

WELCH & MORGAN

ATTORNEYS AT LAW

300 FARRAGUT BUILDING
900 SEVENTEENTH STREET, N.W.
WASHINGTON, D. C. 20006

AREA CODE 202
296-5151

CABLE ADDRESS
"WASHLAW"

VINCENT B. WELCH
EDWARD P. MORGAN
ROBERT N. GREEN
FORBES W. BLAIR
EDWARD J. STEGEMANN
EDWARD S. O'NEILL
A. ROBERT CHERIN
PIERRE E. MAILLOUX
JOHN H. MACKES
JAMES C. DAGGITT
MARVIN S. ROMANOFF

December 12, 1966

Mr. Ben F. Waple, Secretary
Federal Communications Commission
Washington, D. C. 20554

Dear Mr. Waple:

Enclosed herewith, on behalf of Las Vegas Television, Inc., are three (3) copies of an application for license to change existing station facilities in connection with File No. BPCT-3785. Also enclosed is a check in the amount of \$30.00 to cover filing fees.

Should any further information be desired in connection with this matter, please communicate with this office.

Very truly yours,

Robert N. Green

Enclosures (4)



COPY TO ENGINEERS

VINCENT B. WELCH
EDWARD P. MORGAN
EDWARD J. STEGEMANN
A. ROBERT CHERIN
PIERRE E. MAILLOUX
JOHN H. MACKES
GERALD S. ROURKE
WALTER H. SWEENEY
THOMAS M. P. CHRISTENSEN
JOSEPH M. MORRISSEY
RAYMOND J. SHELESKY

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WASHINGTON, D. C. 20006

AREA CODE 202
296-5151

CHARLES A. MCNELIS
OF COUNSEL

CABLE ADDRESS
"WASHLAW"

RECEIVED

JUL 1 1970

June 29, 1970

TV APPLICATIONS BRANCH
(ENGINEERING)

Mr. Ben F. Waple, Secretary
Federal Communications Commission
Washington, D.C. 20554

Re: Docket No. 17253

Dear Mr. Waple:

Transmitted herewith, on behalf of Hughes Tool Company, licensee of KLAS-TV, Channel 8, Las Vegas, Nevada, is a statement by the station's engineer concerning its predicted Grade A and B contours as calculated pursuant to amended Rule 73.684.

Should any further information be desired in connection with this matter, please communicate with this office.

Very truly yours,

Thomas M. P. Christensen

Enclosure

BROADCAST FACILITIES
DIVISION

JUN 30 1970

CHANNEL EIGHT FOR SOUTHERN NEVADA

KLAS-TV | CBS



HUGHES TOOL COMPANY

P.O. BOX 1504
LAS VEGAS, NEVADA - 8911
702 / 735-751

June 20, 1970

Federal Communications Commission
1919 M Street, N. W.
Washington D. C. 20554

RECEIVED

JUL 1 1970

TV APPLICATIONS BRANCH
(ENGINEERING)

Gentlemen:

I hereby certify that after careful examination of the predicted Grade A and B contours according to 73.684 as amended, that there is no change on any radial.

Sincerely,

William Haught
Director of Engineering
Hughes Tool Company dba KLAS-TV

BROADCAST FACILITIES
DIVISION

JUN 30 1970

WH:jb

See pd.

FCC Form 302
November 1962
Section I

Form Approved
Budget Bureau No. 62-R016-17

File No. **BLET-1635**

United States of America
Federal Communications Commission

BROADCAST FACILITIES

Post office address of applicant (See Instruction D)

APPLICATION FOR NEW BROADCAST STATION LICENSE

Las Vegas Television, Inc.
250 E. Desert Inn Road
Las Vegas, Nevada, 89109

INSTRUCTIONS

DEC 13 1966

A. This form is to be used in all cases when applying for a Broadcast Station License. It consists of this part, Section I, and the following sections:

- Section II - A, License Application Engineering Data Standard Broadcast
- Section II - B, License Application Engineering Data FM Broadcast
- Section II - C, License Application Engineering Data Television Broadcast

B. Prepare and file three copies of this form and all exhibits with Federal Communications Commission, Washington, D.C. 20554.

C. Number exhibits serially in the space provided in the body of the form and list each exhibit in the space provided on page 2 of this Section. Date each exhibit and each antenna pattern.

D. The name of the applicant must be stated exactly as it appears on the construction permit which is being covered.

E. Information called for by this application which is already on file with the Commission need not be refiled in this application provided (1) the information is now on file in another application or FCC form filed by or on behalf of this applicant; (2) the information is identified fully by reference to the file number (if any), the FCC form number, and the filing date of the application or other form containing the information and the page or paragraph referred to, and (3) after making the reference, the applicant states: "No change since date of filing." Any such reference will be considered to incorporate into this application all information, confidential or otherwise, contained in the application or other form referred to. The incorporated application or other form will thereafter, in its entirety, be open to the public.

F. This application shall be personally signed by the applicant, if the applicant is an individual; by one of the partners, if the applicant is a partnership; by an officer, if the applicant is a corporation; by a member who is an officer, if the applicant is an unincorporated association; by such duly elected or appointed officials as may be competent to do so under the laws of the applicable jurisdiction, if the applicant is an eligible government entity; or by the applicant's attorney in case of the applicant's physical disability or of his absence from the United States. The attorney shall, in the event he signs for the applicant, separately set forth the reason why the application is not signed by the applicant. In addition, if any matter is stated on the basis of the attorney's belief only (rather than his knowledge), he shall separately set forth his reasons for believing that such statements are true.

G. BE SURE ALL NECESSARY INFORMATION IS FURNISHED AND ALL PARAGRAPHS ARE FULLY ANSWERED. IF ANY PORTIONS OF THE APPLICATION ARE NOT APPLICABLE, SPECIFICALLY SO STATE. DEFECTIVE OR INCOMPLETE APPLICATIONS MAY BE RETURNED WITHOUT CONSIDERATION.

Notices and communications with respect to this application are to be addressed to the following - named persons at the address indicated (1) above; (2) Welch & Morgan, 300 Farragut Building, Washington, D. C. 20006

1. Facilities authorized by construction permit

Frequency	Channel No.	Power in kilowatts	
		Day	Night
180-186 mc	8	200	20
Hours of operation		Call letters	
Mon-Fri-7:00a.m.-1:00a.m.		n	
Sat.&Sun-8:00a.m.-1:00a.m.		KLAS-TV	

2. Construction permit covered by this application

File number	Date
BPCT-3785	6/29/66
Construction begun	Construction completed
7/1/66	10/11/66

Is the station now in satisfactory operating condition and ready for regular operation? Yes No
If not, explain

PROGRAM DATA

3. Has applicant any contract, arrangement, or understanding, expressed or implied, with a network organization for the broadcasting of network programs? Yes No

Does applicant, in the event this application is granted, propose to broadcast network programs? Yes No
If network programs are to be broadcast, state as Exhibit No. -- arrangements under which they are to be obtained and attach copies of any contractual arrangement which may have been made. If the arrangement is based on an oral understanding, a written statement of the arrangement should be submitted. On file.

FINANCIAL DATA

4. Give actual costs of making installation for which construction was authorized

Transmitter proper including tubes	Antenna system, including antenna-ground system, coupling equipment, transmission line	Frequency and modulation monitors	Studio technical equipment, microphones, transcription equipment, etc.
\$ 66,915.30	\$ --	\$ 1,107.85	\$ --
Acquiring land	Acquiring or constructing buildings	Other items, * state nature	Total
\$ --	\$ 2,488.00	\$ 19,872.72	\$ 90,383.87

* Air conditioning and installation \$9026.65; commercial power installation \$6086.15; miscellaneous supplies \$648.21; Labor \$4,111.71.

FINANCIAL DATA (Continued)

5. (a) Attach a detailed balance sheet, as at the completion date of the authorized construction, showing applicant's financial position as Exhibit No. 1 (b) If the actual cost of construction materially exceeds the original estimated cost of construction, attach as Exhibit No. - - a detailed statement showing the plan used to finance such construction. (If applicant is licensee of a broadcast station having on file with the Commission an Annual Financial Report (FCC Form 324) showing its financial position within the past 12 months and the request in this application is for a change in existing facilities, these exhibits need not be supplied provided that no substantial reduction in financial position has occurred.)

6. State changes, if any, in capitalization, and report any contracts affecting ownership not shown in the application for construction permit. (If none, so state)

None

7. Apart from the apparatus constructed, have all the terms, conditions, and obligations set forth in the above-described application for construction permit been fully met? If "No", state exceptions. Yes No

8. Is a request for authority to conduct program tests a part of this application? Yes No

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

THE APPLICANT represents that this application is not filed for the purpose of impeding, obstructing, or delaying determination on any other application with which it may be in conflict.

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 if set out in full in the application.

CERTIFICATION

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.

Signed and dated this 8th day of December, 1966.

EFFECTIVE JANUARY 1, 1964, INCLUDE FILING FEE WITH THIS APPLICATION. SEE PART 1 OF FCC RULES FOR AMOUNT OF FEE.

Las Vegas Television, Inc.
(NAME OF APPLICANT)

By *[Signature]*
(SIGNATURE)

WILLFUL FALSE STATEMENTS MADE ON THIS FORM ARE PUNISHABLE BY FINE AND IMPRISONMENT. U. S. CODE, TITLE 18, SECTION 1001.

Title *[Signature]*

EXHIBITS furnished as required by this form:

Exhibit No.	Section and Para. No. of Form	Name of officer or employee (1) by whom or (2) under whose direction exhibit was prepared (show which)	Official title
1	Sec. I, para. 5(a)	H. M. Greenspun (2)	President
E	Sec. II-C	Robert E. Schenke (1)	General Electric Broadcast Service Engineer
E-2	Sec. II-C para. 8(b)	Herschel C. McKenzie (1)	Chief Engineer

Broadcast Application		FEDERAL COMMUNICATIONS COMMISSION		Section II-C	
LICENSE APPLICATION ENGINEERING DATA TELEVISION BROADCAST			Name of applicant Las Vegas Television, Inc.		
1. Facilities authorized in construction permit			Aural transmitter		
Call letters	Channel No.	File No. of construction permit	D. C. plate current in last radio stage, in amperes	Applied D. C. plate voltage of last radio stage, in volts	
KLAS-TV	8	BPCT-3785	1.3	6500	
Frequency		Carrier frequency		Plate input power to last radio stage in kilowatts	
180 — 186 Mc.		Visual 181.24 Mc Aural 185.7± Mc.		8.450	
Effective Radiated Power (visual)	Effective Radiated Power (aural)	Antenna height above average terrain		Efficiency factor F of transmitter at operating power, in percent	
In dbk: 23.01 In kw: 200	In dbk: 13.01 In kw: 20.0	140 137 feet		+1.5%	
2. Station location (principal community)			Transmitter power output		
State	City or town		In dbk: 5.414 In kw: 3.5	RF transmission line meter reading	
Nevada	Las Vegas		100		
3. Transmitter location			6. Antenna and transmission line		
State	County		Antenna make and Type No.		
Nevada	Clark		General Electric TY28-F		
City or town Hwy 91, 1 mi. so. of Las Vegas City Limits			Number of sections		
Street Address (or other identification) 250 East Desert Inn Road			6		
4. Main studio location			Power gain in db		
State	County		7.99		
Nevada	Clark		Antenna supporting structure		
City or town Hwy 91, 1 mi. so. of Las Vegas City Limits			Ideco self-supporting		
Street address 250 East Desert Inn Road			Overall height of antenna system above ground in feet		
5. Transmitters Installed			241 ft. X		
Visual			Geographical coordinates of antenna (to nearest second)		
Make	Type No.	Rated power	North latitude		
General Electric	TT51-B	In dbk: 15.44 In kw: 35	36° 07' 49"		
Aural			West longitude		
Make	Type No.	Rated power	115° 09' 52"		
General Electric	TT-32-B	In dbk: 7.4 In kw: 5.5	If directional antenna is used, give full details including horizontal and vertical plane radiation patterns, as Exhibit No. --		
Operating constants			Is electrical or mechanical beam tilting employed? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Visual transmitter (while transmitting black)			If so, describe fully in Exhibit No. --		
D. C. plate current in last radio stage, in amperes	Applied D. C. plate voltage of last radio stage, in volts		including horizontal and pertinent vertical radiation patterns.		
7.8	6250		Has antenna been altered to provide null fill-in? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Transmitter power output (after vestigial sidoband filter, if used, and after multiplexer, if combined)		Multiplexer loss in db, if separate:	If so, describe fully in Exhibit No. --		
In dbk: 15.4 In kw: 34.8		Included in transmitter rating	Transmission line		
Transmission line power loss in db:		Antenna input power in dbk:	Make		
0.39db	15.02	7.99	Andrew		
Attach as Exhibit No. E complete information concerning the method of power output determination. If power is measured at output of multiplexer, so state.		Antenna power gain in db:	Type No.		
		7.99	562A		
Reading of power output meter (transmission line voltage, current or power; indicate which) while operating at authorized power:		Effective radiated power	Coaxial or waveguide		
100 units		In dbk: 23.01 In kw: 200 kw	Coaxial		
			Size (nominal inside transverse dimensions) in inches		
			3.027		
			Length in feet		
			257		
			Power loss in db for this length		
			.39		
			Multiplexer		
			Make		
			General Electric		
			Type No.		
			PY-16-C		
			If emergency antenna or transmission line measures are provided, describe in Exhibit No. --		
			7. Modulation monitors		
			(a) Visual monitor or monitoring equipment		
			Make RCA, Conrad Type No. (or describe in Exhibit No. E) Page 2		
			(b) Aural monitor		
			Make		
			General Radio		
			Type No.		
			1183-T2		
			8. Frequency monitors		
			(a) Visual monitor		
			Make		
			General Radio		
			Type No.		
			1183-T2		
			Normal limits of deviation of carrier frequency shown by monitor		
			200 high cps. low to + 0 high cps. low		

6. (Continued)

(b) Aural monitor

Make

General Radio

Type No.

1183-T2

Normal limits of deviation of carrier frequency shown by monitor

+200	high	+100	high
	cps.	to	cps.
	low		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. E-2, 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. E 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. E 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. E 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. E 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, 200, 300, 1000, 5000, 10,000 and 15,000 cycles. The frequency response measurements should normally be made without deemphasis; 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?

Does not differ from that described in the application for construction permit.

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 December 2, 1966


Thomas P. D'Arco, Chief Engineer & Consulting Engineer

LAS VEGAS TELEVISION, INC. -- BALANCE SHEET, AS AT SEPTEMBER 30, 1966

ASSETS

Current Assets

Cash:

Petty Cash	57.08	
Demand Deposits in Bank	<u>2,279.82</u>	2,336.90
Accounts Receivable:		
Regular Trade	139,767.82	
Due from Employees	642.48	
A/C Rec. Las Vegas Sun	8,296.00	
" " Claims	<u>(686.10)</u>	
	48,018.20	
Less Reserve f. Bad Debts	<u>(55,964.71)</u>	92,053.49
Accrued Interest Receivable		5,200.00
Film Inventory		<u>228,462.49</u>

Total Current Assets:

328,052.88

Fixed Assets

Equipment & Leasehold Improvements	1,002,225.52	
Less: Reserve f. Depreciation & Amortization	<u>(651,524.75)</u>	
	350,700.77	

Total Fixed Assets:

~~651,524.75~~
350,700.77

Deferred Assets

Investment Tax Credit	1,103.65	
Cash Surrender Value of Insurance on Lives of Officers	42,920.89	
Prepaid Life Insurance Premium	1,325.78	
Prepaid Insurance	21,505.36	
Prepaid Interest	<u>24,865.99</u>	

Total Deferred Assets:

91,721.67

Other Assets

Refundable Deposits	202.00	
Investment - Alta Corp.	9,629.53	
Intangible Assets	4,994.47	
Organization Costs	10,559.83	
Note Receivable - Alta Corp.	<u>80,000.00</u>	

Total Other Assets:

105,385.83

TOTAL ASSETS:

875,861.15

LIABILITIES AND NET WORTH

Current Liabilities

Notes & Accounts Payable:

A/C Payable - Trade	48,767.39	
A/C Payable - L.V.Sun	131,765.59	
Notes & Contracts Payable- Due Within One Year	156,227.10	
Film Costs Payable - Due Within One Year	111,219.56	
Due to Officer - H.M.Greenbaum	(16,009.00)	431,970.64
Accrued Payroll		9,897.16
Payroll Taxes-Accrued and Withheld		3,440.66
Accrued Property Tax		(5,445.84)
Accrued Interest Payable		6,865.64
Accrued Music Fees		<u>19,235.03</u>

Total Current Liabilities: 465,963.29

Fixed Liabilities

Notes & Contracts Payable- Due After One Year	292,102.45
Film Costs Payable-Due After One Year	<u>66,035.17</u>

Total Fixed Liabilities: 358,137.62
Deferred Investment Credit Income: 27,674.19

TOTAL LIABILITIES: 851,775.10

NET WORTH

Capital Stock Issued, 2200 Shares, Par Value \$100 Per Share	220,000.00	
Less: Treasury Stock at Cost	(130,156.25)	(110,156.25)
Earned Surplus:		
Balance, January 1, 1965 and 1964, Respectively	40,721.40	
Net Profit for Period, Add:	<u>93,520.90</u>	<u>134,242.30</u>

TOTAL NET WORTH: 24,086.05

TOTAL LIABILITIES AND NET WORTH: 875,861.15

EXHIBIT "E"

ENGINEERING REPORT

of measurements made in support of

Proof of Performance

at

KLAS-TV

Channel 8

Las Vegas, Nevada



This report prepared by:

Broadcast Service Engineering
General Electric Company,
Electronics Park
Syracuse, New York

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Introduction and Affidavit

This engineering report was prepared in support of a proof of performance of a General Electric type TT-46 transmitter in the television service operated by _____ licensee of station KLAS-TV operating on assigned frequencies of 181.25 and 185.75 MHZ. The transmitter is located at 250 East Desert Inn Road, Las Vegas, Nevada.

Measurements were made by or under the direct supervision of R. E. Schenke, a General Electric Broadcast Service Engineer who has sworn the following affidavit.

Affidavit

State of: Nevada)

(ss.

County of: Clark)

Robert E. Schenke being duly sworn upon oath, deposes and states that:

The General Electric Company was retained by KLAS-TV of Las Vegas, Nevada to prepare this engineering statement.

The engineering data was obtained by him or under his supervision and direction.

That all facts stated herein are true of his own knowledge, except for such facts as are stated to be on information and belief and as such facts he believes them to be true.

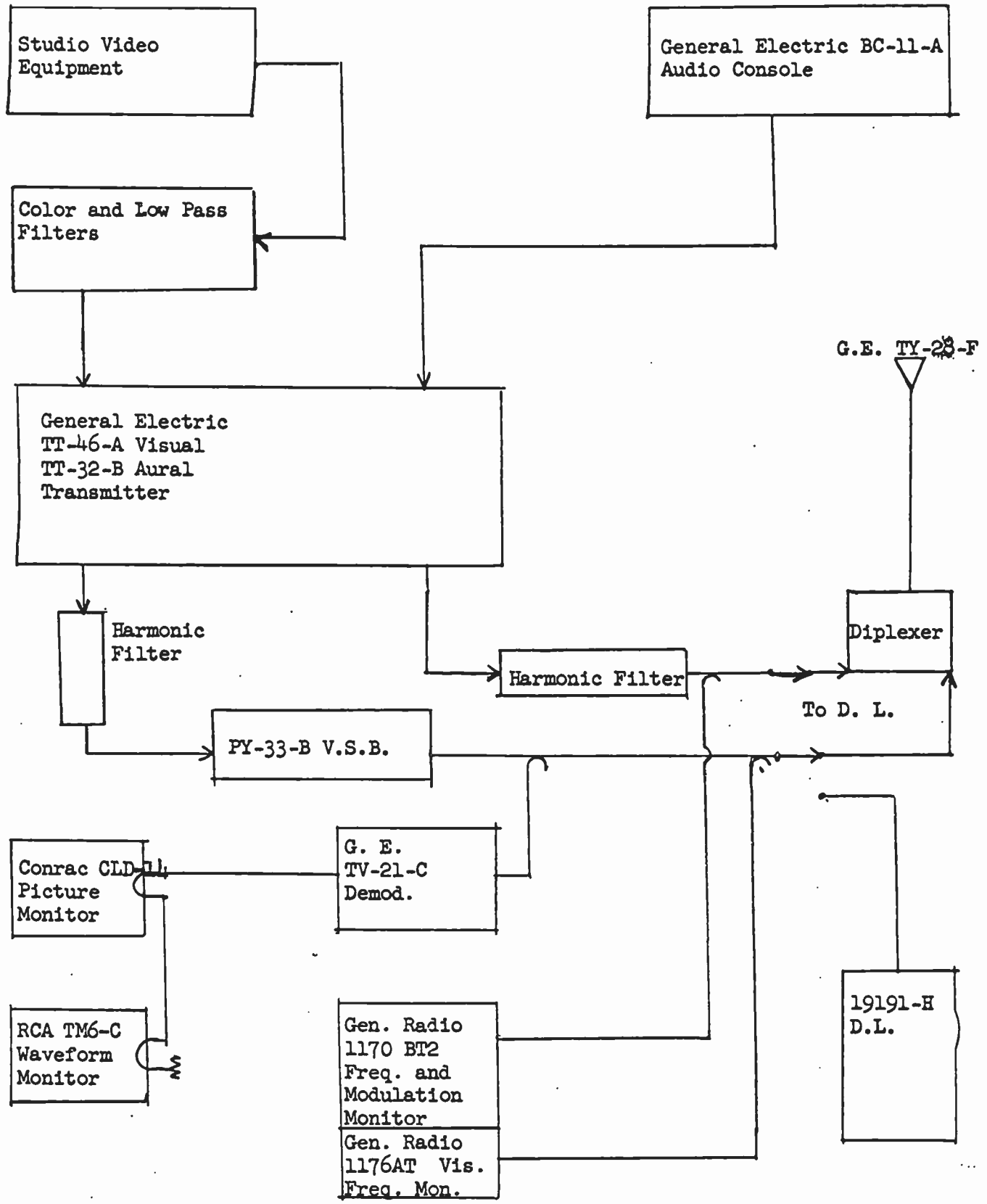
Robert E. Schenke
Broadcast Service Engineering

Subscribed and sworn to before me on this day of November 1st, 1966

Ursula Schindler
Notary Public

My commission expires 10-1-70

URSULA SCHINDLER
NOTARY PUBLIC - STATE OF NEVADA
COUNTY OF CLARK
My Commission Expires October 1, 1970



Overall Transmission System

Measurements made at KLAS-TV Date 10/27/66

1. Power Measurements

A. Visual Transmitter

General Electric transmitter type TT-46-A operated into dummy load type RCA MI-19191H serial # 1046 with standard black picture with 25% sync out of transmitter.

Average Power 20.7 KW measured in the dummy load.

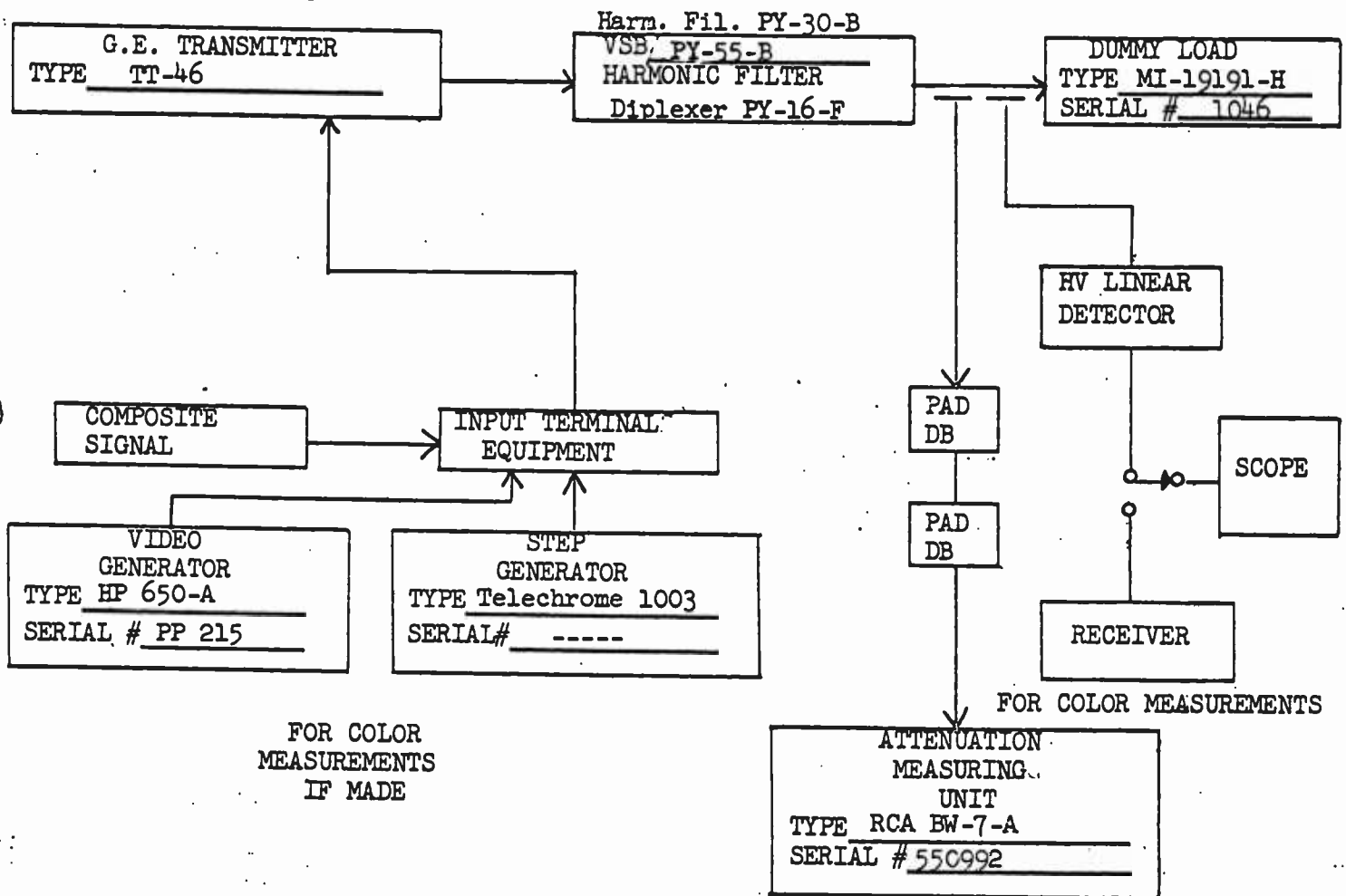
Peak power output = 20.7 x 1.68 = 34.8 KW
 = 15.41 dbk

Peak output power indicating meter set to read at 100 units for this power level.

PA DC Plate voltage and plate current at this power level are:

$I_b = \underline{7.8}$ amps
 $E_{bb} = \underline{6250}$ volts

Test set up is as shown below:



Test Set-up for Measuring Video Transmitter Characteristics
 Fig. 1

Measurements made at KLAS-TV Date 10/27/66

B. Transmission Line

Make Andrew Type 562A Size 3-1/8" Length 257'
Line loss .39 db
Diplexer power loss Negligible db
Total losses .39 db
Antenna input power 15.02 db
Antenna gain 7.99 db
Effective radiated power 23.01 dbk
200 KW

C. Aural Transmitter

DC plate voltage, final stage E_{bb} = 6500 volts
DC plate current, final stage I_b = 1.3 amps
Input power to final stage $E_b I_b$ = 8450 watts
Output power as measured in the dummy load 3.5 KW
5.414 dbk
Efficiency factor 41.5%

Output power indicating meter reading set to read at 100 units for this power level.

Frequency Measurements None made.

Frequency measurements of both the aural and visual transmitter were made on Date: _____ by _____

At the time of measurements, aural and visual crystals were adjusted for operation on the exact authorized frequencies. Frequency measurements reports are attached at end of this report.

General Radio type 1183-T2 frequency monitor serial

1020 is used to monitor the operating frequency of visual carrier.

General Radio type 1183-T2 frequency monitor serial

630 is used to monitor the operating frequency of the aural carrier.

3. Overall amplitude versus frequency response-visual transmitter

A. Test Equipment - The equipment was set up as shown and identified in Figure #1.

B. Test Procedure

The visual transmitter was adjusted for CW operation at midcharacteristic (43% of sync peak level.) It was then modulated by a signal from a type H.P. 650A Serial # PP215 Generator. The modulation was set so that the excursions were approximately 70% (max.) of the reference white to reference black region. A selective receiver RCA model BW7A serial # 550992 was used to select and measure the signal level of each of the sidebands of the modulating frequency. 500 KHZ upper sideband was chosen as reference level since it was the lowest modulating frequency that could be accurately separated from the carrier. Measurements were made at the modulation frequencies tabulated on page 6, and results plotted on the graph on page 7.

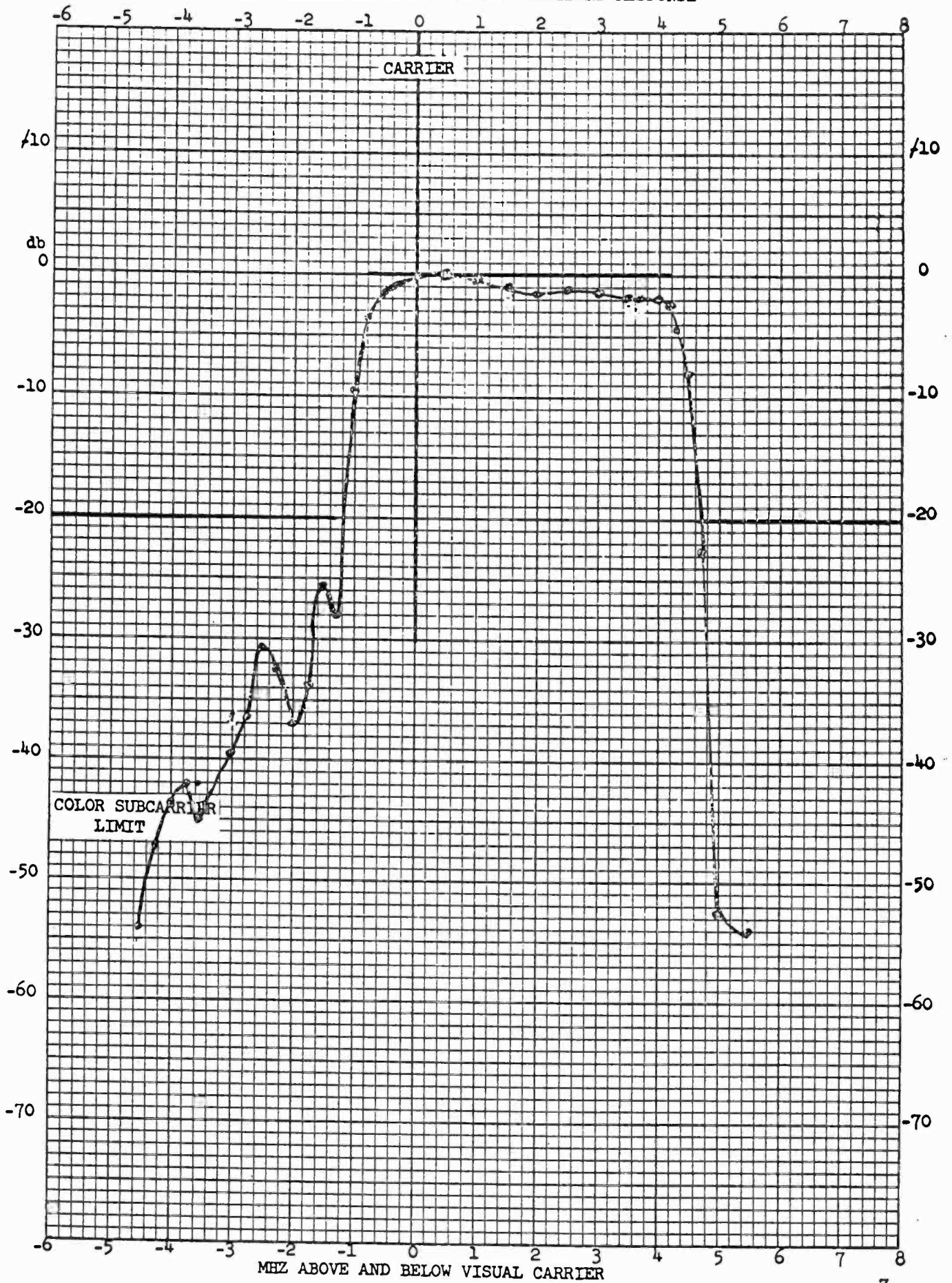
Measurements made at KLAS-TV Date 10/27/66

Tabulation of Overall Amplitude vs. Frequency Response

<u>MHZ</u>	<u>Upper Sideband</u>		<u>Lower Sideband</u>	
	<u>Relative Volts</u>	<u>db</u>	<u>Relative Volts</u>	<u>db</u>
.500	10 x 100	0	8.5 x 100	-1.4
.750	9.8 x 100	-.02	6.5 x 100	-3.7
1.000	9.8 x 100	-.02	3.3 x 100	-9.6
1.250	9.2 x 100	-.8	4.0 x 10	-28.0
1.500	9.0 x 100	-1.0	5.2 x 10	-25.6
1.750	8.5 x 100	-1.4	2.0 x 10	-34
2.000	8.5 x 100	-1.4	1.4 x 10	-37
2.100	8.5 x 100	-1.4	-----	-----
2.250	8.5 x 100	-1.4	2.4 x 10	-32.4
2.500	8.8 x 100	-1.1	3.0 x 10	-30.4
2.750	8.6 x 100	-1.3	1.5 x 10	-36.4
3.000	8.5 x 100	-1.4	1.1 x 10	-39.2
3.500	8.2 x 100	-1.8	6.5 x 1	-43.8
3.580	8.2 x 100	-1.8	5.8 x 1	-44.8
3.750	8.0 x 100	-1.9	7.0 x 1	-43
4.000	8.0 x 100	-1.9	6.5 x 1	-43.8
4.180	7.6 x 100	-2.4	-----	-----
4.250	6.0 x 100	-4.4	4.5 x 1	-47
4.500	4.0 x 100	-8.0	2.0 x 1	-54
4.750	7.2 x 10	-22.8		
5.000	3.0 x 1	-52.6		
5.500	2.0	-54.0		
6.000	Noise	-----		
6.500	Noise	-----		
7.000	Noise	-----		
7.500	Noise	-----		
8.000	Noise	-----		

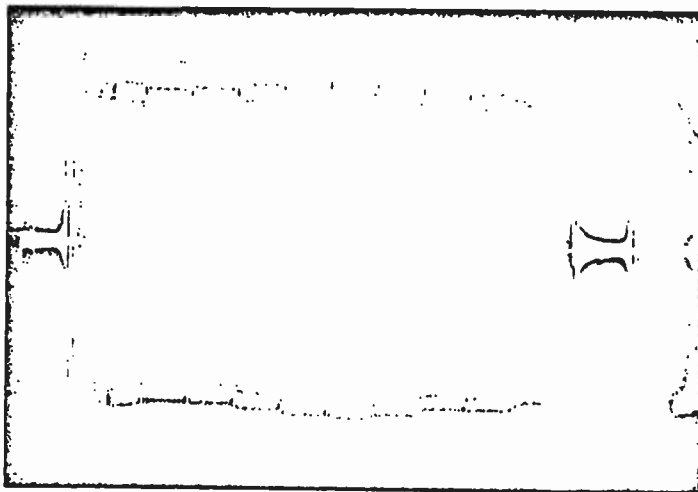
Measurements Made
 At KLAS-TV
 Date 10/27/66

VISUAL TRANSMITTER UPPER & LOWER SIDEBAND RESPONSE



4. Linearity Check-Differential Gain-Differential Phase

A. Output linearity of the transmitter was checked by modulating it with a composite signal consisting of a stair step signal with 20% peak-to peak 3.58 MHz superimposed on the steps (minimum of eight steps). This test signal supplied by a Telechrome type 1003C serial # ----- stair step generator at rated sync and rated output power. The depth of modulation was set to $12\frac{1}{2}\%$ of sync peak as observed on a vestigial sideband demodulator. A photograph of this measurement as viewed on an oscilloscope with a high pass filter inserted in the system is shown below. The test equipment is as shown on Page 3. Readings of the relative gain of the system are tabulated together with the phase measurements .Page:9: (Differential gain and phase were measured using a high voltage linear diode).



Measurements made at KLAS-TV Date 10/27/66

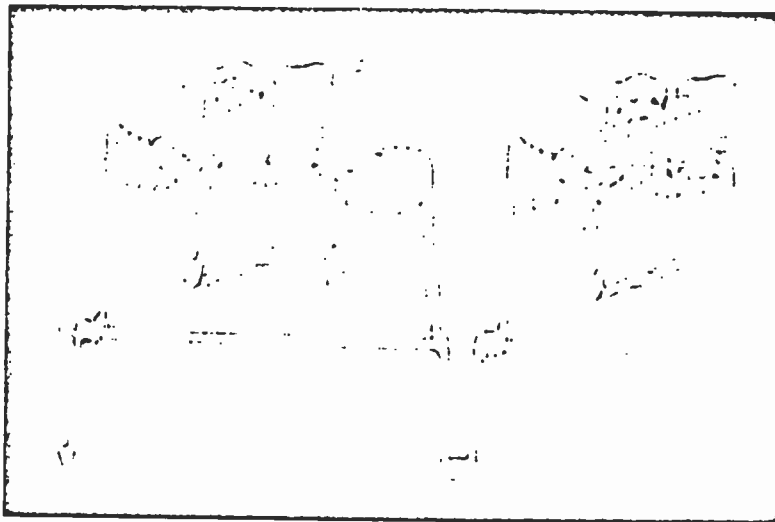
B. The differential phase was measured by employing a stair step signal as in A. The phase and gain readings were recorded in degrees as shown in the following table:

Step No. Burst	Phase Angle	Relative Gain
1 (Back Porch)	0	9.5
2	+0.5	9.0
3	+1.0	9.0
4	+1.0	9.2
5	+2.0	9.8
6	+2.5	10
7	+3.0	9.6
8	+4.0	9.1
9	+5.0	9.0
10 (White level)	+6.0	8.6

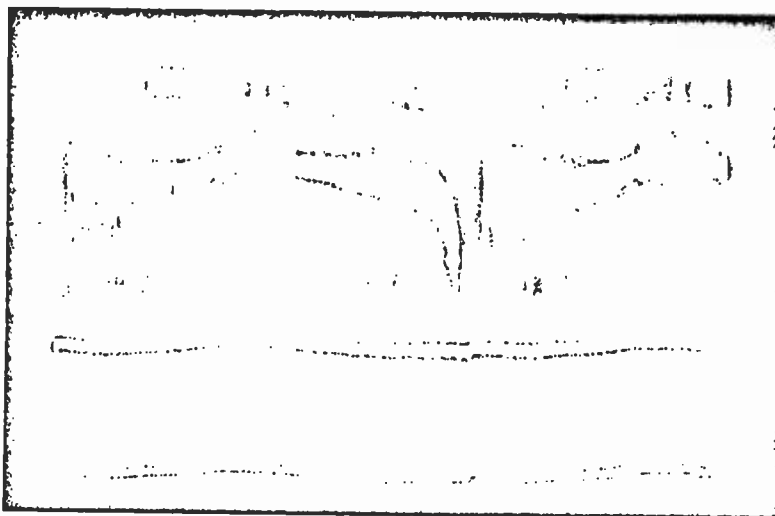
$$\text{Differential gain} = \frac{\text{Min. Gain}}{\text{Max. Gain}} = \frac{8.6}{10} = 86\%$$

5. Photographs of Horizontal and Vertical Sync Intervals.

Photographs of horizontal and vertical sync intervals are shown below:



Horizontal Sync Interval

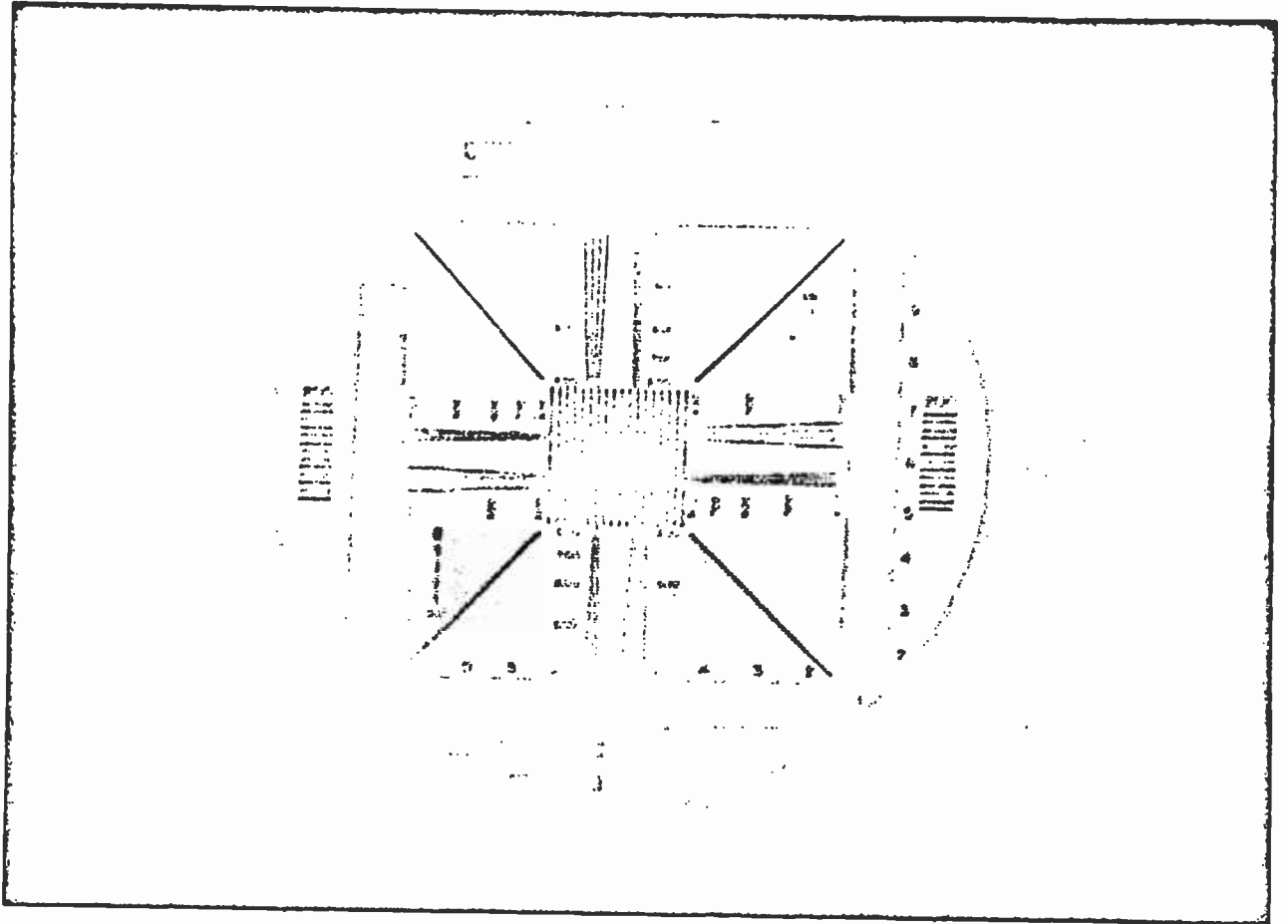


Vertical Sync Interval

Measurements made at KLAS-TV Date 10/27/66

6. Test Pattern

Picture of station test pattern through the system and detected by the
Demodulator type TV-21-B



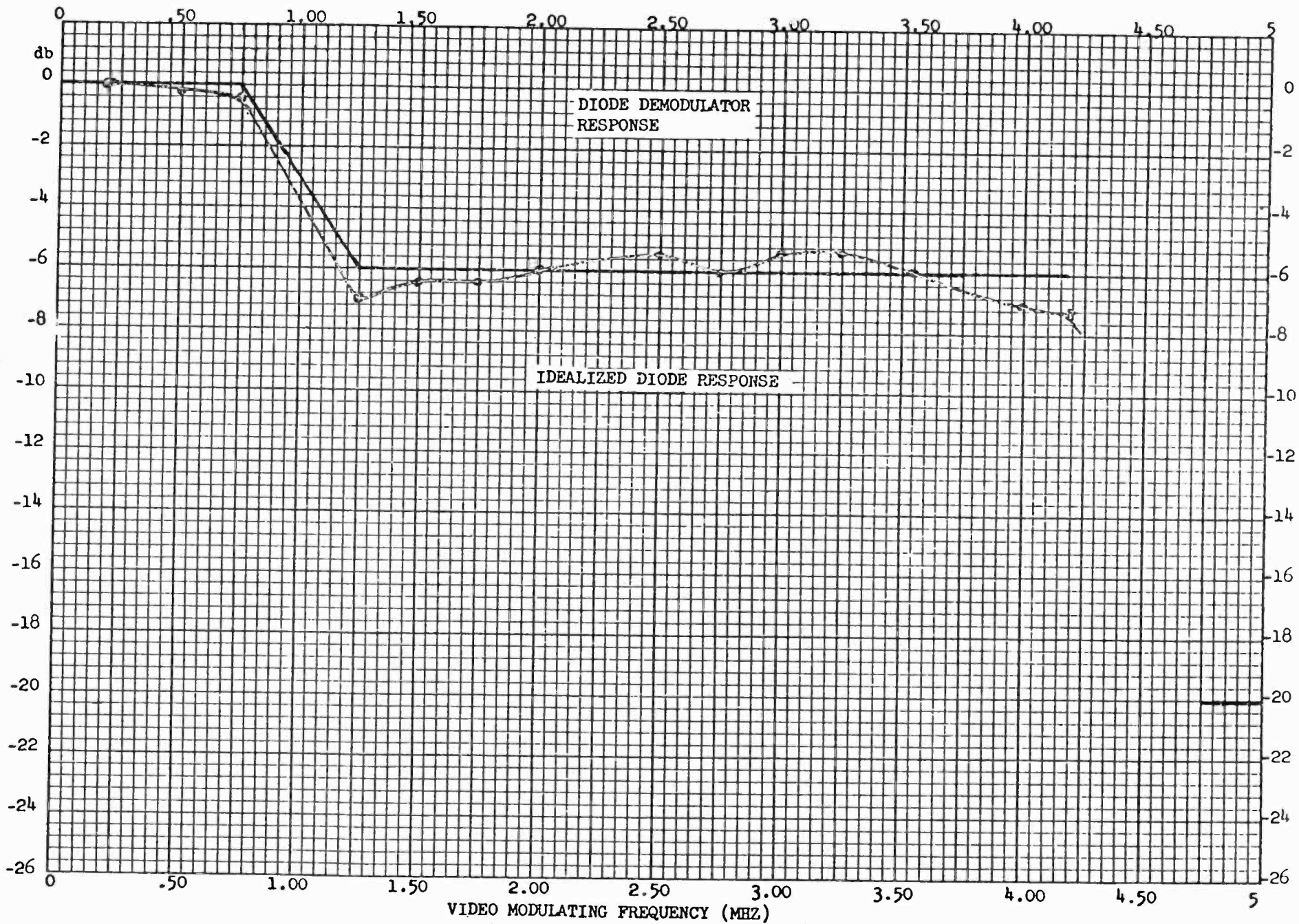
Measurements made at KLAS-TV Date 10/27/66

7. Diode Demodulator Response

Diode demodulator amplitude vs. frequency response was determined using the test set up shown in Figure 2, Page 18 with the exception that the diode demodulator output was connected to a 524AD scope and the output was read by scaling from the scope. A graph of the response is attached on page 13.

Tabulation of Diode Demodulator Response

Modulating Frequency MHZ	Relative Voltage	db
0.20	10	0
0.50	9.8	-0.2
0.75	8.0	-2.0
1.25	4.5	-7.0
1.5	4.8	-6.4
1.75	5.0	-6.0
2.0	5.0	-6.0
2.10	5.0	-6.0
2.25	5.0	-6.0
2.50	5.2	-5.7
2.75	5.0	-6.0
3.00	5.2	-5.7
3.25	5.2	-5.7
3.58	5.0	-6.0
3.75	4.8	-6.4
4.00	4.5	-7.0
4.18	4.5	-7.0
4.75	Unreadable	



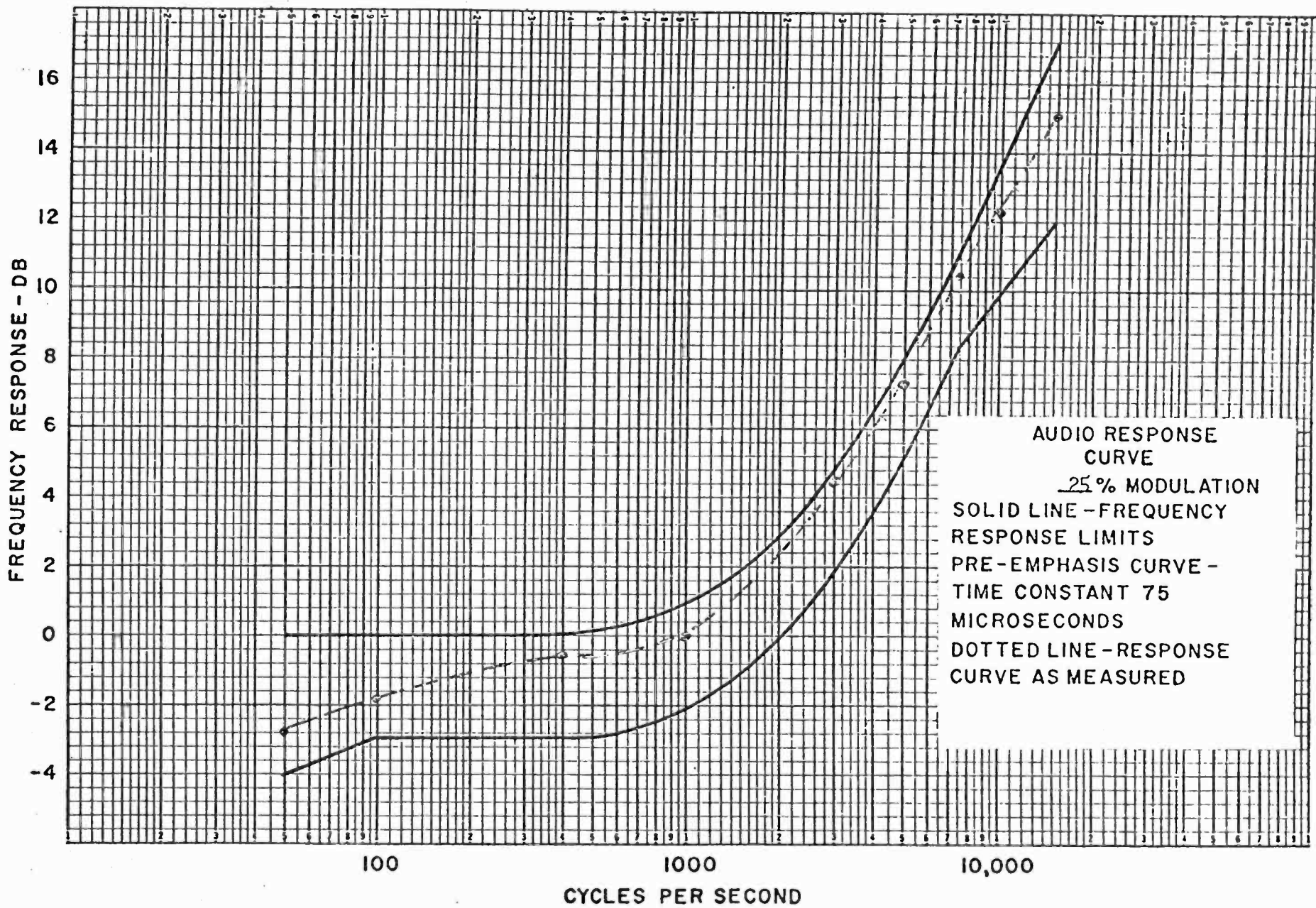
8. Audio Frequency Response-Aural Transmitter

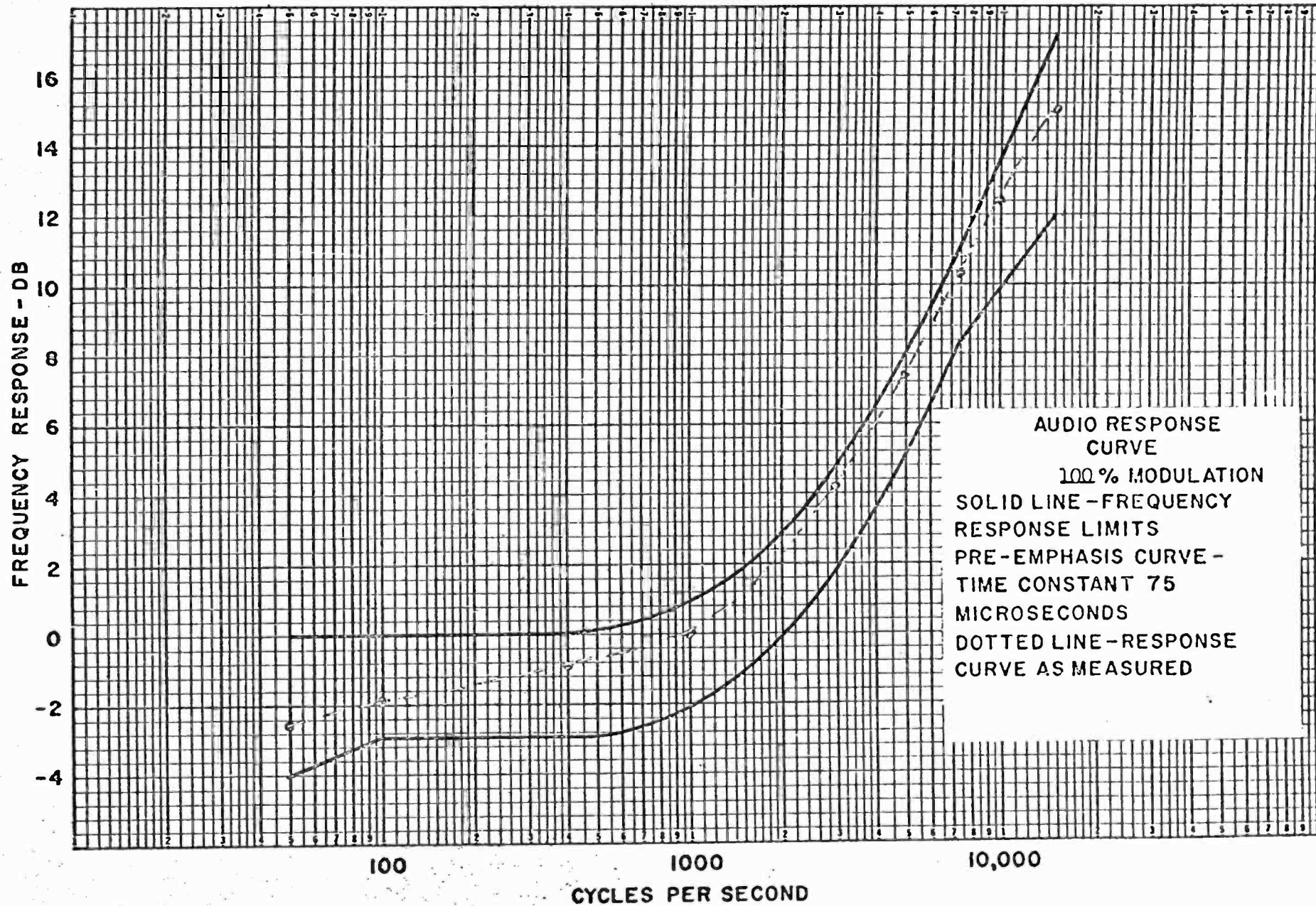
Test set up for measuring the overall audio frequency response is shown in Figure 2, Page 18. The aural transmitter was modulated while operating at rated power, to 25%, 50%, 100% modulation as indicated by the station modulation monitor. A modulating tone was supplied by an audio oscillator HP type 206 serial # 766 at the frequencies tabulated below, with the modulation percentage held constant at 1000 cycles was used as a reference level and the increases or decreases in level required to maintain the percentage modulation constant was converted to db and tabulated. The signal was introduced at the main studio microphone terminal and passed through the audio system to the aural transmitter. Limiter actions in the limiting amplifiers were disabled for these tests. Curves of these results are shown on Pages 15, 16, and 17.

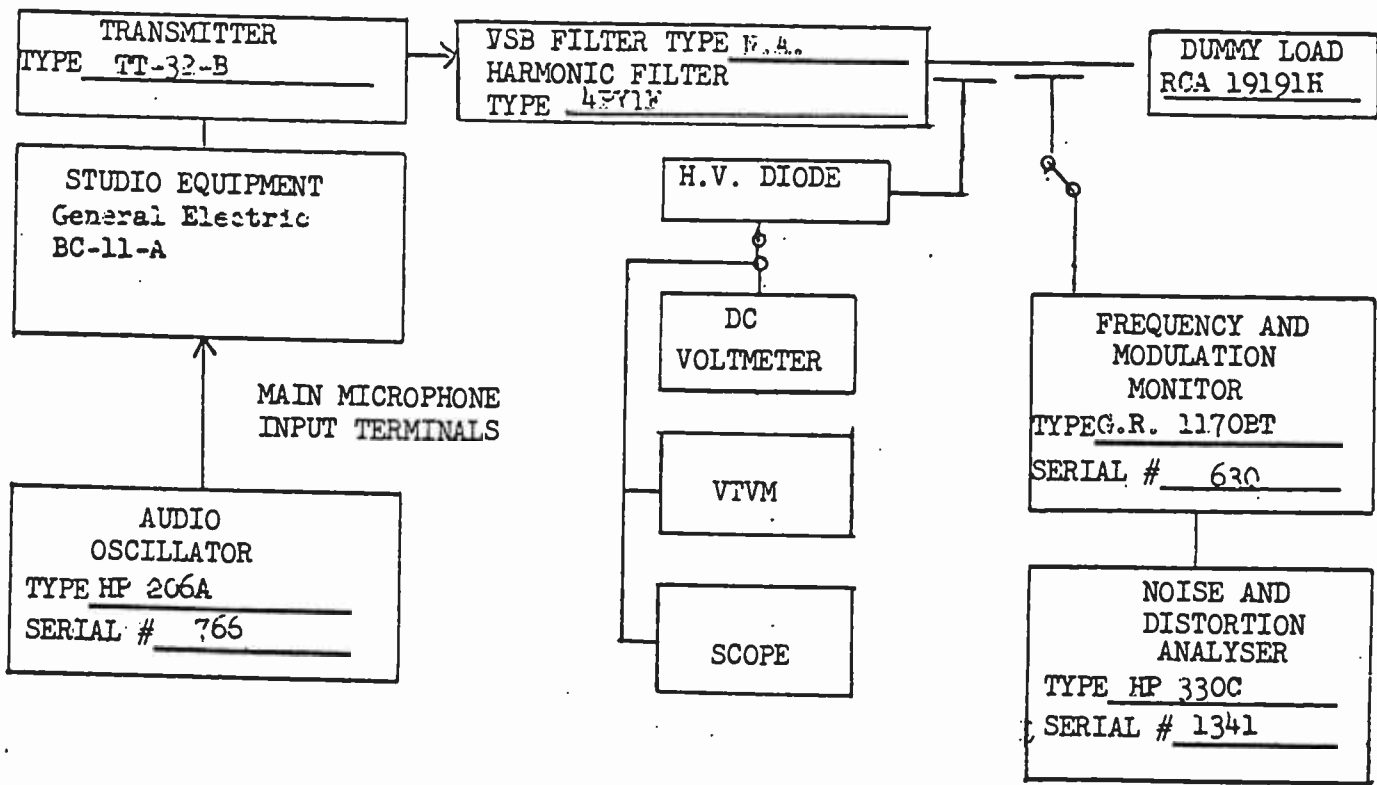
Audio Frequency Response

Frequency	25% Mod.	50% Mod.	100% Mod.
50	<u>-2.6</u>	<u>-2.7</u>	<u>-2.3</u>
100	<u>-1.9</u>	<u>-2.2</u>	<u>-1.9</u>
400	<u>-0.5</u>	<u>-1.3</u>	<u>-0.9</u>
1000	<u>0</u>	<u>0</u>	<u>0</u>
2500	<u></u>	<u></u>	<u></u>
5000	<u>+7.4</u>	<u>+7.4</u>	<u>+7.5</u>
7500	<u>+10.5</u>	<u>+10.5</u>	<u>+10.3</u>
10000	<u>+12.2</u>	<u>+12.0</u>	<u>+12.4</u>
15000	<u>+15.0</u>	<u>+14.8</u>	<u>+15.0</u>

Measurements made at KLAS-TV Date 10/27/66







All limiting amplifiers disabled

Test Set-up for Measuring Aural Transmitter Characteristics

Fig. 2

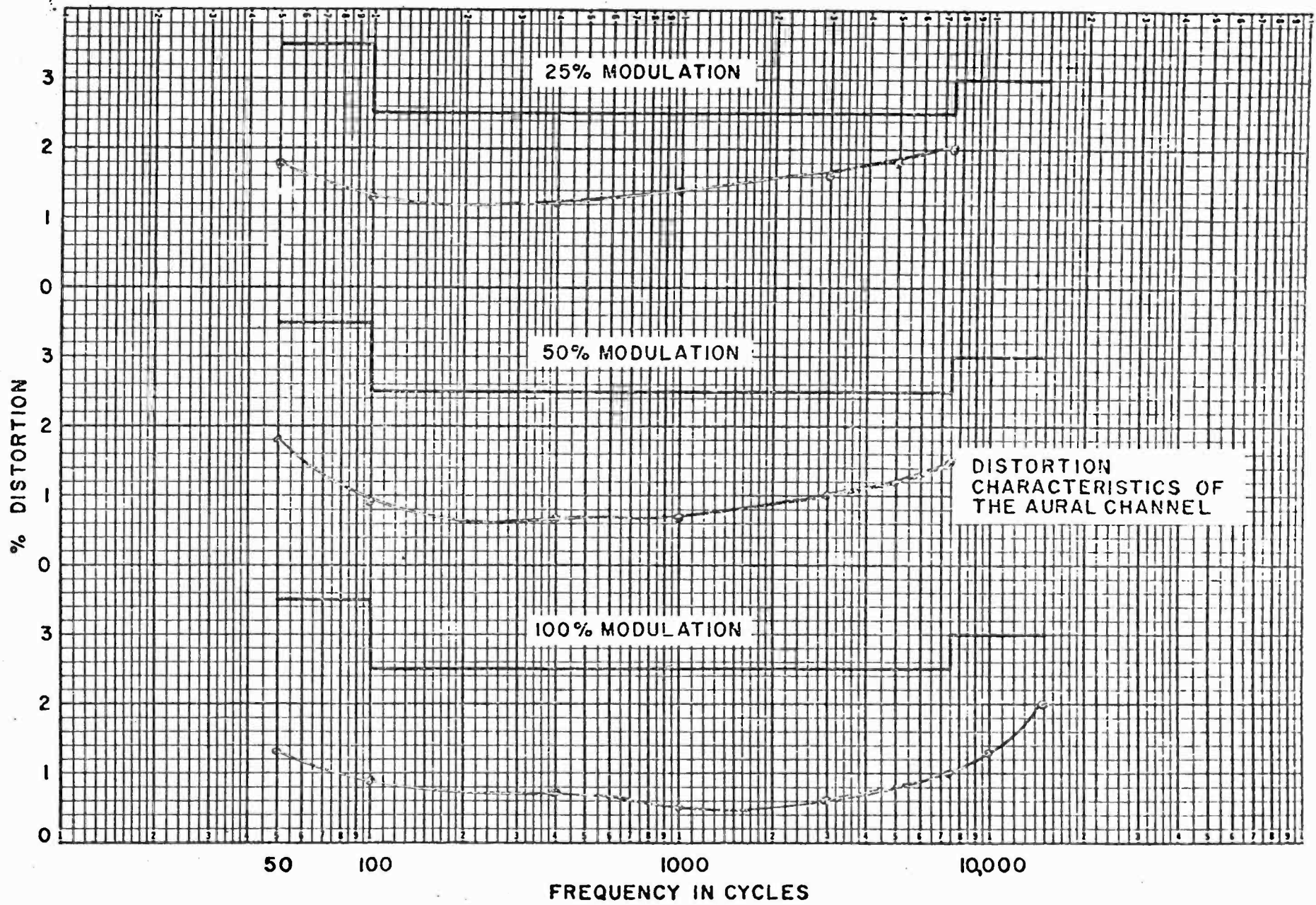
9. Audio Harmonic Distortion Measurements

The Audio harmonic distortion products were measured using the set up shown in Figure 2. The aural transmitter was operated at rated power and measurements were made for selected frequencies at 25%, 50%, 100% modulation. The audio frequencies as tabulated below were supplied by an audio oscillator

H.P. _____ type 206A Serial # 766. Audio distortion products were read directly on noise and distortion analyzer

H.P. _____ type 330C serial # 1341. A graph of these results is shown on Page 20.

Modulation Frequency Cycles	Percentage Distortion		
	100% Mod.	50% Mod.	25% Mod.
50	<u>1.3</u>	<u>1.4</u>	<u>1.4</u>
100	<u>0.9</u>	<u>0.9</u>	<u>1.3</u>
400	<u>0.7</u>	<u>0.7</u>	<u>1.1</u>
1000	<u>0.5</u>	<u>0.7</u>	<u>1.2</u>
2500			
5000	<u>0.9</u>	<u>1.2</u>	<u>1.8</u>
7500	<u>1.0</u>	<u>1.5</u>	<u>2.0</u>
10000	<u>1.3</u>		
15000	<u>2.0</u>		



10. Aural FM Noise Measurement

FM noise level was measured using the test set up shown in Fig. 2. A 400 cps signal was fed in the system at main microphone input. This was used to establish 0 db reference at 100% modulation. The signal was removed from the aural transmitter and the transmitter input shunted by its rated input impedance.

Residual FM noise level is 58 db below 100% modulation with 400 cps.

11. Aural AM Noise Measurements

AM noise was measured using a diode detector in the aural RF transmission line. The RF probe was inserted in the output transmission line to give a 4.0 VDC signal. With a noise and distortion analyzer connected to the diode, the residual noise voltage read .005 volts (RMS).

Signal to noise ratio was $20 \log_{10} \frac{.707 \text{ (DC Voltmeter)}}{\text{(N\&D Analyzer Reading)}} = \underline{55.0}$ db

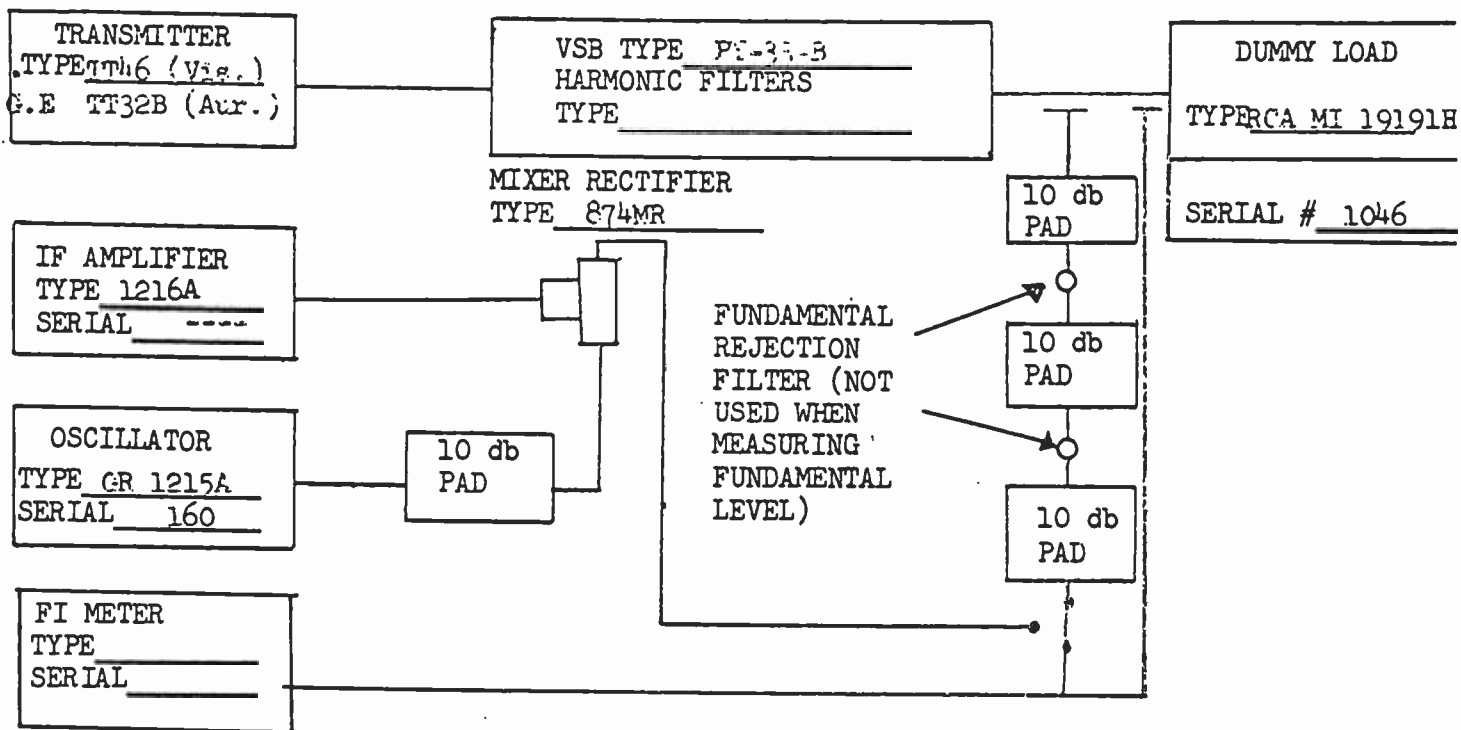
Measurements made by KLAS-TV Date 10/27/66

13: Measurements of Spurious and RF Harmonic Measurements

RF harmonic level for the aural and visual transmitting systems were made using the equipment set up shown in Figure #3. The aural transmitter was operated at rated power and the visual at rated black level power. A directional probe was inserted in the transmission line, beyond the harmonic filter and the GR unit oscillator tuned to a frequency of carrier frequency +30 MHZ. The probe depth was then adjusted to give a convenient reference level and locked in that position. Fundamental rejection filters were then inserted as shown in Figure #3 and tuned for maximum fundamental rejection. The oscillator was then tuned to each harmonic frequency +30 MHZ and harmonic level read in db below carrier reference. Corrections for directional probe and fundamental filters were made and the results of measurements on the aural and visual RF harmonics were then tabulated below.

Harmonic	Visual Transmitter db below fundamental	Aural Transmitter db below fundamental
2	<u>90 db</u>	<u>better than 90</u>
3	<u>better than 90</u>	<u>better than 90</u>
4	<u>unreadable</u>	<u>unreadable</u>
5	<u>unreadable</u>	<u>unreadable</u>
6	<u>_____</u>	<u>_____</u>
7	<u>_____</u>	<u>_____</u>
8	<u>_____</u>	<u>_____</u>
9	<u>_____</u>	<u>_____</u>
10	<u>_____</u>	<u>_____</u>

Measurements made by KLAS-TV Date 10/27/66



Test Set-up for Measuring Relative Harmonic Level

Fig. 3

Measurements made at KLAS-TV Date 10/27/66

EXHIBIT NO. E-2

Frequency Measurement made on December 1, 1966, 2:10 am

Equipment: Motorola T1020A Frequency Meter (Gertsch)
Serial #860
Factory Calibrated March 18, 1966

Method: The T1020A Frequency Meter was allowed a 30 minute warm up period. Internal oscillator was calibrated in the normal manner.

A zero beat was obtained on the T1020A against the Visual Carrier and computed to be 181.24015 mc. The station frequency monitor indicated a minus (-) 100 cps.

Internal calibration procedure was repeated for the Aural Frequency. With no modulation a beat was obtained against the Aural Carrier on the T1020A and the frequency was computed to be 185.74000 mc. The station frequency monitor indicated a minus (-) 150 cps.