

## 402–403 MHz

### 1. Band Introduction

The Federal operations in the 402-403 MHz band consist of meteorological-satellite earth stations transmitting in the Earth-to-space direction related to collection of meteorological data associated with the Geostationary Operational Environmental Satellites (GOES) systems. Federal agencies also use this band for radiosondes operating in the meteorological aids service.

### 2. Allocations

#### 2a. Allocation Table

The frequency allocation table shown below is extracted from the Manual of Regulations and Procedures for Federal Radio Frequency Management, Chapter 4 – Allocations, Allotments and Plans.

*Table of Frequency Allocations*

*United States Table*

Federal Table	Non-Federal Table	FCC Rule Part(s)
402-403 METEOROLOGICAL AIDS (radiosonde) US70 EARTH EXPLORATION- SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) US345 US384	402-403 METEOROLOGICAL AIDS (radiosonde) US70 Earth exploration-satellite (Earth-to-space) Meteorological-satellite (Earth-to-space) US345 US384	MEDRadio (95I)

#### 2b. Additional Allocation Table Information

**US70** The meteorological aids service allocation in the band 400.15-406.0 MHz does not preclude the operation therein of associated ground transmitters.

**US345** In the band 401-406 MHz, the mobile, except aeronautical mobile, service is allocated on a secondary basis and is limited to, with the exception of military tactical mobile stations, Medical Device Radiocommunication Service (MedRadio) operations. MedRadio stations are authorized by rule on the condition that harmful interference is not caused to stations in the meteorological aids, meteorological-satellite, and Earth exploration-satellite services, and that MedRadio stations accept interference from stations in the meteorological aids, meteorological-satellite, and Earth exploration-satellite services.

**US384** In the band 401-403 MHz, the non-Federal Earth exploration-satellite (Earth-to-space) and meteorological-satellite (Earth-to-space) services are limited to earth stations transmitting to Federal space stations.

### 3. Federal Agency Use

#### 3a. Federal Agency Frequency Assignments Table

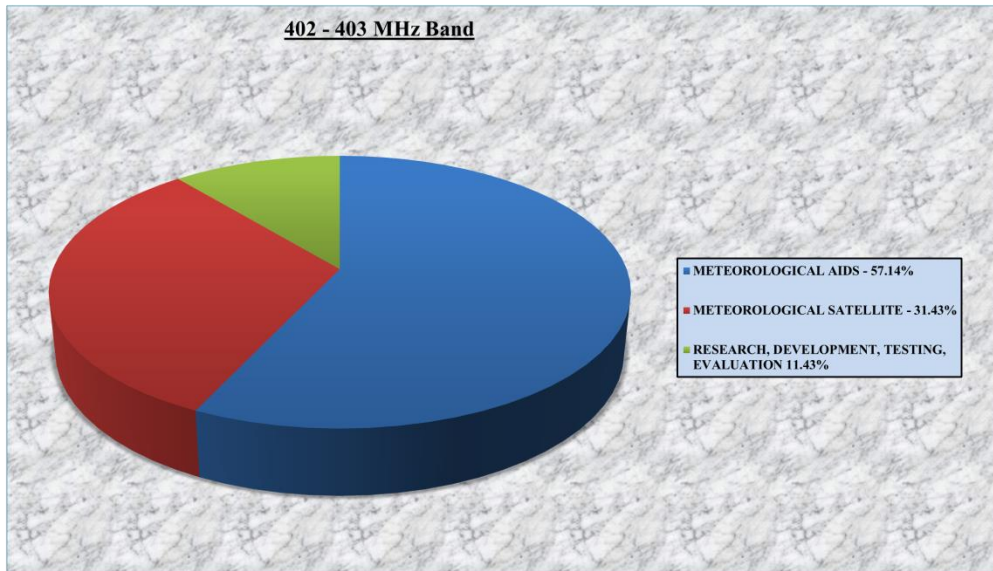
The following table identifies the frequency band, type(s) of allocation(s), types of application, and the number of frequency assignments by agency.

*Federal Frequency Assignment Table*

402-403 MHz Band					
SHARED BAND					
AGENCY	EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL AIDS (radiosonde) METEOROLOGICAL-SATELLITE (Earth-to-space)				
	TYPE OF APPLICATION				
	METEOROLOGICAL AIDS	METEOROLOGICAL SATELLITE		RESEARCH DEVELOPMENT TESTING	TOTAL
AF	2			4	6
AR	1				1
DOC		5			5
DOE	6	4			10
DOI		2			2
N	11				11
<b>TOTAL</b>	<b>20</b>	<b>11</b>		<b>4</b>	<b>35</b>
The number of actual systems, or number of equipments, may exceed and sometimes far exceed, the number of frequency assignments in a band. Also, a frequency assignment may represent, a local, state, regional, or nationwide authorization. Therefore, care must be taken in evaluating bands strictly on the basis of assignment counts or percentages of assignments.					

### 3b. Percentage of Frequency Assignments Chart

The following chart displays the percentage of frequency assignments for the systems operating in the frequency band 402-403 MHz.



## 4. Frequency Band Analysis By Application

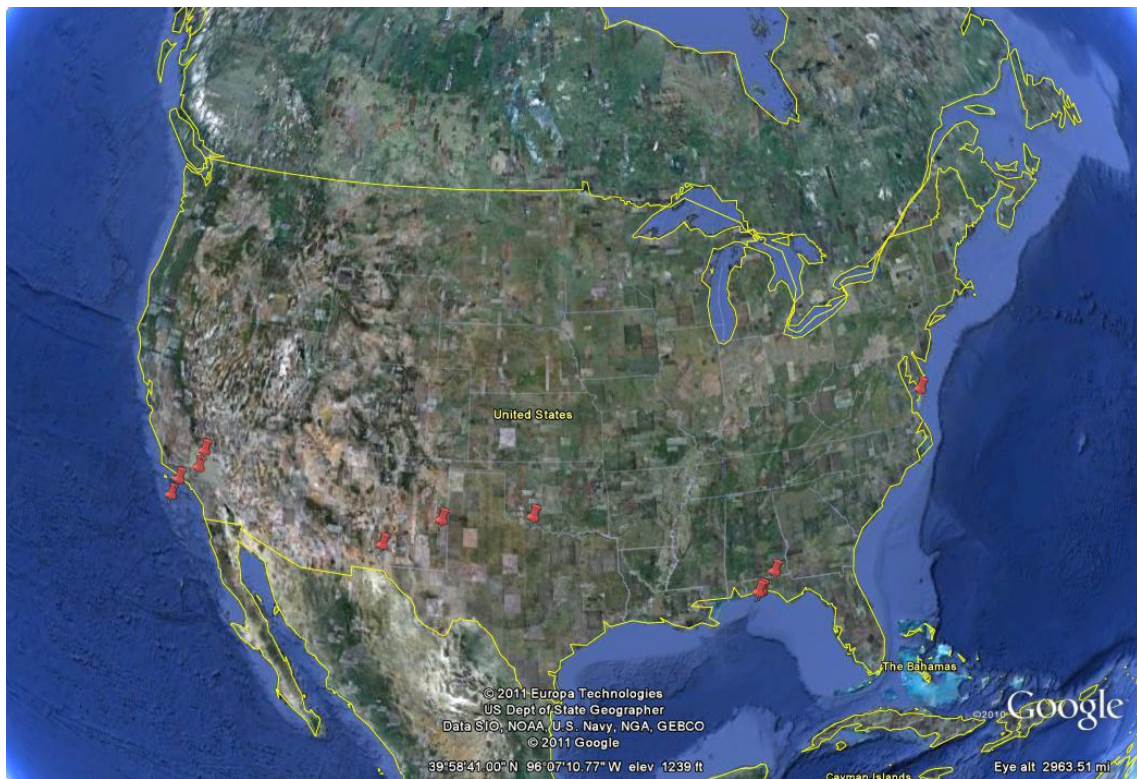
### 4a. Meteorological-Satellite

The Department of Commerce's National Environmental Satellite, Data, and Information Service (NESDIS) operates remote sensing satellites, which make day and night observations of weather (clouds, temperature, and winds), ocean state (sea surface temperature), geological and agricultural features over the entire Earth. Various ground stations transmit these data and other environmental data using the 402-403 MHz band throughout the United States and Possessions. Ground stations or platforms gather the data then GOES satellites re-transmit the information to a central processing center. The meteorological-satellite system also provides collection and radio relay of data from

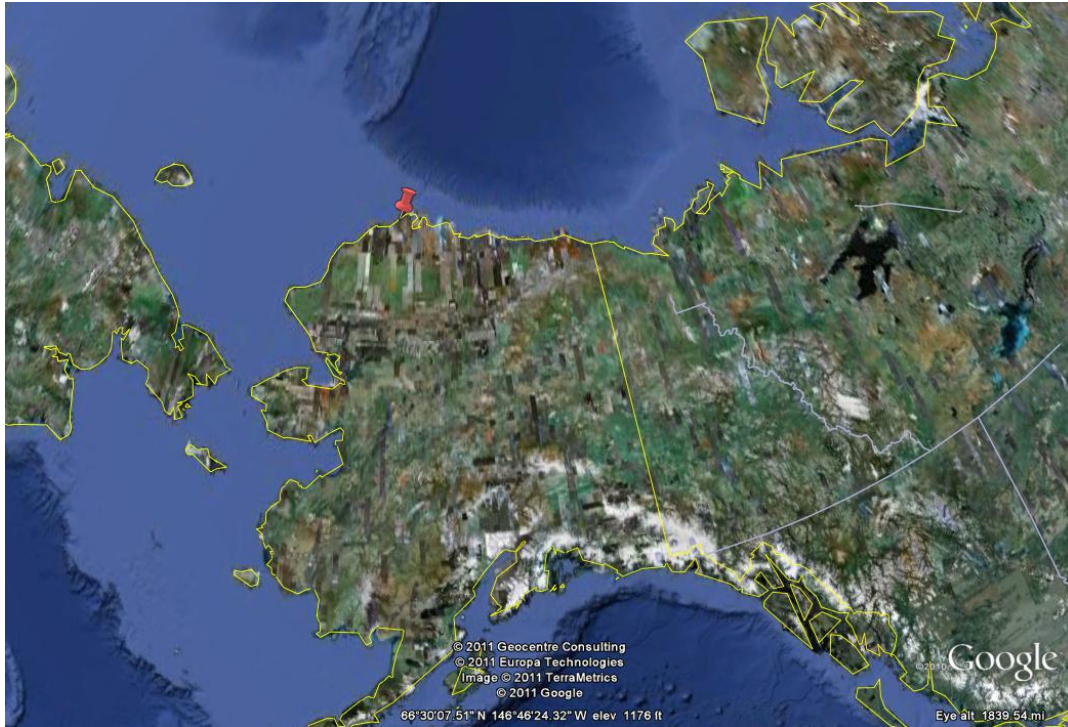
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fixed, mobile, and transportable environmental observing platforms (ships, aircraft, ocean buoys, and remote surface sites).

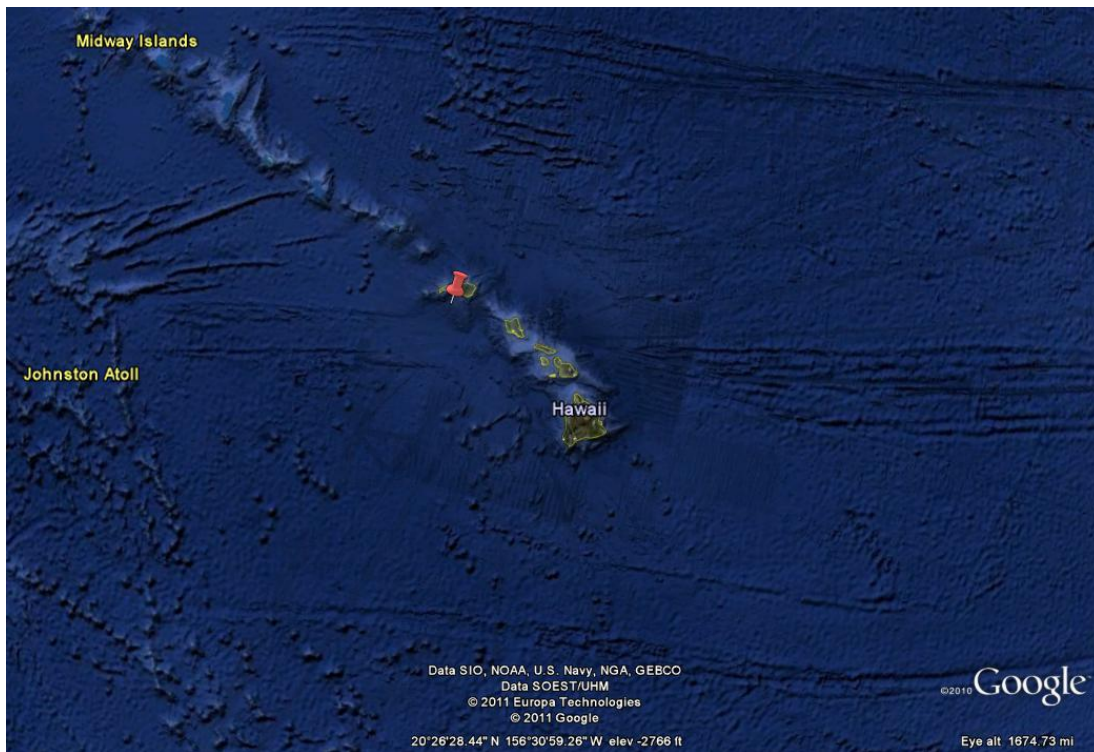
The National Oceanographic and Atmospheric Administration (NOAA) uses this band for satellite uplinks from transmitters called data collection platforms (DCPs). The DCPs are buoys, free-floating balloons, and remote weather stations that provide near real-time environmental data. The information from the DCPs is provides warnings and forecasts of weather events such as tornados, tsunamis, and tropical cyclones. The DCPs collect environmental measurements such as wind velocity, temperature, relative humidity and then transmit the information via the GOES system, to a receiving station that forwards the data to NOAA data processing centers in the United States, as well as other locations worldwide. Figure 1 depicts Federal meteorological sites in the 402-403 MHz band.



**Figure 1. Federal meteorological sites in the 402-403 MHz band - Continental U.S.**



**Figure 2. Federal meteorological sites in the 402-403 MHz band -Alaska**



**Figure 3. Federal meteorological sites in the 402-403 MHz band -Hawaii**

#### **4b. Meteorological Aids**

The Department of Defense (DOD), the National Aeronautics and Space Administration (NASA), and the Department of Energy (DOE) use this band in the Meteorological Aids Service, for collection of weather data using radiosondes. Radiosondes are expendable free-floating balloons transmitting data to the global meteorological community as an essential input to weather models and by researchers for atmospheric and climatologic research. Federal agencies use this data obtained via radiosonde operations to provide warnings and forecasts of weather events such as tornados and tropical cyclones. The radiosonde systems use the band 402-403 MHz to transmit signals from the radiosondes to the supporting ground tracking stations. Radiosonde systems perform measurements of the atmospheric pressure, temperature, and relative humidity. The wind speed and direction is determined using radio frequency direction finding measuring the azimuth and elevation angle of the radiosonde with respect to the receiving antenna. Meteorologists use radiosonde data, which includes measurements of atmospheric temperature, humidity, wind speed, and wind direction for weather forecasting.

#### **5. Planned Use**

The current Federal operations in the 402–403 MHz band will continue for the foreseeable future.