Broadcast Application | FEDERAL COMMUNICATIONS COMMISSION | Section II-C

LICENSE APPLICATION ENGINEERING DATA TELEVISION BROADCAST

Name of applicant: Television Co. of America, Inc. BLCT—760

1. Facilities authorized in construction permit

Call letters	Channel No.	File No. of construction permit
KSHO-TV	13	BMPCT 4854

Frequency: 210 — 216 Mc.

Carrier frequency: Visual 211.24 Mc; Aural 215.74 Mc

Effective Radiated Power (visual)	Effective Radiated Power (aural)	Antenna height above average terrain
In dbk: 10.417	In dbk: 7.393	130 feet
In kw: 11.0	In kw: 5.5	

2. Station location (principal community)

State	City or town
Nevada	Las Vegas

3. Transmitter location

State	County
Nevada	Clark

City or town	Street Address (or other identification)
Las Vegas	El Rancho Vegas Hotel

4. Main studio location

State	County
same as transmitter	

City or town	Street address

5. Transmitters Installed

Visual

Make	Type No.	Rated power
RCA	TT2AH	In dbk: 3.01 In kw: 2.0

Aural

Make	Type No.	Rated power
RCA	TT2AH	In dbk: 0.8 In kw: 1.2

Operating constants

Visual transmitter (while transmitting black)

D. C. plate current in last radio stage, in amperes	Applied D. C. plate voltage of last radio stage, in volts
1.09	3100

Transmitter power output (after vestigial sideband filter, if used, and after multiplexer, if combined)	Multiplexer loss in db, if separate:	Input to transmission line in dbk:
In dbk: 3.01 In kw: 2.0	.043	2.967

Transmission line power loss in db:	Antenna input power in dbk:	Antenna power gain in db:	Effective radiated power
.750	2.217	8.20	In dbk: 10.417 In kw: 11.0

Attach as Exhibit No. complete information concerning the method of power output determination. If power is measured at output of multiplexer, so state.

Reading of power output meter (transmission line voltage, current or power; indicate which) while operating at authorized power:

100% Reflectometer

Aural transmitter

D. C. plate current in last radio stage, in amperes	Applied D. C. plate voltage of last radio stage, in volts
.56	3200

Plate input power to last radio stage in kilowatts	Efficiency factor F of transmitter at operating power, in percent
1.792	56

Transmitter power output	RF transmission line meter reading
In dbk: 1.0 In kw:	100%

6. Antenna and transmission line

Antenna make and Type No.	Number of sections	Power gain in db
RCA TF 6A1	6	8.20

Antenna supporting structure: 205 foot guyed tower

Overall height of antenna system above ground in feet: 245

Geographical coordinates of antenna (to nearest second): North latitude 36° 08. 32" West longitude 115° 09. 37"

If directional antenna is used, give full details including horizontal and vertical plane radiation patterns, as Exhibit No.

Is electrical or mechanical beam tilting employed? Yes ☐ No ☒
If so, describe fully in Exhibit No. , including horizontal and pertinent vertical radiation patterns.

Has antenna been altered to provide null fill-in? Yes ☐ No ☒
If so, describe fully in Exhibit No.

Transmission line

Make	Type No.	Coaxial or waveguide
Andrew	451	Coaxial

Size (nominal inside transverse dimensions) in inches	Length in feet	Power loss in db for this length
1.527	227.5	.750

Multiplexer

Make	Type No.
RCA	TF-19022

If emergency antenna or transmission line measures are provided, describe in Exhibit No. None

7. Modulation monitors

(a) Visual monitor or monitoring equipment

Make	Type No. (or describe in Exhibit No.)
Packard Bell Receiver	17VTI

(b) Aural monitor

Make	Type No.
Hewlett Packard	335E Ser 132

8. Frequency monitors

(a) Visual monitor

Make	Normal limits of deviation of carrier frequency shown by monitor
Hewlett Packard	500 cps. high low to 1000 cps. high low
Type No. 335E	

8. (Continued)

(b) Aural monitor

Make	Normal limits of deviation of carrier frequency shown by monitor
Hewlett Packard	1800 cps. high to low
Type No. 335E	1300 cps. high low

If either frequency monitor indicates any carrier deviation in excess of the permissible tolerance, describe in Exhibit No. and state the corrective measures taken.

If the carrier frequencies have been measured by other means, describe in Exhibit No. , giving the date, method used or frequency measuring service employed, the results obtained and the monitor readings (high or low) at the time.

9. Performance data - Visual transmitter

a. Attach as Exhibit No. Notel data showing the following:

1. Overall attenuation versus frequency of the visual transmitter;
2. Field strength or voltage of the lower side-band for a modulating frequency of 1.25 mc. or greater, and of the upper side-band for a modulating frequency of 4.75 mc. or greater;
3. A description of the equipment and technique used in making these measurements.

b. Attach as Exhibit No. Notel data demonstrating that the waveform of the transmitted signal conforms to that specified by the standards. Until the form of these measurements may be specified by the Commission, the character of this data is left to the discretion of the applicant.

c. Attach as Exhibit No. Notel a photograph of a test pattern taken from a receiver or monitor connected to the transmitter output.

10. Performance data - Aural transmitter

Attach as Exhibit No. Notel data, diagrams, and appropriate graphs together with description of measurement procedures and instruments with regard to the following: (All measurements shall be made with the equipment adjusted for normal program operation and shall include all circuits between the main studio microphone terminals and the antenna output, including telephone lines, pre-emphasis circuits and any equalizers employed except for microphones, and without compression if a compression amplifier is installed.)

a. Audio frequency response from 50 to 15,000 cycles for approximately 25, 50 and 100 percent modulation. Measurements shall be made on at least the following audio frequencies: 50, 100, 400, 1000, 5000, 10,000 and 15,000 cycles. The frequency response measurements should normally be made without de-emphasis; however, standard 75 microsecond deemphasis may be employed in the measuring equipment or system provided the accuracy of the deemphasis circuit is sufficient to insure that the measured response is within the prescribed limits.

b. Audio frequency harmonic distortion for 25, 50 and 100 percent modulation for the fundamental frequencies of 50, 100, 400, 1000 and 5000 cycles. Audio frequency harmonics for 100 percent modulation for fundamental frequencies of 10,000 and 15,000 cycles. Measurements shall normally include harmonics to 30,000 cycles. The distortion measurements shall be made employing 75 microsecond deemphasis in the measuring equipment or system.

c. Output noise level (frequency modulation) in the band of 50 to 15,000 cycles in decibels below the audio frequency level representing a frequency swing of 25 kilocycles. The noise measurements shall be made employing 75 microsecond deemphasis in the measuring equipment or system.

d. Output noise level (amplitude modulation) in the band of 50 to 15,000 cycles in decibels below the level representing 100 percent amplitude modulation. The noise measurements shall be made employing 75 microsecond deemphasis in the measuring equipment or system.

11. In what respect, if any, does the apparatus constructed differ from that described in the application for construction permit or in the permit? The original construction permit application contained a typographical error in the listing of the antenna type. It was listed as a TF6AH whereas it is actually a TF6A1. This license application lists the type antenna actually in use.

Note 1: The data for sections 9 and 10 are included in the attached "License Application Engineering Data" labeled exhibit A

Note 2: Attached as exhibits B & C are data showing that no adverse effect upon the operations of KENO(AM) & KORK (AM) has resulted from the construction of KSHO-TV.

I certify that I am the Technical Director, Chief Engineer or Consulting Engineer for the applicant of the radio station for which this application is submitted and that I have examined the foregoing statement of technical information and that it is true to the best of my knowledge and belief. (This signature may be omitted provided the engineer's original signed report of the data from which the information contained herein has been obtained is attached hereto.)

Date Nov. 18, 1957

Edward P White

~~Technical Director~~, Chief Engineer or ~~Consulting Engineer~~

U. S. GOVERNMENT PRINTING OFFICE: 1953 O - 257441

EXHIBIT "B"

Following are field intensity measurements on Radio Station KENO (AM) Las Vegas, Nevada.

Sunday, September 29, 1957

Monitoring point field intensity:

114 degrees	T	23.5	mv/m	Time 10:10 PM
268 "	T	10.0	mv/m	Time 10:35 PM
324 "	T	24.0	mv/m	Time 10:50 PM

Monday, October 14, 1957

Monitoring point field intensity:

114 degrees	T	23.0	Mv/m	Time 10:40 PM
268 "	T	10.5	mv/m	Time 10:55 PM
324 "	T	24.0	mv/m	Time 11:10 PM

The operations of KENO (AM) (directional have not been adversely affected by the erection of the KSHO-TV Tower and Antenna to the best of my knowledge

Harry W. Anderson
Chief Engineer

October 21, 1957

1340 on your dial
KORK NBC in Las Vegas
Thunderbird Hotel - Las Vegas, Nevada

EXHIBIT "C"

October 21, 1957

This is to certify that the operations of KORK (AM) have not been adversely affected by the erection of the KSHO-TV tower and antenna.

Gregg Gelhart
Chief Engineer
KORK Radio

RCA SERVICE COMPANY, INC.
A RADIO CORPORATION OF AMERICA SUBSIDIARY
CAMDEN 8, NEW JERSEY

EXHIBIT A

LICENSE APPLICATION ENGINEERING DATA

TELEVISION BROADCAST STATION KSHO-TV

The information contained herein was obtained by the undersigned during the period October 19, 1957 to November 17, 1957.

The data presented is an exact copy or scaled from original tracings and photographs made of measurements taken at this time.

All original material, drawings, data and photographs are on file with the RCA Service Company., at its Western Area Office.

H. W. Dover,
FIELD REPRESENTATIVE
RCA SERVICE COMPANY, INC.

RCA SERVICE COMPANY, INC.
A RADIO CORPORATION OF AMERICA SUBSIDIARY
CAMDEN 8, NEW JERSEY

TELEVISION STATION KSHO-TV

Date Oct. 21, 1957

License Application Engineering Data

TELEVISION BROADCAST

1. Facilities authorized in Construction Permit.

   a. Call Letters KSHO-TV

   b. Channel number 13

   c. File number of construction permit

   d. Frequency 210 to 216 MC.

   e. Carrier frequency, visual 211.24 MC.

   f. Aural 215.74 MC.

   g. Effective Radiated Power, (Visual) in DBK. 10.417
      in KW. 11.0

   h. Effective Radiated Power, (Aural) in DBK. 7.393
      in KW. 5.5

   i. Antenna height above average terrain 130 feet.

2. Station location (Principal Community).

   a. State Nevada

   b. City or Town Las Vegas

3. Transmitter Location

   a. State Nevada

   b. County Clark

   c. City or Town Las Vegas

   d. Street Address (or other identification)

      El Rancho Vegas Hotel

4. Main Studio Location

   a. State Nevada

   b. County Clark

   c. City or Town Las Vegas

   d. Street Address El Rancho Vegas Hotel

RCA SERVICE COMPANY, INC.
A RADIO CORPORATION OF AMERICA SUBSIDIARY
CAMDEN 8, NEW JERSEY

TELEVISION STATION KSHO-TV

SECTION II-C

Date Oct. 22, 1957

OF FCC FORM 302

5. Transmitters Installed

Visual

Make	Type No.	Rated Power
RCA	TT2AH	
Aural		In dbk: 3.01 In KW. 2.0
Make	Type No.	Rated Power
RCA	TT2AH	
Operating Constants		In dbk: 0.8 In KW. 1.2

Visual Transmitter (while transmitting black)

D.C. Plate current In last radio stage, In amperes	Applied D.C. plate Voltage of last radio stage, in volts
1.09	3100

Transmitter power output (after vestigial sideband filter, if used, and after multiplexer, if combined)	Multiplexer loss in db, if separate	Input to transmission line in dbk:
In dbk: 3.01 In KW. 2	.043	2.967

Transmission line power loss in db:	Antenna input power in dbk:	Antenna power gain in db:	Effective radiated power
.750	2.217	8.20	10.417 In dbk: In KW. 11.0

Attach as Exhibit No. _____ complete information concerning the method of power output determination. If power is measured at output of multiplexer, so state.

Reading of power output meter (transmission line voltage, current or power, indicate which) while operating at authorized power:

100% on Reflectometer (Peak reading voltmeter)

Aural Transmitter

D.C. Plate current in last radio state, in amperes	Applied D.C. plate voltage of last radio stage, in volts
.56	3200
Plate input power to last radio stage in kilowatts	Efficiency factor F of transmitter at operating power, in percent realized
1.792	56
Transmitter power output	rf Transmission line meter reading
In dbk: 0 In KW. 1	100% Thermocouple RF voltmeter

RCA SERVICE COMPANY, INC.
A RADIO CORPORATION OF AMERICA SUBSIDIARY
CAMDEN 8, NEW JERSEY

Exhibit No. 1

Date Oct. 22, 1957

TELEVISION STATION KSHO-TV

Paragraph 5, Section II C, Form 302

Method of power output determination for the visual transmitter as described in the FCC Rules and Regulations, Part 3, Subpart E, rules governing TV Broadcast Stations, Sect. 3.689, Paragraph (a) (1).

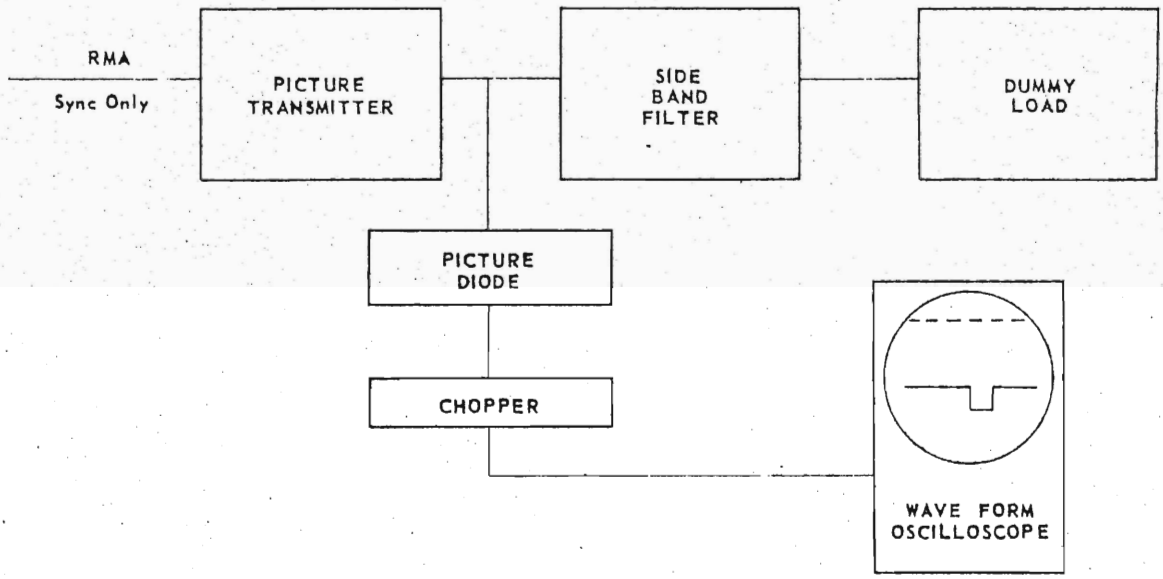


FIGURE 1

With PA tank and load coupling adjustments the same as for the video response characteristic as included under Section) of Section II-C of FCC Form 302, and the transmitter operating in DC coupled condition, a signal consisting of standard RMA sync only was fed in at the video input as indicated in Figure 1 above. With this "Black Picture", operating condition and 25% sync as indicated on the oscilloscope trace, PA plate voltage and current readings were recorded as listed below. Average Power output was read on a calibrated dummy load

Plate current = 1.09A
Plate voltage = 3100 V

Power Output meter (Reflectometer) reads 100%

Dummy Load = 1.19KW Average
Peak Power = 1.19 x 1.68 = 2.0 KW

Radio Station KSHO-TV

C.E. Edward White

Data by: H. W. Dover

Date October 21, 1957

RCA SERVICE COMPANY, INC.
A RADIO CORPORATION OF AMERICA SUBSIDIARY
CAMDEN 8, NEW JERSEY

TELEVISION STATION KSHO-TV

Date October 21, 1957

6. Antenna and Transmission line

(a) Antenna make RCA

(b) Antenna type TF6A1

(c) Number of Sections 6

(d) Power gain in db. 8.20

(e) Antenna supporting structure 205 feet guyed tower

(f) Overall height of antenna system above ground in feet. 245

(g) Geographical co-ordinates of antenna (to nearest second)

36 ° 08 ' 32 " North latitude.
115 ° 09 ' 37 " West longitude

(h) If directional antenna is used, give full details including horizontal and vertical plane radiation patters, as exhibit No. Not applicable

(i) Has antenna been altered to provide null fill in? No
If so, describe fully in exhibit No. _____.

(j) Transmission Line

1. Make Andrew
2. Type No. 451
3. Coaxial or waveguide Coaxial
4. Size (Nominal inside transverse dimensions) in inches 1.527
5. Length in feet 227.5
6. Power loss in db for this length .750

(k) Multiplexer

1. Make RCA
2. Type No. MI-19022

(l) If emergency antenna or transmission line measures are provided, describe in Exhibit No. None.

RCA SERVICE COMPANY, INC.
A RADIO CORPORATION OF AMERICA SUBSIDIARY
CAMDEN 8, NEW JERSEY

TELEVISION STATION KSHO-TV

Exhibit No. _____

Date 10/22/57

7. Modulation Monitors

(a) Visual monitor or monitoring equipment.

1. Make Packard Bell Receiver coupled to Transmission line after VSBF

2. Type No., (or describe in Exhibit No._____)
Model #17VTI

(b) Aural Monitor

1. Make Hewlett Packard

2. Type No. 335E Ser. No. 132

Frequency Monitors

(a) Visual Monitor

1. Make Hewlett Packard

2. Type No. 335E

3. Normal limits of deviation of carrier frequency shown by monitor 500 cps high to 1000 cps low.

(b) Aural Monitor

1. Make Hewlett Packard

2. Type No. 335E

3. Normal limits of deviation of carrier frequency shown by monitor 1800 cps high to 1300 cps low.

(c) If either frequency monitor indicates any carrier deviation in excess of the permissible tolerance, describe in Exhibit No. not applicable and state the corrective measures taken.

(d) If the carrier frequencies have been measured by other means, describe in Exhibit No._____ giving the date, method used or frequency measuring service employed, the results obtained and the monitor readings, (high or low), at any time.

There is no frequency measuring service within reception range of the station

RCA SERVICE COMPANY, INC.
A RADIO CORPORATION OF AMERICA SUBSIDIARY
CAMDEN 8, NEW JERSEY

TELEVISION
STATION KSHO-TV

Exhibit No. 2

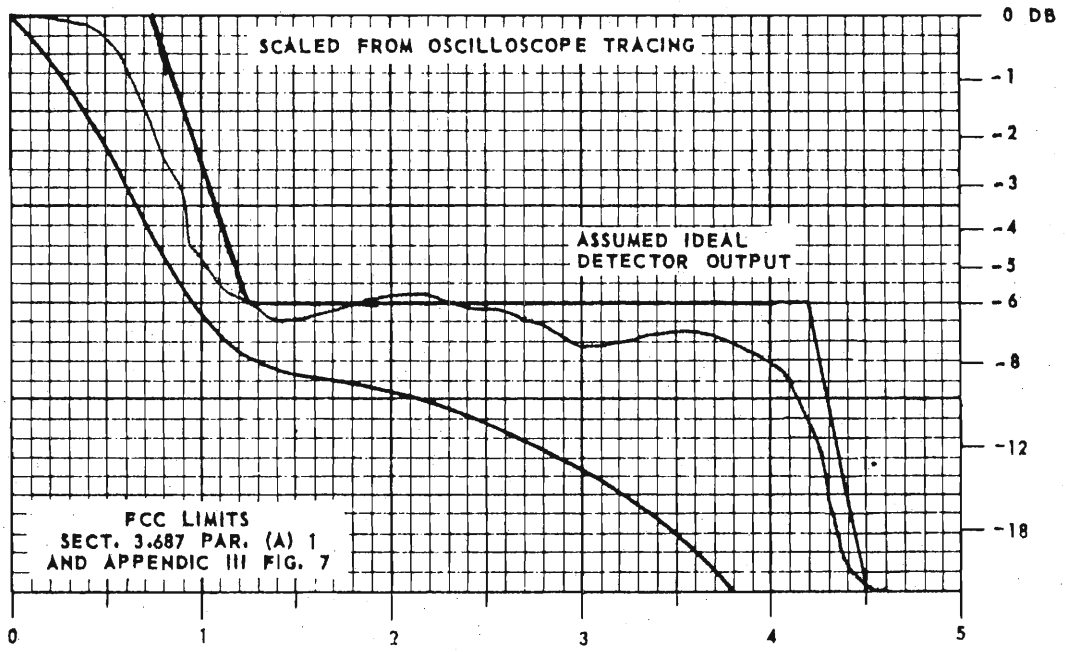
Date Oct. 21, 1957

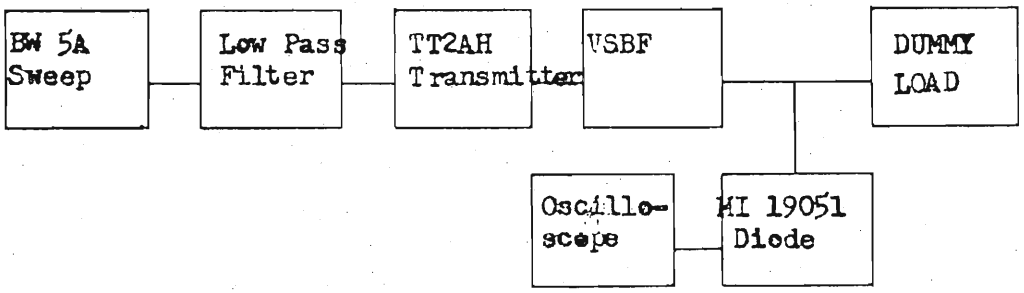
9. Performance Data. Visual Transmitter. (Monochrome and Color)

(a) Attach as Exhibit No. 2 Data showing the following:

1. Overall attenuation versus modulating frequency of demodulated signal for modulating frequencies from zero to 4.75 Mc.

(For Color) Sect. 3.687 Par. (a) 2





Method of measurement: A video sweep generator with constant output from 100 KC to at least 4.75 MC is used for modulation. With the transmitter AC coupled and the DC level set for mid-characteristic operation, input video level and rf Drive are carefully adjusted to avoid compression. The demodulated voltage is measured across a dummy load of pure resistance. This demodulated signal is presented on an oscilloscope and a tracing or photograph made of the waveform.

RCA SERVICE COMPANY, INC.
A RADIO CORPORATION OF AMERICA SUBSIDIARY
CAMDEN 8, NEW JERSEY

(Monochrome)

TELEVISION STATION KSHO-TV

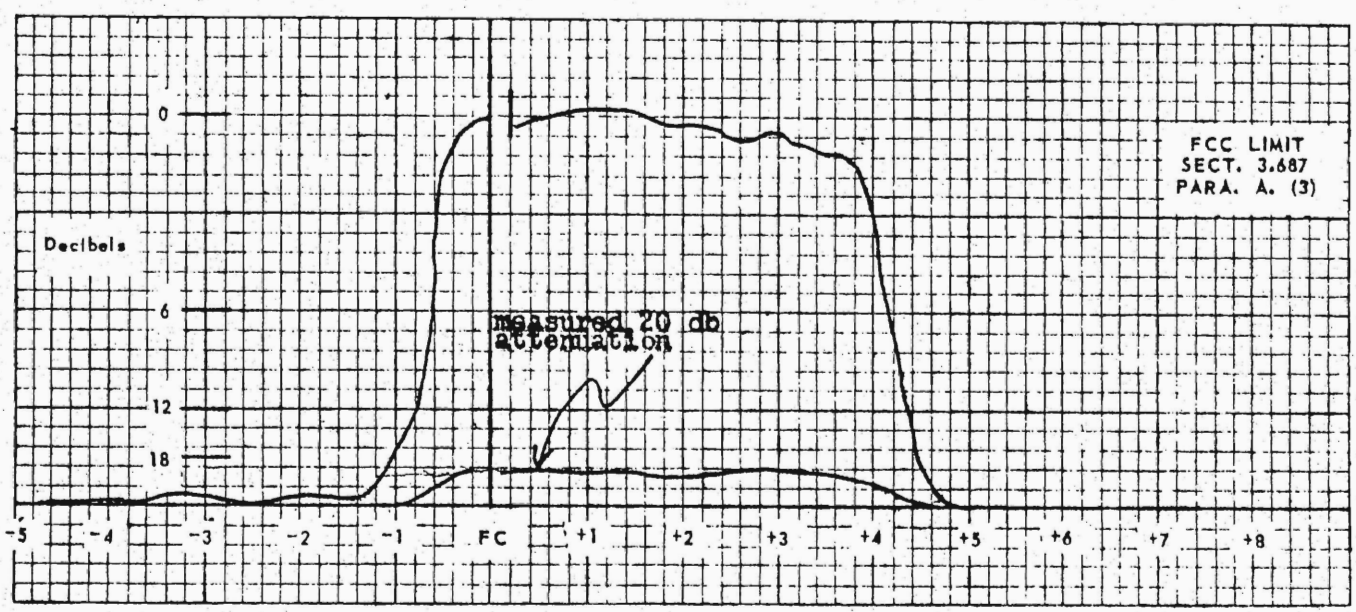
Exhibit No. 3

Date 10/21/57

9. Performance data. Visual Transmitter

(a) Attach as Exhibit No. 3 data showing the following:

2. Field Strength or voltage of lower sideband for modulating frequencies of 200 KC to 5 MC and of the upper sideband for modulating frequencies of 200 KC to 8 MC.



Method of Measurement: A video sweep generator with constant output from 10 KC to 8 MC (Part of RCA sideband analyzer) is used for modulation. With the transmitter AC coupled and the DC level set for mid-characteristic operation, input video level and rf drive are carefully adjusted to avoid compression. The demodulated voltage is measured across a dummy load of pure resistance. A tracing or photograph is submitted of the entire sideband response as demodulated by the RCA sideband analyzer.

Without disturbing other adjustments, a 20 db Microlab 51.5 ohm attenuating pad is placed in the circuit with the 6 db pad normally used. A tracing or double exposure photograph is made of the resultant sideband response. The base line and response are made coincidental with the original tracing or exposure. With reference to carrier plus 200 KC, a horizontal dotted line is extended from this point on the attenuated trace to intersect the full amplitude trace on both ends. This dotted line represents 20 db attenuation from carrier plus 200 KC.

RCA SERVICE COMPANY, INC.
A RADIO CORPORATION OF AMERICA SUBSIDIARY
CAMDEN 8, NEW JERSEY

TELEVISION
STATION KSHO-TV

Exhibit No. _____

Date Oct. 22, 1957

9. Performance Data. Visual Transmitter

(a) 2. Field strength or voltage of lower sideband for modulating frequencies of 200 KC to 5 MC and of the upper sideband for modulating frequencies of 200 KC to 8 MC.

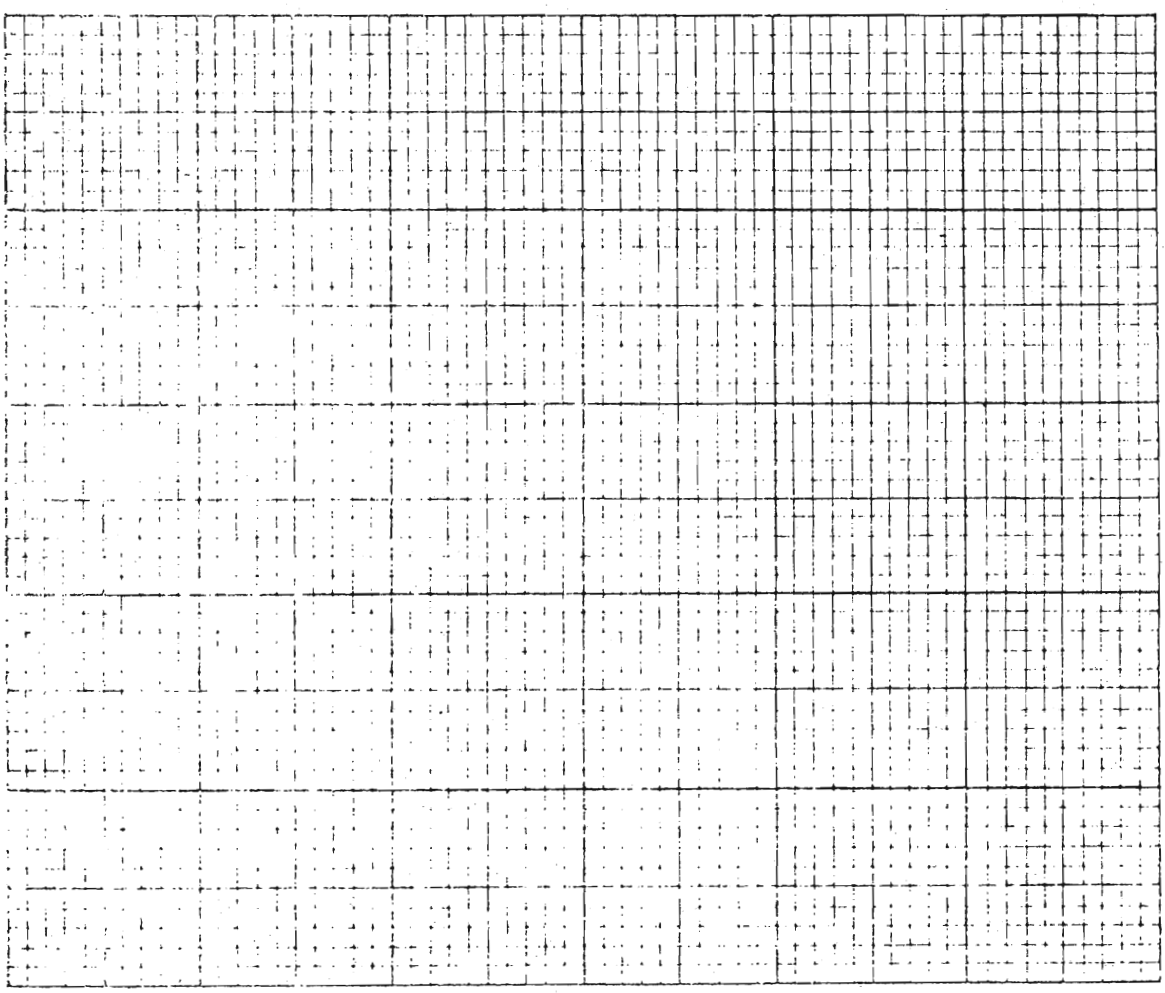
Reference FCC Rules and Regulations
Sub-part E, Section 3.687, Paragraph (a) 3, Foot note 28, the following data is submitted describing the antenna characteristics.

The antenna system described on Page 5 was measured and voltage standing wave ratio computed for integral megacycles within the assigned channel. Data and method of measurement are shown in Exhibits No. 4 and No. 5

Electrical isolation measurements were made and the data recorded and method of measurement is shown in Exhibit No. **Not applicable.**

Quadrature phasing of the antenna was measured and the data and method of measurement is shown in Exhibit No. Attached and Exhibit No. **Not applicable.**

MEASUREMENT – QUADRATURE PHASING



FREQUENCY IN MEGACYCLES

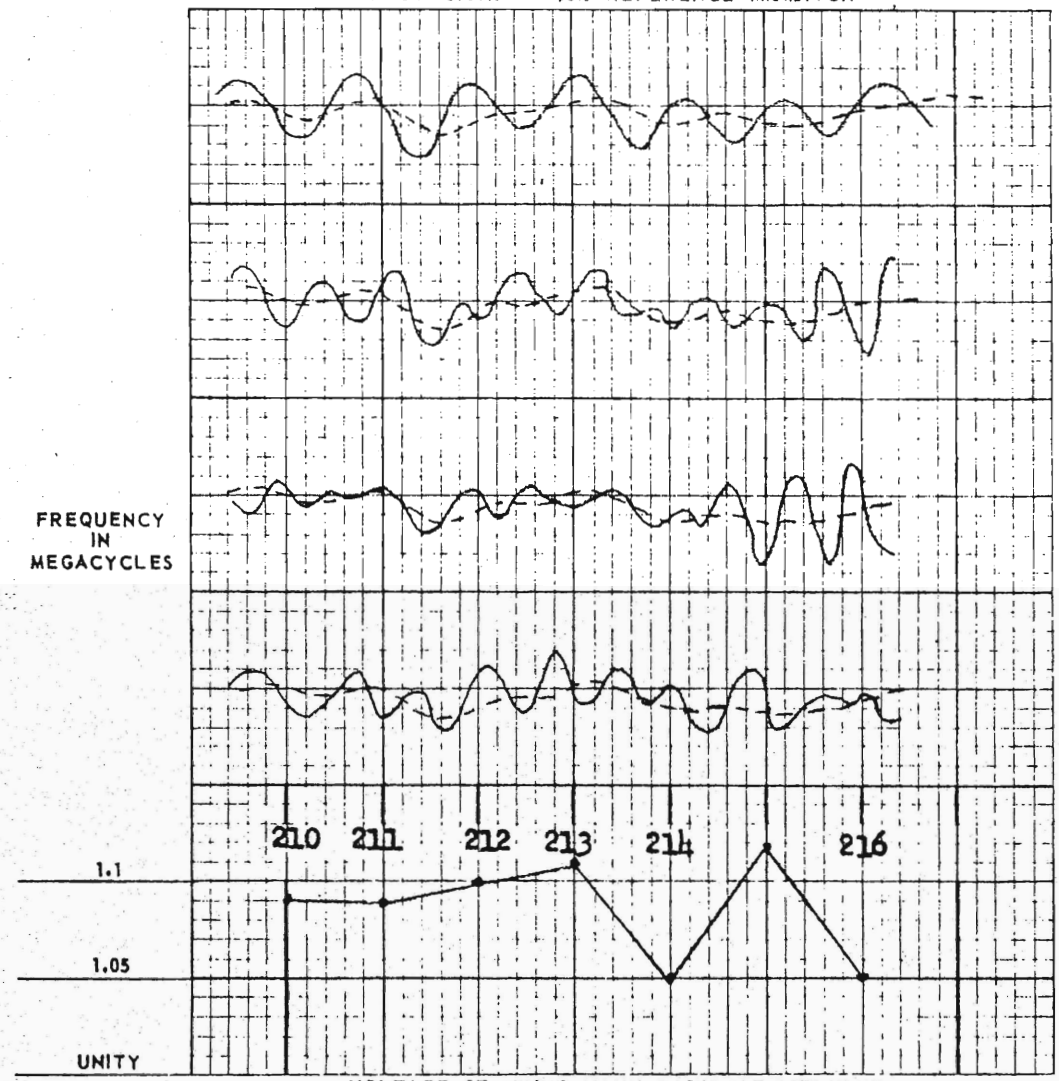
RCA SERVICE COMPANY, INC.
A RADIO CORPORATION OF AMERICA SUBSIDIARY
CAMDEN 8, NEW JERSEY

TELEVISION STATION KSHO-TV Exhibit No. 4

TF 6A-T ANTENNA SYSTEM CHARACTERISTICS.

Date Oct. 21, 1957

40 DIVISIONS = 100% REFERENCE MISMATCH



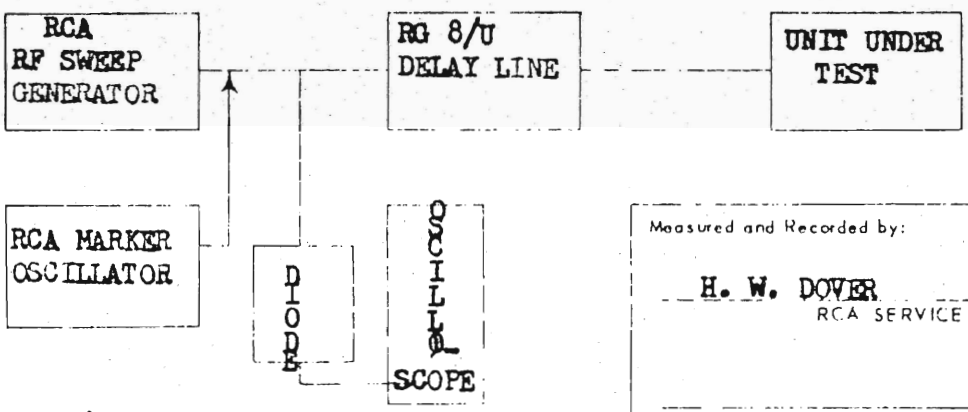
DOTTED LINE IS BIRD 51.5 OHM TERMALINE LOAD SUPERIMPOSED ON RCA SERVICE CO., 1.09 % REFERENCE MISMATCH # CAL. DATE

N-S BATWINGS & TRANS. LINE. WITH SUPERIMPOSED CHARACTERISTIC.

E-W BATWINGS & TRANS. LINE WITH SUPERIMPOSED CHARACTERISTIC.

DIPLEXER, VIDEO INPUT, TERMINATED IN TRANS. LINE AND ANTENNA

VOLTAGE STANDING WAVE RATIO AT DIPLEXER VIDEO INPUT COMPUTED FROM ABOVE TRACE



Measured and Recorded by:

H. W. DOVER
RCA SERVICE CO., INC.

Date: October 21, 1957

RCA SERVICE COMPANY, INC.
A RADIO CORPORATION OF AMERICA SUBSIDIARY
CAMDEN 8, NEW JERSEY

Date October 20, 1957

Exhibit No. 5

TELEVISION STATION KSHO-TV

RCA Service Company, Inc., standard procedure for Panoramic Sweep Measurements of VHF Antenna Systems.

(a) The method of measuring the voltage standing wave ratio of the antenna system described consists of feeding a signal from a sweep generator through a long transmission line (300 to 350 ft. of RG-8U), connected between antenna system and generator. The amplitude of the reflected voltage is measured when the load end of the long transmission line is short circuited, then compared with the amplitude when the antenna is the load.

(b) When a short circuit is placed at the load end of the RG-8U delay line a pattern will be produced which is adjusted to a convenient amplitude by the oscilloscope gain control. The RCA Service Company has standardized on four inches.

By removing the short circuit and using the antenna as a load, the pattern becomes as shown. Comparison of the short circuit pattern amplitude with the terminated amplitude can be computed in terms of percentage match or VSWR by the formulae, $\text{VSWR} = \frac{40 + X}{40 - X}$ or % match $= \frac{40 - X}{40 + X}$, X being the terminated amplitude.

Integral megacycles and channel limits are determined by use of a crystal calibrated frequency generator loosely coupled to the sweep generator.

Under less than laboratory controlled conditions, inaccuracies of this method require the use of a 90% or 1.1 VSWR load as a comparison to be included with panoramic sweep measurements.

This referenced load is carefully checked on a slotted line in the RCA Service Company laboratories and recalibrated at stated intervals. The last calibration and date thereof is attached to the load and recorded in the data presented.

RCA SERVICE COMPANY, INC.
A RADIO CORPORATION OF AMERICA SUBSIDIARY
CAMDEN 8, NEW JERSEY

TELEVISION STATION KSHO-TV

Exhibit No. 6

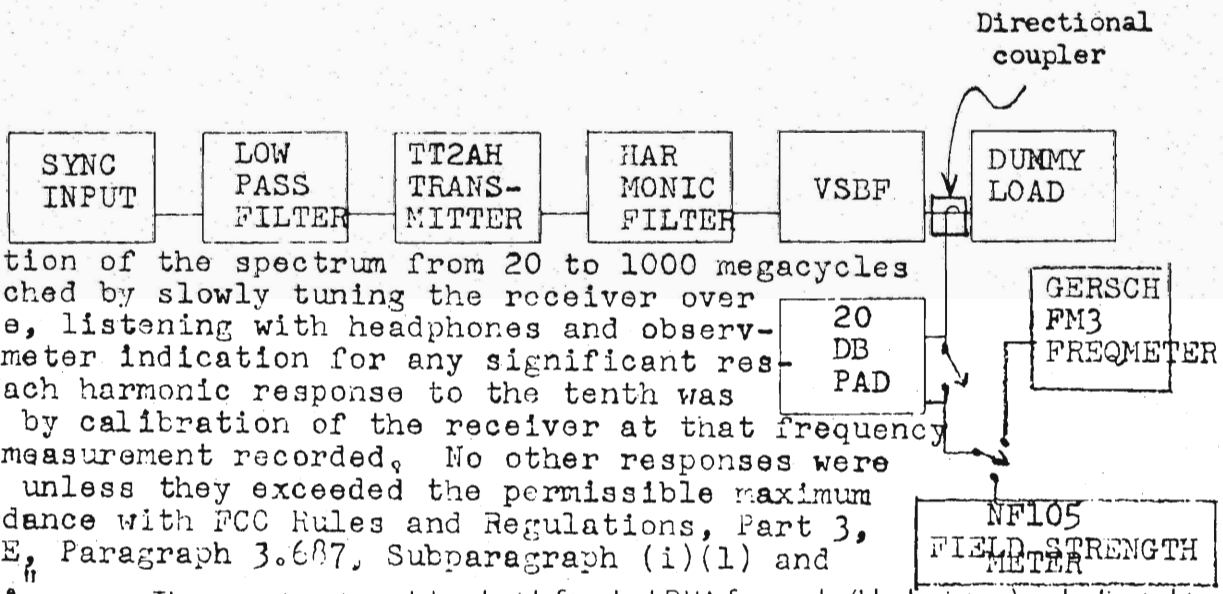
Date 11-17-57

9. Performance data. Visual Transmitter

(a) Attach as Exhibit No. 6 data showing the following:

3. Attenuation with respect to visual transmitter peak power of each r. f. harmonic up to and including the tenth, as measured at the transmitter output terminals (including harmonic filters), except harmonics of Channels 2-13 above 1000 MC and harmonics of Channels 14-83 above 3000 MC.

Picture carrier.	Freq. MC 211.24	Voltage 120.5 DB above 1uV		Attenuation db.
2nd Harmonic	Freq. MC 422.48	Voltage 39.0 " " "		81.5
3rd Harmonic	Freq. MC 633.72	Voltage 29.3 " " "		91.2
4th Harmonic	Freq. MC 844.96	Voltage 13.8 " " "		106.7
5th Harmonic	Freq. MC	Voltage		
6th Harmonic	Freq. MC	Voltage		
7th Harmonic	Freq. MC	Voltage		
8th Harmonic	Freq. MC	Voltage		
9th Harmonic	Freq. MC	Voltage		
10th Harmonic	Freq. MC	Voltage		



"The portion of the spectrum from 20 to 1000 megacycles was searched by slowly tuning the receiver over its range, listening with headphones and observing the meter indication for any significant response.*Each harmonic response to the tenth was measured by calibration of the receiver at that frequency and the measurement recorded. No other responses were recorded unless they exceeded the permissible maximum in accordance with FCC Rules and Regulations, Part 3, Subpart E, Paragraph 3.687, Subparagraph (i)(1) and (a) (3)."

Method of Measurement: The transmitter is modulated with Standard RMA Sync only (black picture) and adjusted to radiate 100% of licensed peak power. With the search receiver adjusted to read peak voltage it is calibrated to read zero level at carrier frequency. Each harmonic to the tenth except beyond 1000 MC is measured in db below reference level.

RCA SERVICE COMPANY, INC
A RADIO CORPORATION OF AMERICA SUBSIDIARY
CAMDEN, NEW JERSEY

Exhibit No. 7

Date: 11/17/57

TELEVISION STATION KSHO-TV

9. Performance data. Visual Transmitter.

(a) Attach as Exhibit No. 7 data showing the following:

2. Field Strength or voltage of lower sideband for modulating frequencies of 200 KC to 5 MC and of the upper sideband for modulating frequencies of 200 KC to 8 MC

Equipment setup. See Page 12 Exhibit 6

Method: With test pattern modulation as described in Exhibits 8 and 9, the search receiver was calibrated to read Zero level at visual carrier frequency. The receiver was then slowly tuned to cover the regions from F_L - 3 MC to F_L-6MC and from F_H + 3 MC to F_H + 6 MC, observing the meter indication for any significant response.

Attenuation measurements were made and are recorded below for F_L - 3MC and F_H + 3MC. No other responses were recorded unless they exceeded the permissible maximum in accordance with FCC Rules and Regulations, Part 3, Subpart E, Paragraph 3.687, Subparagraph (i) (1).

	Frequency in Megacycles	Meter Reading (db above 1 uV)	Attenuation in DB
Picture Carrier	211.24	119.5	0
F_L - 3 MC	207	48.2	71.3
F_H + 3 MC	219	36.8	82.7

Note: F_L = Lower Channel Edge 210 MC
F_H = Upper Channel Edge 216 MC

Measured and Recorded by:

H. W. Dover
Date: 11/17/57

RCA SERVICE COMPANY, INC.
A RADIO CORPORATION OF AMERICA SUBSIDIARY
CAMDEN 8, NEW JERSEY

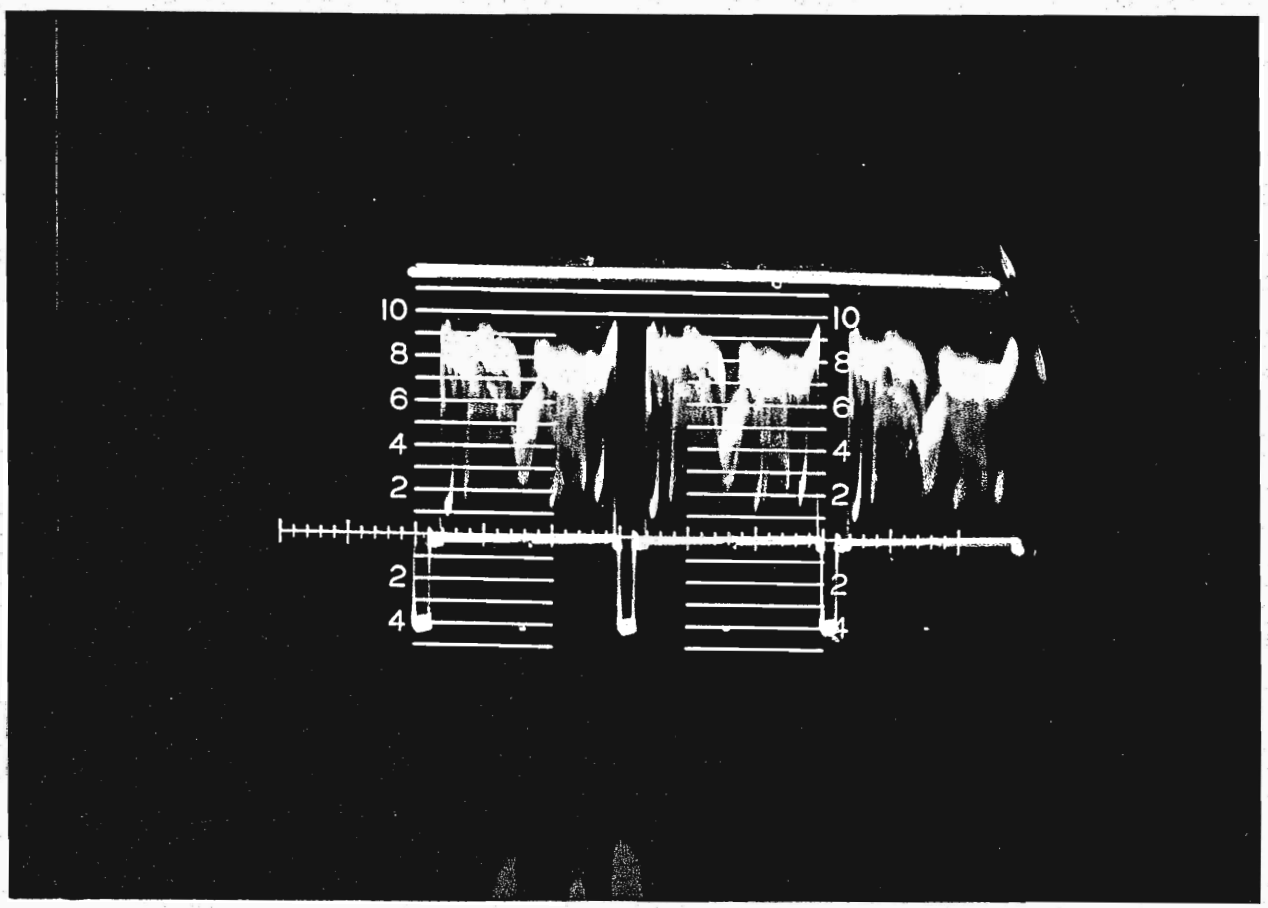
TELEVISION
STATION KSHO-TV

Exhibit No. 8

Date Oct. 21, 1957

9. Performance Data. Visual Transmitter

(b) Attach as Exhibit No. 8 data demonstrating that the wave-form of the transmitted signal conforms to that specified by the standards. Until the form of these measurements may be specified by the Commission, the character of the data is left to the discretion of the applicant.



This is exhibit No. 8. It is a photograph of the Master Monitor CRO presenting the demodulated waveform at horizontal frame frequency. The waveform is that for the Test Pattern photographed as Exhibit No. 9. Blanking level is 75% and reference white level is 12.5% of peak of sync power with ± 2.5% tolerance. Reference black level is 7.5% of the amplitude from blanking to reference white levels with a ± 2.5% tolerance.

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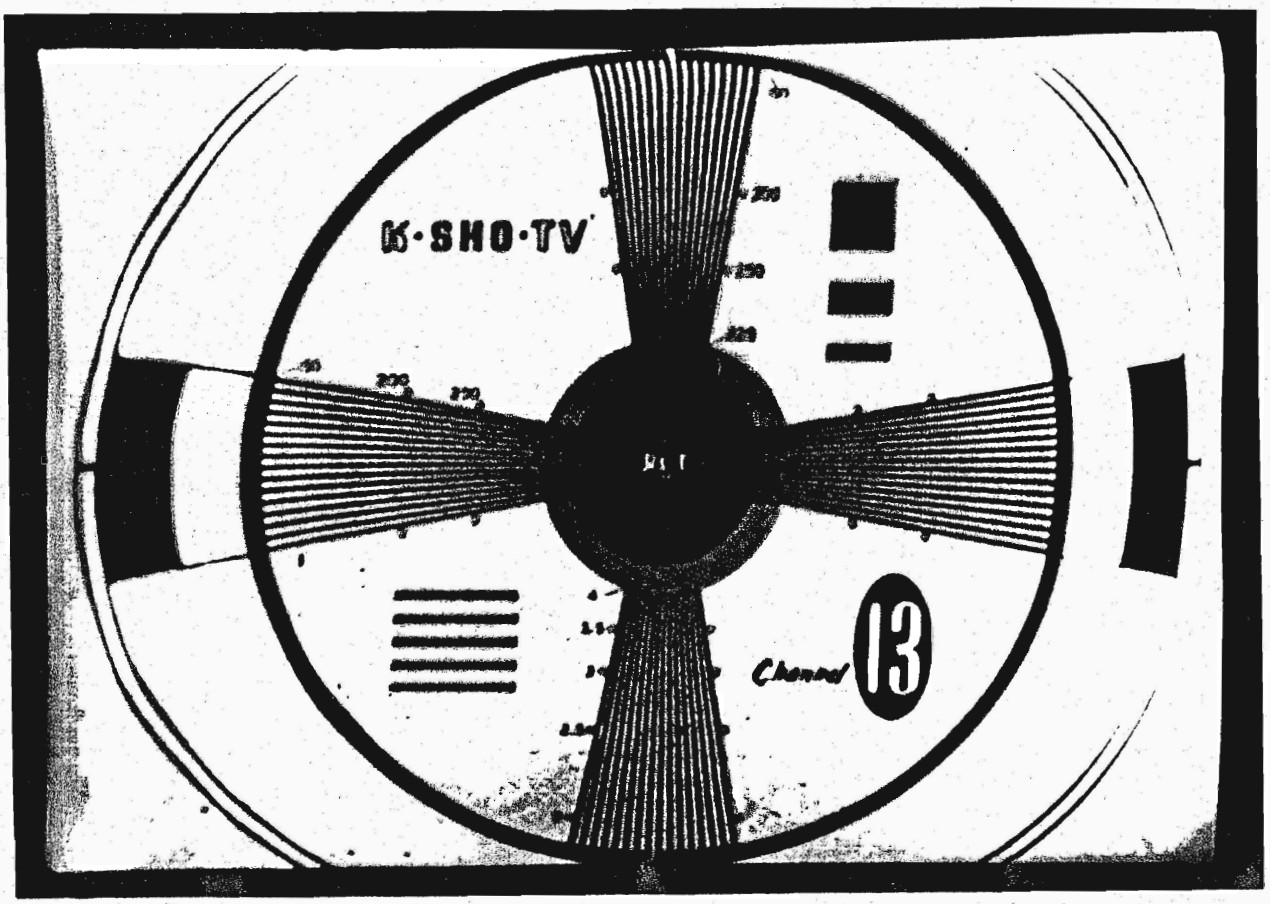
TELEVISION
STATION ~~KSHO-TV~~

Exhibit No. 9

Date Oct. 21, 1957

9. Performance Data – Visual Transmitter.

(c) Attach as Exhibit No. 9 a photograph of a test pattern taken from a receiver or monitor connected to the transmitter output.



This is a photograph of the test pattern as shown on the station monitor described in paragraph 7A of Section II-C.

9. Performance Data. Visual Transmitter

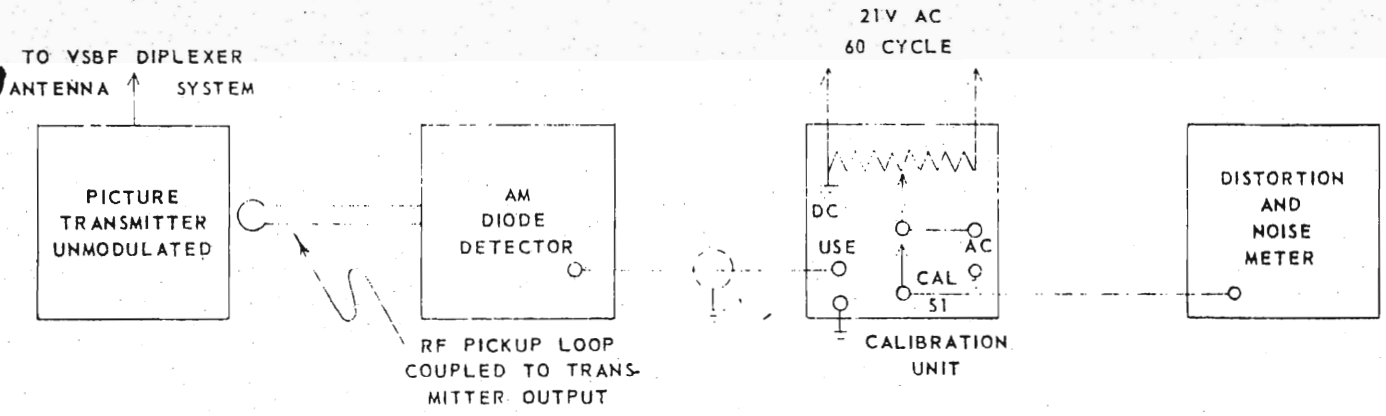
Additional data submitted pending revision of FCC Form 302.

Reference: FCC Rules and Regulations Sect. 3.682, Par. (a) 16.

Exhibits: 1. Photograph of oscilloscope vertical presentation, (2 fields) as demodulated by vestigial side band demodulator after VSBF while transmitting test pattern. Exhibit Nos.

2. Block diagram of measuring equipment arrangement.

3. Description of method of measurement.



Using the method described below, the AM noise level was read to be -42 db.

Method: The transmitter was adjusted for unmodulated, AC coupled, mid-characteristic operation in order to establish a hypothetical AC axis for amplitude modulation.

In order to calibrate the noise meter a reference point was established to represent this level.

A. Calibration to establish a reference point equivalent to 100% amplitude modulation.

1. Read EDC the rectified diode voltage with switch S-1 of Cal. Unit in "USE" position.

2. Adjust the noise meter for zero db indication when:
   (a) S-1 of Cal. Unit is in "CAL" position.
   (b) The calibrating pot. is adjusted for an AC voltage (rms) of EDC. x 0.707.

B. Measurement
Read the AM noise level on the noise meter with S-1 of Cal. Unit in the "USE" position.

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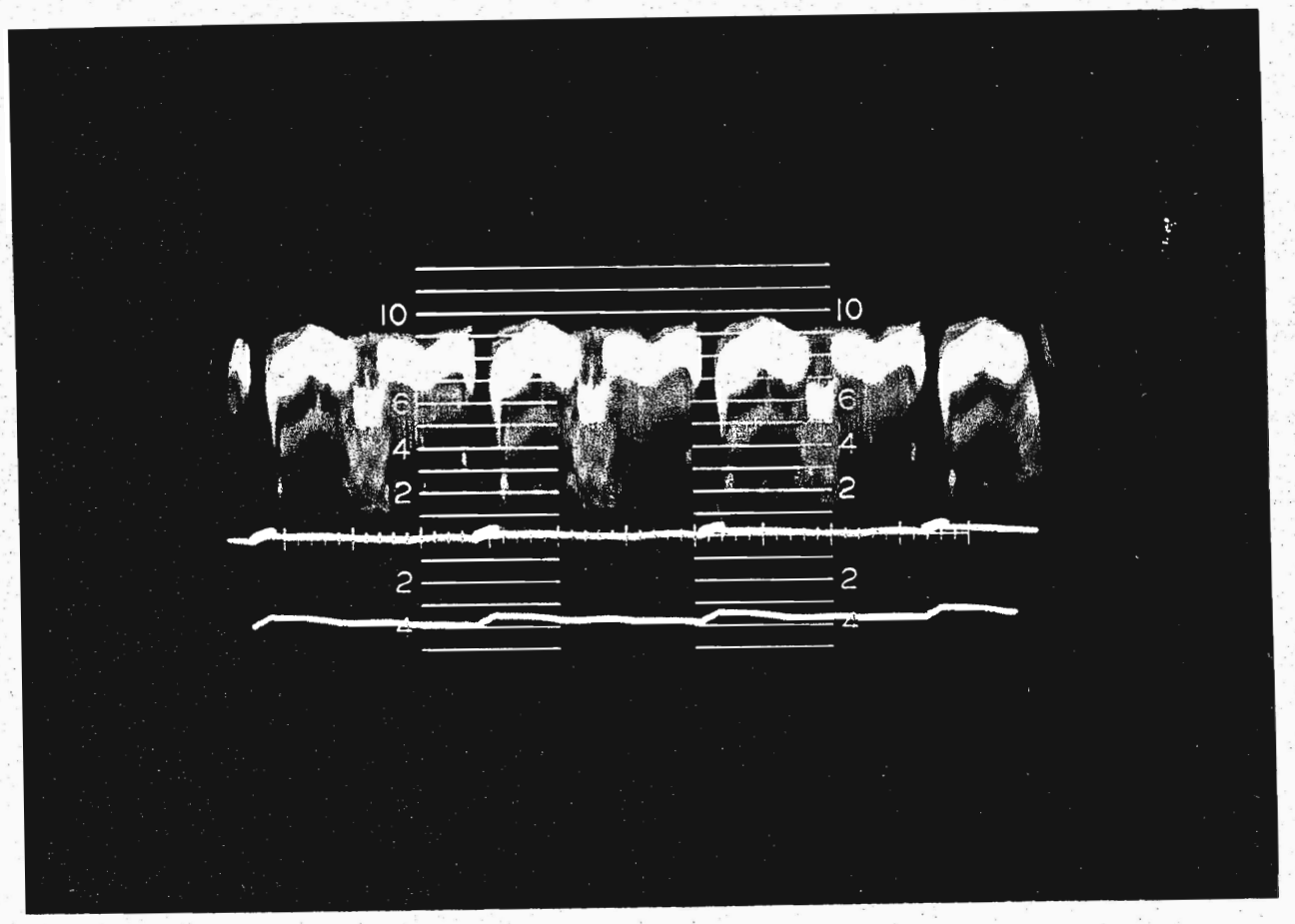
Exhibit No. 11

Date Oct. 21, 1957

TELEVISION STATION KSHO-TV



RCA MI 19051 Diode

Photograph of oscilloscope vertical presentation, (2 fields) as demodulated by ~~vestigial sideband demodulator~~ after VSBF while transmitting test pattern.

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TELEVISION STATION KSHO-TV

Date Oct. 21, 1957

9. Performance Data. Visual Transmitter

(a) Attach as Exhibit No. Attached Data showing the following:

Additional data submitted pending revision of FCC Form 302.

I Has your equipment been modified to meet the performance requirements, for color, of Section 3.687? No.

II If not, does your station accept color programs from outside sources?

No

III If response to II is "Yes", state whether provision has been made to attenuate the chrominance portion of such color programs, describing the method employed.

IV If your equipment has been modified for color transmission, include data or exhibits which indicate compliance with the performance requirements of the rules relating to visual/aural carrier frequency tolerance, sub-carrier frequency tolerance if locally generated and transfer characteristic.

RCA SERVICE COMPANY, INC.
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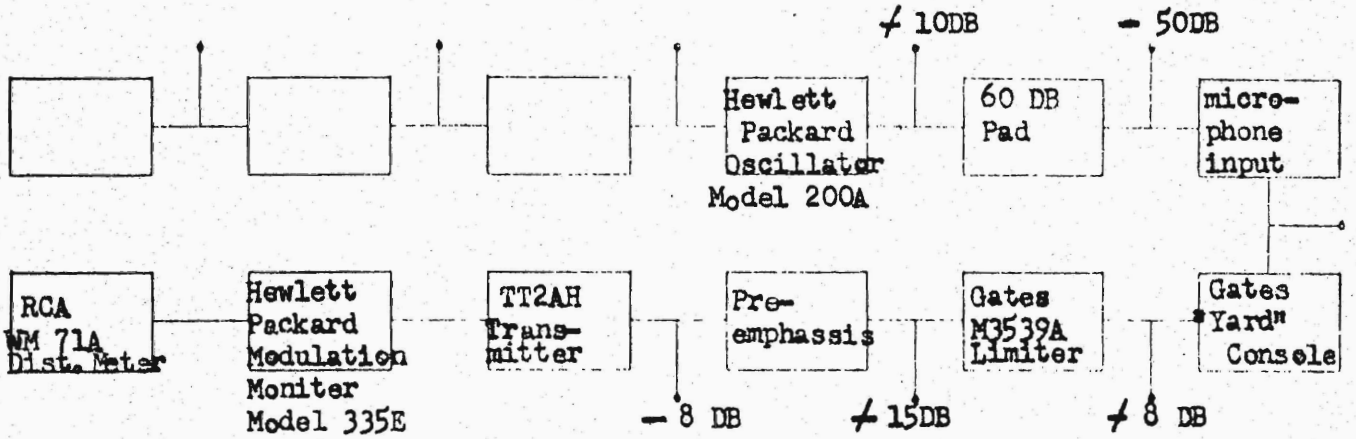
Exhibit No. 12

Date Oct. 24, 1957

TELEVISION STATION KSHO-TV

10. Performance Data-Aural Transmitter

Attach as Exhibit No. 12-17 data, diagrams, and appropriate graphs together with descriptions of measurement procedures and instruments with regard to the following: (All measurements shall be made with the equipment adjusted for normal program operation and shall include all circuits between the main studio microphone terminals and the antenna output, including telephone lines, pre-emphasis circuits and any equalizers employed except for microphones, and without compression if a compression amplifier is installed.)



(a) The audio frequency response from 50 to 15,000 cycles for 25, 50 and 100% modulation was measured using the equipment arrangement shown above. A standard 75 microsecond pre-emphasis network was included in the audio system and the limiting Amplifier (if used) operated with limiting off. No de-emphasis was used.

(b) Audio Frequency Harmonic Distortion was measured, using the equipment arrangement shown above for 25, 50 and 100% modulation. These measurements were made using standard 75 microsecond de emphasis in the measuring equipment. All equipment was adjusted for normal program level and the level at microphone input was -50db.

(c) The Output Noise Level (FM) was measured using the equipment arrangement shown above. The transmitter was modulated 100% with 400 cycle input with levels as indicated. The distortion and noise meter was then calibrated 100% or 0 db. The input was removed and microphone input jack shorted. The resultant noise in the range of 50 to 15,000 cycles was then measured and recorded. Standard de-emphasis was used in the measuring equipment.

EXHIBIT NO. 13

RCA SERVICE COMPANY, INC.
A RADIO CORPORATION OF AMERICA SUBSIDIARY
CAMDEN 8, NEW JERSEY

AUDIO PERFORMANCE
R-F POWER OUTPUT
for
F-M Broadcast or T-V Sound

STATION KSHO-TV Date 10/24/57

Engineer H. W. Dover

Transmitter Type TT2AH

CARRIER NOISE

Power 1 Kw., FM level 57.5 DB below 100% Frequency Modulation, AM level 57.5 DB below 100% Amplitude Modulation, 400 cycle ref.

A-F INPUT for 100% Modulation + 15 dbm, measured at input to premphassis network, 400 cycle ref.

DISTORTION IN PERCENT (see curve sheet # _____)

CPS	50	100	200	400	750	1000	2000	3000	5000	7500	10,000	15,000	
100% Mod.	.80	.38	.38	.45	.60	.71	1.0	1.25	1.55	1.85	1.95	2.15	
50% Mod.	.68	.50	.52	.42	.56	.58	.74	.95	1.25				
25% Mod.	.78	.72	.70	.56	.75	.75	.95	1.10	1.5				

FIDELITY (see curve sheets # _____, _____, _____)

CPS	30	50	70	100	200	400	750	1000	2000	3000	4000	5000	6000	7000	8000	9000	10,000	12,000	14,000	15,000
A.F. In 100% M.	9.5	9.5	9.7	9.8	9.5	9.2	8.5	8.0	5.9	3.6	1.9	0.2	-1	-2.2	-3.1	-3.8	-4.2	-4.8	-5.1	-5.1
Shifted to 1000 Cycle Reference & Inverted		-1.5	-1.7	-1.7	-1.5	-1.2	-.5	0	2.1	4.4	6.1	7.8	9	10.2	11.1	11.8	12.2	12.8	13.1	13.1
Std. Pre-Emp. Curve (Max.)	0	0	0	0	0.05	0.2	0.5	0.9	2.8	4.8	6.6	8.2	9.6	10.8	11.8	12.8	13.7	15.2	16.5	17.1
Min. Limit		-4	-3.5	-3.0	-2.95	-2.8	-2.5	-2.1	-0.2	1.8	3.6	5.2	6.6	7.8	8.6	9.3	9.9	10.8	11.7	12.1
AF in 50% M.		9.7	9.5	9.7	9.3	9.0	8.5	7.8	5.8	3.5	1.8	0.2	-1.	-1.8	-2.7	-3.3	-3.8	-4.5	-4.8	-4.8
shift, and Inv.		-1.9	-1.7	-1.9	-1.5	-1.2	-.7	0	2.	4.3	6.0	7.6	8.8	9.6	10.5	11.1	11.6	12.3	12.6	12.6
AF in 25% M.		9.7	9.6	9.5	9.5	9.2	8.6	8.0	5.6	3.5	2.0	.2	-1.1	-2.	-2.4	-3.2	-3.6	-4.4	-4.8	-4.9
shift & Inv.		-1.7	-1.6	-1.5	-1.5	-1.2	-.6	0	2.4	4.5	6.0	7.8	9.1	10.0	10.4	11.2	11.6	12.4	12.8	12.9

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CAMDEN 8, NEW JERSEY

Date October 24, 1957

Exhibit No. 14

Television Station KSHO-TV

Distortion Limit FCC Sect. 3.687
Par. 10 (b) 3

Audio Frequency Distortion of Sound Transmitter
Microphone Input to Transmitter Output

Measured Distortion

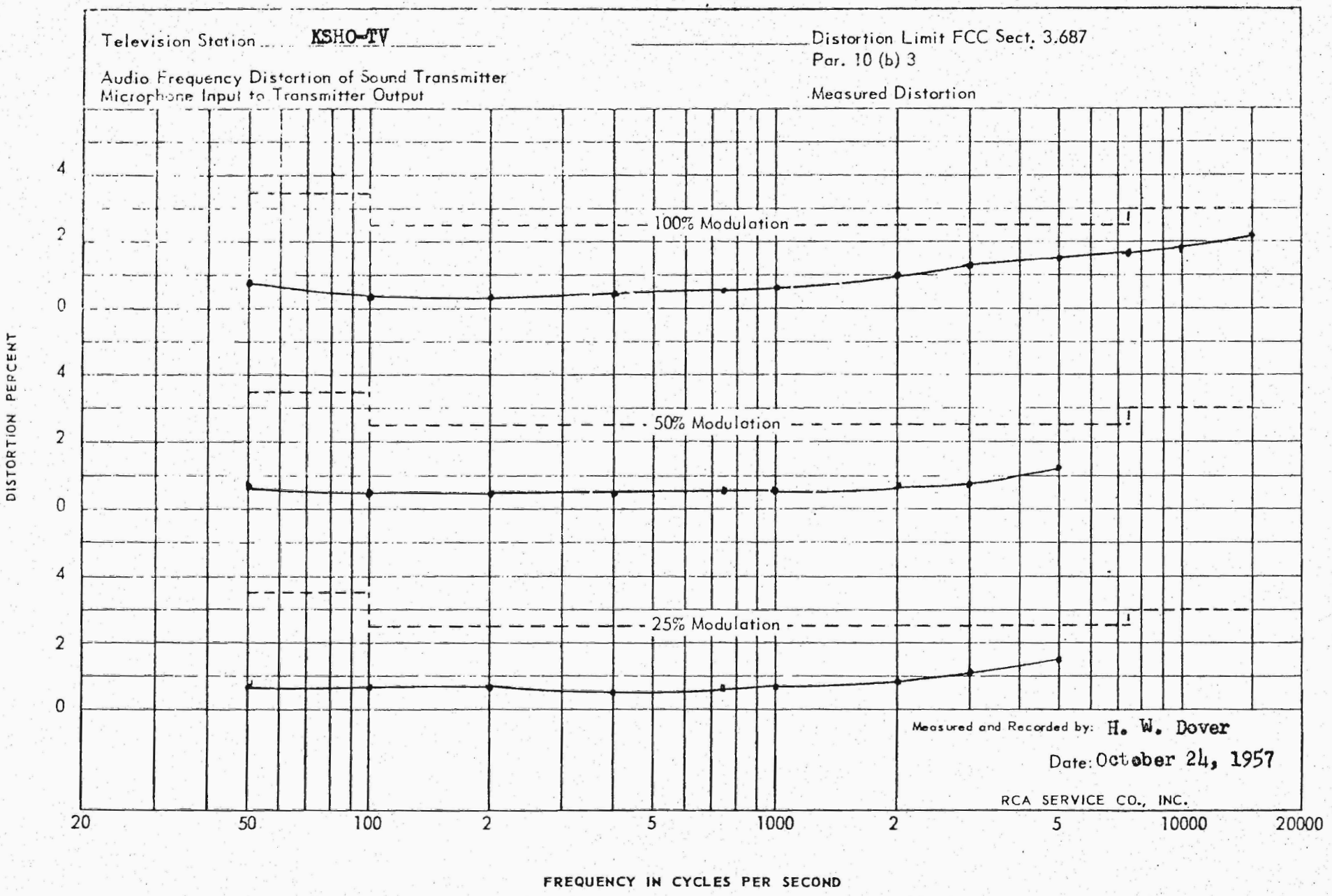

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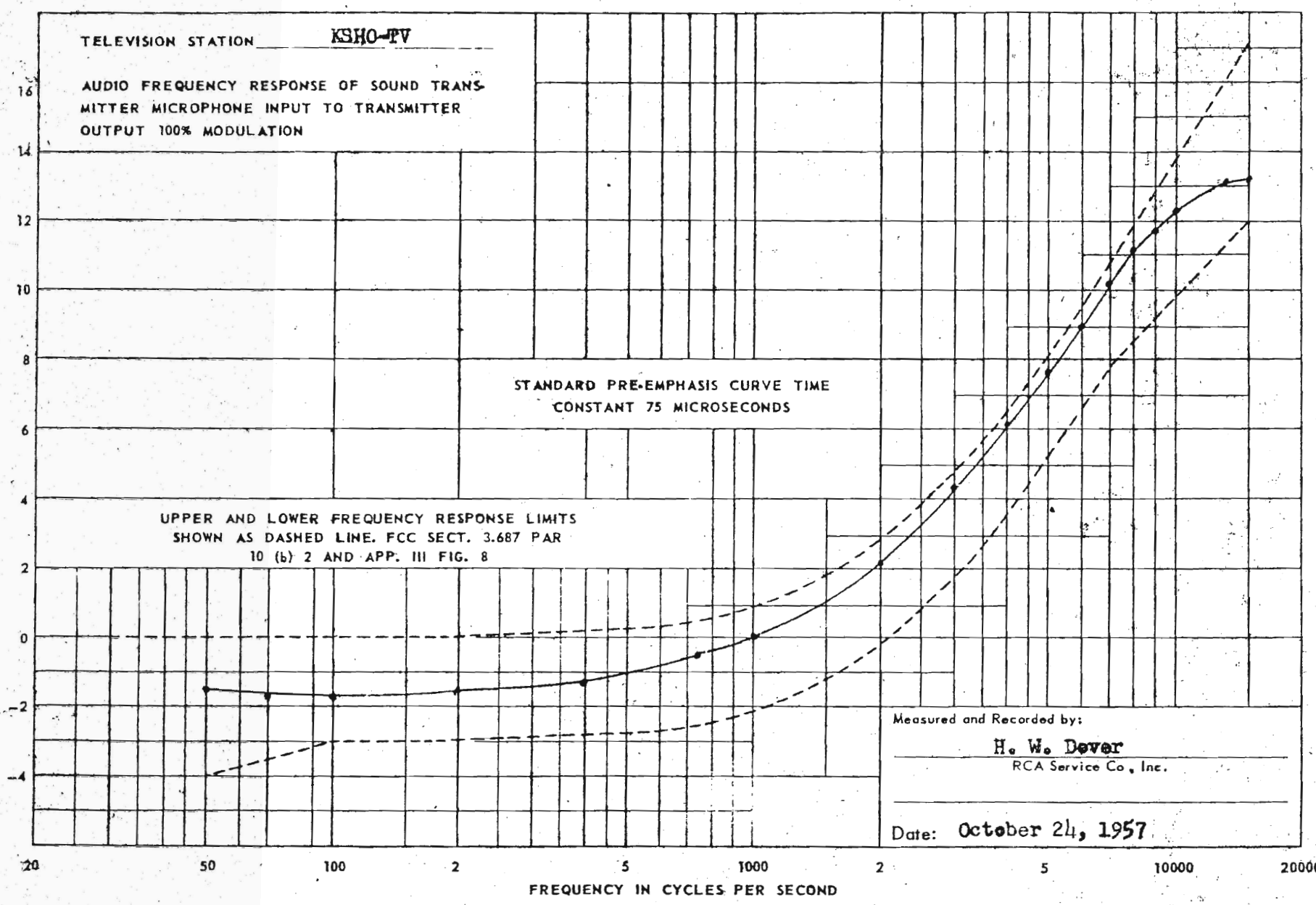
Exhibit No. 15

Date Oct. 24, 1957



RCA SERVICE COMPANY, INC.
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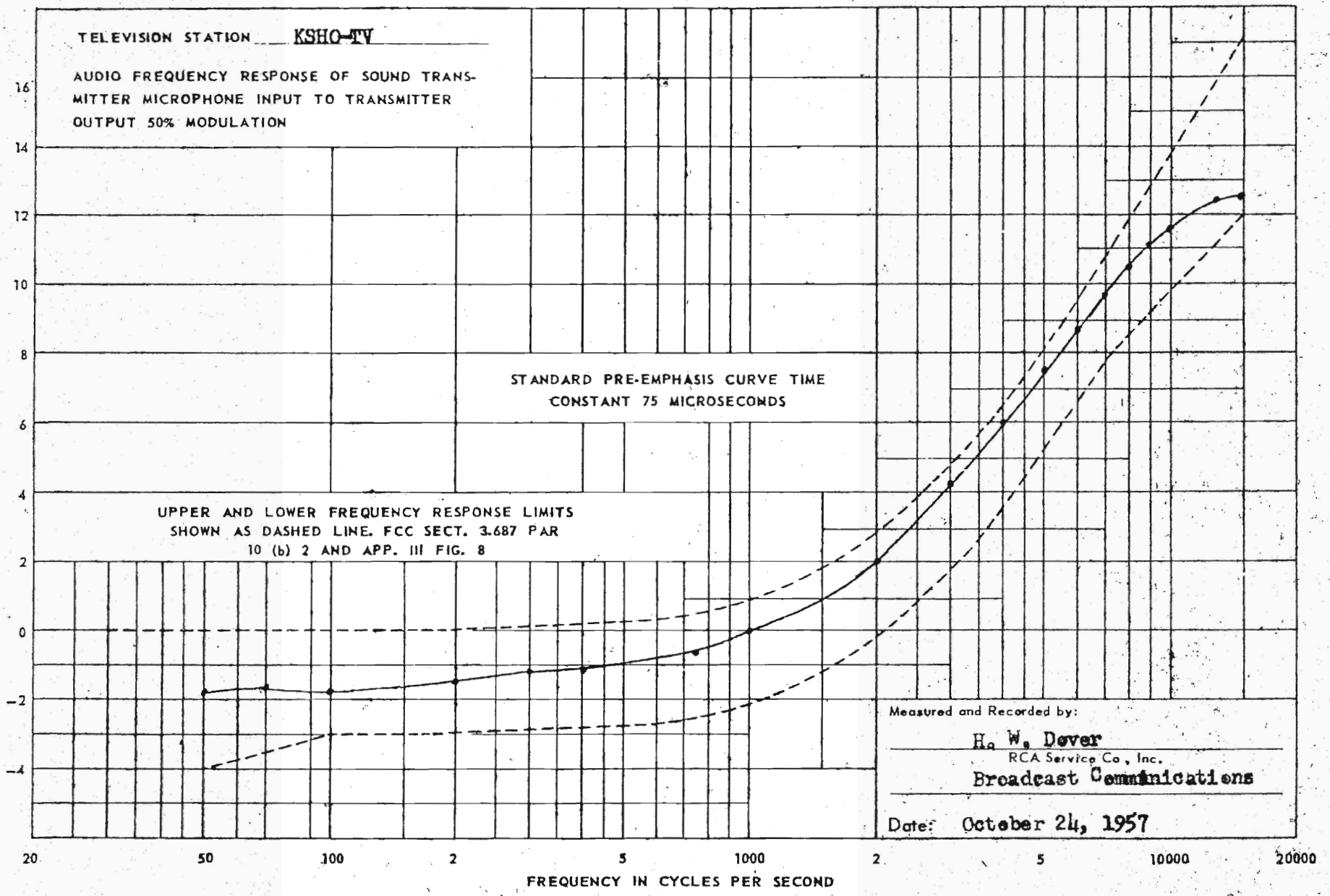
CAMDEN 8, NEW JERSEY

Exhibit No. 16

Date Oct. 24, 1957

TELEVISION STATION KSHO-TV

AUDIO FREQUENCY RESPONSE OF SOUND TRANSMITTER MICROPHONE INPUT TO TRANSMITTER OUTPUT 50% MODULATION



Measured and Recorded by:

H. W. Dever

RCA Service Co., Inc.

Broadcast Communications

Date: October 24, 1957

RCA SERVICE COMPANY, INC.
A RADIO CORPORATION OF AMERICA SUBSIDIARY
CAMDEN 8, NEW JERSEY

Exhibit No. 17

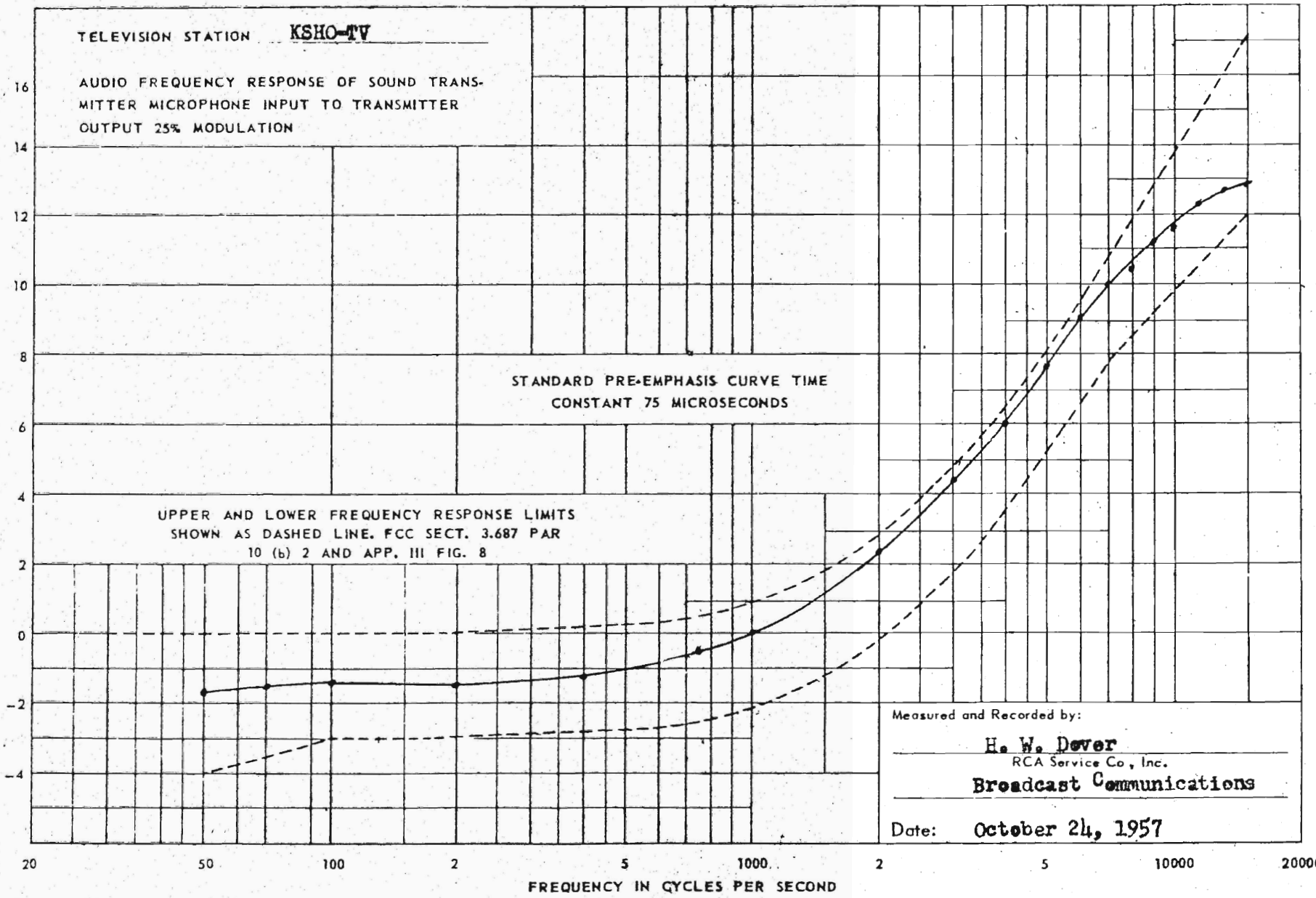
Date Oct. 24, 1957

TELEVISION STATION KSHO-TV

AUDIO FREQUENCY RESPONSE OF SOUND TRANSMITTER MICROPHONE INPUT TO TRANSMITTER OUTPUT 25% MODULATION

STANDARD PRE-EMPHASIS CURVE TIME CONSTANT 75 MICROSECONDS

UPPER AND LOWER FREQUENCY RESPONSE LIMITS SHOWN AS DASHED LINE. FCC SECT. 3.687 PAR 10 (b) 2 AND APP. III FIG. 8



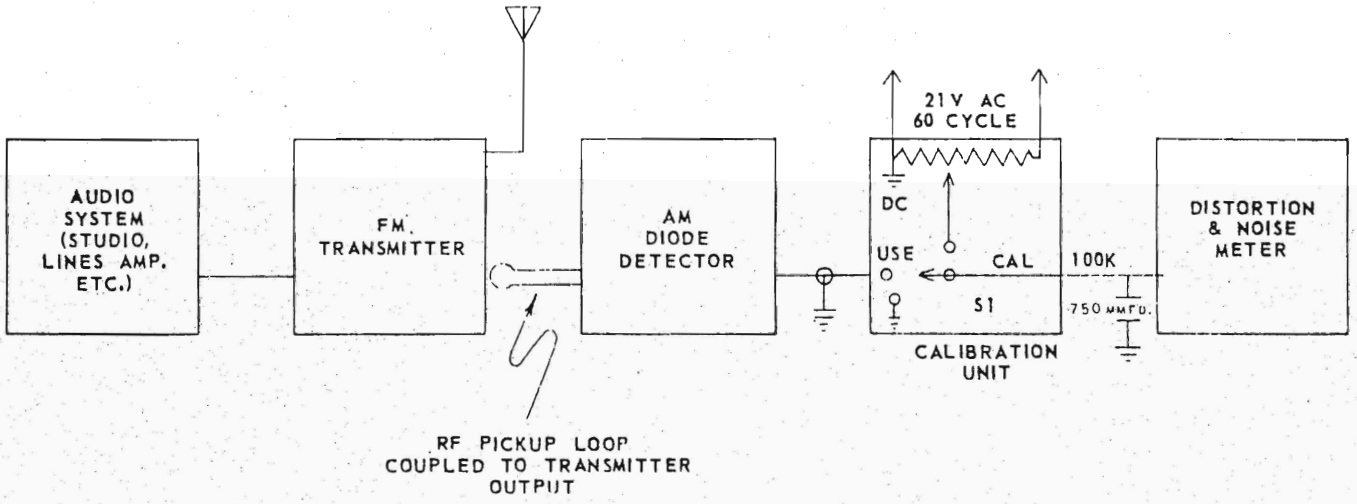
Measured and Recorded by:

H. W. Dever
RCA Service Co., Inc.
Broadcast Communications

Date: October 24, 1957

10. Performance Data – Aural Transmitter.

(d) Output noise level (amplitude modulation) was measured using the equipment arrangement below and found to be 57.5 db below the level representing 100% amplitude modulation. The equipment employed standard 75 microsecond de-emphasis.



I. Measuring Equipment Arrangement
(above)

II. Method

A. Calibration to establish a reference point equivalent to 100% amplitude modulation.

1. Read EDC. the rectified diode voltage with switch S-1 of Cal. Unit in "USE" position.
2. Adjust the noise meter for zero db. indication when:
   a. S-1 of Cal. Unit is in "CAL" position.
   b. The calibrating pot. is adjusted for an AC voltage (rms) of EDC. x 0.707.

B. Measurement

Read the AM noise level on the noise meter with S-1 of Cal, Unit in the "USE" position.

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CAMDEN 8, NEW JERSEY

TELEVISION STATION KSHO-TV

Exhibit No. 19

Date

10. Performance Data – Aural Transmitter

(d) Attach as Exhibit No. 19 data showing the following:

3. Attenuation with respect to Visual transmitter peak power of each r.f. harmonic up to and including the tenth, as measured at the transmitter output terminals (including harmonic filters) except harmonics of Channels 2 – 13 above 1000 Mc. and harmonics of Channels 14 -- 83 above 3000 Mc.

Picture carrier.	Freq. MC	211.24	Voltage	118.7 DB above 1 uV	Attenuation db
2nd Harmonic.	Freq. MC	431.48	Voltage	36.4 " " " "	82.3
3rd Harmonic	Freq. MC	647.22	Voltage	10.1 " " " "	108.6
4th Harmonic	Freq. MC	862.96	Voltage	19.5 " " " "	99.2
5th Harmonic	Freq. MC		Voltage		
6th Harmonic	Freq. MC		Voltage		
7th Harmonic	Freq. MC		Voltage		
8th Harmonic	Freq. MC		Voltage		
9th Harmonic	Freq. MC		Voltage		
10th Harmonic	Freq. MC		Voltage		

Method of Measurement. The measurement receiver calibration was kept the same as in Par. 9 (a) 3; that is, referenced to Visual Transmitter peak power at carrier. With the search receiver adjusted to read peak power each aural carrier harmonic to the tenth excepting beyond 1000 MC. was measured in db below reference level.

"The portion of the spectrum from 20 to 1000 megacycles was searched by slowly tuning the receiver over its range, listening with headphones and observing the meter indication for any significant response. *Each harmonic response to the tenth was measured by calibration of the receiver at that frequency and the measurement recorded. No other responses were recorded unless they exceeded the permissible maximum in accordance with FCC Rules and Regulations, Part 3, Subpart E, Paragraph 3.687, Subparagraph (i) (1) and (a) (3)."

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CAMDEN 8, NEW JERSEY

Exhibit No. 20

TELEVISION STATION KSHO-TV

Date 11/17/57

TEST EQUIPMENT USED IN PROOF OF PERFORMANCE

EQUIPMENT TYPE	SERIAL NUMBER
RCA WA21A Video Sweep Generator	—
RCA (BW5A) (BWU5A) Sideband Analyzer	243
RCA MI-19051 Diode Demodulator	No Serial
RCA BW7A Field Intensity Meter	—
Empire Devices Noise and Field Intensity Meter Model NF-105	118
Gertsch FM-3 Frequency Meter	743
RCA WR59C RF Sweep Generator	TVSG 33
RCA WR39C RF Signal Generator	TVMG 32
RCA Service Company, Inc. RF Diode	D-2
RCA WO56A Oscilloscope	S-20
General Radio Type 874-LA Line Stretcher	—
RCA MI-34017 Linearity Checker	—
RCA MI-34016 Color Signal Analyzer	—
RCA Service Company, Inc. AM Noise Diode and Calibrator	No Serial
Hewlett Packard Model 805-A Slotted Line	—
Hewlett Packard Model 415-A VSWR Indicator	—
Hewlett Packard Model 306-A or B Low Pass Filter	—
General Radio 1021AU Signal Generator	—
General Radio Model 720 Frequency Meter	—
RCA Service Company Transition Taper 7/8" to 3 1/8"	—
RCA Service Company 90° Reference Match	6
WI71A Noise & Distortion Meter	231
Hewlett Packard Audio Oscillator Model 200A	