



Recommendation WG 12.87.010

TRANSBORDER COORDINATION :
STANDARD FOR INTERCHANGE
of
LARGE VOLUMN EARTH STATION DATA

www.nhma.org

RECOMMENDATION

Subject Area: Data Exchanges

Title: Standard for Interchange of Large Volume Earth Station Data

INTRODUCTION

This document defines a standard for use in exchanging data on Earth Stations; the stations involved in microwave communications between an earth terminal, and a communications satellite. This is done to ease frequency coordination and site selection, design and modification.

This standard is not intended to be a specification for the structure of any users database, but files complying with it should be convertible with minimum effort to and from most structures currently used. It is purely a structure for communicating the database information of one organization to the database of another.

THE APPROACH

It is desirable that there be one unique format for data interchange. This is so that those interchanging data will know that each time they receive a set of data, it will be in the same format as the last one they received. It is assumed that each subscriber to the standard has two in-house computer procedures. One converts the subscribers database to the standard, the other converts the standard to the subscribers database. A subscriber might also have other utility procedures to aid in the construction of translation tables. The standard therefore consists of:

- A common representation of the earth station terminal environment, including the technical, regulatory, and administrative information.
- A common format to represent description tables for antenna codes and operator/owner codes in order to ease the task of code translation. Each subscriber is responsible for maintaining the necessary

translation tables to convert to or from their own system.

DESCRIPTION TABLES

Description tables are necessary in a standard such as this. These tables contain such information as antenna codes and owner/operator codes in a form that can be recognized by someone who must construct a translation table for them. They should be designed to ease the construction of the necessary translation tables needed to convert data. The information to be included in the description tables is given in the relevant sections.

TAPE RECORDING FORMAT

The term "tape" here means the medium used to transport the data from one site to another, since reels of magnetic tape are historically the most common. It means anything that can be written at the sender's site and read at the receiver's, such as floppy disks, or even the use of communications lines. The essence is the sequential nature of the transmission medium.

The actual recording format is left up to the requirements of the supplier and receiver of the tape. If a tape were used, for instance, these considerations would include such details as whether the tape was ASCII or EBCDIC, labeled or unlabeled, nine track or seven, blocked (and how), and so forth. This standard is concerned with the record contents. It is assumed that the tape supplied will be readable by software on the target system.

The only constrain this standard impose on the recording format is that all alphabetic characters be in upper case, since some systems distinguish between the two cases on input.

Note that all information will be in "formatted" form (i.e. containing no machine dependent binary, as FORTRAN "unformatted" would). The tape should be "printable" without any translation.

TAPE CONTENTS

Transmit or Receive Indicator

Length 1 character

This field is "T" if the terminal is transmitting to a satellite, and "R" if receiving from it. If doing both, there will be two or more records, each with the different band and operation.

Terminal Name

Length 11 characters

This is anything meaningful to describe the terminal.

Terminal Province, State or Territory

Length 2 characters

The two character USPS abbreviation of the state, province or territory.

Terminal Latitude

Length 6 characters

Six character representation to the second : ddmms, all zeros are present explicitly, for example 490700.

Terminal Longitude

Length 7 characters

Seven character representation to the second : dddmms, all zeros are present explicitly, for example 0770001.

Terminal Ground Height

Length 5 Characters

Height above mean sea level in feet.

Terminal Status

Length 1 Character

This is the status of this segment of the terminal. The various status codes are given in Appendix A.

Rain Zone of Terminal

Length 2 characters

This is the rain zone as defined in the ITU Radio Regulations Appendix 28. Note that 2 characters are allocated although currently this is a number from 1 to 5. It is likely that soon it will be changed to be from A to P. as per the CCIR report 563-2. If we choose to continue to use numerics to represent this, it would mean numbers from 1 to 16 and thus require 2 characters.

Radio Zone of Terminal

Length 2 characters

This is A, B. or C, as defined in the ITU Radio Regulations, Appendix 28. CCIR Report 569-2 recommends the zones A1, A2, B and C, so two characters will be needed if this becomes an ITU regulation.

Terminal Operating Company

Length 8 characters

This is the key into the owner/operator translation table for the company that operates the terminal.

Date Last Altered

Length 6 characters

This is the date last changed, and may be absent. It is stored in International Standard form (YYMMDD) so that it may be used as a sort key. In this way changes made to the database since a given time may be selected from the exchanged data.

Antenna

Length 8 characters

This is the key into the antenna translation table for the antenna. If the CCIR standard antenna pattern is being used, the first four characters will be "CCIR", followed by a 4 character field containing the antenna gain on the main lobe. There need be no entry in the antenna description table for such an antenna, as the off-axis discrimination and beam width is calculated from the equations given in Appendix 28 of the ITU Radio Regulations (Page 40).

Antenna Height

Length 4 characters

The height above ground of the centerline of the main antenna at this end, in feet.

Antenna Feed System Loss

Length 4 characters

This is the feed system loss in dB to 1 decimal place, for the main antenna (e.g. 5.2 dB would be 05.2).

Due to the multitude of ways in which transmitted and received power may be expressed, the following three fields should be present, if possible.

Power

Length 4 characters

The total output power of the transmission equipment in dBW to 1 decimal point. This is the received power in dBW with no decimal point for receive terminals.

Power Density

Length 4 characters

The output of the -transmission equipment in dBW/4kHz to 1 decimal point. For example 10.0 represents 10.0 dBW/4kHz. Note that the density is for a reference bandwidth of 4kHz. This field will be blank on receive.

Emission Designator

Length 10 characters

The FCC Emission Designator to be used for coordination purposes. This will also allow the user to tell whether the coordination is for digital or analog transmission.

Satellite

Length 8 characters

The name of the communications satellite the terminal is addressing.

Satellite Operator

Length 8 characters

The operating company or body responsible for the satellite.

Minimum Satellite Operating Longitude

Length 6 characters

The minimum operating longitude of any satellite to which this link points. East Longitude is negative. The number is to 1 decimal place as: "120.5".

Maximum Satellite Operating Longitude

Length 6 characters

The maximum operating longitude of any satellite to which this link points. East Longitude is negative. The number is to 1 decimal place as: "135.5".

Nominal Azimuth of the Main Lobe

Length 6 characters

The nominal azimuth of the antenna. This is an optional field. Many users will prefer to calculate the actual direction from the satellite position. If present, it is to 2 decimal places, in degrees clockwise from North,:"120.50".

Nominal Elevation of the Main Lobe

Length 5 characters

The nominal elevation of the main lobe. This is an optional field. Many users will prefer to calculate the actual direction from the satellite position. If present, it is to two decimal places in degrees, e.g. "45.25".

Energy Dispersal Factor

Length 4 characters

The energy dispersal due to modulation, to be applied to the transmission power for a transmit terminal. Three significant figures with one decimal place, in db, for example: "20.0". This is an optional field on transmit and is zero or absent on receive.

Maximum Interference Requirement

Length	20% Requirement	6 characters
	Short Term Percentage	6 characters
	Short Term Requirement	6 characters

These are the maximum permissible interference levels tolerable from a single source into a receiver or generated by a transmitter. The requirements are in dbW per 1MHz of bandwidth for receiving systems and dbW per 4KHz for a transmitting system, to one decimal place, e.g. "-149.5". The percentage is in actual percentage with the decimal present, e.g. "0.0025".

Frequency Range of Coordination Band

Length	Lower Limit of Band	6 characters
	Upper Limit of Band	6 characters

This field consists of two values, indicating the lower and upper frequency of the band, for which the terminal will be coordinated. Each value will be in GHz to three decimal places, with the decimal point being present, for example, "6.175".

Since each new satellite that goes up has a different potential set of plans in its' band, it is expected that only band coordination will be done at the international level.

Number of Coordination Frequencies

Length	2 characters
--------	--------------

This is the number of frequencies at the terminal instead of the bands. It is a value from 0 to 12. If zero or absent

then it is assumed that the terminal will be involved in band analysis only, using the reference frequency range given in the previous fields: the frequency range of the coordination band.

Coordination Frequencies

Length 12 fields of: 8 characters (96)

These are the actual coordinating frequencies, if present. There will be as many as indicated in the previous field (the Number of Coordinating Fields), up to 12. All frequencies will occupy the first of the positions and the remainder will be zero or blank.

Precipitation Coordination Radius

Length 4 characters

The radius for coordination of precipitation interference in km.

Tropospheric Loss Coordination Contours

Length 72 fields of 4 characters (288)

This is the tropospheric loss coordination contour with distances in km, every 5 degrees, starting with 000 degrees (North).

Horizon Elevations

Length 72 fields of 4 characters (288)

This is the horizon elevation in degrees, to one decimal place. The range is expected to be "-9.9" to "90.0". The elevations are every 5 degrees of azimuth, starting from 000 degrees (North).

TERMINAL OPERATOR RECORD FORMAT

This section of the media contains the codes for, and interpretation of, the operating companies referred to in the terminal data. The records are all be of fixed length, consisting of:

Operating Company Key

Length 8 characters

This is the key used, in the terminal data, to refer to the operating company for each terminal. It may be any eight alphanumeric characters.

Operating Company Name

Length 30 characters

The name of the operating company or institution.

Operating Company Address

Length 30 characters

The street address of the company or institution.

Operating Company City

Length 15 characters

The city of the company or institution.

Operating Company State, Province or Territory

Length 2 characters

The USPS code for the jurisdiction.

Operating Company Zip

Length 9 characters

The postal code for the operating company; alphanumeric.

Operating Company Coordination Contact

Length 30 characters

The name of the person or department to contact for coordination purposes.

Operating Company Phone Number

Length 13 characters

The telephone number including area code in the form (999) 999-9999.

Operating Company Identification Number

Length 12 characters

This is an optional field that can be used to contain the FCC or DOC designated number referring to the operating company.

Coordination Protection Company for this Operator.

Length 8 characters

The company code (of an operator in this file) of the company responsible for frequency coordination for this company. This will be blank if the operator is responsible for their own protection.

ANTENNA DESCRIPTION RECORD FORMAT

This section of the media contains the description of the antennas used in the first section. The records are fixed length and contain the following:

Antenna Key

Length 8 characters

This is the eight alphanumeric character key used in the terminal data records to refer to an antenna.

Antenna Manufacturer

Length 20 characters

The name of the company that manufactured the antenna.

Antenna Catalogue Number

Length 20 characters

This is the number of this antenna in the manufacturers catalogue. If this is not a relevant description, it is the code most commonly used to unambiguously refer to the antenna.

Antenna FCC Designation

Length 6 characters

In cases where the antenna has an FCC designation this field appears in order to ease the process of translation and allow some automation of the process.

Appendix A - Status Characters

The status is a one character code to indicate the terminal's operational status.

- P - Planned
- C - Pre-coordinated
- A - Applied for License
- B - Building Permit Granted
- O - Operational
- T - Temporary
- R - Removed from operation This status could be used to indicate terminals to be removed from a database
- ? - Status is unknown.

Recommended: WG12.87.010
Approved: 11-05-87
To Membership: 03-27-89