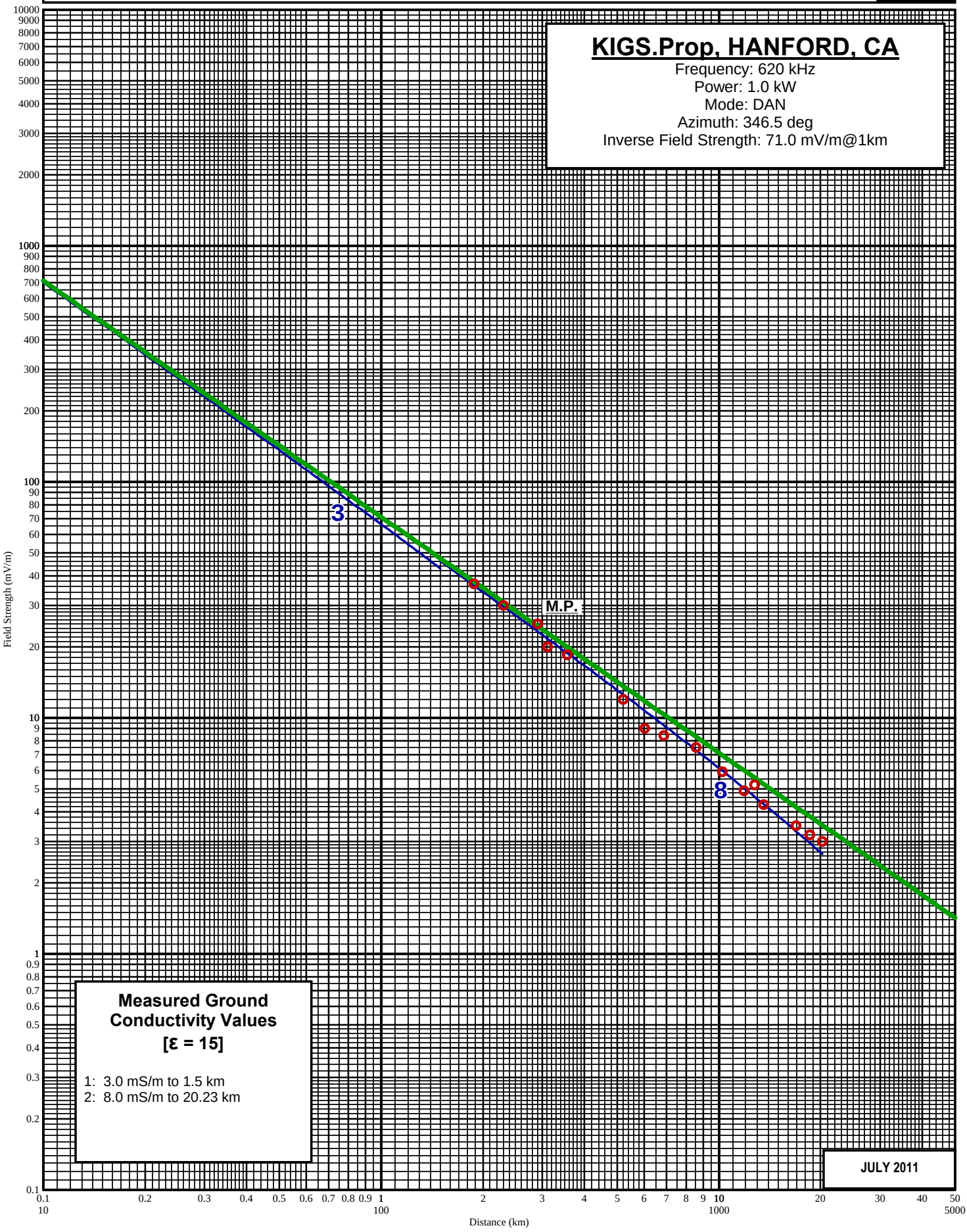
Sheet 4 of 6
Measured Nighttime Directional Field Strength Graphs



Sheet 5 of 6
Measured Nighttime Directional Field Strength Graphs



Sheet 6 of 6
Measured Nighttime Directional Field Strength Graphs



Mullaney Engineering, Inc.

APPENDIX D

REFERENCE GROUND CONDUCTIVITY GRAPH

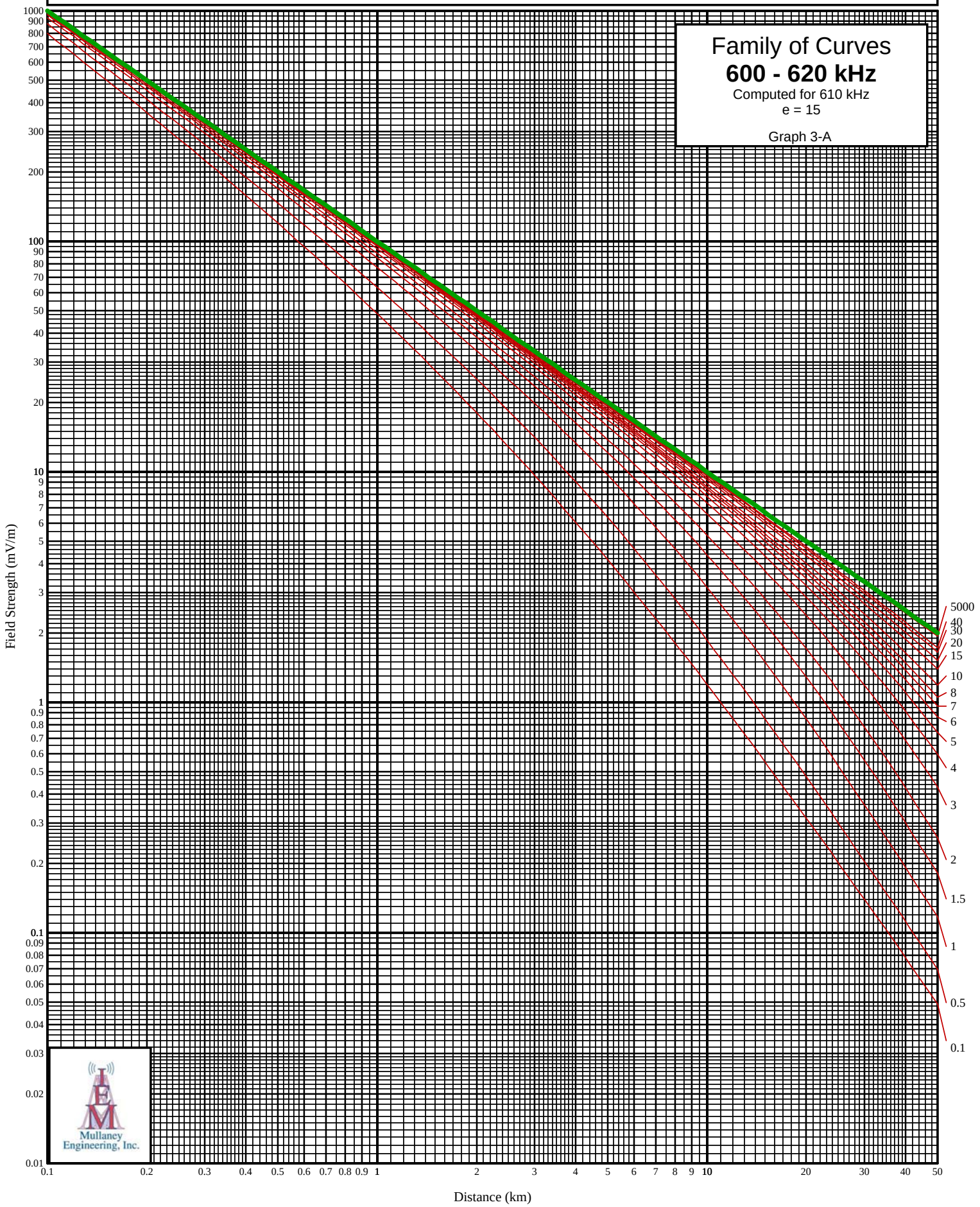
Groundwave Field Strength vs. Distance

Inverse Distance Field: 100.0 mV/m@1km

Family of Curves
600 - 620 kHz

Computed for 610 kHz
e = 15

Graph 3-A



APPENDIX E

MONITOR POINT DESCRIPTIONS AND PHOTOGRAPHS

Mullaney Engineering, Inc.

Appendix E (Sheet 1 of 2)

NIGHTTIME MONITOR POINT DESCRIPTIONS AND PHOTOGRAPHS

Point is located 0.88 mile (1.42 km) north of Houston Avenue on a dirt road (4th Avenue) running along the west side of a north/south canal. The reading is taken in the middle of the dirt road.

Distance from transmitter	GPS Coordinates [NAD83 Datum]	Measured Field Strength [Nighttime Directional]
3.77 km (2.34 mi.) {RADIAL POINT #1}	36° 18' 42.3" N 119° 31' 45.8" W	17.0 mV/m

Mullaney Engineering, Inc.

Appendix E (Sheet 2 of 2)

NIGHTTIME MONITOR POINT DESCRIPTIONS AND PHOTOGRAPHS

Point is located on a dirt road running along the west side of a north/south section of canal. The point is accessed off of Grangeville Boulevard by first turning north on a dirt road located approximately 0.25 mile (0.40 km) east of the intersection of Grangeville Boulevard and 7th Avenue. Proceed north 0.60 mile (0.97 km) to another dirt road heading east. Proceed east on this second dirt road for 0.20 mile (0.32 km) to the dirt road running along the west side of the canal. The reading is taken in the middle of the canal road, 60 feet (18 m) North of the east/west dirt road.

Distance from transmitter	GPS Coordinates [NAD83 Datum]	Measured Field Strength [Nighttime Directional]
2.91 km (1.81 mi.) {RADIAL POINT #F}	36° 21' 06.4" N 119° 34' 29.6" W	25.0 mV/m

Mullaney Engineering, Inc.

APPENDIX F

STATEMENT OF QUALIFICATIONS FOR MARVIN L. SAWYER

STATEMENT OF QUALIFICATIONS

The measurements submitted for this KIGS-AM report were taken by Marvin L. Sawyer. Mr. Sawyer has been in the broadcast technical field for over 45 years. During that period of time, Mr. Sawyer has taken a multitude of AM broadcast field intensity readings and conducted AM antenna impedance measurements. Some of the stations Mr. Sawyer has worked for have been KFRE-AM, Fresno, CA; KJOP-AM , Lemoore, CA; KOLI-AM, Coalinga, CA; KLAN-AM, Lemoore, CA; KIGS-AM (formerly KNGS-AM), Hanford, CA.

I certify the measurements submitted herein were taken by me personally and are accurate and correct to the best of my knowledge and belief.

Marvin L. Sawyer 07/19/2011