Fletcher, Heald & Hildreth

1300 NORTH 17th STREET, 11th FLOOR
ARLINGTON, VIRGINIA 22209

OFFICE: (703) 812-0400
FAX: (703) 812-0486
www.fhhlaw.com
www.commlawblog.com

2012 DEC 11 A 7:56

RECEIVED

December 6, 2012

FILED/ACCEPTED

DEC 6 2012

Federal Communications Commission
Office of the Secretary

DAVINA S. SASHKIN
(703) 812-0458
SASHKIN@FHHLAW.COM

Via Hand Delivery

Ms. Marlene Dortch, Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, DC 20554

Attn: Audio Division, Media Bureau

Re: South Texas Broadcasting, Inc.
Station KTEK(AM), Alvin, Texas (Facility ID No. 10827)

FCC Form 302-AM Moment Method License Application

Dear Ms. Dortch:

Transmitted herewith in triplicate, on Form 302-AM, is a license application for Station KTEK(AM), Alvin, Texas (Facility ID No. 10827). A copy of the FCC Form 159 demonstrating payment in full of the application filing fee of $1,365.00 is also enclosed.

Please date-stamp and return the enclosed additional copy of this application. Should you have any questions, please do not hesitate to contact the undersigned.

Very truly yours,

Davina S. Sashkin
Counsel for South Texas Broadcasting, Inc.

Enclosures

SoN

FILED/ACCEPTED

DEC 6 2012

Federal Communications Commission
Office of the Secretary

Federal Communications Commission
Washington, D. C. 20554

Approved by OMB
3060-0627
Expires 01/31/98

FOR FCC USE ONLY

FCC 302-AM
APPLICATION FOR AM BROADCAST STATION LICENSE

(Please read instructions before filling out form.

FOR COMMISSION USE ONLY
FILE NO. BMML-20121206AEL

SNC 12/12/12

SECTION I - APPLICANT FEE INFORMATION

1. PAYOR NAME (Last, First, Middle Initial)

SOUTH TEXAS BROADCASTING, INC.

MAILING ADDRESS (Line 1) (Maximum 35 characters)
4880 SANTA ROSA ROAD

MAILING ADDRESS (Line 2) (Maximum 35 characters)
SUITE 300

CITY	STATE OR COUNTRY (if foreign address)	ZIP CODE
CAMARILLO	CA	93012

TELEPHONE NUMBER (include area code)	CALL LETTERS	OTHER FCC IDENTIFIER (If applicable)
805-987-0400	KTEK	10827

2. A. Is a fee submitted with this application? ☑ Yes ☐ No

B. If No, indicate reason for fee exemption (see 47 C.F.R. Section

☐ Governmental Entity ☐ Noncommercial educational licensee ☐ Other (Please explain):

C. If Yes, provide the following information:

Enter in Column (A) the correct Fee Type Code for the service you are applying for. Fee Type Codes may be found in the "Mass Media Services Fee Filing Guide." Column (B) lists the Fee Multiple applicable for this application. Enter fee amount due in Column (C).

(A) FEE TYPE CODE	(B) FEE MULTIPLE	(C) FEE DUE FOR FEE TYPE CODE IN COLUMN (A)	FOR FCC USE ONLY
MMR	0001	$ 635.00	

To be used only when you are requesting concurrent actions which result in a requirement to list more than one Fee Type Code.

(A)	(B)	(C)	FOR FCC USE ONLY
MOR	0001	$ 730.00	

	TOTAL AMOUNT REMITTED WITH THIS APPLICATION	FOR FCC USE ONLY
ADD ALL AMOUNTS SHOWN IN COLUMN C, AND ENTER THE TOTAL HERE. THIS AMOUNT SHOULD EQUAL YOUR ENCLOSED REMITTANCE.	$ 1,365.00	

SECTION II - APPLICANT INFORMATION		
1. NAME OF APPLICANT SOUTH TEXAS BROADCASTING, INC.		
MAILING ADDRESS 4880 SANTA ROSA ROAD, SUITE 300		
CITY CAMARILLO	STATE CA	ZIP CODE 93012

2. This application is for:

☑ Commercial ☐ Noncommercial

☑ AM Directional ☐ AM Non-Directional

Call letters	Community of License	Construction Permit File No.	Modification of Construction Permit File No(s).	Expiration Date of Last Construction Permit
KTEK	ALVIN, TX	N/A	N/A	N/A

3. Is the station now operating pursuant to automatic program test authority in accordance with 47 C.F.R. Section 73.1620?

☐ Yes ☐ No

N/A

If No, explain in an Exhibit.

Exhibit No. N/A

4. Have all the terms, conditions, and obligations set forth in the above described construction permit been fully met?

☐ Yes ☐ No

N/A

If No, state exceptions in an Exhibit.

Exhibit No. N/A

5. Apart from the changes already reported, has any cause or circumstance arisen since the grant of the underlying construction permit which would result in any statement or representation contained in the construction permit application to be now incorrect?

☐ Yes ☐ No

If Yes, explain in an Exhibit.

N/A

Exhibit No. N/A

6. Has the permittee filed its Ownership Report (FCC Form 323) or ownership certification in accordance with 47 C.F.R. Section 73.3615(b)?

☐ Yes ☐ No

☑ Does not apply

N/A

If No, explain in an Exhibit.

Exhibit No. N/A

7. Has an adverse finding been made or an adverse final action been taken by any court or administrative body with respect to the applicant or parties to the application in a civil or criminal proceeding, brought under the provisions of any law relating to the following: any felony; mass media related antitrust or unfair competition; fraudulent statements to another governmental unit; or discrimination?

☐ Yes ☑ No

If the answer is Yes, attach as an Exhibit a full disclosure of the persons and matters involved, including an identification of the court or administrative body and the proceeding (by dates and file numbers), and the disposition of the litigation. Where the requisite information has been earlier disclosed in connection with another application or as required by 47 U.S.C. Section 1.65(c), the applicant need only provide: (i) an identification of that previous submission by reference to the file number in the case of an application, the call letters of the station regarding which the application or Section 1.65 information was filed, and the date of filing; and (ii) the disposition of the previously reported matter.

Exhibit No. N/A

8. Does the applicant, or any party to the application, have a petition on file to migrate to the expanded band (1605-1705 kHz) or a permit or license either in the existing band or expanded band that is held in combination (pursuant to the 5 year holding period allowed) with the AM facility proposed to be modified herein?

☐ Yes ☑ No

If Yes, provide particulars as an Exhibit.

Exhibit No. N/A

The APPLICANT hereby waives any claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because use of the same, whether by license or otherwise, and requests and authorization in accordance with this application. (See Section 304 of the Communications Act of 1934, as amended).

The APPLICANT acknowledges that all the statements made in this application and attached exhibits are considered material representations and that all the exhibits are a material part hereof and are incorporated herein as set out in full in

CERTIFICATION

1. By checking Yes, the applicant certifies, that, in the case of an individual applicant, he or she is not subject to a denial of federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. Section 862, or, in the case of a non-individual applicant (e.g., corporation, partnership or other unincorporated association), no party to the application is subject to a denial of federal benefits that includes FCC benefits pursuant to that section. For the definition of a "party" for these purposes, see 47 C.F.R. Section 1.2002(b).

☑ Yes ☐ No

2. I certify that the statements in this application are true, complete, and correct to the best of my knowledge and belief, and are made in good faith.

Name	Signature	
CHRISTOPHER J. HENDERSON		
Title	Date	Telephone Number
VICE PRESIDENT AND SECRETARY		805-987-0400

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001), AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION

FCC NOTICE TO INDIVIDUALS REQUIRED BY THE PRIVACY ACT AND THE PAPERWORK REDUCTION ACT

The solicitation of personal information requested in this application is authorized by the Communications Act of 1934, as amended. The Commission will use the information provided in this form to determine whether grant of the application is in the public interest. In reaching that determination, or for law enforcement purposes, it may become necessary to refer personal information contained in this form to another government agency. In addition, all information provided in this form will be available for public inspection. If information requested on the form is not provided, the application may be returned without action having been taken upon it or its processing may be delayed while a request is made to provide the missing information. Your response is required to obtain the requested authorization.

Public reporting burden for this collection of information is estimated to average 639 hours and 53 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, can be sent to the Federal Communications Commission, Records Management Branch, Paperwork Reduction Project (3060-0627), Washington, D. C. 20554. Do NOT send completed forms to this address.

THE FOREGOING NOTICE IS REQUIRED BY THE PRIVACY ACT OF 1974, P.L. 93-579, DECEMBER 31, 1974, 5 U.S.C. 552a(e)(3), AND THE PAPERWORK REDUCTION ACT OF 1980, P.L. 96-511, DECEMBER 11, 1980, 44 U.S.C. 3507.

Consulting Engineers
CTJC
CARL T. JONES CORPORATION

ENGINEERING EXHIBIT
IN SUPPORT OF AN
APPLICATION FOR STATION LICENSE
STATION KTEK – ALVIN, TEXAS
1110 kHz – 2.5 kW-D, 2.5 kW-CH, DA-2
FACILITY ID: 10827

Applicant: South Texas Broadcasting, Inc.

NOVEMBER, 2012

7901 Yarnwood Court
Springfield, VA 22153-2899

tel: (703) 569-7704
fax: (703) 569-6417

email: info@ctjc.com
www.ctjc.com

TABLE OF CONTENTS

SECTION III OF FCC FORM 302-AM

ENGINEERING STATEMENT OF CARL T. JONES, JR., P.E.

FIGURE

SECTION III - LICENSE APPLICATION ENGINEERING DATA

Name of Applicant
South Texas Broadcasting, Inc

PURPOSE OF AUTHORIZATION APPLIED FOR: (check one)

☒ Station License ☐ Direct Measurement of Power
BMML-

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
KTEK		1110	Daytime	---	2.5*

2. Station location	
State	City or Town
Texas	Alvin

3. Transmitter location			
State	County	City or Town	Street address (or other identification)
TX	Brazoria	Alvin	4100 Country Rd 833

4. Main studio location			
State	County	City or Town	Street address (or other identification)
TX	Harris	Houston	6161 Savoy Drive

5. Remote control point location (specify only if authorized directional antenna)			
State	County	City or Town	Street address (or other identification)
TX	Harris	Houston	6161 Savoy Drive

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.
Eng Stmt

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 ~~7.53~~ (6.43 - critical hours)
Measured antenna or common point resistance (in ohms) at operating frequency Night Day 50.0	Measured antenna or common point reactance (in ohms) at operating frequency Night Day +j14.4

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		-132.4		0.363		N/A
2		+0.0		1.000		N/A
3		+122.2		0.724		N/A
4		-172.1		0.287		N/A
5		-36.1		0.914		N/A
6		+85.2		0.687		N/A

Manufacturer and type of antenna monitor: Potomac Instruments Model 1901-6, S/N 365

*Critical hours nominal power=2.5 kW with controlled RMS

SECTION III - Page 2

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.
uniform, cross-section guyed, steel	ALL - 73.6	ALL - 74.6	#1,3,4,6 - 75.5 #2, 5 - 74.6	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			
	29 °	22 '	51 "		95 °	14 '	15 "

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. Eng Stmt

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

Exhibit No. On File - No Change

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

N/A

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

No change.

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)
Carl T. Jones, Jr.	
Address (include ZIP Code)	Date
	November 30, 2012
Carl T. Jones Corporation 7901 Yarnwood Court Springfield, Virginia 22153	Telephone No. (Include Area Code) (703) 569-7704

☐ Technical Director

☒ Registered Professional Engineer

☐ Chief Operator

☐ Technical Consultant

☐ Other (specify)

Consulting Engineers
CTJC
CARL T. JONES CORPORATION

ENGINEERING STATEMENT OF CARL T. JONES, JR., P.E.
IN SUPPORT OF AN
APPLICATION FOR STATION LICENSE
STATION KTEK - ALVIN, TEXAS
1110 kHz - 2.5 kW-D, 2.5 kW-CH, DA-2
FACILITY ID: 10827

Applicant: South Texas Broadcasting, Inc.

I am a Consulting Engineer, president in the firm of Carl T. Jones Corporation, with offices located in Springfield, Virginia. My education and experience are a matter of record with the Federal Communications Commission. I am a Registered Professional Engineer in the Commonwealth of Virginia, Registration No. 013391.

1.0 GENERAL

This office has been authorized by South Texas Broadcasting, Inc. ("STB"), licensee of AM Station KTEK, to prepare this engineering statement and the associated figures and appendices in support of an Application for License. Station KTEK is licensed for operation on 1110 kilohertz at a power of 2.5 kilowatts during daytime hours and 2.5 kilowatts during critical hours using a controlled RMS. Computer modeling and sample system verification techniques, as described in Section 47 CFR 73.151(c) of the Commission's Rules and Regulations, were employed to verify performance of the directional antenna pattern for the daytime and critical hours operations. The KTEK critical hours pattern is identical to the daytime directional pattern with the exception that

7901 Yarnwood Court
Springfield, VA 22153-2899
tel: (703) 569-7704
fax: (703) 569-6417
email: info@ctjc.com
www.ctjc.com

the pattern RMS is controlled resulting in a lower common point current than that of the daytime directional pattern. The specific measurement and modeling techniques used in performing the proof of performance on the KTEK directional patterns are described in detail in this engineering statement. Impedance measurement data, sample system verification measurement data and model derived operating parameters are tabulated in the figures attached to this engineering statement. Finally, all pertinent computer model input and output files are contained in the attached Appendices A and B.

2.0 IMPEDANCE MEASUREMENTS, COMPUTER MODELING AND SAMPLE SYSTEM VERIFICATION

The proof of performance contained herein is based on the computer modeling and sample system verification procedures described in Section 47 CFR 73.151(c) of the FCC's Rules and Regulations. The KTEK antenna array consists of six equal height, triangular, uniform cross-section, guyed towers. The face width of towers 1, 2, 3, 5, and 6 is 18 inches and the face width of tower 4 is 24 inches. The sampling system employs identical toroidal current transformers located in the output branch of each tower's ATU network. A detailed description of the impedance and sample system measurements and the computer models employed is contained below.

2.1 INDIVIDUAL TOWER IMPEDANCE MEASUREMENTS

Impedance measurements were performed at the base of each tower, by the undersigned, at the ammeter switch located in the output branch of the ATU network. This location is immediately adjacent to the sampling system toroidal current transformer. The impedance measurements were performed using a Hewlett-Packard Model 4396A network analyzer; an Amplifier Research Model 5W1000 power amplifier; and a Tunwall Radio directional coupler. The impedance of each tower was measured with the other five towers open-circuited at the corresponding ammeter switch location. The measured impedances are tabulated in Figure 2.

2.2 INDIVIDUAL TOWER COMPUTER MODELS

A Method of Moments ("MoM") computer model was developed to model each element in the array using Expert MiniNEC Broadcast Professional (Version 23.0). A wire model was developed for each tower in the array that is comprised of 21 segments. To replicate the individual measured base impedances to within FCC specified tolerances, each tower's physical height was adjusted in the MiniNEC model and series inductances were employed in a separate circuit model. The actual equivalent physical radius was used in all computer models contained in this application. Details of the modeled individual tower adjusted heights are contained in Figure 1.

The values of the lumped series inductances used in the circuit model are contained in Figure 2. A comparison of the measured individual tower impedances, the modeled individual tower impedances, and the adjusted modeled (circuit model)

individual tower impedances is also contained in Figure 2. The percentage difference between the adjusted modeled tower height and the actual physical tower height and the magnitude of the lumped series inductances that were used in the circuit models are all within the tolerances set forth in the Rules.

As demonstrated by the data contained in Figure 2, the adjusted modeled individual tower resistance and reactance for each tower is well within ± 2 ohms and ± 4 percent tolerance of the corresponding measured individual tower resistance and reactance. The text files containing all pertinent input and output data associated with the individual tower models are contained in Appendix A.

2.3 DIRECTIONAL ANTENNA COMPUTER MODEL AND ANTENNA MONITOR PARAMETERS

The KTEK daytime directional antenna theoretical field parameters and the licensed tower spacings and orientations were used in combination with the adjusted individual tower models to produce the directional antenna computer model. Because the critical hours directional pattern is the same as the daytime directional pattern, with the exception of the common point current, a separate model was not developed for the critical hours operation. From the directional computer model, tower currents were derived for each wire segment of each antenna. Each segment current was multiplied by the segment length and numerically integrated and normalized to the appropriate reference tower to verify that the modeled current moments are essentially identical to the authorized relative directional field parameters.

The new operating parameters were determined from the modeled base currents and are tabulated in Figure 3. The text files containing all pertinent input and output data associated with the directional antenna computer model are contained in Appendix B.

2.4 SAMPLE SYSTEM DESCRIPTION AND VERIFICATION MEASUREMENTS

The KTEK antenna sampling is comprised of: 1) Delta Electronics, Model TCT-3, toroidal current transformers mounted in an identical manner in the ATU network output branch for each tower; 2) approximate equal lengths of Cablewave Systems, Type FCC 38-50J, 3/8-inch, foam dielectric, coaxial cable between each toroidal current transformer and the transmitter building; 3) short unequal length jumper cables of Andrew Corporation, Type FSJ4-50B, 1/2-inch, superflex, foam dielectric, coaxial cable between the Cablewave Systems sample cables and the antenna monitor; and 4) a Potomac Instruments Model 1901-6 antenna monitor. Each sample line between the ATU building and the transmitter building, including excess lengths, is buried; therefore, each sample line is subjected to the same environmental conditions.

Initial measurement of the sample line lengths indicated that the line lengths had a variation of approximately 2.3 electrical degrees at 1110 kHz. Therefore, short jumpers of Andrew superflex line, ranging in length from 3-2/3 feet to 6-1/4 feet, were fabricated and inserted between the sample lines entering the transmitter building and the antenna monitor. The length of each jumper was specifically cut so the lengths of

the sample lines including the length of the jumper cables were within 1 electrical degree at 1110 kHz.

The sample lines, including the superflex jumper cables, were verified to be equal in length by measuring the open-circuit series resonate frequency closest to the carrier frequency. The characteristic impedance was verified by measuring the impedance at frequencies corresponding to odd multiples of 1/8 wavelength immediately above and below the open circuit series resonant frequency closest to the carrier frequency, while the line was open-circuited at the sample element end of the line. The characteristic impedance was calculated by the following formula:

$$Z = \sqrt{\sqrt{R_1^2 + X_1^2} \times \sqrt{R_2^2 + X_2^2}}$$

where:

Z = *Characteristic impedance and*

$R_1 + jX_1$ *and* $R_2 + jX_2$ *are the measured impedances at* $\pm$ *45 degrees offset frequencies.*

A tabulation of the measured sample line lengths and the characteristic impedance of each line is contained in Figure 4. All sample line verification measurements were performed by the undersigned using a Hewlett-Packard, Model 4396A, network analyzer; an Amplifier Research, Model 5W1000, power amplifier; and a Tunwall Radio directional coupler. As demonstrated by the measured values in Figure 4, the measured sample line lengths are within 1 electrical degree with respect to

each other and the measured characteristic impedances are well within 2 ohms of each other, as required by Section 47 CFR 73.151(c)(2)(I) of the FCC Rules and Regulations.

An impedance measurement was performed at the input to each sample line, at the antenna monitor end of the line, with the toroidal current transformer connected. The measurement was performed at the KTEK operating frequency of 1110 kilohertz. The measured sample line impedances with the current transformers connected are tabulated in Figure 4 under the heading "Reference Impedance Sample Transformer Connected." The impedance measurement in Figure 4 for the tower #5 sample line was performed with the replacement current transformer as discussed below.

The performance of the toroidal current transformers was verified by driving a common reference current through all six transformers and comparing the relative outputs as observed on the Potomac Instruments Model 1901-6 antenna monitor. Based on the test results, it was determined that the performance of the current transformer installed in the ATU for tower #5 was operating outside of the manufacturer's stated tolerance. Therefore, a replacement current transformer was purchased for tower #5 and the test was repeated. The second test confirmed that the performance of all six of the KTEK current transformers is well within the manufacturer's stated accuracy. A tabulation of the toroidal current transformer measurement data and the serial number of each toroidal current transformer is contained in Figure 5.

The antenna monitor that is employed at KTEK is a Potomac Instruments, Model 1901-6, Serial Number 365, last calibrated by the manufacturer in January, 1999. The performance of the antenna monitor was verified, by the undersigned, to be well within

the manufacturer's stated accuracy. The verification was performed by comparison of the measured relative directional operating parameters, as observed on the antenna monitor, with those measured using the network analyzer when the phasing and coupling system common point was driven with the network analyzer swept source through a power amplifier.

3.0 COMMON POINT IMPEDANCE AND COMMON POINT CURRENT

The networks associated with the directional antenna system were adjusted for proper impedance transformation and the common point impedance matching network was set for Z = 50 +j14.4 Ohms. The transmitter output power level was adjusted for a daytime common point current of 7.35 amperes and a critical hours common point current of 6.43 amperes (controlled RMS).

4.0 REFERENCE FIELD STRENGTH MEASUREMENTS

Reference field strength measurements were performed on the KTEK daytime directional pattern on the 329° radial bearing, corresponding to the pattern main radiation lobe; and the 74.5°, 130°, 161.5°, and 216.5° radial bearings, corresponding to the directional pattern minima. Three reference field strength measurements were performed on each of the selected radial bearings.

The measurements were performed by Mr. Douglas Allen, Chief Engineer of Station KTEK. The meter that was employed to perform the measurements is a

Potomac Instruments, Model FIM-41, Serial Number 370, last calibrated by the manufacturer in April 2012.

The measured field strength value for each established reference point location is tabulated in Figure 6, Sheets 1 through 3. The tabulations contained in Figure 6 also include for each reference location; GPS coordinates (NAD83), distance from the KTEK array center, and a description of measurement location.

5.0 ANTENNAS MOUNTED ON TOWER AND ISOLATION CIRCUITS

There are no other antennas mounted on the KTEK towers. Lighting chokes are mounted in the ATU enclosures for towers 1, 3, 4, and 6 to allow the lighting system electrical wires to cross the base insulator. Third wire of the lighting choke is used as a tower static drain. Static drains are installed in the ATU enclosure for towers 2 and 5.

SUMMARY

It is submitted that the KTEK directional pattern performance has been verified using computer modeling and sample system verification procedures in accordance with 47 CFR 73.151(c). It is believed that the daytime and critical hours antenna systems, as adjusted, fully comply with the terms of the station's FCC Authorization and all applicable FCC Rules and Regulations. It is requested that a superseding license be issued to STB reflecting the new MoM model derived operating parameters as contained herein.

This engineering statement and the attached figures and appendices were prepared by the undersigned or under the direct supervision of the undersigned and are believed to be true and correct.

COMMONWEALTH OF VIRGINIA
CARL THOMAS JONES JR
Lic. No. 013391
PROFESSIONAL ENGINEER

Dated: November 30, 2012

Carl T. Jones, Jr., P.E.

TOWER MODEL HEIGHT AND RADIUS

STATION KTEK - ALVIN, TEXAS
1110 kHz - 2.5 kW-D, 2.5 kW-CH, DA-2
NOVEMBER, 2012

Tower	Physical Height (degrees)	Modeled Height (degrees)	Percent of Physical Height	Modeled Radius	Percent of Equivalent Radius
1	98.0	104.4	106.5	0.2183	100.0
2	98.0	104.4	106.5	0.2183	100.0
3	98.0	103.3	105.4	0.2183	100.0
4	98.0	104.4	106.5	0.2911	100.0
5	98.0	105.4	107.6	0.2183	100.0
6	98.0	105.5	107.7	0.2183	100.0

MEASURED AND MODELED IMPEDANCES

STATION KTEK - ALVIN, TEXAS
1110 kHz - 2.5 kW-D, 2.5 kW-CH, DA-2
NOVEMBER, 2012

Tower	Measured Tower Base Impedance[1]	Modeled Tower Base Impedance	Shunt Capacitance (pF)	Modeled plus Shunt Reactance	Lumped Series Inductance (uH)	Total Adjusted Tower Base Impedance
1	73.8 +j 131.1	73.8 +j 109.0	0.0	73.8 +j 109.0	3.2	73.8 +j 131.3
2	69.2 +j 126.3	69.4 +j 106.2	0.0	69.4 +j 106.2	2.9	69.4 +j 126.4
3	69.3 +j 128.1	69.6 +j 100.2	0.0	69.6 +j 100.2	4.0	69.6 +j 128.1
4	74.5 +j 130.2	74.3 +j 102.9	0.0	74.3 +j 102.9	3.9	74.3 +j 130.1
5	71.6 +j 128.2	71.3 +j 112.3	0.0	71.3 +j 112.3	2.3	71.3 +j 128.4
6	77.1 +j 131.6	77.1 +j 116.1	0.0	77.1 +j 116.1	2.2	77.1 +j 131.4

[1] Measured at output of matching network with other towers open-circuited

Figure 2

ANTENNA MONITOR PARAMETERS AND COMMON POINT DATA

STATION KTEK - ALVIN, TEXAS
1110 kHz - 2.5 kW-D, 2.5 kW-CH, DA-2
NOVEMBER, 2012

DAYTIME		
Tower	Ratio	Phase (deg)
1	0.363	-132.4
2	1.000	0.0
3	0.724	122.2
4	0.287	-172.1
5	0.914	-36.1
6	0.687	85.2
Common Point Impedance = 50 +j14.4 Ohms Common Point Current = 7.35 Amperes Antenna Input Power = 2700 Watts		

CRITICAL HOURS (CONTROLLED RMS)		
Tower	Ratio	Phase (deg)
1	0.363	-132.4
2	1.000	0.0
3	0.724	122.2
4	0.287	-172.1
5	0.914	-36.1
6	0.687	85.2
Common Point Impedance = 50 +j14.4 Ohms Common Point Current = 6.43 Amperes Antenna Input Power = 2066 Watts		

SAMPLE LINE VERIFICATION MEASUREMENTS

STATION KTEK - ALVIN, TEXAS
1110 kHz - 2.5 kW-D, 2.5 kW-CH, DA-2
NOVEMBER, 2012

Tower	Open Circuit Series Resonant Frequency[1] (kHz)	Open Circuit Measured Line Length[2] (degrees)	Resonant Frequency -45 degree Offset Frequency (kHz)	Resonant Frequency -45 degree Offset Impedance (Ohms)	Resonant Frequency +45 degree Offset Frequency (kHz)	Resonant Frequency +45 degree Offset Impedance (Ohms)	Calculated Characteristic Impedance (Ohms)	Reference Impedance Sample Transformer Connected[2] (Ohms)
1	1253.0	398.6	1127.7	8.92 -j 47.33	1378.3	11.27 +j 47.31	48.40	50.02 - j1.84
2	1253.8	398.4	1128.4	9.27 -j 48.27	1379.2	11.41 +j 47.40	48.95	50.66 - j0.64
3	1253.7	398.4	1128.3	8.98 -j 47.83	1379.1	11.21 +j 47.77	48.87	50.67 - j1.17
4	1253.6	398.5	1128.2	9.58 -j 47.61	1379.0	11.96 +j 47.25	48.65	49.39 - j1.59
5	1253.8	398.4	1128.4	8.80 -j 48.31	1379.1	11.24 +j 48.25	49.32	51.49 - j0.03
6	1252.9	398.7	1127.6	8.85 -j 46.90	1378.1	11.28 +j 47.32	48.18	50.44 - j1.37

[1] At this frequency, the sample line electrical length is equal to 450°.

[2] Measurements performed at 1110 kHz.

Figure 4

SAMPLE DEVICE VERIFICATION MEASUREMENTS

STATION KTEK - ALVIN, TEXAS
1110 kHz - 2.5 kW-D, 2.5 kW-CH, DA-2
NOVEMBER, 2012

Reference Sample Toroid Number	Measured Sample Toroid Number	Measured	
		Field Ratio	Phase (degrees)
2	1	1.000	-0.2
2	3	0.999	-0.1
2	4	0.997	-0.2
2	5	0.997	-0.1
2	6	0.995	-0.1

Sample Toroid Number	Type	Serial Number
1	Delta Electronics, TCT-3	1677
2	Delta Electronics, TCT-3	1675
3	Delta Electronics, TCT-3	1711
4	Delta Electronics, TCT-3	1654
5	Delta Electronics, TCT-3	18083
6	Delta Electronics, TCT-3	17523

REFERENCE FIELD STRENGTH MEASUREMENTS

STATION KTEK - ALVIN, TEXAS
1110 kHz - 2.5 kW-D, 2.5 kW-CH, DA-2
NOVEMBER, 2012

74.5 Degree Radial

Point Number	Distance (km)	Daytime Field (mV/m)	Geographic Coordinates (NAD83)		Description
			Latitude	Longitude	
1	1.61	66	29° 23' 05.9"	95° 13' 18.3"	Point is located on the west edge of CR 156, 60 ft south of the nearest edge of the driveway to #4015.
2	2.88	23	29° 23' 17.1"	95° 12' 32.6"	Point is located on the west side of Swinkle Rd (CR 326), adjacent to marker at culvert pipe northwest of the driveway for #3815 and south of the utility poles supplying service to the house.
3	6.08	8.6	29° 23' 44.8"	95° 10' 37.9"	Point is located at 10 Lilley Rd, 5 ft north of utility pole #537 at back corner of house #606.

130 Degree Radial

Point Number	Distance (km)	Daytime Field (mV/m)	Geographic Coordinates (NAD83)		Description
			Latitude	Longitude	
1	1.72	20	29° 22' 15.9"	95° 13' 26.9"	Point is located at #3604 CR 160, 10 steps or 15 ft from southeast edge of driveway, east side of street.
2	2.99	9	29° 21' 49.4"	95° 12' 50.7"	Point is located at #3731 CR 163, 25 ft from back fence line, east side of road.
3	3.75	8	29° 21' 33.6"	95° 12' 29.3"	Point is located at #3507 CR 159, 10 ft from southeastern most inner driveway edge, southeast side of street.

REFERENCE FIELD STRENGTH MEASUREMENTS

STATION KTEK - ALVIN, TEXAS
1110 kHz - 2.5 kW-D, 2.5 kW-CH, DA-2
NOVEMBER, 2012

165.5 Degree Radial

Point Number	Distance (km)	Daytime Field (mV/m)	Geographic Coordinates (NAD83)		Description
			Latitude	Longitude	
1	2.67	14	29° 21' 29.8"	95° 13' 44.4"	Point is located on the east side of CR 160, 193 steps or 290 feet south of the east side of the bridge where cemet guard rail begins.
2	3.73	10	29° 20' 57.3"	95° 13' 31.9"	Point is located on the southwest side of CR 169, 35 steps or 53 ft north of dual utility poles #R595/CBA, 15 ft from edge of road in grass.
3	5.33	6	29° 20' 08.5"	95° 13' 13.3"	Point is located on the northwest edge of CR 170, at the end of the paved road across from utility pole #12APB10T.

216.5 Degree Radial

Point Number	Distance (km)	Daytime Field (mV/m)	Geographic Coordinates (NAD83)		Description
			Latitude	Longitude	
1	2.96	4.7	29° 21' 34.6"	95° 15' 21.2"	Point is located at #5202 on the west side of FM Road 2402, 50 steps or 75 feet south of driveway edge at #5202.
2	6.02	7.2	29° 20' 14.9"	95° 16' 28.4"	Point is located at #547, 10 ft west of driveway edge on south side of FM Road 2917.
3	9.29	5.2	29° 18' 49.5"	95° 17' 40.2"	Point is located at #8534 CR 195, directly across from grass driveway with cement culvert.

REFERENCE FIELD STRENGTH MEASUREMENTS

STATION KTEK - ALVIN, TEXAS
1110 kHz - 2.5 kW-D, 2.5 kW-CH, DA-2
NOVEMBER, 2012

329 Degree Radial

Point Number	Distance (km)	Daytime Field (mV/m)	Geographic Coordinates (NAD83)		Description
			Latitude	Longitude	
1	2.09	550	29° 23' 49.9"	95° 14' 55.5"	Point is located on the east side of the rear parking lot entrance, 50 steps or 75 ft from the near edge of most rear drive, west of Highway 35.
2	2.46	450	29° 24' 00.3"	95° 15' 02.7"	Point is located on the northwest side of FM 1462 across from the rear parking entrance to Highland Square Center Mall.
3	4.07	230	29° 24' 45.3"	95° 15' 33.0"	Point is located on the west side of Highland Drive adjacent to mailbox at #1514.

APPENDIX A

INDIVIDUAL TOWER MODELING

IMPEDANCE - TOWER #1
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
1.11	73.783	108.99	131.62	55.9	5.1803	-3.3961	-2.656

GEOMETRY - TOWER #1
Wire coordinates in degrees; other dimensions in meters
Environment: perfect ground

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.2183	21
		0	0	104.4		
2	none	80.	145.	0	.2183	21
		80.	145.	104.4		
3	none	160.	145.	0	.2183	21
		160.	145.	103.3		
4	none	143.6	46.	0	.2911	21
		143.6	46.	104.4		
5	none	153.058	77.1	0	.2183	21
		153.058	77.1	105.4		
6	none	197.566	99.1	0	.2183	21
		197.566	99.1	105.5		

Number of wires = 6
current nodes = 126

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	3	4.91905	6	5.02381
radius	1	.2183	4	.2911

ELECTRICAL DESCRIPTION - TOWER #1
Frequencies (MHz)

no.	frequency lowest	step	no. of steps	segment length (wavelengths) minimum	maximum
1	1.11	0	1	.013664	.013955

Sources

source	node	sector	magnitude	phase	type
1	1	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	1.E-03	0	0	0	0
2	22	1.E-03	-10,000.	0	0	0
3	43	1.E-03	-10,000.	0	0	0
4	64	1.E-03	-10,000.	0	0	0
5	85	1.E-03	-10,000.	0	0	0
6	106	1.E-03	-10,000.	0	0	0

IMPEDANCE - TOWER #2
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 22, sector 1							
1.11	69.423	106.21	126.89	56.8	5.1649	-3.4065	-2.6473

GEOMETRY - TOWER #2
Wire coordinates in degrees; other dimensions in meters
Environment: perfect ground

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.2183	21
		0	0	104.4		
2	none	80.	145.	0	.2183	21
		80.	145.	104.4		
3	none	160.	145.	0	.2183	21
		160.	145.	103.3		
4	none	143.6	46.	0	.2911	21
		143.6	46.	104.4		
5	none	153.058	77.1	0	.2183	21
		153.058	77.1	105.4		
6	none	197.566	99.1	0	.2183	21
		197.566	99.1	105.5		

Number of wires = 6
current nodes = 126

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	3	4.91905	6	5.02381
radius	1	.2183	4	.2911

ELECTRICAL DESCRIPTION - TOWER #2
Frequencies (MHz)

no.	frequency lowest	step	no. of steps	segment length (wavelengths) minimum	maximum
1	1.11	0	1	.013664	.013955

Sources

source	node	sector	magnitude	phase	type
1	22	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	1.E-03	-10,000.	0	0	0
2	22	1.E-03	0	0	0	0
3	43	1.E-03	-10,000.	0	0	0
4	64	1.E-03	-10,000.	0	0	0
5	85	1.E-03	-10,000.	0	0	0
6	106	1.E-03	-10,000.	0	0	0

IMPEDANCE - TOWER #3
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 43, sector 1							
1.11	69.585	100.17	121.97	55.2	4.7855	-3.6844	-2.4269

GEOMETRY - TOWER #3
Wire coordinates in degrees; other dimensions in meters
Environment: perfect ground

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.2183	21
		0	0	104.4		
2	none	80.	145.	0	.2183	21
		80.	145.	104.4		
3	none	160.	145.	0	.2183	21
		160.	145.	103.3		
4	none	143.6	46.	0	.2911	21
		143.6	46.	104.4		
5	none	153.058	77.1	0	.2183	21
		153.058	77.1	105.4		
6	none	197.566	99.1	0	.2183	21
		197.566	99.1	105.5		

Number of wires = 6
current nodes = 126

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	3	4.91905	6	5.02381
radius	1	.2183	4	.2911

ELECTRICAL DESCRIPTION - TOWER #3
Frequencies (MHz)

no.	frequency lowest	step	no. of steps	segment length (wavelengths) minimum	maximum
1	1.11	0	1	.013664	.013955

Sources

source	node	sector	magnitude	phase	type
1	43	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	1.E-03	-10,000.	0	0	0
2	22	1.E-03	-10,000.	0	0	0
3	43	1.E-03	0	0	0	0
4	64	1.E-03	-10,000.	0	0	0
5	85	1.E-03	-10,000.	0	0	0
6	106	1.E-03	-10,000.	0	0	0

IMPEDANCE - TOWER #4
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 64, sector 1							
1.11	74.287	102.94	126.95	54.2	4.8036	-3.6701	-2.4377

GEOMETRY - TOWER #4
Wire coordinates in degrees; other dimensions in meters
Environment: perfect ground

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.2183	21
		0	0	104.4		
2	none	80.	145.	0	.2183	21
		80.	145.	104.4		
3	none	160.	145.	0	.2183	21
		160.	145.	103.3		
4	none	143.6	46.	0	.2911	21
		143.6	46.	104.4		
5	none	153.058	77.1	0	.2183	21
		153.058	77.1	105.4		
6	none	197.566	99.1	0	.2183	21
		197.566	99.1	105.5		

Number of wires = 6
current nodes = 126

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	3	4.91905	6	5.02381
radius	1	.2183	4	.2911

ELECTRICAL DESCRIPTION - TOWER #4
Frequencies (MHz)

no.	frequency lowest	step	no. of steps	segment length (wavelengths) minimum	maximum
1	1.11	0	1	.013664	.013955

Sources

source	node	sector	magnitude	phase	type
1	64	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	1.E-03	-10,000.	0	0	0
2	22	1.E-03	-10,000.	0	0	0
3	43	1.E-03	-10,000.	0	0	0
4	64	1.E-03	0	0	0	0
5	85	1.E-03	-10,000.	0	0	0
6	106	1.E-03	-10,000.	0	0	0

IMPEDANCE - TOWER #5
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 85, sector 1							
1.11	71.296	112.31	133.03	57.6	5.4832	-3.204	-2.8248

GEOMETRY - TOWER #5
Wire coordinates in degrees; other dimensions in meters
Environment: perfect ground

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.2183	21
		0	0	104.4		
2	none	80.	145.	0	.2183	21
		80.	145.	104.4		
3	none	160.	145.	0	.2183	21
		160.	145.	103.3		
4	none	143.6	46.	0	.2911	21
		143.6	46.	104.4		
5	none	153.058	77.1	0	.2183	21
		153.058	77.1	105.4		
6	none	197.566	99.1	0	.2183	21
		197.566	99.1	105.5		

Number of wires = 6
current nodes = 126

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	3	4.91905	6	5.02381
radius	1	.2183	4	.2911

ELECTRICAL DESCRIPTION - TOWER #5
Frequencies (MHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1.11	0	1	.013664	.013955

Sources

source	node	sector	magnitude	phase	type
1	85	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	1.E-03	-10,000.	0	0	0
2	22	1.E-03	-10,000.	0	0	0
3	43	1.E-03	-10,000.	0	0	0
4	64	1.E-03	-10,000.	0	0	0
5	85	1.E-03	0	0	0	0
6	106	1.E-03	-10,000.	0	0	0

IMPEDANCE - TOWER #6
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 106, sector 1							
1.11	77.117	116.09	139.37	56.4	5.5043	-3.1915	-2.8364

GEOMETRY - TOWER #6
Wire coordinates in degrees; other dimensions in meters
Environment: perfect ground

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.2183	21
		0	0	104.4		
2	none	80.	145.	0	.2183	21
		80.	145.	104.4		
3	none	160.	145.	0	.2183	21
		160.	145.	103.3		
4	none	143.6	46.	0	.2911	21
		143.6	46.	104.4		
5	none	153.058	77.1	0	.2183	21
		153.058	77.1	105.4		
6	none	197.566	99.1	0	.2183	21
		197.566	99.1	105.5		

Number of wires = 6
current nodes = 126

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	3	4.91905	6	5.02381
radius	1	.2183	4	.2911

ELECTRICAL DESCRIPTION - TOWER #6
Frequencies (MHz)

no.	frequency lowest	step	no. of steps	segment length (wavelengths) minimum	maximum
1	1.11	0	1	.013664	.013955

Sources

source	node	sector	magnitude	phase	type
1	106	1	1.	0	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	1.E-03	-10,000.	0	0	0
2	22	1.E-03	-10,000.	0	0	0
3	43	1.E-03	-10,000.	0	0	0
4	64	1.E-03	-10,000.	0	0	0
5	85	1.E-03	-10,000.	0	0	0
6	106	1.E-03	0	0	0	0

APPENDIX B

DIRECTIONAL ARRAY MODEL

IMPEDANCE - DAYTIME
normalization = 50.

freq (MHz)	resist (ohms)	react (ohms)	imped (ohms)	phase (deg)	VSWR	S11 dB	S12 dB
source = 1; node 1, sector 1							
1.11	78.544	287.8	298.33	74.7	23.256	-.74746	-8.0104
source = 2; node 22, sector 1							
1.11	54.706	117.57	129.67	65.	6.917	-2.5292	-3.5514
source = 3; node 43, sector 1							
1.11	11.049	72.797	73.631	81.4	14.269	-1.2194	-6.1117
source = 4; node 64, sector 1							
1.11	64.572	406.28	411.38	81.	53.171	-.32675	-11.398
source = 5; node 85, sector 1							
1.11	77.283	132.15	153.09	59.7	6.5594	-2.6692	-3.3805
source = 6; node 106, sector 1							
1.11	20.682	62.423	65.76	71.7	6.4443	-2.7176	-3.3241

GEOMETRY - DAYTIME
Wire coordinates in degrees; other dimensions in meters
Environment: perfect ground

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.2183	21
		0	0	104.4		
2	none	80.	145.	0	.2183	21
		80.	145.	104.4		
3	none	160.	145.	0	.2183	21
		160.	145.	103.3		
4	none	143.6	46.	0	.2911	21
		143.6	46.	104.4		
5	none	153.058	77.1	0	.2183	21
		153.058	77.1	105.4		
6	none	197.566	99.1	0	.2183	21
		197.566	99.1	105.5		

Number of wires = 6
current nodes = 126

	minimum wire	minimum value	maximum wire	maximum value
Individual wires				
segment length	3	4.91905	6	5.02381
radius	1	.2183	4	.2911

ELECTRICAL DESCRIPTION - DAYTIME
Frequencies (MHz)

no.	frequency lowest	step	no. of steps	segment length (wavelengths) minimum	maximum
1	1.11	0	1	.013664	.013955

Sources

source	node	sector	magnitude	phase	type
1	1	1	624.474	307.6	voltage
2	22	1	747.451	70.4	voltage
3	43	1	307.467	208.9	voltage
4	64	1	680.718	274.2	voltage
5	85	1	806.471	28.9	voltage
6	106	1	260.289	162.1	voltage

Lumped loads

load	node	resistance (ohms)	reactance (ohms)	inductance (mH)	capacitance (uF)	passive circuit
1	1	1.E-03	0	0	0	0
2	22	1.E-03	0	0	0	0
3	43	1.E-03	0	0	0	0
4	64	1.E-03	0	0	0	0
5	85	1.E-03	0	0	0	0
6	106	1.E-03	0	0	0	0

PEAK CURRENT - DAYTIME
Frequency = 1.11 MHz
Input power = 2,500. watts
Efficiency = 100. %
coordinates in degrees

current no.	X	Y	Z	mag (amps)	phase (deg)	real (amps)	imaginary (amps)
GND	0	0	0	2.09326	232.9	-1.26397	-1.66857
2	0	0	4.97143	2.41832	230.7	-1.53087	-1.87209
3	0	0	9.94286	2.61196	229.6	-1.69171	-1.99009
4	0	0	14.9143	2.75583	228.8	-1.81403	-2.07459
5	0	0	19.8857	2.85959	228.2	-1.90589	-2.13187
6	0	0	24.8571	2.92731	227.7	-1.97065	-2.16464
7	0	0	29.8286	2.96101	227.2	-2.00998	-2.1743
8	0	0	34.8	2.96202	226.9	-2.02491	-2.16178
9	0	0	39.7714	2.93133	226.5	-2.01619	-2.12783
10	0	0	44.7429	2.86985	226.3	-1.98447	-2.07314
11	0	0	49.7143	2.7785	226.	-1.93041	-1.99839
12	0	0	54.6857	2.65826	225.8	-1.8547	-1.90432
13	0	0	59.6571	2.51017	225.5	-1.75806	-1.7917
14	0	0	64.6286	2.33535	225.3	-1.64129	-1.66134
15	0	0	69.6	2.13495	225.2	-1.5052	-1.51406
16	0	0	74.5714	1.91011	225.	-1.35061	-1.35069
17	0	0	79.5429	1.66187	224.8	-1.17827	-1.17196
18	0	0	84.5143	1.391	224.7	-.988714	-.978424
19	0	0	89.4857	1.0976	224.6	-.782032	-.770164
20	0	0	94.4572	.780192	224.4	-.557146	-.546158
21	0	0	99.4286	.432975	224.3	-.30988	-.302394
END	0	0	104.4	0	0	0	0
GND	-65.5322	-45.8861	0	5.76407	5.3	5.73904	.536562
23	-65.5322	-45.8861	4.97143	6.12096	3.7	6.10801	.398033
24	-65.5322	-45.8861	9.94286	6.312	2.8	6.30454	.306853
25	-65.5322	-45.8861	14.9143	6.429	2.	6.42493	.228842
26	-65.5322	-45.8861	19.8857	6.48295	1.4	6.48098	.160006
27	-65.5322	-45.8861	24.8571	6.47869	.9	6.47794	.0987656
28	-65.5322	-45.8861	29.8286	6.41894	.4	6.41879	.0444392
29	-65.5322	-45.8861	34.8	6.30568	360.	6.30568	-3.29E-03
30	-65.5322	-45.8861	39.7714	6.14065	359.6	6.14049	-.044562
31	-65.5322	-45.8861	44.7429	5.92562	359.2	5.92509	-.0794476
32	-65.5322	-45.8861	49.7143	5.66243	358.9	5.6614	-.107976
33	-65.5322	-45.8861	54.6857	5.35305	358.6	5.35147	-.130168
34	-65.5322	-45.8861	59.6571	4.99963	358.3	4.9975	-.146047
35	-65.5322	-45.8861	64.6286	4.60439	358.1	4.60176	-.155648
36	-65.5322	-45.8861	69.6	4.16962	357.8	4.16659	-.159017
37	-65.5322	-45.8861	74.5714	3.69759	357.6	3.69429	-.156209
38	-65.5322	-45.8861	79.5429	3.19031	357.4	3.18691	-.147274
39	-65.5322	-45.8861	84.5143	2.64928	357.1	2.64598	-.132242
40	-65.5322	-45.8861	89.4857	2.0748	356.9	2.07183	-.111071
41	-65.5322	-45.8861	94.4572	1.46417	356.7	1.46179	-.0835239
42	-65.5322	-45.8861	99.4286	.806836	356.5	.805358	-.048825
END	-65.5322	-45.8861	104.4	0	0	0	0
GND	-131.064	-91.7722	0	4.17579	127.5	-2.54185	3.31304
44	-131.064	-91.7722	4.91905	4.32947	127.2	-2.61539	3.45023
45	-131.064	-91.7722	9.8381	4.39974	127.	-2.64525	3.51573
46	-131.064	-91.7722	14.7571	4.42816	126.8	-2.65177	3.54637
47	-131.064	-91.7722	19.6762	4.41994	126.6	-2.63755	3.54672
48	-131.064	-91.7722	24.5952	4.37751	126.5	-2.60386	3.51888
49	-131.064	-91.7722	29.5143	4.30241	126.4	-2.55154	3.46416
50	-131.064	-91.7722	34.4333	4.19583	126.3	-2.48129	3.38352
51	-131.064	-91.7722	39.3524	4.05894	126.1	-2.39382	3.2779
52	-131.064	-91.7722	44.2714	3.89291	126.	-2.28986	3.14822
53	-131.064	-91.7722	49.1905	3.69898	125.9	-2.17019	2.99545
54	-131.064	-91.7722	54.1095	3.47848	125.8	-2.03565	2.82063
55	-131.064	-91.7722	59.0286	3.23284	125.7	-1.88714	2.62487

56	-131.064	-91.7722	63.9476	2.9635	125.6	-1.72558	2.4093
57	-131.064	-91.7722	68.8667	2.67199	125.5	-1.55194	2.17509
58	-131.064	-91.7722	73.7857	2.35975	125.4	-1.36713	1.92338
59	-131.064	-91.7722	78.7048	2.02807	125.3	-1.17198	1.65515
60	-131.064	-91.7722	83.6238	1.67791	125.2	-.967147	1.37113
61	-131.064	-91.7722	88.5429	1.30944	125.1	-.752807	1.07141
62	-131.064	-91.7722	93.4619	.920996	125.	-.528094	.754554
63	-131.064	-91.7722	98.381	.505966	124.9	-.289333	.415076
END	-131.064	-91.7722	103.3	0	0	0	0
GND	99.7529	-103.297	0	1.65473	193.2	-1.61097	-.378049
65	99.7529	-103.297	4.97143	2.06567	191.4	-2.02508	-.407492
66	99.7529	-103.297	9.94286	2.30385	190.6	-2.26476	-.422622
67	99.7529	-103.297	14.9143	2.48593	190.	-2.44809	-.43209
68	99.7529	-103.297	19.8857	2.6239	189.6	-2.58728	-.436829
69	99.7529	-103.297	24.8571	2.72303	189.2	-2.68769	-.437289
70	99.7529	-103.297	29.8286	2.7859	189.	-2.75193	-.433735
71	99.7529	-103.297	34.8	2.81407	188.7	-2.78158	-.426361
72	99.7529	-103.297	39.7714	2.80863	188.5	-2.77775	-.415341
73	99.7529	-103.297	44.7429	2.77054	188.3	-2.74139	-.400837
74	99.7529	-103.297	49.7143	2.70069	188.2	-2.67339	-.383013
75	99.7529	-103.297	54.6857	2.60003	188.	-2.5747	-.362036
76	99.7529	-103.297	59.6571	2.46953	187.9	-2.44628	-.338076
77	99.7529	-103.297	64.6286	2.31024	187.7	-2.28917	-.311301
78	99.7529	-103.297	69.6	2.12324	187.6	-2.10445	-.281882
79	99.7529	-103.297	74.5714	1.90959	187.5	-1.89316	-.249978
80	99.7529	-103.297	79.5429	1.67022	187.4	-1.65623	-.215733
81	99.7529	-103.297	84.5143	1.40577	187.3	-1.39429	-.179252
82	99.7529	-103.297	89.4857	1.11616	187.2	-1.10727	-.140553
83	99.7529	-103.297	94.4572	.799553	187.1	-.793344	-.0994509
84	99.7529	-103.297	99.4286	.449779	187.1	-.446373	-.0552505
END	99.7529	-103.297	104.4	0	0	0	0
GND	34.1702	-149.195	0	5.26805	329.2	4.52497	-2.6976
86	34.1702	-149.195	5.01905	5.64059	326.9	4.72657	-3.07828
87	34.1702	-149.195	10.0381	5.84688	325.6	4.82506	-3.30224
88	34.1702	-149.195	15.0571	5.98064	324.6	4.87386	-3.46606
89	34.1702	-149.195	20.0762	6.05286	323.7	4.87964	-3.58137
90	34.1702	-149.195	25.0952	6.06825	323.	4.84547	-3.6531
91	34.1702	-149.195	30.1143	6.0294	322.3	4.7732	-3.68378
92	34.1702	-149.195	35.1333	5.93812	321.8	4.66427	-3.67504
93	34.1702	-149.195	40.1524	5.79605	321.2	4.52003	-3.62816
94	34.1702	-149.195	45.1714	5.60478	320.8	4.34184	-3.5443
95	34.1702	-149.195	50.1905	5.36603	320.3	4.13113	-3.42463
96	34.1702	-149.195	55.2095	5.08166	319.9	3.88945	-3.27039
97	34.1702	-149.195	60.2286	4.75368	319.6	3.61846	-3.0829
98	34.1702	-149.195	65.2476	4.38423	319.2	3.31986	-2.86356
99	34.1702	-149.195	70.2667	3.9755	318.9	2.99542	-2.61383
100	34.1702	-149.195	75.2857	3.52969	318.6	2.64687	-2.33513
101	34.1702	-149.195	80.3048	3.04878	318.3	2.27577	-2.02877
102	34.1702	-149.195	85.3238	2.53426	318.	1.88333	-1.69574
103	34.1702	-149.195	90.3429	1.98645	317.7	1.46986	-1.33622
104	34.1702	-149.195	95.3619	1.40286	317.5	1.03366	-.948459
105	34.1702	-149.195	100.381	.773439	317.2	.567488	-.525515
END	34.1702	-149.195	105.4	0	0	0	0
GND	-31.2467	-195.079	0	3.95816	90.5	-.0326594	3.95803
107	-31.2467	-195.079	5.02381	4.08337	89.8	.0114199	4.08336
108	-31.2467	-195.079	10.0476	4.13735	89.4	.0398282	4.13716
109	-31.2467	-195.079	15.0714	4.15393	89.1	.0634586	4.15345
110	-31.2467	-195.079	20.0952	4.13742	88.8	.0835873	4.13658
111	-31.2467	-195.079	25.1191	4.08986	88.6	.100715	4.08862
112	-31.2467	-195.079	30.1429	4.01257	88.4	.115056	4.01092
113	-31.2467	-195.079	35.1667	3.90662	88.1	.126705	3.90457
114	-31.2467	-195.079	40.1905	3.77311	87.9	.135698	3.77067
115	-31.2467	-195.079	45.2143	3.61312	87.7	.142046	3.61033
116	-31.2467	-195.079	50.2381	3.42787	87.6	.145744	3.42477

117	-31.2467	-195.079	55.2619	3.21862	87.4	.146781	3.21527
118	-31.2467	-195.079	60.2857	2.98675	87.2	.145144	2.98322
119	-31.2467	-195.079	65.3095	2.73369	87.	.140821	2.73006
120	-31.2467	-195.079	70.3333	2.46089	86.9	.133801	2.45725
121	-31.2467	-195.079	75.3571	2.16978	86.7	.124072	2.16623
122	-31.2467	-195.079	80.381	1.86166	86.6	.111618	1.85831
123	-31.2467	-195.079	85.4048	1.53752	86.4	.0964061	1.53449
124	-31.2467	-195.079	90.4286	1.19763	86.2	.0783606	1.19506
125	-31.2467	-195.079	95.4524	.840607	86.1	.0572873	.838653
126	-31.2467	-195.079	100.476	.460624	85.9	.0326583	.459465
END	-31.2467	-195.079	105.5	0	0	0	0