SELLMEYER ENGINEERING
BROADCAST AND COMMUNICATION CONSULTING ENGINEERS
P.O. Box 356 McKinney, Texas 75070
MEMBER AFCCE
(214) 495-9764

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C. P. FILE NUMBER BPH-20000824ABG
FACILITY NUMBER 23084
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RADIO STATION KHKS
CHANNEL 291C, 99 KW ERP 508 MTRS AAT
DENTON, TEXAS

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ENGINEERING STATEMENT
APPLICATION FOR STATION LICENSE
C. P. FILE NUMBER BPH-20000824ABG
FACILITY NUMBER 23084
AMFM TEXAS LICENSES LIMITED PARTNERSHIP
RADIO STATION KHKS
CHANNEL 291C, 99 KW ERP 508 MTRS AAT
DENTON, TEXAS

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This Firm has been retained by AMFM Texas Licenses Limited Partnership ("AMFM") to perform measurements demonstrating compliance with Section 73.317(b) through 73.317(d) of the Rules and to prepare FCC Form 302-FM for its application for station license.

AMFM holds construction permit file number BPH-20000824ABG which authorizes construction of a new main transmitter facility at a location 0.16 kilometers from its presently licensed main facility. The construction permit contains a condition requiring submission of spurious emission measurements demonstrating compliance with Section 73.317(b) through 73.317(d) of the Rules.

Construction has been completed on the new facility and the required measurements have been completed during the experimental period. This Statement provides documentation of the measurements together with a description of the methods employed to make the measurements.

Station KHKS is one of six stations presently sharing a Harris model number TAC-8FMB-3/24 eight element panel antenna located on the "Cowboy Tower" in Cedar Hill, Texas. The antenna employs three circularly polarized elements, each of which is a cavity backed radiator, at each of eight levels. The elements are spaced vertically one wavelength at the band center. The stations are combined with a chain of constant impedance bandpass filters as shown on the block diagram of Exhibit E1-2. The filters are designed to couple each transmitter into a common transmission line via a pair of 90 degree hybrid networks and an appropriate number of bandpass filters. This provides a relatively flat symmetrical pass band for the desired frequency together with a high level of rejection of other frequencies in the transmission line. All of the filters are housed in a large air conditioned room. The transmitters are housed in individual rooms. The KHKS installation has two Harris HT-35CD transmitters with an automatic changeover switch to assure continuous service to the public.

Occupied bandwidth and spurious emission levels were measured via a broadband directional coupler element inserted into a Bird directional coupler assembly in the output line of the RF transfer switch as shown on the block diagram of Exhibit E1-2. The coupler was oriented toward the coupling filters for the KHKS operation. A ten decibel attenuator was attached to the output of the coupler via a short length of double shielded RG-223/U cable. A second section of RG-223/U cable was run from this location to a table located in front of the transmitters. The cable was terminated in a twenty

decibel attenuator to assure a uniform match for the transmission line. The attenuator feeds a notch filter which was used to attenuate the carrier frequency amplitude to allow observation of low level spurious signals emitted by the transmitter. The output of the notch filter was fed into a six decibel attenuator attached to the input of a Tektronix 2712 spectrum analyzer. Use of the notch filter allowed measurement of emissions down to a noise floor of approximately -110 decibels (dBc) below the unmodulated carrier level.

The notch filter characteristics were measured by the undersigned and are plotted on the graph of Exhibit E1-3. A Potomac Instruments model FIM-71 VHF field intensity meter was used together with a Hewlett Packard model 5385A frequency counter to determine the response characteristics of the notch filter. The system was initially calibrated by bypassing the notch filter and calibrating the instrument to 0 dB full scale at the KHKS operating frequency of 106.1 megahertz. The filter was then inserted into the test setup and adjusted for maximum rejection. This was determined to be 32 decibels. The instrument was then calibrated at each frequency to be measured and the insertion loss was measured and plotted. At frequencies above 225 megahertz, the spectrum analyzer was used with a Hewlett Packard 8640A signal generator. The response was determined to be essentially flat from 225 through 450 megahertz.

A check on the attenuator accuracy of the spectrum analyzer was made in accordance with the block diagram of Exhibit E1-4. A Hewlett Packard model 8640A signal generator was attached to the input of the spectrum analyzer through a short length of double shielded coaxial cable. A Hewlett Packard model 5385A frequency counter was fed through a BNC TEE connector to monitor the test frequency. The output level of the signal generator was maintained at a constant level and the output attenuator was stepped through a 100 decibel range while the level was read from the spectrum analyzer graticle. The input attenuator on the spectrum analyzer was adjusted as necessary to allow accurate observation of the level. The difference in level as a function of frequency was recorded in the tabulation of Exhibit E1-4. The system was determined to be within the manufacturer's stated specifications.

Section 73.317(b) requires any emission removed from the carrier frequency between 120 and 240 kilohertz to be attenuated at least 25 dB below the unmodulated carrier frequency.

The spectrum analyzer was connected to the directional coupler sample with the notch filter bypassed and the spectrum was observed over a 500 kilohertz span using the peak hold provisions of the analyzer for a period of approximately ten minutes with normal program material applied to the transmitter. No emissions were observed between 120 and 240 kilohertz removed from the carrier frequency with levels exceeding -25 decibels below that of the unmodulated carrier.

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Section 73.317(c) requires any emission removed from the carrier frequency between 240 and 600 kilohertz to be attenuated at least 35 dB below the unmodulated carrier frequency.

With the setup described for Section 73.317(b) above, the spectrum was observed over a one megahertz span using the peak hold provisions of the analyzer for a period of approximately ten minutes with normal program material applied to the transmitter. No emissions were observed between 240 and 600 kilohertz removed from the carrier frequency with levels exceeding -35 decibels below that of the unmodulated carrier.

Section 73.317(d) requires any emission removed from the carrier frequency by more than 600 kilohertz to be attenuated at least 80 dB below the unmodulated carrier frequency in the case of the KHKS facility.

With the setup described in Exhibit E1-2, the spectrum was observed over a span from 50 megahertz to one gigahertz. Calculations were made for each of the potential two station intermodulatioin products for the six stations feeding the common antenna. The formula 2F1 +/- F2 was used with F1 being the KHKS operating frequency of 106.1 megahertz and F2 being the operating frequencies of the five other stations operating into the common antenna. Each of these potential frequencies together with the harmonics of Station KHKS were singled out for specific observation and measurement. The measurements are reported in the tabulation of Exhibit E1-1.

There are fifteen other FM stations located on several towers within two kilometers of the "Cowboy Tower". Each of the other frequencies was checked for potential intermodulation products but none were noted with the exception of Station KKDA-FM which is co-located with KHKS and which appeared in the forward port of the coupler at an amplitude of -74 dBc. The KHKS transmitter was turned off and no change in the level of the KKDA-FM emission resulted. The emission on 107.7 megahertz disappeared as expected.

The entire spectrum between 50 megahertz and one gigahertz was then slowly scanned in increments of approximately one megahertz while observing any unexpected spurious emissions.

No spurious emissions were observed in violation of the requirements of Section 73.317(d) of the Rules.

It is the opinion of the undersigned that all of the requirements of Construction Permit file number BPH-20000824ABG have been met.

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TRANSMITTER POWER OUTPUT CALCULATIONS

The following data was used to calculate the required transmitter power output:

GAINS/LOSSES	dB LOSS	EFFICIENCY
Antenna input power = ERP/Gain		
99.0 kW/3.92 = 25.26 kW		
Antenna Line Loss = 1450 ft/10 X 0.05 dB/100 ft:	0.725 dB	84.65%
Combiner Loss:	0.450 dB	90.16%
Transmitter Line Losses:		
110 ft, 4-1/16 Inch Rigid Line	0.075 dB	98.29%
11 ft, 3-1/8 Inch Rigid Line	0.010 dB	99.77%
Total Losses:	1.260 dB	74.82%

Transmitter Power Output = Antenna Input/% Efficiency

25.26/0.7482 = **33.76 kW**

SELLMEYER ENGINEERING
MCKINNEY, TEXAS
FIELD DATA

EXHIBIT E1-1

STATION: KHKS DATE: FEB. 28, 02

LOCATION: DENTON, TEXAS PAGE 1 OF 1

FREQUENCY: 106.1 MHZ

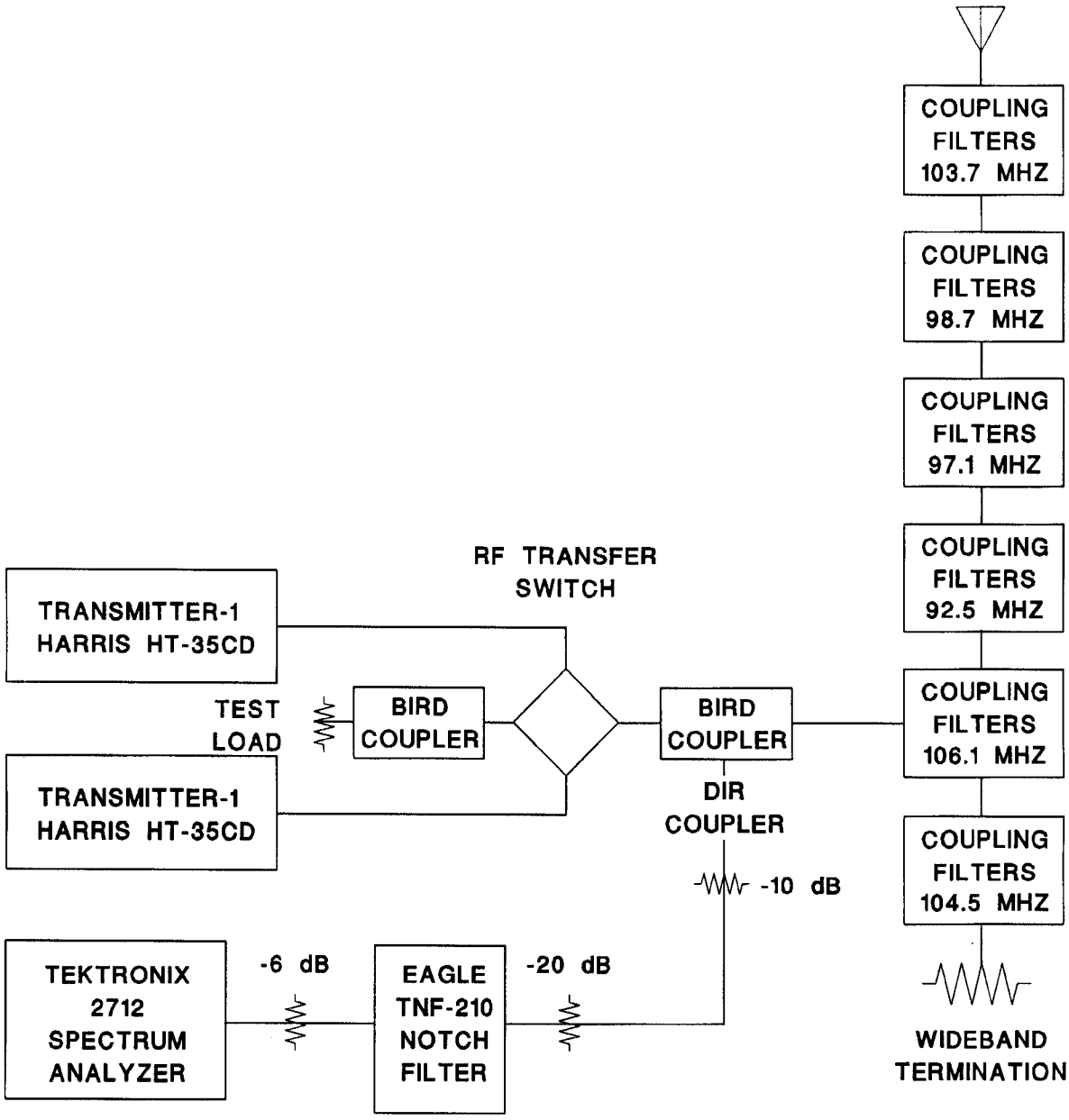
FACILITY: X MAIN ___ AUX X Eagle TNF-210 Fltr

INSTRUMENT: X TEK 2712, SN: B022284 ATT CHK: 020228

___ POTOMAC FIM-71, SN: 852 ATT CHK: _____

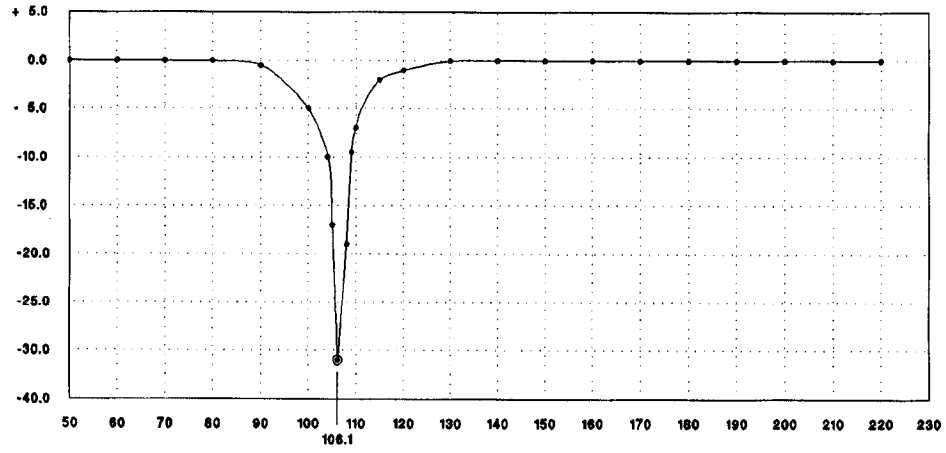
FREQUENCY	LEVEL	C. F.	dBc	COMMENTS
119.7 mHz	<-110	+1.0	<-109	KZPS, 92.5 mHz
304.7 mHz	<-110	0.0	<-109	KZPS, 92.5 mHz
115.1 mHz	<-110	+2.5	<-107	KEGL 97.1 mHz
309.3 mHz	<-110	0.0	<-110	KEGL 97.1 mHz
113.5 mHz	<-110	+3.0	<-107	KLUV 98.7 mHz
310.9 mHz	<-110	0.0	<-110	KLUV 98.7 mHz
108.5 mHz	<-110	+12.8	<-97.2	KVIL 103.7 mHz
315.9 mHz	<-110	0.0	<-110	KVIL 103.7 mHz
107.7 mHz	<-110	+17.0	<-93.0	KKDA 104.5 mHz
316.7 mHz	<-110	0.0	<-110	KKDA 104.5 mHz
106.7 mHz	-105	+22	-83	Broadband Noise
105.15 mHz	-104	+18	-86	Broadband Noise
104.5 mHz	-88	+14	-74	KKDA Feedthrough
— — — —	— —	— —	— —	Unchanged w/KHKS off
107.9 mHz	-104	+13	-91	Broadband Noise
212.2 mHz	-94	0.0	-94	KHKS 2nd Harmonic
318.3 mHz	-88	0.0	-88	KHKS 3rd Harmonic

C.F.: CORRECTION FACTOR FOR FILTER

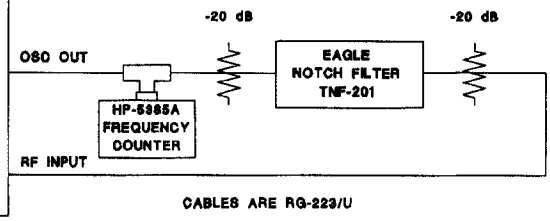


PROJ NO:	SELLMEYER ENGINEERING McKINNEY, TEXAS 75069
PREP: 20020226, JSS	BLOCK DIAGRAM MEASUREMENT TEST SETUP RADIO STATION KHKS 106.1 MHZ, 99 KW ERP
CHK	SIZE: / DWG NO: EXHIBIT E1-2
	SCALE: / SHEET: 1 OF 1

CALIBRATION CURVE
EAGLE NOTCH FILTER
TNF-210
20020226



POTOMAC INSTRUMENTS
FIM-71, S/N 852



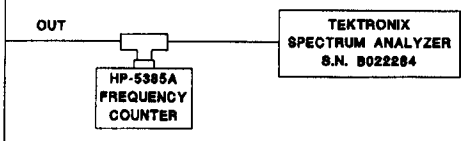
CABLES ARE RG-223/U

PROJ NO:	SELLMEYER ENGINEERING McKINNEY, TEXAS 75069	
PREP: 20020226, JSS	BLOCK DIAGRAM NOTCH FILTER TEST SETUP RADIO STATION KHKS 106.1 MHZ, 99 KW ERP	
CHK	SIZE:	DWG NO: EXHIBIT E1-3
	SCALE:	SHEET: 1 OF 1

	MEASURED LEVEL				
SIG LVL	50 mHz	100 mHz	150 mHz	200 mHz	250 mHz
0.0 dBm	0.0 dBm	0.0 dBm	0.0 dBm	0.0 dBm	0.0 dBm
- 10.0 dBm	- 10.0 dBm	- 10.0 dBm	- 10.0 dBm	- 10.0 dBm	- 10.0 dBm
- 20.0 dBm	- 20.0 dBm	- 20.0 dBm	- 20.0 dBm	- 20.0 dBm	- 20.0 dBm
- 30.0 dBm	- 30.0 dBm	- 30.0 dBm	- 30.0 dBm	- 30.0 dBm	- 30.0 dBm
- 40.0 dBm	- 40.0 dBm	- 40.0 dBm	- 40.0 dBm	- 40.0 dBm	- 40.0 dBm
- 50.0 dBm	- 50.0 dBm	- 50.0 dBm	- 50.0 dBm	- 50.0 dBm	- 50.0 dBm
- 60.0 dBm	- 60.0 dBm	- 60.0 dBm	- 60.0 dBm	- 60.0 dBm	- 60.0 dBm
- 70.0 dBm	- 70.0 dBm	- 70.0 dBm	- 70.5 dBm	- 70.0 dBm	- 70.0 dBm
- 80.0 dBm	- 80.0 dBm	- 80.5 dBm	- 80.0 dBm	- 79.5 dBm	- 80.0 dBm
- 90.0 dBm	- 90.0 dBm	- 90.5 dBm	- 90.0 dBm	- 89.5 dBm	- 90.0 dBm
-100.0 dBm	- 99.0 dBm	-100.0 dBm	-100.0 dBm	-100.0 dBm	- 99.0 dBm

	MEASURED LEVEL			
SIG LVL	300 mHz	350 mHz	400 mHz	450 mHz
0.0 dBm	0.0 dBm	0.0 dBm	0.0 dBm	0.0 dBm
- 10.0 dBm	- 10.0 dBm	- 10.0 dBm	- 10.0 dBm	- 10.0 dBm
- 20.0 dBm	- 20.0 dBm	- 20.0 dBm	- 20.0 dBm	- 20.0 dBm
- 30.0 dBm	- 30.0 dBm	- 30.0 dBm	- 30.0 dBm	- 30.0 dBm
- 40.0 dBm	- 40.0 dBm	- 40.0 dBm	- 40.0 dBm	- 40.0 dBm
- 50.0 dBm	- 50.0 dBm	- 50.0 dBm	- 50.5 dBm	- 50.0 dBm
- 60.0 dBm	- 60.0 dBm	- 60.0 dBm	- 60.5 dBm	- 60.0 dBm
- 70.0 dBm	- 70.0 dBm	- 69.5 dBm	- 70.0 dBm	- 71.0 dBm
- 80.0 dBm	- 79.5 dBm	- 79.5 dBm	- 80.0 dBm	- 80.5 dBm
- 90.0 dBm	- 89.5 dBm	- 90.0 dBm	- 89.5 dBm	- 90.0 dBm
-100.0 dBm	- 99.0 dBm	-100.0 dBm	-100.0 dBm	-100.0 dBm

HEWLETT PACKARD
SIGNAL GENERATOR
8640A, S.N.: 1330A00267
CAL: AUG 24, 1999



CABLES ARE RG-223/U

PROJ NO:	SELLMEYER ENGINEERING McKINNEY, TEXAS 75069
PREP: 20020226, JSS	BLOCK DIAGRAM ATTENUATOR TEST SETUP RADIO STATION KHKS 106.1 MHZ, 99 KW ERP
CHK	SIZE: / DWG NO: EXHIBIT E1-4
	SCALE: / SHEET: 1 OF 1

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EXHIBIT E1-5A
TABULATION OF VERTICAL PATTERN
RADIO STATION KHKS
DENTON, TEXAS

PATTERN LISTING

DATE: 2-25-1997
TIME: 10:59 AM

PAT. NO.: 6052E08K

PLOT FILENAME = 1061EL.PLT

ELEVATION	REL. FIELD	ELEVATION	REL. FIELD
-90.0	.121	.0	.992
-80.0	.208	6.5	.108
-72.6	.276	9.4	.241
-70.0	.265	10.0	.235
-60.0	.051	13.6	.024
-59.7	.050	17.0	.148
-53.7	.134	20.0	.051
-50.0	.075	20.9	.007
-47.8	.016	24.6	.117
-42.8	.109	28.6	.001
-40.0	.062	30.0	.056
-38.2	.006	32.7	.107
-33.9	.105	36.9	.006
-30.0	.010	40.0	.097
-29.8	.001	41.6	.112
-25.7	.116	46.3	.017
-22.0	.007	50.0	.118
-20.0	.101	52.3	.140
-18.0	.147	57.8	.054
-14.6	.024	60.0	.103
-10.4	.240	70.0	.306
-10.0	.236	70.6	.307
-7.5	.108	80.0	.201
-.5	1.000	90.0	.110

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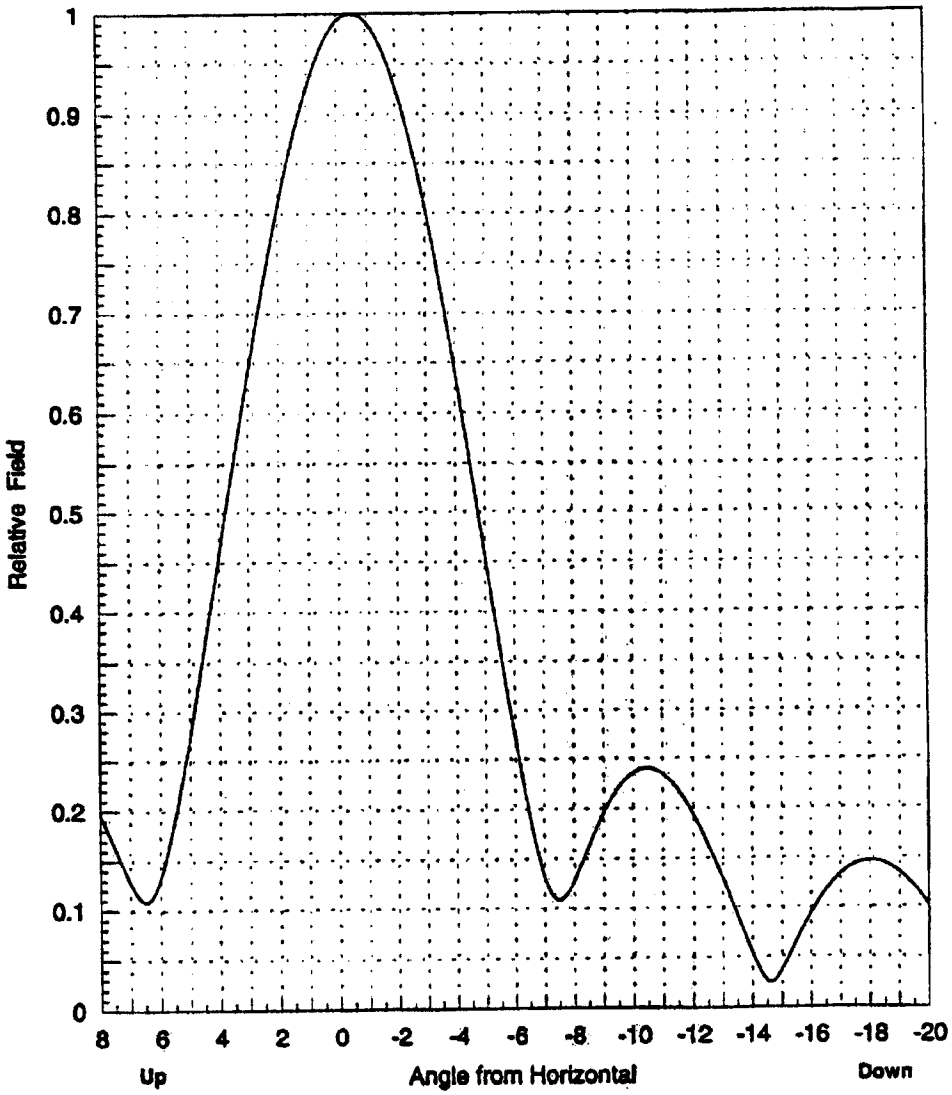
EXHIBIT E1-5B
PLOT OF VERTICAL PATTERN
RADIO STATION KHKS
DENTON, TEXAS

HARRIS

Calculated Elevation Pattern



MODEL: TAC-8FMB-3/24
Pattern No.: 6052E08K
F=106.1 MHz

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LIST OF INSTRUMENTS
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RADIO STATION KHKS
CHANNEL 291C, 99 KW ERP 508 MTRS AAT
DENTON, TEXAS

INSTRUMENT	MANUFACTURER, MODEL & SERIAL NO.	CALIBRATION DATE
Spectrum Analyzer	Tektronix, Model 2712 Serial Number B022284	Attenuator: 20020226 J. S. Sellmeyer
Field Intensity Meter	Potomac Instruments Model FIM-71, S.N.: 852	Factory
Signal Generator	Hewlett Packard, Model 8640A Serial Number 1330A00267	19990824 Central Inst Lab
Frequency Counter	Hewlett Packard, Model 5385A Serial Number 2730A04168	20020226 Against WWV J. S. Sellmeyer
Bandpass Filter	Eagle Model TNF-210 No Serial Number	20020226 J. S. Sellmeyer

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CERTIFICATION OF ENGINEER

I hereby state that:

I am President of Sellmeyer Engineering

The Firm of Sellmeyer Engineering has been retained by AMFM Texas Licenses Limited Partnership to prepare this Engineering Exhibit

I am a graduate of Arizona State University with the degree of Bachelor of Science in Engineering

I am a Registered Professional Engineer in the States of Ohio and Texas

My qualifications as an Engineer are a matter of record with the Federal Communications Commission

This Engineering Exhibit was prepared by me personally or under my direct supervision, and

All facts stated herein are true and correct to the best of my knowledge and belief.

J. S. Sellmeyer, P. E.

March 4, 2002

P. O. Box 356
McKinney, Texas 75070
214-495-9764