

Selected Canadian Airports Altitude Correction Plots Off-Standard Atmosphere

Revision Date: June 1, 2017

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Flight Deck Engineering



1.1 Abstract

Most aviation authorities' procedures and regulations require or recommend that pilots apply corrections to minimum instrument approach altitudes during periods of very cold weather conditions, or cold weather conditions in combination with terrain. The purpose of this document is to provide means to implement the cold temperature altitude corrections recommended by International Civil Aviation Organization (ICAO) in document PANS OPS Doc 8168 [1].

ICAO document PANS OPS Doc 8168 [1] recommends the use of three different formulas. These formulas provide altitude corrections with different degrees of approximation for an Off-ISA Atmosphere, which is an atmosphere with the same characteristic of the International Standard Atmosphere but whose temperature profile differs from ISA by a constant temperature offset.

The first formula, called "Sea Level Approximation" is the same used to calculate the well-known ICAO Cold Temperature Altitude Correction Table. It is the least accurate of the three formulas, as it assumes that the airport/station is located at sea level.

The second formula, called "Off-Standard Atmosphere Approximated" still includes approximations, yet it is more accurate than the first one, as it takes into account the airport/station elevation.

The third formula, called "Off-Standard Atmosphere" includes only minor approximations, providing the most accurate corrections.

This document provides Cold Temperature Altitude Correction Plots for a selected number of Canadian Airports.

The formula used is the third of those recommended by International Civil Aviation Organization (ICAO) in document PANS OPS Doc 8168 [1], the so called "Off-Standard Atmosphere".



1.2 Disclaimer

These notes were produced to improve understanding of cold temperature correction and promote situational awareness. The content of this document should not be used for navigation and the user should always refer to current published documents and charts.

The pilot in command of an aircraft is ultimately responsible for its operation and safety during flight.

In these notes, the term “corrected altitude” is used with the intended meaning of “altitude corrected for non-standard temperature”.

1.3 Further Information

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1.4	Table of Contents	
1.1	ABSTRACT	1
1.2	DISCLAIMER	2
1.3	FURTHER INFORMATION.....	2
1.4	TABLE OF CONTENTS.....	3
2	ALBERTA AIRPORTS	6
2.1	CYEG - EDMONTON, AB, CANADA	7
2.2	CYMM - FORT McMURRAY, AB, CANADA	8
2.3	CYQF - RED DEER, AB, CANADA	9
2.4	CYQL - LETHBRIDGE, AB, CANADA.....	10
2.5	CYQU - GRANDE PRAIRIE, AB, CANADA	11
2.6	CYXH - MEDICINE HAT, AB, CANADA	12
2.7	CYYC - CALGARY, AB, CANADA	13
3	BRITISH COLUMBIA AIRPORTS	14
3.1	CYBL - CAMPBELL RIVER, BC, CANADA	15
3.2	CYCD - NANAIMO, BC, CANADA.....	16
3.3	CYCG - CASTLEGAR, BC, CANADA.....	17
3.4	CYKA - KAMLOOPS, BC, CANADA.....	18
3.5	CYLW - KELOWNA, BC, CANADA.....	19
3.6	CYPR - PRINCE RUPERT, BC, CANADA.....	20
3.7	CYQQ - COMOX, BC, CANADA.....	21
3.8	CYQZ - QUESNEL, BC, CANADA.....	22
3.9	CYVR - VANCOUVER, BC, CANADA.....	23
3.10	CYWL - WILLIAMS LAKE, BC, CANADA	24
3.11	CYXC - CRANBROOK, BC, CANADA	25
3.12	CYXJ - FORT ST. JOHN, BC, CANADA.....	26
3.13	CYXS - PRINCE GEORGE, BC, CANADA.....	27
3.14	CYXT - TERRACE, BC, CANADA	28
3.15	CYXX - ABBOTSFORD, BC, CANADA.....	29
3.16	CYYD - SMITHERS, BC, CANADA.....	30
3.17	CYYF - PENTICTON, BC, CANADA.....	31



3.18 CYYJ - VICTORIA, BC, CANADA	32
3.19 CYZP - SANDSPIT, BC, CANADA	33
4 MANITOBA AIRPORTS	34
4.1 CYWG - WINNIPEG, MB, CANADA	35
5 NEW BRUNSWICK AIRPORTS	36
5.1 CYFC - FREDERICTON, NB, CANADA	37
5.2 CYQM - MONCTON, NB, CANADA.....	38
5.3 CYSJ - SAINT JOHN, NB, CANADA	39
5.4 CZBF - BATHURST, NB, CANADA	40
6 NEWFOUNDLAND AND LABRADOR AIRPORTS	41
6.1 CYDF - DEER LAKE, NL, CANADA.....	42
6.2 CYQX - GANDER, NL, CANADA.....	43
6.3 CYWK - WABUSH, NL, CANADA.....	44
6.4 CYYR - GOOSE BAY, NL, CANADA	45
6.5 CYYT - ST JOHN'S, NL, CANADA	46
7 NORTHWEST TERRITORIES AIRPORTS.....	47
7.1 CYZF - YELLOWKNIFE, NT, CANADA.....	48
8 NOVA SCOTIA AIRPORTS.....	49
8.1 CYHZ - HALIFAX, NS, CANADA	50
8.2 CYQY - SYDNEY, NS, CANADA	51
9 NUNAVUT AIRPORTS	52
9.1 CYFB - IQALUIT, NU, CANADA.....	53
10 ONTARIO AIRPORTS	54
10.1 CYAM - SAULT STE. MARIE, ON, CANADA	55
10.2 CYGK - KINGSTON, ON, CANADA	56
10.3 CYKF - KITCHENER, ON, CANADA.....	57
10.4 CYOW - OTTAWA, ON, CANADA	58
10.5 CYQT - THUNDER BAY, ON, CANADA	59
10.6 CYSB - SUDBURY, ON, CANADA.....	60
10.7 CYTS - TIMMINS, ON, CANADA.....	61
10.8 CYXU - LONDON, ON, CANADA	62
10.9 CYYB - NORTH BAY, ON, CANADA	63



10.10 CYYZ - TORONTO, ON, CANADA.....	64
10.11 CYZR - SARNIA, ON, CANADA	65
11 PRINCE EDWARD ISLAND AIRPORTS.....	66
11.1 CYYG - CHARLOTTETOWN, PE, CANADA	67
12 QUEBEC AIRPORTS.....	68
12.1 CYBC - BAIE COMEAU, QC, CANADA	69
12.2 CYBG - BAGOTVILLE, QC, CANADA	70
12.3 CYFJ - MONT TREMBLANT, QC, CANADA	71
12.4 CYGP - GASPE, QC, CANADA.....	72
12.5 CYGR - ILES DE LA MADELEINE, QC, CANADA.....	73
12.6 CYQB - QUEBEC, QC, CANADA.....	74
12.7 CYUL - MONTREAL, QC, CANADA.....	75
12.8 CYUY - ROUYN-NORANDA, QC, CANADA	76
12.9 CYVO - VAL D'OR, QC, CANADA	77
12.10 CYYY - MONT JOLI, QC, CANADA	78
12.11 CYZV - SEPT-ILES, QC, CANADA	79
13 SASKATCHEWAN AIRPORTS.....	80
13.1 CYQR - REGINA, SK, CANADA	81
13.2 CYXE - SASKATOON, SK, CANADA.....	82
14 YUKON AIRPORTS.....	83
14.1 CYXY - WHITEHORSE, YT, CANADA	84
15 BIBLIOGRAPHY.....	85



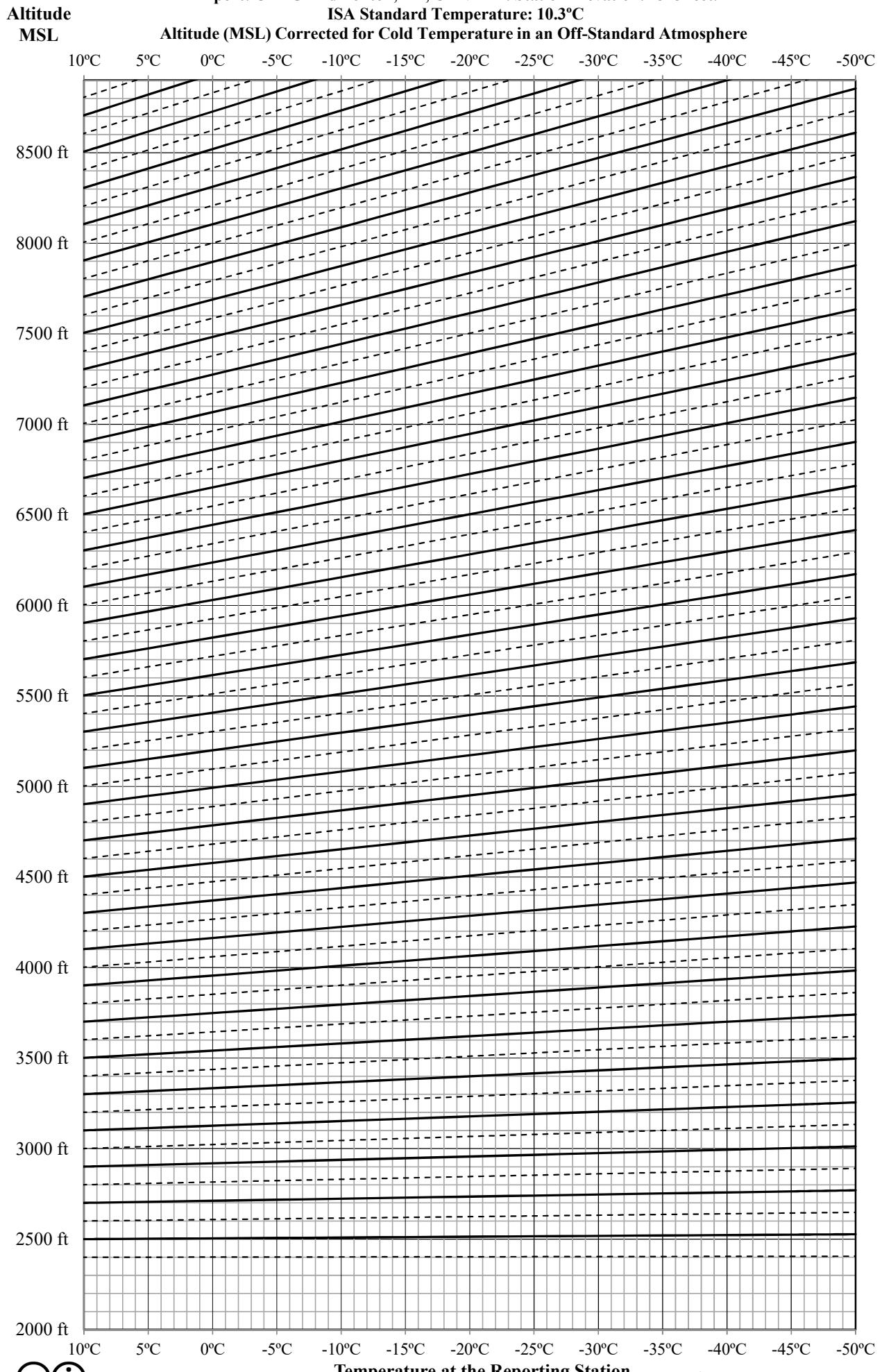
2 Alberta Airports

2.1	CYEG - EDMONTON, AB, CANADA.....	7
2.2	CYMM - FORT MCMURRAY, AB, CANADA.....	8
2.3	CYQF - RED DEER, AB, CANADA	9
2.4	CYQL - LETHBRIDGE, AB, CANADA	10
2.5	CYQU - GRANDE PRAIRIE, AB, CANADA	11
2.6	CYXH - MEDICINE HAT, AB, CANADA	12
2.7	CYYC - CALGARY, AB, CANADA.....	13

Airport: CYEG - Edmonton, AB, CANADA. Station Elevation: 2373 feet.

ISA Standard Temperature: 10.3°C

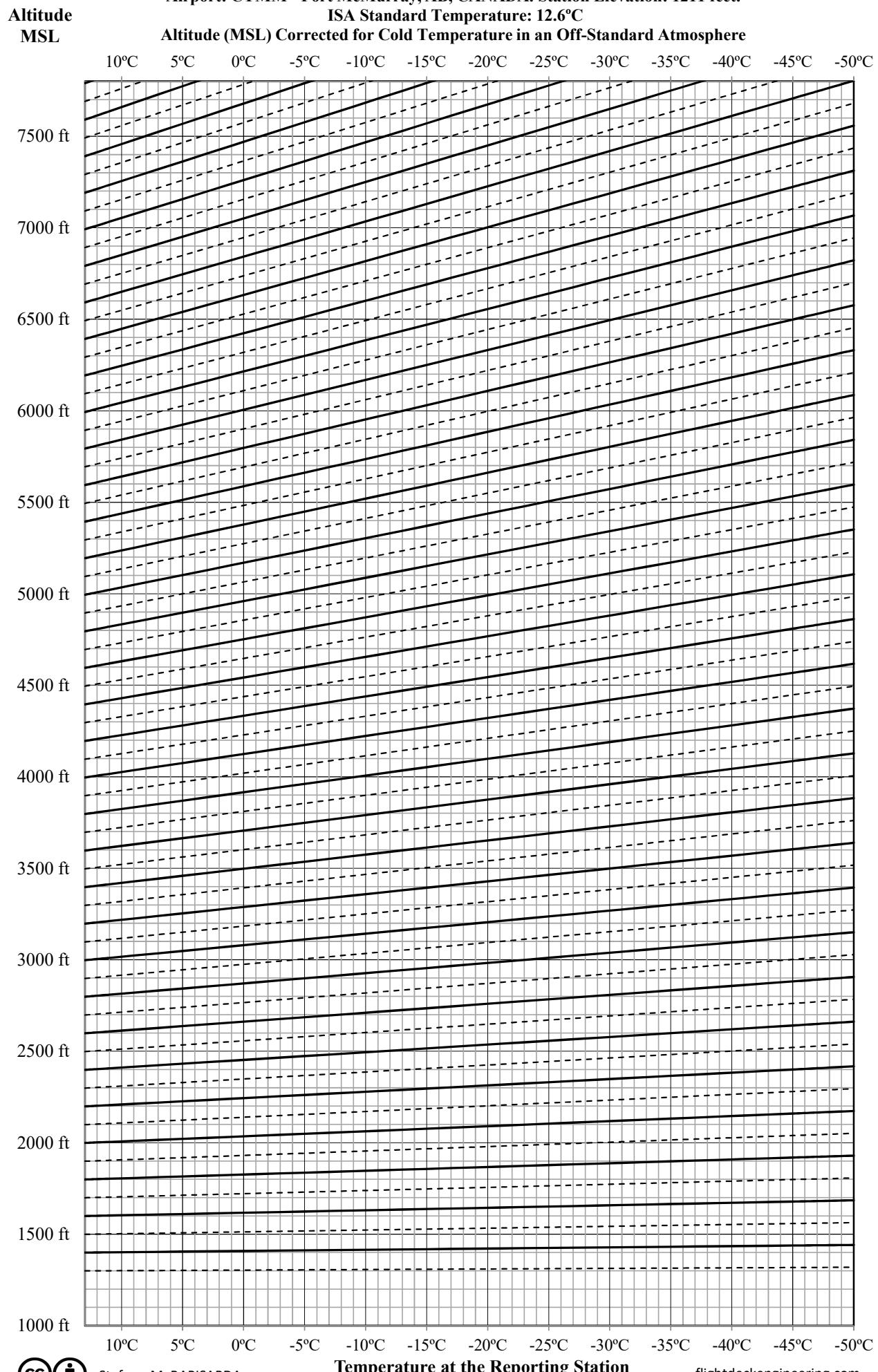
Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



Airport: CYMM - Fort McMurray, AB, CANADA. Station Elevation: 1211 feet.

ISA Standard Temperature: 12.6°C

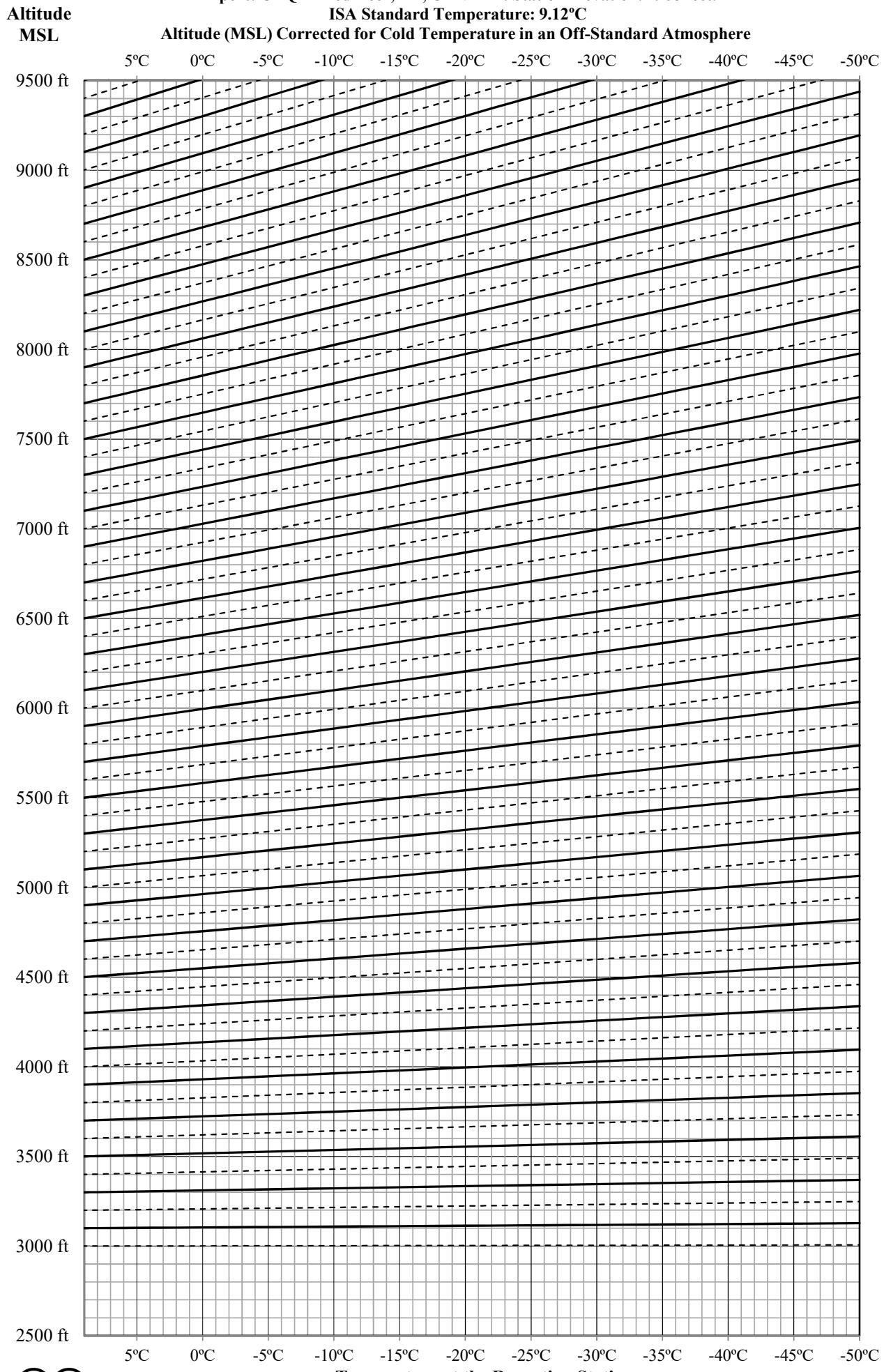
Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



Airport: CYQF - Red Deer, AB, CANADA. Station Elevation: 2968 feet.

ISA Standard Temperature: 9.12°C

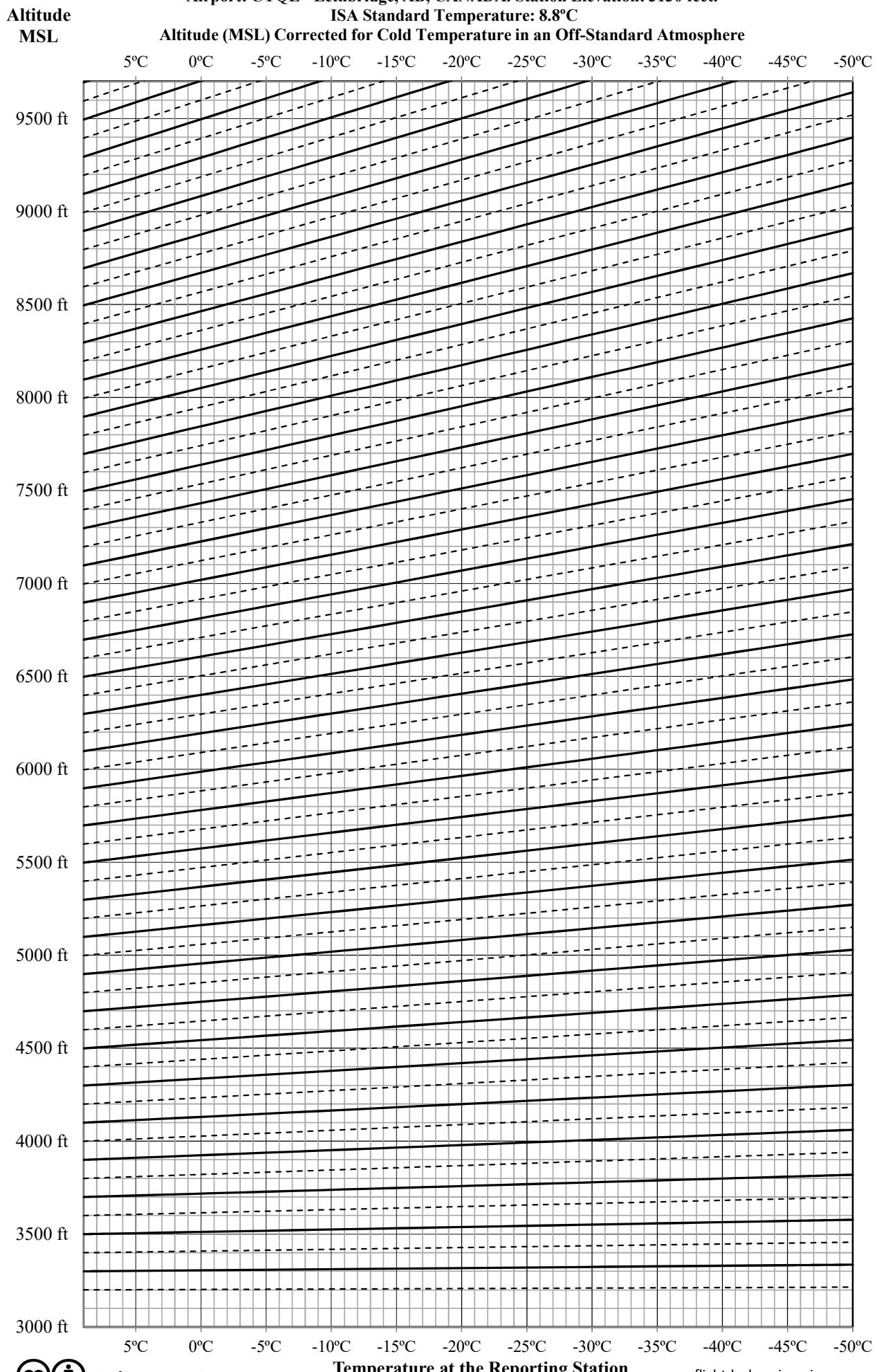
Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



Airport: CYQL - Lethbridge, AB, CANADA. Station Elevation: 3130 feet.

ISA Standard Temperature: 8.8°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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Temperature at the Reporting Station

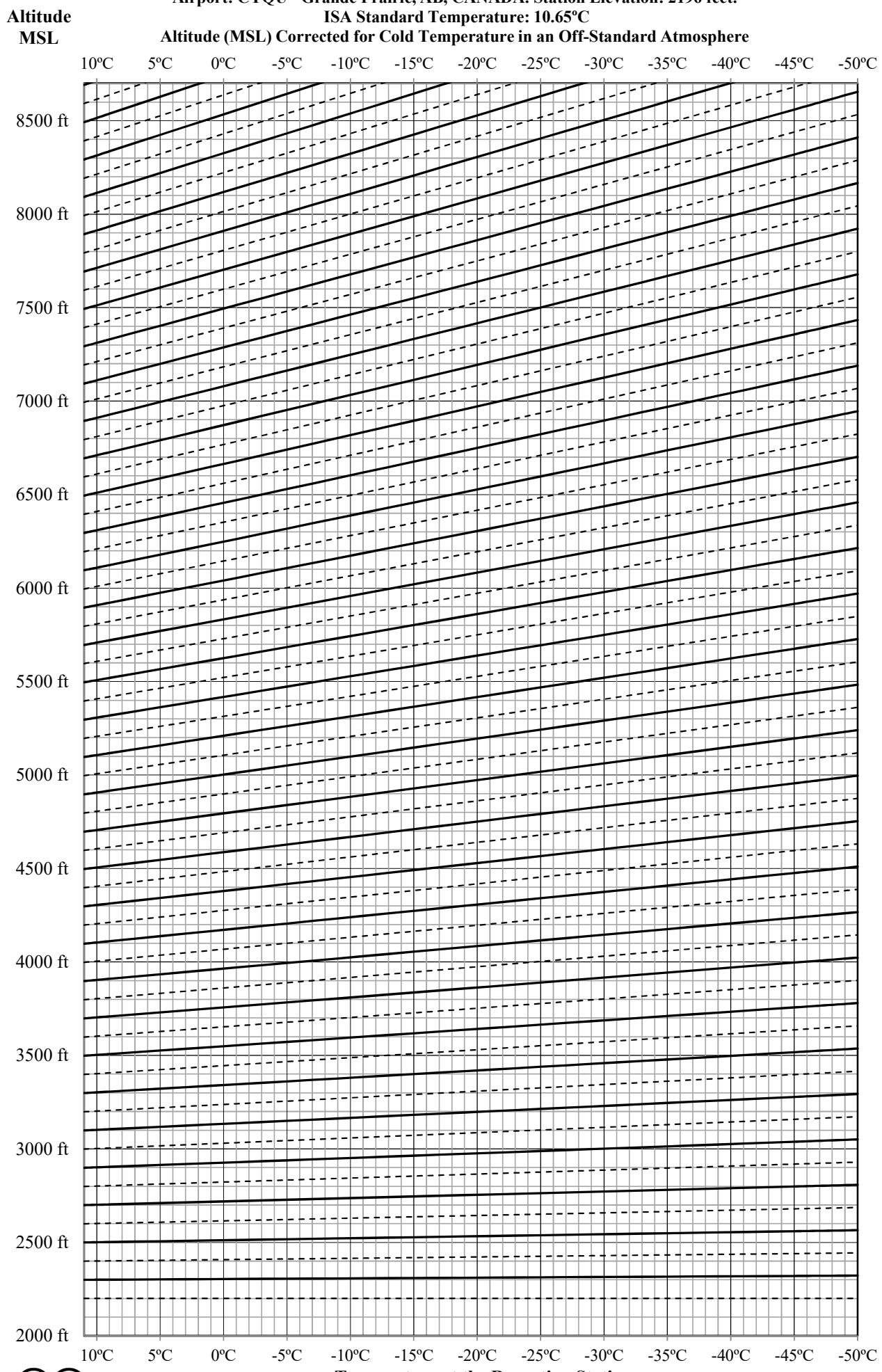
Page 10

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Airport: CYQU - Grande Prairie, AB, CANADA. Station Elevation: 2196 feet.

ISA Standard Temperature: 10.65°C

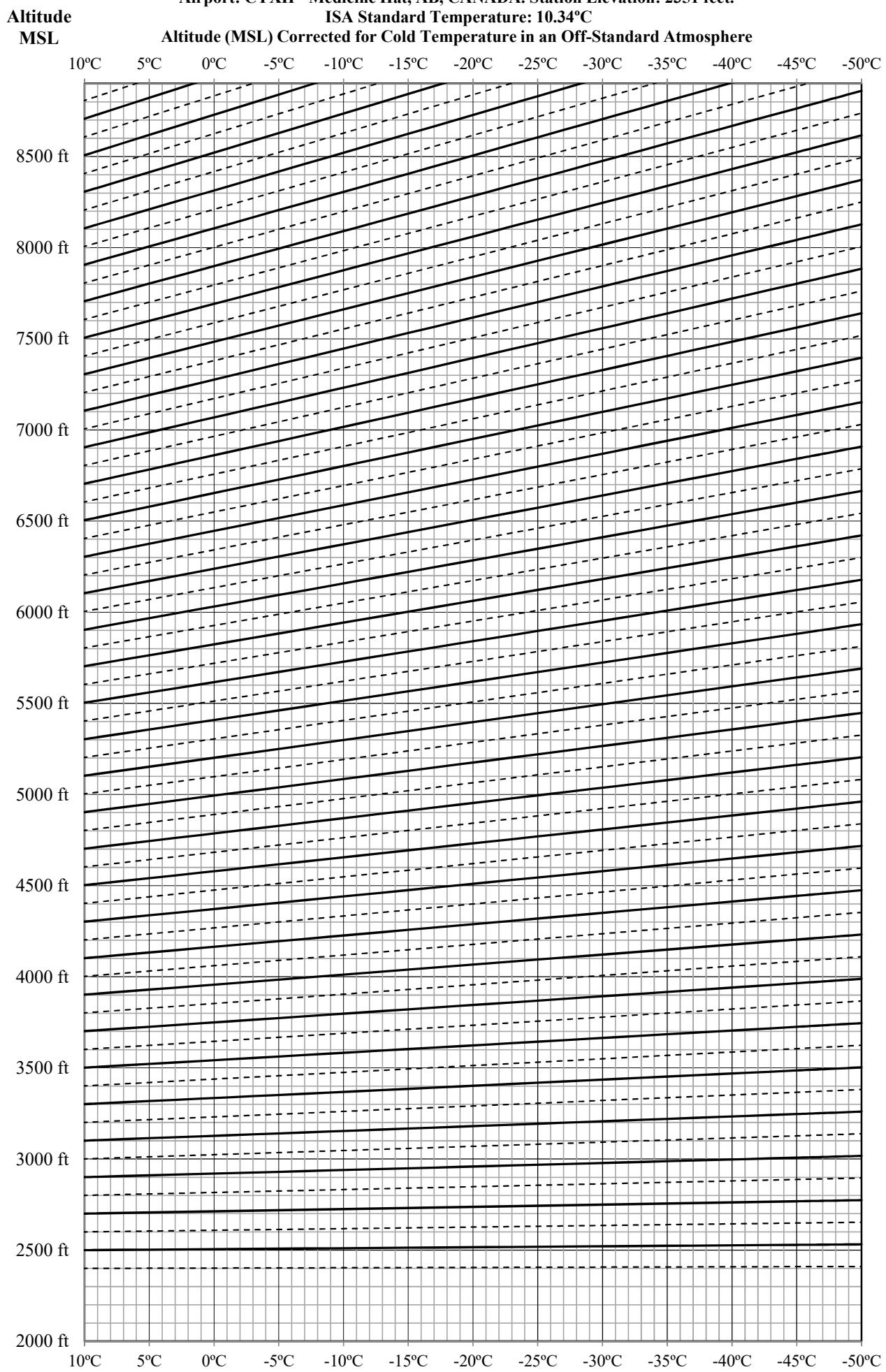
Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



Airport: CYXH - Medicine Hat, AB, CANADA. Station Elevation: 2351 feet.

ISA Standard Temperature: 10.34°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



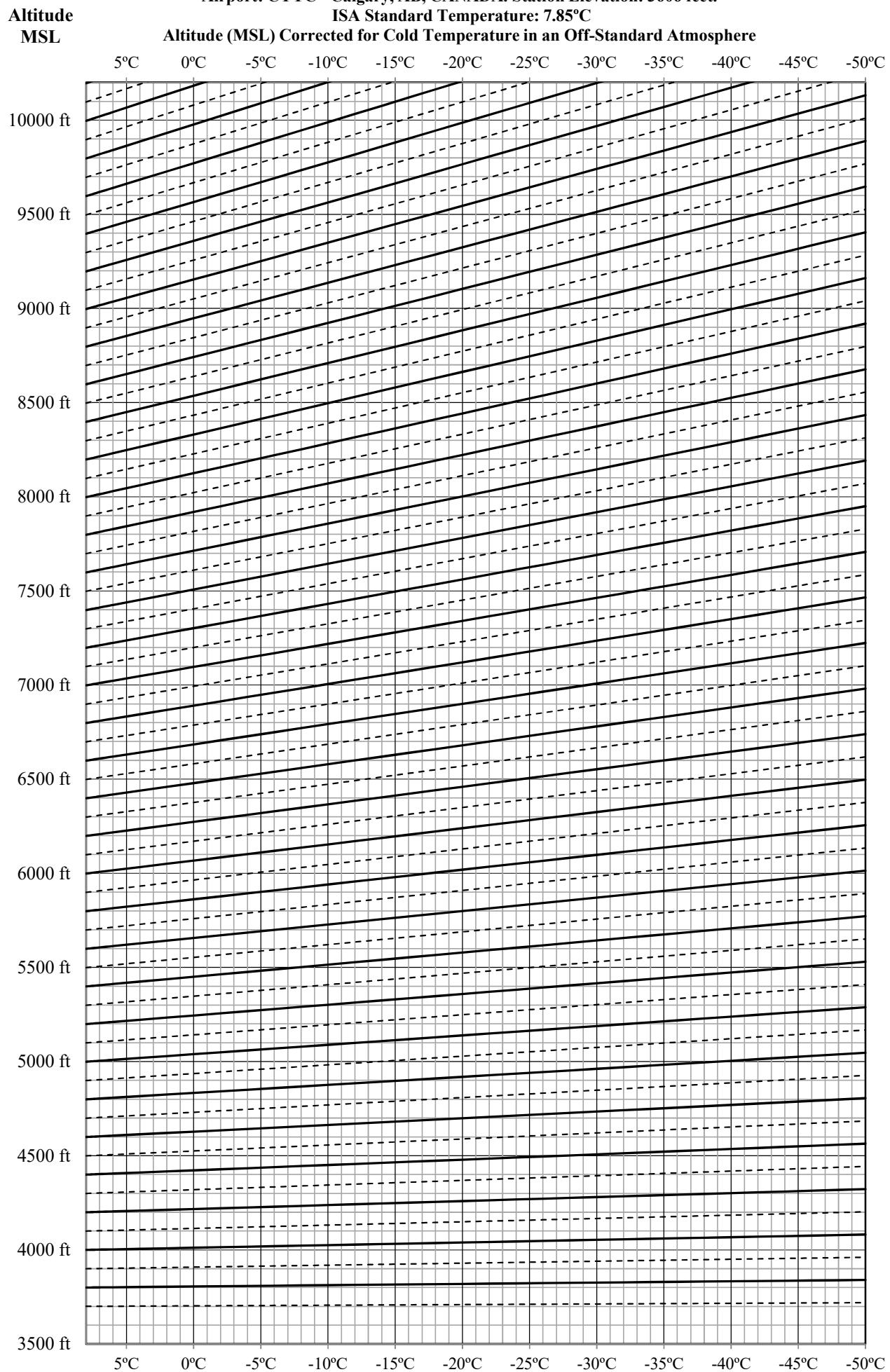
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Temperature at the Reporting Station

Airport: CYYC - Calgary, AB, CANADA. Station Elevation: 3606 feet.

ISA Standard Temperature: 7.85°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere





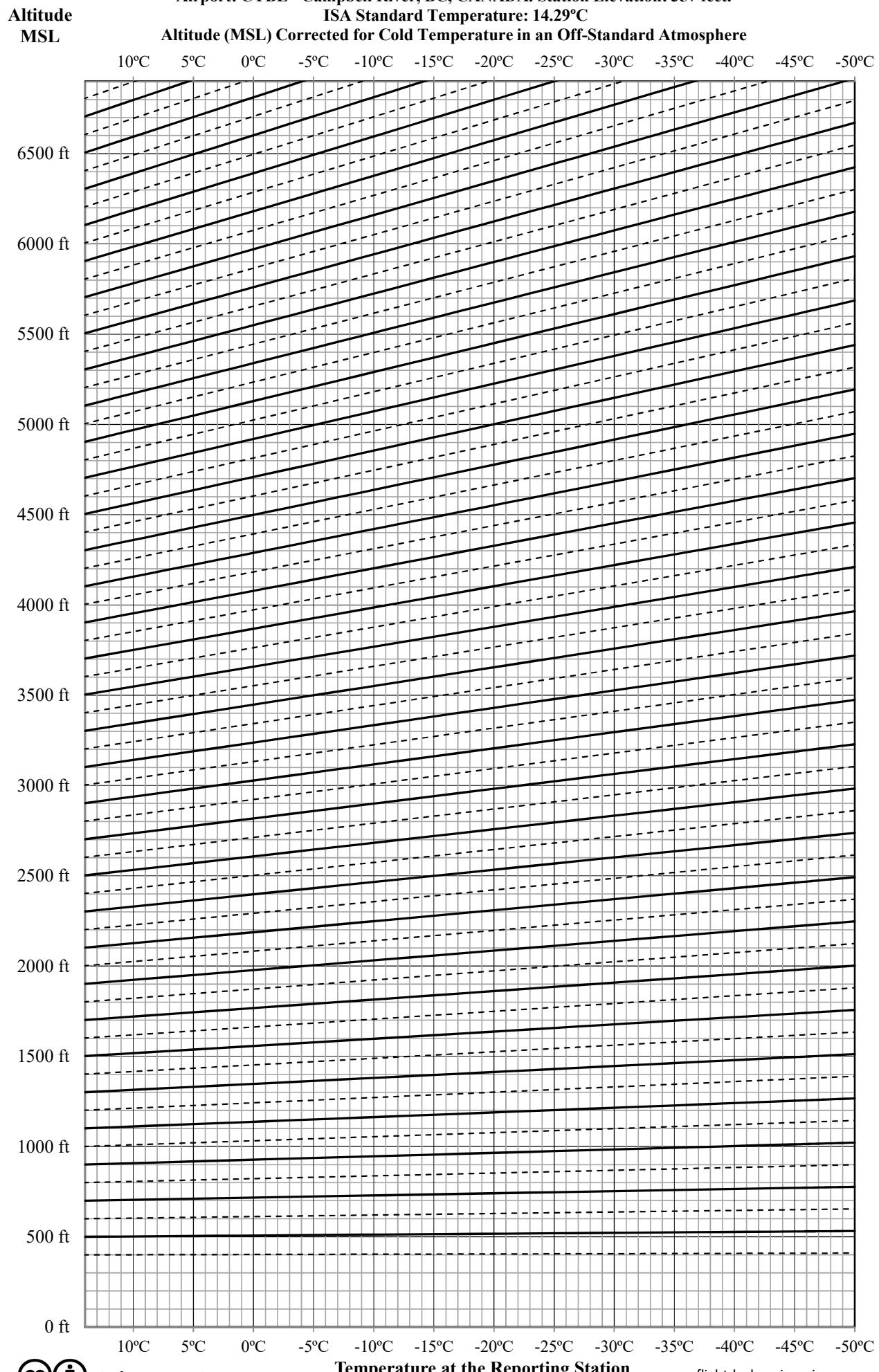
3 British Columbia Airports

3.1	CYBL - CAMPBELL RIVER, BC, CANADA	15
3.2	CYCD - NANAIMO, BC, CANADA	16
3.3	CYCG - CASTLEGAR, BC, CANADA.....	17
3.4	CYKA - KAMLOOPS, BC, CANADA	18
3.5	CYLW - KELOWNA, BC, CANADA.....	19
3.6	CYPR - PRINCE RUPERT, BC, CANADA.....	20
3.7	CYQQ - COMOX, BC, CANADA	21
3.8	CYQZ - QUESNEL, BC, CANADA	22
3.9	CYVR - VANCOUVER, BC, CANADA.....	23
3.10	CYWL - WILLIAMS LAKE, BC, CANADA	24
3.11	CYXC - CRANBROOK, BC, CANADA	25
3.12	CYXJ - FORT ST.JOHN, BC, CANADA.....	26
3.13	CYXS - PRINCE GEORGE, BC, CANADA.....	27
3.14	CYXT - TERRACE, BC, CANADA.....	28
3.15	CYXX - ABBOTSFORD, BC, CANADA	29
3.16	CYYD - SMITHERS, BC, CANADA	30
3.17	CYYF - PENTICTON, BC, CANADA	31
3.18	CYYJ - VICTORIA, BC, CANADA	32
3.19	CYZP - SANDSPIT, BC, CANADA	33

Airport: CYBL - Campbell River, BC, CANADA. Station Elevation: 357 feet.

ISA Standard Temperature: 14.29°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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Temperature at the Reporting Station

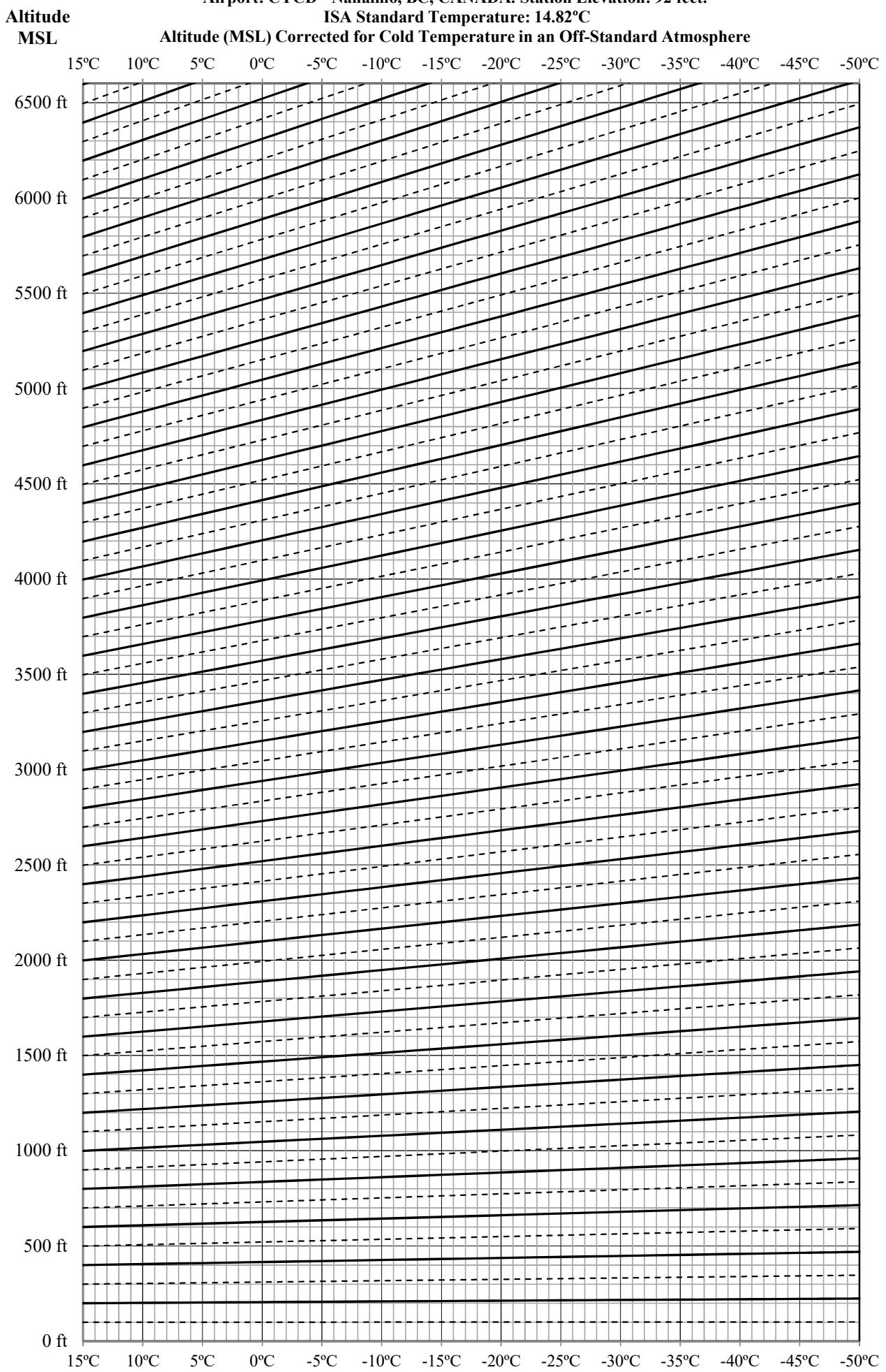
Page 15

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Airport: CYCD - Nanaimo, BC, CANADA. Station Elevation: 92 feet.

ISA Standard Temperature: 14.82°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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Temperature at the Reporting Station

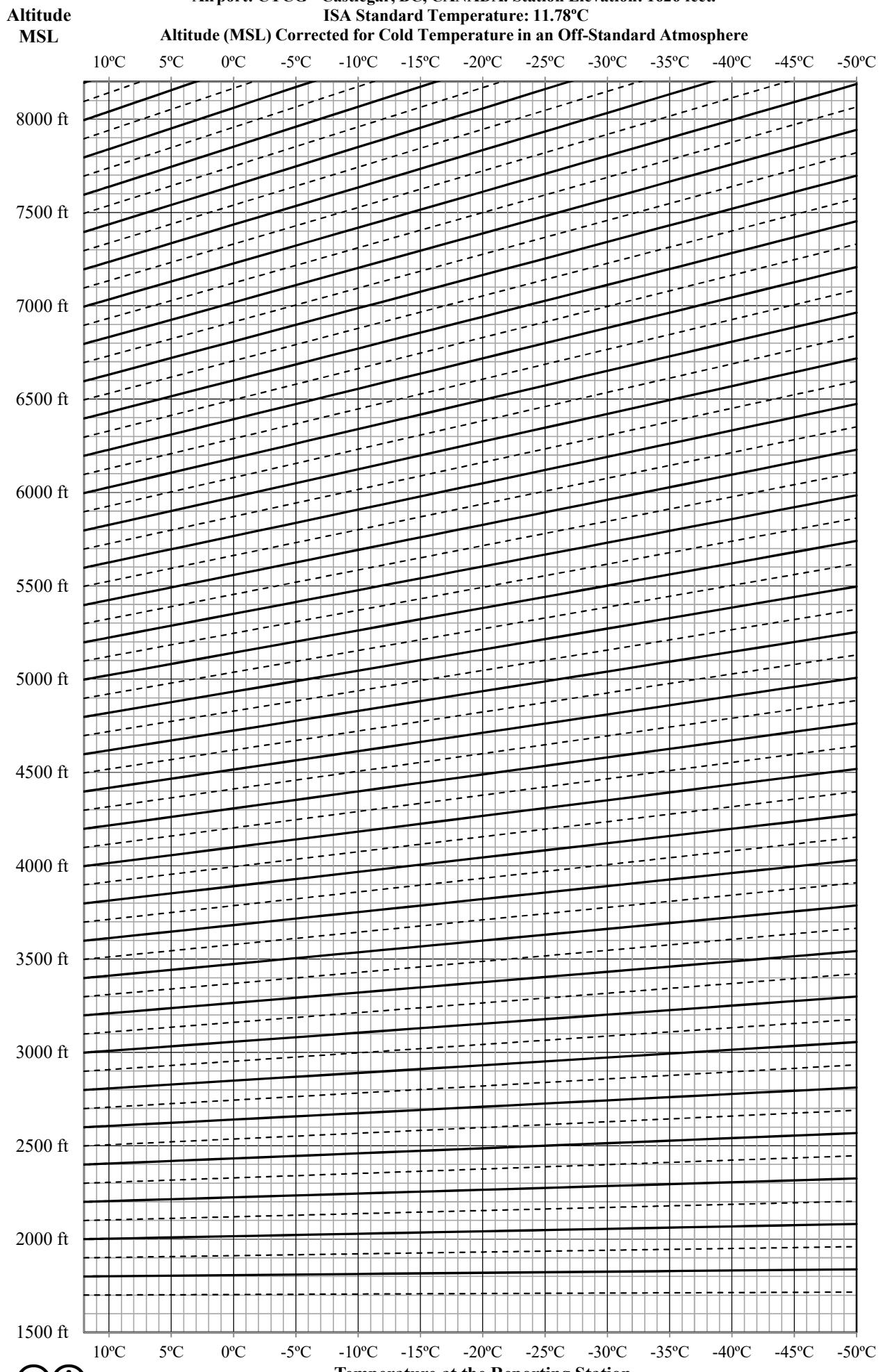
Page 16

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Airport: CYCG - Castlegar, BC, CANADA. Station Elevation: 1626 feet.

ISA Standard Temperature: 11.78°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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Temperature at the Reporting Station

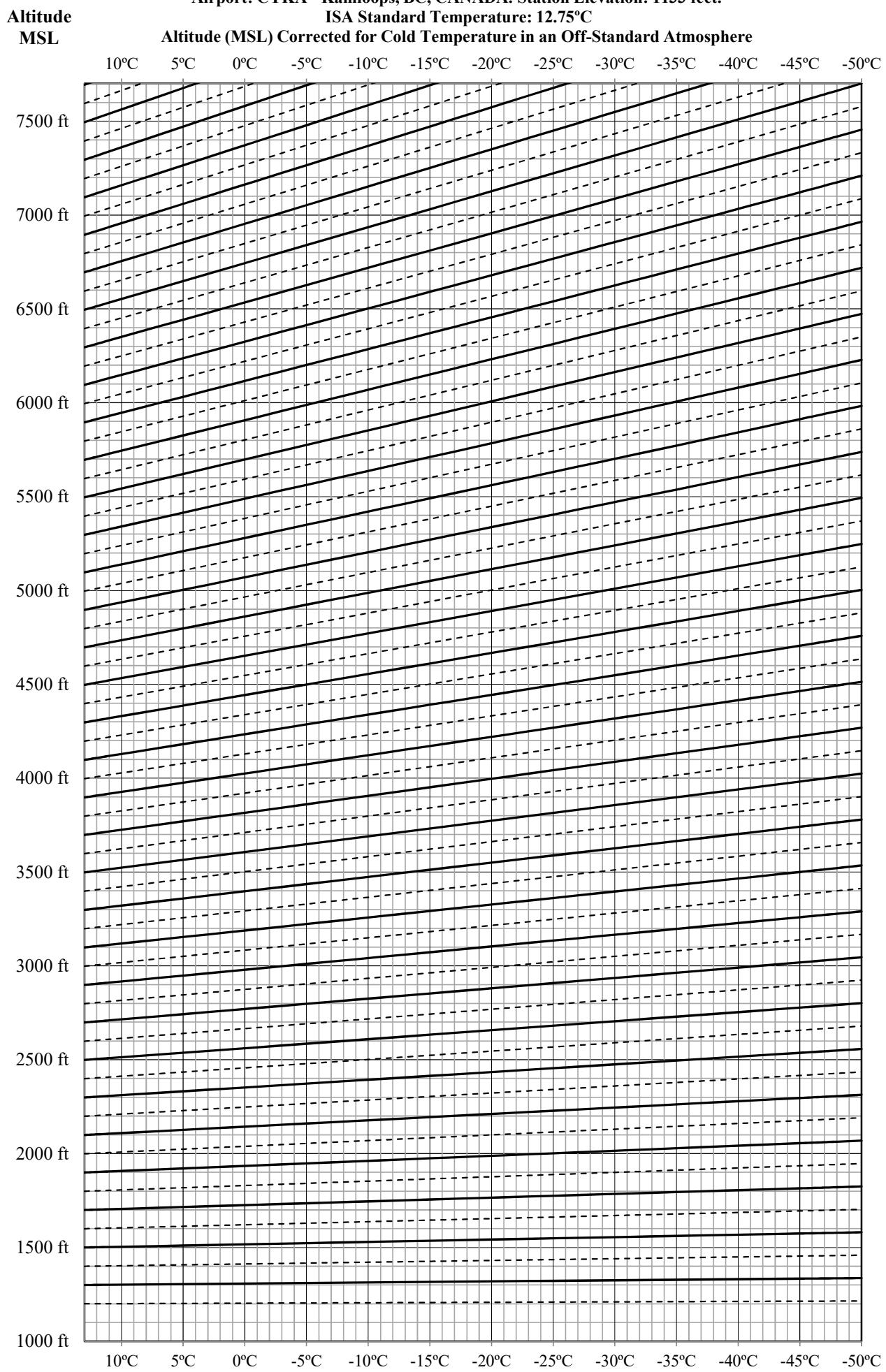
Page 17

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Airport: CYKA - Kamloops, BC, CANADA. Station Elevation: 1133 feet.

ISA Standard Temperature: 12.75°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



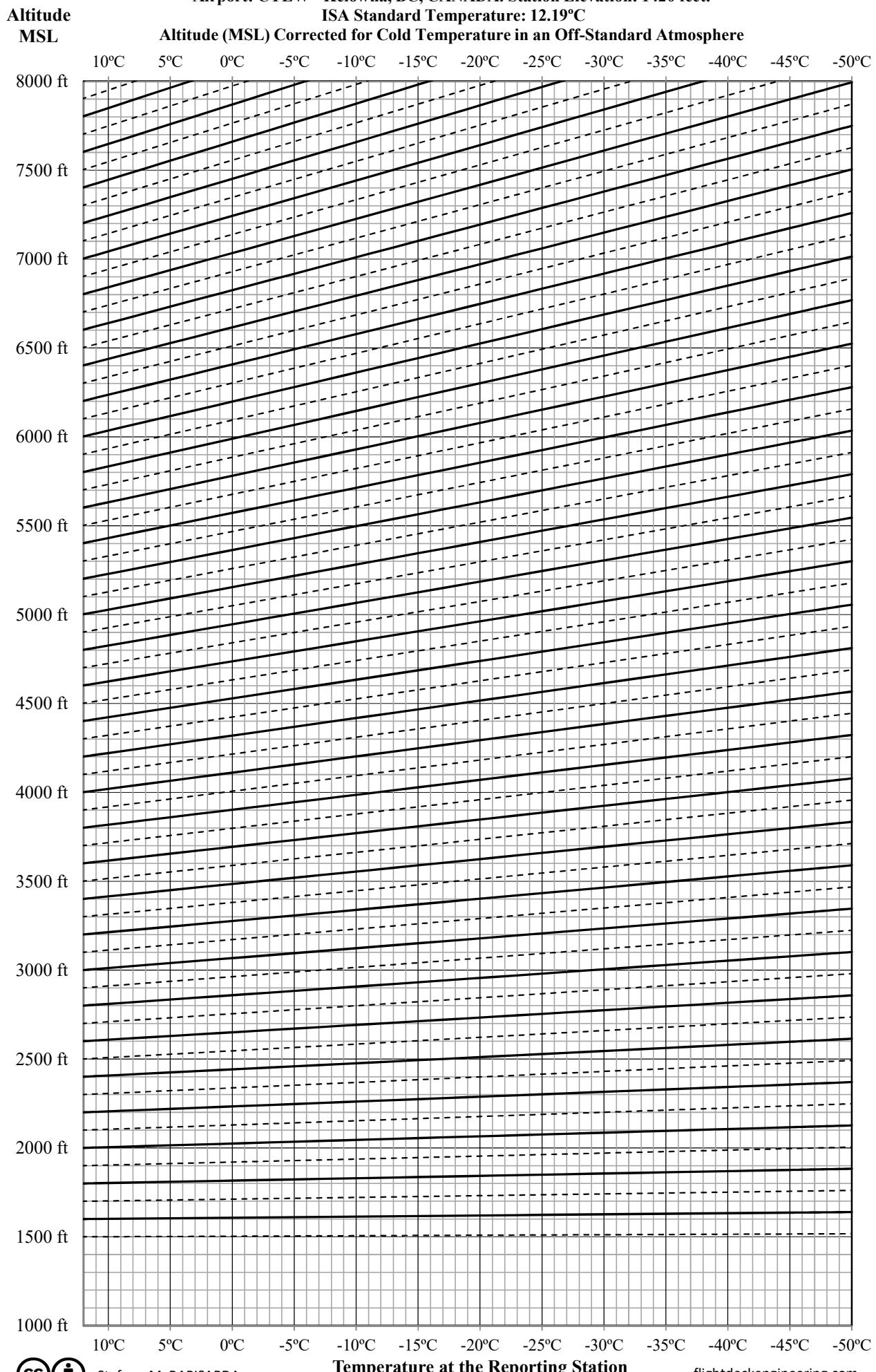
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Temperature at the Reporting Station

Airport: CYLW - Kelowna, BC, CANADA. Station Elevation: 1420 feet.

ISA Standard Temperature: 12.19°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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Temperature at the Reporting Station

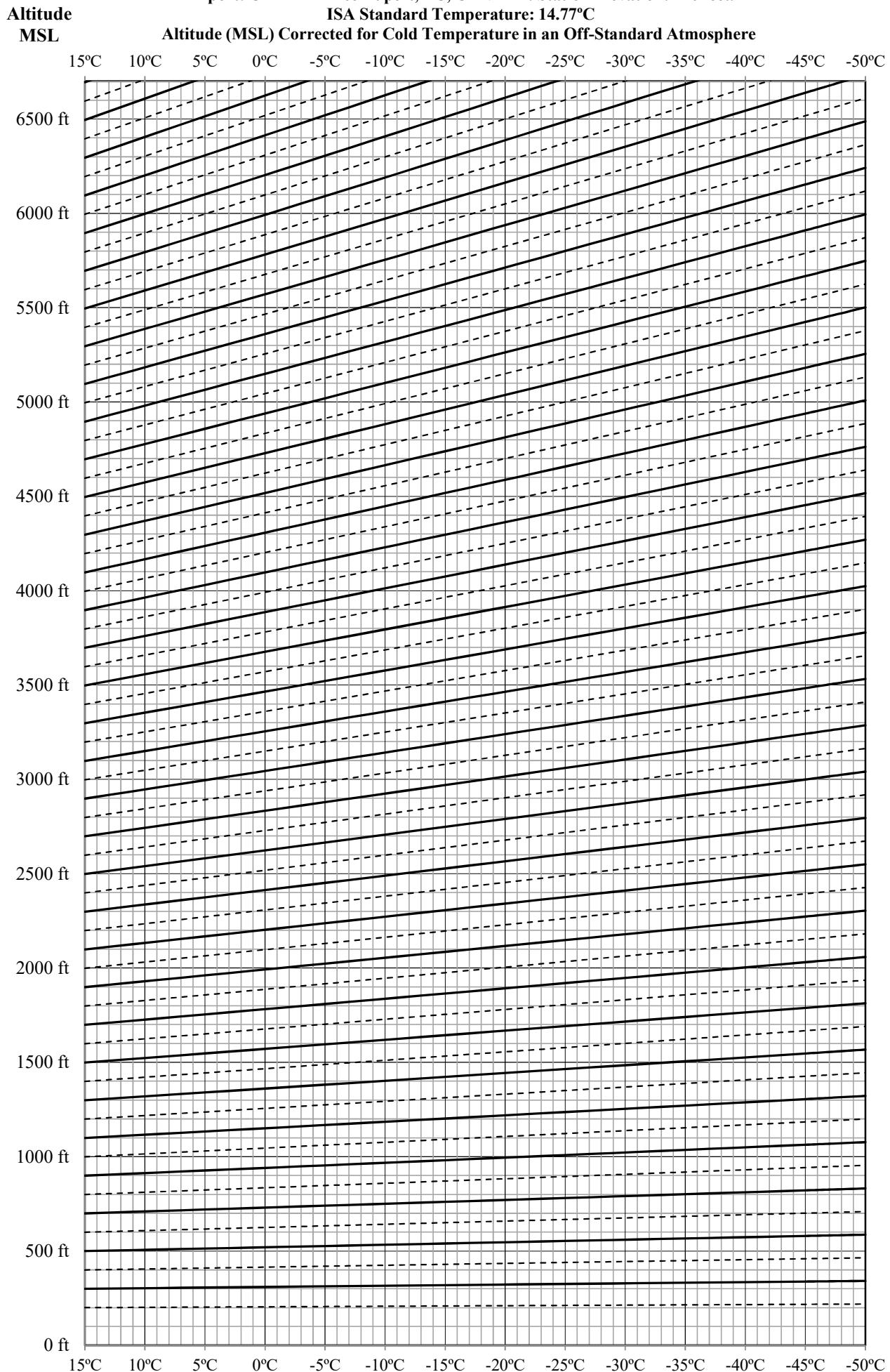
Page 19

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Airport: CYPR - Prince Rupert, BC, CANADA. Station Elevation: 116 feet.

ISA Standard Temperature: 14.77°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



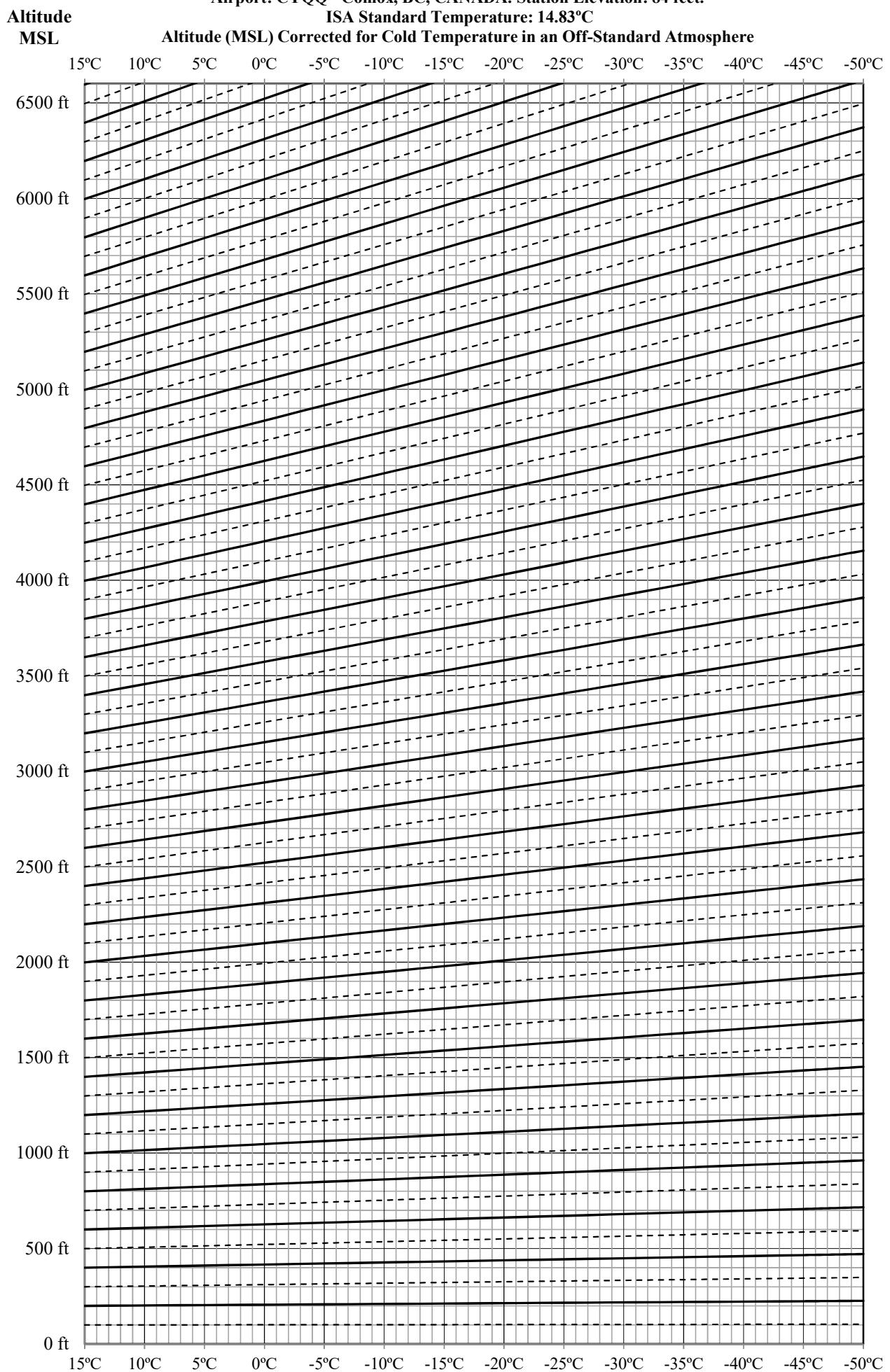
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Temperature at the Reporting Station

Airport: CYQQ - Comox, BC, CANADA. Station Elevation: 84 feet.

ISA Standard Temperature: 14.83°C

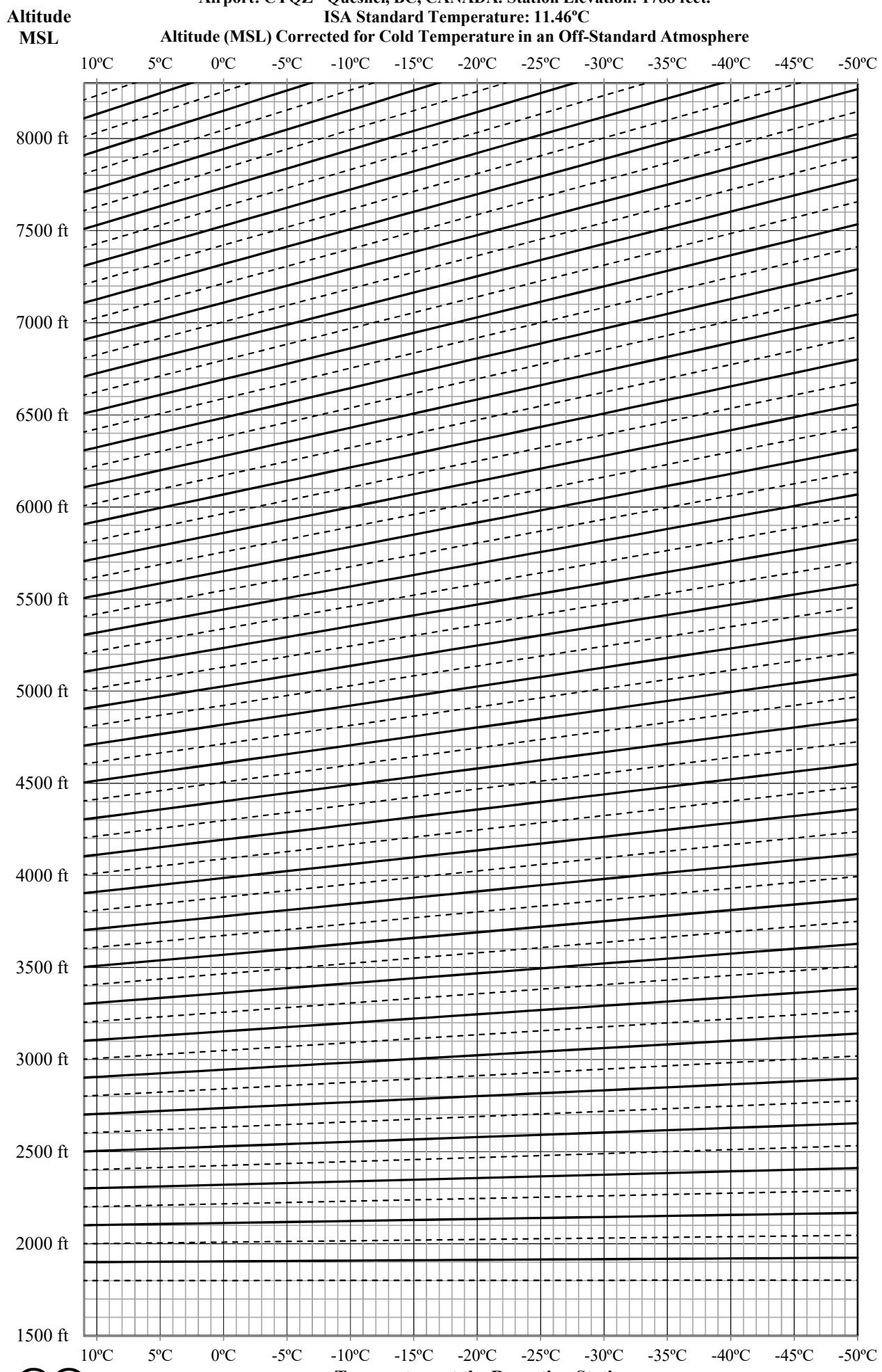
Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



Airport: CYQZ - Quesnel, BC, CANADA. Station Elevation: 1788 feet.

ISA Standard Temperature: 11.46°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



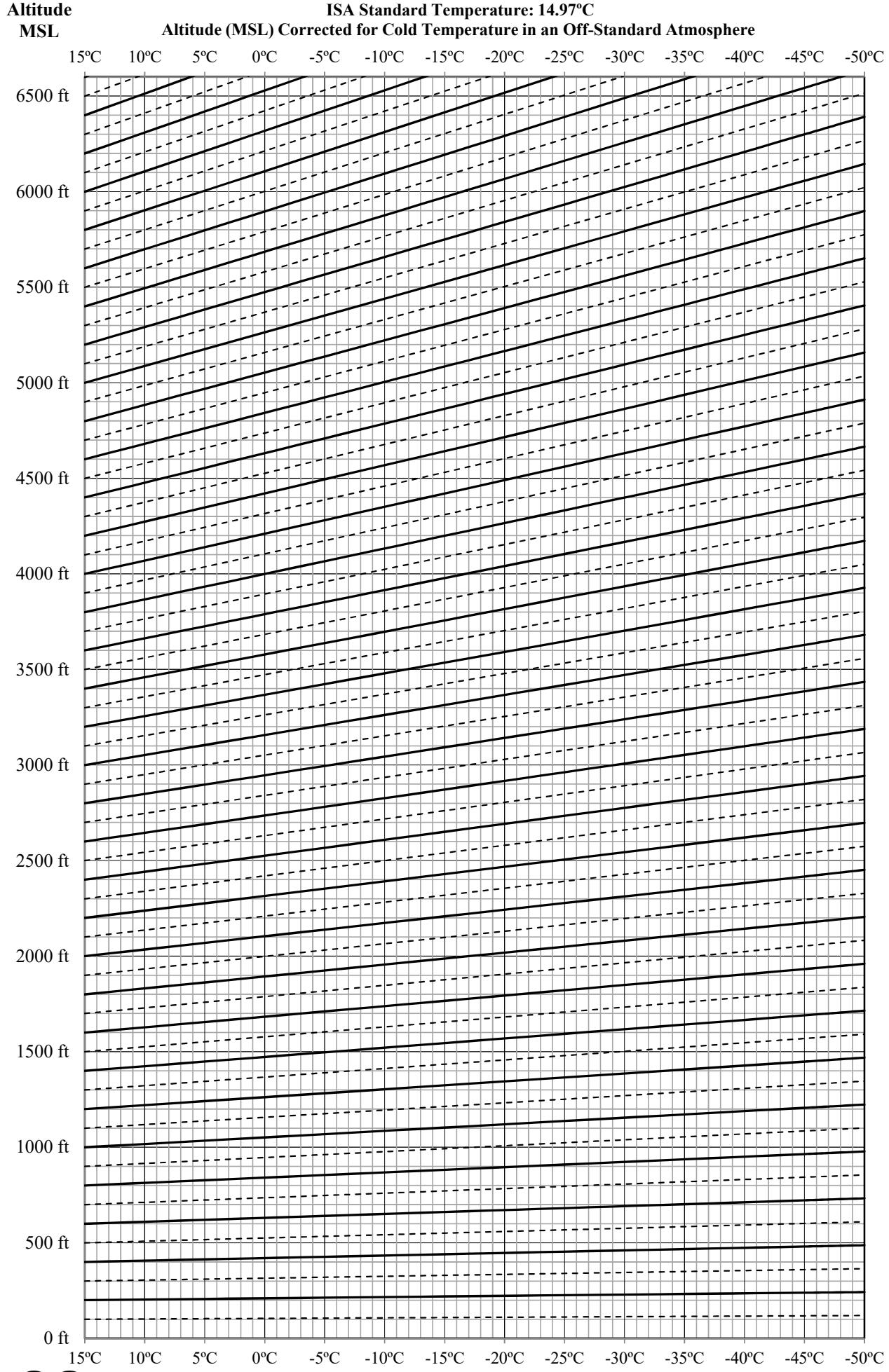
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Temperature at the Reporting Station

Airport: CYVR - Vancouver, BC, CANADA. Station Elevation: 13 feet.

ISA Standard Temperature: 14.97°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



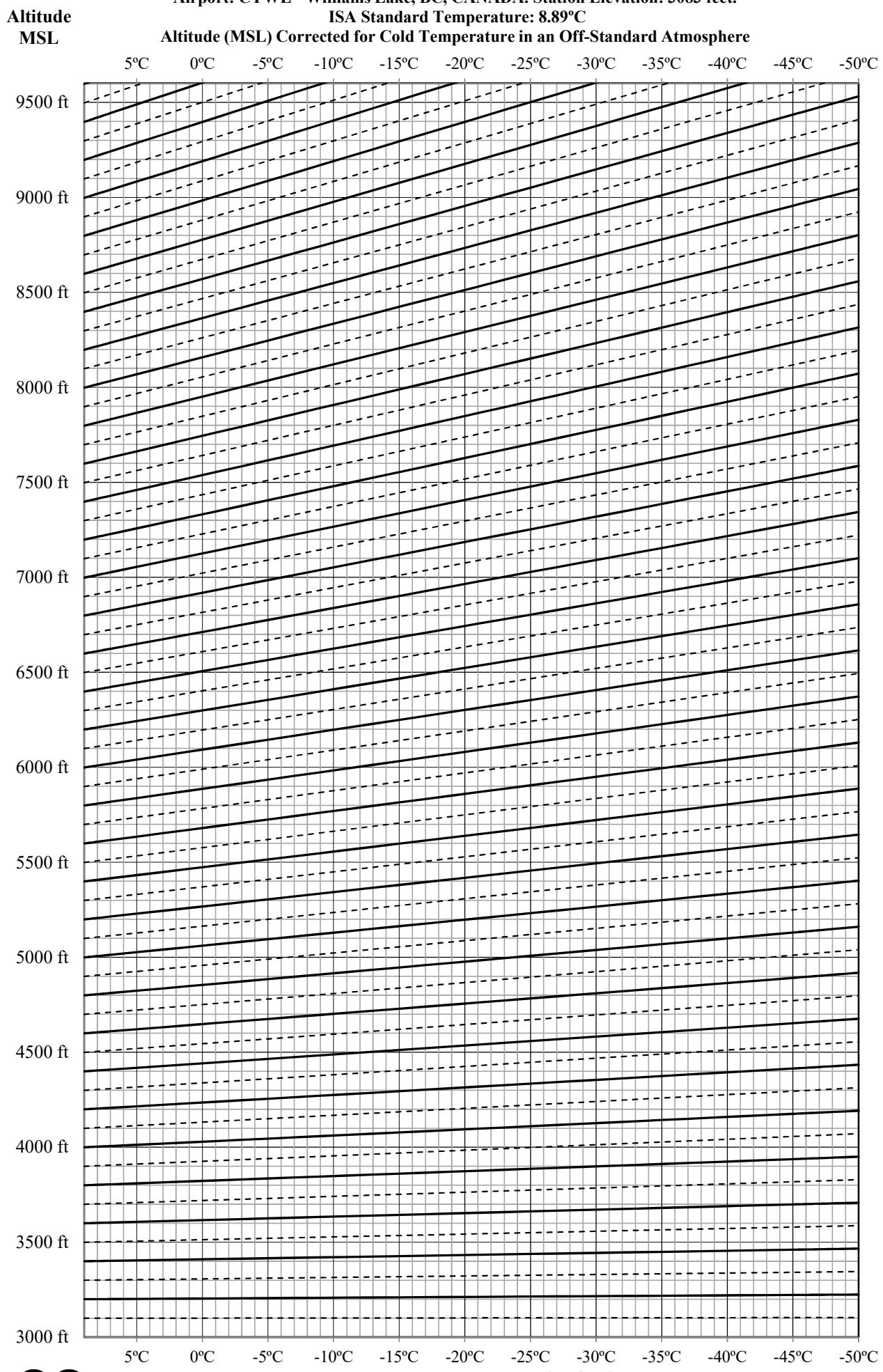
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Temperature at the Reporting Station

Airport: CYWL - Williams Lake, BC, CANADA. Station Elevation: 3083 feet.

ISA Standard Temperature: 8.89°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



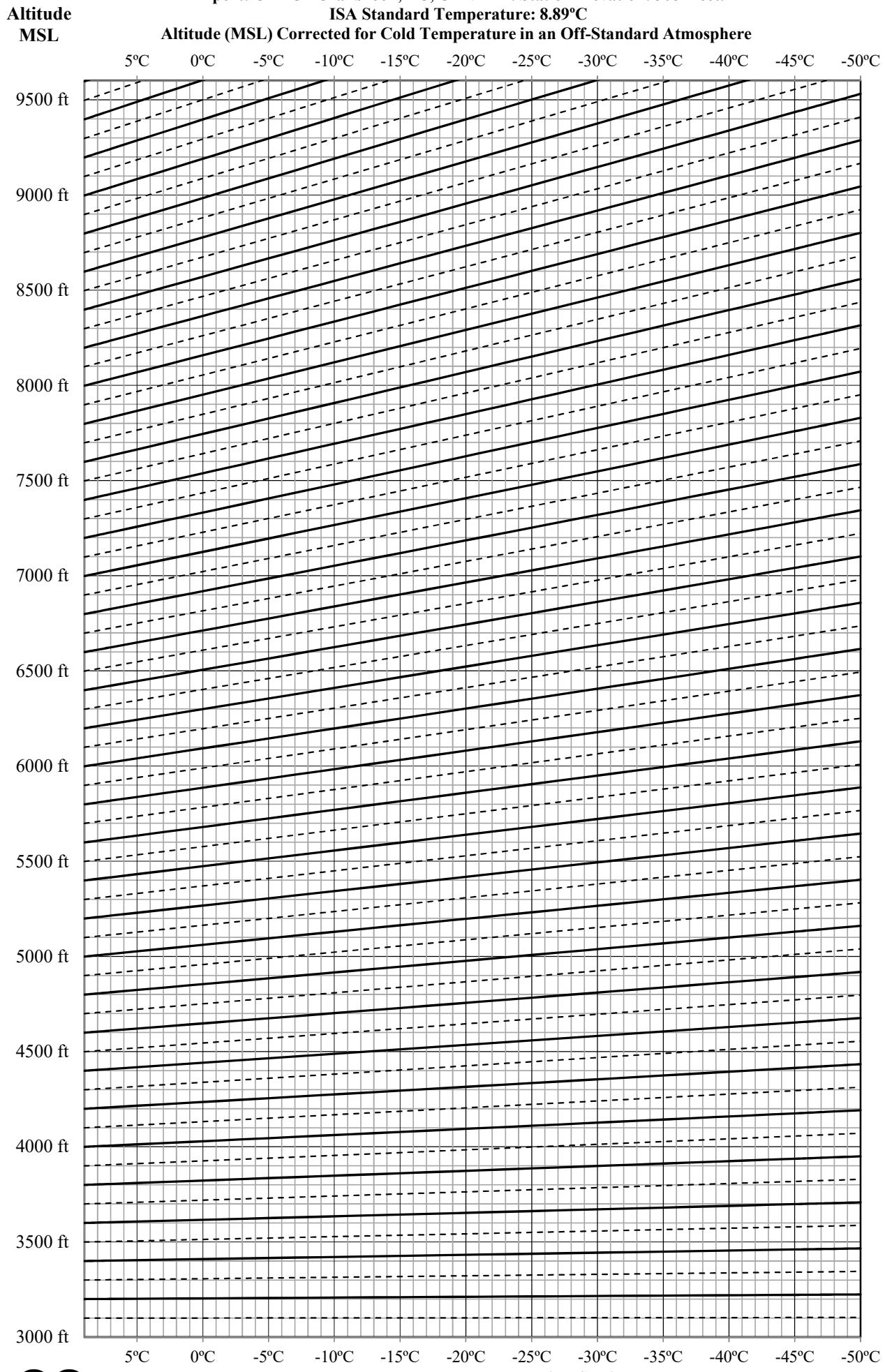
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Temperature at the Reporting Station

Airport: CYXC - Cranbrook, BC, CANADA. Station Elevation: 3084 feet.

ISA Standard Temperature: 8.89°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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Temperature at the Reporting Station

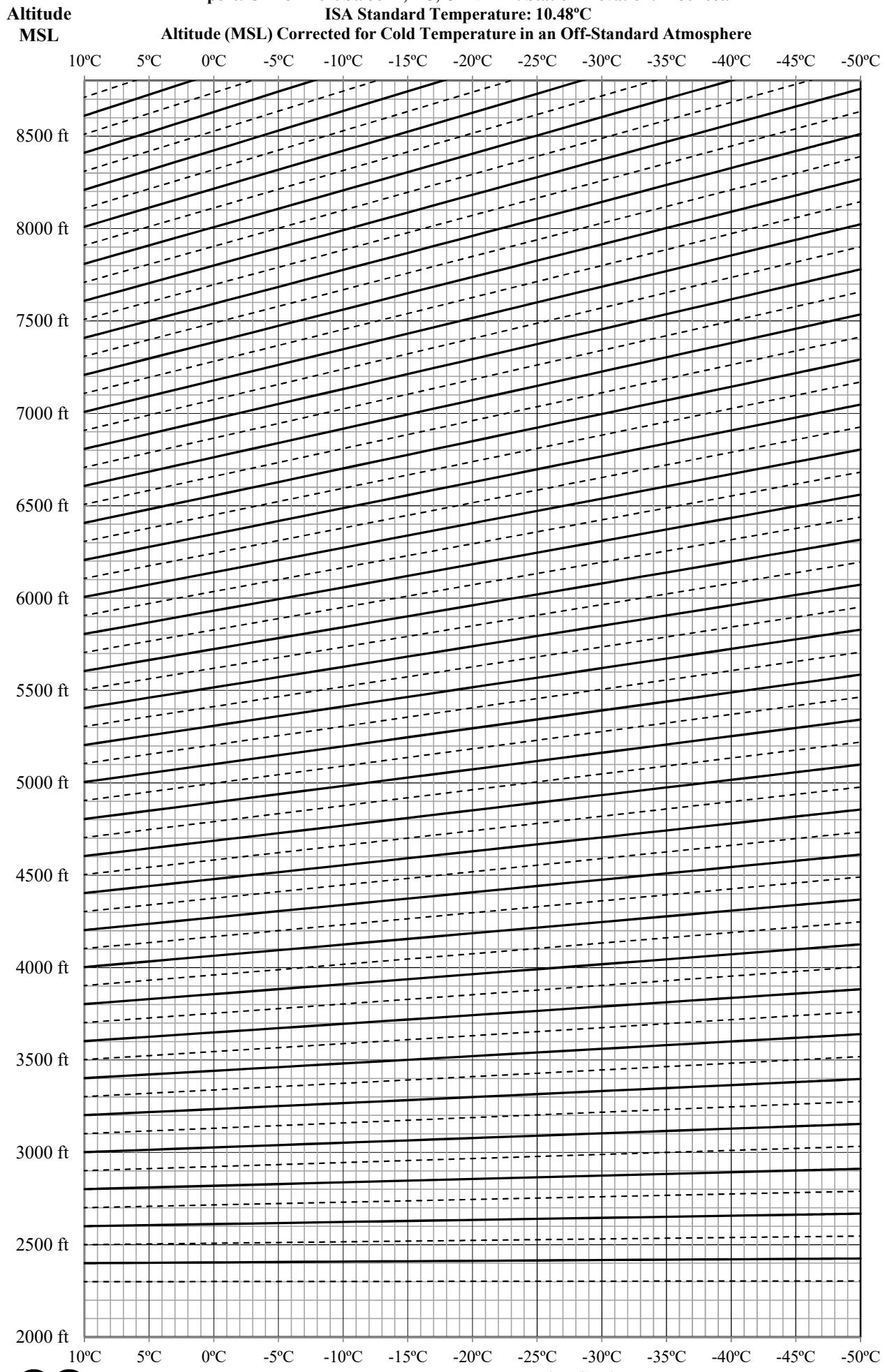
Page 25

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Airport: CYXJ - Fort St. John, BC, CANADA. Station Elevation: 2280 feet.

ISA Standard Temperature: 10.48°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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Temperature at the Reporting Station

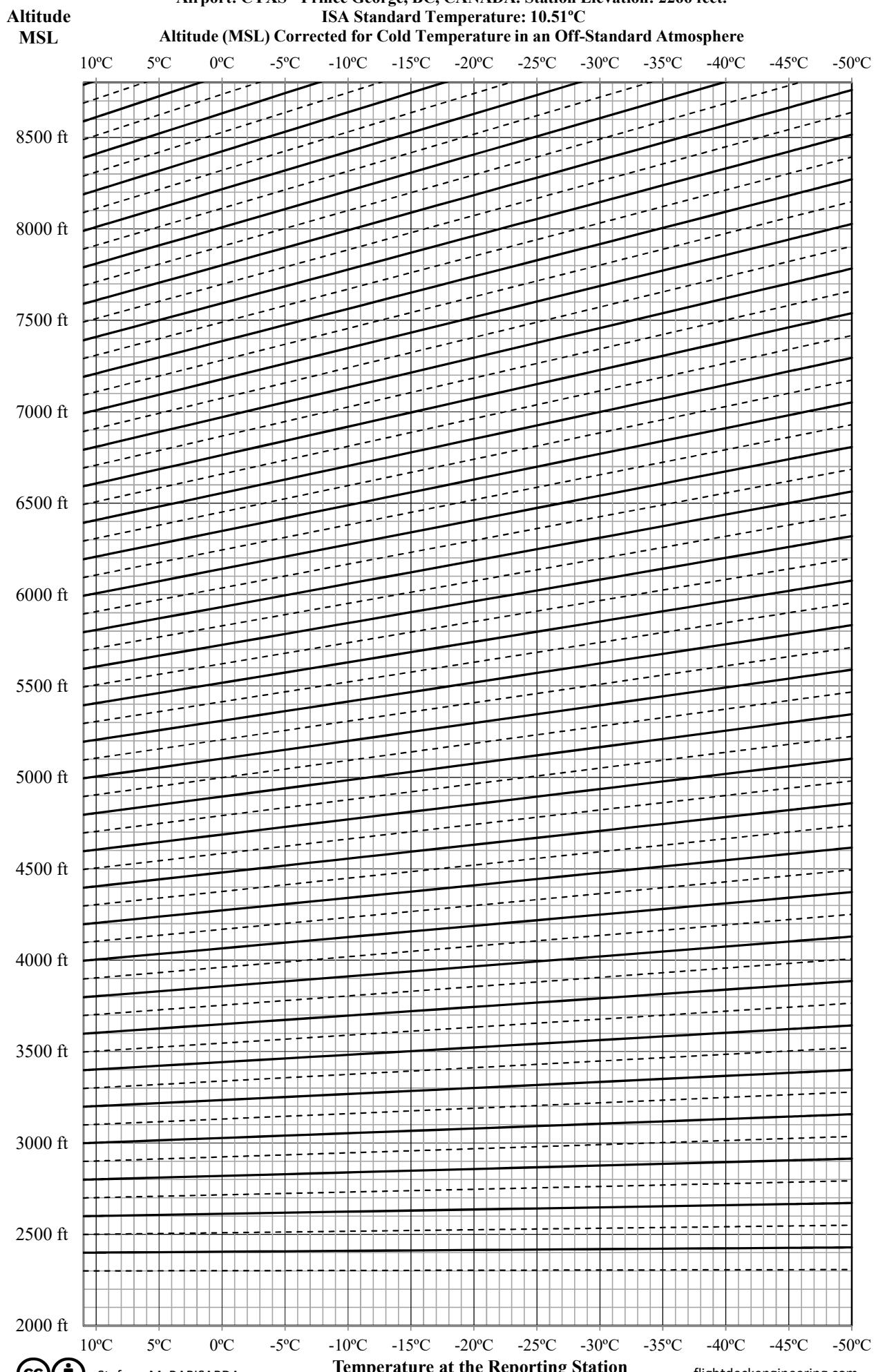
Page 26

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Airport: CYXS - Prince George, BC, CANADA. Station Elevation: 2266 feet.

ISA Standard Temperature: 10.51°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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Temperature at the Reporting Station

Page 27

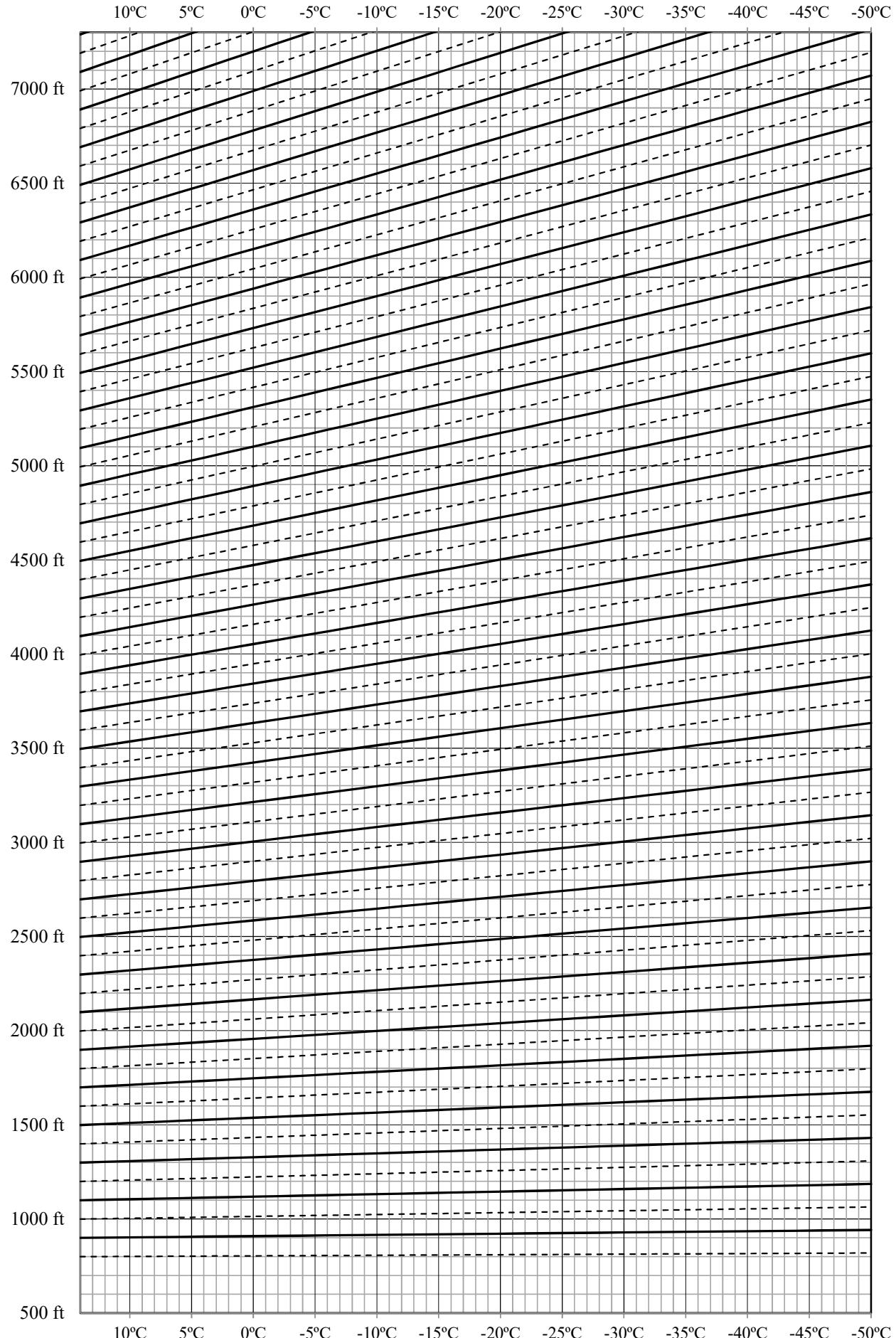
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Airport: CYXT - Terrace, BC, CANADA. Station Elevation: 713 feet.

ISA Standard Temperature: 13.59°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere

Altitude
MSL



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Temperature at the Reporting Station

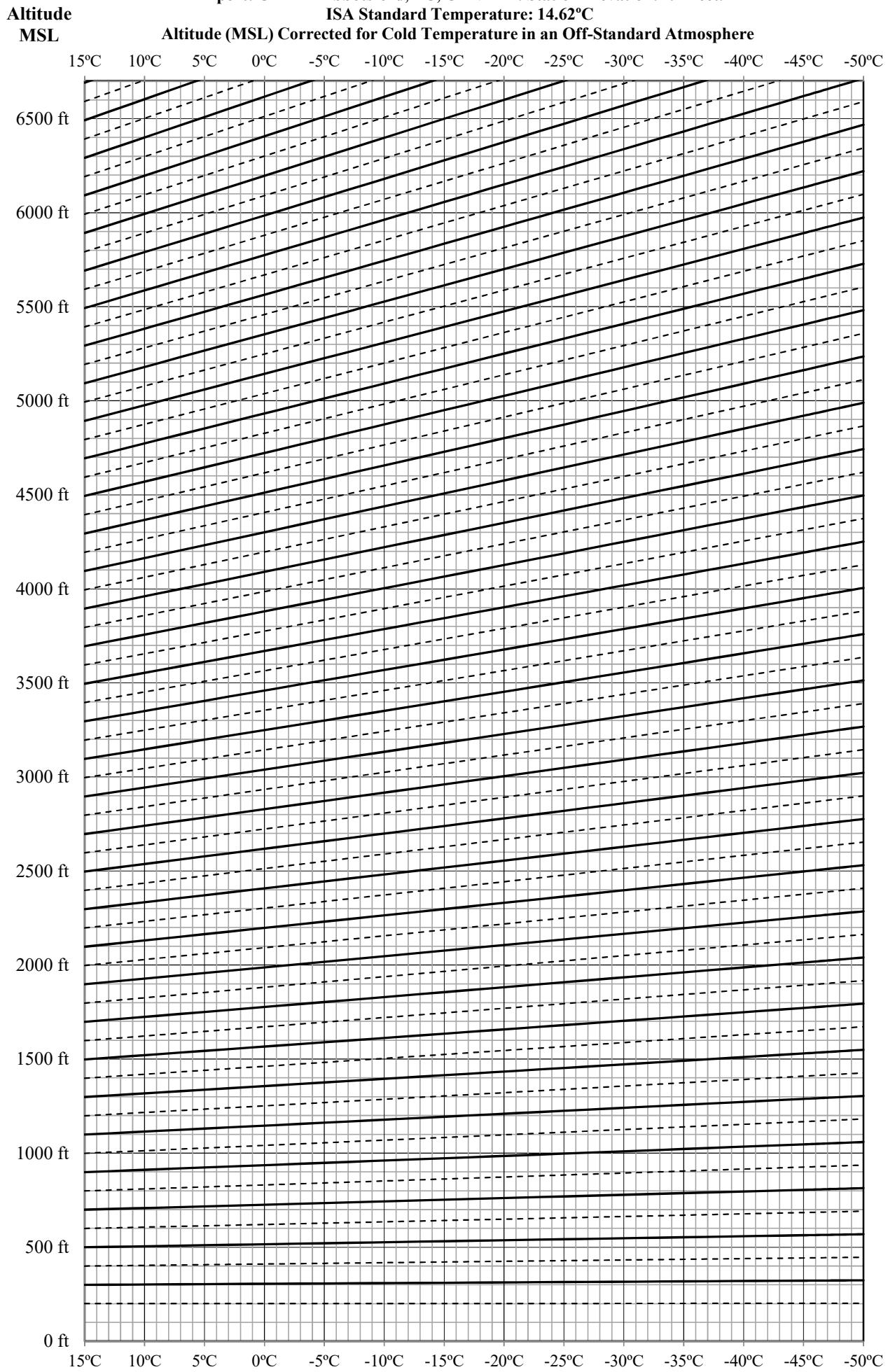
Page 28

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Airport: CYXX - Abbotsford, BC, CANADA. Station Elevation: 194 feet.

ISA Standard Temperature: 14.62°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



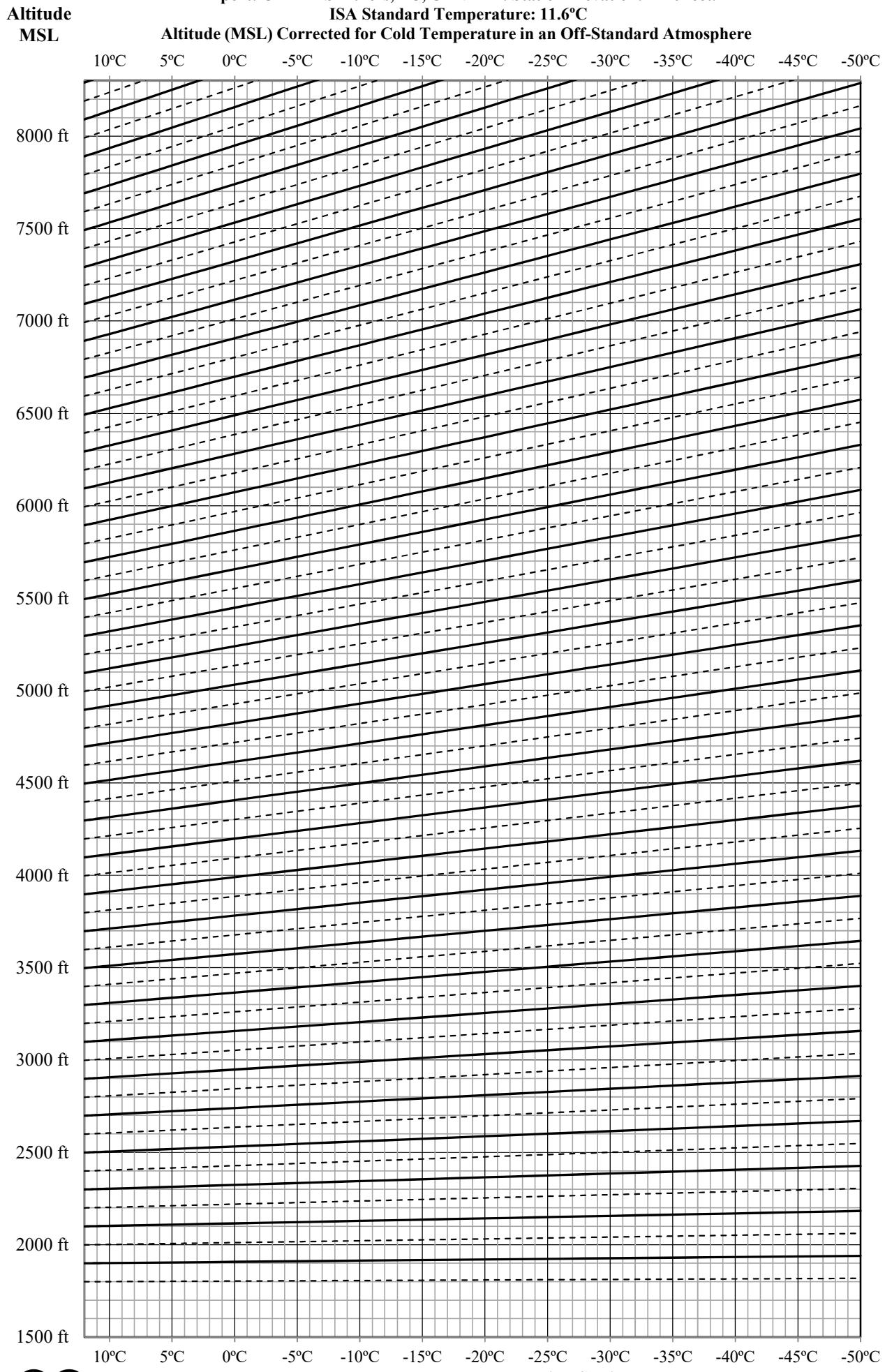
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Temperature at the Reporting Station

Airport: CYYD - Smithers, BC, CANADA. Station Elevation: 1716 feet.

ISA Standard Temperature: 11.6°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



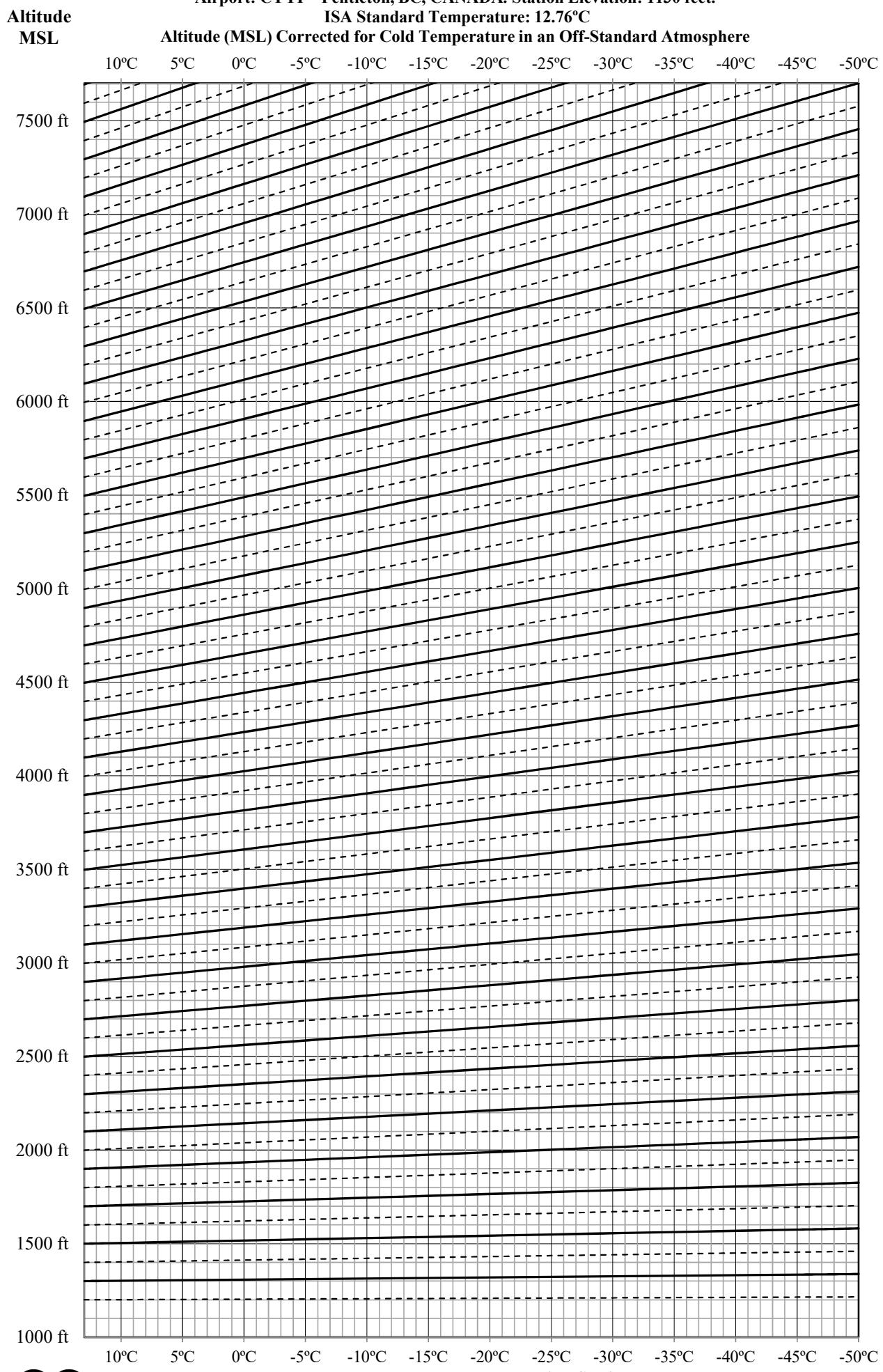
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Temperature at the Reporting Station

Airport: CYYF - Penticton, BC, CANADA. Station Elevation: 1130 feet.

ISA Standard Temperature: 12.76°C

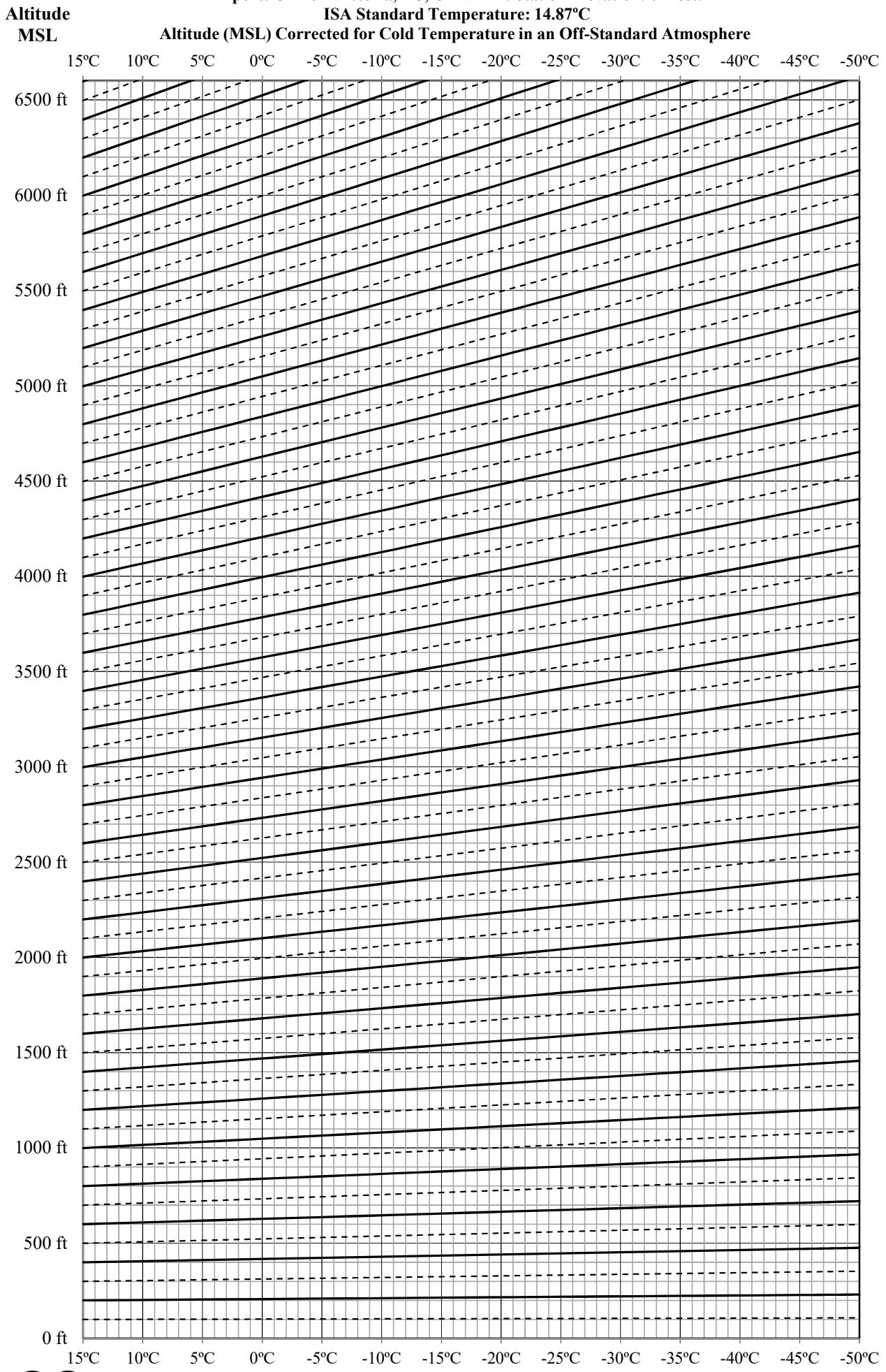
Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



Airport: CYYJ - Victoria, BC, CANADA. Station Elevation: 64 feet.

ISA Standard Temperature: 14.87°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



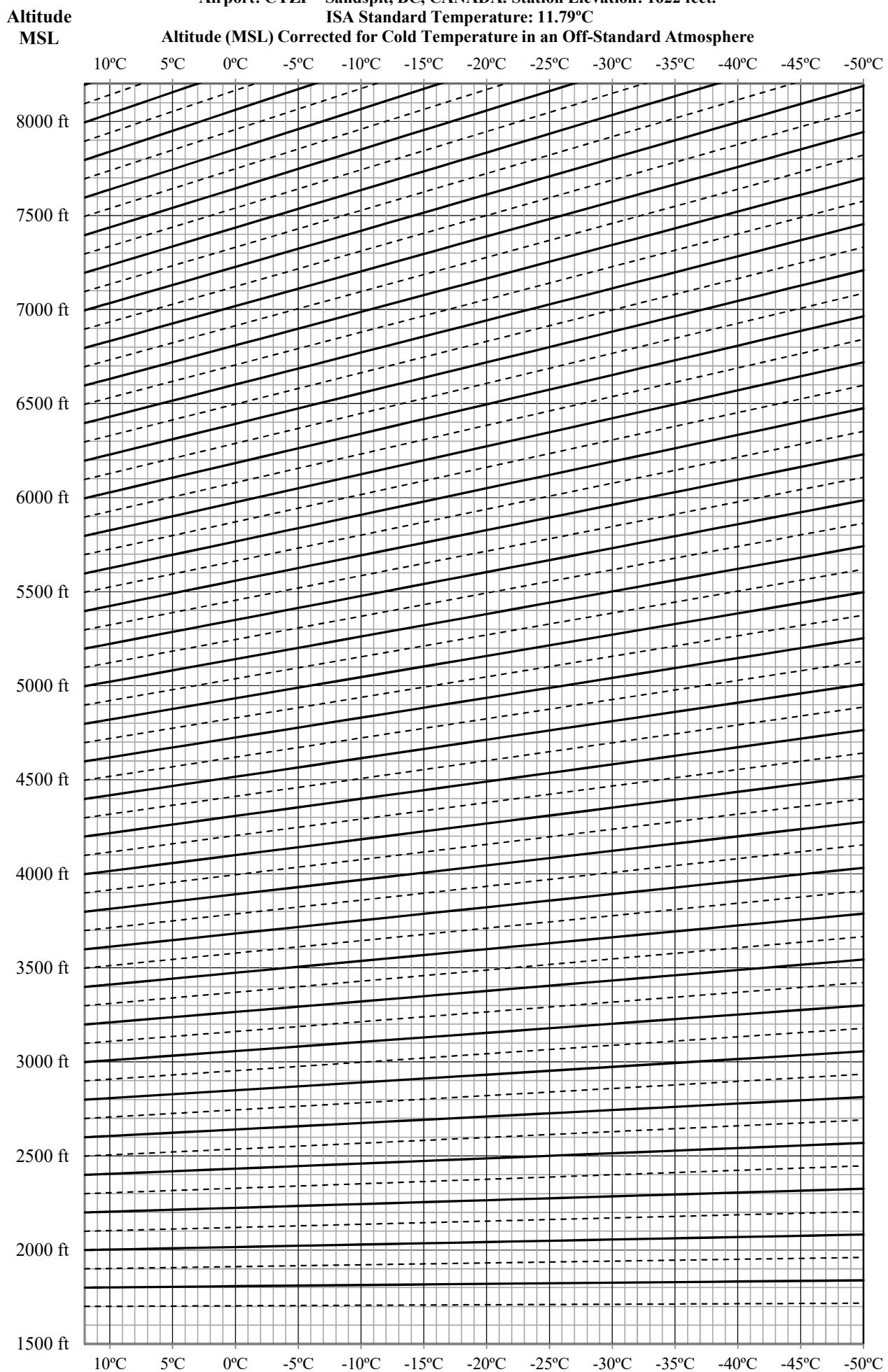
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Temperature at the Reporting Station

Airport: CYZP - Sandspit, BC, CANADA. Station Elevation: 1622 feet.

ISA Standard Temperature: 11.79°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere





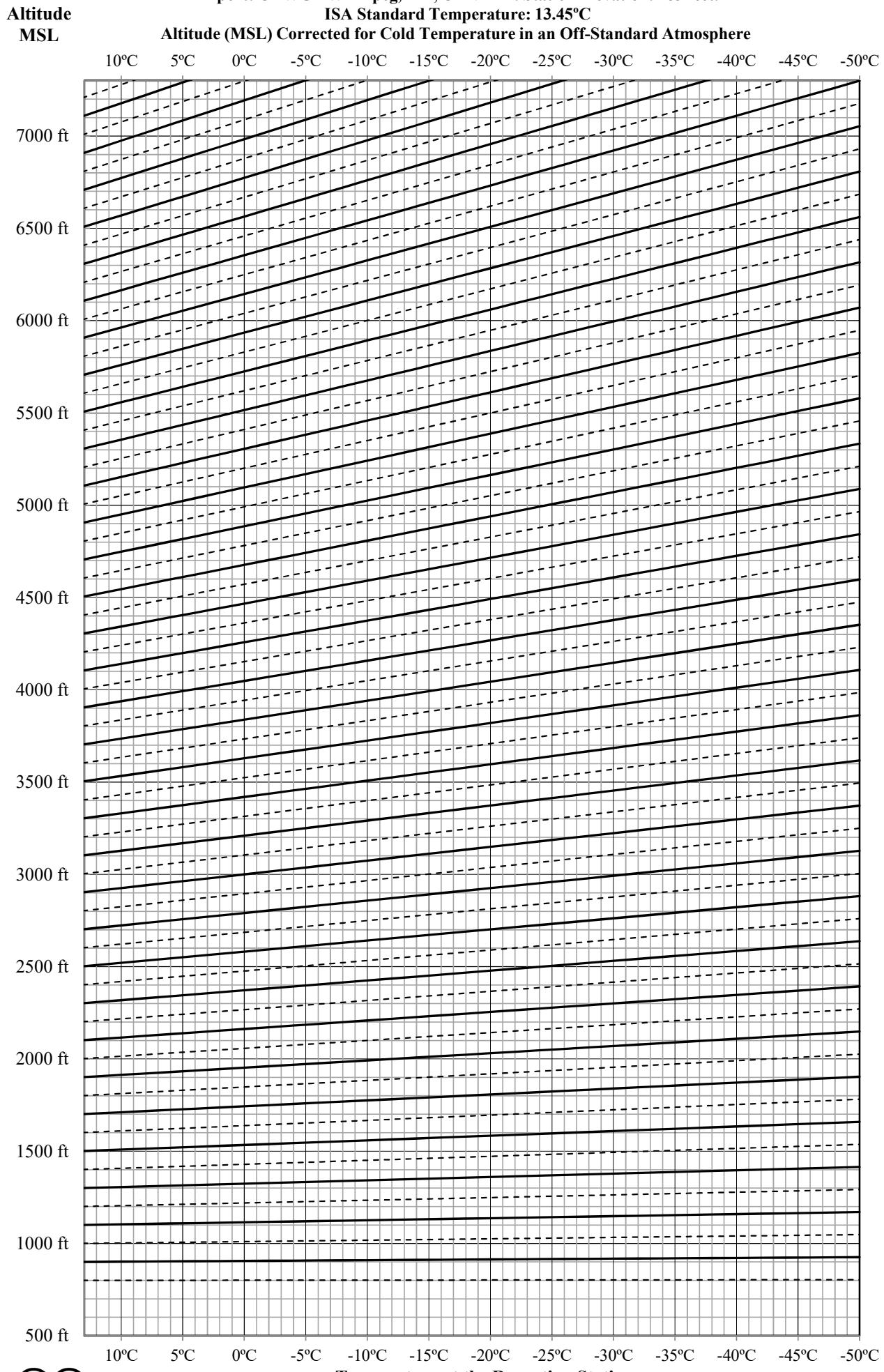
4 Manitoba Airports

4.1 CYWG - WINNIPEG, MB, CANADA.....	35
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Airport: CYWG - Winnipeg, MB, CANADA. Station Elevation: 783 feet.

ISA Standard Temperature: 13.45°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere





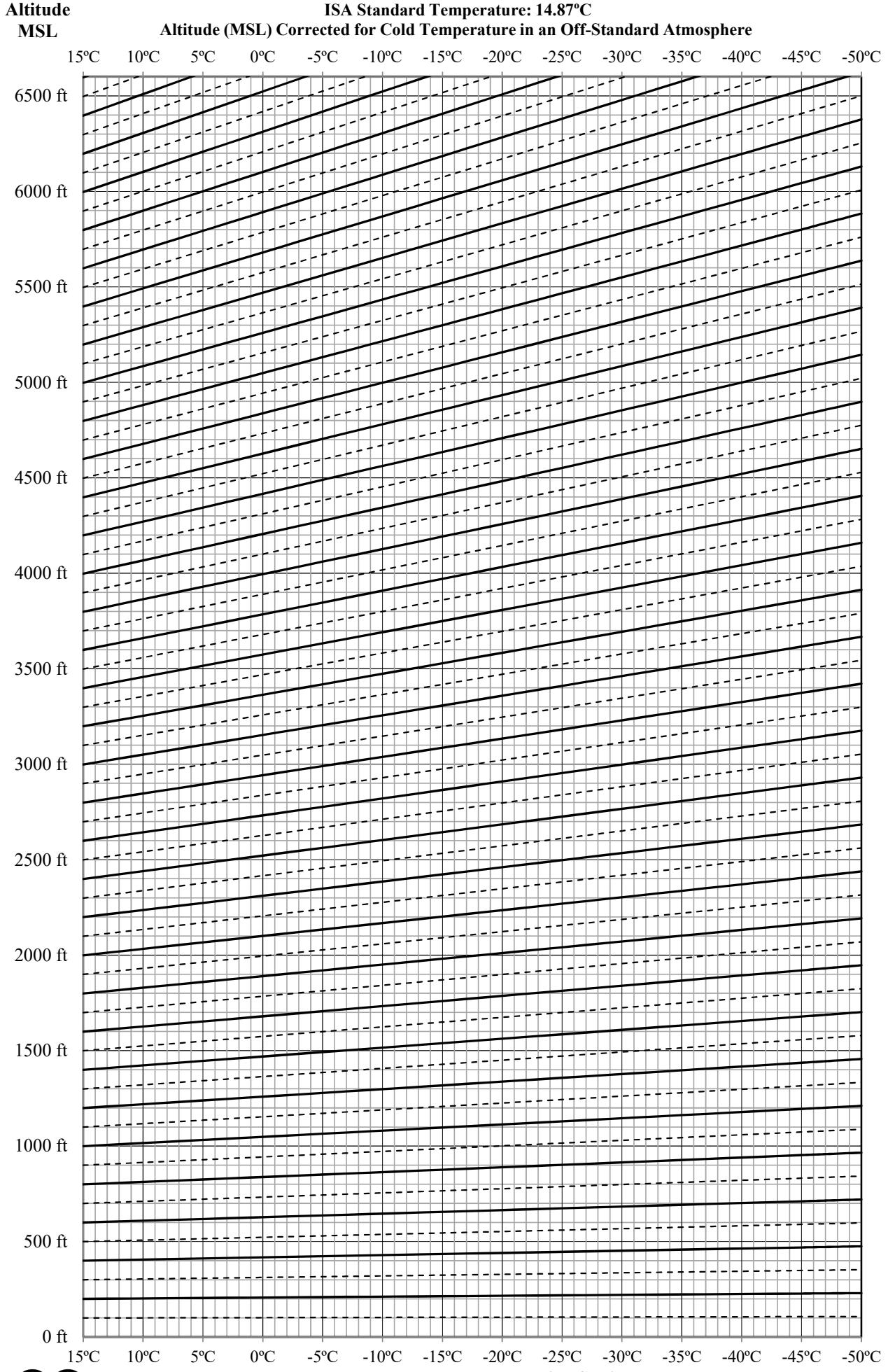
5 New Brunswick Airports

5.1	CYFC - FREDERICTON, NB, CANADA	37
5.2	CYQM - MONCTON, NB, CANADA.....	38
5.3	CYSJ - SAINT JOHN, NB, CANADA	39
5.4	CZBF - BATHURST, NB, CANADA.....	40

Airport: CYFC - Fredericton, NB, CANADA. Station Elevation: 67 feet.

ISA Standard Temperature: 14.87°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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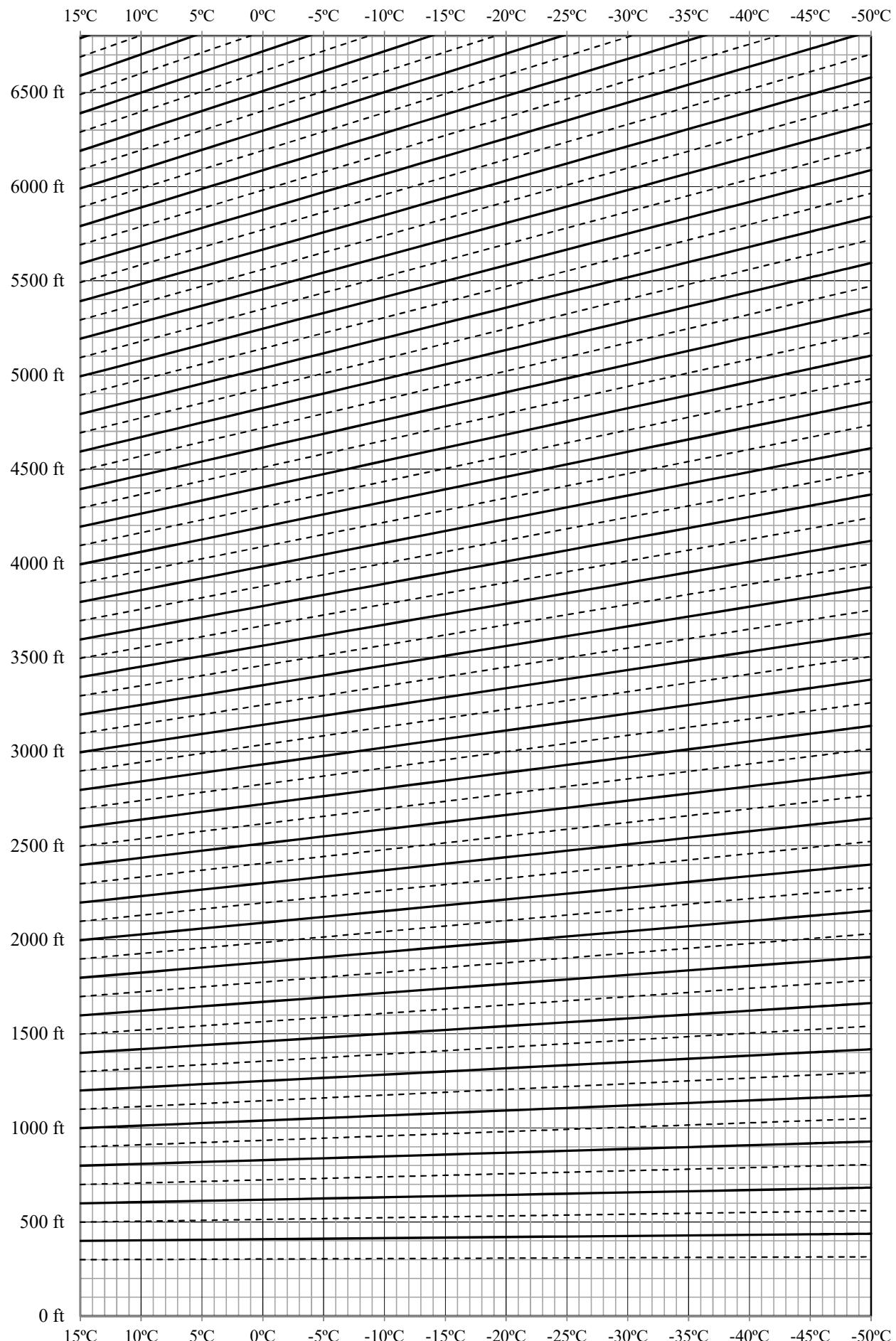
Temperature at the Reporting Station

Airport: CYQM - Moncton, NB, CANADA. Station Elevation: 232 feet.

ISA Standard Temperature: 14.54°C

Altitude
MSL

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



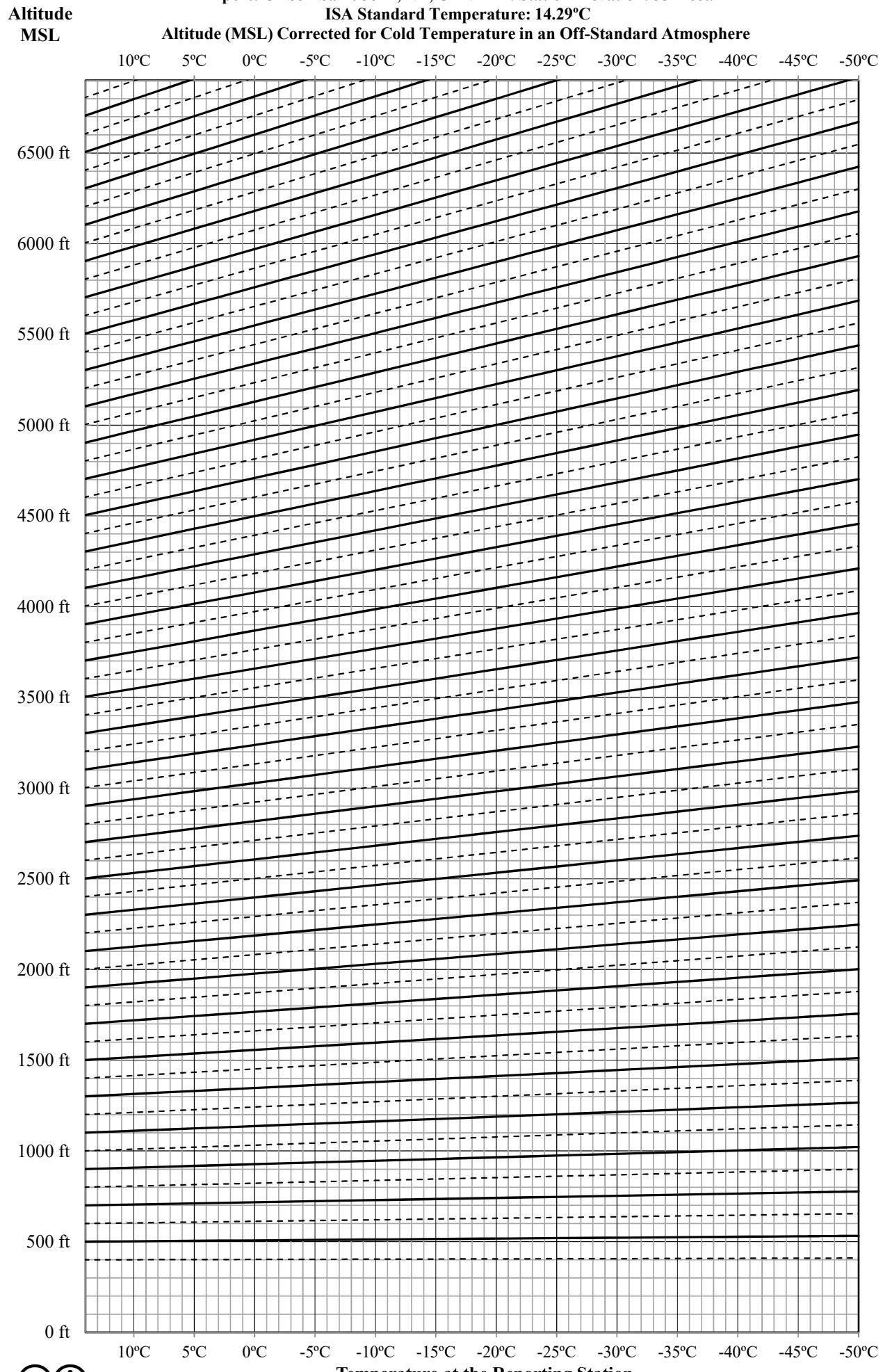
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Temperature at the Reporting Station

Airport: CYSJ - Saint John, NB, CANADA. Station Elevation: 357 feet.

ISA Standard Temperature: 14.29°C

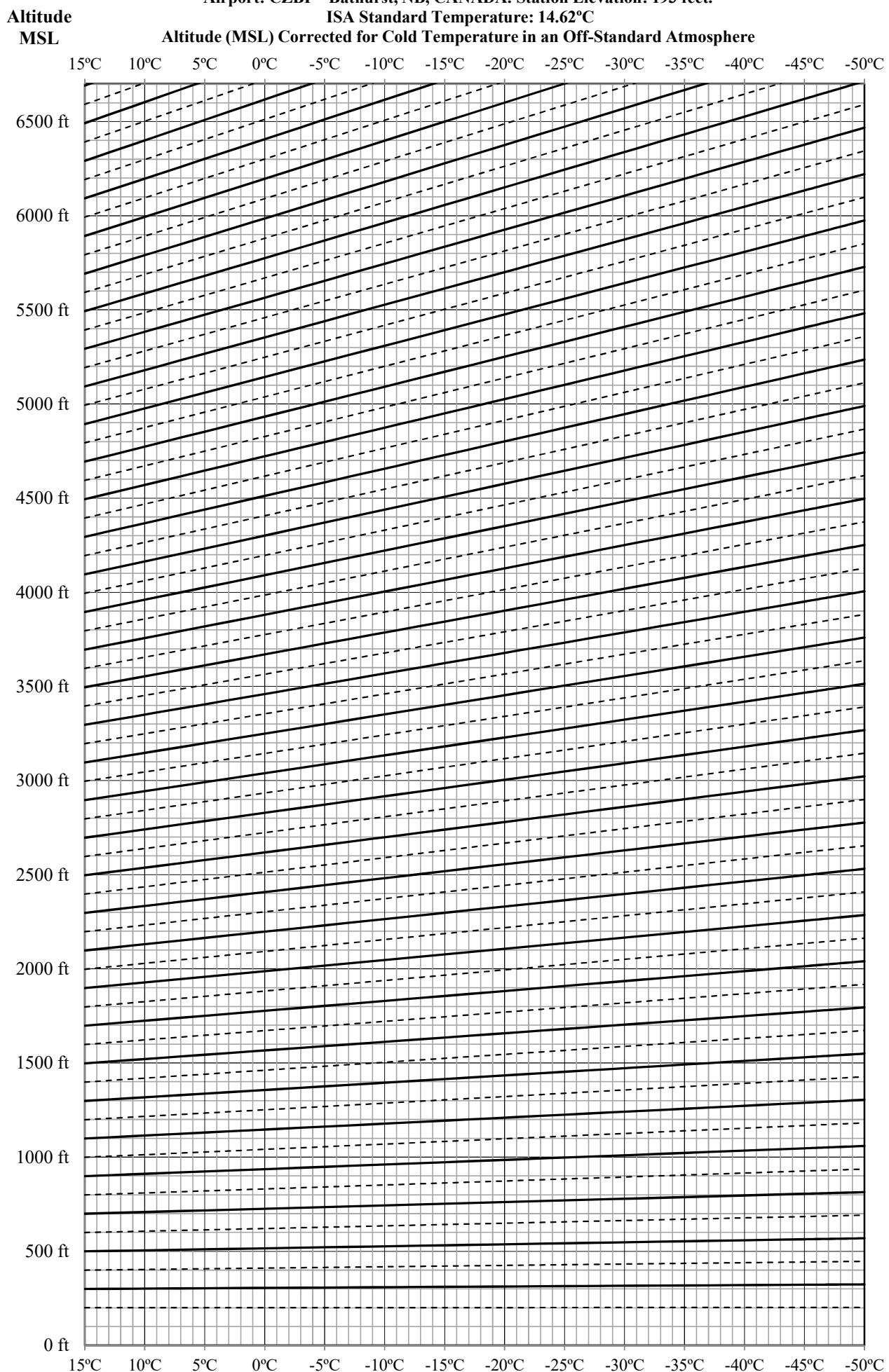
Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



Airport: CZBF - Bathurst, NB, CANADA. Station Elevation: 193 feet.

ISA Standard Temperature: 14.62°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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Temperature at the Reporting Station



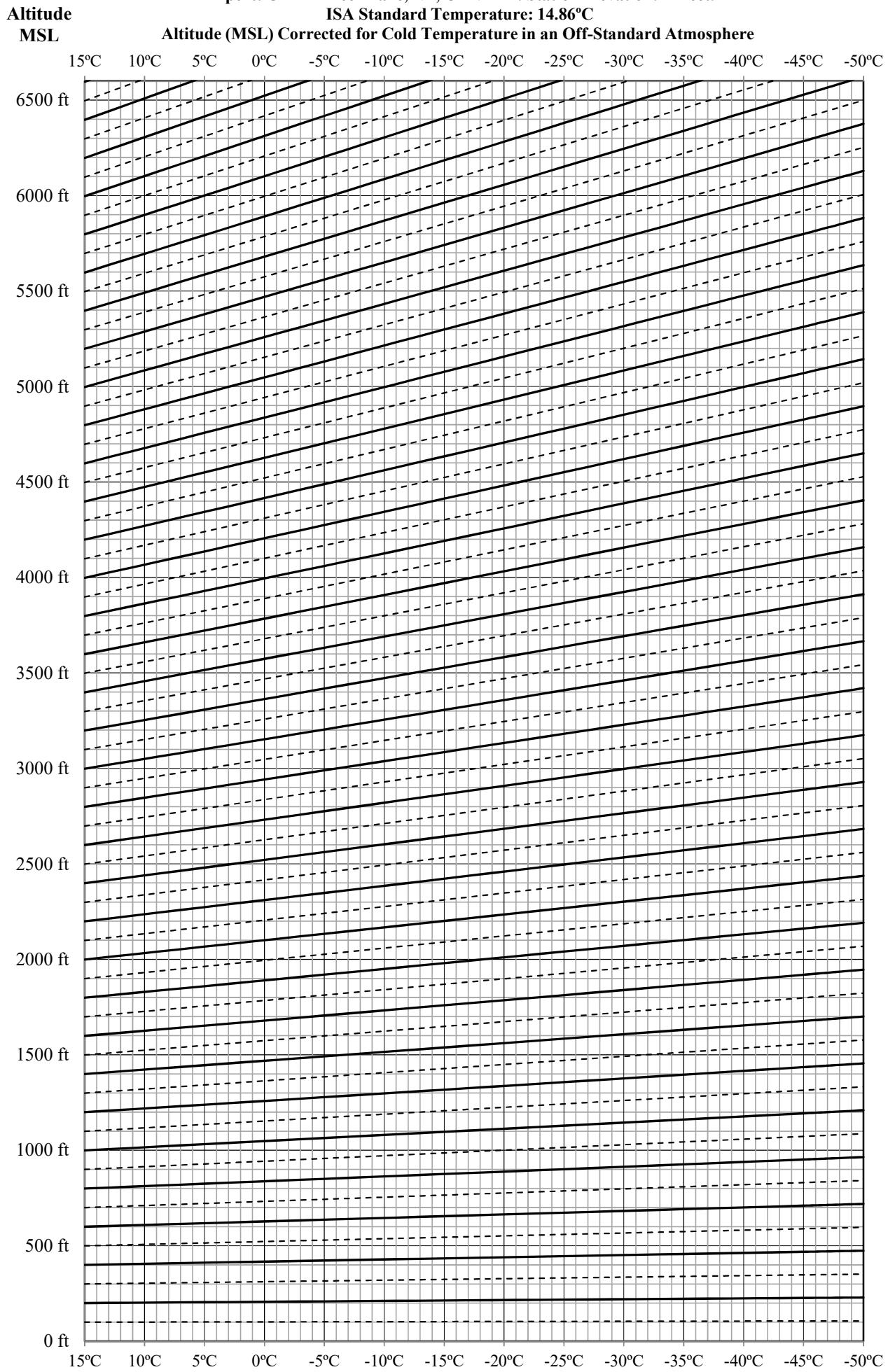
6 Newfoundland and Labrador Airports

6.1	CYDF - DEER LAKE, NL, CANADA	42
6.2	CYQX - GANDER, NL, CANADA	43
6.3	CYWK - WABUSH, NL, CANADA	44
6.4	CYYR - GOOSE BAY, NL, CANADA.....	45
6.5	CYYT - ST JOHN'S, NL, CANADA.....	46

Airport: CYDF - Deer Lake, NL, CANADA. Station Elevation: 72 feet.

ISA Standard Temperature: 14.86°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



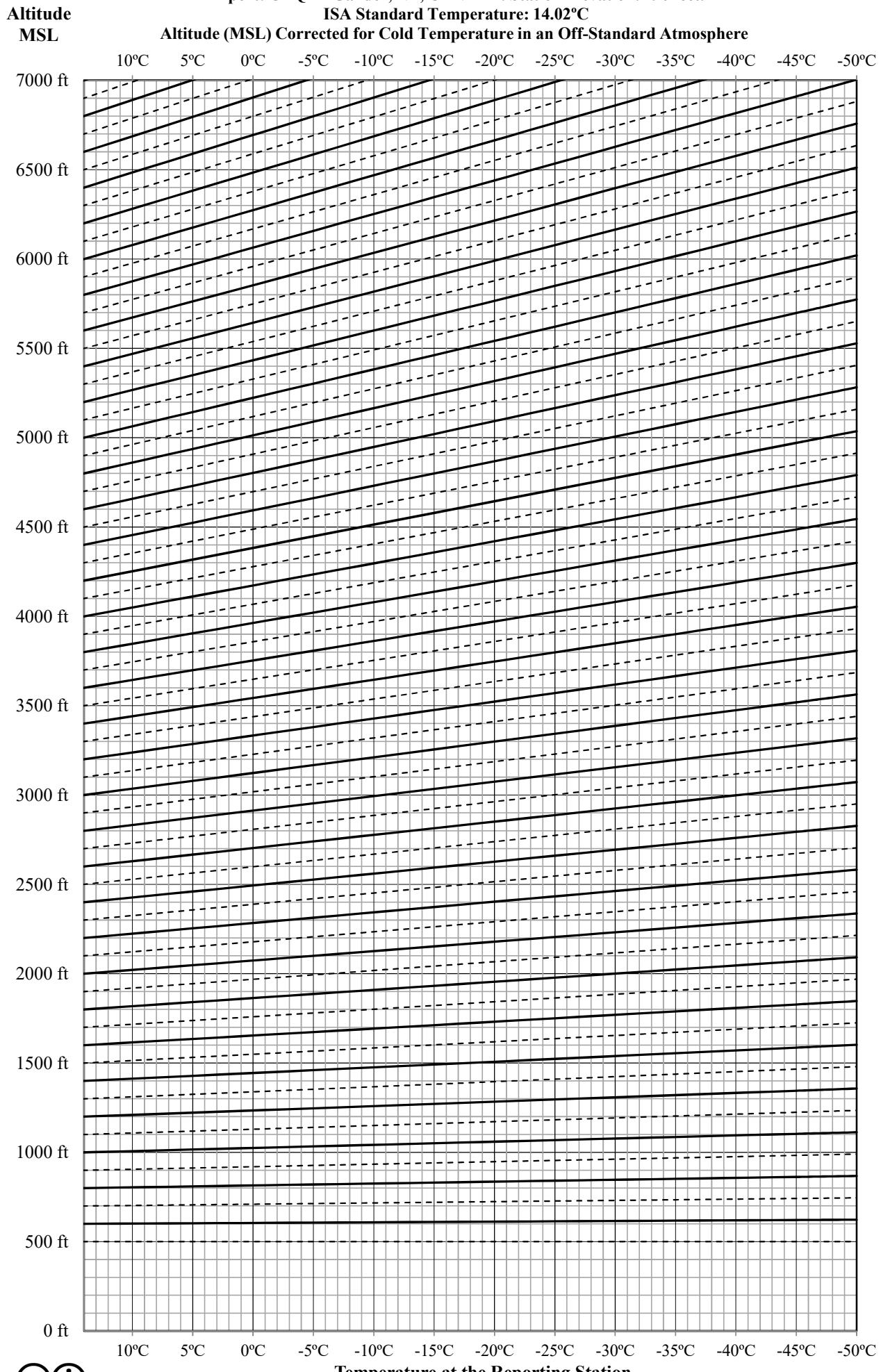
Stefano M. RAPISARDA

Temperature at the Reporting Station

Airport: CYQX - Gander, NL, CANADA. Station Elevation: 496 feet.

ISA Standard Temperature: 14.02°C

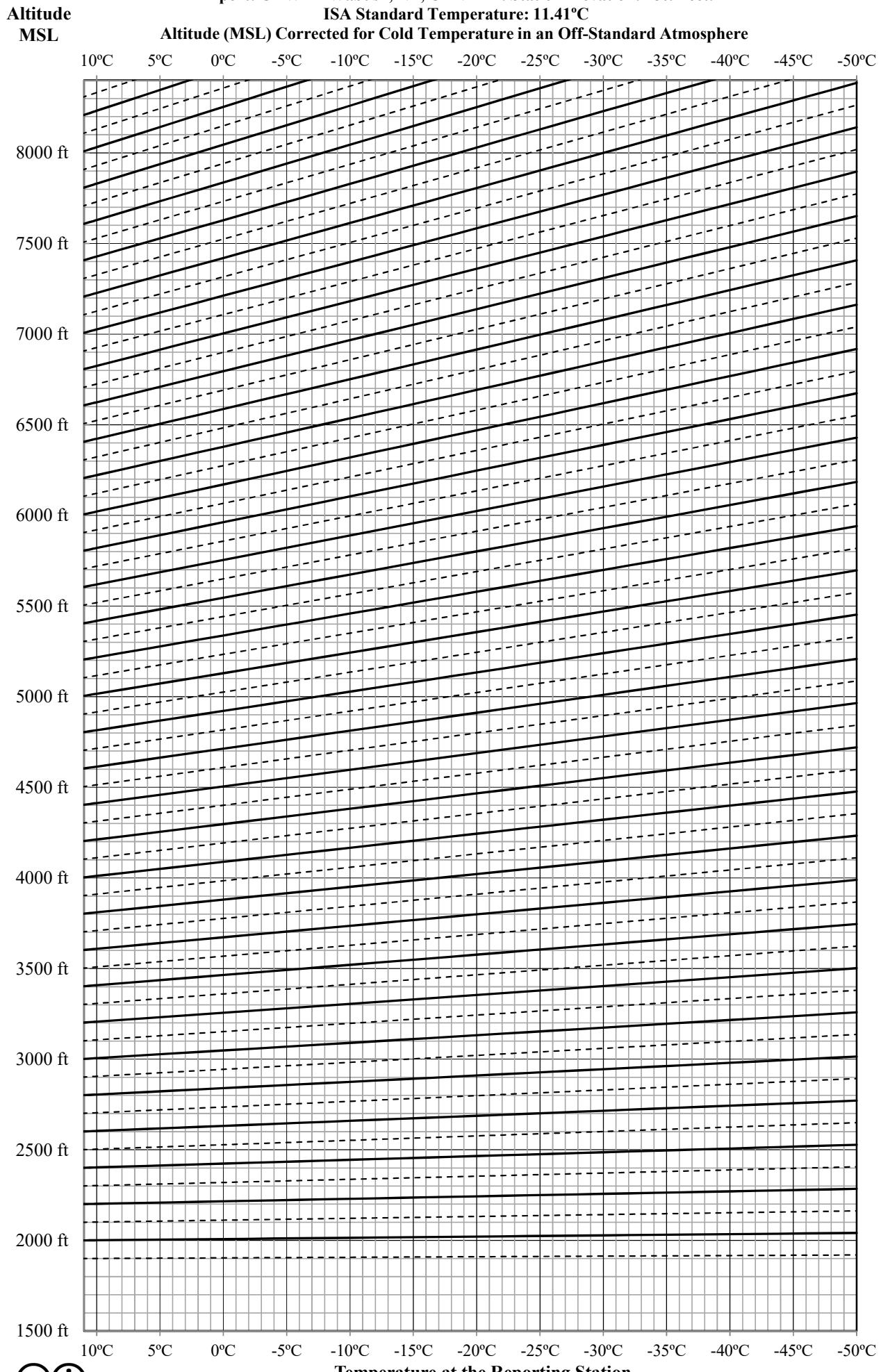
Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



Airport: CYWK - Wabush, NL, CANADA. Station Elevation: 1809 feet.

ISA Standard Temperature: 11.41°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



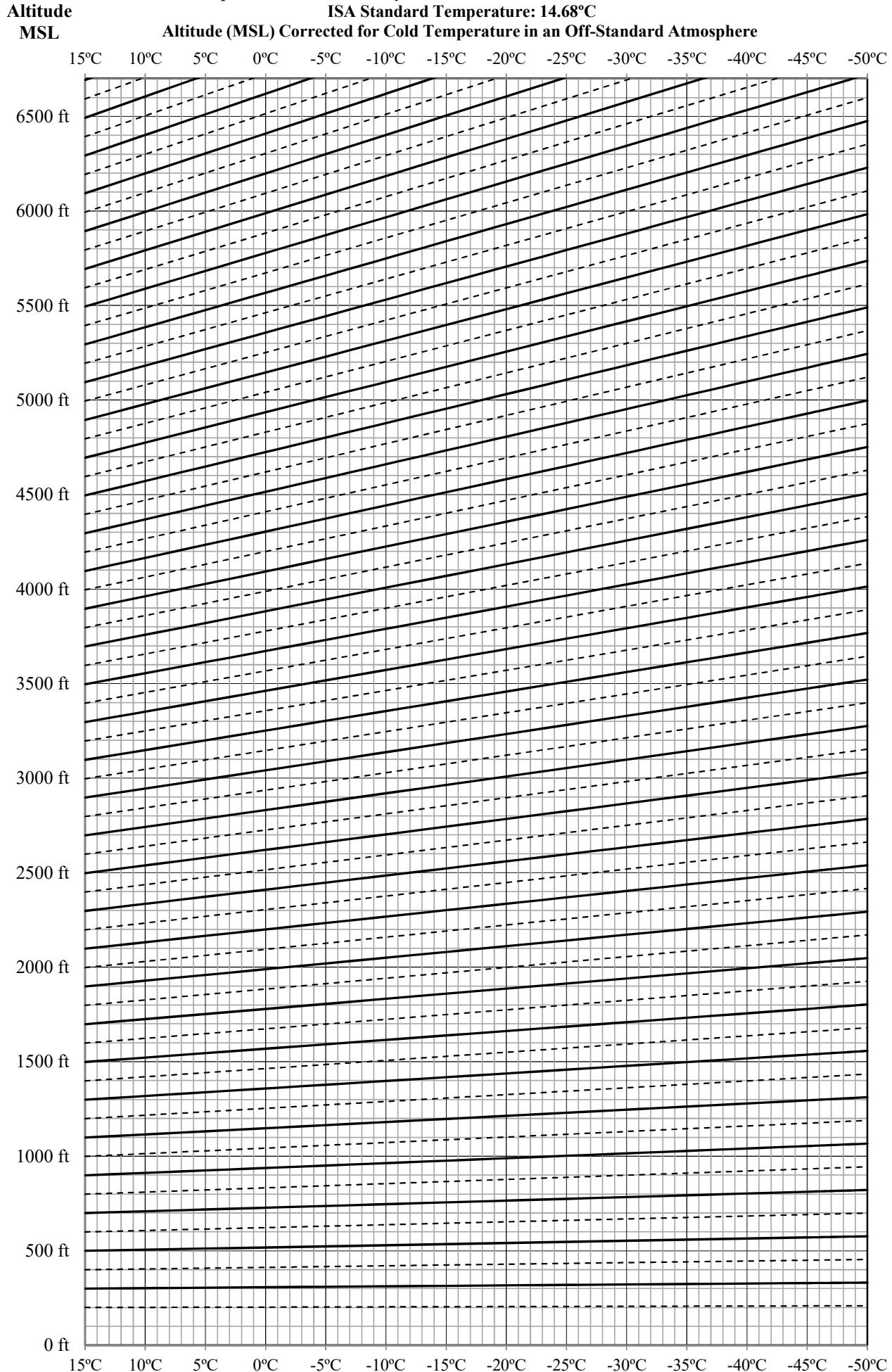
Stefano M. RAPISARDA

Temperature at the Reporting Station

Airport: CYYR - Goose Bay, NL, CANADA. Station Elevation: 160 feet.

ISA Standard Temperature: 14.68°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



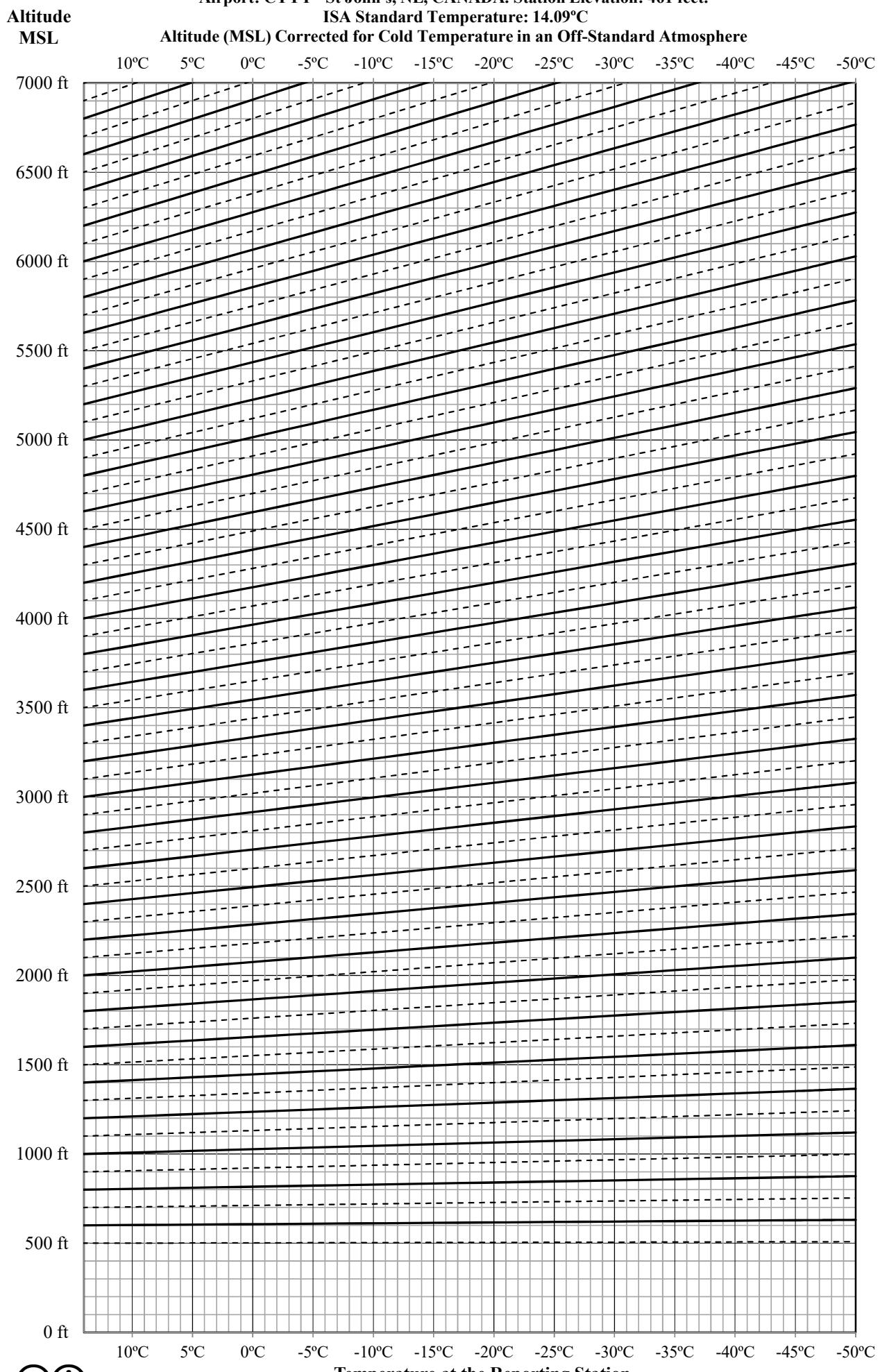
Stefano M. RAPISARDA

Temperature at the Reporting Station

Airport: CYYT - St John's, NL, CANADA. Station Elevation: 461 feet.

ISA Standard Temperature: 14.09°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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Temperature at the Reporting Station



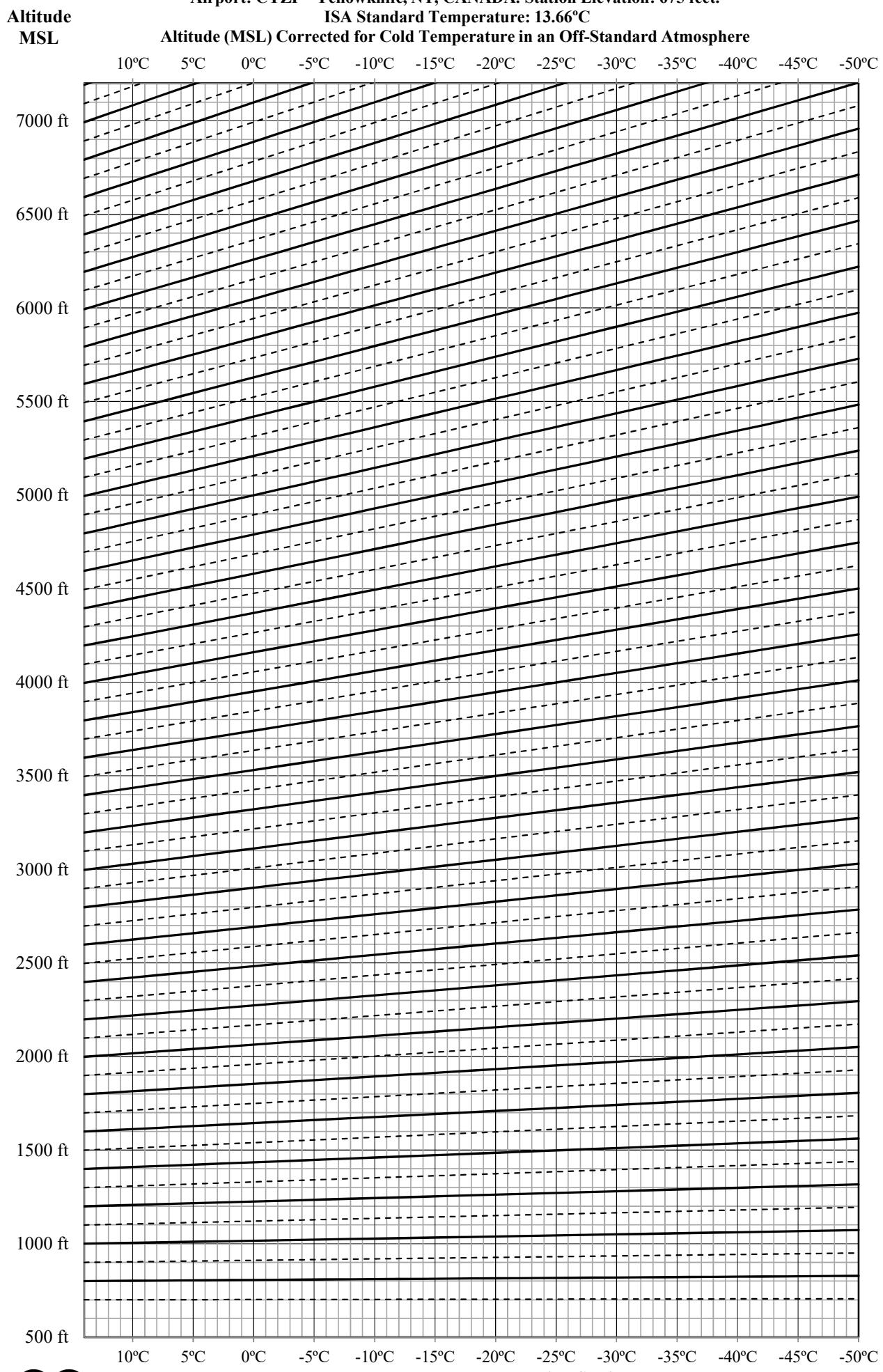
7 Northwest Territories Airports

7.1 CYZF - YELLOWKNIFE, NT, CANADA.....	48
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Airport: CYZF - Yellowknife, NT, CANADA. Station Elevation: 675 feet.

ISA Standard Temperature: 13.66°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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Temperature at the Reporting Station

Page 48

flightdeckengineering.com



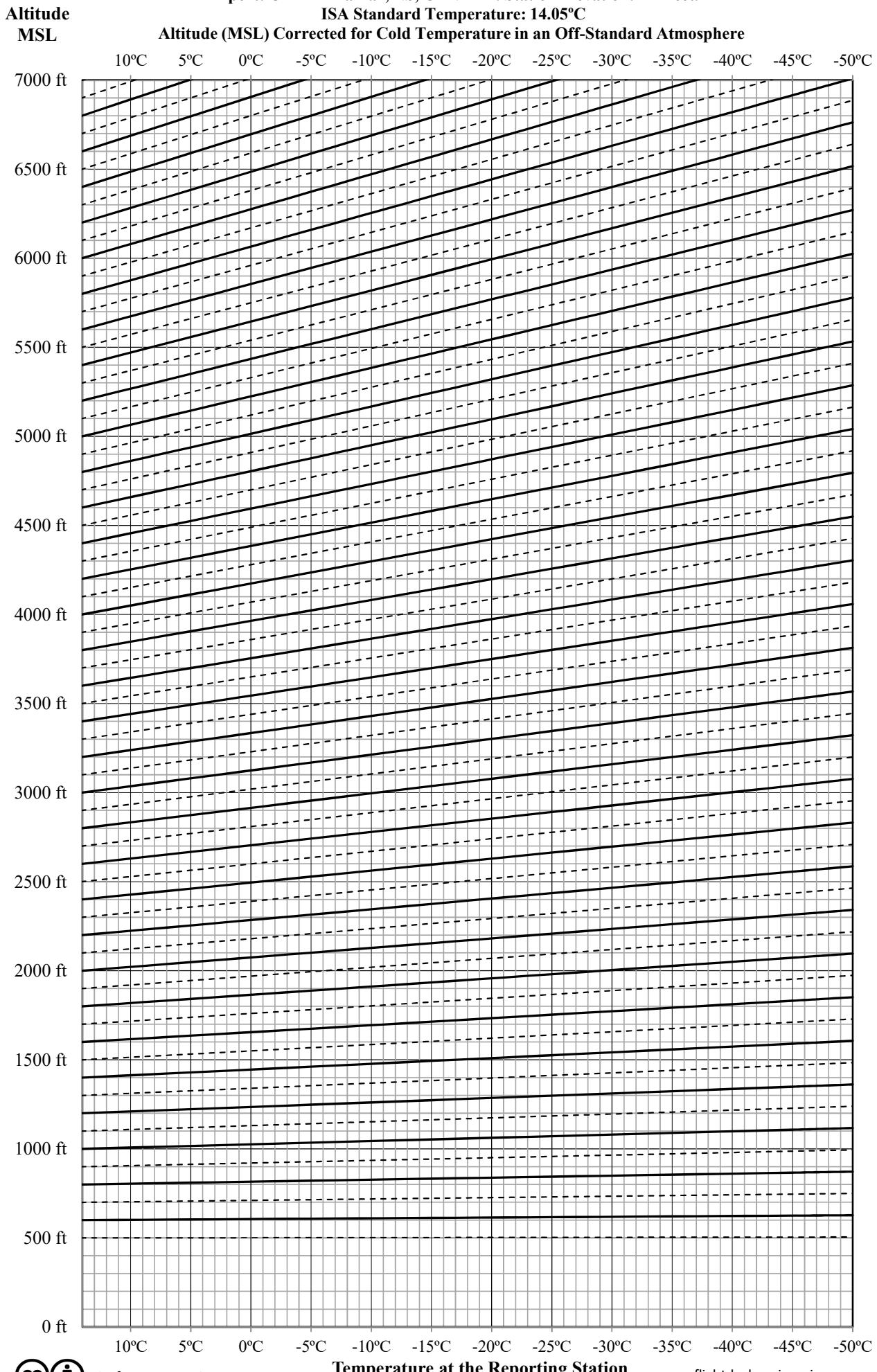
8 Nova Scotia Airports

8.1 CYHZ - HALIFAX, NS, CANADA.....	50
8.2 CYQY - SYDNEY, NS, CANADA	51

Airport: CYHZ - Halifax, NS, CANADA. Station Elevation: 477 feet.

ISA Standard Temperature: 14.05°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere

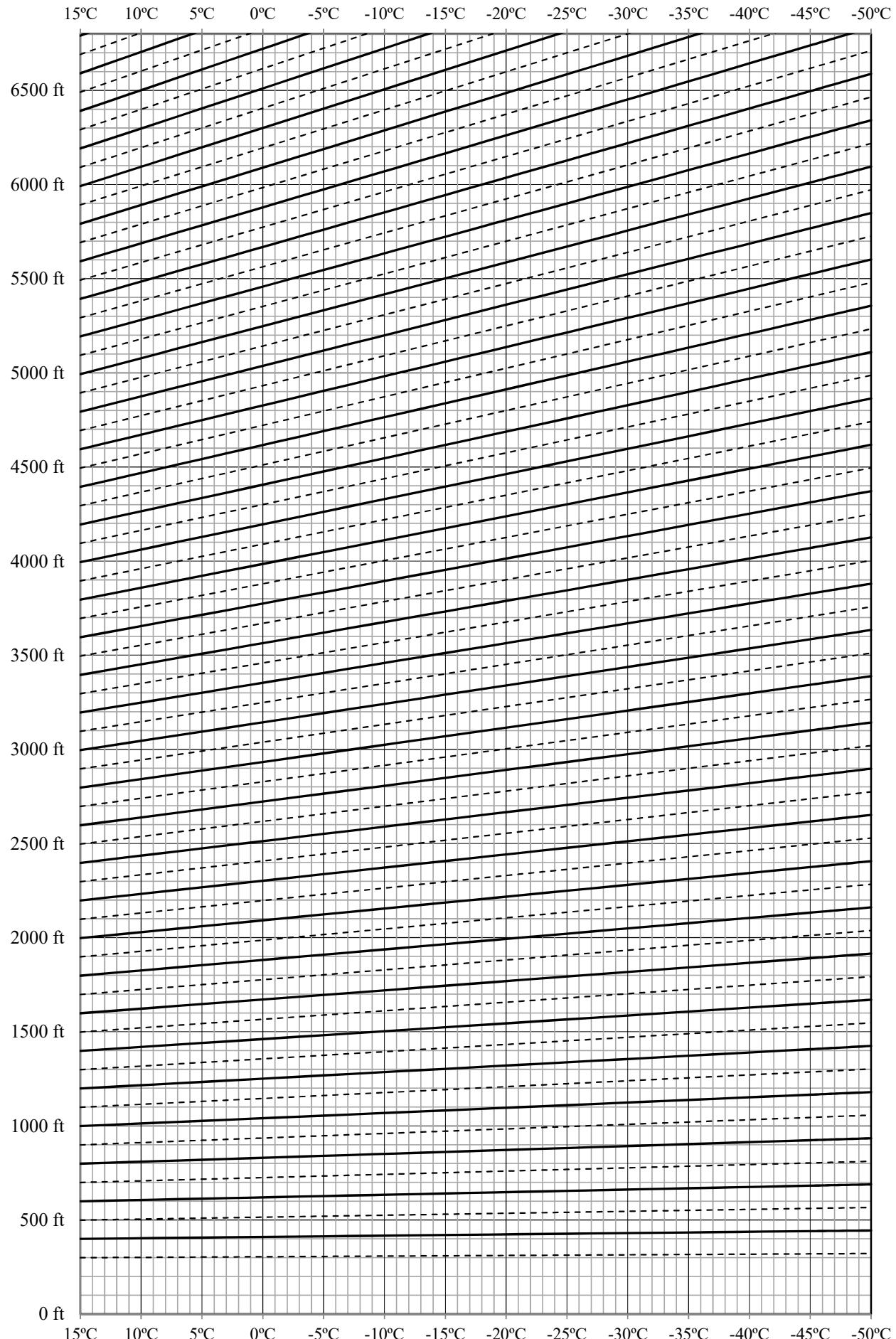


Airport: CYQY - Sydney, NS, CANADA. Station Elevation: 203 feet.

ISA Standard Temperature: 14.6°C

Altitude
MSL

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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Temperature at the Reporting Station



9 Nunavut Airports

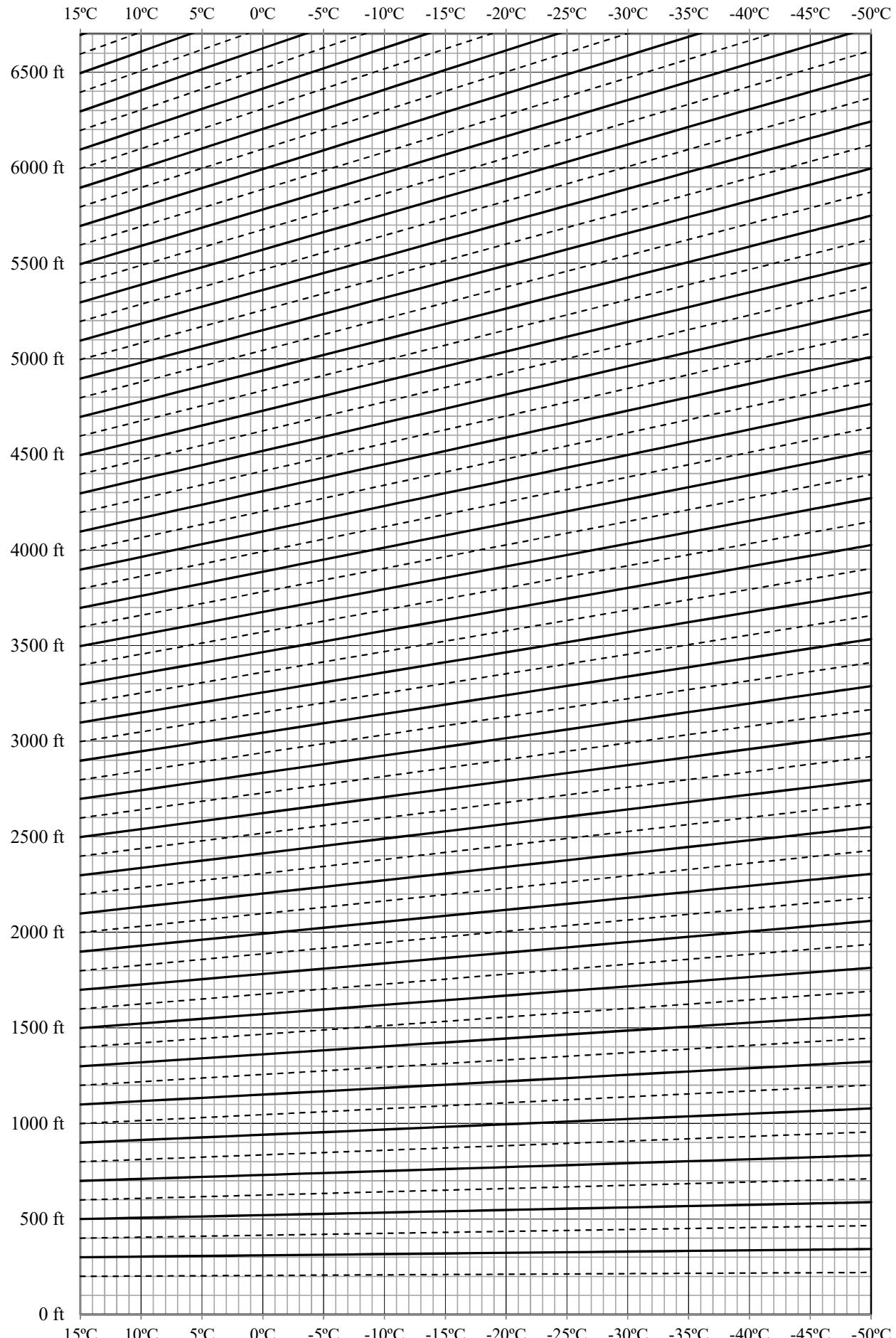
9.1 CYFB - IQALUIT, NU, CANADA	53
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Airport: CYFB - Iqaluit, NU, CANADA. Station Elevation: 110 feet.

ISA Standard Temperature: 14.78°C

Altitude
MSL

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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Temperature at the Reporting Station



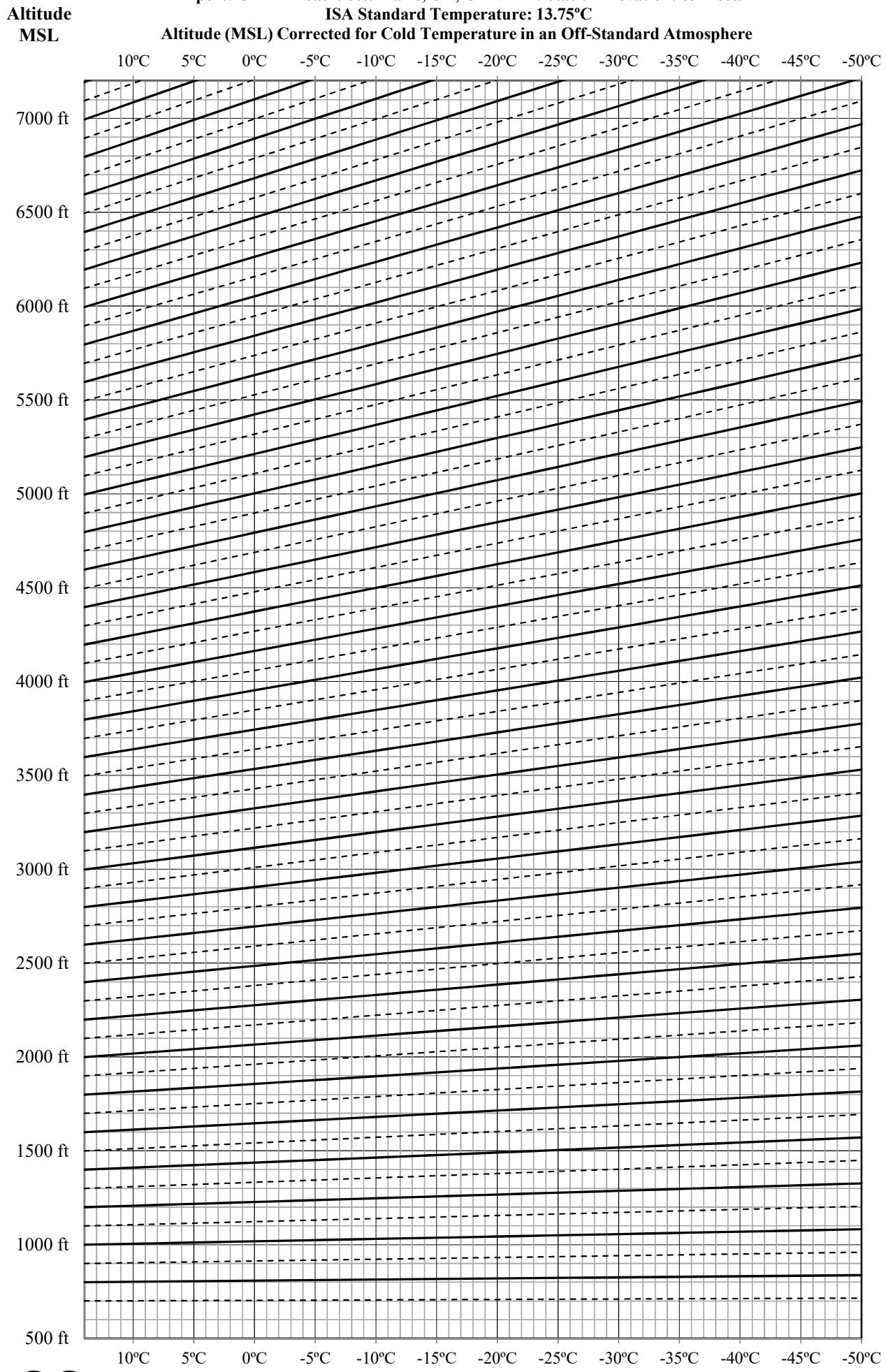
10 Ontario Airports

10.1 CYAM - SAULT STE. MARIE, ON, CANADA.....	55
10.2 CYGK - KINGSTON, ON, CANADA	56
10.3 CYKF - KITCHENER, ON, CANADA	57
10.4 CYOW - OTTAWA, ON, CANADA.....	58
10.5 CYQT - THUNDER BAY, ON, CANADA	59
10.6 CYSB - SUDBURY, ON, CANADA	60
10.7 CYTS - TIMMINS, ON, CANADA	61
10.8 CYXU - LONDON, ON, CANADA.....	62
10.9 CYYB - NORTH BAY, ON, CANADA	63
10.10 CYYZ - TORONTO, ON, CANADA	64
10.11 CYZR - SARNIA, ON, CANADA.....	65

Airport: CYAM - Sault Ste. Marie, ON, CANADA. Station Elevation: 632 feet.

ISA Standard Temperature: 13.75°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere

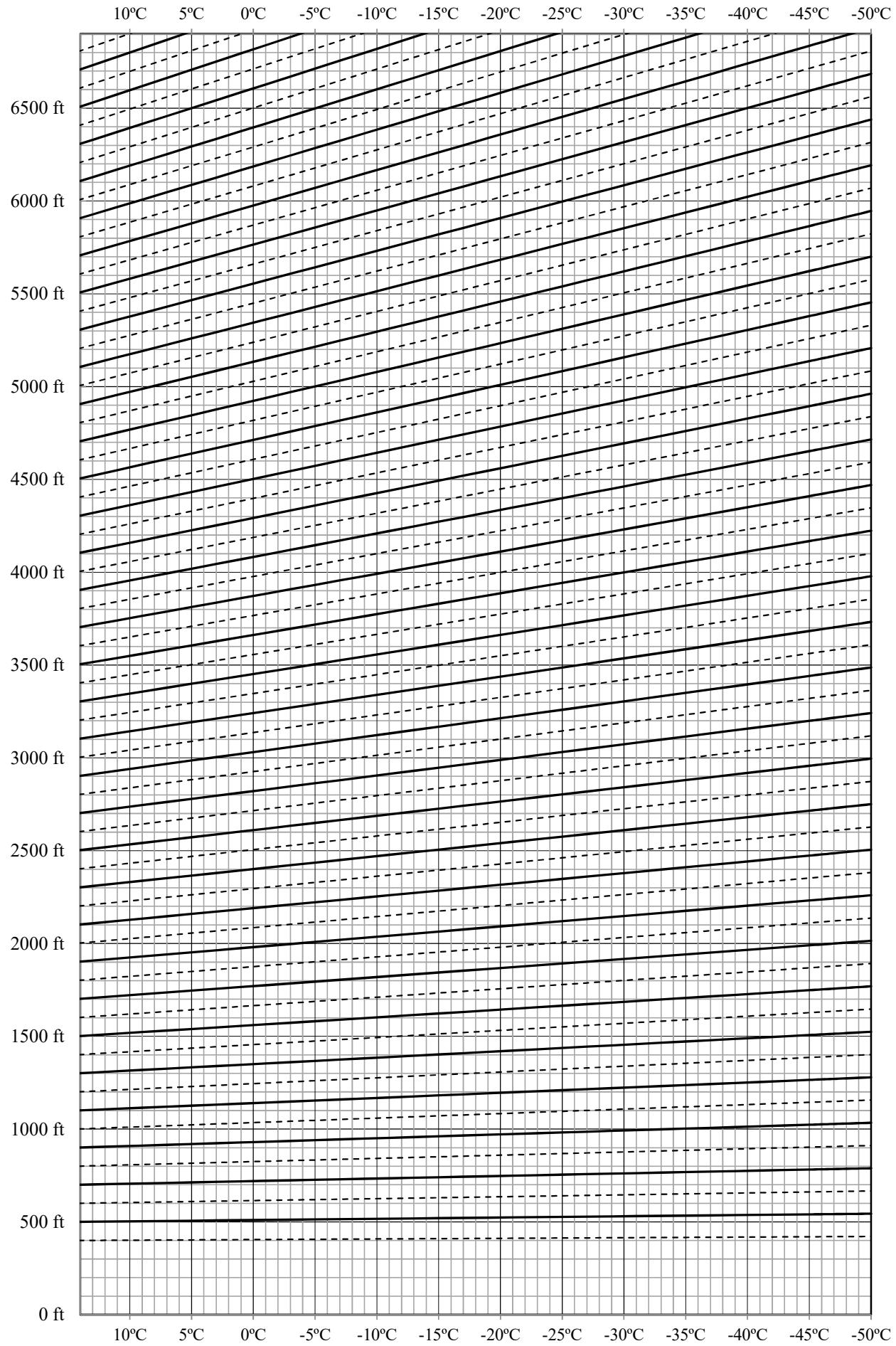


Airport: CYGK - Kingston, ON, CANADA. Station Elevation: 303 feet.

ISA Standard Temperature: 14.4°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere

Altitude
MSL



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Temperature at the Reporting Station

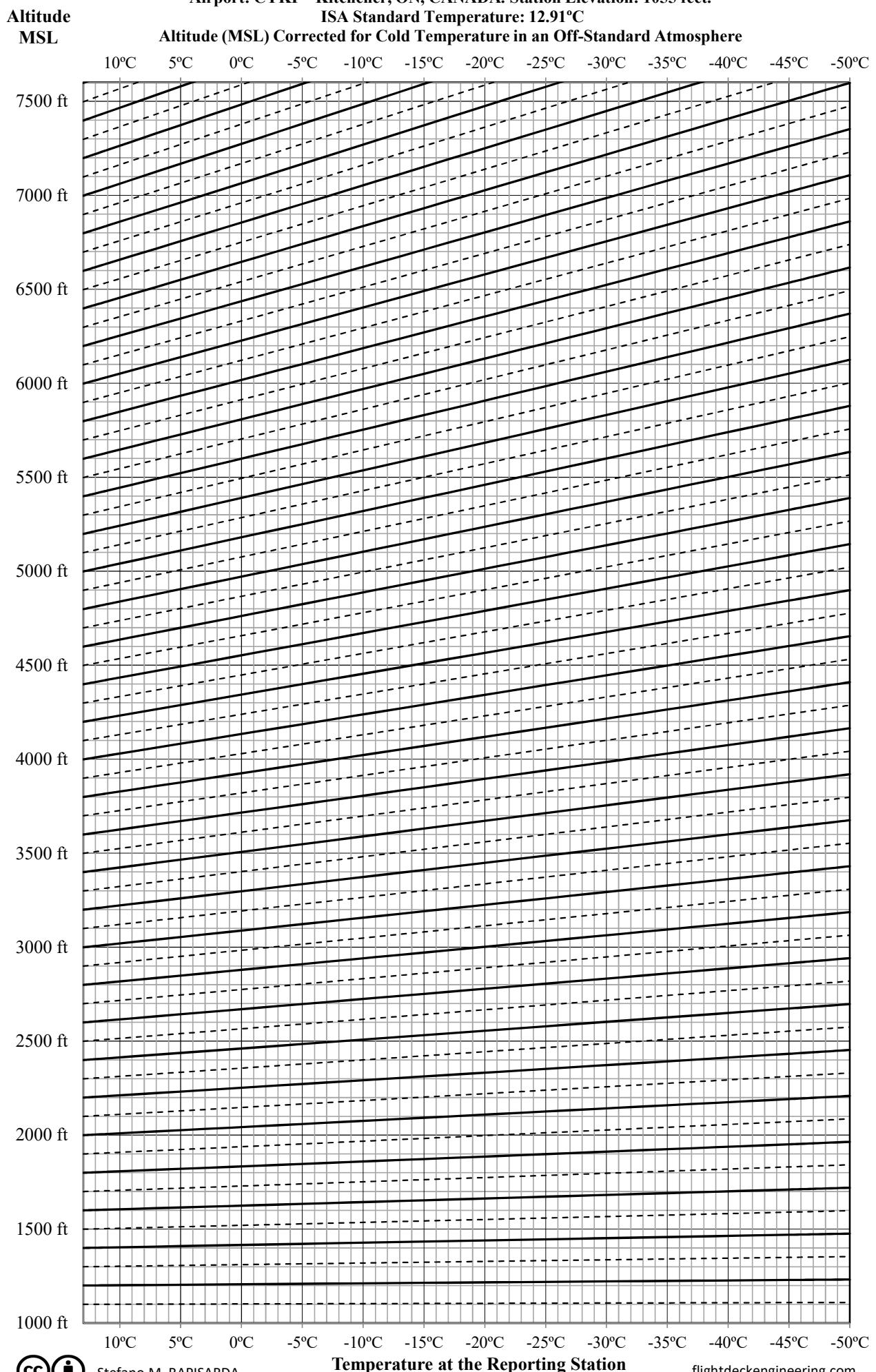
Page 56

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Airport: CYKF - Kitchener, ON, CANADA. Station Elevation: 1055 feet.

ISA Standard Temperature: 12.91°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere

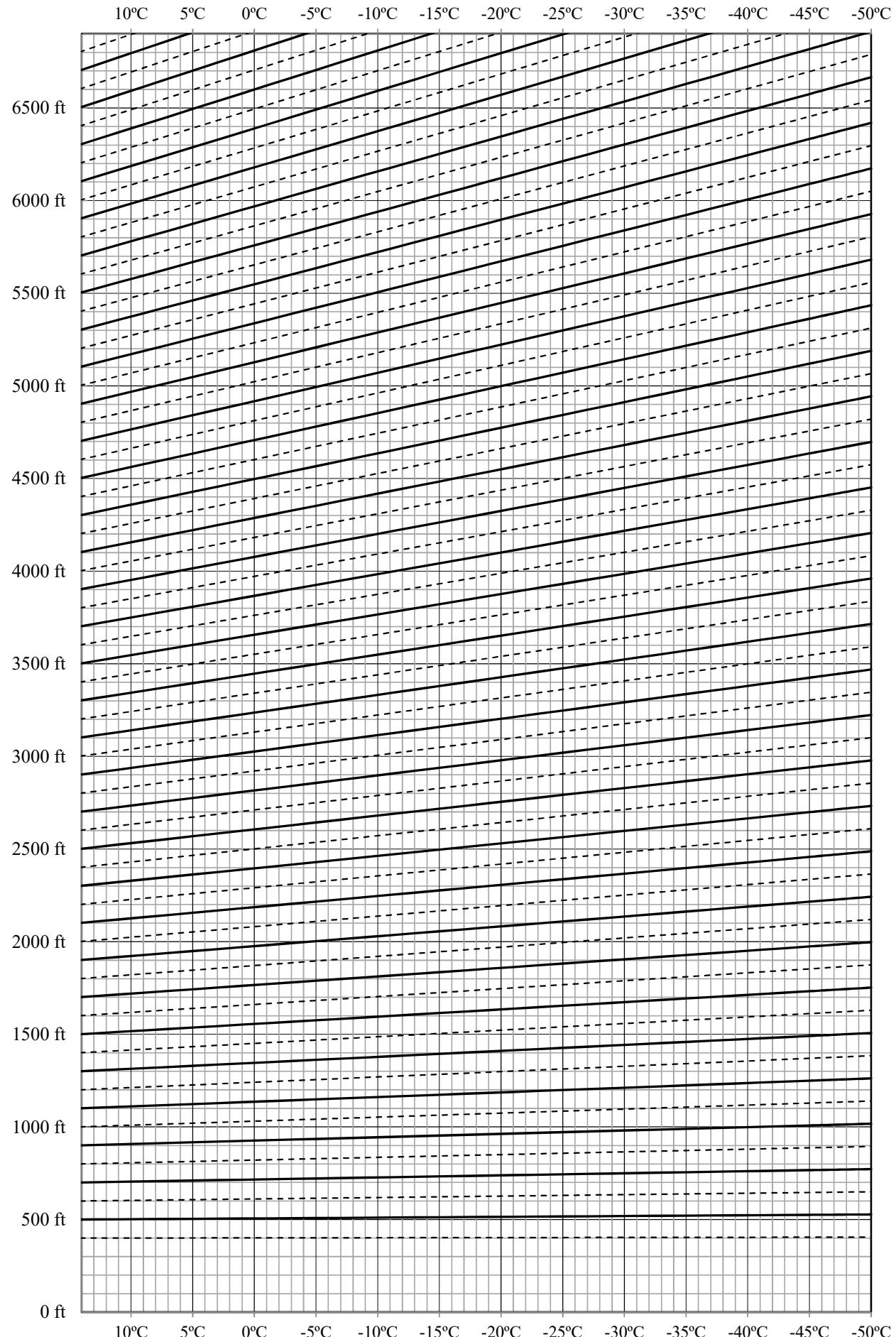


Airport: CYOW - Ottawa, ON, CANADA. Station Elevation: 377 feet.

ISA Standard Temperature: 14.25°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere

Altitude
MSL



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Temperature at the Reporting Station

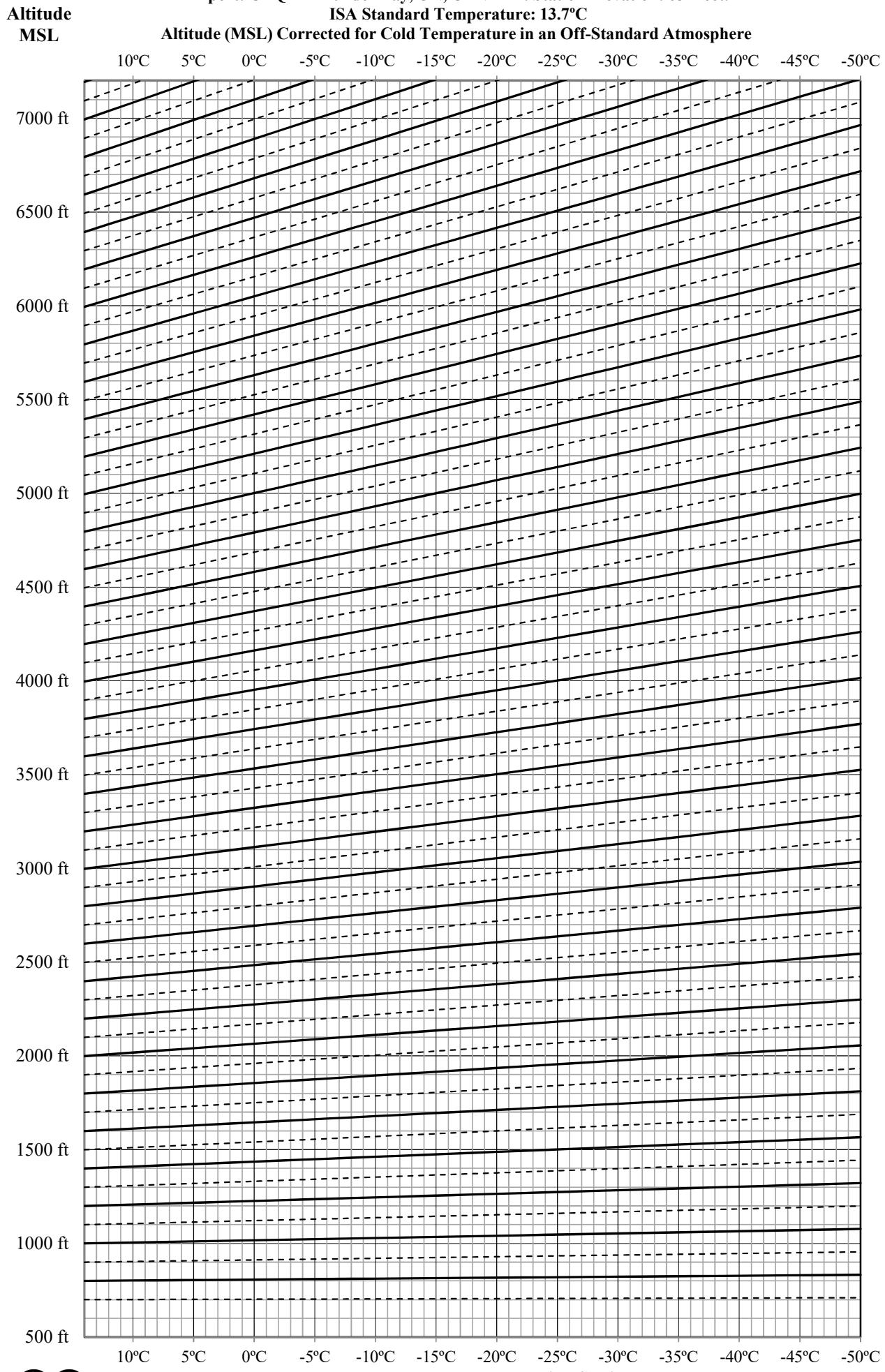
Page 58

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Airport: CYQT - Thunder Bay, ON, CANADA. Station Elevation: 654 feet.

ISA Standard Temperature: 13.7°C

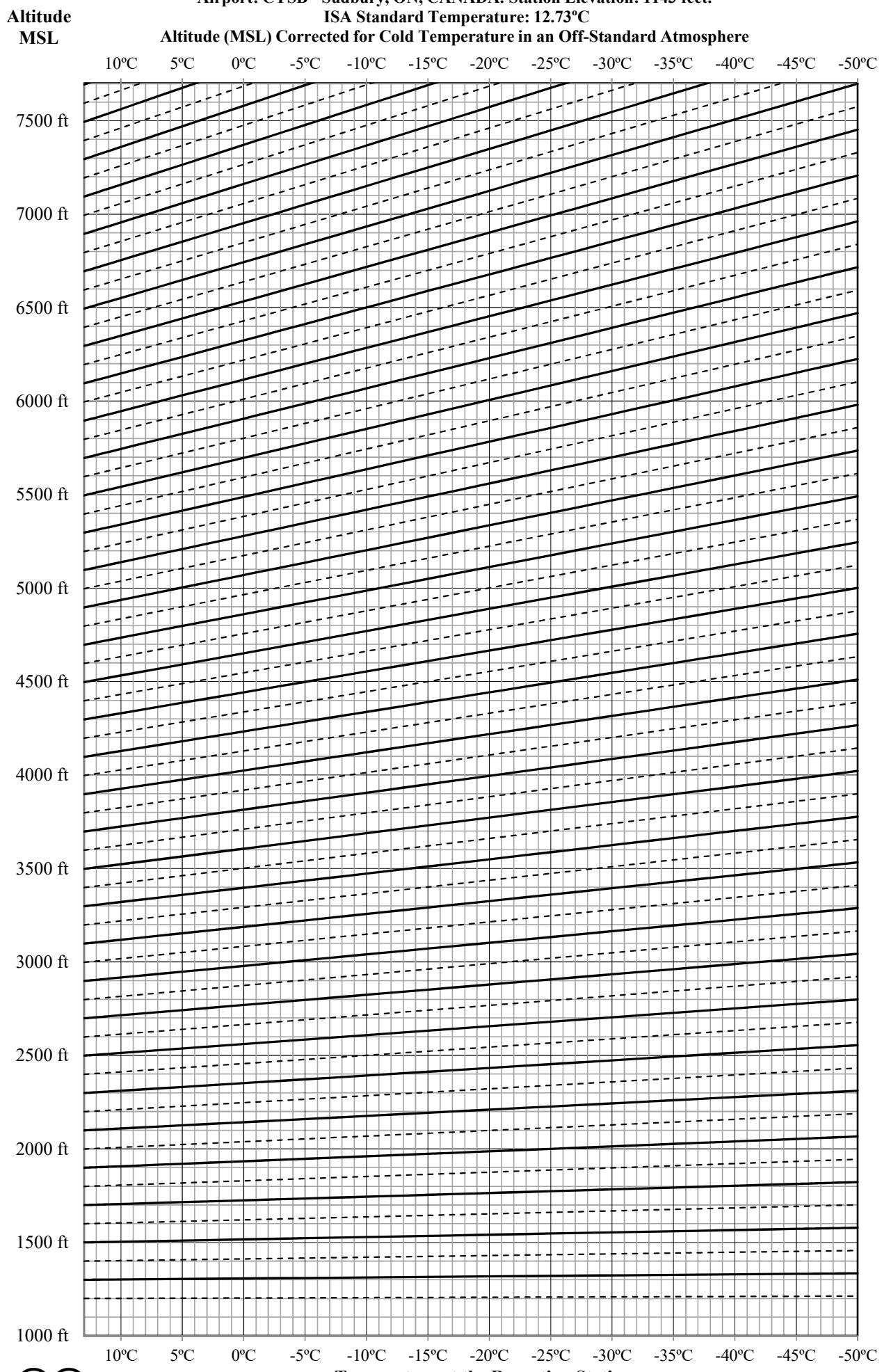
Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



Airport: CYSB - Sudbury, ON, CANADA. Station Elevation: 1143 feet.

ISA Standard Temperature: 12.73°C

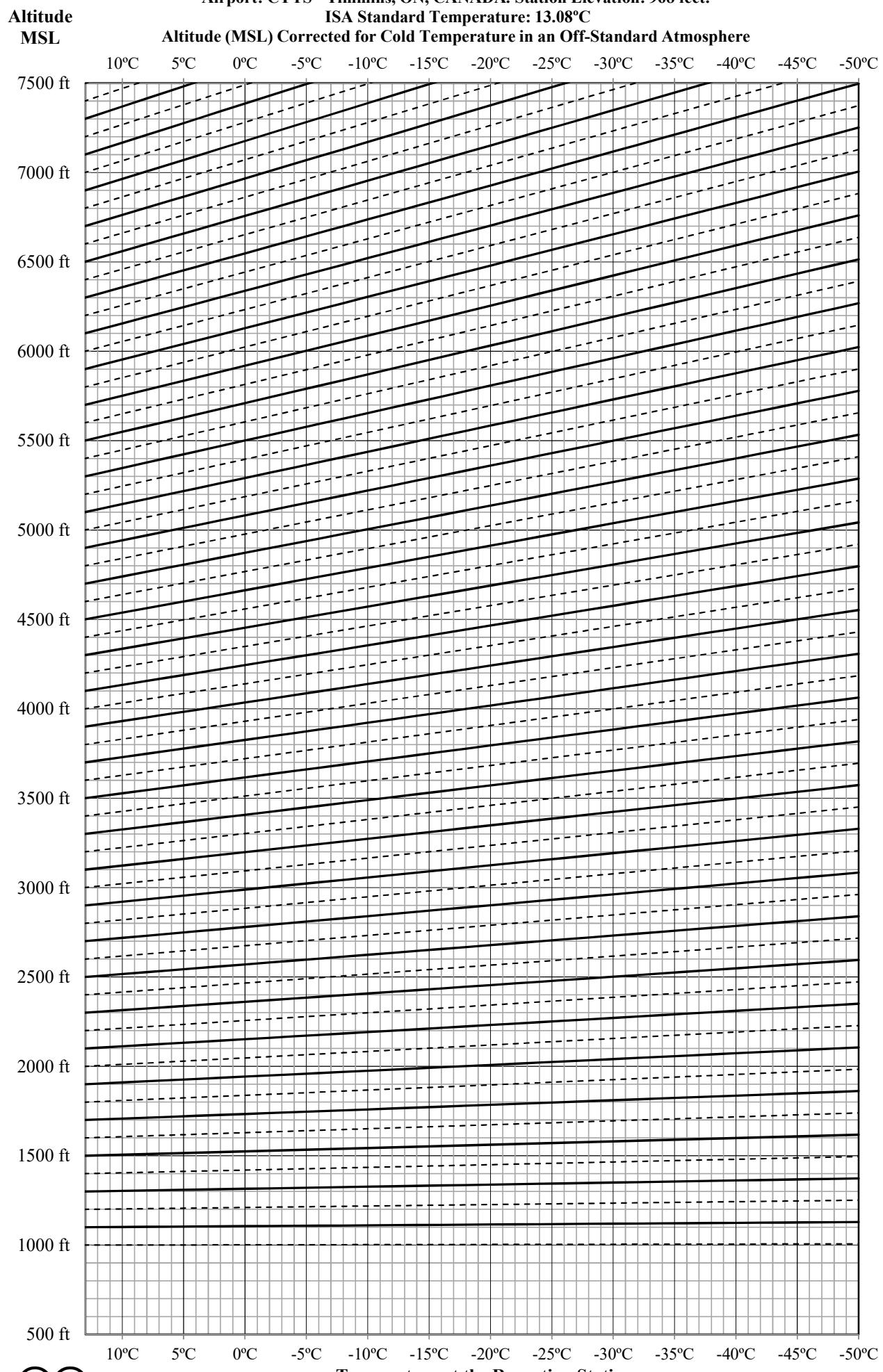
Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



Airport: CYTS - Timmins, ON, CANADA. Station Elevation: 968 feet.

ISA Standard Temperature: 13.08°C

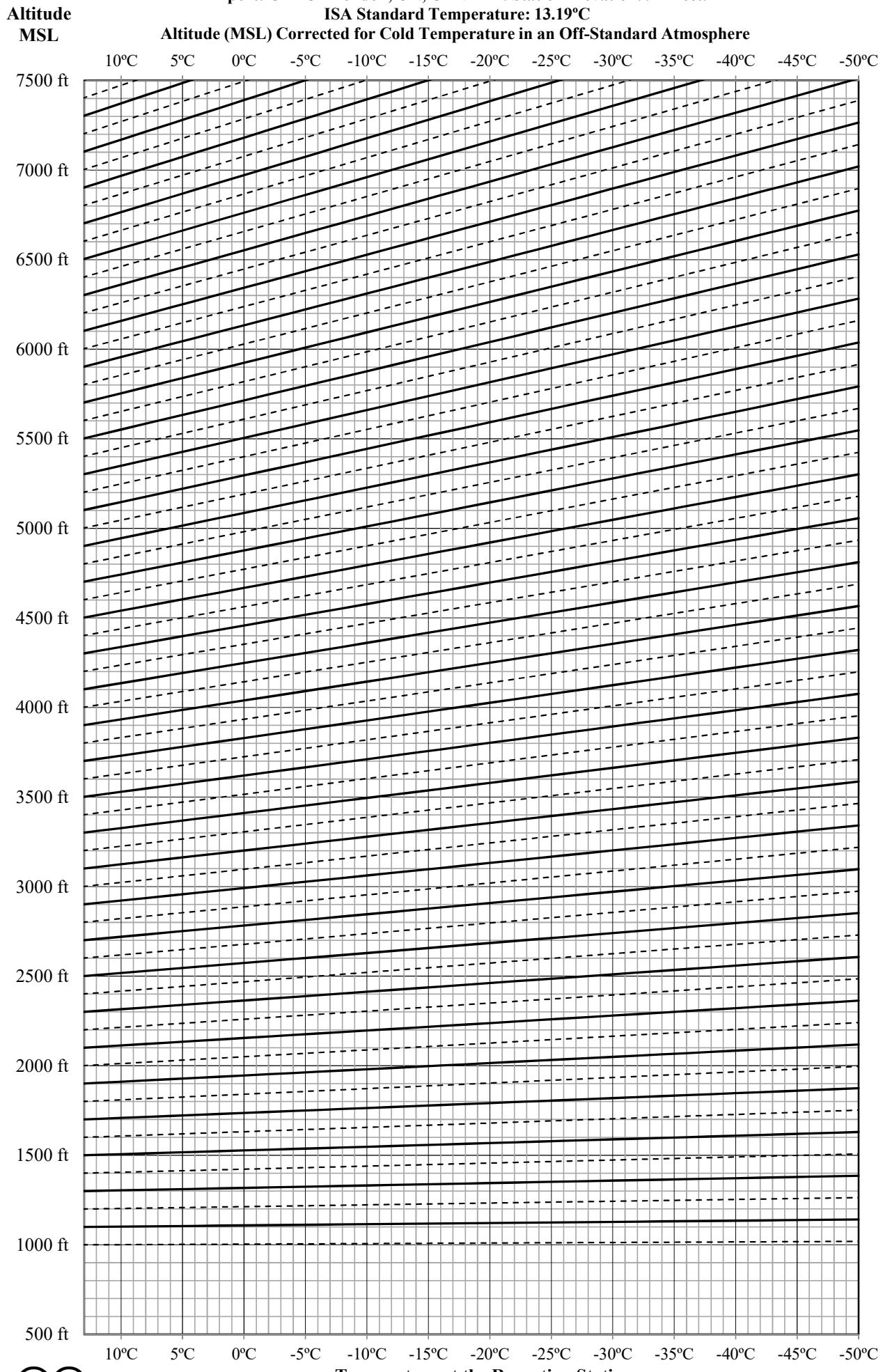
Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



Airport: CYXU - London, ON, CANADA. Station Elevation: 912 feet.

ISA Standard Temperature: 13.19°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



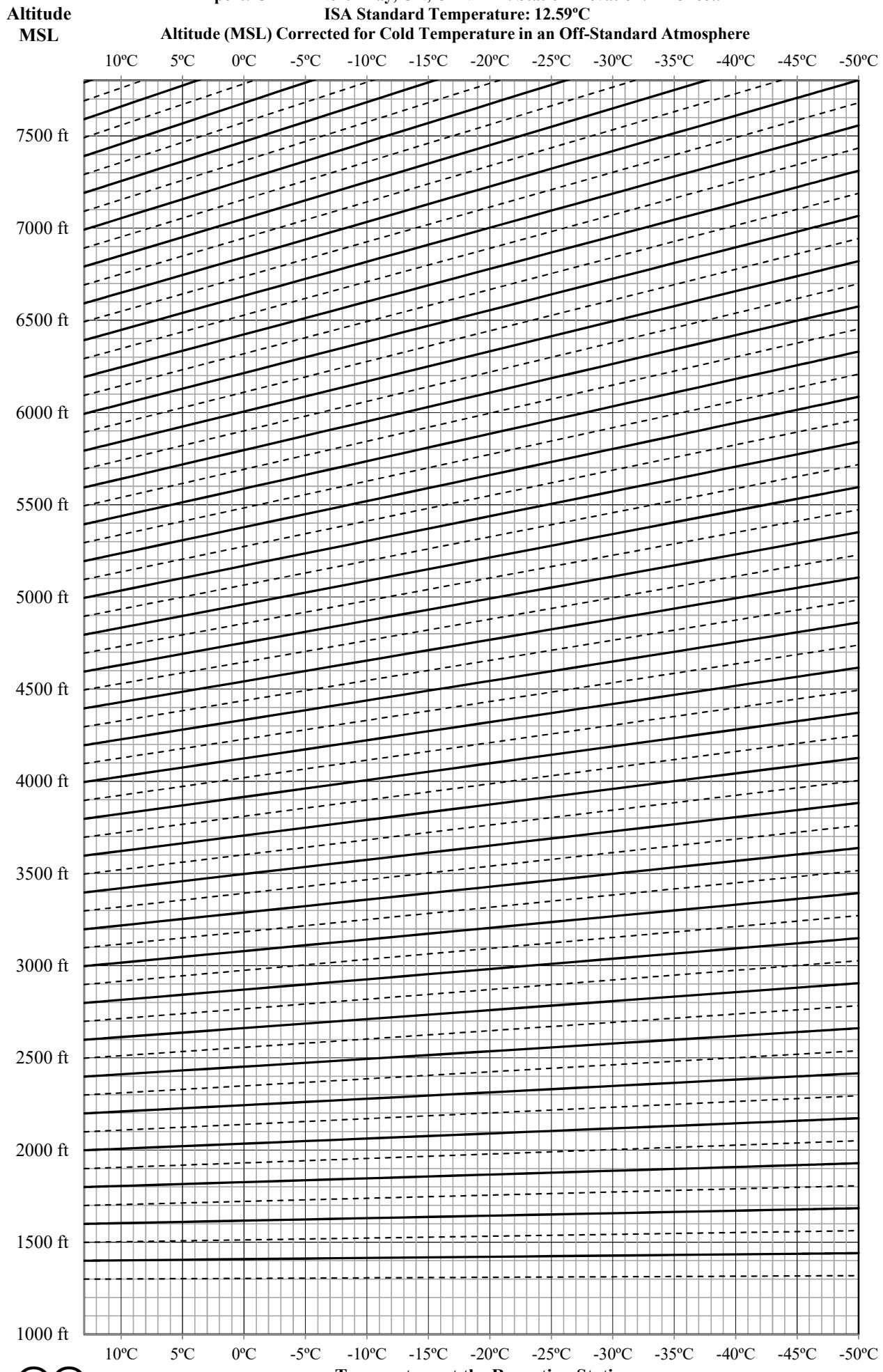
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Temperature at the Reporting Station

Airport: CYYB - North Bay, ON, CANADA. Station Elevation: 1215 feet.

ISA Standard Temperature: 12.59°C

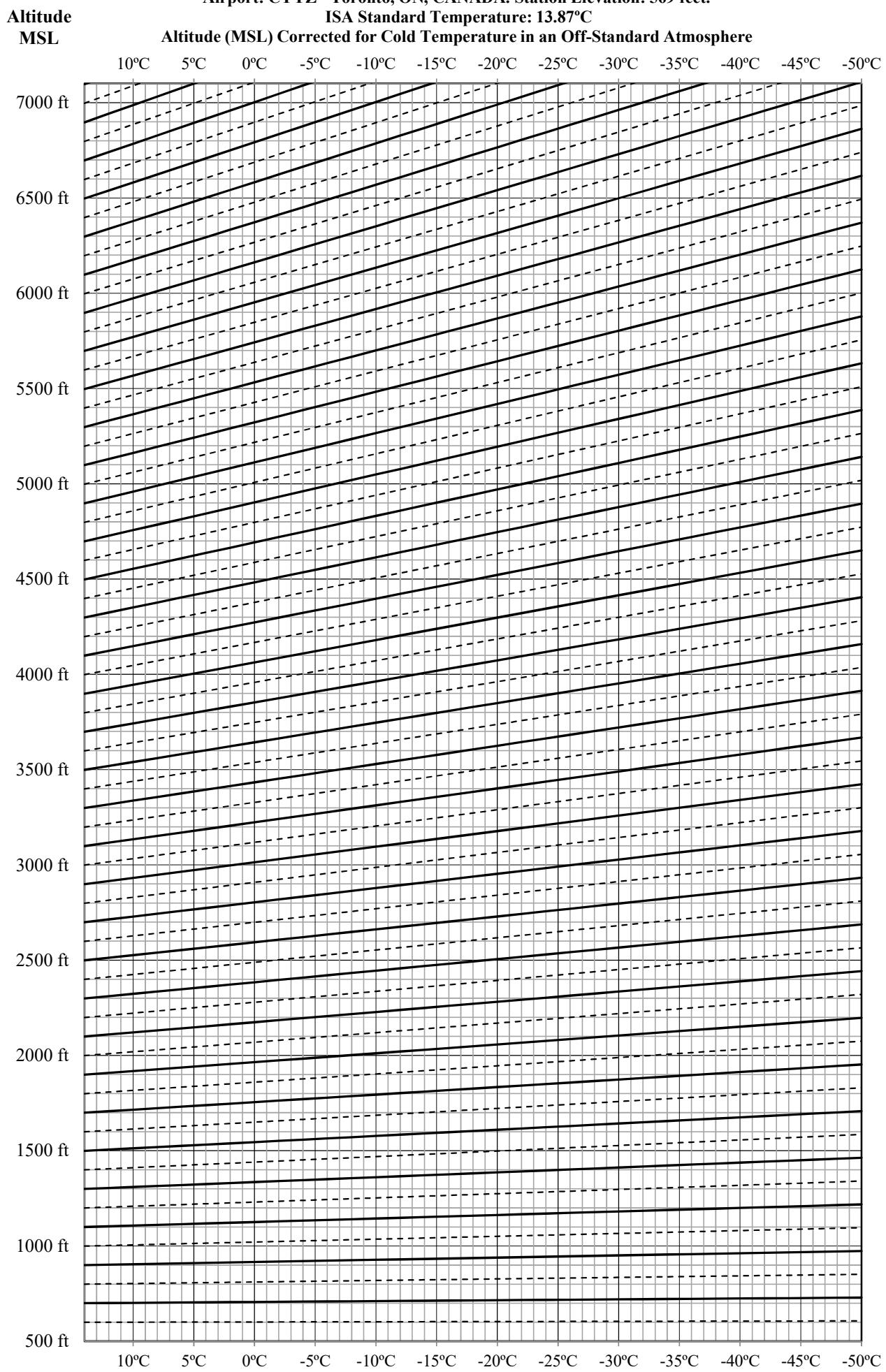
Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



Airport: CYYZ - Toronto, ON, CANADA. Station Elevation: 569 feet.

ISA Standard Temperature: 13.87°C

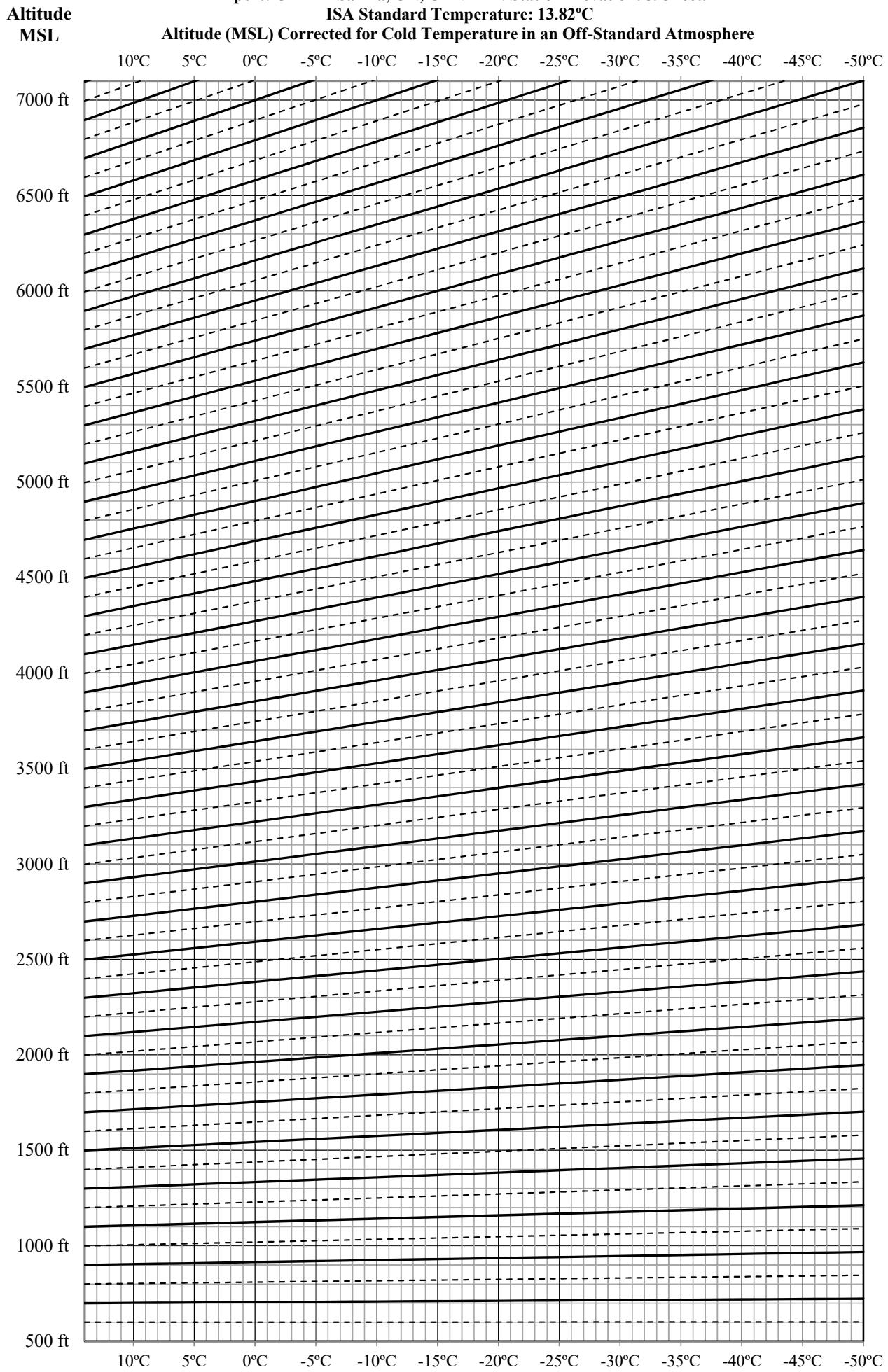
Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



Airport: CYZR - Sarnia, ON, CANADA. Station Elevation: 595 feet.

ISA Standard Temperature: 13.82°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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Temperature at the Reporting Station



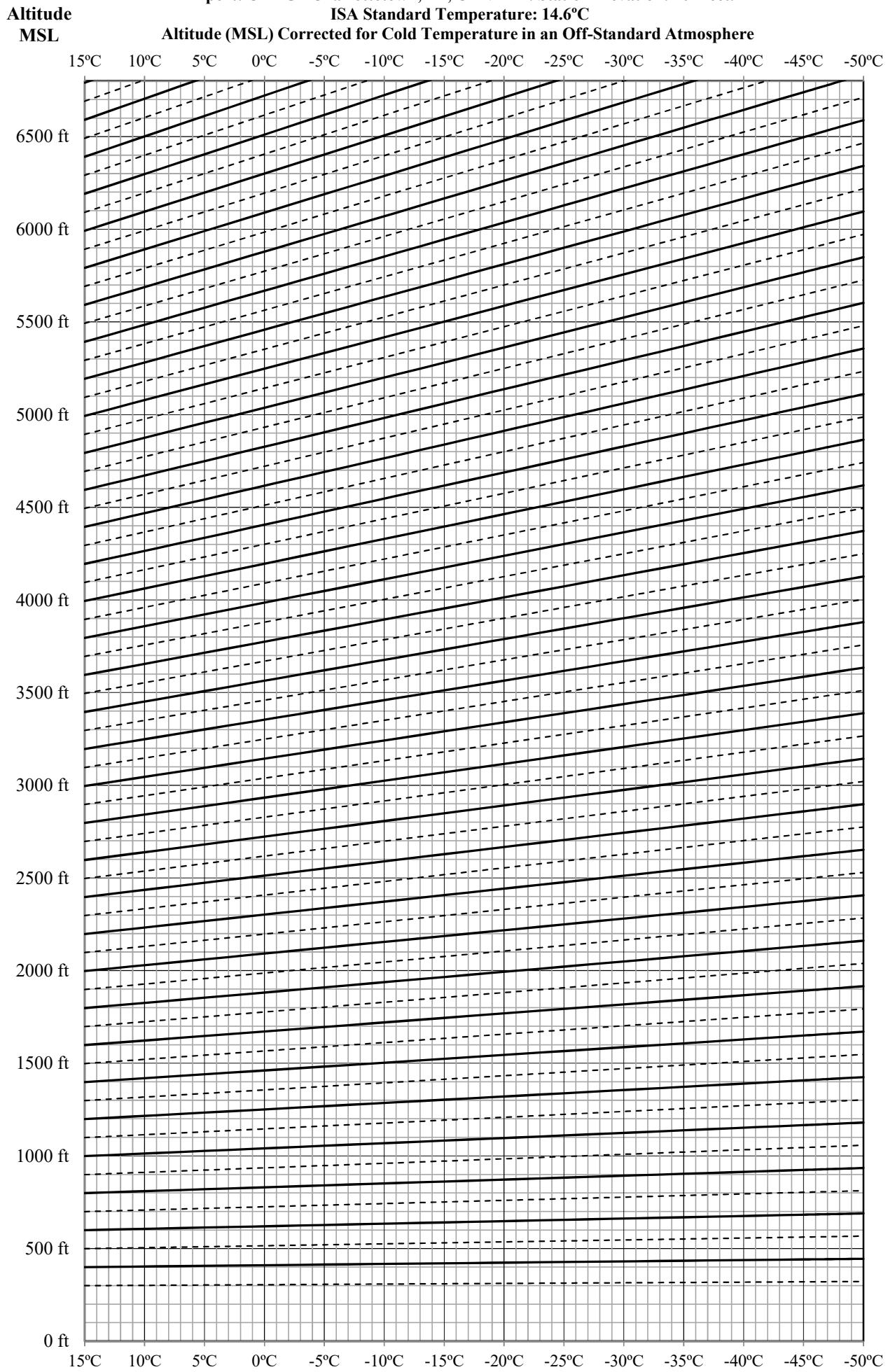
11 Prince Edward Island Airports

11.1 CYYG - CHARLOTTETOWN, PE, CANADA.....	67
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Airport: CYYG - Charlottetown, PE, CANADA. Station Elevation: 201 feet.

ISA Standard Temperature: 14.6°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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Temperature at the Reporting Station



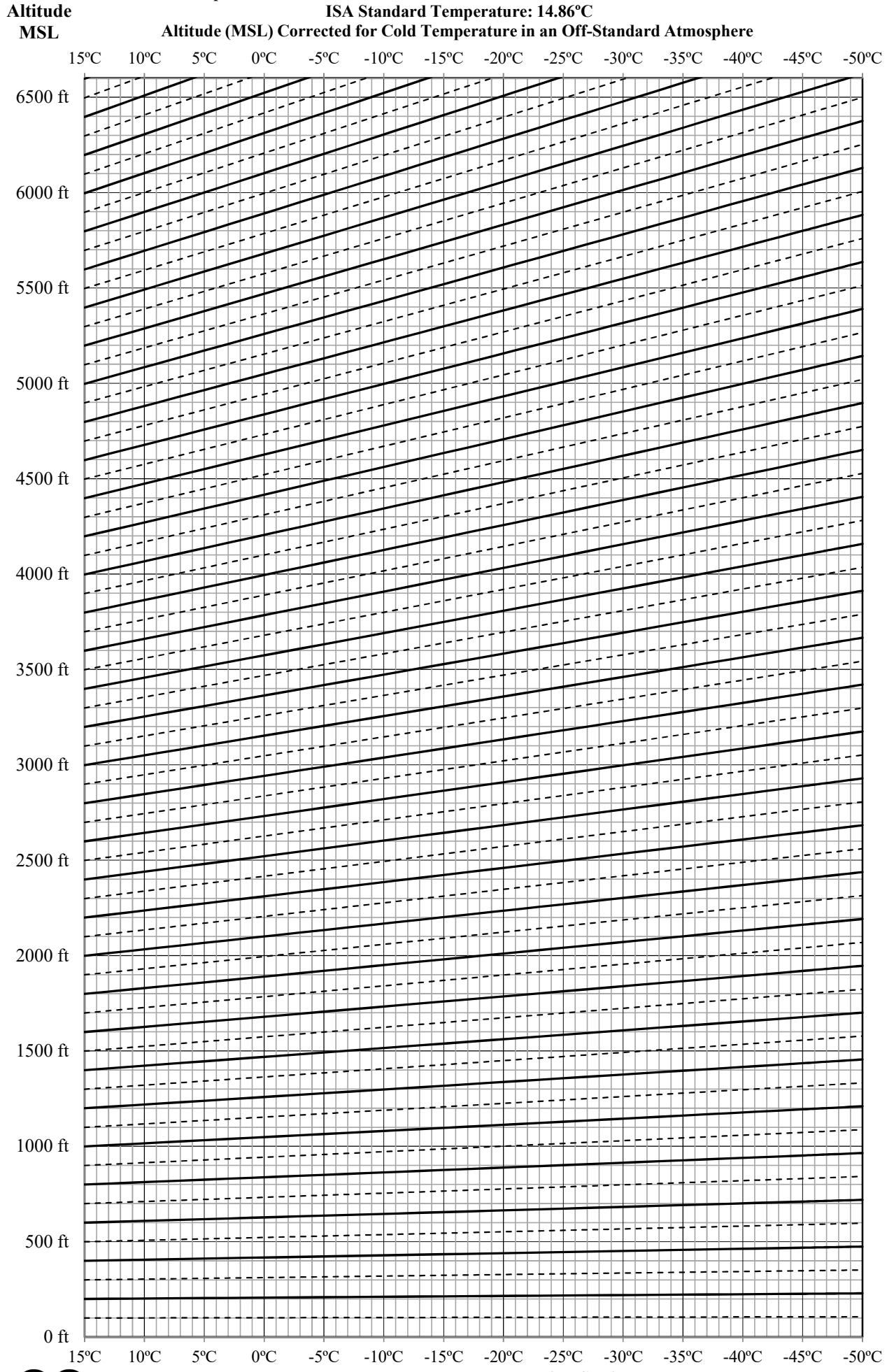
12 Quebec Airports

12.1 CYBC - BAIE COMEAU, QC, CANADA	69
12.2 CYBG - BAGOTVILLE, QC, CANADA	70
12.3 CYFJ - MONT TREMBLANT, QC, CANADA	71
12.4 CYGP - GASPE, QC, CANADA	72
12.5 CYGR - ILES DE LA MADELEINE, QC, CANADA	73
12.6 CYQB - QUEBEC, QC, CANADA	74
12.7 CYUL - MONTREAL, QC, CANADA.....	75
12.8 CYUY - ROUYN-NORANDA, QC, CANADA	76
12.9 CYVO - VAL D'OR, QC, CANADA	77
12.10 CYYY - MONT JOLI, QC, CANADA	78
12.11 CYZV - SEPT-ILES, QC, CANADA.....	79

Airport: CYBC - Baie Comeau, QC, CANADA. Station Elevation: 71 feet.

ISA Standard Temperature: 14.86°C

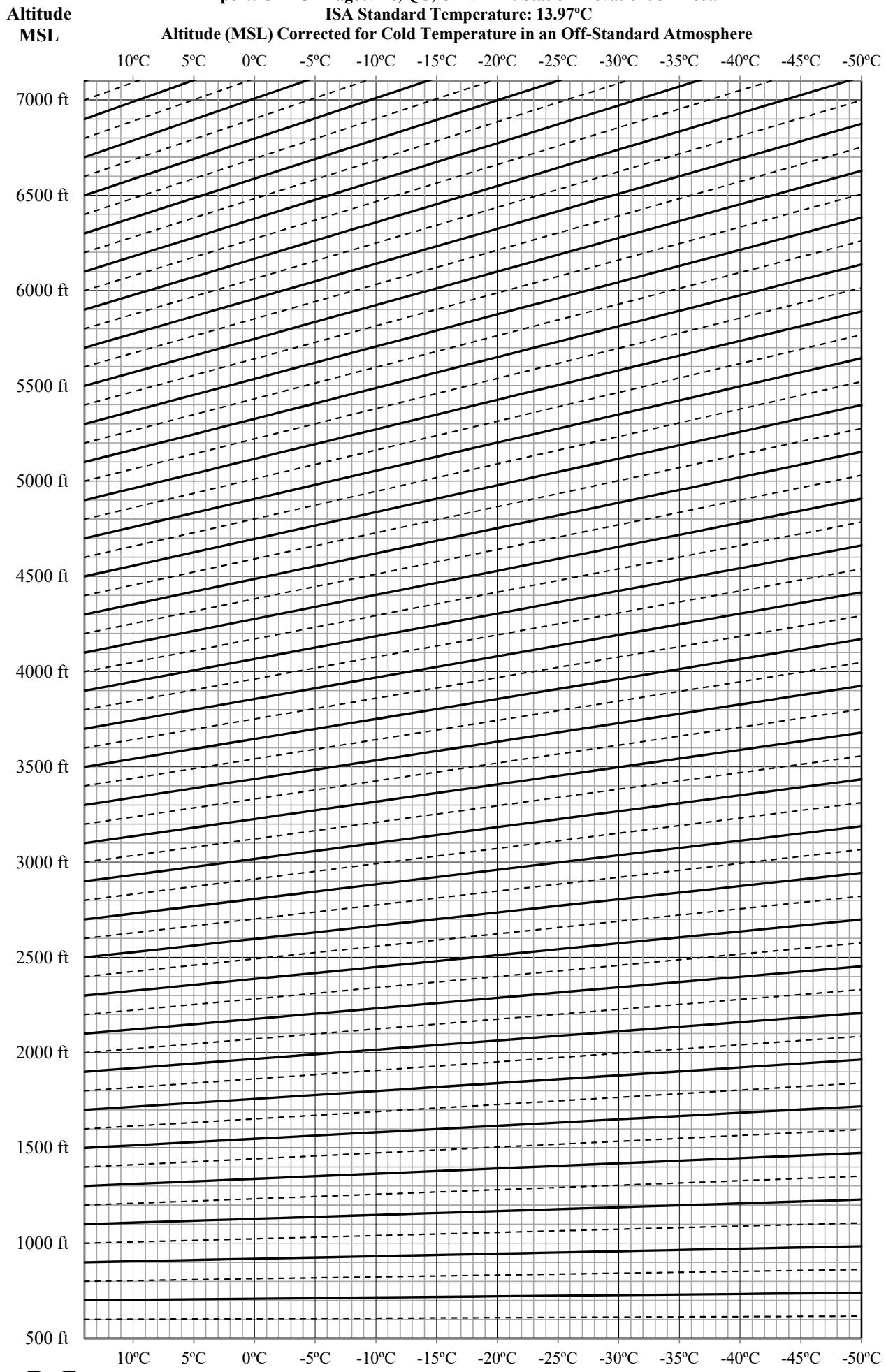
Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



Airport: CYBG - Bagotville, QC, CANADA. Station Elevation: 522 feet.

ISA Standard Temperature: 13.97°C

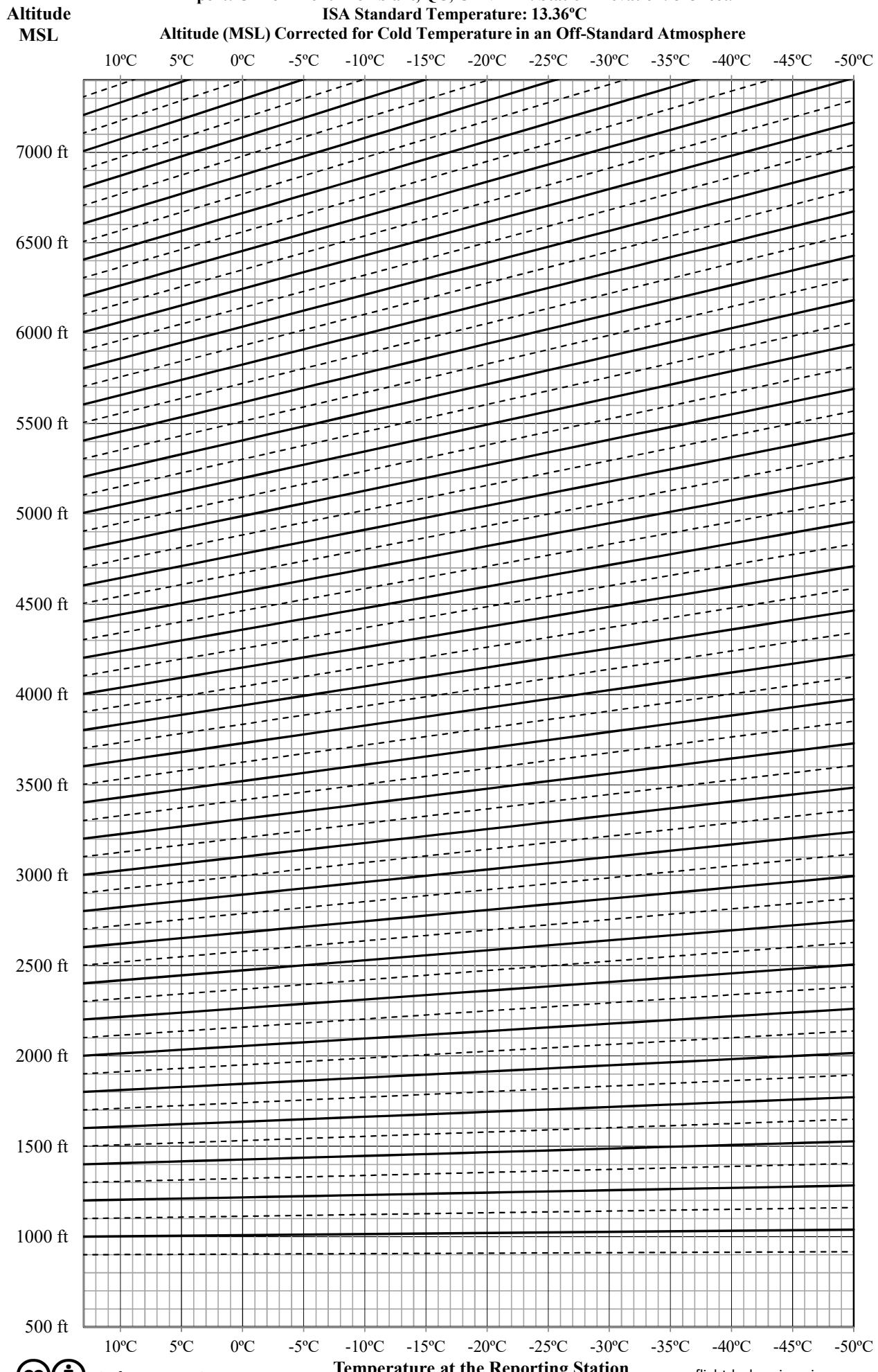
Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



Airport: CYFJ - Mont Tremblant, QC, CANADA. Station Elevation: 825 feet.

ISA Standard Temperature: 13.36°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere

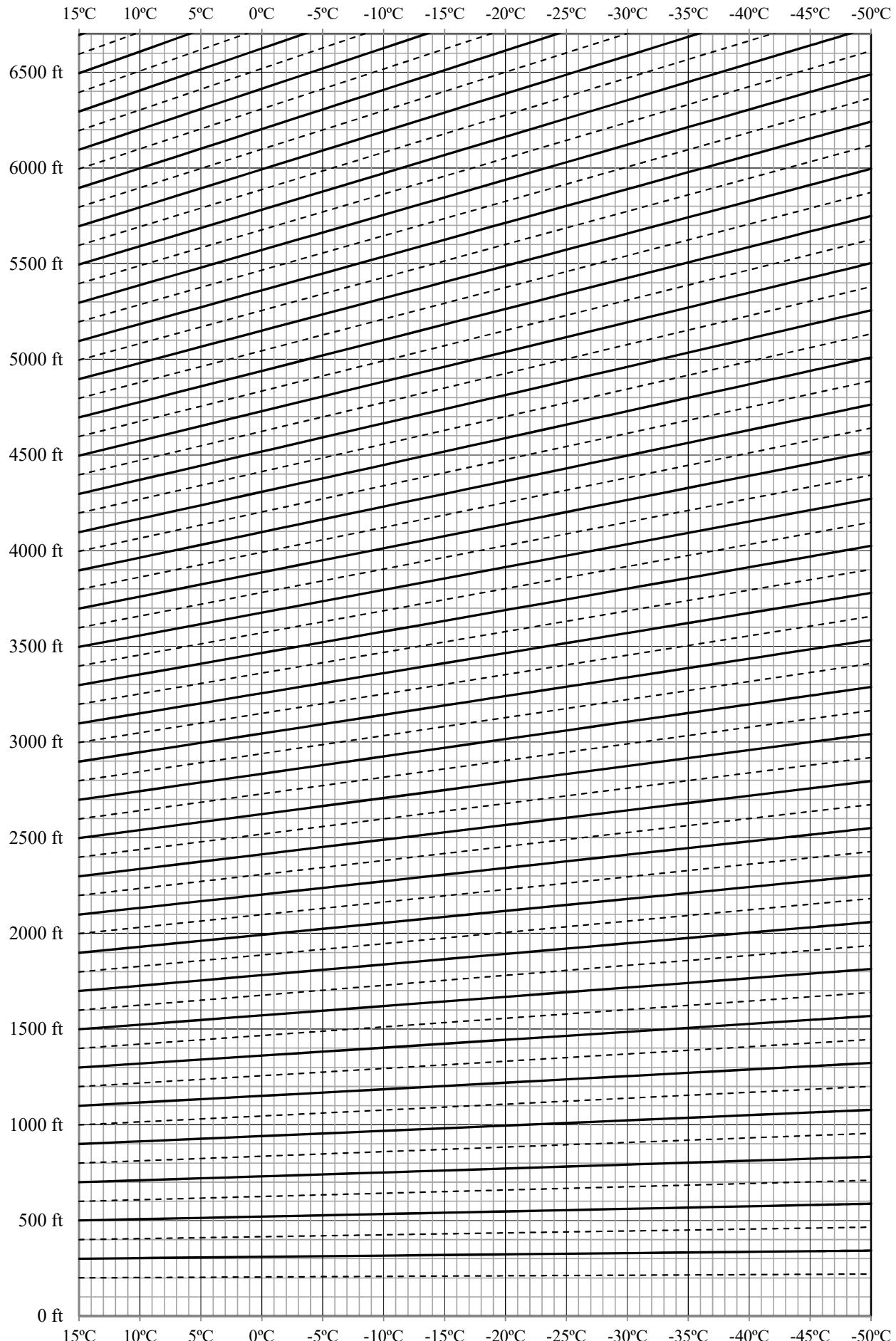


Airport: CYGP - Gaspe, QC, CANADA. Station Elevation: 112 feet.

ISA Standard Temperature: 14.78°C

Altitude
MSL

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



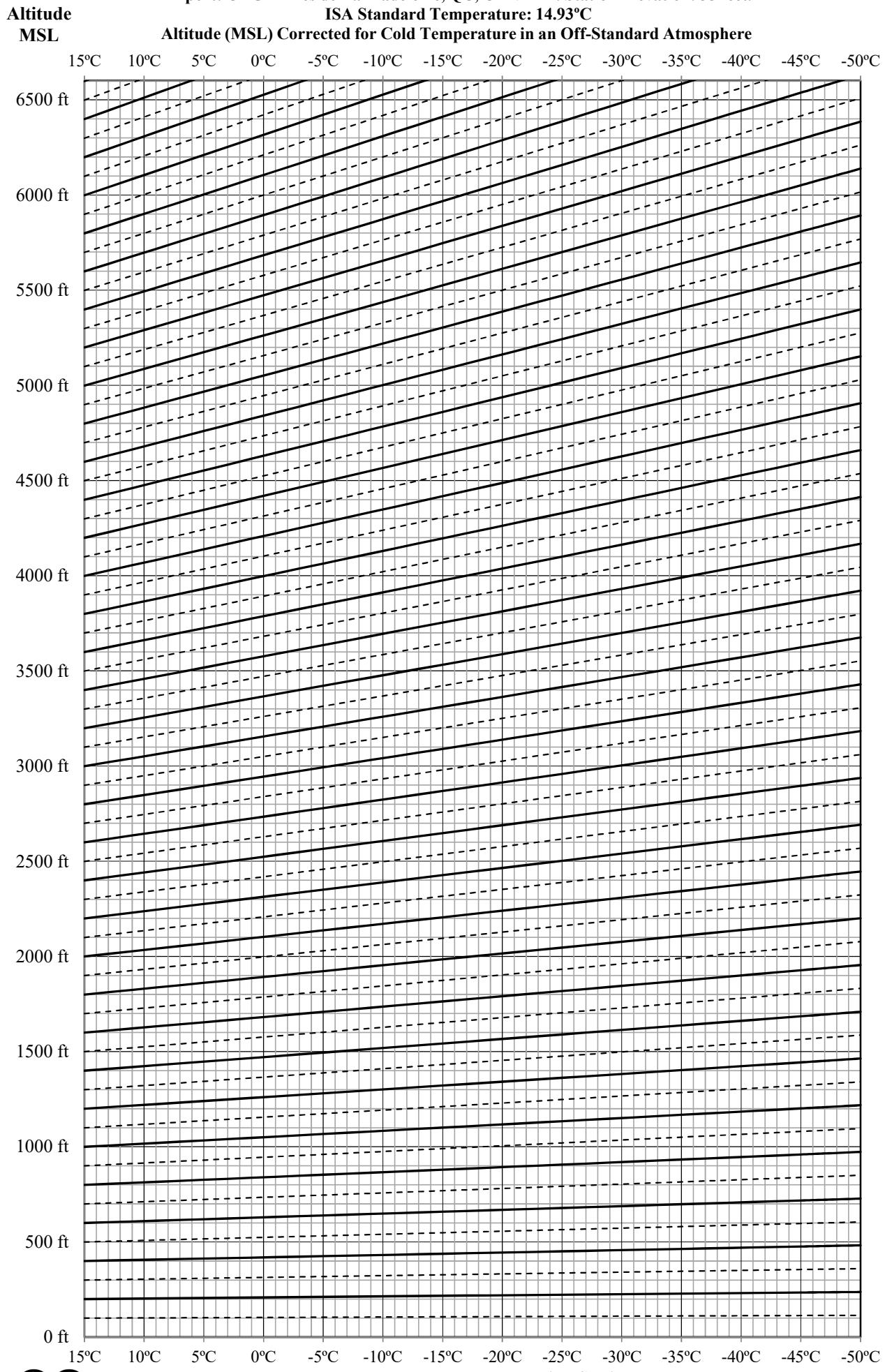
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Temperature at the Reporting Station

Airport: CYGR - Iles de La Madeleine, QC, CANADA. Station Elevation: 35 feet.

ISA Standard Temperature: 14.93°C

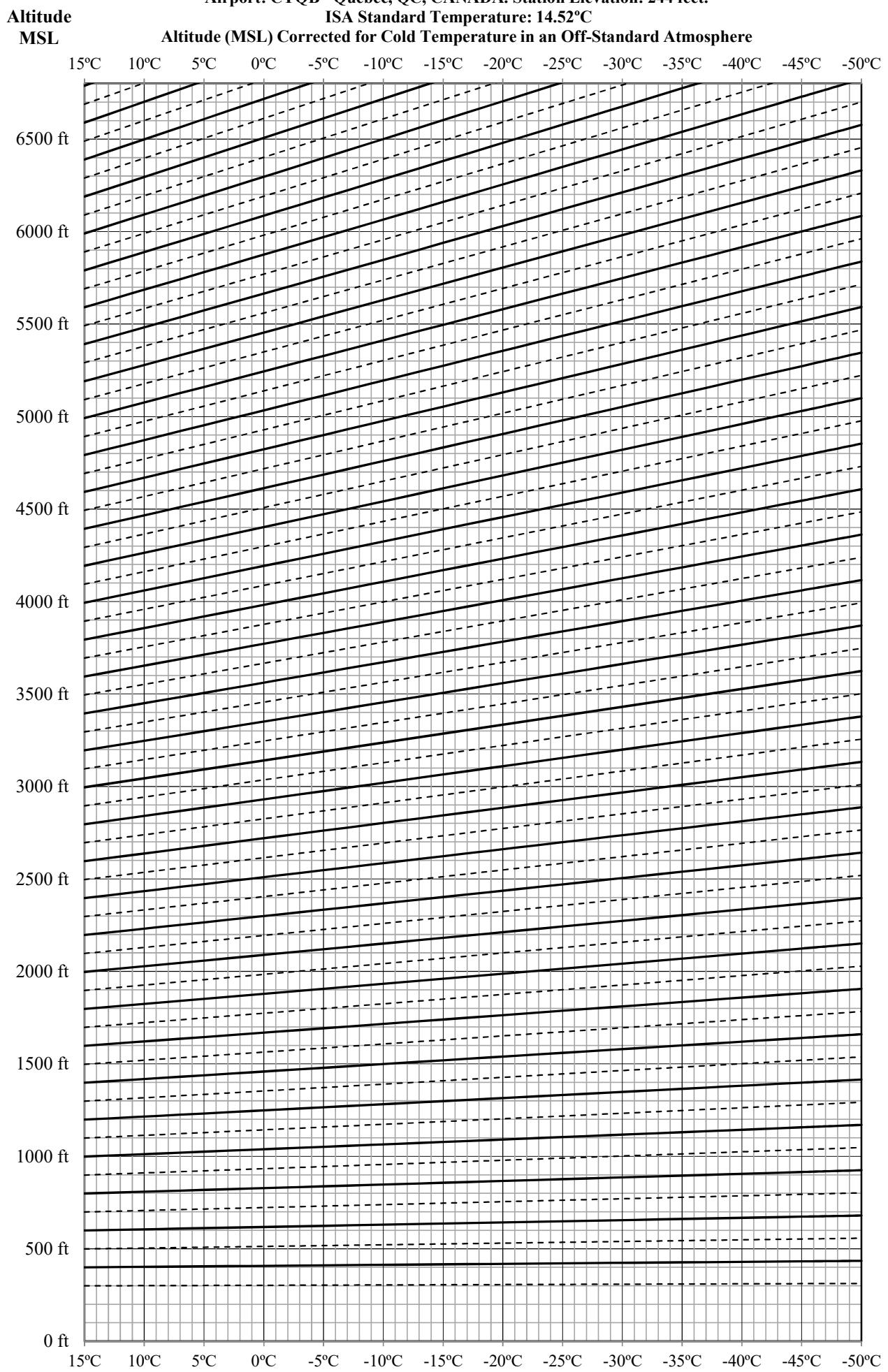
Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



Airport: CYQB - Quebec, QC, CANADA. Station Elevation: 244 feet.

ISA Standard Temperature: 14.52°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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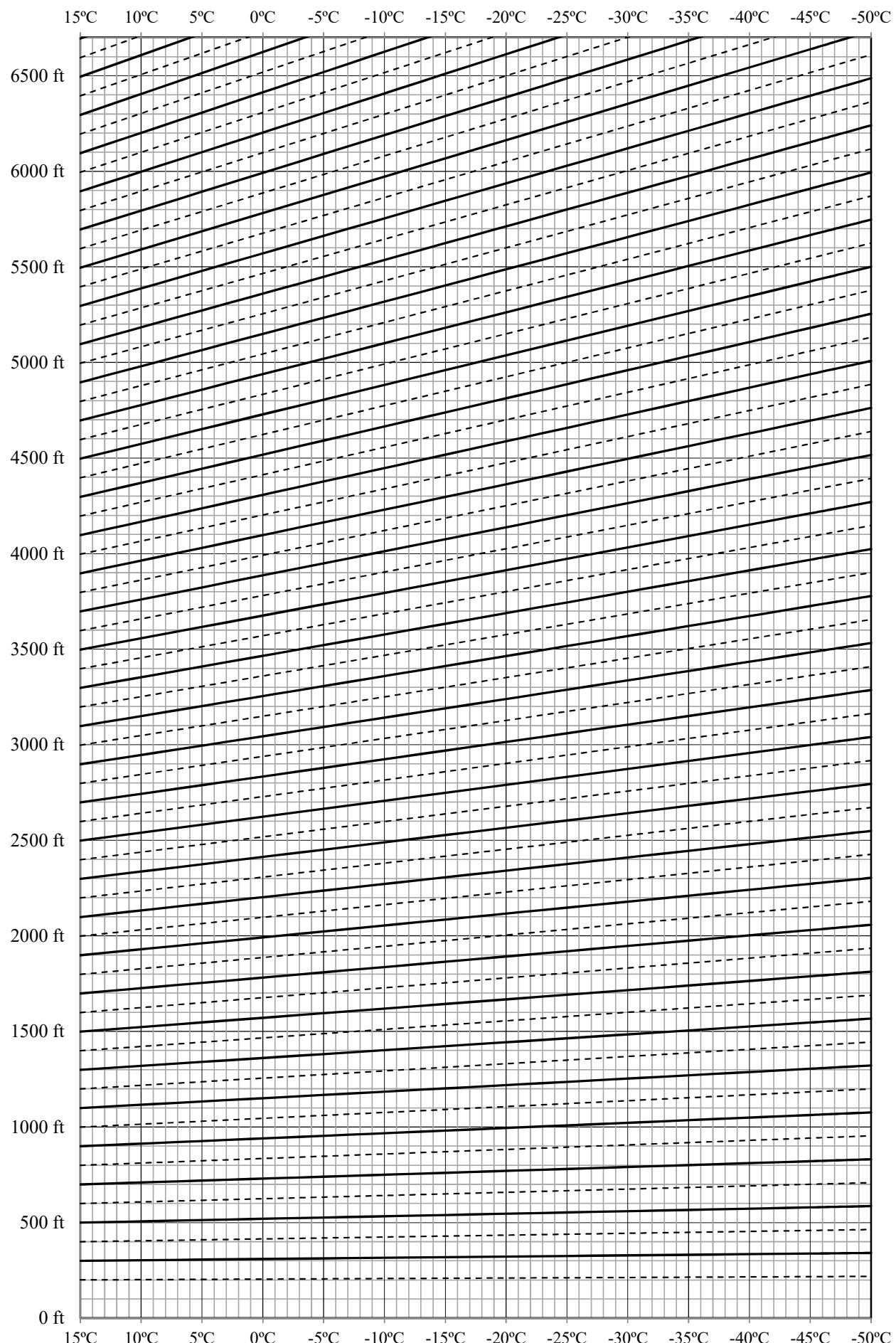
Temperature at the Reporting Station

Airport: CYUL - Montreal, QC, CANADA. Station Elevation: 118 feet.

ISA Standard Temperature: 14.77°C

Altitude
MSL

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



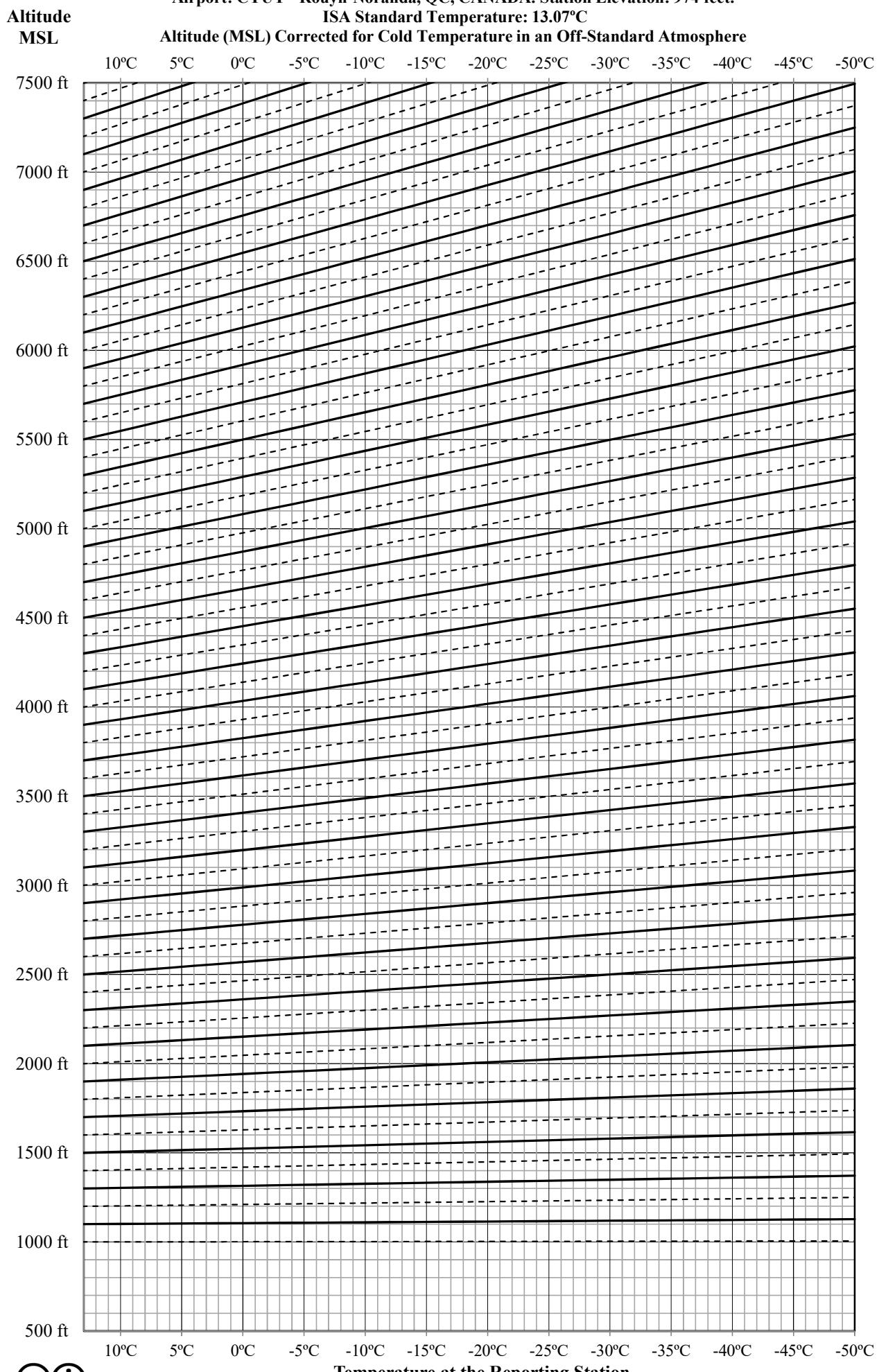
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Temperature at the Reporting Station

Airport: CYUY - Rouyn-Noranda, QC, CANADA. Station Elevation: 974 feet.

ISA Standard Temperature: 13.07°C

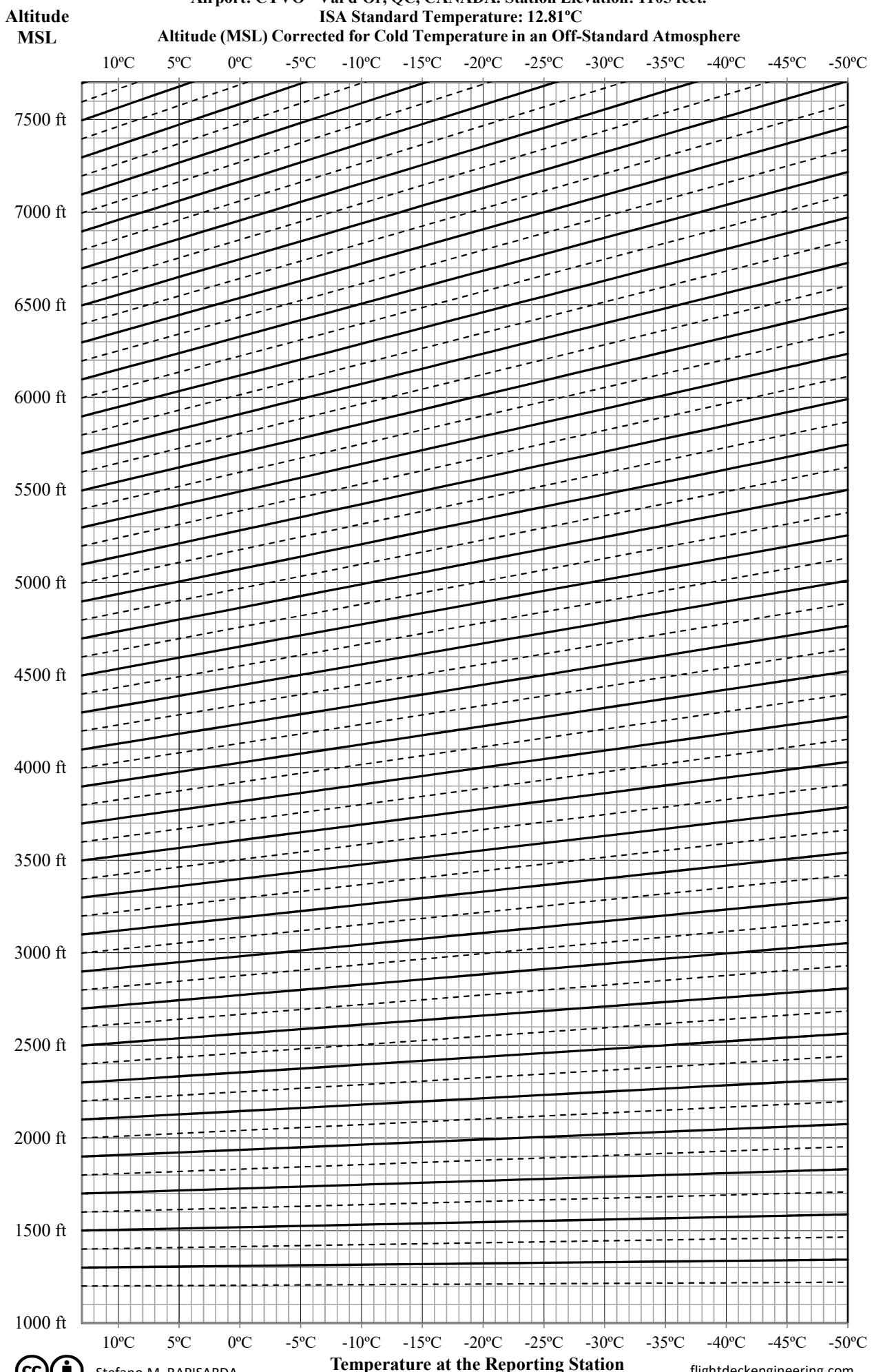
Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



Airport: CYVO - Val d'Or, QC, CANADA. Station Elevation: 1105 feet.

ISA Standard Temperature: 12.81°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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Temperature at the Reporting Station

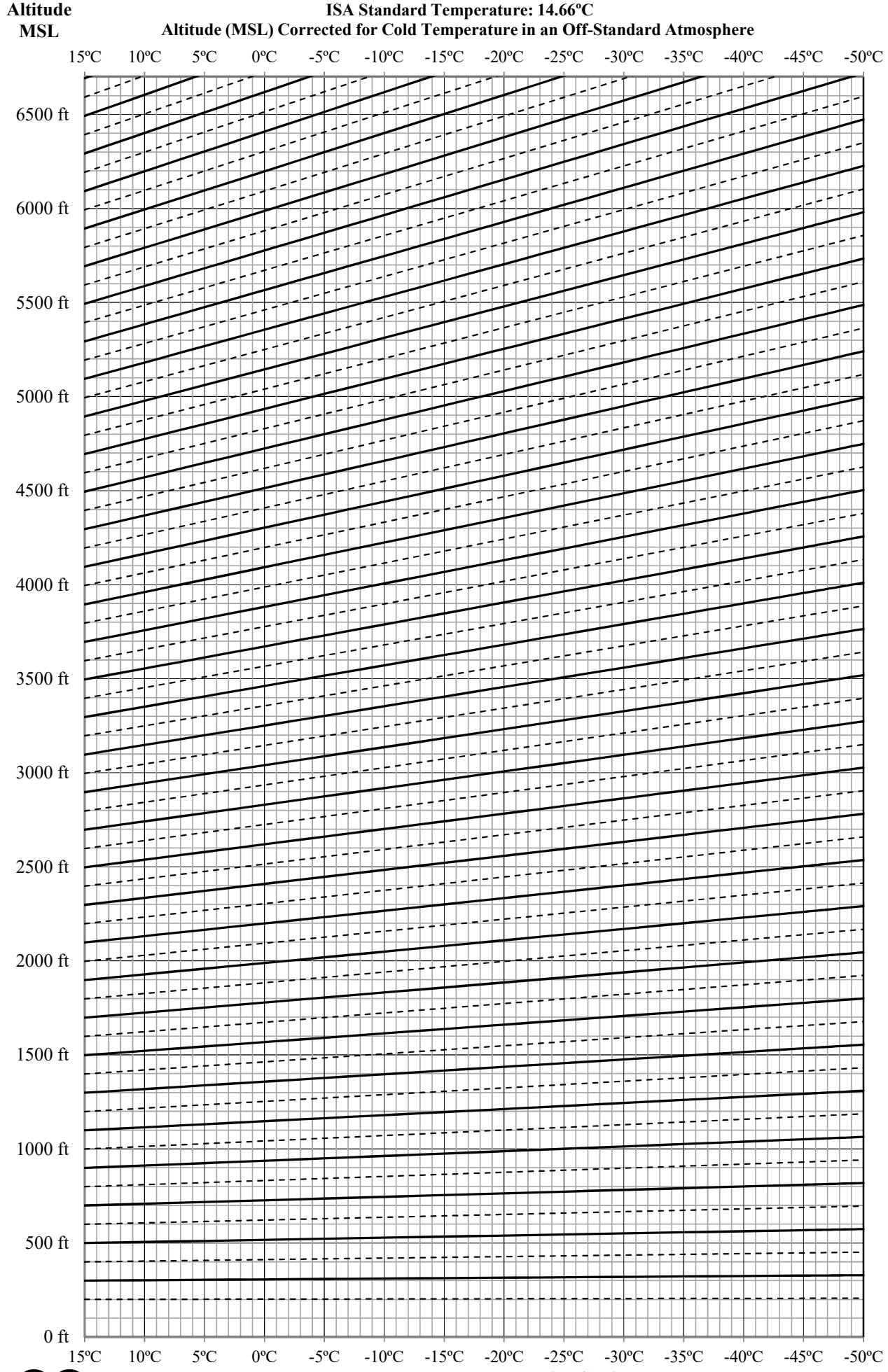
Page 77

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Airport: CYYY - Mont Joli, QC, CANADA. Station Elevation: 172 feet.

ISA Standard Temperature: 14.66°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



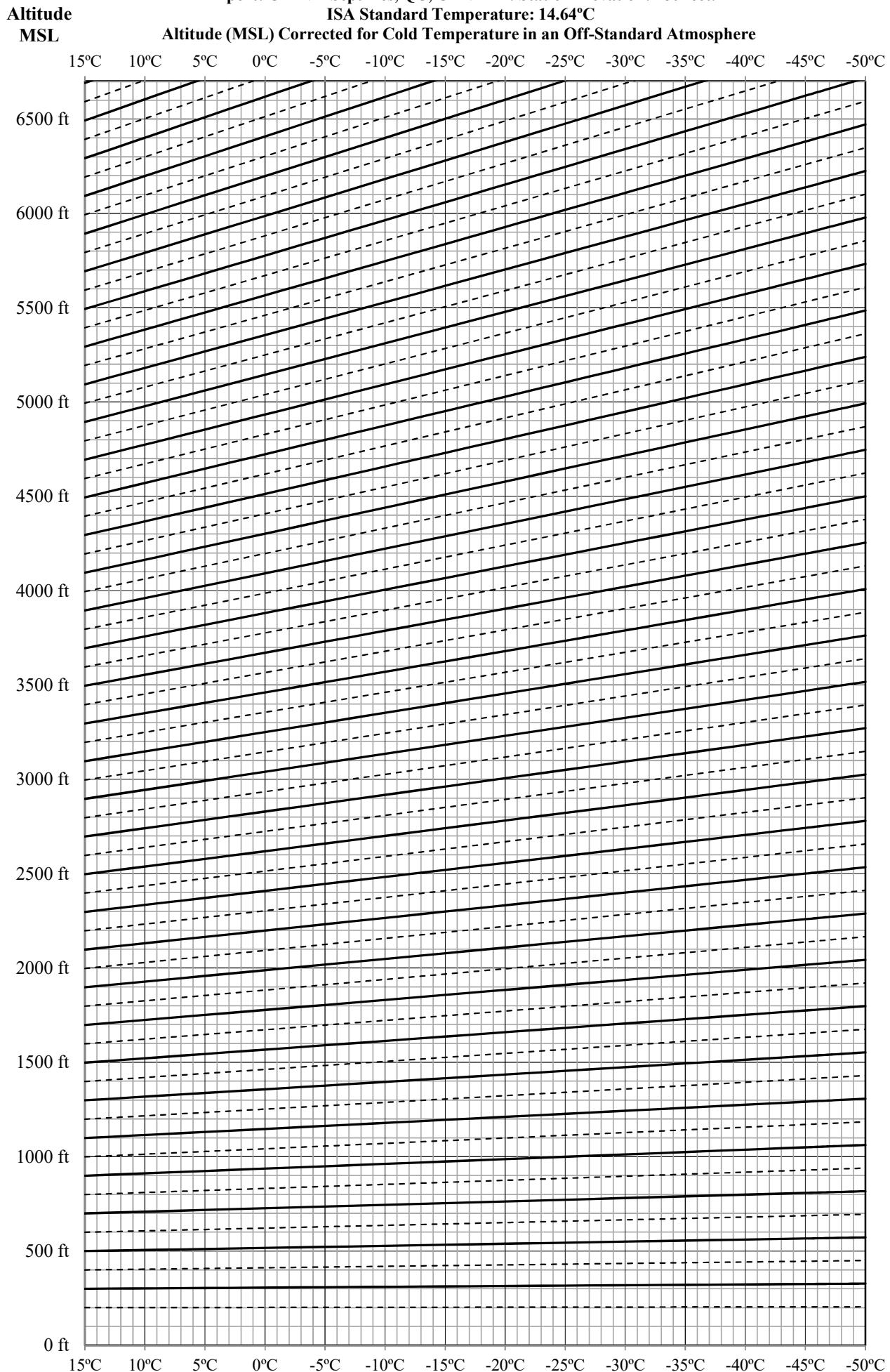
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Temperature at the Reporting Station

Airport: CYZV - Sept-Iles, QC, CANADA. Station Elevation: 180 feet.

ISA Standard Temperature: 14.64°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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Temperature at the Reporting Station



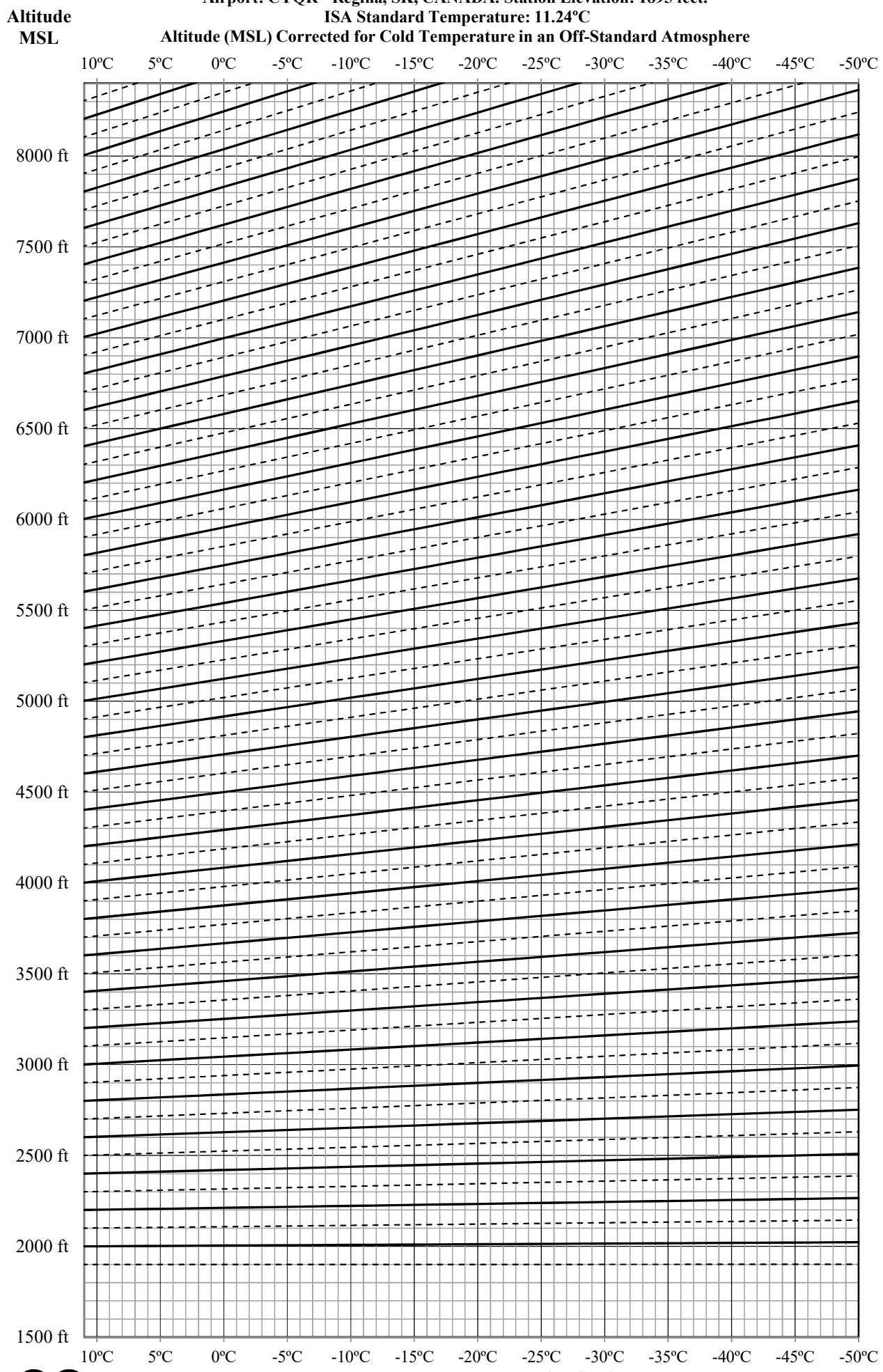
13 Saskatchewan Airports

13.1 CYQR - REGINA, SK, CANADA	81
13.2 CYXE - SASKATOON, SK, CANADA.....	82

Airport: CYQR - Regina, SK, CANADA. Station Elevation: 1895 feet.

ISA Standard Temperature: 11.24°C

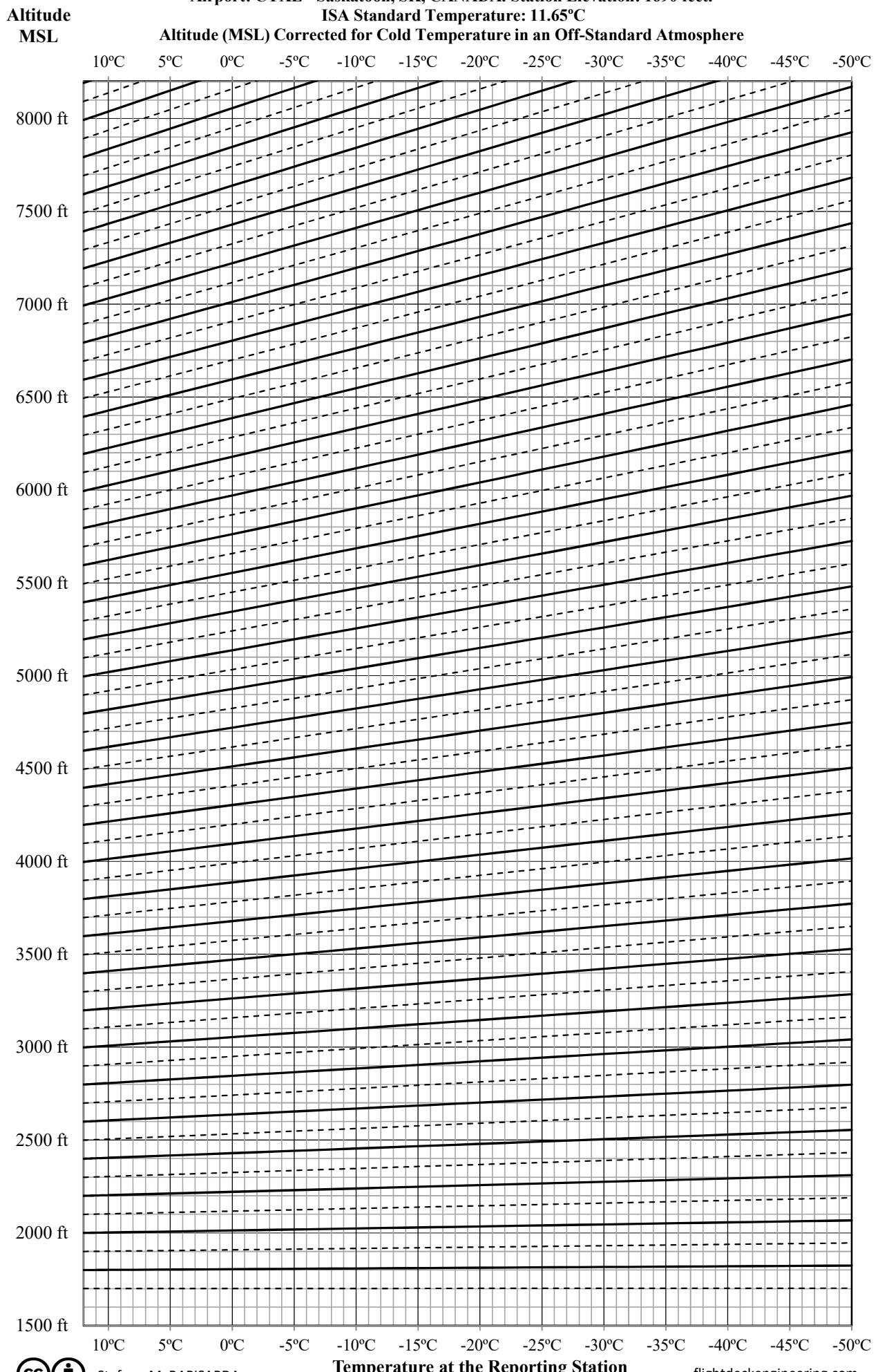
Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



Airport: CYXE - Saskatoon, SK, CANADA. Station Elevation: 1690 feet.

ISA Standard Temperature: 11.65°C

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



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Temperature at the Reporting Station

Page 82

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14 Yukon Airports

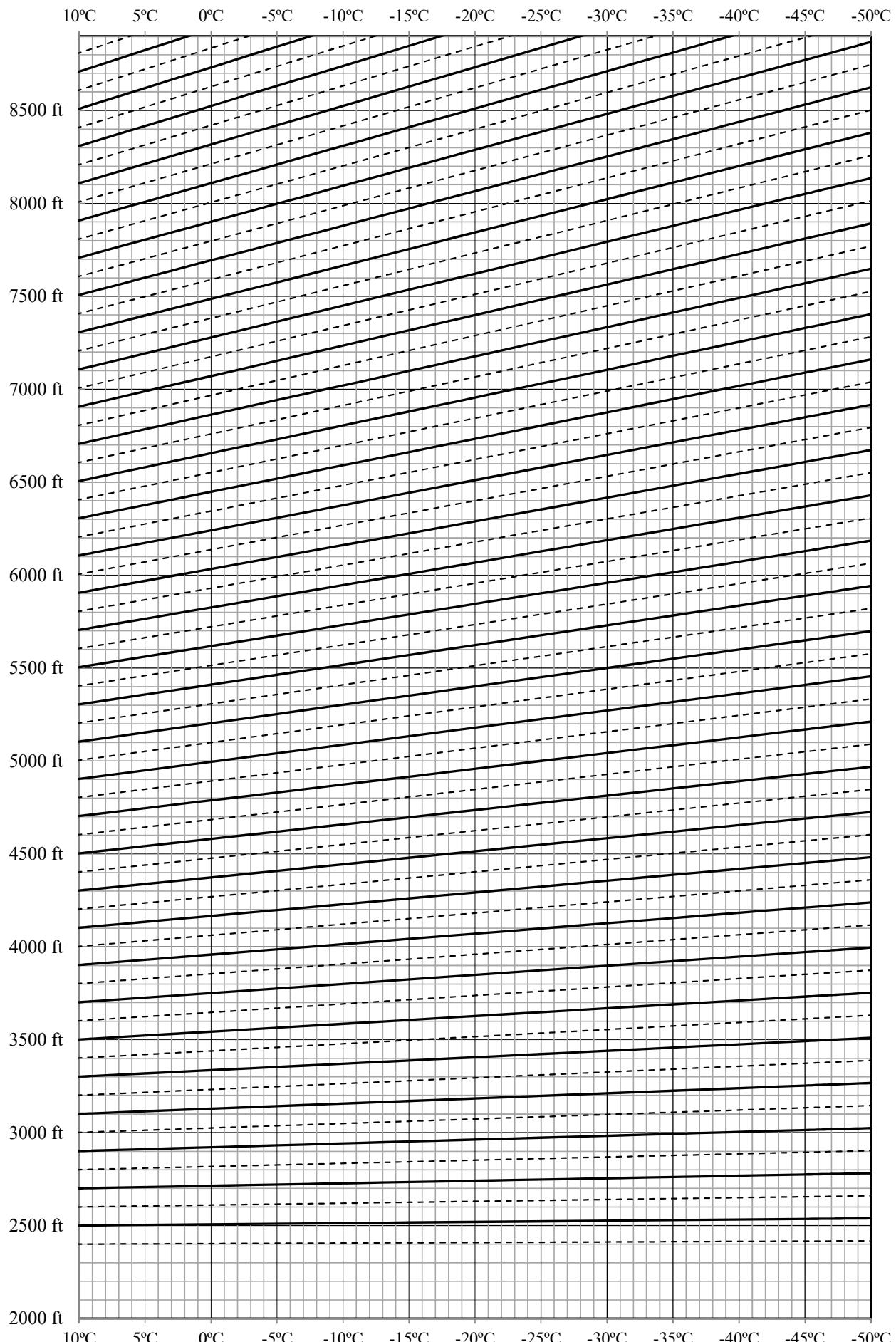
14.1 CYXY - WHITEHORSE, YT, CANADA	84
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Airport: CYXY - Whitehorse, YT, CANADA. Station Elevation: 2317 feet.

ISA Standard Temperature: 10.41°C

Altitude
MSL

Altitude (MSL) Corrected for Cold Temperature in an Off-Standard Atmosphere



Stefano M. RAPISARDA

Temperature at the Reporting Station



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