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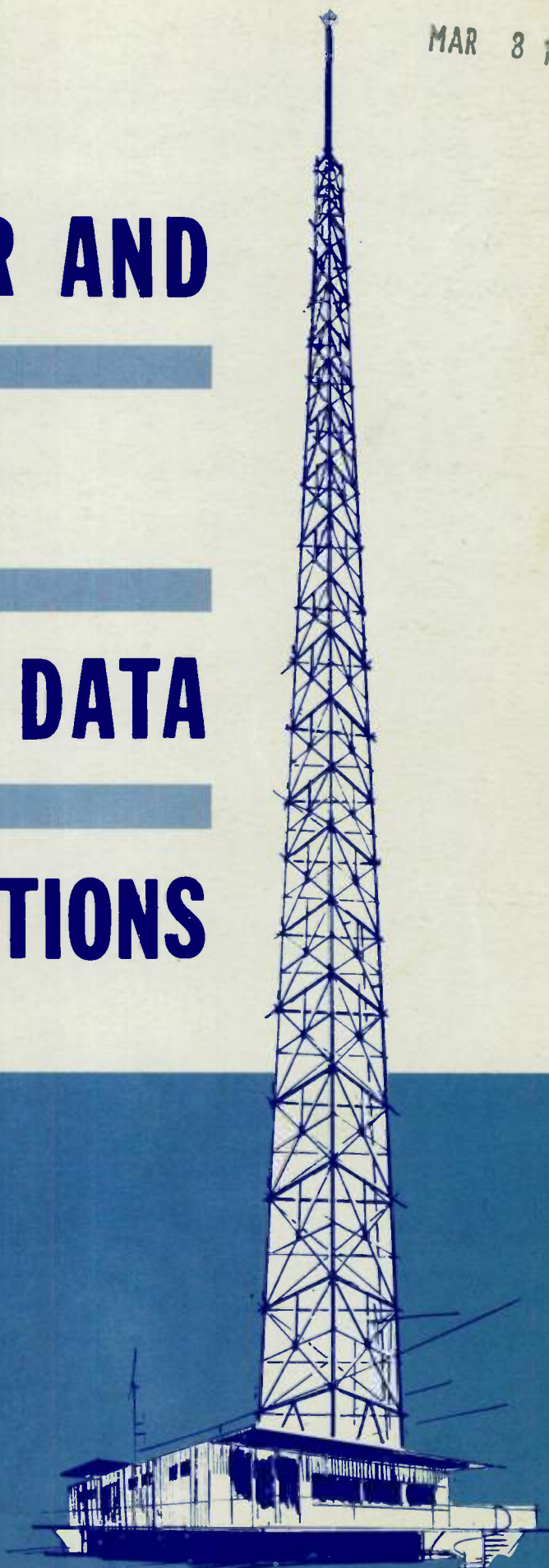
TRANSMITTER AND

ANTENNA

APPLICATION DATA

for

TELEVISION STATIONS



**TRANSMITTER AND ANTENNA
APPLICATION DATA
for
TELEVISION STATIONS**



Prepared by

Broadcast and Television Equipment Department

RADIO CORPORATION OF AMERICA

Camden, N. J. 08102

PRICE: TWO DOLLARS

CHANGES IN DESIGN—*In order to make improvements in design and to effect economies in manufacture, Radio Corporation of America reserves the right to change the design of its products at any time, and in accordance with its sole judgment, while adhering in good faith to the intent of the information contained herein.*

FOREWORD

The filing information contained in this manual provides the television equipment engineering data required to complete Section V-C of FCC Form 301. The information has been condensed and presented in tabular form to provide a quick reference for the specific filing data required.

If additional information is desired, consult RCA broadcast and television equipment catalogs (supplied free upon request). They contain complete descriptions and specifications for all major items of equipment.

RCA manufactures a complete line of broadcast equipment for television stations. In addition, RCA offers custom built equipment to meet special requirements.

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Broadcast Application		FEDERAL COMMUNICATIONS COMMISSION		Section V-C	
TELEVISION BROADCAST ENGINEERING DATA		Name of applicant			
1. Purpose of authorization applied for: (Indicate by check mark) (If application is for a new station or for any of the changes numbered B through D, complete all paragraphs of this form; if change E is of a character which will change coverage or increase the overall height of the antenna structure more than 3 feet, answer all paragraphs; otherwise complete only paragraphs 2 and 7 and the appropriate other paragraphs; for changes F through I, complete only paragraph 2 and the appropriate other paragraphs; for change J, complete only paragraphs 2, 5 and 16(b).) A. ☐ Construct a new station B. ☐ Change effective radiated power or antenna height above average terrain C. ☐ Change transmitter location D. ☐ Change frequency E. ☐ Change antenna system F. ☐ Construct or change auxiliary antenna system G. ☐ Change transmitter H. ☐ Install auxiliary or alternate main transmitter I. ☐ Other changes (specify) J. ☐ Change studio location					
2. Facilities requested Frequency _____ Mc. Channel No. _____			7. (a) Antenna structure Is the proposed construction in the immediate vicinity of any other radio station or will the proposed transmitting antenna be supported by the antenna structure of any other radio station? If "Yes", attach as Exhibit No. _____ complete engineering data showing details and effect upon other station. Submit as Exhibit No. _____ a vertical plan sketch for the proposed total structure (including supporting building if any) giving heights above ground in feet for all significant features. Effective Radiated Power (visual) _____ In dbk: _____ In kw: _____ Effective Radiated Power (aural) _____ In dbk: _____ In kw: _____ Antenna height above average terrain _____ feet Overall height in feet above ground (Without obstruction lighting) _____ Overall height in feet above mean sea level (With obstruction lighting) _____ Overall height in feet above ground (With obstruction lighting) _____ Overall height in feet above mean sea level (With obstruction lighting) _____ Height of antenna structure in feet above ground _____ feet Geographical coordinates of antenna (to nearest second) North latitude _____ West longitude _____ How were coordinates determined? _____ Indicate by check mark the zone in which structure is located. 1 ☐ 2 ☐ 3 ☐		
3. Station location (principal community) State _____ City or town _____			(b) Antenna data Visual Make _____ Model No. _____ Rated power _____ In dbk: _____ In kw: _____ Power gain in db _____ Aural (separate) Make _____ Model No. _____ Rated input power _____ In dbk: _____ Power gain in db _____		
4. Transmitter location State _____ County _____ City or town _____ Street Address (or other identification) _____			5. Main studio location State _____ County _____ City or town _____ Street address _____		
6. Transmitters Visual Make _____ Model No. _____ Rated power _____ In dbk: _____ In kw: _____ Aural Make _____ Model No. _____ Rated power _____ In dbk: _____ In kw: _____			(If the above transmitter has not been accepted for licensing by the F.C.C., attach as Exhibit No. _____ ON FILE a complete showing of transmitter details. Showing should include schematic diagram and full details of frequency control. If changes are to be made in licensed transmitter include schematic diagram and give full details of change.)		
(a) Describe in Exhibit No. _____ means which will be used for determining and maintaining power output of the transmitters to the values specified in this application.			If directional antenna is proposed, give full details including horizontal and vertical plane radiation patterns, as Exhibit No. _____		
(b) Multiplexer: Make _____ Type No. _____ Rated input _____ db Rated loss: Visual _____ db Aural _____ db			Is electrical or mechanical beam tilting proposed? If so, describe fully in Exhibit No. _____ including horizontal and pertinent vertical radiation patterns. Will antenna be altered to provide full fill-in? Yes ☐ No ☐ If yes, describe fully in Exhibit No. _____		

VHF See pgs. 8-10

UHF See pgs. 13-18

VHF See pg. 6

UHF See pg. 11

VHF See pgs. 8-10

UHF See pgs. 13-15

VHF See pg. 7

UHF See pg. 12

8. Transmission line proposed to supply power to the antenna from the transmitter

(a) Visual			(b) Aural (if separate)		
Make	Type No.	Rated input power in dbk	Make	Type No.	Rated input power in dbk
Size (nominal inside transverse dimensions) in inches	Length in feet	Power loss in dbk for this length	Size (nominal inside transverse dimensions) in inches	Length in feet	Power loss in dbk for this length

See pgs. 19 through 29

9. Proposed operation

(a) Visual			(b) Aural		
Transmitter power output (after vestigial side-band filter, if used) In dbk: In kw:	Multiplexer loss in db: INCL. IN TRANSMITTER POWER OUTPUT RATING	Input to transmission line in dbk:	Transmitter power output In dbk: In kw:	Multiplexer loss in db: VHF See pg. 7 UHF See pg. 12	Input to transmission line in dbk:
Transmission line power loss in dbk: See pgs. 21 through 29	Antenna input power in dbk: VHF See pgs. 8-10 UHF See pgs. 13-15	Antenna power gain in db: Effective radiated power In dbk: In kw:	Transmission line power loss in dbk: See pgs. 21 through 29	Antenna input power in dbk: VHF See pgs. 8-10 UHF See pgs. 13-15	Antenna power gain in db: Effective radiated power In dbk: In kw:

10. Modulation monitors

(a) Visual monitor or monitoring equipment		
Make	RCA	
Make	HEWLETT-PACKARD	
Type No.	335E TYPE 3	

VHF See pg. 6
UHF See pg. 11

11. Frequency monitors

(a) Visual monitor		
Make	Type No.	Accuracy
HEWLETT-PACKARD	335E TYPE 3	ON FILE

(b) Aural monitor		
Make	Type No.	Accuracy
HEWLETT-PACKARD	335E TYPE 3	ON FILE

12. If the above monitors or monitoring equipment have not been approved by the F.C.C., include as Exhibit No. ON FILE a brief technical description of each.

13. Will the studios, cameras, microphones, and other equipment proposed for transmission of programs be designed for compliance with the Commission's Rules? Yes ☐ No ☐

14. (a) Attach as Exhibit No. a map(s) (topographic where obtainable, such as U. S. Geological Survey quadrangles) for the area within 15 miles of the proposed transmitter location and show drawn thereon the following data:

1. Proposed transmitter location—accurately plotted;
2. Transmitter location and call letters of all known radio stations (except amateur) and the location of known commercial and government receiving stations within 2 miles of the proposed transmitter location;
3. Character of the area within 2 miles of proposed transmitter location, suitably designated as to residential, business, industrial, and rural nature;
4. At least eight radials each extending to a distance of ten or more miles from the proposed transmitter location, one or more of which must extend through the principal city to be served.

(b) Attach as Exhibit No. profile graphs with reasonably large scales for the radials in (a) (4) above. Each graph shall show the elevation of the antenna radiation center. Identify each graph by its bearing from the proposed transmitter location. Direction of true north shall be zero azimuth, with angles measured clockwise. Show source of topographical data on each.

15. From the profile graphs in 14(b), for the eight mile distance between two and ten miles from the proposed transmitter location, and in accordance with the procedure prescribed in the Commission's Rules, supply the following tabulation of data:

Radial bearing (degrees true)	Average elevation of radial (2-10 mi.) in feet above mean sea level	Height in feet of antenna radiation center above average elevation of radial (2-10 mi.)	Effective radiated power in radial direction	Predicted distance in miles to the Grade A contour	Predicted distance in miles to the Grade B contour
0	 feet	 feet	 dbk	 mi.	 mi.
45					
90					
135					
180					
225					
270					
315					
(e)					
Average					

*Radial over principal community if not included above. Do not include in average.

Antenna height above average terrain feet (Must be identical with Paragraph 2)

VHF TV TRANSMITTERS

POWER RATINGS

Type	Channels	Rated Visual Power ¹		Rated Aural Power ²	
		kw	dbk	kw	dbk
TTL-100AL	2-6	0.12	-9.21	0.06	-12.22
TTL-100AH	7-13	0.12	-9.21	0.06	-12.22
TTL-500AL	2-6	0.5	-3.01	0.3	-5.23
TTL-500AH	7-13	0.5	-3.01	0.3	-5.23
TT-2BL	2-6	2.0	3.01	1.05	.21
TT-2BH	7-13	2.0	3.01	1.2	.79
TT-5BH	7-13	5.0	6.99	3.0	4.77
TT-6AL	2-6	6.0	7.78	3.15	4.98
TT-6ALLA	2-6	6.0	7.78	1.30	1.14
TT-6EL	2-6	6.0	7.78	5.50	7.40
TT-11AH	7-13	11.0	10.41	6.0	7.78
TT-12BL	2-6	12.5	10.97	3.5	5.44
TT-12/12EL	2-6	25.0	13.98	5.5	7.38
TT-12/12BL	2-6	25.0	13.98	5.5	7.38
TT-12EL	2-6	12.5	10.97	2.75	4.41
TT-25DL	2-6	25.0	13.98	7.0	8.45
TT-25EL	2-6	25.0	13.98	7.0	8.45
TT-25CH	7-13	25.0	13.98	14.0	11.46
TT-25CHLA	7-13	25.0	13.98	6.0	7.78
TT-25DH	7-13	25.0	13.98	13.6	11.35
TT-25DHLA	7-13	25.0	13.98	3.0	4.77
TT-35CH	7-13	35.0	15.44	21.0	13.22
TT-35CHLA	7-13	35.0	15.44	6.0	7.78
TT-50DH	7-13	50.0	16.99	27.2	14.35

¹ Measured at output of sideband filter or filterplexer.

² Measured at input of sideband filter or filterplexer.

MONITOR DATA

Description	Make	Type
Visual Modulation Monitor	RCA	BW-4B/TO-4
Aural Modulation Monitor	Hewlett-Packard	335E Type 3
Visual Frequency Monitor	Hewlett-Packard	335E Type 3
Aural Frequency Monitor	Hewlett-Packard	335E Type 3

VHF TV TRANSMITTERS

BRIDGE DIPLEXER POWER RATINGS

Type Number	Channel	TV Power Rating (50% aural)		Rated Visual Loss db	Rated Aural Loss db
		kw	dbk		
MI-19390	2-6	12.5	10.98	0.004	0.004
MI-19390	7-13	12.5	10.98	0.004	0.004
MI-19391	2-6	50.0	16.99	0.004	0.004
MI-19394	7-13	50.0	16.99	0.004	0.004

FILTERPLEXER POWER RATINGS

Type Number	Channel	TV Power Rating (50% aural except as noted)		Rated Visual Loss ¹ db	Rated Aural Loss db
		kw	dbk		
MI-19179	2-6	25.0	13.98	0.22	0.22
MI-561530	7-13	35.0 (20% aural)	15.44	0.27	0.36
MI-27316	7-13	50.0	16.99	0.27	0.36

¹ Visual losses included in transmitter peak power ratings.

NOTCH DIPLEXER POWER RATINGS

Type Number	Channel	TV Power Rating		Rated Visual Loss ¹ db	Rated Aural Loss db
		kw	dbk		
MI-561531	2-6	40.0 (20% aural)	16.02	0.30	0.40
MI-27965	7-13	50.0 (50% aural)	16.99	0.20	0.40

¹ Visual losses included in transmitter peak power ratings.

VHF TV ANTENNAS

SUPERTURNSTILE ANTENNA DATA

Type No.	No. of Sections	H ₂ in feet ¹	H ₃ in feet ²	H ₄ in feet ³	Channel	db Gain	Power Gain	TV Power Rating (50% aural except as noted) kw dbk	
TF-2BH	2	13.75	7.65	16.5	7	3.22	2.1	6.5	8.12 (20% aural)
					8	3.22	2.1		
					9	3.42	2.2		
					10	3.42	2.2		
					11	3.42	2.2		
					12	3.62	2.3		
					13	3.80	2.4		
TF-2BM	2	26.75	14.0	31.1	4	2.79	1.9	10.6	10.25 (20% aural)
					5	3.22	2.1		
					6	3.42	2.2		
TF-2BL	2	32.0	16.5	37.5	2	2.79	1.9	12.3	10.89 (20% aural)
					3	3.22	2.1		
TF-3EL	3	50.0	26.0	55.5	2	4.62	2.9	25.0	13.98
					3	4.91	3.1		
TF-3EM	3	41.75	22.0	46.1	4	4.62	2.9	25.0	13.98
					5	4.91	3.1		
					6	5.18	3.3		
TF-4BL	4	66.0	33.5	72.5	2	6.02	4.0	33.3	15.25
					3	6.12	4.1		
TF-4BM	4	54.75	28.0	59.1	4	6.02	4.0	33.3	15.25
					5	6.23	4.2		
					6	6.43	4.4		
TF-5CL	5	83.0	42.0	88.5	2	6.90	4.9	41.6	16.20
					3	7.08	5.1		
TF-5CM	5	68.75	35.0	73.1	4	6.90	4.9	41.6	16.20
					5	7.24	5.3		
					6	7.32	5.4		
TF-6AL	6	101.0	51.5	106.5	2	7.71	5.9	50.0	16.99
					3	7.85	6.1		
TF-6BM	6	82.75	42.0	87.1	4	7.78	6.0	50.0	16.99
					5	8.06	6.4		
					6	8.13	6.5		
TF-6AH	6	37.25	19.25	40.0	7	7.92	6.2	35.0	15.46
					8	7.99	6.3		
					9	8.26	6.7		
					10	8.26	6.7		
					11	8.33	6.8		
					12	8.33	6.8		
					13	8.39	6.9		
TF-12AL	12	202.0	121.9	207.5	2	10.57	11.4	50.0	16.99
					3	10.61	11.5		
TF-12AM	12	166.75	100.8	171.1	4	10.72	11.8	50.0	16.99
					5	10.79	12.0		
					6	10.83	12.1		
TF-12AH	12	72.9	44.3	75.6	7	10.61	11.5	50.0	16.99
					8	10.68	11.7		
					9	10.83	12.1		
					10	10.93	12.4		
					11	10.83	12.1		
					12	10.72	11.8		
					13	10.68	11.7		
TF-12BH	12	72.9	37.25	75.6	7	9.82	9.6	50.0	16.99
					8	9.82	9.6		
					9	10.0	10.0		
					10	10.21	10.5		
					11	10.21	10.5		
					12	9.91	9.8		
					13	9.91	9.8		

¹ H₂ Height of antenna above tower top (without obstruction lighting)

² H₃ Height of radiation center above tower top.

³ H₄ Height of antenna above tower top including obstruction lighting.

VHF TV ANTENNAS

TRAVELING WAVE ANTENNA DATA

(Note: For Radome installations, also see data on following page)

Type No.	No. of Sections ⁴	H ₂ in feet ¹	H ₃ in feet ²	H ₄ in feet ³	Channel	db Gain	Power Gain	TV Power Rating (50% aural) kw dbk
TW-9A7-P	76.0	76.0	40.0	79.0	7	9.74	9.4	50.0 16.99
TW-9A8-P	73.0	73.0	38.0	76.0	8	9.55	9.0	50.0 16.99
TW-9A9-P	69.0	69.0	36.0	72.0	9	9.55	9.0	50.0 16.99
TW-9A10-P	68.0	68.0	35.5	71.0	10	9.55	9.0	50.0 16.99
TW-9A11-P	67.0	67.0	35.0	70.0	11	9.55	9.0	50.0 16.99
TW-9A12-P	66.0	66.0	34.5	69.0	12	9.55	9.0	50.0 16.99
TW-9A13-P	62.0	62.0	31.5	65.0	13	9.55	9.0	50.0 16.99
TW-12A7-P	95.0	95.0	49.0	98.0	7	10.8	12.0	50.0 16.99
TW-12A8-F	92.0	92.0	47.5	95.0	8	10.8	12.0	50.0 16.99
TW-12A9-P	86.0	86.0	45.0	89.0	9	10.8	12.0	50.0 16.99
TW-12A10-P	87.0	87.0	45.0	90.0	10	10.8	12.0	50.0 16.99
TW-12A11-P	82.0	82.0	43.0	85.0	11	10.8	12.0	50.0 16.99
TW-12A12-P	80.0	80.0	42.0	83.0	12	10.8	12.0	50.0 16.99
TW-12A13-P	78.0	78.0	40.5	81.0	13	10.94	12.4	50.0 16.99
TW-15A7-P	116.0	116.0	59.0	121.0	7	11.77	15.0	50.0 16.99
TW-15A8-P	115.0	115.0	59.0	118.0	8	12.0	15.8	50.0 16.99
TW-15A9-P	110.0	110.0	56.5	113.0	9	11.77	15.0	50.0 16.99
TW-15A10-P	107.0	107.0	55.5	110.0	10	11.77	15.0	50.0 16.99
TW-15A11-P	109.0	109.0	56.5	112.0	11	12.0	15.8	50.0 16.99
TW-15A12-P	101.0	101.0	54.0	104.0	12	11.77	15.0	50.0 16.99
TW-15A13-P	98.0	98.0	50.5	101.0	13	11.77	15.0	50.0 16.99
TW-18A7-P	137.5	137.5	70.75	140.5	7	12.56	18.0	50.0 16.99
TW-18A8-P	133.0	133.0	68.0	136.0	8	12.56	18.0	50.0 16.99
TW-18A9-P	126.0	126.0	64.5	129.0	9	12.56	18.0	50.0 16.99
TW-18A10-P	123.0	123.0	63.0	126.0	10	12.56	18.0	50.0 16.99
TW-18A11-P	122.0	122.0	62.5	125.0	11	12.56	18.0	50.0 16.99
TW-18A12-P	119.0	119.0	61.0	122.0	12	12.56	18.0	50.0 16.99
TW-18A13-P	113.0	113.0	58.0	116.0	13	12.56	18.0	50.0 16.99

¹ H₂ Height of antenna above tower top (without obstruction lighting).

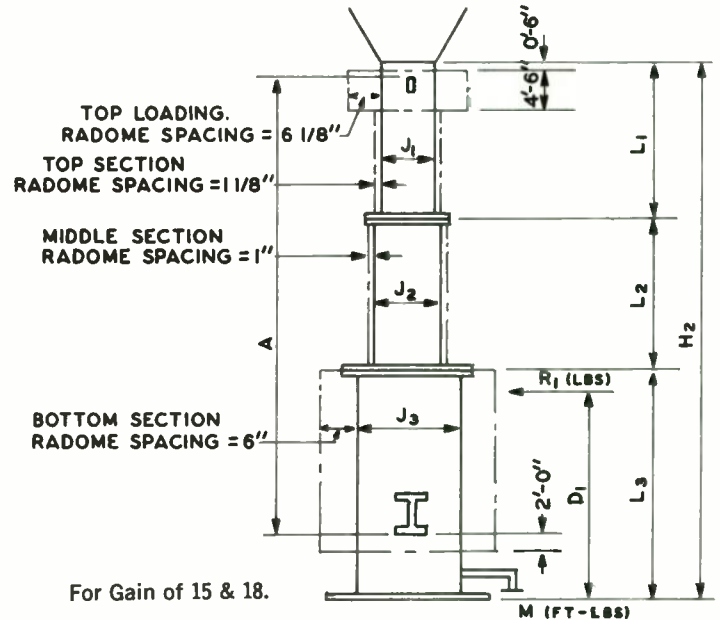
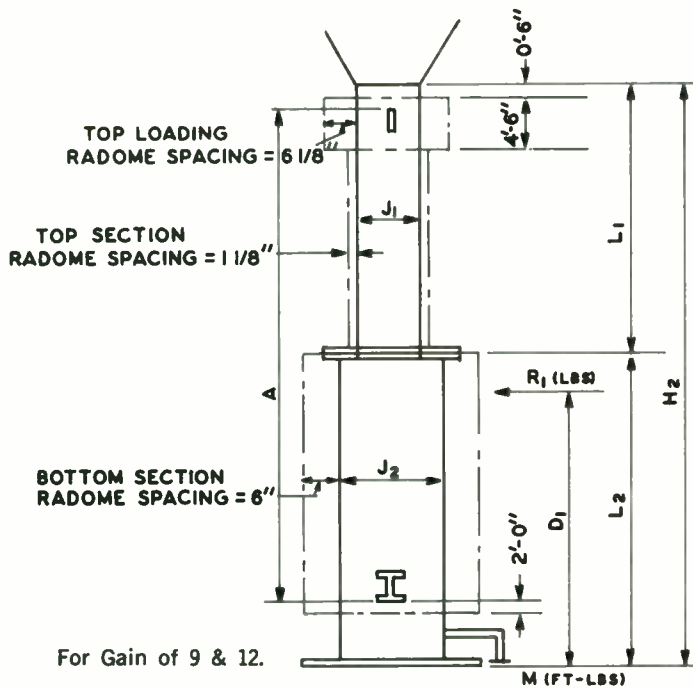
² H₃ Height of radiation center above tower top.

³ H₄ Height of antenna above tower top including obstruction lighting.

⁴ Use antenna length, in feet (H₂)

VHF TV ANTENNAS

TRAVELING WAVE ANTENNAS WITH RADOMES MECHANICAL SPECIFICATIONS



Based on 50/33 psf

Type	H-2	J-1	J-2	J-3	L-1	L-2	L-3	R-1	M
TW-9A7-R	76	10.75	14	—	32	44	—	4510	157.8
TW-9A8-R	73	14	14	—	37	36	—	4380	149
TW-9A9-R	69	14	14	—	30.5	38.5	—	4380	148
TW-9A10-R	68	14	14	—	29.5	38.5	—	4300	144
*TW-9A11-R	67	14	14	—	29.5	37.5	—	4260	140
TW-9A12-R	66	14	14	—	33	33	—	3960	129.1
TW-9A13-R	62	14	14	—	31.5	30.5	—	3830	117
*TW-12A7-R	95	10.75	18	—	42.3	52.6	—	6100	253.5
*TW-12A8-R	92	10.75	18	—	42.3	49.7	—	5860	235.5
TW-12A9-R	87	10.75	14	—	42.3	44.7	—	4930	195.5
TW-12A10-R	83	10.75	18	—	46	37	—	4960	178.3
TW-12A11-R	82	10.75	14	—	45	37	—	4470	164
TW-12A12-R	80	14	14	—	39	41	—	4960	193.2
TW-12A13-R	78	10.75	14	—	45	33	—	4205	149.3
TW-15A7-R	116	10.75	18	18	48.5	26.5	41	6890	344
TW-15A8-R	115	10.75	18	18	44	31	40	6910	342
TW-15A9-R	110	10.75	10.75	18	28	32.3	49.7	6515	321
TW-15A10-R	107	10.75	10.75	18	29.5	31.0	46.5	6225	287.5
TW-15A11-R	109	10.75	18	18	45	30.7	33.3	6475	307
TW-15A12-R	97	10.75	10.75	18	25.7	31.9	39.5	5630	234
TW-15A13-R	98	10.75	10.75	18	29	33	36	5440	234
TW-18A7-R	137.5	10.75	14	20	45	40.8	51.7	8300	477
TW-18A8-R	133	10.75	18	20	50.75	36.25	46	8200	463
TW-18A9-R	126	10.75	14	20	45	37.5	43.5	7420	392
TW-18A10-R	123	10.75	14	20	44	34.4	44.6	7340	378
*TW-18A11-R	122	10.75	14	20	46.5	31.5	44	7230	370
TW-18A12-R	117	10.75	14	18	46.5	22.5	43	6750	340.5
TW-18A13-R	113	10.75	14	18	45	27	41	6520	317.5

* Estimated, subject to actual design being completed.

Symbol
H-2
J-1
J-2
Units
Feet
Inches
Inches

Symbol
J-3
L-1
L-2
Units
Inches
Feet
Feet

Symbol
L-3
R-1
M
Units
Feet
Lbs.
KIP Feet

UHF TV TRANSMITTERS

POWER RATINGS

Type	Channels	Rated Visual Power ¹		Rated Aural Power ²	
		kw	dbk	kw	dbk
TTU-1B	14-83	1.0	0.00	0.6	-2.22
TTU-1BLA	14-83	1.0	0.00	0.22	-6.58
TTU-2A	14-83	2.0	3.01	2.8	4.47
TTU-10A	14-83	10.0	10.00	2.8	4.47
TTU-12A ³	14-83	12.6	11.00	7.6	8.79
		to	to	to	to
		10.3	10.13	6.2	7.92
TTU-12ALA	14-83	12.6	11.00	2.77	4.43
		to	to	to	to
		10.3	10.13	2.26	3.54
TTU-25B ³	14-83	25.0	13.98	15.0	11.76
		to	to	to	to
		18.6	12.70	11.2	10.49
TTU-25BLA ³	14-83	25.0	13.98	5.5	7.4
		to	to	to	to
		18.6	12.70	4.09	6.12
TTU-30A ⁴	14-83	30.0	14.77	17.0	12.30
TTU-30A ⁵	14-83	30.0	14.77	8.5	9.29
TTU-50C	14-83	55.0	17.40	16.0	12.04
TTU-50C1	14-83	55.0	17.40	16.0	12.04

¹ Measured at filterplexer output.

² Measured at filterplexer input.

³ Full rating through Channel 31. Higher channel derating curve shown in RCA Broadcast Transmitting Catalog for VHF-UHF Television and on file with FCC.

⁴ With ES-27254 Filterplexer.

⁵ With MI-19086-F Filterplexer.

MONITOR DATA

Description	Make	Type
Visual Modulation Monitor	RCA	BWU-4B/TO-4
Aural Modulation Monitor	Hewlett-Packard	335E Type 3
Visual Frequency Monitor	Hewlett-Packard	335E Type 3
Aural Frequency Monitor	Hewlett-Packard	335E Type 3

UHF TV TRANSMITTERS

FILTERPLEXER POWER RATINGS

Type No.	Used with Transmitter Type	TV Power Rating (25% aural)		Rated Aural Loss db	Rated Visual Loss ¹ db
		kw	dbk		
MI-19086-H	TTU-1B	1	0.0	0.46	0.46
MI-19086-HM	TTU-2A	2	3.01	0.46	0.46
MI-19086-J	TTU-10A TTU-12A	12.5	10.96	0.46	0.46
MI-19086-F	TTU-25BLA TTU-30A	30	14.77	0.46	0.46
MI-561550	TTU-50C (Ch. 14-42)	60	17.78	0.30 ²	0.20 ³
MI-561551	TTU-50C (Ch. 43-83)	60	17.78	0.30 ²	0.20 ³

¹ Visual losses included in Transmitter peak power ratings.

² Typical measured aural efficiency is 94%.

³ Typical measured visual efficiency is 97%.

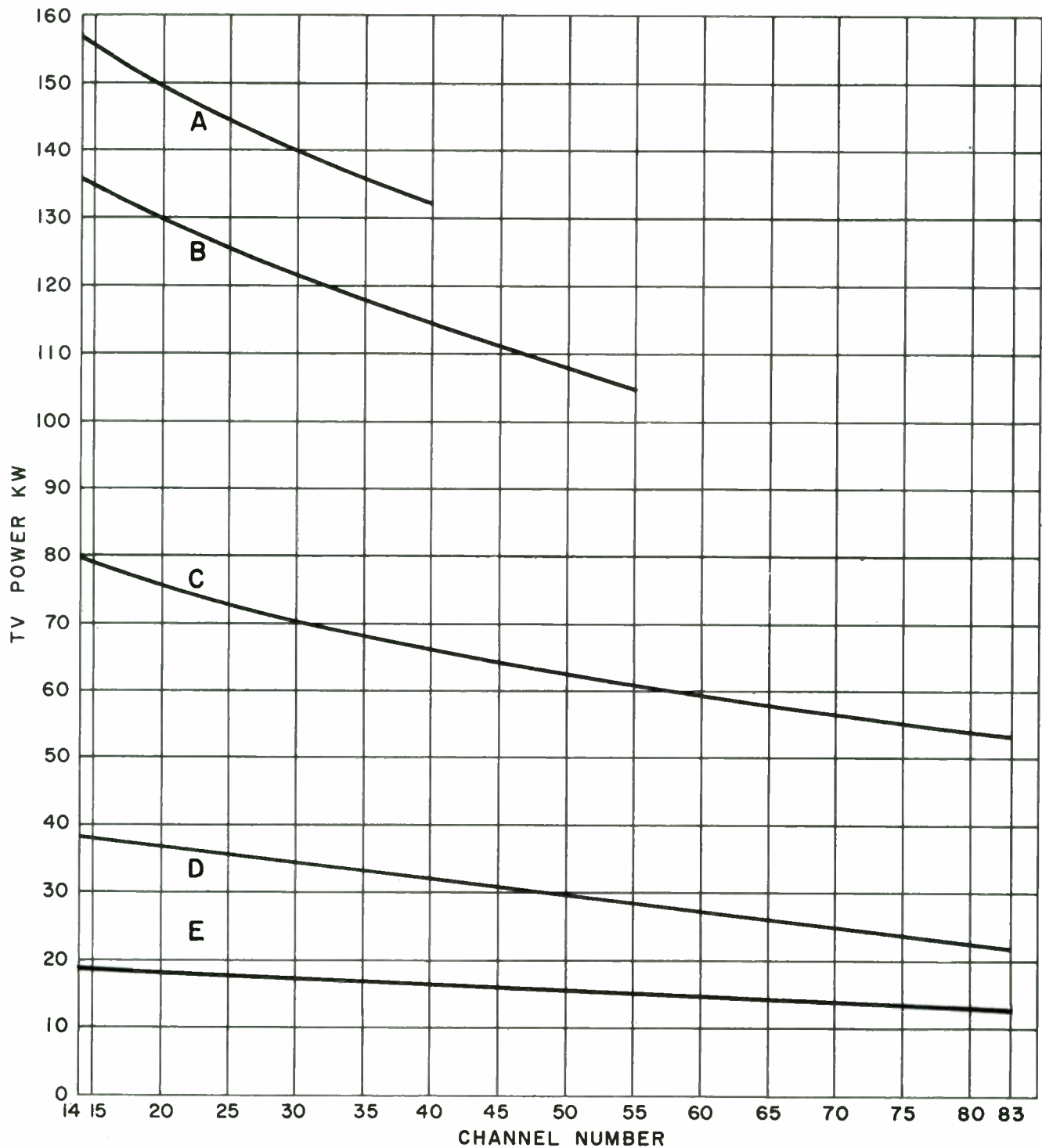
UHF TV ANTENNAS

PYLON ANTENNA DATA

Channel	Type Number	No. of Sections	TV Power Rating kw dbk	Electrical Beam Tilt degrees	Major Lobe Gain db Power	Horizontal Gain db Power		
14-57	TFU-6C		See Curve E Page 14	0.0	6	7.78	5.96	7.75
14-83	TFU-6J		See Curve D Page 14	2.0	6	7.78	5.96	7.75
14-30	TFU-24DL		See Curve E Page 14	0	24	13.80	—	—
				0.25	23.2	13.65	22.8	13.57
				0.5	22.1	13.44	19.5	12.90
				0.75	20.5	13.11	14.2	11.52
				1.0	18.7	12.71	10.0	10.0
31-50	TFU-24DM	Use	See Curve E Page 14	0	24	13.80	—	—
		Antenna		0.25	23.2	13.65	22.8	13.57
		Length		0.5	22.1	13.44	19.5	12.90
		in		0.75	20.5	13.11	14.2	11.52
		Feet		1.0	18.7	12.71	10.0	10.0
31-70	TFU-27DJ	(H ₂)	See Curve D	0	27	14.31	—	—
		See	Page 14	0.25	25.4	14.04	24.5	13.89
		Pages 16, 17 & 18		0.5	24.0	13.80	20.3	13.07
				0.75	21.9	13.40	14.0	11.46
				1.0	19.4	12.87	8.0	9.03
14-70	TFU-30J			0	30	14.77	—	—
			See Curve C	0.25	28.5	14.54	27.3	14.36
			Page 14	0.5	27.0	14.31	22.5	13.52
				0.75	25.5	14.06	16.5	12.17
				1.0	22.5	13.52	8.9	9.49
14-70	TFU-25G		Channel 14-55	0	25	13.98	—	—
			See Curve B	0.25	25	13.98	24.3	13.85
			Channel 56-70	0.5	25	13.98	22.3	13.48
			See Curve C	0.75	25	13.98	18.9	12.76
			Page 14					
14-70	TFU-46K		Channel 14-40	0	46	16.62	—	—
			See Curve A	0.25	46	16.62	40.8	16.10
			Channel 41-55	0.5	46	16.62	27.4	14.37
			See Curve B	0.75	46	16.62	12.8	11.07
			Channel 56-70					
			See Curve C					
			Page 14					

UHF TV ANTENNAS

POWER INPUT RATINGS

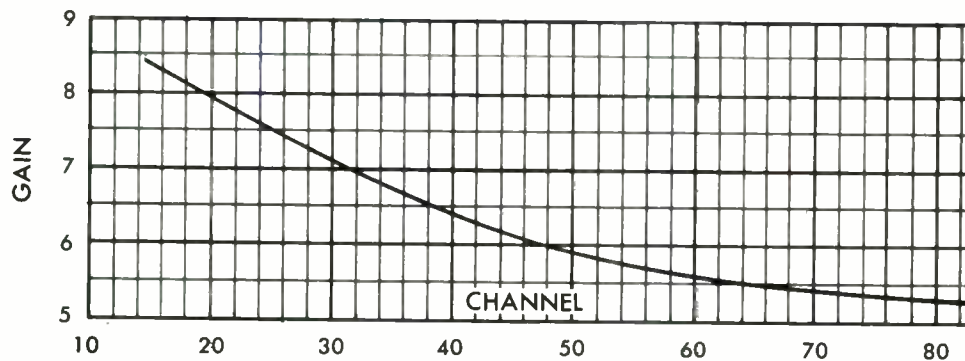


NOTE: Values based on 0.6 black level visual power and 0.2 aural power.

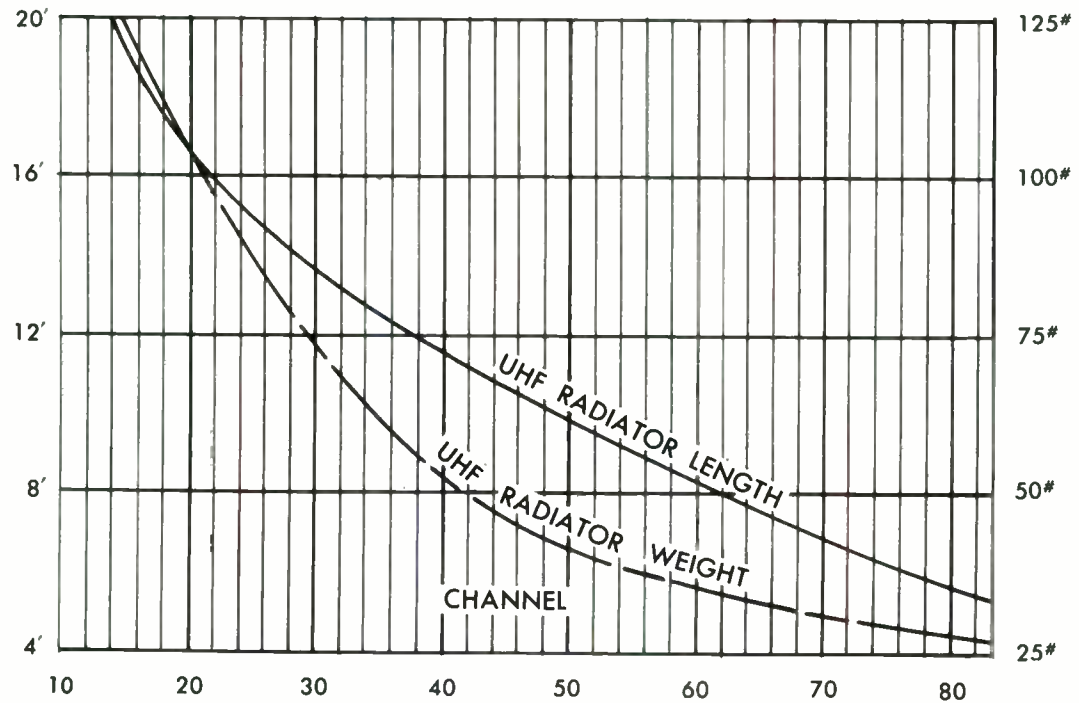
UHF TV ANTENNAS

ZEE AND VEE-ZEE PANEL DATA

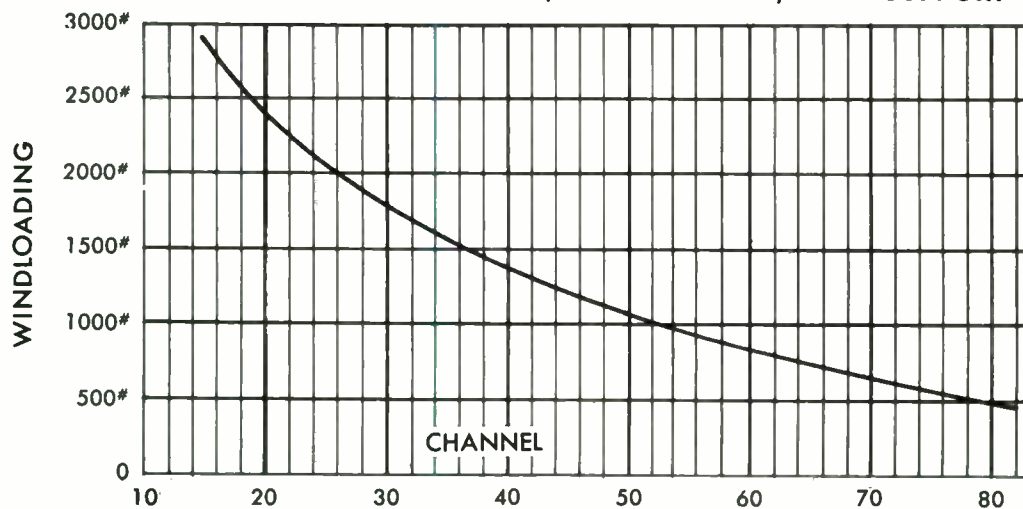
APPROX. OMNIDIRECTIONAL SINGLE LAYER GAIN



APPROX. SINGLE RADIATOR LENGTH AND WEIGHT



ESTIMATED WIND LOADING, SINGLE LAYER, LESS SUPPORT



UHF TV ANTENNAS

HEIGHT IN FEET

Channel	Type TFU-6C1 H ₂	H ₃	Type TFU-6J H ₂	H ₃	H ₄	Type TFU-24DL H ₂	H ₃	H ₄	Type TFU-24DM H ₂	H ₃	H ₄	Channel
14	15.0	7.5	16.9	8.5		53.1	26.6					14
15	14.9	7.5	16.7	8.4		52.4	26.2					15
16	14.7	7.4	16.5	8.3		51.8	25.9					16
17	14.5	7.3	16.3	8.2		51.4	25.7					17
18	14.4	7.2	16.2	8.1		50.8	25.4					18
19	14.2	7.1	16.0	8.0		49.9	25.0					19
20	14.0	7.0	15.8	7.9		49.6	24.8					20
21	13.9	7.0	15.6	7.8		49.1	24.6					21
22	13.7	6.9	15.5	7.8		48.4	24.2					22
23	13.6	6.8	15.3	7.7		47.8	23.9					23
24	13.4	6.7	15.2	7.6		47.3	23.7					24
25	13.3	6.7	15.0	7.5		46.9	23.5					25
26	13.1	6.6	14.9	7.4		46.3	23.4					26
27	13.0	6.5	14.7	7.4		45.8	22.9					27
28	12.9	6.5	14.6	7.3		45.3	22.7					28
29	12.7	6.4	14.4	7.2		45.0	22.5					29
30	12.6	6.3	14.3	7.2		44.4	22.2					30
31	12.5	6.3	14.2	7.1								31
32	12.4	6.2	14.0	7.0								32
33	12.2	6.1	13.9	7.0								33
34	12.1	6.1	13.8	6.9								34
35	12.0	6.0	13.7	6.9								35
36	11.9	6.0	13.6	6.8								36
37	11.8	5.9	13.5	6.8								37
38	11.7	5.9	13.4	6.7								38
39	11.6	5.8	13.2	6.6								39
40	11.4	5.7	13.1	6.6								40
41	11.3	5.7	13.0	6.5								41
42	11.2	5.6	12.9	6.5								42
43	11.1	5.6	12.8	6.4								43
44	11.0	5.5	12.7	6.4								44
45	10.9	5.5	12.6	6.3								45
46	10.9	5.5	12.5	6.3								46
47	10.8	5.4	12.4	6.2								47
48	10.7	5.4	12.3	6.2								48
49	10.6	5.3	12.2	6.1								49
50	10.5	5.3	12.1	6.1								50
51	10.4	5.2	12.0	6.0								51
52	10.3	5.2	11.9	6.0								52
53	10.2	5.1	11.8	5.9								53
54	10.2	5.1	11.7	5.9								54
55	10.1	5.1	11.6	5.8								55
56	10.0	5.0	11.5	5.8								56
57	9.9	5.0	11.4	5.7								57
58			11.3	5.7								58
59			11.3	5.7								59
60			11.2	5.6								60
61			11.1	5.6								61
62			11.0	5.5								62
63			10.9	5.5								63
64			10.8	5.4								64
65			10.8	5.4								65
66			10.7	5.4								66
67			10.6	5.3								67
68			10.5	5.3								68
69			10.5	5.3								69
70			10.4	5.2								70
71			10.3	5.2								71
72			10.3	5.2								72
73			10.2	5.1								73
74			10.2	5.1								74
75			10.1	5.1								75
76			10.0	5.0								76
77			10.0	5.0								77
78			9.9	5.0								78
79			9.9	5.0								79
80			9.8	4.9								80
81			9.8	4.9								81
82			9.7	4.9								82
83			9.7	4.9								83

$$H_4 = H_2 + 4.0$$

$$H_4 = H_2 + 5.2$$

$$H_4 = H_2 + 5.2$$

¹ No provisions are made for mounting obstruction lighting.

H₂ Height of antenna above tower top
H₃ Height of radiation center above tower top

UHF TV ANTENNAS

HEIGHT IN FEET

Channel	Type TFU-27DJ				Type TFU-25C				Type TFU-30J 0° - 0.75° Beam Tilt				Channel
	H ₂	H ₃	H ₄		H ₂	H ₃	H ₄		H ₂	H ₃	H ₄		
14					69.1	34.1			56.2	28.1			14
15					68.2	33.8			55.5	27.8			15
16					67.5	33.4			54.8	27.4			16
17					66.7	33.0			54.2	27.1			17
18					65.9	32.6			53.5	26.8			18
19					65.2	32.2			52.8	26.4			19
20					64.3	31.8			52.3	26.2			20
21					63.5	31.4			51.7	25.9			21
22					62.8	31.0			51.1	25.6			22
23					62.0	30.7			50.5	25.3			23
24					61.3	30.3			50.0	25.0			24
25					60.6	30.0			49.5	24.8			25
26					59.9	29.7			49.0	24.5			26
27					59.3	29.4			48.5	24.3			27
28					58.7	29.0			48.0	24.0			28
29					58.0	28.7			47.5	23.8			29
30					57.4	28.4			47.0	23.5			30
31	46.5	23.3			56.8	28.2			46.5	23.3			31
32	46.0	23.0			56.3	27.9			46.0	23.0			32
33	45.5	22.8			55.7	27.6			45.5	22.8			33
34	45.0	22.5			55.1	27.3			45.0	22.5			34
35	44.6	22.3			54.6	27.0			44.6	22.3			35
36	44.2	22.1			54.0	26.8			44.2	22.1			36
37	43.8	21.9			53.5	26.5			43.8	21.9			37
38	43.3	21.7			53.0	26.3			43.3	21.7			38
39	42.9	21.5			52.5	26.0			42.9	21.5			39
40	42.5	21.3			52.0	25.8			42.5	21.3			40
41	42.1	21.1			51.5	25.5			42.1	21.1			41
42	41.7	20.9			51.0	25.3			41.7	20.9			42
43	41.3	20.7			50.5	25.0			41.3	20.7			43
44	41.0	20.5			50.0	24.8			41.0	20.5			44
45	40.7	20.4			49.6	24.6			40.7	20.4			45
46	40.3	20.2			49.2	24.4			40.3	20.2			46
47	40.0	20.0			48.8	24.2			40.0	20.0			47
48	39.7	19.9			48.3	23.9			39.7	19.9			48
49	39.3	19.7			47.8	23.7			39.3	19.7			49
50	39.0	19.5			47.4	23.5			39.2	19.5			50
51	38.5	19.3			47.0	23.3			39.0	19.3			51
52	38.3	19.2			46.6	23.2			38.5	19.2			52
53	38.0	19.0			46.3	22.9			38.3	19.0			53
54	37.7	18.9			45.8	22.8			38.0	18.9			54
55	37.4	18.7			45.5	22.6			37.7	18.7			55
56	37.0	18.5			45.1	22.4			37.4	18.5			56
57	36.8	18.4			44.8	22.2			37.0	18.4			57
58	36.5	18.3			44.4	22.0			36.8	18.3			58
59	36.2	18.1			44.0	21.9			36.5	18.1			59
60	35.9	18.0			43.7	21.7			36.2	18.0			60
61	35.7	17.9			43.3	21.5			35.9	17.9			61
62	35.4	17.7			43.0	21.4			35.7	17.7			62
63	35.1	17.6			42.7	21.2			35.4	17.6			63
64	34.8	17.4			42.3	21.0			35.1	17.4			64
65	34.6	17.3			42.0	20.9			34.8	17.3			65
66	34.3	17.2			41.8	20.8			34.6	17.2			66
67	34.0	17.0			41.5	20.6			34.3	17.0			67
68	33.8	16.9			41.2	20.5			34.0	16.9			68
69	33.5	16.8			40.9	20.3			33.8	16.8			69
70	33.3	16.7			40.6	20.1			33.5	16.7			70
71													71
72													72
73													73
74													74
75													75
76													76
77													77
78													78
79													79
80													80
81													81
82													82
83													83

$$H_4 = H_2 + 5.2$$

$$H_4 = H_2 + 4.0$$

$$H_4 = H_2 + 4.0$$

H₂ Height of antenna above tower top
H₃ Height of radiation center above tower top

UHF TV ANTENNAS

HEIGHT IN FEET

Channel	Type TFU-30J 1.0° Beam Tilt				Type TFU-46K				Type TFU-24DAS				Channel
	H ₂	H ₃	H ₄		H ₂	H ₃	H ₄		H ₂	H ₃	H ₄		
14	57.3	28.7		→	123.4	61.7		→	63.6	31.8		→	14
15	56.6	28.3			121.8	60.9			62.8	31.4			15
16	55.9	28.0			120.3	60.2			62.1	31.2			16
17	55.3	27.7			118.9	59.5			61.4	30.7			17
18	54.6	27.3			117.5	58.8			60.6	30.3			18
19	53.9	27.0			116.2	58.1			59.8	29.9			19
20	53.3	26.7			114.8	57.4			59.1	29.6			20
21	52.8	26.4			113.6	56.8			58.4	29.2			21
22	52.2	26.1			112.8	56.4			57.7	28.9			22
23	51.6	25.8			111.2	55.6			57.1	28.6			23
24	51.0	25.5		→	110.0	55.0		→	56.5	28.3		→	24
25	50.5	25.3			108.8	54.4			55.8	27.9			25
26	49.9	25.0			107.6	53.8			55.2	27.6			26
27	49.3	24.7			106.4	53.2			54.6	27.3			27
28	48.8	24.4			105.2	52.6			54.0	27.0			28
29	48.3	24.2			104.1	52.1			53.4	26.7			29
30	47.8	23.9			102.8	51.4			52.9	26.5			30
31	47.3	23.7			101.8	50.9			52.3	26.2			31
32	46.8	23.4			100.8	50.4			51.7	25.9			32
33	46.4	23.2			99.7	49.9			51.2	25.6			33
34	46.0	23.0		→	98.6	49.3		→	50.6	25.3		→	34
35	45.5	22.8			97.6	48.8			50.1	25.1			35
36	45.0	22.5			96.6	48.3			49.6	24.8			36
37	44.6	22.3			95.7	47.9			49.2	24.6			37
38	44.2	22.1			94.8	47.4			48.7	24.4			38
39	43.8	22.1			93.8	46.9			48.3	24.2			39
40	43.3	21.7			93.0	46.5			47.8	23.9			40
41	42.9	21.5			92.9	46.5			47.3	23.7			41
42	42.5	21.3			92.1	46.1			46.9	23.5			42
43	42.1	21.2			91.3	45.7			46.5	23.3			43
44	41.7	20.9		→	90.5	45.3		→	46.0	23.0		→	44
45	41.3	20.7			89.6	44.8			45.6	22.8			45
46	41.0	20.5			88.9	44.5			45.2	22.6			46
47	40.6	20.3			88.1	44.1			44.8	22.4			47
48	40.3	20.2			87.2	43.6			44.4	22.2			48
49	40.0	20.0			86.5	43.3			44.0	22.0			49
50	39.7	19.9			85.7	42.9			43.7	21.9			50
51	39.2	19.6			85.0	42.5			43.3	21.7			51
52	38.9	19.5			84.2	42.1			42.9	21.5			52
53	38.6	19.3		→	83.5	41.8		→	42.5	21.3		→	53
54	38.3	19.2			82.8	41.4			42.1	21.1			54
55	37.9	19.0			82.2	41.1			41.8	20.9			55
56	37.6	18.8			81.3	40.7			41.5	20.8			56
57	37.3	18.7			80.7	40.4			41.2	20.6			57
58	37.0	18.5			80.1	40.1			40.9	20.5			58
59	36.7	18.4			79.4	39.7			40.6	20.3			59
60	36.4	18.2			78.8	39.4			40.3	20.2			60
61	36.2	18.1			78.2	39.1			40.0	20.0			61
62	35.9	18.0		→	77.5	38.8		→	39.6	19.8		→	62
63	35.6	17.8			76.9	38.5			39.3	19.7			63
64	35.3	17.7			76.3	38.2			39.0	19.5			64
65	35.1	17.6			75.7	37.9			38.7	19.4			65
66	34.8	17.4			75.1	37.6			38.4	19.2			66
67	34.6	17.3			74.6	37.3			38.1	19.1			67
68	34.3	17.2			74.0	37.0			37.8	18.9			68
69	34.1	17.1			73.5	36.8			37.5	18.8			69
70	33.8	16.9			72.9	36.5			37.3	18.7			70
71				→				→				→	71
72													72
73													73
74													74
75													75
76													76
77													77
78													78
79													79
80													80
81													81
82													82
83													83

H₂ Height of antenna above tower top

H₃ Height of radiation center above tower top

TELEVISION TRANSMISSION LINE

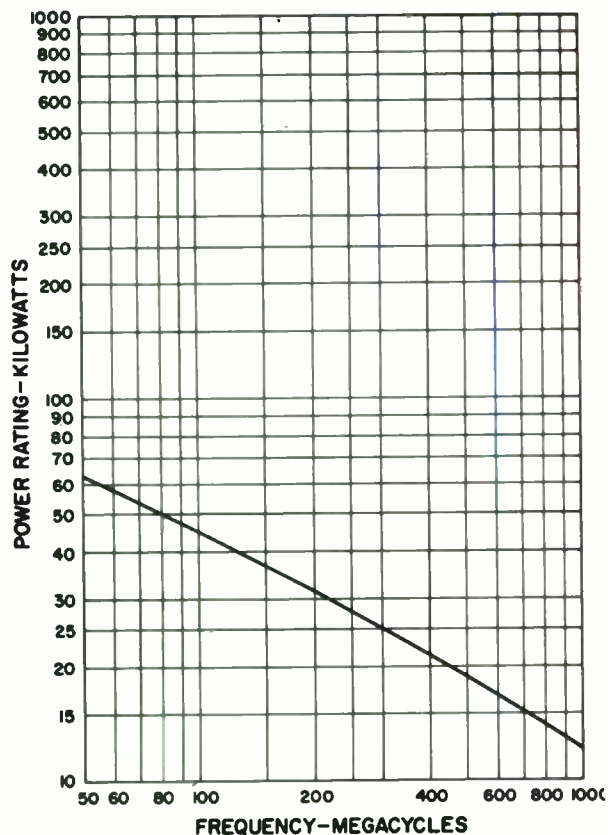
TYPES AND DESCRIPTION

Size	Type Number	Impedance	Insulator Type	Recommended Service
3 1/8"	MI-27791-D	50-ohm	Teflon (Wafer)	VHF/UHF Television
6 1/8"	MI-27792-D	75-ohm	Teflon (Wafer)	VHF/UHF Television
9 1/8"	MI-27793-D	75-ohm	Teflon (Wafer)	VHF/UHF Television
3 1/8"	MI-19313	51.5-ohm	Teflon (Wafer)	VHF Television
3 1/8"	MI-19113-C	51.5-ohm	Steatite (Wafer)	VHF Television Channels 2-6
6 1/8"	MI-19314-C	51.5-ohm	Steatite (Pin Type)	VHF Television
3 1/8"	MI-19089	50-ohm	Teflon (Wafer)	UHF Television
6 1/8"	MI-19387	75-ohm	Teflon (Wafer)	UHF Television

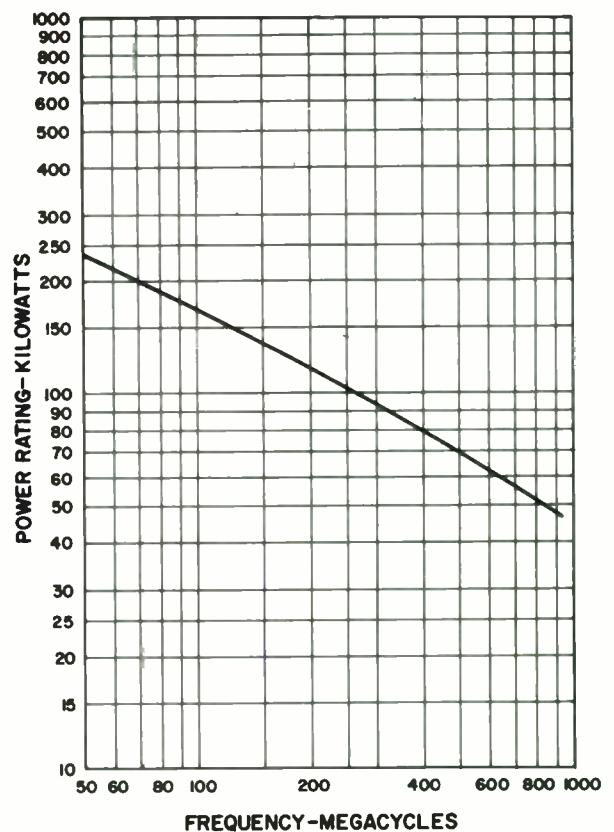
POWER RATING CURVES

(Average power vs. frequency, based on unity VSWR @ 40°C ambient temperature)

MI 27791-D, MI 19313, MI 19089 3 1/8" LINE



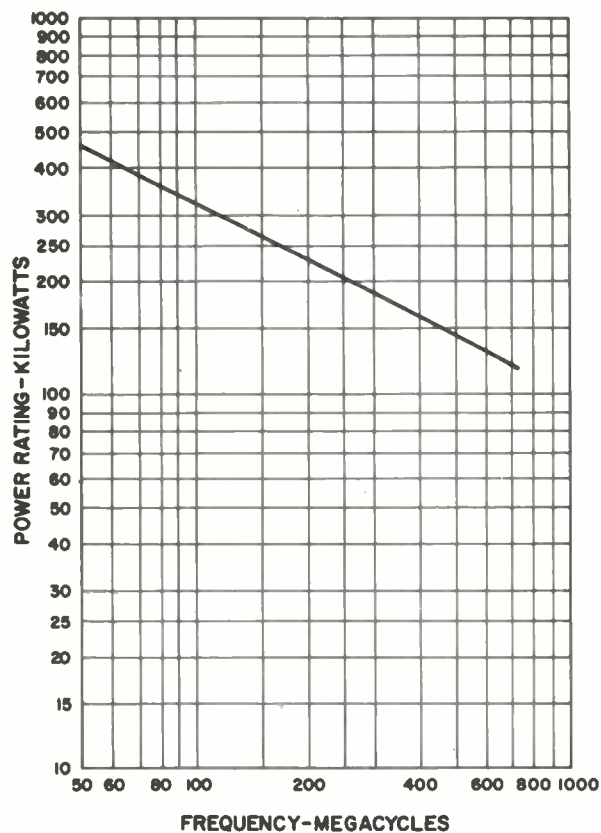
MI 27792-D, MI 19387 6 1/8" LINE



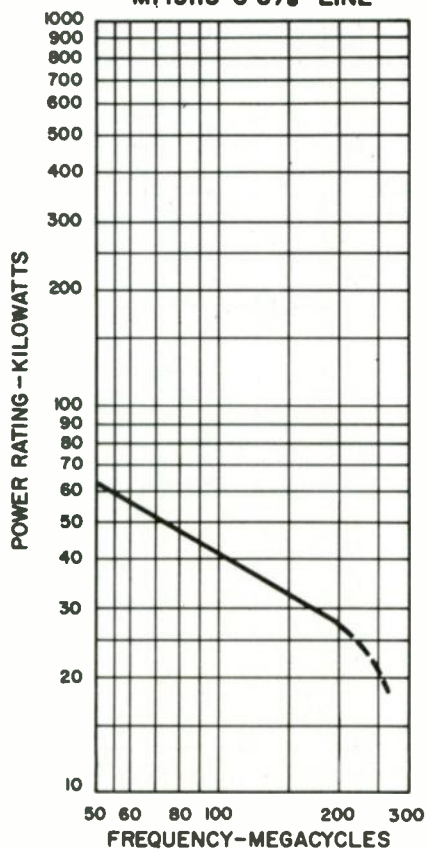
TELEVISION TRANSMISSION LINE

POWER RATING CURVES (Cont.)

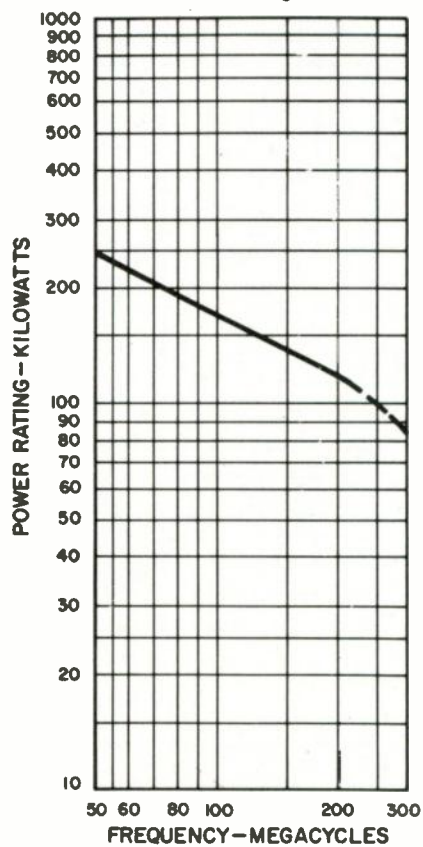
MI 27793-D $9\frac{1}{8}$ " LINE



MI 19113-C $3\frac{1}{8}$ " LINE



MI 19314-C $6\frac{1}{8}$ " LINE



TELEVISION TRANSMISSION LINE

3 1/8" UNIVERSAL TRANSMISSION LINE, MI-27791-D, MI-19089—EFFICIENCY IN PER CENT

CHANNEL	DB LOSS PER 100 FT.	LENGTH IN FEET														
		100	200	300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
2	.0723	98.3	96.7	95.1	93.6	92.0	90.5	89.8	87.5	86.1	84.7	81.9	79.2	76.6	74.1	71.7
3	.0762	98.3	96.6	94.9	93.2	91.6	90.0	88.4	87.0	85.4	83.9	81.0	78.2	75.5	72.9	70.3
4	.080	98.2	96.4	94.6	92.9	91.2	89.5	87.9	86.3	84.7	83.2	80.2	77.3	74.5	71.7	69.2
5	.086	98.0	96.1	94.4	92.4	90.6	88.9	87.1	85.4	83.6	82.1	78.9	75.9	72.8	69.8	67.4
6	.089	98.0	96.0	94.0	92.1	90.3	88.4	86.6	84.9	83.2	81.5	78.2	75.1	72.0	69.2	66.4
7	.130	97.0	94.2	91.4	88.7	86.1	83.6	81.1	78.7	76.4	74.1	69.9	65.8	62.0	58.3	54.9
8	.132	97.0	94.1	91.3	88.5	85.9	83.4	80.9	78.4	76.1	73.8	69.5	65.3	61.5	57.9	54.4
9	.134	97.0	94.0	91.1	88.3	85.7	83.1	80.7	78.1	75.7	73.4	69.2	64.9	61.0	57.3	53.8
10	.136	96.9	94.0	90.9	88.1	85.5	82.9	80.4	77.8	75.4	73.1	68.8	64.5	60.6	56.8	53.4
11	.138	96.9	93.8	90.9	88.1	85.3	82.6	80.1	77.6	75.1	72.8	68.3	64.1	60.2	56.4	52.9
12	.141	96.8	93.7	90.7	87.8	85.0	82.3	79.7	77.1	74.7	72.3	67.7	63.5	59.5	55.8	52.2
13	.143	96.8	93.6	90.6	87.7	84.8	82.1	79.4	76.8	74.4	71.9	67.4	63.1	59.1	55.3	51.6
14	.223	95.0	90.2	85.7	81.4	77.4	73.5	69.8	66.3	63.0	59.8	54.0	48.7	44.0	39.6	35.7
15	.225	95.0	90.2	85.6	81.3	77.2	73.3	69.6	66.1	62.7	59.6	53.7	48.4	43.7	39.3	35.5
16	.227	94.9	90.1	85.5	81.1	77.0	73.1	69.4	65.8	62.5	59.3	53.4	48.1	43.3	39.0	35.1
17	.229	94.9	90.0	85.4	81.0	76.8	72.9	69.1	65.6	62.2	59.0	53.1	47.8	43.0	38.6	34.8
18	.231	94.8	89.9	85.3	80.8	76.7	72.7	68.9	65.3	62.0	58.8	52.8	47.5	42.7	38.4	34.5
19	.233	94.8	89.8	85.1	80.7	76.5	72.5	68.7	65.1	61.7	58.5	52.5	47.2	42.4	38.0	34.2
20	.234	94.8	89.8	85.1	80.6	76.4	72.4	68.6	65.0	61.6	58.3	52.4	47.0	42.2	37.9	33.9
21	.235	94.7	89.7	85.0	80.5	76.3	72.3	68.5	64.9	61.5	58.2	52.2	46.9	42.1	37.8	33.8
22	.237	94.7	89.7	84.9	80.4	76.1	72.1	68.3	64.6	61.2	57.9	52.0	46.6	41.8	37.4	33.5
23	.239	94.6	89.6	84.8	80.2	75.9	71.9	68.0	64.4	60.9	57.7	51.7	46.3	41.5	37.0	33.2
24	.240	94.6	89.5	84.7	80.2	75.9	71.8	67.9	64.3	60.8	57.5	51.5	46.1	41.3	36.9	33.0
25	.242	94.6	89.5	84.6	80.0	75.7	71.6	67.7	64.0	60.6	57.3	51.2	45.8	41.0	36.7	32.8
26	.243	94.6	89.4	84.6	80.0	75.6	71.5	67.6	63.9	60.4	57.2	51.1	45.7	40.9	36.4	32.7
27	.245	94.5	89.3	84.4	79.8	75.4	71.3	67.4	63.7	60.2	56.9	50.8	45.4	40.6	36.2	32.3
28	.247	94.5	89.3	84.3	79.7	75.3	71.1	67.2	63.5	60.0	56.6	50.5	45.1	40.3	36.0	32.0
29	.249	94.4	89.2	84.2	79.5	75.1	70.9	67.0	63.2	60.0	56.4	50.3	44.8	40.0	35.7	31.8
30	.250	94.4	89.1	84.1	79.4	75.0	70.8	66.8	63.1	57.6	56.2	50.1	44.7	39.8	35.5	31.5
31	.252	94.4	89.0	84.0	79.3	74.8	70.6	66.6	62.9	59.3	56.0	49.8	44.4	39.5	35.1	31.3
32	.254	94.3	89.0	83.9	79.1	74.6	70.4	66.4	62.6	59.1	55.7	49.6	44.1	39.2	34.9	31.1
33	.255	94.3	88.9	83.9	79.1	74.6	70.3	66.3	62.5	59.0	55.6	49.4	43.9	39.1	34.8	30.9
34	.256	94.3	88.9	83.8	79.0	74.5	70.2	66.2	62.4	58.8	55.5	49.3	43.8	38.9	34.5	30.8
35	.257	94.3	88.8	83.7	78.9	74.4	70.1	66.1	62.3	58.7	55.3	49.2	43.7	38.8	34.4	30.5
36	.258	94.2	88.8	83.7	78.9	74.3	70.0	66.0	62.2	58.6	55.2	49.0	43.5	38.7	34.3	30.4
37	.260	94.2	88.7	83.6	78.7	74.1	69.8	65.8	61.9	58.3	55.0	48.8	43.3	38.4	33.9	30.2
38	.262	94.1	88.6	83.4	78.6	74.0	69.6	65.6	61.8	58.1	54.7	48.5	43.0	38.1	33.7	29.9
39	.264	94.1	88.6	83.3	78.4	73.8	69.4	65.3	61.5	57.9	54.5	48.2	42.7	37.8	33.5	29.7
40	.265	94.1	88.5	83.3	78.3	73.7	69.3	65.2	61.4	57.7	54.3	48.1	42.6	37.7	33.2	29.4
41	.266	94.1	88.5	83.2	78.3	73.6	69.3	65.1	61.3	57.6	54.2	48.0	42.4	37.5	33.1	29.3
42	.267	94.0	88.4	83.2	78.2	73.5	69.2	65.0	61.2	57.5	54.1	47.8	42.3	37.4	33.0	29.2

TELEVISION TRANSMISSION LINE

3/8" UNIVERSAL TRANSMISSION LINE, MI-27791-D, MI-19089—EFFICIENCY IN PER CENT

CHANNEL	DB LOSS PER 100 FT.	LENGTH IN FEET														
		100	200	300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
43	.269	94.0	88.3	83.0	78.0	73.4	69.0	64.8	60.9	57.3	53.8	47.6	42.0	37.1	32.8	28.9
44	.270	94.0	88.3	83.0	78.0	73.3	68.9	64.7	60.8	57.2	53.7	47.4	41.9	37.0	32.7	28.8
45	.272	93.9	88.2	82.9	77.8	73.1	68.7	64.5	60.6	56.9	53.5	47.2	41.6	36.7	32.3	28.6
46	.274	93.9	88.1	82.8	77.7	72.9	68.5	64.3	60.4	56.7	53.2	46.9	41.3	36.4	32.1	28.3
47	.275	93.8	88.0	82.7	77.6	72.9	68.4	64.2	60.3	56.6	53.1	46.8	41.2	36.3	32.0	28.2
48	.276	93.8	88.1	82.6	77.6	72.8	68.3	64.1	60.1	56.4	53.0	46.6	41.1	36.2	31.8	28.0
49	.278	93.8	88.0	82.5	77.4	72.6	68.1	63.9	59.9	56.2	52.7	46.4	40.8	35.9	31.5	27.7
50	.279	93.8	87.9	82.5	77.3	72.5	68.0	63.8	59.8	56.1	52.6	46.3	40.7	35.8	31.4	27.6
51	.281	93.7	87.9	82.4	77.2	72.4	67.8	63.6	59.6	55.9	52.4	46.0	40.4	35.5	31.2	27.4
52	.282	93.7	87.8	82.3	77.1	72.3	67.7	63.5	59.5	55.7	52.2	45.9	40.3	35.4	31.1	27.2
53	.283	93.7	87.8	82.2	77.1	72.2	67.6	63.4	59.4	55.6	52.1	45.7	40.2	35.3	30.9	27.1
54	.284	93.7	87.7	82.2	77.0	72.1	67.5	63.3	59.3	55.5	52.0	45.6	40.0	35.1	30.8	27.0
55	.285	93.7	87.6	82.1	76.9	72.0	67.5	63.2	59.2	55.4	51.9	45.5	39.9	35.0	30.6	26.9
56	.286	93.6	87.7	82.1	76.8	71.9	67.4	63.1	59.1	55.3	51.8	45.4	40.0	34.9	30.5	26.8
57	.287	93.6	87.6	82.0	76.8	71.9	67.3	63.0	58.9	55.2	51.6	45.2	39.6	34.7	30.4	26.6
58	.290	93.5	87.5	81.8	76.6	71.6	67.0	62.7	58.6	54.8	51.3	44.9	39.3	34.4	30.0	26.3
59	.292	93.5	87.4	81.7	76.4	71.5	66.8	62.5	58.4	54.6	51.1	44.6	39.0	34.1	29.8	26.1
60	.294	93.5	87.3	81.6	76.3	71.3	66.6	62.3	58.2	54.4	50.8	44.4	38.8	33.9	29.6	25.8
61	.295	93.4	87.3	81.6	76.2	71.2	66.5	62.2	58.1	54.3	50.7	44.3	38.6	33.7	29.4	25.7
62	.297	93.4	87.2	81.5	76.1	71.0	66.3	62.0	57.9	54.0	50.5	44.0	38.4	33.5	29.1	25.5
63	.298	93.4	87.2	81.4	76.0	71.0	66.3	61.9	57.8	53.9	50.3	43.9	38.3	33.4	29.0	25.3
64	.299	93.3	87.1	81.3	75.9	70.9	66.2	61.8	57.7	53.8	50.2	43.8	38.1	33.2	28.9	25.2
65	.300	93.3	87.1	81.3	75.9	70.8	66.1	61.7	57.5	53.7	50.1	43.7	38.0	33.1	28.8	25.1
66	.301	93.3	87.1	81.2	75.8	70.7	66.0	61.6	57.4	53.6	50.0	43.5	37.9	33.0	28.7	25.0
67	.302	93.3	87.0	81.2	75.7	70.6	65.9	61.5	57.3	53.5	49.9	43.4	37.8	32.9	28.6	24.9
68	.3025	93.3	87.0	81.1	75.7	70.6	65.8	61.4	57.3	53.4	49.8	43.4	37.7	32.8	28.5	24.8
69	.303	93.3	87.0	81.1	75.6	70.6	65.8	61.4	57.2	53.4	49.8	43.3	37.7	32.7	28.5	24.8
70	.3035	93.2	87.0	81.1	75.6	70.5	65.8	61.3	57.2	53.3	49.7	43.2	37.6	32.7	28.4	24.7
71	.304	93.2	86.9	81.1	75.6	70.5	65.7	61.3	57.1	53.3	49.7	43.2	37.5	32.6	28.4	24.7
72	.305	93.2	86.9	81.0	75.5	70.4	65.6	61.2	57.0	53.1	49.5	43.1	37.4	32.5	28.2	24.5
73	.306	93.2	86.7	81.0	75.4	70.3	65.5	61.1	56.9	53.0	49.4	42.9	37.3	32.4	28.0	24.4
74	.307	93.2	86.8	80.9	75.4	70.2	65.4	61.0	56.8	52.9	49.3	42.8	37.2	32.3	27.9	24.3
75	.3075	93.2	86.8	80.9	75.3	70.2	65.4	60.9	56.8	52.8	49.3	42.8	37.1	32.2	27.8	24.3
76	.308	93.2	86.8	80.8	75.3	70.1	65.3	60.9	56.7	52.8	49.2	42.7	37.1	32.2	27.8	24.2
77	.3085	93.1	86.8	80.8	75.3	70.1	65.3	60.8	56.7	52.8	49.2	42.6	37.0	32.1	27.8	24.2
78	.309	93.1	86.7	80.8	75.2	70.1	65.3	60.8	56.6	52.7	49.1	42.6	36.9	32.0	27.7	24.1
79	.310	93.1	86.7	80.7	75.2	70.0	65.2	60.7	56.5	52.6	49.0	42.5	36.8	31.9	27.6	24.0
80	.311	93.1	86.7	80.7	75.1	70.0	65.1	60.6	56.4	52.5	48.9	42.3	36.7	31.8	27.5	23.9
81	.312	93.1	86.6	80.6	75.0	69.8	65.0	60.5	56.3	52.4	48.8	42.2	36.6	31.7	27.4	23.8
82	.3125	93.1	86.6	80.6	75.0	69.8	64.9	60.4	56.2	52.3	48.7	42.2	36.5	31.6	27.3	23.7
83	.313	93.0	86.6	80.6	75.0	69.7	64.9	60.4	56.2	52.2	48.6	42.1	36.5	31.6	27.2	23.6

TELEVISION TRANSMISSION LINE

6 1/8" UNIVERSAL TRANSMISSION LINE, MI-27792-D—EFFICIENCY IN PER CENT

CHANNEL	DB LOSS PER 100 FT.	LENGTH IN FEET														
		100	200	300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
2	.0339	99.2	98.5	97.7	96.9	96.2	95.4	94.7	94.1	93.2	92.5	91.1	89.6	88.3	86.8	85.5
3	.0355	99.2	98.4	97.6	96.8	96.0	95.2	94.4	93.7	92.9	92.1	90.7	89.2	87.7	86.3	84.8
4	.0372	99.1	98.3	97.5	96.6	95.8	95.0	94.2	93.4	92.6	91.8	90.2	88.7	87.2	85.7	84.2
5	.040	99.1	98.2	97.3	96.4	95.5	94.6	93.8	92.9	92.0	91.2	89.5	87.9	86.3	84.6	83.1
6	.0417	99.0	98.1	97.2	96.2	95.3	94.4	93.5	92.6	91.7	90.8	89.1	87.4	85.8	84.0	82.4
7	.0615	98.6	97.1	95.9	94.5	93.1	91.8	90.5	89.4	88.0	86.7	84.4	82.0	79.7	77.4	75.1
8	.0625	98.6	97.1	95.8	94.4	93.0	91.7	90.4	89.1	87.8	86.6	84.1	81.7	79.4	77.0	74.9
9	.0635	98.6	97.0	95.7	94.3	92.9	91.6	90.2	88.9	87.6	86.4	83.9	81.5	79.1	76.8	74.6
10	.0645	98.5	97.1	95.6	94.2	92.8	91.5	90.1	88.8	87.5	86.2	83.7	81.2	78.9	76.5	74.3
11	.0655	98.5	97.0	95.6	94.1	92.7	91.4	90.0	88.6	87.4	86.0	83.5	81.0	78.6	76.4	73.9
12	.0665	98.5	97.0	95.5	94.1	92.6	91.2	89.8	88.5	87.1	85.8	83.2	80.7	78.3	75.8	73.6
13	.0675	98.5	96.9	95.4	94.0	92.5	91.1	89.7	88.3	86.9	85.6	83.0	80.4	78.0	75.5	73.2
14	.105	97.6	95.3	93.0	90.8	88.6	86.5	84.4	82.4	80.4	78.5	74.8	71.3	67.9	64.6	61.6
15	.106	97.6	95.2	92.9	90.7	88.5	86.4	84.3	82.3	80.3	78.4	74.6	71.1	67.7	64.4	61.4
16	.107	97.6	95.2	92.9	90.6	88.4	86.3	84.2	82.1	80.1	78.2	74.4	70.8	67.4	64.1	61.1
17	.1075	97.6	95.2	92.8	90.6	88.4	86.2	84.1	82.0	80.0	78.1	74.3	70.7	67.3	64.0	60.9
18	.108	97.5	95.2	92.8	90.5	88.3	86.1	84.0	82.0	80.0	78.0	74.2	70.6	67.2	64.0	60.8
19	.109	97.5	95.1	92.8	90.5	88.2	86.0	83.9	81.8	79.8	77.8	74.0	70.4	66.9	63.6	60.5
20	.1095	97.5	95.1	92.7	90.4	88.2	86.0	83.8	81.7	79.7	77.7	73.9	70.3	66.8	63.5	60.3
21	.110	97.5	95.1	92.7	90.4	88.1	85.9	83.8	81.7	79.6	77.6	73.8	70.2	66.7	63.3	60.2
22	.111	97.5	95.0	92.6	90.3	88.0	85.8	83.6	81.5	79.4	77.5	73.6	70.0	66.4	63.0	60.0
23	.112	97.5	95.0	92.6	90.2	87.9	85.7	83.5	81.4	79.3	77.3	73.4	69.7	66.2	62.8	59.7
24	.113	97.4	94.9	92.5	90.1	87.8	85.5	83.3	81.2	79.1	77.1	73.2	69.5	65.9	62.5	59.4
25	.1135	97.4	94.9	92.5	90.1	87.8	85.5	83.3	81.1	79.0	77.0	73.1	69.4	65.8	62.4	59.3
26	.1140	97.4	94.9	92.4	90.0	87.7	85.4	83.2	81.1	79.0	76.9	73.0	69.3	65.7	62.4	59.1
27	.1145	97.4	94.9	92.4	90.0	87.7	85.4	83.1	81.0	78.9	76.8	72.9	69.1	65.6	62.2	58.9
28	.115	97.4	94.8	92.4	90.0	87.6	85.3	83.1	80.9	78.8	76.7	72.8	69.0	65.5	62.0	58.8
29	.116	97.4	94.8	92.3	89.9	87.5	85.2	83.0	80.8	78.6	76.6	72.6	68.8	65.2	61.7	58.6
30	.117	97.3	94.8	92.3	90.0	87.4	85.1	82.8	80.6	78.5	76.4	72.4	68.6	65.0	61.6	58.3
31	.1175	97.3	94.7	92.2	89.7	87.3	85.0	82.7	80.5	78.4	76.3	72.3	68.5	64.9	61.4	58.2
32	.118	97.3	94.7	92.2	89.7	87.3	85.0	82.7	80.5	78.3	76.2	72.2	68.4	64.7	61.2	58.0
33	.1185	97.3	94.7	92.1	89.7	87.2	84.9	82.6	80.4	78.2	76.1	72.1	68.3	64.6	61.1	57.9
34	.119	97.3	94.7	92.1	89.6	87.2	84.8	82.6	80.3	78.1	76.0	72.0	68.2	64.5	60.9	57.8
35	.120	97.3	94.6	92.1	89.5	87.1	84.7	82.4	80.2	78.0	75.9	71.8	67.9	64.3	60.8	57.7
36	.1205	97.3	94.6	92.0	89.5	87.0	84.7	82.3	80.1	77.9	75.8	71.7	67.8	64.2	60.7	57.4
37	.121	97.3	94.6	92.0	89.5	87.0	84.6	82.3	80.0	77.8	75.7	71.6	67.7	64.0	60.5	57.3
38	.1215	97.2	94.6	91.9	89.4	86.9	84.5	82.2	79.9	77.7	75.6	71.5	67.6	63.9	60.3	57.1
39	.122	97.2	94.5	91.9	89.4	86.9	84.5	82.2	80.0	77.7	75.5	71.4	67.5	63.8	60.3	57.0
40	.123	97.2	94.5	91.9	89.3	86.8	84.4	82.0	79.7	77.5	75.3	71.2	67.3	63.6	60.0	56.8
41	.1235	97.2	94.5	91.8	89.2	86.7	84.3	82.0	79.6	77.4	75.2	71.0	67.1	63.4	59.9	56.5
42	.124	97.2	94.5	91.8	89.2	86.7	84.3	81.9	79.6	77.3	75.2	71.0	67.1	63.3	59.7	56.5

TELEVISION TRANSMISSION LINE

6 1/8" UNIVERSAL TRANSMISSION LINE, MI-27792-D—EFFICIENCY IN PER CENT

CHANNEL	DB LOSS PER 100 FT.	LENGTH IN FEET														
		100	200	300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
43	.1245	97.2	94.4	91.8	89.2	86.6	84.2	81.8	79.5	77.3	75.1	70.9	66.9	63.2	59.7	56.4
44	.125	97.2	94.4	91.7	89.1	86.6	84.1	81.8	79.4	77.2	75.0	70.8	66.8	63.1	59.5	56.2
45	.126	97.1	94.4	91.7	89.0	86.5	84.0	81.6	79.3	77.0	74.8	70.5	66.6	62.9	59.3	55.9
46	.1265	97.1	94.3	91.6	89.0	86.4	84.0	81.6	79.2	76.9	74.7	70.0	66.5	62.7	59.1	55.8
47	.127	97.1	94.3	91.6	89.0	86.4	83.9	81.5	79.1	76.9	74.6	70.4	66.4	62.6	59.1	55.6
48	.128	97.1	94.3	91.5	88.9	86.3	83.8	81.4	79.0	76.7	74.0	70.2	66.2	62.4	58.8	55.3
49	.129	97.1	94.2	91.5	88.8	86.2	83.7	81.2	78.9	76.5	74.3	70.0	66.0	62.2	58.5	55.2
50	.130	97.1	94.2	91.4	88.7	86.1	83.6	81.1	78.7	76.4	74.1	69.8	65.8	61.9	58.3	54.9
51	.1305	97.0	94.2	91.4	88.7	86.1	83.5	81.0	78.6	76.3	74.0	69.7	65.7	61.8	58.2	54.7
52	.131	97.0	94.1	91.4	88.6	86.0	83.4	81.0	78.6	76.2	74.0	69.6	65.6	61.7	58.0	54.7
53	.132	97.0	94.1	91.3	88.5	85.9	83.3	80.8	78.4	76.1	73.8	69.4	65.3	61.5	57.9	54.4
54	.1325	97.0	94.1	91.3	88.5	85.9	83.3	80.8	78.3	76.0	73.7	69.3	65.2	61.4	57.7	54.3
55	.133	97.0	94.1	91.2	88.5	85.8	83.2	80.7	78.3	75.9	73.6	69.3	65.1	61.3	57.6	54.1
56	.1335	97.0	94.0	91.2	88.4	85.8	83.2	80.6	78.1	75.8	73.5	69.1	65.0	61.2	57.4	54.0
57	.134	97.0	94.0	91.2	88.4	85.7	83.1	80.6	78.1	75.8	73.5	69.1	64.9	61.0	57.4	54.0
58	.1345	96.9	94.0	91.1	88.3	85.7	83.0	80.5	78.0	75.7	73.4	69.0	64.8	60.9	57.3	53.8
59	.135	96.9	94.0	91.1	88.3	85.6	83.0	80.4	78.0	75.6	73.3	68.9	64.7	60.8	57.1	53.7
60	.136	96.9	93.9	91.0	88.2	85.5	82.9	80.3	77.8	75.4	73.1	68.7	64.5	60.6	56.8	53.4
61	.1365	96.9	93.9	91.0	88.2	85.5	82.8	80.3	77.8	75.4	73.0	68.6	64.4	60.5	56.8	53.2
62	.137	96.9	93.9	91.0	88.1	85.4	82.8	80.2	77.7	75.3	72.9	68.5	64.3	60.4	56.8	53.1
63	.1375	96.9	93.9	90.9	88.1	85.4	82.7	80.1	77.6	75.2	72.9	68.4	64.2	60.3	56.5	53.1
64	.138	96.9	93.8	90.9	88.1	85.3	82.6	80.1	77.6	75.1	72.8	68.3	64.1	60.2	56.4	52.9
65	.1385	96.9	93.8	90.0	88.0	85.3	82.6	80.0	77.5	75.0	72.7	68.2	64.0	60.0	56.2	52.8
66	.139	96.9	93.8	90.8	88.0	85.2	82.5	79.9	77.4	75.0	72.6	68.1	63.9	60.0	56.2	52.7
67	.140	96.8	93.8	90.8	87.9	85.1	82.4	79.8	77.3	74.8	72.4	67.9	63.7	59.7	55.9	52.4
68	.141	96.8	93.7	90.7	87.8	85.0	82.3	79.7	77.1	74.7	72.3	67.7	63.5	59.5	55.8	52.3
69	.1415	96.8	93.7	90.7	87.8	85.0	82.2	79.6	77.1	74.6	72.2	67.6	63.4	59.4	55.6	52.1
70	.142	96.8	93.7	90.7	87.7	84.9	82.2	79.5	77.0	74.5	72.1	67.5	63.3	59.3	55.5	52.0
71	.1425	96.8	93.7	90.6	87.7	84.9	82.1	79.5	76.9	74.4	72.0	67.5	63.2	59.2	55.3	51.8
72	.143	96.8	93.6	90.6	87.7	84.8	82.1	79.4	76.8	74.4	71.9	67.4	63.1	59.1	55.3	51.6
73	.1435	96.7	93.6	90.6	87.6	84.8	82.0	79.4	76.8	74.3	71.9	67.3	63.0	58.9	55.2	51.6
74	.144	96.7	93.6	90.5	87.6	84.7	82.0	79.3	76.7	74.2	71.8	67.2	62.9	58.8	55.0	51.5
75	.145	96.7	93.5	90.5	87.5	84.6	81.9	79.2	76.6	74.1	71.6	67.0	62.7	58.6	54.9	51.2
76	.1455	96.7	93.5	90.4	87.5	84.6	81.8	79.1	76.5	74.0	71.5	66.9	62.6	58.5	54.7	51.1
77	.146	96.7	93.5	90.4	87.4	84.5	81.7	79.0	76.4	73.9	71.4	66.8	62.5	58.4	54.6	50.9
78	.1465	96.7	93.5	90.4	87.4	84.5	81.7	79.0	76.3	73.8	71.4	66.7	62.4	58.3	54.4	50.9
79	.147	96.7	93.5	90.3	87.3	84.4	81.6	79.0	76.3	73.8	71.3	66.6	62.3	58.2	54.4	50.8
80	.1475	96.7	93.4	90.3	87.3	84.4	81.6	78.8	76.2	73.7	71.2	66.5	62.2	58.1	54.3	50.6
81	.148	96.7	93.4	90.3	87.3	84.3	81.5	78.8	76.1	73.6	71.1	66.4	62.1	58.0	54.1	50.5
82	.149	96.6	93.4	90.2	87.2	84.2	81.4	78.6	76.0	73.5	71.0	66.3	61.9	57.8	54.0	50.4
83	.1495	96.6	93.3	90.2	87.1	84.2	81.3	78.6	75.9	73.4	70.9	66.2	61.8	57.7	53.8	50.2

TELEVISION TRANSMISSION LINE

9 $\frac{3}{16}$ " UNIVERSAL TRANSMISSION LINE, MI-27793-D—EFFICIENCY IN PER CENT

CHANNEL	DB LOSS PER 100 FT.	LENGTH IN FEET														
		100	200	300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
2	.0226	99.5	99.0	98.5	97.9	97.4	96.9	96.4	95.9	95.4	94.9	93.9	93.0	92.0	91.0	90.0
3	.0234	99.5	98.9	98.4	97.9	97.3	96.8	96.3	95.8	95.3	94.8	93.7	92.7	91.7	90.8	89.8
4	.025	99.3	98.9	98.3	97.7	97.2	96.6	96.1	95.5	94.9	94.4	93.3	92.3	91.2	90.0	89.1
5	.0268	99.4	98.8	98.2	97.6	97.0	96.4	95.8	95.2	94.6	94.0	92.9	91.7	90.6	89.4	88.3
6	.0278	99.4	98.7	98.1	97.5	96.9	96.2	95.6	95.0	94.4	93.8	92.6	91.4	90.3	89.1	87.9
7	.0408	99.1	98.1	97.2	96.3	95.4	94.5	93.6	92.8	91.9	91.0	89.3	87.7	86.0	84.4	82.9
8	.0413	99.0	98.1	97.2	96.3	95.4	94.5	93.6	92.7	91.8	90.9	89.2	87.5	85.9	84.2	82.6
9	.042	99.0	98.1	97.1	96.2	95.3	94.4	93.5	92.6	91.7	90.8	89.0	87.3	85.7	84.0	82.4
10	.0428	99.0	98.0	97.1	96.1	95.2	94.3	93.3	92.4	91.5	90.6	88.8	87.1	85.4	83.7	82.0
11	.0435	99.0	98.0	97.0	96.1	95.1	94.2	93.2	92.3	91.4	90.5	88.7	86.9	85.2	83.5	81.9
12	.0441	99.0	98.0	97.0	96.0	95.0	94.1	93.1	92.2	91.3	90.3	88.5	86.7	85.0	83.3	81.5
13	.0448	99.0	98.0	97.0	96.0	95.0	94.0	93.0	92.1	91.1	90.2	88.4	86.6	84.8	82.9	81.3
14	.0678	98.5	96.9	95.4	93.9	92.5	91.1	89.6	88.3	86.9	85.5	82.9	80.4	77.9	75.5	73.1
15	.068	98.4	96.9	95.4	93.9	92.5	91.0	89.6	88.2	86.9	85.5	82.9	80.3	77.8	75.5	73.1
16	.0685	98.4	96.9	95.4	93.9	92.4	91.0	89.5	88.1	86.8	85.4	82.8	80.2	77.7	75.3	72.9
17	.069	98.4	96.9	95.3	93.8	92.4	90.9	89.5	88.1	86.7	85.3	82.6	80.1	77.6	75.1	72.7
18	.0696	98.4	96.8	95.3	93.8	92.3	90.8	89.4	88.0	86.6	85.2	82.5	79.9	77.4	74.9	72.5
19	.070	98.4	96.9	95.4	93.8	92.2	90.8	89.4	87.9	86.5	85.1	82.4	79.9	77.3	74.8	72.4
20	.0704	98.4	96.8	95.3	93.7	92.2	90.7	89.3	87.8	86.4	85.0	82.3	79.7	77.2	74.6	72.2
21	.0709	98.4	96.8	95.2	93.7	92.2	90.7	89.2	87.8	86.3	84.9	82.2	79.6	77.0	74.4	72.0
22	.0715	98.4	96.8	95.2	93.6	92.1	90.6	89.1	87.7	86.2	84.8	82.1	79.4	76.8	74.3	71.9
23	.072	98.4	96.7	95.1	93.6	92.0	90.5	89.0	87.6	86.1	84.7	82.0	79.3	76.7	74.1	71.7
24	.0724	98.3	96.7	95.1	93.5	92.0	90.5	89.0	87.5	86.1	84.6	81.9	79.2	76.6	74.1	71.5
25	.0727	98.3	96.7	95.1	93.5	92.0	90.4	88.9	87.5	86.0	84.6	81.8	79.1	76.5	73.9	71.5
26	.073	98.3	96.7	95.1	93.5	91.9	90.4	88.9	87.4	86.0	84.5	81.7	79.0	76.4	73.9	71.4
27	.0735	98.3	96.7	95.0	93.5	91.9	90.3	88.8	87.3	85.9	84.4	81.6	78.9	76.3	73.7	71.2
28	.074	98.3	96.6	95.0	93.4	91.8	90.3	88.8	87.3	85.8	84.3	81.5	78.8	76.1	73.6	71.0
29	.0745	98.3	96.6	95.0	93.4	91.8	90.2	88.7	87.2	85.7	84.2	81.4	78.6	76.0	73.4	70.8
30	.075	98.3	96.6	94.9	93.3	91.7	90.2	88.6	87.1	85.6	84.1	81.3	78.5	75.9	73.2	70.7
31	.0755	98.3	96.6	94.9	93.3	91.7	90.1	88.5	87.0	85.5	84.0	81.2	78.4	75.7	73.1	70.5
32	.076	98.3	96.6	94.9	93.2	91.6	90.0	88.5	86.9	85.4	83.9	81.1	78.3	75.6	72.9	70.3
33	.0763	98.3	96.5	94.9	92.2	91.6	90.0	88.4	86.9	85.4	83.9	81.0	78.2	75.5	72.9	70.3
34	.0766	98.3	96.5	94.8	93.2	91.6	90.0	88.4	86.8	85.3	83.8	80.9	78.1	75.4	72.7	70.2
35	.0768	98.3	96.5	94.8	93.2	91.5	89.9	88.4	86.8	85.3	83.8	80.9	78.1	75.4	72.7	70.2
36	.077	98.2	96.5	94.9	93.2	91.6	89.9	88.4	86.9	85.3	83.8	80.9	78.1	75.3	72.7	70.2
37	.0773	98.2	96.5	94.8	93.1	91.5	89.9	88.3	86.7	85.2	83.7	80.8	77.9	75.2	72.5	70.0
38	.0777	98.2	96.5	94.8	93.1	91.4	89.8	88.2	86.7	85.1	83.6	80.7	77.8	75.1	72.4	69.8
39	.078	98.2	96.5	94.8	93.1	91.4	89.8	88.2	86.6	85.1	83.6	80.6	77.8	75.0	72.4	69.8
40	.0783	98.2	96.5	94.7	93.0	91.4	89.8	88.1	86.6	85.0	83.5	80.5	77.7	74.9	72.2	69.7

TELEVISION TRANSMISSION LINE

3 1/8" VHF TRANSMISSION LINE, MI-19313—EFFICIENCY IN PER CENT

CHANNEL	DB LOSS PER 100 FT.	LENGTH IN FEET														
		100	200	300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
2	.0723	98.3	96.7	95.1	93.6	92.0	90.5	89.8	87.5	86.1	84.7	81.9	79.2	76.6	74.1	72.0
3	.0762	98.3	96.6	94.9	93.2	91.6	90.0	88.4	87.0	85.4	83.9	81.0	78.2	75.5	72.9	70.3
4	.080	98.2	96.4	94.6	92.9	91.2	89.5	87.9	86.3	84.7	83.2	80.2	77.3	74.5	71.7	69.2
5	.086	98.0	96.1	94.4	92.4	90.6	88.9	87.1	85.4	83.6	82.1	78.9	75.9	72.8	69.8	67.4
6	.089	98.0	96.0	94.0	92.1	90.3	88.4	86.6	84.9	83.2	81.5	78.2	75.1	72.0	69.2	66.4
7	.130	97.0	94.2	91.4	88.7	86.1	83.6	81.1	78.7	76.4	74.1	69.9	65.8	62.0	58.3	54.9
8	.132	97.0	94.1	91.3	88.5	85.9	83.4	80.9	78.4	76.1	73.8	69.5	65.3	61.5	57.9	54.4
9	.134	97.0	94.0	91.1	88.3	85.7	83.1	80.7	78.1	75.7	73.4	69.2	64.9	61.0	57.3	53.8
10	.136	96.9	94.0	90.9	88.1	85.5	82.9	80.4	77.8	75.4	73.1	68.8	64.5	60.6	56.8	53.4
11	.138	96.9	93.8	90.9	88.1	85.3	82.6	80.1	77.6	75.1	72.8	68.3	64.1	60.2	56.4	52.9
12	.141	96.8	93.7	90.7	87.8	85.0	82.3	79.7	77.1	74.7	72.3	67.7	63.5	59.5	55.8	52.2
13	.143	96.8	93.6	90.6	87.7	84.8	82.1	79.4	76.8	74.4	71.9	67.4	63.1	59.1	55.3	51.6

3 1/8" VHF TRANSMISSION LINE, MI-19113-C—EFFICIENCY IN PER CENT

CHANNEL	DB LOSS PER 100 FT.	LENGTH IN FEET												
		100	200	300	400	500	600	700	800	900	1000	1200	1400	1600
2	.1018	97.7	95.4	93.2	91.1	88.9	86.9	84.9	82.9	81.0	79.1	75.5	72.0	68.7
3	.1081	97.5	95.2	92.8	90.5	88.3	86.1	84.0	82.0	79.9	78.0	74.2	70.6	67.2
4	.1146	97.4	94.9	92.4	90.0	87.6	85.4	83.1	81.0	78.9	76.8	72.9	69.1	65.6
5	.1246	97.2	94.4	91.8	89.2	86.6	84.2	81.8	79.5	77.2	75.1	70.9	66.9	63.2
6	.1306	97.0	94.2	91.4	88.7	86.0	83.5	81.0	78.6	76.3	74.0	69.7	65.6	61.8

6 1/8" VHF TRANSMISSION LINE, MI-19314-C—EFFICIENCY IN PER CENT

CHANNEL	DB LOSS PER 100 FT.	LENGTH IN FEET														
		100	200	300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
2	.0415	99.1	98.1	97.2	96.3	95.3	94.4	93.5	92.6	91.8	90.9	89.2	87.5	85.8	84.2	82.6
3	.0437	99.0	98.0	97.0	96.1	95.1	94.1	93.2	92.3	91.3	90.4	88.6	86.9	85.1	83.3	81.7
4	.0459	99.0	97.9	96.9	95.9	94.9	93.9	92.9	91.9	90.9	90.0	88.1	86.2	84.5	82.6	81.0
5	.0494	98.9	97.8	96.7	95.6	94.5	93.4	92.3	91.3	90.3	89.3	87.2	85.3	83.4	81.5	79.7
6	.0514	98.8	97.7	96.5	95.4	94.2	93.1	92.1	91.0	89.9	88.8	86.8	84.7	82.8	80.8	78.8
7	.0761	98.3	96.6	94.9	93.2	91.6	90.0	88.5	86.9	85.4	83.9	81.0	78.3	75.6	72.9	70.3
8	.0774	98.2	96.5	94.8	93.1	91.5	89.9	88.3	86.7	85.2	83.7	80.7	77.9	75.2	72.5	70.0
9	.0788	98.2	96.4	94.7	93.0	91.3	89.7	88.1	86.5	84.9	83.4	80.4	77.6	74.8	72.0	69.5
10	.0801	98.2	96.4	94.6	92.9	91.2	89.5	87.9	86.3	84.7	83.2	80.2	77.2	74.4	71.7	69.2
11	.0815	98.2	96.3	94.5	92.8	91.0	89.4	87.7	86.1	84.5	82.9	79.8	76.9	74.1	71.4	68.7
12	.0828	98.1	96.3	94.4	92.7	90.9	89.2	87.5	85.9	84.2	82.6	79.6	76.6	73.7	70.8	68.2
13	.0840	98.1	96.2	94.4	92.6	90.8	89.0	87.3	85.7	84.0	82.4	79.3	76.3	73.4	70.5	67.8

TELEVISION TRANSMISSION LINE

6⅛" UHF TRANSMISSION LINE, MI-19387—EFFICIENCY IN PER CENT

Channel	DB Loss Per 100 Ft.	LENGTH IN FEET														
		100	200	300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
14	.102	97.7	95.4	93.2	91.0	88.9	86.9	84.8	82.9	81.0	79.1	75.4	72.0	68.7	65.6	62.5
15	.102	97.7	95.4	93.2	91.0	88.9	86.8	84.8	82.9	81.0	79.1	75.4	72.0	68.7	65.6	62.5
16	.103	97.7	95.4	93.1	91.0	88.8	86.7	84.7	82.7	80.8	78.9	75.2	71.8	68.4	65.2	62.2
17	.104	97.6	95.3	93.1	90.9	88.7	86.6	84.6	82.6	80.6	78.7	75.0	71.5	68.2	64.9	61.9
18	.105	97.6	95.3	93.0	90.8	88.6	86.5	84.4	82.4	80.4	78.5	74.8	71.3	67.9	64.6	61.6
19	.106	97.6	95.2	92.9	90.7	88.5	86.4	84.3	82.3	80.3	78.4	74.6	71.1	67.7	64.4	61.4
20	.107	97.6	95.2	92.9	90.6	88.4	86.3	84.2	82.1	80.1	78.2	74.4	70.8	67.4	64.1	61.1
21	.108	97.5	95.2	92.8	90.5	88.3	86.1	84.0	82.0	80.0	78.0	74.2	70.6	67.2	64.0	60.8
22	.109	97.5	95.1	92.8	90.5	88.2	86.0	83.9	81.8	79.8	77.8	74.0	70.4	66.9	63.6	60.5
23	.110	97.5	95.1	92.7	90.4	88.1	85.9	83.8	81.7	79.6	77.6	73.8	70.2	66.7	63.3	60.2
24	.111	97.5	95.0	92.6	90.3	88.0	85.8	83.6	81.5	79.4	77.5	73.6	70.0	66.4	63.0	60.0
25	.112	97.5	95.0	92.6	90.2	87.9	85.7	83.5	81.4	79.3	77.3	73.4	69.7	66.2	62.8	59.7
26	.113	97.4	94.9	92.5	90.1	87.8	85.5	83.4	81.2	79.1	77.1	73.2	69.5	66.0	62.5	59.4
27	.113	97.4	94.9	92.5	90.1	87.8	85.5	83.4	81.2	79.1	77.1	73.2	69.5	66.0	62.5	59.4
28	.114	97.4	94.9	92.4	90.0	87.7	85.4	83.2	81.1	79.0	76.9	73.0	69.3	65.7	62.4	59.1
29	.116	97.4	94.8	92.3	89.9	87.5	85.2	83.0	80.8	78.6	76.6	72.6	68.8	65.2	61.7	58.6
30	.117	97.3	94.8	92.3	90.0	87.4	85.1	82.8	80.6	78.5	76.4	72.4	68.6	65.0	61.6	58.3
31	.118	97.3	94.7	92.2	89.7	87.3	85.0	82.7	80.5	78.3	76.2	72.2	68.4	64.7	61.3	58.0
32	.119	97.3	94.7	92.1	89.6	87.2	84.8	82.6	80.3	78.1	76.0	72.0	68.2	64.5	60.9	57.7
33	.119	97.3	94.7	92.1	89.6	87.2	84.8	82.6	80.3	78.1	76.0	72.0	68.2	64.5	60.9	57.7
34	.120	97.3	94.6	92.1	89.5	87.1	84.7	82.4	80.2	78.0	75.9	71.8	67.9	64.3	60.8	57.6
35	.121	97.3	94.6	92.0	89.5	87.0	84.6	82.3	80.0	77.8	75.7	71.6	67.7	64.0	60.5	57.3
36	.122	97.2	94.5	91.9	89.4	86.9	84.5	82.2	80.0	77.7	75.5	71.4	67.5	63.8	60.3	57.0
37	.123	97.2	94.5	91.9	89.3	86.8	84.4	82.0	79.7	77.5	75.3	71.2	67.3	63.6	60.0	56.7
38	.124	97.2	94.5	91.8	89.2	86.7	84.3	81.9	79.6	77.3	75.2	71.0	67.1	63.3	59.7	56.5
39	.125	97.2	94.4	91.7	89.1	86.6	84.1	81.8	79.4	77.2	75.0	70.8	66.8	63.1	59.5	56.2
40	.127	97.1	94.3	91.6	89.0	86.4	83.9	81.5	79.1	76.9	74.6	70.4	66.4	62.6	59.1	55.6
41	.128	97.1	94.3	91.5	88.9	86.3	83.8	81.4	79.0	76.7	74.0	70.2	66.2	62.4	58.8	55.5
42	.129	97.1	94.2	91.5	88.8	86.2	83.7	81.2	78.9	76.5	74.3	70.0	66.0	62.2	58.5	55.2
43	.130	97.1	94.2	91.4	88.7	86.1	83.6	81.1	78.7	76.4	74.1	69.8	65.8	61.9	58.3	54.9
44	.131	97.0	94.1	91.4	88.6	86.0	83.4	81.0	78.6	76.2	74.0	69.6	65.6	61.7	58.0	54.7
45	.132	97.0	94.1	91.3	88.5	85.9	83.3	80.8	78.4	76.1	73.8	69.4	65.3	61.5	57.9	54.4
46	.133	97.0	94.1	91.2	88.5	85.8	83.2	80.7	78.3	75.9	73.6	69.3	65.1	61.3	57.6	54.1
47	.134	97.0	94.0	91.2	88.4	85.7	83.1	80.6	78.1	75.8	73.5	69.1	64.9	61.0	57.4	54.0
48	.135	96.9	94.0	91.1	88.3	85.6	83.0	80.4	78.0	75.6	73.3	68.9	64.7	60.8	57.1	53.7

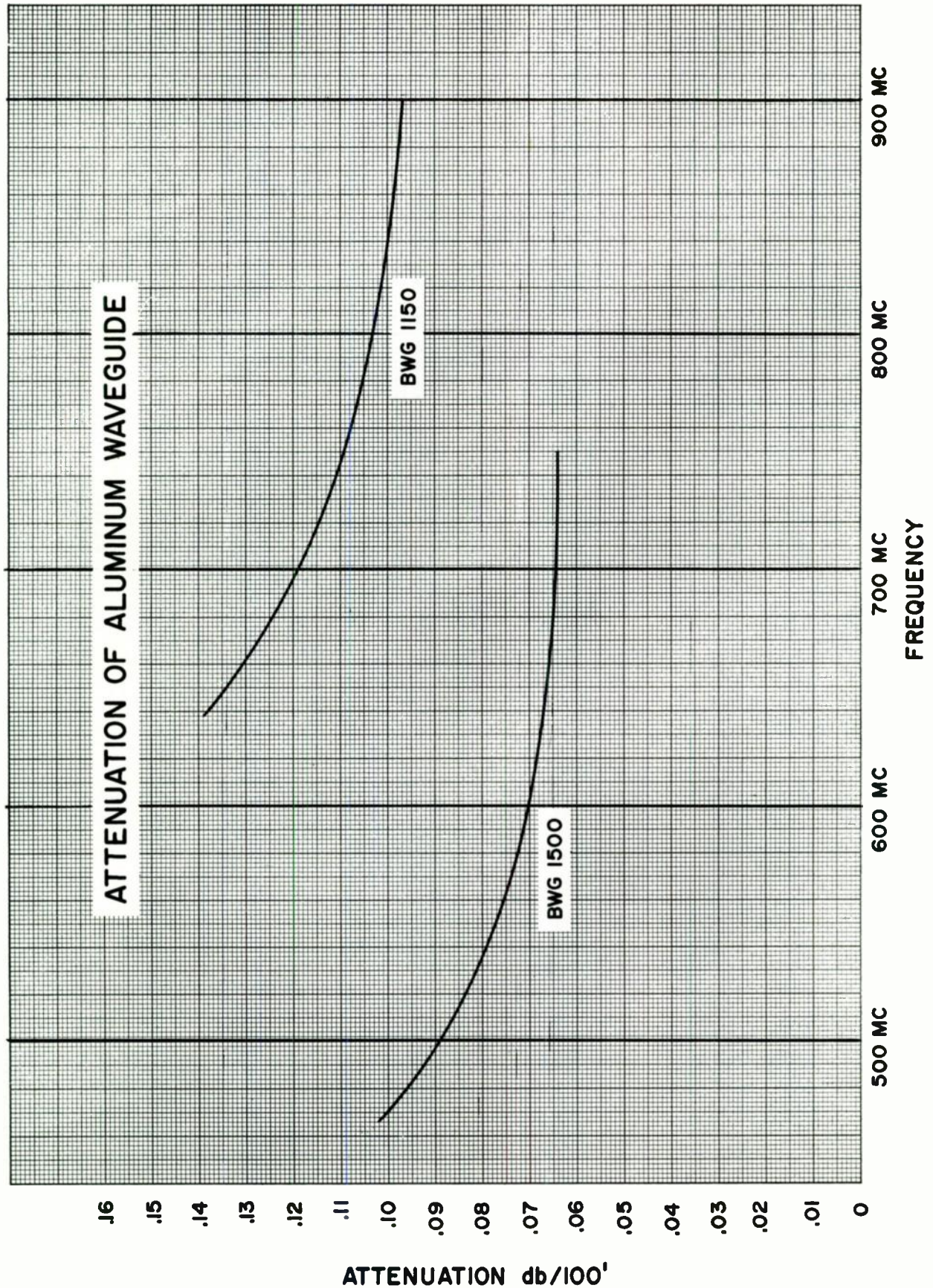
TELEVISION TRANSMISSION LINE

6⅛" UHF TRANSMISSION LINE, MI-19387—EFFICIENCY IN PER CENT

Channel	DB Loss Per 100 Ft.	LENGTH IN FEET														
		100	200	300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
49	.136	96.9	93.9	91.0	88.2	85.5	82.9	80.3	77.8	75.4	73.1	68.7	64.5	60.6	56.8	53.4
50	.137	96.9	93.9	91.0	88.1	85.4	82.8	80.2	77.7	75.3	72.9	68.5	64.3	60.4	56.7	53.1
51	.138	96.9	93.8	90.9	88.1	85.3	82.6	80.1	77.6	75.1	72.8	68.3	64.1	60.2	56.4	52.9
52	.140	96.8	93.8	90.8	87.9	85.1	82.4	79.8	77.3	74.8	72.4	67.9	63.7	59.7	55.9	52.4
53	.141	96.8	93.7	90.7	87.8	85.0	82.3	79.7	77.1	74.7	72.3	67.7	63.5	59.5	55.8	52.2
54	.143	96.8	93.6	90.6	87.7	84.8	82.1	79.4	76.8	74.4	71.9	67.4	63.1	59.1	55.3	51.6
55	.144	96.7	93.6	90.5	87.6	84.7	82.0	79.3	76.7	74.2	71.8	67.2	62.9	58.8	55.0	51.5
56	.145	96.7	93.5	90.5	87.5	84.6	81.9	79.2	76.6	74.1	71.6	67.0	62.7	58.6	54.9	51.2
57	.147	96.7	93.5	90.3	87.3	84.4	81.6	79.0	76.3	73.8	71.3	66.6	62.3	58.2	54.4	50.8
58	.148	96.7	93.4	90.3	87.3	84.3	81.5	78.8	76.1	73.6	71.1	66.4	62.1	58.0	54.1	50.5
59	.150	96.6	93.3	90.2	87.1	84.1	81.3	78.5	75.9	73.3	70.8	66.1	61.7	57.5	53.7	50.1
60	.151	96.6	93.3	90.1	87.0	84.0	81.7	78.4	75.7	73.1	70.6	65.9	61.5	57.3	53.4	49.8
61	.153	96.5	93.2	90.0	86.9	83.9	80.0	78.1	75.4	72.8	70.3	65.5	61.1	56.9	52.9	49.4
62	.155	96.5	93.1	89.9	86.7	83.7	80.7	77.9	75.2	72.5	70.0	65.2	60.7	56.5	52.5	49.0
63	.157	96.5	93.0	89.7	86.5	83.5	80.5	77.7	74.9	72.2	69.7	64.8	60.3	56.1	52.1	48.5
64	.159	96.4	92.9	89.6	86.4	83.3	80.3	77.4	74.6	71.9	69.3	64.5	59.9	55.7	51.6	48.0
65	.161	96.4	92.9	89.5	86.2	83.1	80.1	77.1	74.3	71.6	69.0	64.1	59.5	55.3	51.2	47.6
66	.162	96.3	92.8	89.4	86.1	83.0	80.0	77.0	74.2	71.5	68.9	63.9	59.3	55.1	51.1	47.4
67	.164	96.3	92.7	89.3	86.0	82.8	79.7	76.8	73.9	71.2	68.6	63.6	58.9	54.7	50.6	47.0
68	.165	96.3	92.7	89.2	85.9	82.7	79.6	76.7	73.8	71.0	68.4	63.4	58.8	54.5	50.4	46.7
69	.167	96.2	92.6	89.1	85.7	82.5	79.4	76.4	73.5	70.8	68.1	63.0	58.4	54.1	50.1	46.3
70	.169	96.2	92.5	89.0	85.6	82.3	79.2	76.2	73.3	70.5	67.8	62.7	58.0	53.7	49.7	45.9
71	.172	96.1	92.4	88.8	85.4	82.0	78.9	75.8	72.8	70.0	67.3	62.2	57.4	53.1	49.0	45.2
72	.175	96.1	92.3	88.6	85.1	81.8	78.5	75.4	72.4	69.6	66.8	61.7	56.9	52.5	48.4	44.6
73	.178	96.0	92.1	88.4	84.9	81.5	78.2	75.1	72.1	69.2	66.4	61.2	56.3	51.9	47.8	44.0
74	.180	95.9	92.1	88.3	84.7	81.3	78.0	74.8	71.8	68.9	66.1	60.8	56.0	51.5	47.4	43.6
75	.182	95.9	92.0	88.2	84.6	81.1	77.8	74.6	71.5	68.6	65.8	60.5	55.6	51.2	47.0	43.2
76	.185	95.9	91.8	88.0	84.3	80.8	77.5	74.2	71.1	68.2	65.3	59.9	55.1	50.6	46.5	42.6
77	.188	95.8	91.7	87.8	84.1	80.5	77.1	73.9	70.7	67.7	64.8	59.5	54.6	50.0	45.8	41.9
78	.191	95.7	91.6	87.6	83.9	80.2	76.8	73.5	70.3	67.3	64.4	59.0	54.0	49.5	45.2	41.4
79	.195	95.6	91.4	87.4	83.6	79.9	76.4	73.0	69.8	66.7	63.8	58.3	53.3	48.8	44.4	40.7
80	.199	95.5	91.2	87.2	83.3	79.5	76.0	72.6	69.3	66.2	63.2	57.7	52.7	48.0	43.8	39.9
81	.203	95.4	91.1	86.9	83.0	79.2	75.6	72.1	68.8	65.7	62.7	57.1	52.0	47.3	43.1	39.3
82	.207	95.4	90.9	86.7	82.6	78.8	75.1	71.6	68.3	65.1	62.1	56.4	51.3	46.6	42.3	38.5
83	.210	95.3	90.8	86.5	82.4	78.5	74.8	71.3	67.9	64.7	61.7	56.0	50.8	46.1	41.8	38.0

WAVEGUIDE TV TRANSMISSION LINE

Type	Rated Input Power	Size	Power Loss
BWG-1150	40 megawatts	11½" x 5¾"	Refer to
BWG-1500	40 megawatts	15" x 7½"	Curve Below



KILOWATTS VERSUS DBK

World Radio History

KILOWATTS VERSUS DBK

World Radio History

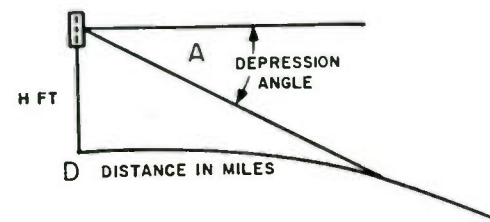
DISTANCE IN MILES TO RECEIVING LOCATION AND DEPRESSION ANGLES FOR VARIOUS ANTENNA HEIGHTS

H—Height in feet to Electrical
center of antenna

D_h —Distance to horizon = $\sqrt{2H}$
(4/3 earth radius)

A_h —Depression angle to horizon = $\frac{.0216H}{D_h}$

The relationship $D = \frac{.0109 H}{A}$



HEIGHT H IN FEET			DEPRESSION ANGLE																			
	D _h	A _h	0.5°	1°	1.5°	2°	2.5°	3°	3.5°	4°	4.5°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°
200	20.0	.216	4.6	2.21	1.45	1.07	0.86	0.71	0.61	0.54	0.48	0.43	0.36	0.31	0.27	0.24	0.22	0.20	0.18	0.17	0.15	0.14
300	24.5	.268	7.2	3.35	2.18	1.64	1.30	1.07	0.92	0.80	0.71	0.64	0.55	0.46	0.41	0.37	0.33	0.30	0.27	0.25	0.23	0.21
400	28.3	.304	9.9	4.49	2.90	2.18	1.75	1.42	1.24	1.06	0.94	0.86	0.73	0.62	0.54	0.49	0.46	0.40	0.36	0.33	0.31	0.29
500	31.6	.343	12.6	5.60	3.65	2.72	2.16	1.82	1.55	1.36	1.21	1.09	0.92	0.78	0.68	0.61	0.55	0.50	0.45	0.42	0.39	0.36
600	34.6	.375	16.0	6.81	4.8	3.61	2.64	2.15	1.86	1.63	1.42	1.31	1.09	0.92	0.81	0.73	0.65	0.59	0.54	0.50	0.46	0.43
700	37.4	.405	19.9	7.98	5.2	3.87	3.08	2.54	2.16	1.90	1.68	1.50	1.25	1.06	0.94	0.83	0.74	0.68	0.62	0.57	0.53	0.50
800	40.0	.435	24.2	9.2	5.9	4.49	3.52	2.89	2.50	2.17	1.90	1.75	1.45	1.22	1.05	0.97	0.86	0.78	0.72	0.67	0.61	0.58
900	42.4	.452	29.5	10.5	6.7	5.05	3.98	3.28	2.80	2.45	2.13	1.96	1.62	1.36	1.19	1.09	0.97	0.88	0.81	0.75	0.69	0.65
1000	45.0	.487	36.2	11.6	7.4	5.51	4.39	3.65	3.10	2.70	2.39	2.15	1.79	1.52	1.32	1.18	1.08	0.98	0.90	0.83	0.77	0.72
1200	49.0	.530	—	14.1	9.0	6.75	5.32	4.39	3.77	3.19	2.85	2.61	2.15	1.81	1.59	1.44	1.29	1.18	1.08	1.00	0.92	0.87
1400	53.0	.577	—	16.7	10.4	7.66	6.12	5.13	4.33	3.77	3.35	3.00	2.48	2.11	1.85	1.63	1.45	1.36	1.24	1.15	1.06	1.00
1600	56.6	.620	—	19.4	12.0	9.10	7.10	5.85	5.02	4.35	3.80	3.40	2.84	2.40	2.13	1.91	1.72	1.55	1.44	1.32	1.23	1.16
1800	60.0	.650	—	22.3	13.6	10.25	8.00	6.60	5.65	4.90	4.30	3.90	3.19	2.69	2.39	2.15	1.94	1.75	1.62	1.48	1.38	1.30
2000	63.2	.683	—	25.4	15.4	11.25	8.89	7.30	6.25	5.45	4.80	4.30	3.60	3.04	2.68	2.38	2.13	2.00	1.83	1.70	1.56	1.46
5000	100.0	1.080	—	—	42.9	29.5	22.80	18.75	15.85	13.75	12.10	10.90	9.01	7.75	6.73	6.00	5.40	4.90	4.50	4.15	3.84	3.60

TV FREQUENCIES & WAVELENGTHS

Channel	Mc	Visual Carrier, Mc	Wavelengths in inches	Channel	Mc	Visual Carrier, Mc	Wavelengths in inches
2	54-60	55.25	214.0	43	644-650	645.25	18.2
3	60-66	61.25	193.0	44	650-656	651.25	18.1
4	66-72	67.25	176.0	45	656-662	657.25	17.9
5	76-82	77.25	153.0	46	662-668	663.25	17.7
6	82-88	83.25	142.0	47	668-674	669.25	17.6
7	174-180	175.25	67.4	48	674-680	675.25	17.4
8	180-186	181.25	65.2	49	680-686	681.25	17.3
9	186-192	187.25	63.0	50	686-692	687.25	17.1
10	192-198	193.25	61.2	51	692-698	693.25	17.0
11	198-204	199.25	59.3	52	698-704	699.25	16.8
12	204-210	205.25	57.6	53	704-710	705.25	16.7
13	210-216	211.25	55.9	54	710-716	711.25	16.5
14	470-476	471.25	25.0	55	716-722	717.25	16.4
15	476-482	477.25	24.7	56	722-728	723.25	16.3
16	482-488	483.25	24.4	57	728-734	729.25	16.1
17	488-494	489.25	24.1	58	734-740	735.25	16.0
18	494-500	495.25	23.8	59	740-746	741.25	15.9
19	500-506	501.25	23.5	60	746-752	747.25	15.7
20	506-512	507.25	23.2	61	752-758	753.25	15.6
21	512-518	513.25	22.9	62	758-764	759.25	15.5
22	518-524	519.25	22.7	63	764-770	765.25	15.4
23	524-530	525.25	22.4	64	770-776	771.25	15.3
24	530-536	531.25	22.2	65	776-782	777.25	15.1
25	536-542	537.25	21.9	66	782-788	783.25	15.0
26	542-548	543.25	21.7	67	788-794	789.25	14.9
27	548-554	549.25	21.4	68	794-800	795.25	14.8
28	554-560	555.25	21.2	69	800-806	801.25	14.7
29	560-566	561.25	21.0	70	806-812	807.25	14.6
30	566-572	567.25	20.8	71	812-818	813.25	14.5
31	572-578	573.25	20.5	72	818-824	819.25	14.4
32	578-584	579.25	20.3	73	824-830	825.25	14.3
33	584-590	585.25	20.1	74	830-836	831.25	14.1
34	590-596	591.25	19.9	75	836-842	837.25	14.0
35	596-602	597.25	19.7	76	842-848	843.25	13.9
36	602-608	603.25	19.5	77	848-854	849.25	12.8
37	608-614	609.25	19.3	78	854-860	855.25	13.8
38	614-620	615.25	19.1	79	860-866	861.25	13.7
39	620-626	621.25	18.9	80	866-872	867.25	13.6
40	626-632	627.25	18.8	81	872-878	873.25	13.5
41	632-638	633.25	18.6	82	878-884	879.25	13.4
42	638-644	639.25	18.4	83	884-890	885.25	13.3

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210C Court Terrace, Exchange Park, North, 214-351-5361

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