TECHNICAL EXHIBIT
APPLICATION FOR LICENSE
RADIO STATION KSMG(FM)
SEGUIN, TEXAS

Technical Statement

This Technical Exhibit, of which this statement is part, was prepared on behalf of radio station KSMG(FM) on Channel 258C at San Antonio, Texas. KSMG(FM) has recently implemented its construction permit to increase its antenna height above average terrain so its Class C status can be maintained.[1]

Figure 1 is a tabulation of the RF transmission system. The maximum effective radiated power remains unchanged at 100 kilowatts. The new antenna has 0.5° of electrical beamtilt. The gain at the horizontal plane is 7.3 dB, which provides an effective radiated power of 97.5 kilowatts at the horizontal plane.

Within the Appendix contains the intermodulation report for the KSMG(FM) diplexed antenna system. Also contained within the same Appendix is the antenna vertical plane pattern showing the electrical beamtilt.

Charles A. Cooper

April 17, 2006

du Treil, Lundin & Rackley, Inc.
201 Fletcher Avenue
Sarasota, Florida 34237
941.329.6000

[1] See FCC File Number: BPH-20040603ABU.

Figure 1

TECHNICAL EXHIBIT
APPLICATION FOR LICENSE
RADIO STATION KSMG(FM)
SEGUIN, TEXAS

KSMG(FM) RF Transmission System Specifications

Description	System
Transmitter Power Output (23.4 kW):	13.7 dBk
ERI CI973-18/6 Branch Combiner Loss:	0.2 dB
Myat Transmission Line Loss (6″ Rigid) 1,531 feet:	0.9 dB
ERI SHPX-10BC-SP Antenna Gain (5.5 Power Gain):	7.4 dB
Effective Radiated Power (100 kW):	20.0 dBk

APPENDIX

TRANSMITTING ANTENNA INFORMATION
AND
INTERMODULATION REPORT

ELECTRONICS RESEARCH, INC. ERI

Report Of Intermodulation Product Findings

COX Radio

KISS	**99.5**
KSMG	**105.3**
KXTN	**107.5**

April 10, 2006

Electronics Research Inc.
7777 Gardner Road
Chandler, Indiana 47610
Phone (812) 925-6000 Fax (812) 925- 4030

ELECTRONICS RESEARCH, INC. ERI

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San Antonio, Texas

Report of Findings for Intermodulation Product Measurements

Exhibits Accompanying This Report

REPORT OF FINDINGS
KISS/KSMG/KXTN COX RADIO
99.5 MHz San Antonio, TX/105.3 MHz Seguin, TX/107.5 MHz San Antonio, TX

Introduction: This report of findings is based on data collected at the KISS, KSMG, and KXTN Cox Radio broadcast facility located in San Antonio, Texas. The report includes measurements offered as proof that the combined operations of KISS (99.5 MHz.), KSMG (105.3 MHz.), and KXTN (107.5) transmitters are in compliance with the FCC Rules and Regulations as required by the Code of Federal Regulations (CFR) Title 47 section 73.317 paragraph (b) through (d). In brief, the collection of measurements presented in this report shows that all possible third order inter-modulation (IM) products generated by this multiplex system are less than the maximum allowable level as required by section 73.317 (b) through (d). Jon Adams of Electronics Research, Inc. located in Chandler, Indiana performed the measurements summarized herein on ……....

The following exhibits are provided:

Exhibit A:
- A-1 Drawing Depicting Antenna.
- A-2 SHPX-10BC-SP Antenna Specification Sheet.
- A-3 Drawing Depicting Multiplexing Scheme.
- A-4 CI973-18/6 Branch Combiner Multiplexer Specification Sheet.
- A-5 Theoretical Vertical Plane Relative Field Antenna Plots

Exhibit B:
- B-1 Equipment Employed In Intermodulation Product Measurement.
- B-2 Broadcasting Scheme of the Multiplexed Systems.

Table 1. Carrier Reference Levels.
Table 2. Calculated Third Order Products.
Table 3. Intermodulation Analysis Measurements.

Exhibits Accompanying Report: Exhibit A provides comprehensive information on both antenna and filters used by these radio stations. Exhibit B illustrates the broadcasting scheme of each station, the layout of the equipment used to isolate and measure potential intermodulation products and forward carrier reference levels. Found within Table 1 are the narrow band carrier frequency measurements that provide relative output signal levels for the IM analysis. Table 2 lists the calculated third order products that can be generated from FM transmitters broadcasting from the multiplexed system. The IM Analysis Measurements, in Table 3, provides detailed information obtained from the product frequency investigation.

The Nature of Intermodulation Products (IM): Intermodulation products result from inadequate transmitter-to-transmitter isolation. Intermodulation products are commonly generated from radio stations operating into multiplexed facilities and congested antenna broadcast sites. The mechanics associated with the phenomenon have been well documented. When two or more transmitters are coupled to each other, new spectral components are produced by the mixing of the station frequencies in the active circuits of each transmitter. The common term used to describe this phenomenon is third order product denoted by the mathematical expression $[2(F_1)-(F_2)]$, where F_1 signifies the frequency of the transmitter that is generating the intermodulation product, and F2 signifies the frequency causing the interference.

The Multiplexed System: These measurements were taken with three FM stations operating from the combined antenna system. The KISS, KSMG, and KXTN multiplexed system is fundamentally comprised of antenna, feed line and multiplexer unit. The SHPX-10BC-SP (antenna) and CI973-18/6 (branch combiner) multiplexer unit are products of Electronics Research, Inc, whereas the feed line is manufactured by Myat. Refer to Exhibit B-1, for an illustration of the Broadcasting Scheme of these stations.

To accomplish the aggregation of three transmitter signals into a common antenna feed and provide transmitter-to-transmitter isolation, a multiplexing scheme consisting of a Branch Combiner was installed. Specifically, the Multiplexer utilizes three ERI Model CI973-6 constant impedance modules for each transmitter. An interconnecting U-link is required to complete the multiplexer which is illustrated in the attached Exhibit A-3. The multiplexer, fully assembled, exhibited transmitter port-to-port isolation in excess of -70 dB. Other performance measurements, such as match, loss, group-delay, etc, revealed that the multiplexer unit was in proper working condition. Refer to Exhibit A-4 for the Combiner Specification Sheet.

The IM Investigation: Directional Couplers were placed at key locations throughout the combiner to monitor and maintain the multiplexer's performance. All couplers furnished with the system are factory calibrated and capable of delivering accurate and repeatable RF measurements. To facilitate the taking of the measurements, the coupler located at the antenna output of the multiplexed system was used. Care was taken in the selection of the measurement location to insure that the measurements would be made far removed from transmitters and any filtering used to reduce broadcast emissions. The coupler selected would normally be used for antenna reflection measurements and thus would provide greater than -35 dB directivity and a forward signal sample of -60 dB.

The forward port of the coupler was used for sampling the outgoing carrier levels and IM products. The IM sampled signal was fed by shielded cable into a Band Pass Filter where all extraneous energy was steeply attenuated. Various attenuation pads were used, when needed, on the band pass filter and/or the FIM71 to ensure an adequate signal level for measurements without overloading the measurement equipment. A Potomac Instruments FIM-71 Field Strength Receiver Serial # 242 was employed to record the level of all signals investigated. To facilitate the selective tuning of the Receiver and Band Pass Filter a Wavetek Model 3000 Serial # 7512028 signal generator was used. A IFR Model 2399A Spectrum Analyzer Serial # 02113071 was used to measure the close in spectral attenuation of each carrier and wide band search for any anomalies that may need further investigation. See attached Exhibit B-1 for an illustration of the measurement equipment.

Prior to recording measurements, all pertinent broadcasting equipment including Transmitters, Multiplexer, Feed Line and Antenna were adjusted to optimal performance. Also, it was confirmed before taking any measurements that all stations of concern were operating at their full licensed power level. From the equipment setup described above, the relative output signal level of each stations forward carrier was made. The resulting signal levels of these measurements are listed in Table 1, column labeled "Adjusted Level". This level will be used as the reference level for possible IM products of each carrier and was necessary to confirm that no significant levels of spurious energy, referenced to each carrier, were present from any transmitter operating from the multiplexed system.

Table 1 - Carrier Reference Levels.

Carrier Frequency (MHz)	Pad One (dB)	Bandpass Filter Loss (dB)	Full Scale Range (dBµ)	Scale Reading (dB)	**Adjusted Level (dBµ)**	Notes
KISS (99.5)		-	140	17.6	**122.4**	
KSMG (105.3)		-	140	17.9	**122.1**	
KISS (107.5)		-	140	17.8	**122.2**	

Predictable third-order products due to system harmonics mixed with all on-site interfering frequencies that could be generated from the multiplexed system are calculated and listed in Table 2.

Table 2 - Third order Products.

	Carrier Frequency (MHz)		
Interfering Frequency (MHz)	**KISS 99.5 MHz**	**KSMG 105.3 MHz**	**KXTN 107.5 MHz**
KISS 99.5 MHz	**—**	**99.5**	**99.5**
KSMG 105.3 MHz	**105.3**	**—**	**105.3**
KXTN 107.5 MHz	**107.5**	**107.5**	**—**

Using the equipment previously described the IM product measurements were recorded and are listed in Table 3. The signal levels referenced to the carriers are calculated and listed in the column labeled "Level Referenced to Carrier". Refer to Exhibit B-2 for a layout of the measurement equipment.

Table 3 Intermodulation Measurements

Product Frequency (MHz)	Carrier Frequency (MHz)	Interfering Frequency (MHz)	Pad (dB)	Bandpass Filter Loss (dB)	Full Scale Range (dBµ)	Scale reading (dB)	Adjusted Level (dBµ)	Carrier Reference Level (dBµ) (See Table 1)	**Level Referenced to Carrier (dB)**	Notes *
93.7	99.5	105.3	+3	6.7	20	>20	9.7	122.4	**-112.7**	
91.5	99.5	107.5	+3	6.9	20	>20	9.9	122.4	**-112.5**	
111.1	105.3	99.5	+3	6.6	20	>20	9.6	122.1	**-112.5**	
103.1	105.3	107.5	+3	6.5	20	18	11.5	122.1	**-110.6**	
115.5	107.5	99.5	+3	6.8	20	>20	9.8	122.2	**-112.4**	
109.7	107.5	105.3	+3	6.7	20	5.7	24	122.2	**-98.2**	
106.1	99.5	92.9	+3	6.6	20	9.9	19.7	122.4	**-102.7**	
117.7	105.3	92.9	+3	6.8	20	>20	9.8	122.1	**-112.3**	
122.1	107.5	92.9	+3	6.5	20	>20	9.5	122.2	**-112.7**	

*** NOTES**

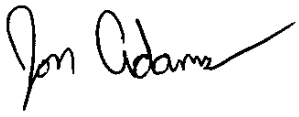
The Spectrum Analyzer was used to check the close in spectral attenuation of the carrier to confirm the operation of the transmitter is in compliance with Sections (b) and (c) of the FCC Rules and Regulations.

As a final proof of the systems IM Product performance, a wide band search was undertaken using the Spectrum Analyzer. The purpose for this measurement was to look for suspicious anomalies that may warrant further investigation. My search ranged the complete frequency span of the receiver and resulted in no additional investigations.

Conclusion: Based upon my observations and measurements taken on April 10, 2006 as summarized in this document, I, Jon Adams, find the subject system- specifically the transmitter and filter system for the operation of KISS/KSMG/KXTN into the antenna to be in proper working order. Furthermore, based on the measured data, it is my opinion that there is no inter-modulation products in excess of 80 dB below carrier levels generated from or within the station operating on the installed system. Based on this recorded data, I conclude that KISS/KSMG/KXTN is in compliance with the requirements of Section 73.317 paragraph (b) through (d) of the FCC Rules and Regulations.

Respectfully submitted,
Electronics Research, Inc.

By Jon Adams Field Technician



State of Maine)
) SS:
County of Cumberland)

AFFIDAVIT

I, Jon Adams, hereby declare that the following statements are true and correct to the best of my knowledge and belief:

1.) I am a Field Technician for Electronics Research, Inc ("ERI ") I am familiar with and have assisted in the design, manufacturing and installation of FM Antennas and FM Filters with ERI.

2.) I have either prepared and/or directly supervised the preparation of all technical information contained in this Report of Findings and to my knowledge to be accurate and true.

3.) ERI has been requested by COX Radio, on behalf of radio station KISS/KSMG/KXTN in San Antonio, Texas to prepare this report of findings.

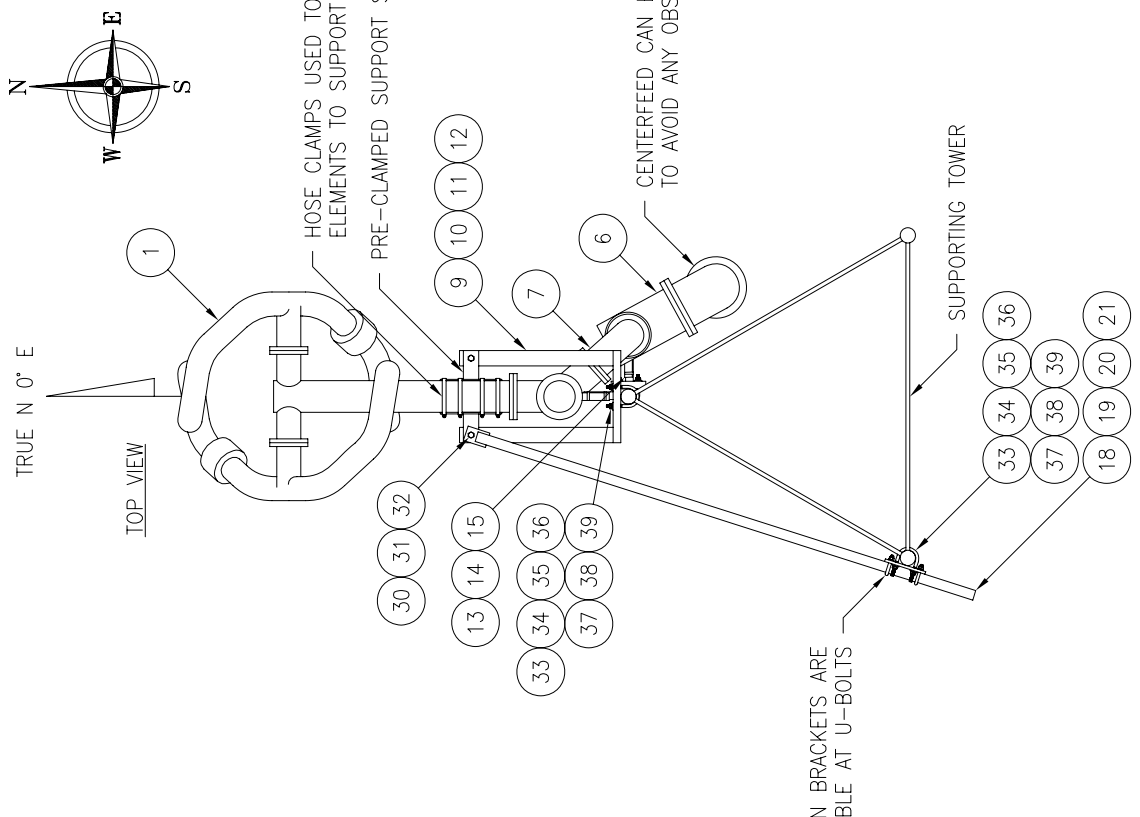
Jon Adams; Field Technician

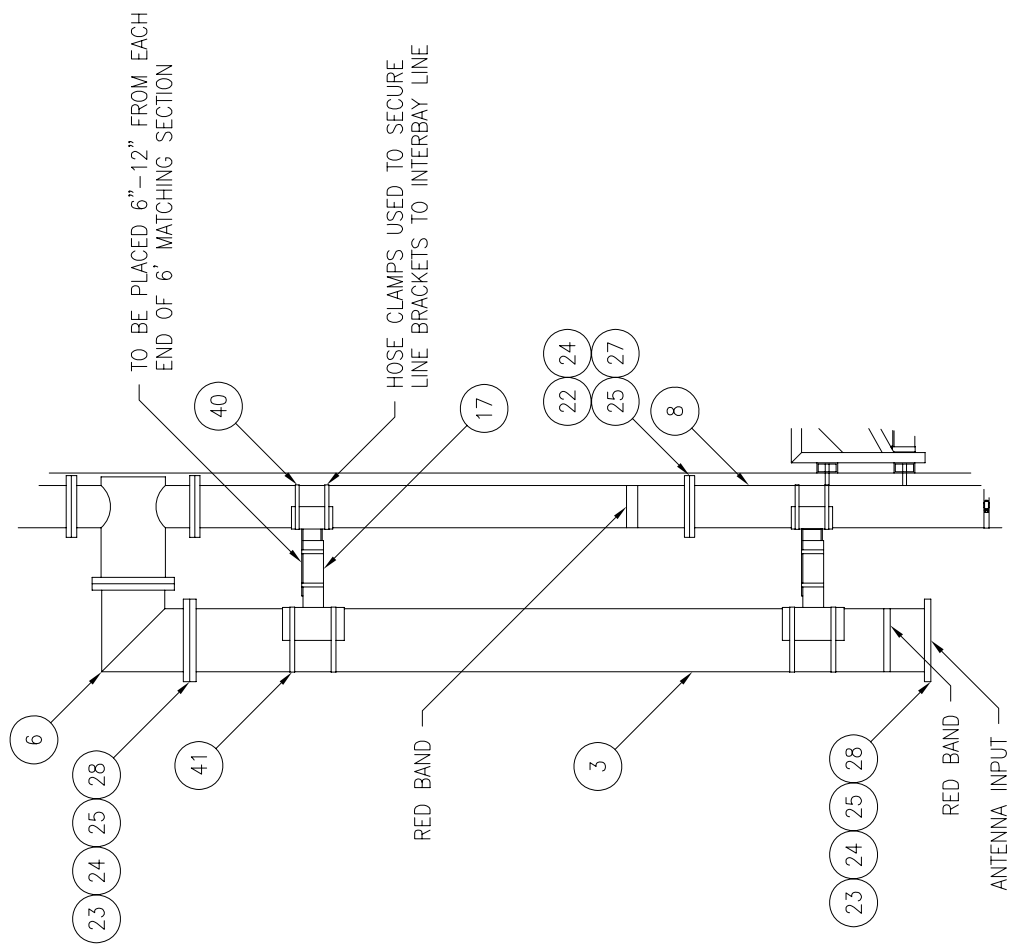
Jon Adams

Subscribed and sworn to before me on this
13th day of April 2006

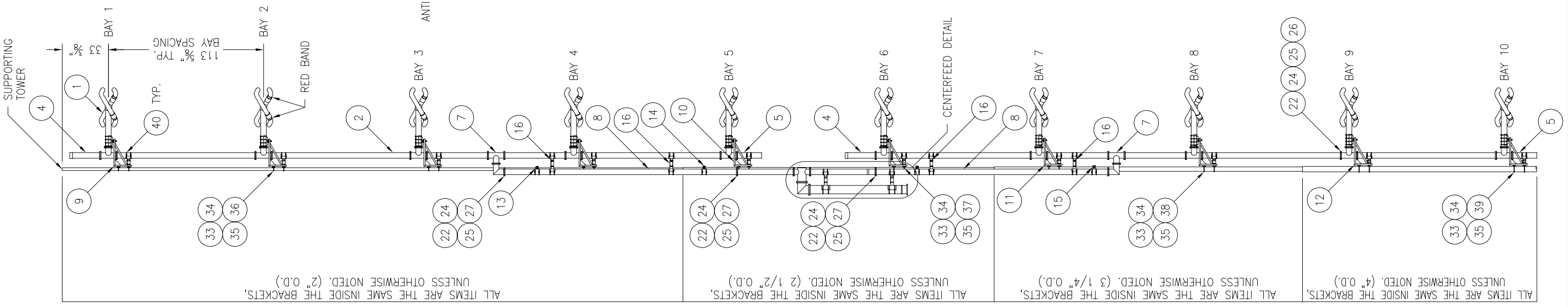
Beth LaSalle

Beth LaSalle; Notary Public
My commission expires May 5, 2012





NOTES:
1. ALL RED BANDS DESIGNATE SIDE TO BE MOUNTED DOWNWARD.
2. ASSEMBLE ANTENNA SYSTEM BY MATING CORRESPONDING NUMBERS.
3. OVERALL LENGTH OF ANTENNA SYSTEM IS 89'-7" APPROXIMATE.
4. ENSURE TO PLUMB ANTENNA VERTICALLY BY LOOSENING HOSE CLAMPS ON PRE-CLAMPED SUPPORT SADDLES AND ADJUSTABLE LINE BRACKETS.
5. ROTATE CENTERFEED ASSEMBLY AS CLOSE TO TOWER AS POSSIBLE.
6. ANTI-ROTATION BRACKETS OMITTED FROM ELEVATION VIEW FOR CLARITY.
7. FINAL ORIENTATION TO BE DETERMINED BY STATION PERSONNEL.



ELEVATION VIEW

ELECTRONICS RESEARCH, INC.
Established 1943
7777 GARDNER RD.
CHANDLER, IN. 47610-9637
PHONE: (812) 925-6000
FAX: (812) 925-4030

SUPERSEDES DWG #:	
SUPERSEDES FILE #:	
MATERIAL:	

	APPROVED	DATE
DRAFT.		
ENG.		
MANUF.		

0.0	±.03
0.00	±.010
0.000	±.003
	± 1/32"
∠	± .5°
TOLERANCES	

NAME	INSTALLATION DRAWING		
STATION:	KISS/KXTN-SAN ANTONIO, TX KSMG-SEGUIN, TX		
FREQUENCY	99.5/105.3/107.5	PROJECT NO.:	13910E/1
PATH	G:\DRAFTING\ALL\PROJECTS\13910E\1		
FILE	IA-1	DRAWN	C.S.L.
SHEET	2 OF 3		
DATE	02-24-06	SCALE	NTS
DWG. NO.	IA-1		
MODEL	SHPX-10BC-SP		

A-2 ERI Antenna Specification Sheet

COX Radio
San Antonio, Texas

General Specifications

Antenna Type . . . . . High Power FM-Broadcast, Suitable For Diplexing
Model Number SHPX-10BC-SP
Number of Bay Levels ..... Ten
Polarization ..... Right Hand Circular

Electrical Specifications

Antenna Input Power Capability (Single Feed) . . . . . 112 KW Max (1)
Operating Frequency Band .....99.5, 105.3 and 107.5 Megahertz.
VSWR. . . . . <1.04:1 @ Operating Frequencies(2)
Azimuthal Pattern Circularity ..... Less Than +/- 1.5 dB from RMS (Free Space)
Power Split ..... 50/50 (Horizontal & Vertical)
Quarter Wave Shorting Stub..... Yes
Frequency Specific Information:

Frequency	Station ERP	Beam Tilt	First Null Fill	Second Null Fill	Power Gain	Line Loss (3)	Filter Loss (4)	Computed TPO
99.5	**100 KW**	**-0.5°**	**8 %**	**8%**	**5.284**	**1.087 db**	**.212 db**	**24.3 KW**
105.3	**100 KW**	**-0.5°**	**4 %**	**4%**	**5.360**	**1.118 db**	**.209 db**	**24.1 KW**
107.5	**100 KW**	**-0.5°**	**8 %**	**8%**	**5.066**	**1.068 db**	**.189 db**	**25.3 KW**

Mechanical Specifications

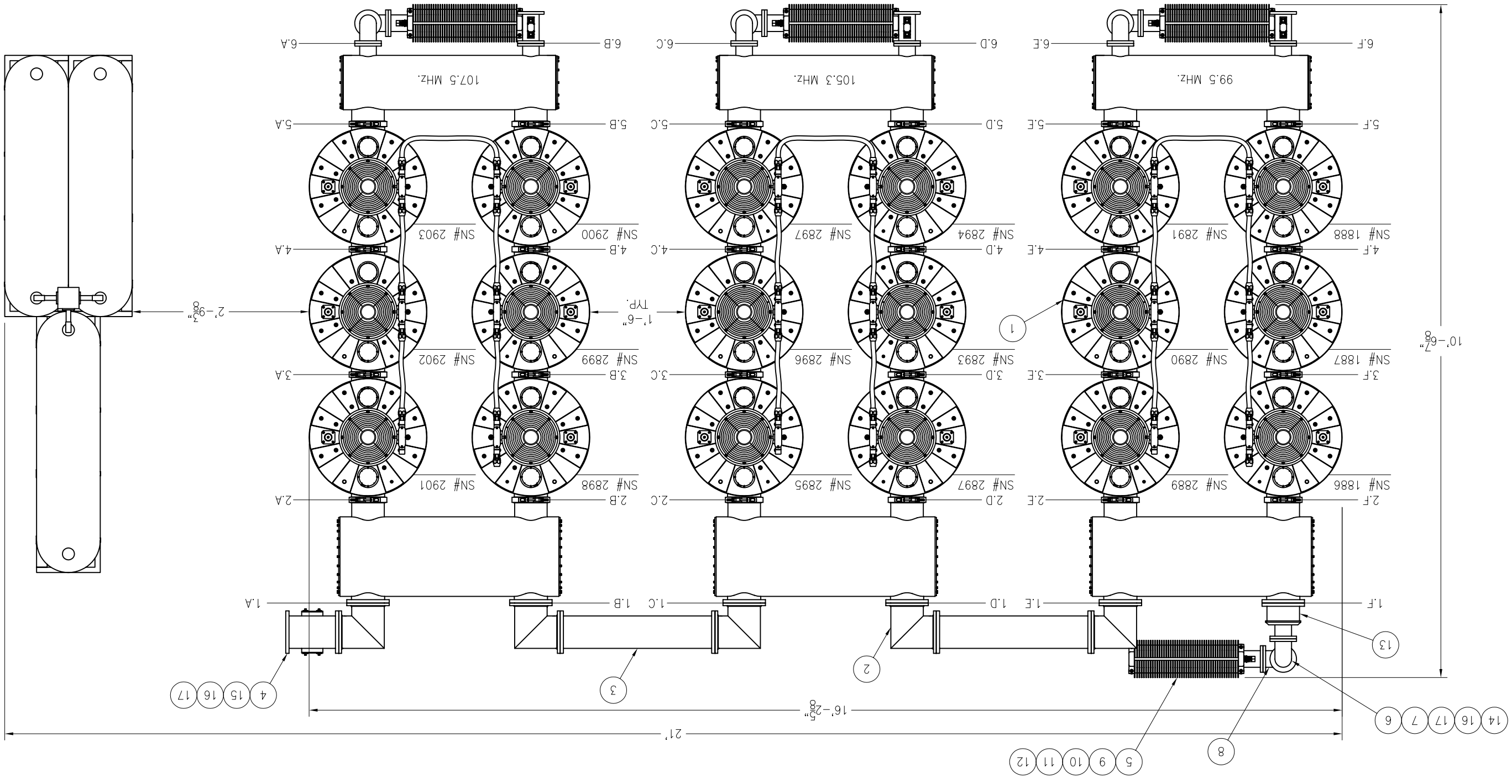
Antenna Feed System .....Fed With Single Line
Input Connector ……6”-50 Ohm EIA Flanged
Element Deicing.....None Ordered
Interbay Spacing ..... 113 5/8” Center to Center
Array Length . . . . . Approximately 90’ 9 3/8”
Construction Material (Antenna) ..... All Noncorrosive
Construction Material (Mounting) ..... All Stainless Steel

1) Power Capability Has Been Rated Assuming an Operating Transmission VSWR of 1.5:1
2) VSWR Specification Achieved After On Site Tuning For User Specific Frequencies.
3) Line Loss Assumes A Feed Run Of 1531 Feet, 6" Myat rigid and <65 Feet, Myat Rigid 3 1/8" Coax.
4) Losses Taken From Actual Multiplexer Measurements.

ITEM NO.	PART NO.	DESCRIPTION	QTY
1	IM-1	COMBINER MODULE ASSEMBLY	3
2	ACX650B-10SE	6 1/8 MITERED ELBOW	5
3	CL6038	COMBINER MODULE ADJOINING SECTION	2
4	DC6005	6 1/8 DUAL DIRECTIONAL COUPLER	1
5	LD02500	2.5 KW DUMP LOAD	1
6	CE3022	3-1/8" FLANGED TO FLANGED ELBOW	1
7	CL3034	3-1/8" FLGED TO UNFLGED LN SEC	1
8	CE3021	3-1/8" FLANGED TO UNFLANGED ELBOW	1
9	FI0223	DUMPLOAD LEGS	4
10	WF0SSS	5/16" FLATWASHER	8
11	WL0SSS	5/16" LOCKWASHER SPLIT TYPE	4

BILL OF MATERIAL

ITEM NO.	PART NO.	DESCRIPTION	QTY
12	NU0518	5/16"-18 HEX NUT	8
13	CR0015	6 1/8 TO 3 1/8 EIA REDUCER	1
14	SC0616H0150	3/8"-16 X 1-1/2" LONG HEX HEAD BOLT	6
15	SC0616H0175	3/8"-16 X 1-3/4" LONG HEX HEAD BOLT	12
16	NU0616	3/8" HEX NUT	18
17	WL06SS	3/8" LOCKWASHER SPLIT TYPE	18



DRAFT.		0.0 ±.03	TOLERANCES
ENG.		0.00 ±.010	
MANUF.		0.000 ±.003	
MATERIAL:		∠ ± .5°	
SUPERSEDES FILE #:		ϟ ± 1/32"	
SUPERSEDES DWG #:	APPROVED	DATE	

NAME COMBINER SYSTEM LAYOUT
STATION: SAN ANTONIO, TX
FREQ. 99.5, 105.3 & 107.5 MHz. PROJECT NO.: 16464/2
PATH G:\DRAFTING\ALL\PROJECTS\13910E\3
FILE 1M — 2 DRAWN BAM SHEET 1 OF 1
DATE 2/1/06 SCALE FULL DWG. NO.
MODEL MA973F06-000-036 1M — 2

ELECTRONICS RESEARCH, INC.
Established 1943
7777 GARDNER RD.
CHANDLER, IN. 47610-9637
PHONE: (812) 925-6000
FAX: (812) 925-4030

A-4 ERI Combiner Specification Sheet

COX Radio
San Antonio, Texas

General Specifications:

Multiplexer Type……...CI973-18/6 Branch Combiner
Number of Combining Units .....Three
Injected Port to Injected Port Isolation..... > - 70 dB
Output Connector.....6 1/8 "50 Ohm EIA (Flanged)
Output Power (Designed) .....85 KW(1)
Combiner Units, Size and Weight :

Type 973-6 Tuned To 99.5 MHz. .....
Type 973-6 Tuned To 105.3 MHz. .....
Type 973-6 Tuned To 107.5 MHz. .....

Heat Removal (All Multiplexer Components)..... Forced Air
Physical Arrangement.....All Components floor mounted

Injected Port Specifications:

Frequency Assignment .....is for 99.5, 105.3 and 107.5 MHz.
Power Rating, Each Injected Port (Designed).....30 KW
Input Connector .....3-1/8" 50 Ohm EIA (Flanged)
VSWR .....< 1.03:1 @ +/-150 KHz(2
Group Delay .....Less than 50 ns Overall Variation, Carrier @ +/- 150 KHz
Insertion Loss (Measured):

99.5 MHz..... - 0.212 dB
105.3 MHz..... - 0.209 dB
107.5 MHz..... - 0.189 dB

1) Power Rating Listed is as Designed Only. Actual Power Capabilities May Vary.
2) When Terminated in 50 Ohm Resistive Load.

ELECTRONICS RESEARCH,INC.
7777 GARDNER ROAD
CHANDLER, IN. 47610

FIGURE 1

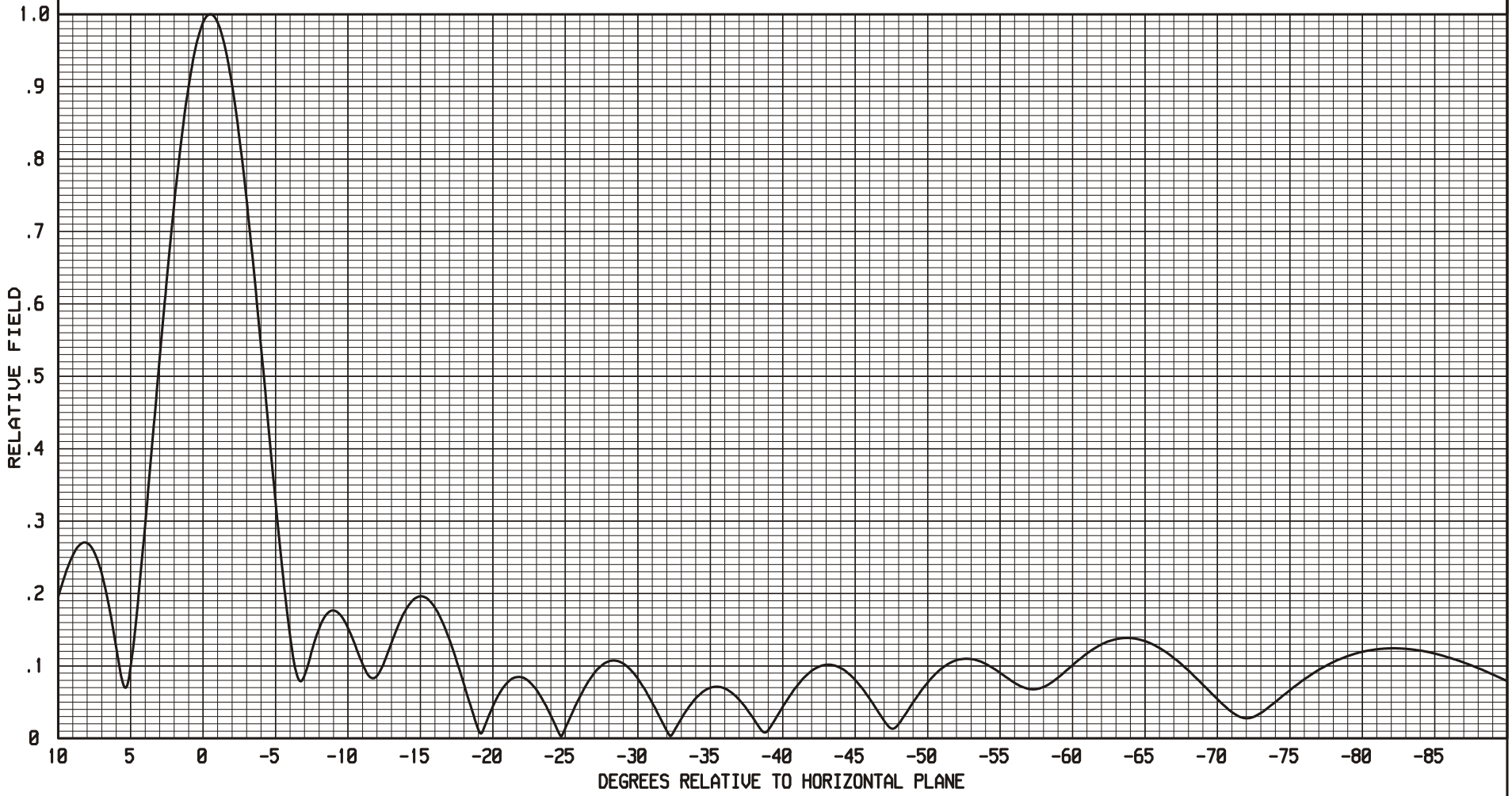
----THEORETICAL----
VERTICAL PLANE RELATIVE FIELD

10 ERI TYPE SHPX HIGH POWER ELEMENTS & CUSTOM PRESSURIZED INPUT
-.50 DEGREE(S) ELECTRICAL BEAM TILT
8 PERCENT FIRST NULL FILL
8 PERCENT SECOND NULL FILL
POWER GAIN IS 5.284 IN THE HORIZONTAL PLANE(5.406 IN THE MAX.)

MARCH 13, 2006

99.5 MHz.

ELEMENT SPACING:
113.625 INCHES



ELECTRONICS RESEARCH,INC.
7777 GARDNER ROAD
CHANDLER, IN. 47610

FIGURE 2

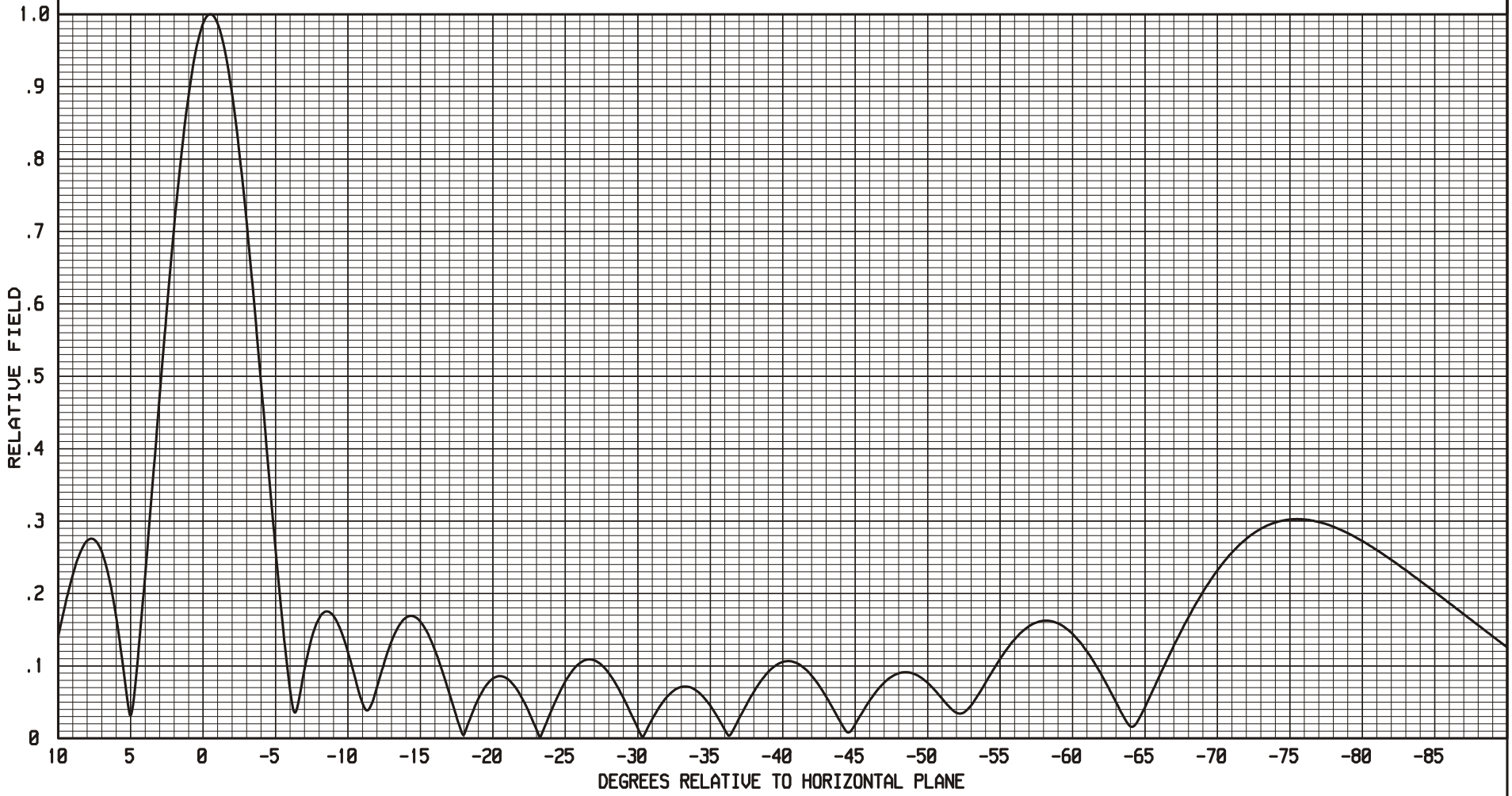
----THEORETICAL----
VERTICAL PLANE RELATIVE FIELD

10 ERI TYPE SHPX HIGH POWER ELEMENTS & CUSTOM PRESSURIZED INPUT
-.50 DEGREE(S) ELECTRICAL BEAM TILT
4 PERCENT FIRST NULL FILL
4 PERCENT SECOND NULL FILL
POWER GAIN IS 5.360 IN THE HORIZONTAL PLANE(5.499 IN THE MAX.)

MARCH 13, 2006

105.3 MHz.

ELEMENT SPACING:
113.625 INCHES



ELECTRONICS RESEARCH,INC.
7777 GARDNER ROAD
CHANDLER, IN. 47610

FIGURE 3

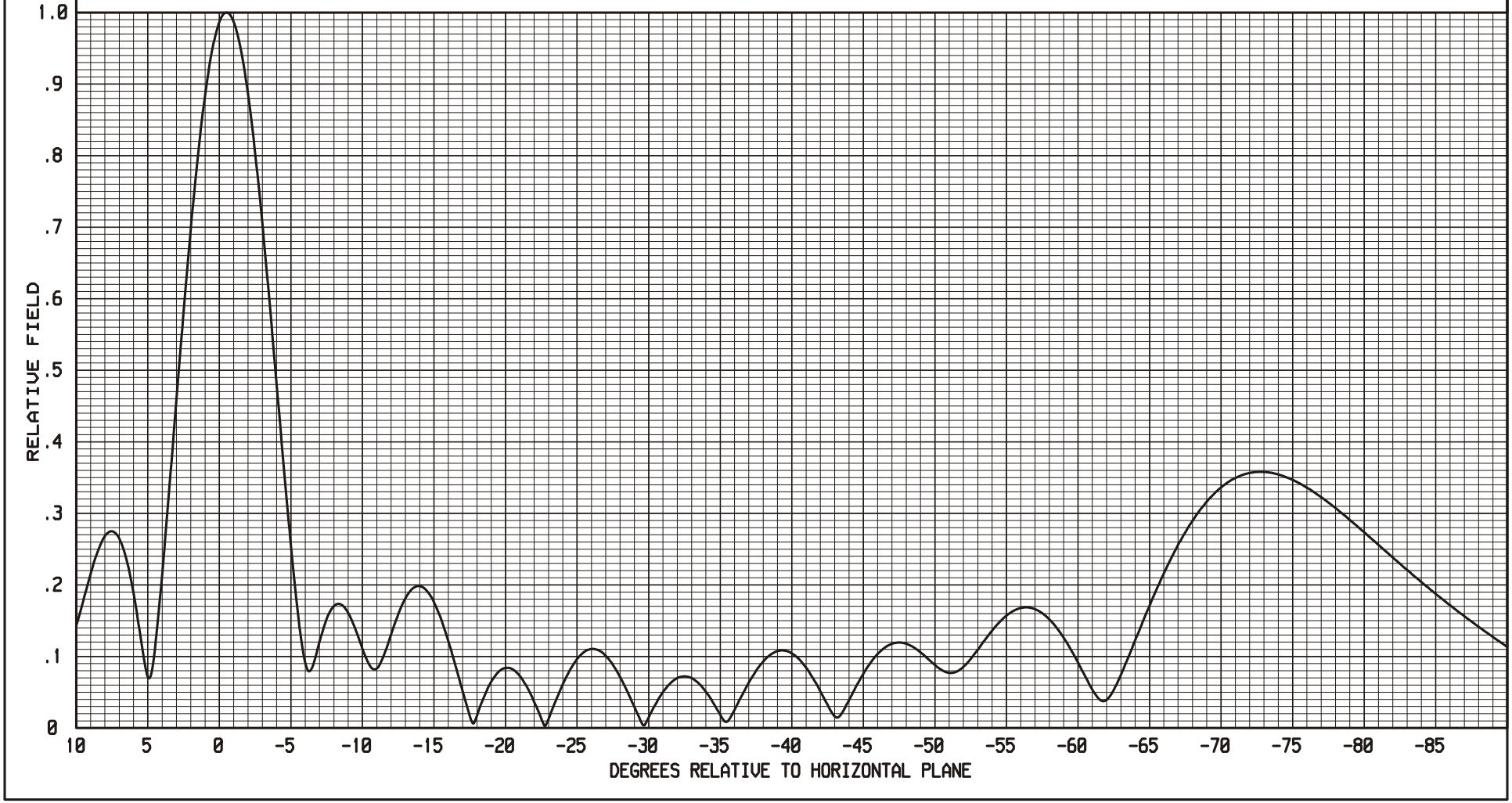
----THEORETICAL----
VERTICAL PLANE RELATIVE FIELD

10 ERI TYPE SHPX HIGH POWER ELEMENTS & CUSTOM PRESSURIZED INPUT
-.50 DEGREE(S) ELECTRICAL BEAM TILT
8 PERCENT FIRST NULL FILL
8 PERCENT SECOND NULL FILL
POWER GAIN IS 5.066 IN THE HORIZONTAL PLANE(5.202 IN THE MAX.)

MARCH 13, 2006

107.5 MHz.

ELEMENT SPACING:
113.625 INCHES



Broadcasting Scheme EXHIBIT - B1

FM TRANSMITTERS
KISS 99.5 MHz.
KSMG 105.3 MHz.
KXTN 107.5 MHz.

COMBINER
ELECTRONICS RESEARCH
KISS 99.5 MHz.
KSMG 105.3 MHz.
KXTN 107.5 MHz.

ERI, 6 1/8"
RF Directional Coupler

ANTENNA
ELECTRONICS RESEARCH
MODEL: SHPX-10BC-SP

Equipment Employed in Intermodulation Measurements
Exhibit B - 2

CALIBRATION SOURCE
1) Potomac Instruments ; Model FIM-71,
Field Strength Meter Ser # 242
2) Wavetek Inc. ; Model 3000, Frequency Generator
Ser # 7512028

SPECTRUM ANALYZER
IFR; Model 2399A
Spectrum Analyzer
Ser # 02113071

BAND PASS FILTER
PASSIVE POWER
ADJUSTABLE RANGE 70~130 MHz.
Ser # 4

Attenuator
(As Needed)

RF VOLT METER
Potomac Instruments ; Model FIM-71
Field Strength Meter
Ser # 242

Note *
All RF Connecting Cable Used In
Measurement Setup Is Double Shielded.

Broadcasting Scheme and Equipment Employed in Intermodulation Measurements

EXHIBIT B