

APPLICATION FOR FCC CERTIFICATION
BZ5MX20U
MODULATOR INPUT
20 WATT UHF TRANSLATOR

EXHIBIT 1

PAGE 4

AUDIO FREQUENCY RESPONSE
REFERENCE 50Hz AT 0dB INTO 600 OHMS

FREQUENCY(Hz)	MODULATION	
	50%	100%
50	0	0
100	-1.49	-1.36
400	+1.50	+1.50
1000	+1.86	+2.23
5000	+6.98	+9.55
10000	+11.76	+14.73
15000	+14.52	+17.57

Tabulated below are the audio harmonic distortion measurements.

AUDIO HARMONIC DISTORTION LEVEL (%)

FREQUENCY(Hz)	MODULATION	
	50%	100%
50	3.11	1.31
100	2.97	1.27
400	2.99	1.28
1000	2.93	1.26
5000	2.90	1.25
10000	*	1.26
15000	*	1.24

* Distortion measurements above 7.5kHz at 50% modulation levels are impractical.

The output noise level (FM measured as prescribed in the band of 50 to 15000Hz) was 55dB below the level representing ± 25 kHz frequency swing.

The system noise output (AM) in the same band was 50dB below the level representing 100% amplitude modulation.

The output noise measurement had to be performed with the visual carrier operative because of the translator's common visual/aural amplifiers.

PART 74.750(d)(2):

The modulator of this translator will accept audio from the microwave television translator relay station in one of two possible ways. First, when the microwave signal carries the audio at a separation of 4.5MHz, it will be passed through the translator's modulator multiplexed on the video. Frequency spacing, deviation, and other characteristics including distortion are therefore determined solely by the originating television station.

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The sound carrier deviation was monitored while the frequency vs. temperature measurements were taken, see Exhibit 4a. The equipment meets the ± 1 kHz requirement.

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EXHIBIT 4a

FREQUENCY DRIFT VS. TEMPERATURE
M369 MODULATOR

DEGREES C	MEASURED LO FREQUENCY(MHz)	DEVIATION(Hz)	DEVIATION(%)
+50	651,241,054	-10,693	-0.001642
+40	651,244,998	- 6,749	-0.001036
+30	651,249,389	- 2,358	-0.000362
+25	651,251,747	0	+0.0000
+20	651,254,160	+ 2,413	+0.000371
+10	651,258,449	+ 6,702	+0.001029
00	651,262,385	+10,638	+0.001633
-10	651,265,375	+13,628	+0.002093
-20	651,267,175	+15,428	+0.002369
-30	651,266,810	+15,063	+0.002313

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EXHIBIT 8

Power requirements for the 20 Watt UHF Translator were determined as follows:

1. The translator's visual power meter measures the peak visual power by reading the average levels of a detected sample of the output. The meter is calibrated by multiplying the above visual power reading by 168%. The visual metering circuitry has a negligible response to the aural power due to the large (>10MHz) detector bandwidth. When the detector bandwidth is this large, the detector does not peak detect the intercarrier beat product.
2. The aural power is measured by reading the peak level of the detected 4.5MHz intercarrier product. The level of this product has a direct correspondence to the aural power and is independent of the visual power as long as the peak visual power exceeds the aural power. This is always true for normal operation.

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POWER MEASUREMENTS

MEASURED VISUAL POWER NOTE 1	MEASURED AURAL POWER NOTE 2	SUPPLY CURRENT TO OUTPUT DEVICES VISUAL ONLY NOTE 3	SUPPLY CURRENT TO OUTPUT DEVICES VISUAL & AURAL NOTE 3
12.5 WATTS	2.0 WATTS	2.9 AMPS	2.9 AMPS

NOTE 1: Measured on the Model 43 Bird Wattmeter with the visual carrier modulated by the standard synchronizing signal at 75% of peak amplitude and the aural carrier disabled.

NOTE 2: Measured on the Model 43 Bird Wattmeter with the visual carrier disabled.

NOTE 3: The voltage across the output devices on all models is +28 volts. The output devices are operated Class A.

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EXHIBIT 9

ATTENUATION VS. FREQUENCY

MODULATING FREQUENCY REF=VISUAL CARRIER(MHz)	UPPER SIDE BAND		LOWER SIDE BAND	
	FCC LIMIT(dB)		FCC LIMIT(dB)	
+0.2	0	Reference	-	-
-0.5	-0.5		-	-
+0.5	-0.1		-	-
+1.25	-0.3		-20	>-20
+2.0	-0.4		-36	>-20
+2.5	-0.4		-40	>-20
+3.0	-0.3		-42	>-20
+3.5	-0.3		-42	>-20
+3.58	-0.2		-44	>-42
+4.1	-0.3		-46	>-20
+4.18	-0.2		-46	>-20
+4.75	-20	>-20	-50	>-20
+5.0	-20	>-20	-50	>-20
+6.0	-50	>-20	-50	>-20
+7.0	-50	>-20	-50	>-20
+8.0	-50	>-20	-50	>-20
+9.0	-50	>-20	-50	>-20
+10.0	-50	>-20	-50	>-20

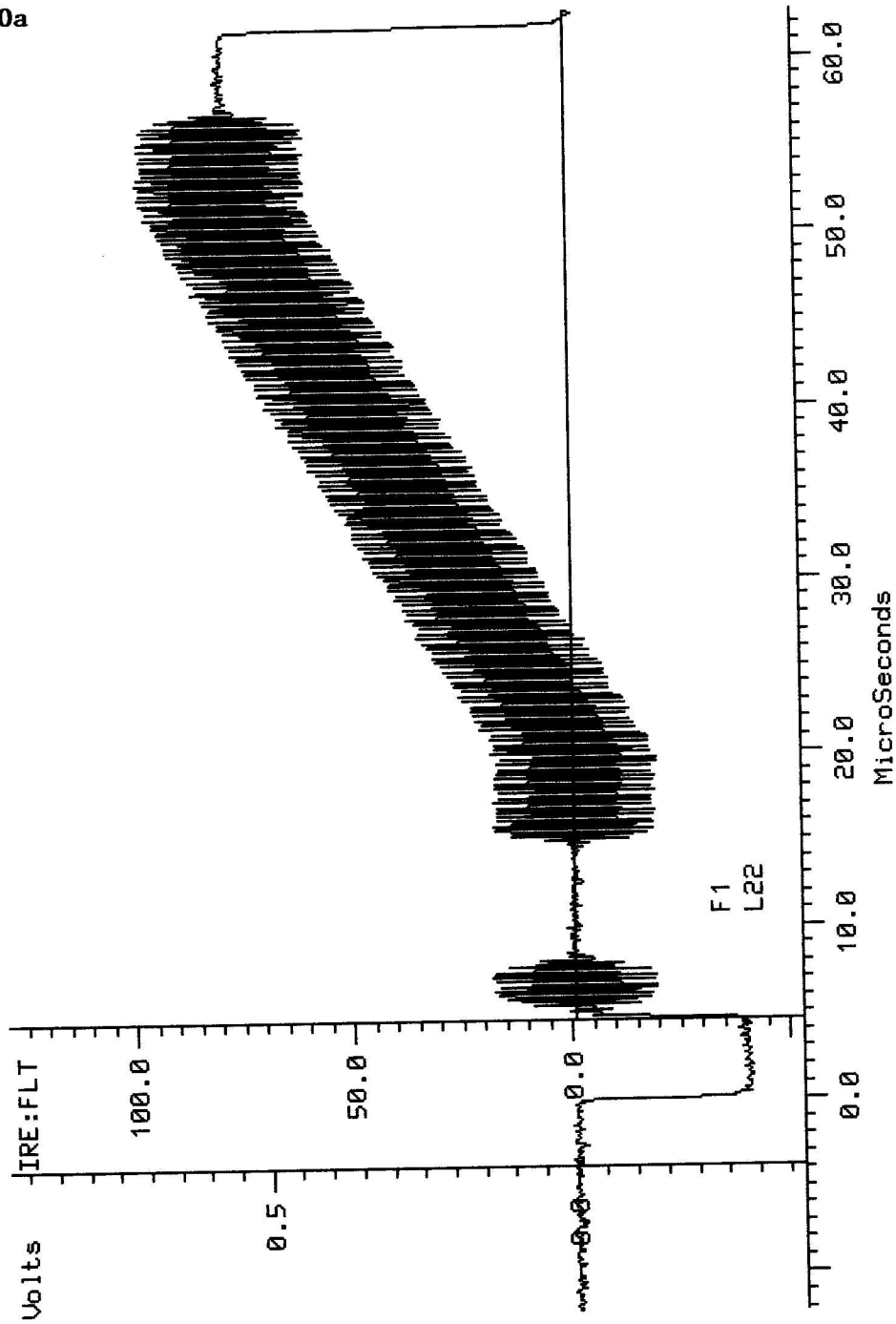
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EXHIBIT 10a

UM700A Video Measurement Set

18-Feb-02 14:27:32

Channel A System Default

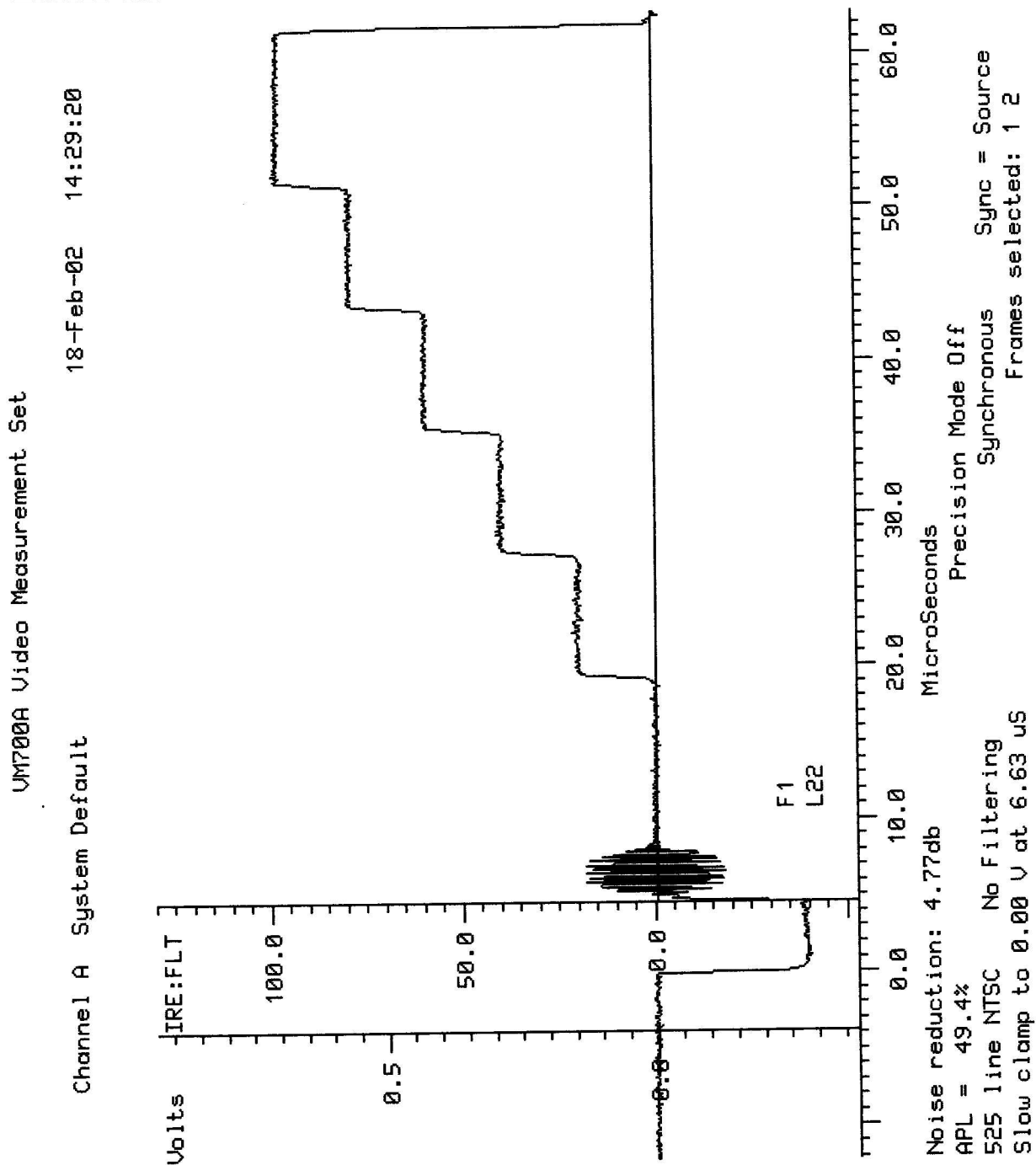


APL = 39.1%
525 line NTSC No Filtering
Slow clamp to 0.00 V at 6.63 uS

Precision Mode Off
Synchronous Sync = Source
Frames selected: 1 2

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EXHIBIT 10b



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UM700A Video Measurement Set

Channel A System Default

18-Feb-02 14:33:00

DG DP (NTSC)

Field = 1 Line = 23 (Synchronous)

Differential Gain (%) min = 0.00 max = 3.88 p-p/max = 3.73
 0.00 0.08 1.26 2.39 2.66 2.99 3.14 3.39 3.88 3.80 3.64

Wfm --> Mod Ramp

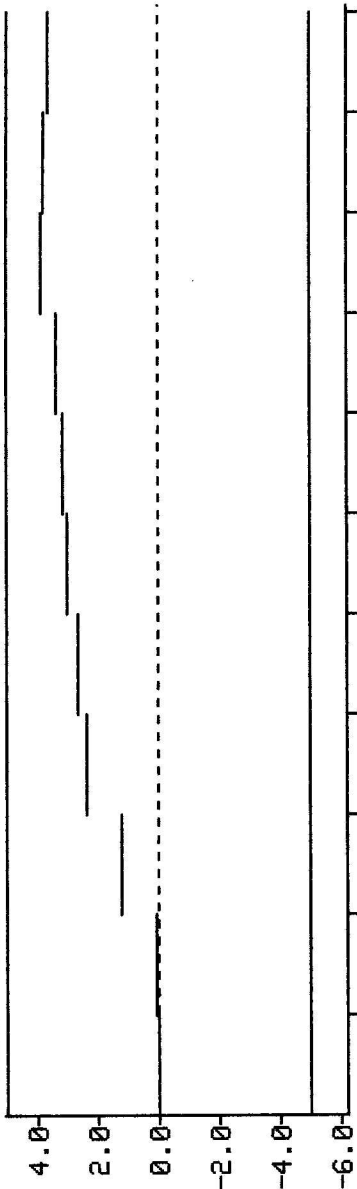


EXHIBIT 10c

Differential Phase (deg) min = 0.00 max = 0.79 pk-pk = 0.79
 0.00 0.05 0.53 0.67 0.58 0.79 0.64 0.53 0.54 0.51 0.58

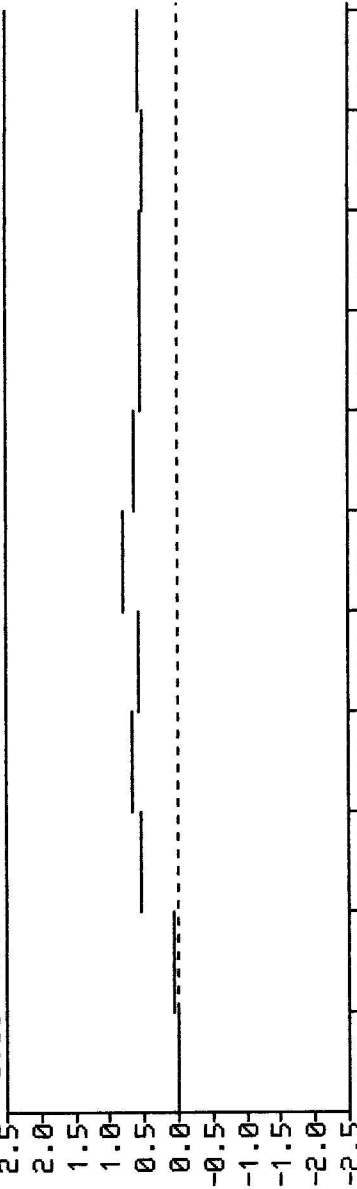


EXHIBIT 10d

1st. 2nd. 3rd. 4th. 5th. 6th. 7th. 8th. 9th. 10th. 11th.
 Average 32 -> 32

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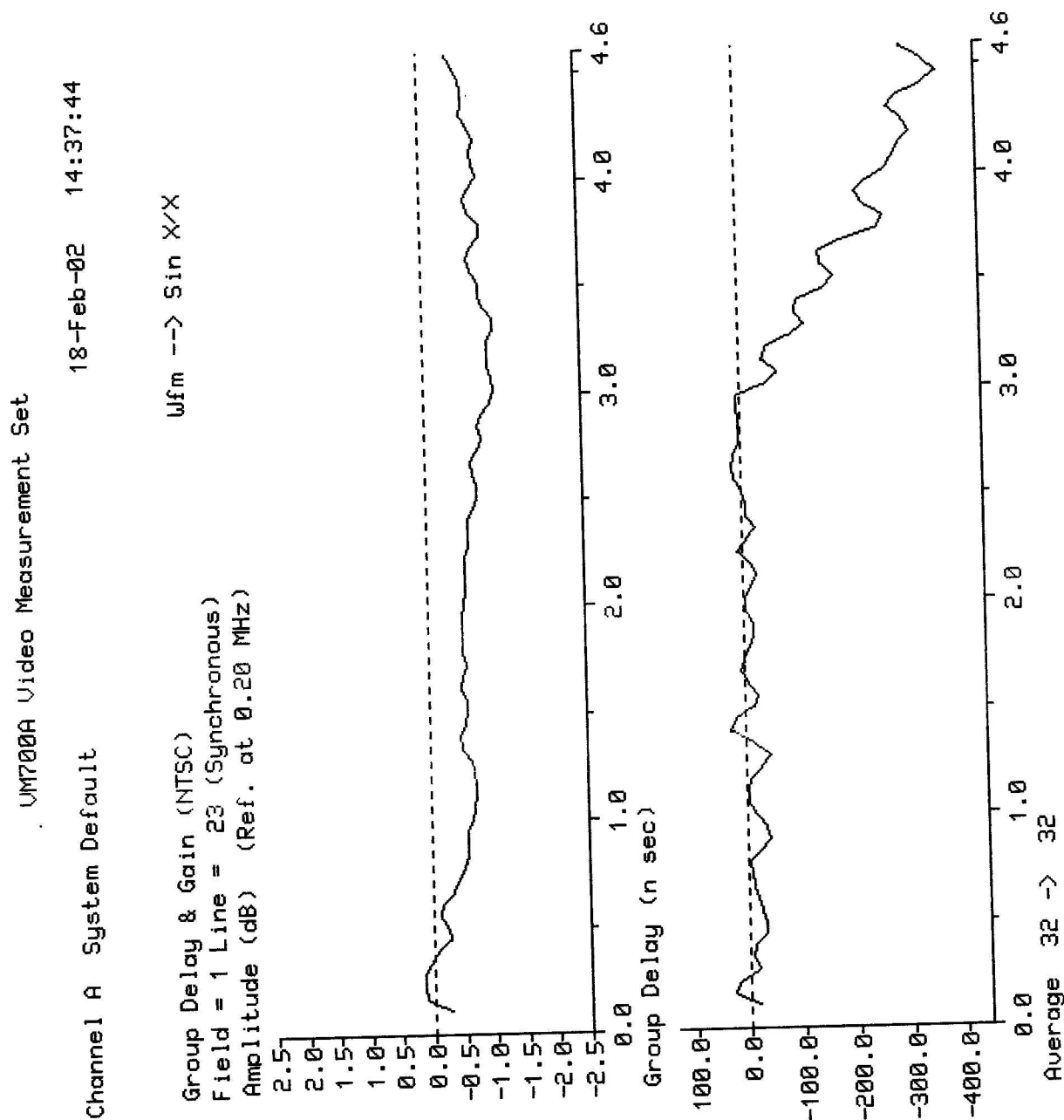
EXHIBIT 11a

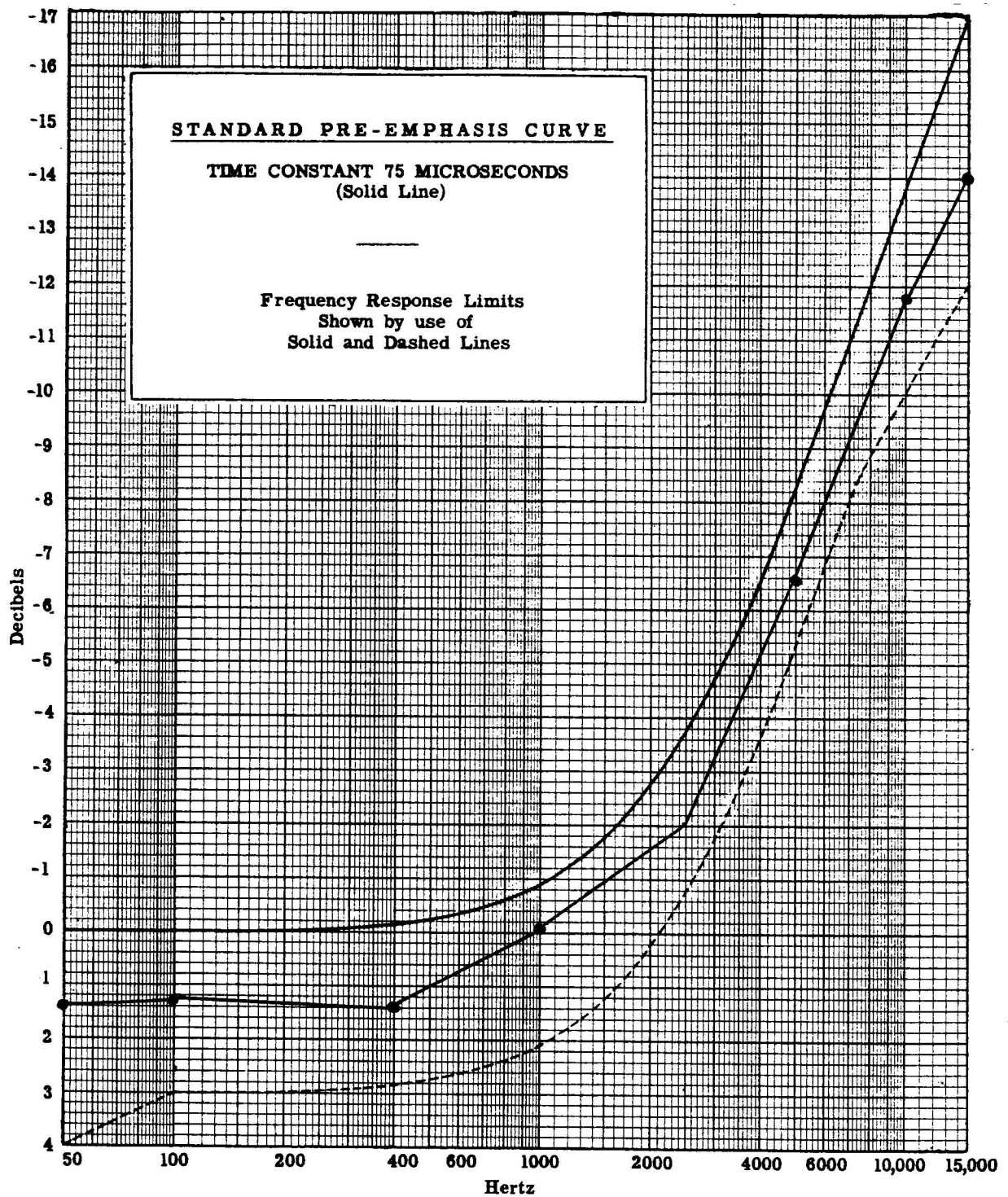
OVERALL GROUP DELAY

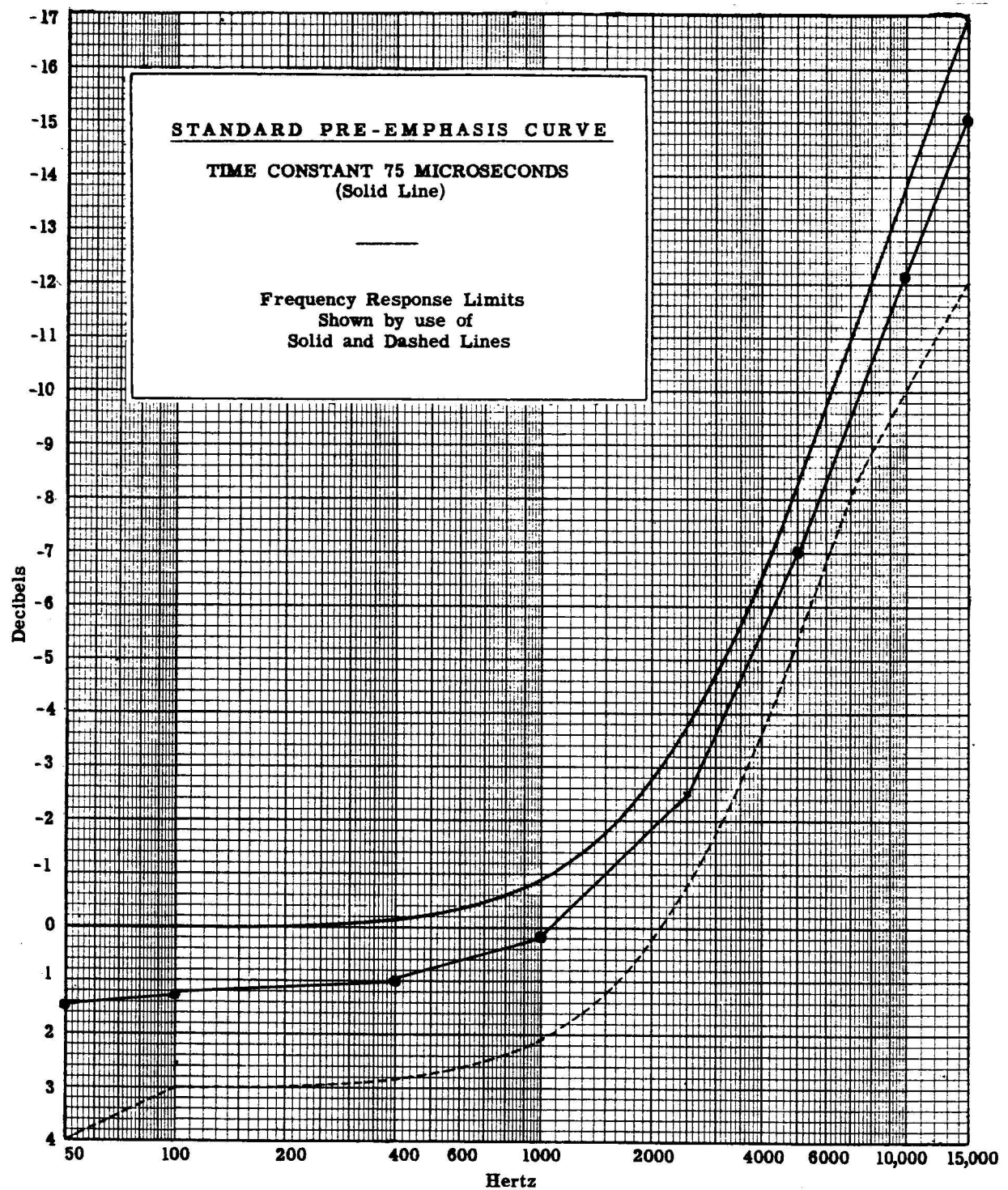
FREQUENCY(MHz)	OVERALL DELAY (nS)
0.20	0 (Reference)
0.40	-40
0.60	-30
0.80	-20
1.00	-10
1.20	-30
1.40	+20
1.60	0
1.80	-10
2.00	0
2.20	+10
2.40	-10
2.60	+10
2.80	0
3.00	-40
3.20	-60
3.40	-100
3.58	-165
3.80	-250
4.00	-280
4.18	-300

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EXHIBIT 11b



AUDIO FREQUENCY RESPONSE 50 % MODULATIONReference 50 Hz; 0dB = 1.5 dB

AUDIO FREQUENCY RESPONSE 100% MODULATIONReference 50 Hz; 0dB = 1.5dB