VU AND VOLUME INDICATOR METERS

10.42 *Knowing the level in decibels and line impedance, how is the voltage determined for other line impedances?—* If the line voltage for a given level at 600 ohms is known, voltages for other line impedances may be calculated:

$$E_x = V_{dB} \sqrt{\frac{Z}{600}}$$

where,

E_x is the unknown voltage,
V_{dB} is the voltage for 600-ohms.

As an example, assume voltage E_x is required for a line impedance of 150 ohms at a level of plus 4 dBm. Referring to Fig. 10-42, the voltage for a level of plus 4 dBm is 1.23 volts. The new voltage may now be calculated:

$$E_x = 1.23 \sqrt{\frac{150}{600}} = 0.615 \text{ volt.}$$

Voltages for a line impedance of 600 ohms for levels between minus 20 dBm to plus 50 dBm may be taken from Fig. 10-42. Additional information is given in Question 23.167, and in Question 25.115.

WATTS	VU dBm	VOLTS
100	+50	245
90	49	218
80	48	195
70	47	173
60	46	155
50	45	138
40	44	123
30	43	109
20	42	97.5
15	41	86.9
10	40	77.5
9	39	69.0
8	38	61.5
7	37	54.8
6	36	48.9
5	35	43.6
4	34	38.8
3	33	34.6
2	32	30.8
1.5	31	27.5
1	30	24.5
900	29	21.8
800	28	19.5
700	27	17.3
600	26	15.5
500	25	13.8
400	24	12.3
300	23	10.9
200	22	9.75
150	21	8.69
100	20	7.75
90	19	6.90
80	18	6.15
70	17	5.48
60	16	4.89
50	15	4.36
40	14	3.88
30	13	3.46
20	12	3.08
15	11	2.75
10	10	2.45
9	9	2.18
8	8	1.95
7	7	1.73
6	6	1.55
5	5	1.38
4	+4	1.23
3	3	1.09
2	2	.975
1.5	1	.869
1	0	.775

(WATTS scale upper portion in watts; lower portion in MILLIWATTS)

Fig. 10-42. Relationship of VU and dBm to power in watts and voltage in a 600-ohm line.