

CHAPTER 1

INTRODUCTION

1.1. Purpose. This Weather Data Exchange Format Document presents a common set of formats to be used for the presentation of weather data among Federal agencies. The document includes formats which meet current and planned requirements of the National Weather Service (NWS), United States Air Force (USAF), United States Navy (USN), and Federal Aviation Administration (FAA). WMO Sponsored international codes (for example, GRIB, GRID, and BUFR) are not addressed in this document

A potential user should not attempt to apply specific formats without: (1) a thorough knowledge of the format contents, (2) an understanding of the product data set format syntax necessary to organize the data, and (3) an understanding of general techniques as applied to automated computer graphics. Reference to Appendix F during the reading of this document will greatly aid the user in understanding the formats.

1.2. Objective. The objectives of this standard formats document are:

- A. To provide a level of data structuring above the telecommunications that is not dependent on the networking and data link procedures.
- B. To provide a format that will support existing products and message data, both graphic and nongraphic.
- C. To provide a device independent format that will allow for expansion to handle new data structures or graphics devices without having to redefine the general structure of the format.
- D. To provide a format that will be convenient for the host processor to generate and for the receiving hardware to process.
- E. To provide a format that readily allows receivers to bypass data formats not usable or necessary at the receiving station.
- F. To provide a format which is byte oriented with 8 bits per byte (octets).

1.3. Scope. This document specifies the format structure for data transfer, identifies categories of products covered by the formats and defines the formats for each data category to the

byte level. Telecommunications protocols are not covered in this document.

1.4. Essential Principles. In order to facilitate automated processing by computer at the sites being serviced by this format, the following principles must apply:

- A. The defined meaning and size of an element must remain absolutely constant, regardless of the mode/submode block (see Section 2.2, Block Format) in which it appears. Elements which are common to more than one mode/submode block must appear in those blocks as defined:
 - 1. In their defined order.
 - 2. In their defined format.
 - 3. Having constancy of meaning regardless of block type.
- B. The defined field size (in either bits or bytes) for an element must remain constant throughout the code.
- C. Redundancy and duplication shall be avoided. This especially applies to defining "new" elements or new block types (mode/submode) which are nearly a duplication of an existing element or block type. For example: Rather than defining a new grid type code, the existing codes should be used by adding to its definition.
- D. Formats shall be "self-contained" as far as technically feasible. That is, they should carry within the code all that is necessary to decode and use the information without reference to assumed or previously understood rules not contained in this publication.
- E. Format elements must always be general rather than device specific or machine specific. For example, a number that must be represented in floating point format as an element should have field lengths which conform easily to byte and/or byte pair boundaries. The format of such elements should fall naturally into the structure of the block which holds them.

1.4.1. Guidelines. In order to maintain fidelity with Objective A, Section 1.2 with respect to "data structuring above the telecommunications level," it is important to adhere to the following guidelines:

- A. Elements included in this document are present for the purpose of non-telecommunication processing. These

data are the innermost part of an envelope whose outer parts are concerned with telecommunications processing.

- B. Changes or enhancements to the telecommunications sections of the product transmission are completely independent of changes to the formats contained herein. Conversely, changes to these formats should not impact in any way the telecommunications format.