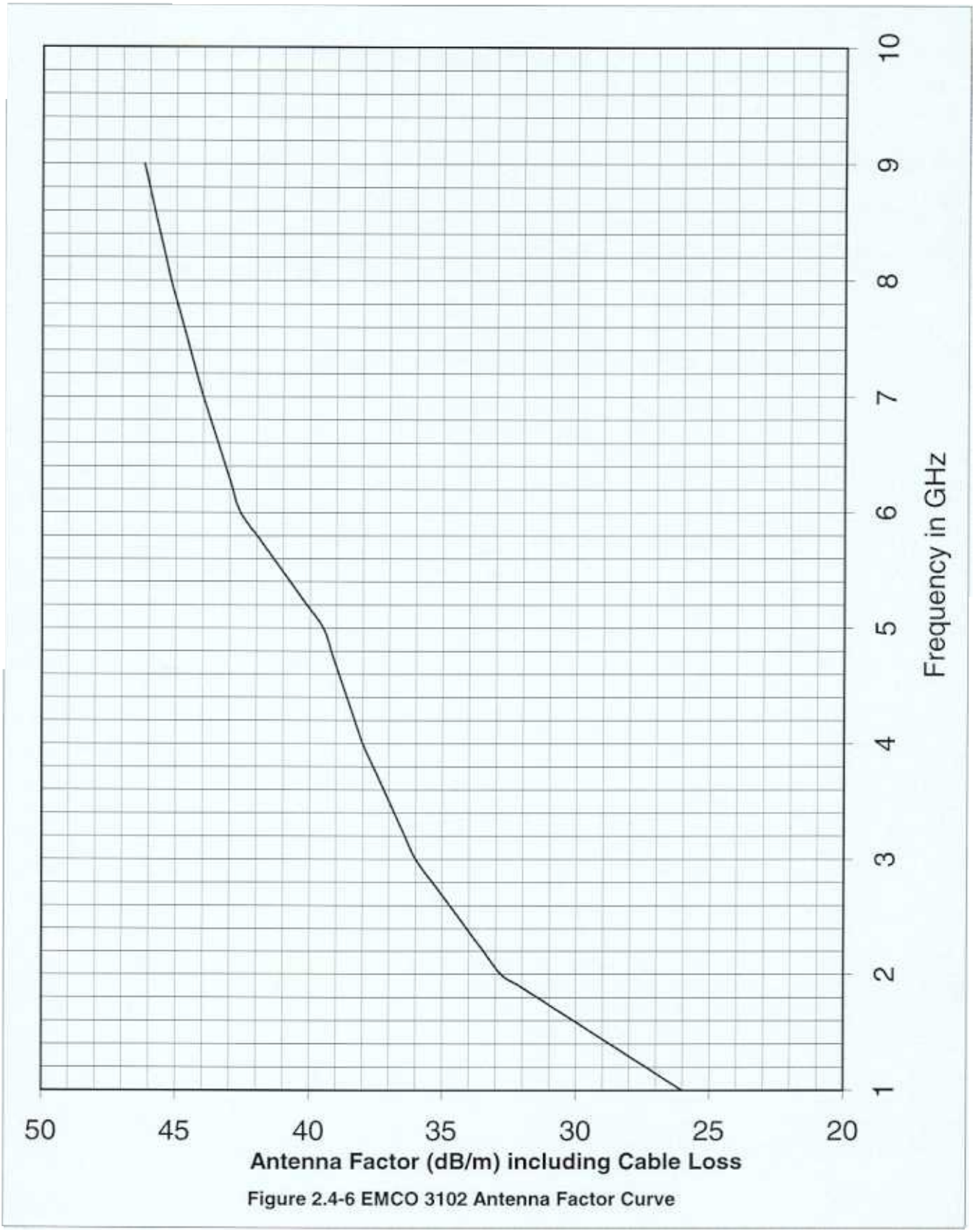

Figure 2.4-6 EMCO 3102 Antenna Factor Curve

2.5 Frequency Stability [2.1055]

Frequency stability measurements shall be performed in accordance with the requirements of FCC Subpart 2.1055.

Requirement - The frequency of the transmitted signal shall remain within ±0.1 ppm of the channel reference or center frequency [22.863].

2.5.1 Measurements

2.5.1.1 Frequency Stability Versus Temperature [2.1055 (b) & (c)]

[2.1055(b)]

Frequency stability measurements shall be made at -30°C, 50°C, and at temperature increments not exceeding 10°C over the range from -30°C to 50°C. Prior to performing each measurement, a period of time shall be allowed for all oscillator circuit components to stabilize at each ambient temperature level. The transient effects on frequency of transmitter keying and oven cycling shall also be shown at each temperature level.

[2.1055(c)]

Frequency stability measurements shall be made from cold starts at -30°C, 0°C, and 30°C. Prior to performing each measurement, a period of time shall be allowed for all oscillator circuit components to stabilize at each ambient temperature level with no primary power applied. Measurements shall be made within one minute after application of primary power and at intervals of no more than one minute thereafter until 10 minutes have elapsed or until frequency stabilization is clearly indicated (whichever is the longer time period). The ambient temperature shall not be allowed to rise more than 10°C above the cold-start ambient temperature during measurements.

2.5.1.2 Frequency Stability Versus Supply Voltage [2.1055(d)]

Frequency stability measurements shall be made at room ambient temperature (22°C ± 2°C) with power supply voltage varied from 85% to 115% of the rated nominal primary power input voltage. Supply voltage shall be measured at the primary power input terminals of the ARTU. The effects on frequency of transmitter keying and oven cycling shall also be noted.

2.5.2 Measurement Procedures

All tests are to be performed without transmitter modulation. I.E. CW Initial adjustments of transmitter frequency shall be made at room ambient temperature ($22^{o}C \pm 2^{o}C$) with 28 VDC power applied to the ARTU. Frequency adjustments shall not be made during the course of any test.

Transmitter operation is inhibited after primary power is applied, by an internal temperature monitor signal from the OCXO. This monitor signal allows the transmitter OCXO to stabilize at operating temperature. The delay interval will be accurately measured when cold-start frequency stability measurements are performed. An "Oven-on" status indicator shall be made available to the tester to facilitate evaluating the effects of oven cycling on transmitter frequency.

2.5.2.1 Frequency Stability Versus Temperature

[2.1055(b)]

1. Prepare the test setup shown in Figure 2.5-1. All RF connections shall be made using 50-ohm coaxial cables.
2. Power the ARTU from a 28 VDC power source.
3. Via the MMT, program the transmitter to operate at the maximum power output level at 895.005500 MHz (Ch. 1, BLk 5).
4. Allow the ARTU to thermally stabilize at an ambient temperature of $-30^{0}C$.
5. Energize the transmitter and measure the frequency of the transmitted signal. Record the measured frequency in the space provided on a test data sheet of the type shown in Figure 2.5-2.
6. While maintaining the ambient temperature at the level recorded in Step 5, energize the transmitter and note the effects of keying and oven cycling on the frequency of the transmitted signal. Record comments in the spaces provided on the test data sheet.
7. Repeat Steps 5 and 6 after the ARTU has thermally stabilized at $-20^{0}C$ and at $10^{0}C$ temperature increments thereafter. The final measurement shall be taken at an ambient temperature of $50^{0}C$.
8. List all test equipment used in these measurements. Include the manufacturer's name and model number, a description of the equipment, and calibration dates.

[2.1055(c)]

1. Using the test setup shown in Figure 2.5-1, allow the ARTU to thermally stabilize at an ambient temperature of $-30^{0}C$ with primary power disconnected. Record the cold-start ambient temperature in the space provided on a test data sheet of the type shown in Figure 2.5-3
2. Power the transmitter from a 28 VDC power source and simultaneously begin measurement of the transmitter-on time delay as determined by the OCXO warm-up signal.
3. Via the MMT, program the transmitter to operate at the maximum power output level at 895.005500 MHz (Ch. 1, Blk 5).