Description of document:	National Institute of Standards and Technology (NIST) Records concerning the potential shutdown of WWV/WWVB and WWVH time signal broadcast stations 2017-2019
Requested date:	09-September-2018
1st Interim Release date:	13-August-2019
Interim Release date:	30-July-2020
3rd Interim Release date:	09-October-2020
Posted date:	20-January-2025
Source of document:	FOIA Request National Institute of Standards and Technology Catherine S. Fletcher, FOIA & Privacy Act Officer 100 Bureau Drive, STOP 1710 Gaithersburg, MD 20899-1710 Email: foia@nist.gov

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-0001

AUG 1 3 2019

This letter is an interim response to your September 9, 2018 Freedom of Information Act (FOIA) request, Log #DOC-NIST-2018-002060, to the National Institute of Standards and Technology (NIST) for:

> FIRST, I request a copy of each memo or report at NIST discussing the potential shutdown of the WWV and WWVH shortwave radio time signals operated by NIST in Boulder, Colorado.
>
> SECOND, I also request a copy of emails at the applicable offices of NIST that mention WWV and/or WWVH. By applicable offices of NIST I mean:
>
> NIST Office of the Director
> NIST Time and Frequency Division (Boulder, Colorado)
> NIST Public and Business Affairs Office
> Boulder Public Affairs (Boulder, Colorado)
>
> I limit this request to records dated between January 1, 2018 and the present.

NIST has conducted a search of our files and located some of the records responsive to your FOIA request. Enclosed you will find thirty-six (36) responsive documents consisting of seventy-six (76) pages that are being released in their entirety. NIST is continuing the process of searching for additional documents related to your request.

Thank you for your patience. We will continue to send you releasable documents on a rolling basis as they become available.

Sincerely,

Catherine S. Fletcher
Freedom of Information Act Officer

Enclosures

NIST

2018-002060

Interim Release

#1

Release In Entirety

DOCUMENT

Burrus, James N. (Fed)

From: Lowe, John P. (Fed)
Sent: Friday, July 6, 2018 11:38 AM
To: Deutch, Matthew J. (Fed); Sutton, Douglas (Fed); Nelson, Glenn (Fed); Yates, William (Fed)
Cc: Novick, Andrew (Fed); Burrus, James N. (Fed); Lombardi, Michael A. (Fed)
Subject: Fw: Thank you

fyi..

From: Wilkinson, Richard (Fed)
Sent: Friday, July 6, 2018 1:11 PM
To: Okayama, Dean T. (Fed); Takamatsu, Dean T. (Fed); Fujita, Chris J. (Fed); Ochinang, Adela Mae P. (Fed); Lowe, John P. (Fed); Oates, Chris (Fed)
Cc: Nobleman, Andrew L. (Fed)
Subject: Thank you

Dean, Dean, Chris, Adela Mae, John, and Chris,

Greetings from Public Affairs. We've posted Andrew Nobleman's article about WWVH and its staff on NIST's internal website at https://inet.nist.gov/nist-connections/time-beach-working-nist-hawaii.

Since Andrew is on leave today, I thought I'd send you this FYI about the article posting.

Thanks for working with Andrew on this article, and thank you for your work for NIST and the nation.

Richard
Public Affairs
301-975-5040

DOCUMENT

Porter, Gail (Fed)

From: www
Sent: Friday, August 24, 2018 8:48 AM
To: Porter, Gail (Fed)
Subject: FW: The ARRL Letter for August 16, 2018

From: ARRL Web site <memberlist@www.arrl.org>
Sent: Thursday, August 16, 2018 4:03 PM
To: www <wwv@nist.gov>
Subject: The ARRL Letter for August 16, 2018

If you are having trouble reading this message, you can see the original at:
http://www.arrl.org/arrlletter/?issue=2018-08-16

ARRL The national association for AMATEUR RADIO™

The ARRL Letter

Public Service
Advocacy
Education
Technology
Membership

August 16, 2018
Editor: Rick Lindquist, WW1ME

ARRL Home Page | *ARRL Letter* Archive | Audio News

- HAARP's WSPR Research Campaign Yields Hundreds of Reports on 40 and 80 Meters
- Indonesian Hams Take Advantage of Satellite for Post-Earthquake Communication
- NIST FY 2019 Budget Would Eliminate WWV and WWVH
- Texas Volunteer Examiner Setting Sights on Next 1,000 Exam Sessions
- The Doctor Will See You Now!
- ARISS Packet Radio System Expected to be Back Late this Year
- 4U1UN UN Amateur Radio Club Operation Could Resume Later this Year
- Storm Takes Down Antennas at Memorial Ham Station on Swedish-Norwegian Border
- Ham-Astronauts among First Nine Astronauts Scheduled to Fly on Commercial Spacecraft
- Dave Popkin, W2CC/AAR2BU, Receives Presidential Lifetime Achievement Award
- In Brief...
- The K7RA Solar Update
- Just Ahead in Radiosport
- Upcoming ARRL Section, State, and Division Conventions

HAARP's WSPR Research Campaign Yields Hundreds of Reports on 40 and 80 Meters

Just-completed research at the High-Frequency Active Auroral Research Program (HAARP) transmitters in Gakona, Alaska, successfully took advantage of the *WSPR* digital protocol and the Weak Signal Propagation Reporter Network (WSPRnet) on July 30 through August 1. University of Alaska Fairbanks (UAF) Space Physics Group researcher and HAARP Chief Scientist Chris Fallen, KL3WX, told ARRL that the research -- HAARP's fourth research campaign under management of the University of Alaska Fairbanks -- went well.

"My 'citizen science' experiments were funded by the National Science Foundation and were conducted for approximately 30 minutes at the end of each campaign day," Fallen said. "They consisted of 2-minute transmissions using the WSPR digital mode in the 40- and 80-meter bands, with a 2-minute off period between transmissions." He said HAARP transmitted in

The HAARP WSPR spots map.

full-carrier, double-sideband AM because it does not have SSB capability. HAARP operated under its Part 5 Experimental license, WI2XFX, with Special Temporary Authority (STA) from the FCC to transmit on amateur bands.

"I systematically varied the HAARP transmission parameters, such as gain, net power, beam direction, and polarization, to see how they affected the reception reports collected in the WSPRnet.org database," Fallen said. "During the 3 days, we gathered more than 300 confirmed reports of signal strength and location from nearly 100 unique participants throughout Canada and the US."

Fallen said the spots, collected along with the corresponding HAARP transmission parameters, are available online, (1) and (2). He said the spreadsheet at the second link is editable by the public, "specifically by citizen scientists who want to manually add their spot or other interesting data analysis," he added. "In this sense, the experiment continues."

He said that HAARP's low-elevation transmissions on 40 meters resulted in the greatest number of spots. "The most distant spot was located at grid EL96xi, near Boca Raton, Florida, reported by W1NEJ, from a distance of 6,154 kilometers," Fallen said. "Interestingly, HAARP was aimed in the magnetic west direction during that spot."

HAARP and the Arecibo Observatory in Puerto Rico are planning to conduct heating campaigns this fall, Fallen noted, although not at the same time, as experimenters are shared. Read more.

Indonesian Hams Take Advantage of Satellite for Post-Earthquake Communication

Amateur Radio volunteers in Indonesia have been taking advantage of the LAPAN-ORARI (IO-86) ham satellite in addition to HF on 7.110 MHz as the Lombok area recovers from two recent earthquakes. The death toll has topped 400. A second powerful earthquake in the area on August 5 killed at least 98 people and seriously injured more than 200 others.

Power in the area has been disrupted, and Kardi Wibisono, YB9KA, and Untung "Adi" Riadi, YB9GV, of the West Nusa Tenggara Region chapter of ORARI, the Indonesian national Amateur Radio organization, have been leading efforts to provide communication to areas lacking cellular coverage. That has included hauling batteries to run repeaters taken down by the power outage. Four repeaters are reported to be operating in the disaster area. ORARI Headquarters has asked for more repeater support from its Bali Island region and issued an official request to help with logistics and additional volunteers in Lombok.

In addition to designating the HF National Emergency Frequency of 7.110 MHz, VHF frequencies have been established and the LAPAN-ORARI (IO-86) satellite has been activated to assist with communication. Launched in 2015, IO-86 carries an FM transponder and an APRS digipeater. The Central Java Region of the Indonesian Search and Rescue Council sent in a team to join the national rescue operation in Lombok and ORARI volunteers.

Indonesian President H. Joko "Jokowi" Widodo is YD2JKW. -- *Thanks to* Southgate Amateur Radio News *via IARU Region 1; Dani, YB2TJV, and* AMSAT News Service

NIST FY 2019 Budget Would Eliminate WWV and WWVH

The National Institute of Standards and Technology (NIST) FY 2019 budget request includes shutting down "NIST radio stations in Colorado and Hawaii," an apparent reference to WWV and WWVH. Radio amateurs, HF listeners, and others around the world routinely make use of the time and frequency standard signals, which also include propagation information. NIST said eliminating funding currently "supporting fundamental measurement dissemination" would include putting WWV and WWVH off the air for a savings of $6.3 million. The overall NIST FY 2019 budget request for efforts related to

fundamental measurement, quantum science and measurement dissemination is $127 million, which, the agency said, is a net decrease of $49 million from FY 2018 levels.

"The proposed reductions will allow NIST to consolidate and focus on narrower core [fundamental] measurement programs while meeting budget levels," the agency said in its FY 2019 budget summary. "NIST will focus on basic research while reducing funding for efforts applying some of its breakthroughs into new measurement applications.

The FY 2019 proposed budget cuts developed earlier this year came to light via Tom Witherspoon, K4SWL, who maintains *The SWLing Post* website, after a number of viewers called it to his attention. He posted an article on his blog.

"I've always considered WWV and WWVH to be the heartbeat of the shortwaves here in North America -- a constant, timely companion and brilliant gauge of HF propagation," Witherspoon wrote. "I assumed both stations would be some of the last to go silent on the shortwaves."

"I find this budget request *very* disappointing," Witherspoon said with respect to the proposed elimination of WWV and WWVH. "Let's hope, somehow, this does not come to fruition." He said *The SWLing Post* would be tracking and posting any new developments. Read more.

Texas Volunteer Examiner Setting Sights on Next 1,000 Exam Sessions

In July, Franz Laugermann, K3FL, of Houston, achieved a milestone that no other Volunteer Examiner (VE) has before, by taking part in his 1,000th exam session as a VE. But, he told ARRL, he's far from finished.

"As long as I can be here, I'm going to go on doing this. It's so rewarding," he said, adding that he's set his sights on 2,000 sessions. He estimated that he's helped about 5,000 people get their Amateur Radio licenses. At one recent session, a 10-year-old boy who passed the exam became the fourth generation in his family to get licensed through Laugermann, who also had conducted the testing sessions at which the boy's father, grandfather, and great-grandfather earned their ham licenses.

Harris County Judge Ed Emmett presents Laugermann with a framed proclamation from the County in recognition of Laugermann's accomplishments as a Volunteer Examiner.

Laugermann became an ARRL-accredited Volunteer Examiner in 1991. His wife Barbara, KA5QES, has been a VE nearly as long as her husband. Both are ARRL members.

Retired from the US Army in 1975, Laugermann, 78, has been licensed since 1978, has served as an Official Observer for 27 years and is a member of ARES®. He supported the ARES effort for Hurricane Harvey at the Harris County Office of Homeland Security and Emergency Management's Emergency Operation Center at Houston TranStar.

He has been running VE sessions at Houston TranStar for more than 16 years. "I like meeting new people," Laugermann said. Whenever he talks to people, young or old, he always encourages them to give Amateur Radio a try. "I tell them, 'I don't know everything, but I'll tell you everything I do know,'" he said with a laugh.

He's taken to telling his recent exam graduates to text him with their new call signs so he can keep an ear out for them when he's on the air. "I'm retired, so I'm on the radio all day long," he said.

The Doctor Will See You Now!

"Dummy Loads" is the topic of the new (August 16) episode of the "ARRL The Doctor is In" podcast. Listen...and learn!

Sponsored by DX Engineering, "ARRL The Doctor is In" is an informative discussion of all things technical. Listen on your computer, tablet, or smartphone – whenever and wherever you like!

Every 2 weeks, your host, *QST* Editor-in-Chief Steve Ford, WB8IMY, and the Doctor himself, Joel Hallas, W1ZR, will discuss a broad range of technical topics. You can also email your questions to doctor@arrl.org, and the Doctor may answer them in a future podcast.

Enjoy "ARRL The Doctor is In" on Apple iTunes, or by using your iPhone or iPad podcast app (just search for "ARRL The Doctor is In"). You can also listen online at Blubrry, or at Stitcher (free registration required, or browse the site as a guest) and through the free Stitcher app for iOS, Kindle, or Android devices. If you've never listened to a podcast before, download our beginner's guide.

ARISS Packet Radio System Expected to be Back Late this Year

The currently silent packet radio system on the International Space Station could be back on the air by year's end. Amateur Radio on the International Space Station (ARISS) hardware team members have located an original duplicate of the packet module that had been in use on the International Space Station (ISS) before failing more than a year ago, after 17 years of service. With a new battery installed, the unit was tested and found to be functioning. The ARISS packet system in the space station's *Columbus* module, operating on 145.825 MHz, quit last July after first experiencing some problems. All necessary paperwork has been completed to manifest the packet module on the Progress 71P spacecraft launch now set for Halloween, with docking on November 2.

"Installation date will depend on the crew's busy schedule, but ARISS hopes packet can be online again by the end of November 2018," ARISS said this week in a news release. ARISS said it's heard from "many hams" who have been asking when the packet system will be back on the air.

When the ARISS packet module aboard ISS died last year, the ARISS hardware team was already overburdened with the design and safety certification of the new interoperable radio system ARISS has been developing, which is set for launch next year. The team did attempt some basic troubleshooting of the old packet module, but was unable to revive it and decided instead to dedicate all of its time to the new replacement radio system, including packet capability.

Early this year, thermal testing of the first flight-identical power supply for the new comprehensive radio system showed that some changes to air flow were needed. This change would delay launch of the new radio equipment from late 2018 to early 2019.

To contribute to the ARISS radio fund, visit the ARISS website and click on the "Donate" button.

4U1UN UN Amateur Radio Club Operation Could Resume Later this Year

Outside of beacon signals, 4U1UN, the Amateur Radio club station at United Nations Headquarters in New York, has not been heard on the air since 2015, and only then under the commemorative 4U70UN call sign marking the UN's 70th anniversary that fall. Even then, operation took place in a ground-level garden area within the UN Headquarters complex. That could change soon.

The 4U1UN station, once within the iconic UN building, was dismantled in 2010 and antennas removed in advance of extensive building renovations. But room for 4U1UN -- which counts as a separate DXCC entity -- was not allocated in the new building layout. UN staffer James Sarte, K2QI, the president of the United Nations Amateur Radio Club, said in late July that "red tape" has been a roadblock to getting 4U1UN back on the air.

"It's taken us years just to get the administration and security to allow us to resume beacon operations," he told DX-World.net. "Security protocols became much tighter after 9/11. And when renovations [for] the Secretariat were completed, staff were no longer permitted to engage in any activities above the [Secretary-General's] floor. That said, we're slowly working to restore operations."

Negotiations have been continuing off and on for a few years now, but Sarte says that any notion of returning to staffed operations from the station's former 41st floor annex is a thing of the past. "Any such activity from the club will have to be done remotely from a broadcast booth that was loaned to us by the UN's broadcast services section," he explained. "The good news, however, is that new equipment was recently donated to the club that would make that a reality. The transceiver, amplifier, and associated network equipment are now in place. We also had a dedicated closed network line installed primarily for that purpose." Operation would take place from UN Headquarters grounds.

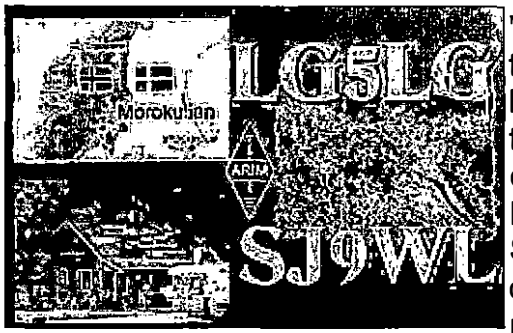
Sarte said the remaining task is to install an antenna and begin testing, which, he estimated, should happen this month. "But I do promise that 4U1UN will be back on the air soon," he concluded.

4U1UN is the 34th most-wanted DXCC entity. Read more.

Storm Takes Down Antennas at Memorial Ham Station on Swedish-Norwegian Border

The SJ9WL-LG5LG Morokulien memorial station on the border of Sweden and Norway is off the air after a large tree, brought down during a severe storm on August 10, caused extensive damage to the station's antennas. According to one report, the station's 100-foot tower was broken into pieces after the tree fell across three tower guy

wires. That pulled the support structure toward the station building, but a third set of guys on the other side of the tower held and kept it from damaging the structure. The tower has been up for at least a decade.



"This is a unique place, because the radio shack is exactly on the border, and the users are obliged to use the call signs alternatively -- one day SJ9WL and the next day LG5LG," Henryk Kotowski, SM0JHF, told ARRL. Kotowski has operated from the station in the past, and a photo he shot at Morokulien appeared on the cover of the October 1996 issue of *QST*.

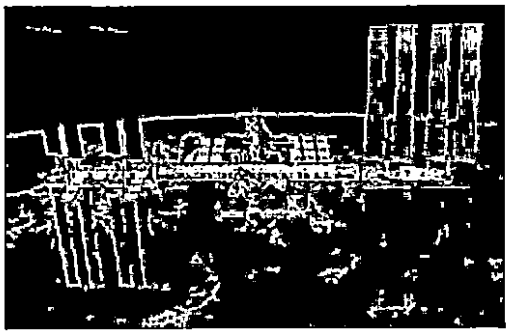
"This was a memorial station devoted to SM5WL and LA5LG," Kotowski explained. "They both promoted Amateur Radio and supported disabled hams. Swedish and Norwegian hams took over the abandoned border checkpoint house 50 years ago and made a joint club station there." He said the area is now devoted to recreation and includes a peace monument. With funds from station rentals, the association Amateur Radio in Morokulien (ARIM) maintains and manages the station, which may be the only one located on an international border in what ARIM calls a "ham state." The name Morokulien is a combination of the words for fun -- *moro* in Norwegian, and *kul* in Swedish -- plus a suffix indicating "in one place."

This fall, clubs on both sides of the international border are planning a joint 50th anniversary celebration. Read more.

Ham-Astronauts among First Nine Astronauts Scheduled to Fly on Commercial Spacecraft

Three radio amateurs are among the initial nine NASA astronauts scheduled to fly on commercial spacecraft to the International Space Station. Others in the group are studying for their ham licensing exams in order to take part in Amateur Radio on the International Space Station (ARISS) school radio contacts, or because they have

expressed interest in supporting ARISS events. The women and men chosen will be the first to fly on one of two commercial spacecraft.



SpaceX plans to fly a two-person crew -- Robert Behnken, KE5GGX, and Doug Hurley -- in *Crew Dragon* atop a Falcon 9 rocket from Kennedy Space Center. A Boeing CST-100 *Starliner* capsule on an Atlas V vehicle from Cape Canaveral will carry a three-person crew -- Eric Boe, Chris Ferguson, and Nicole Aunapa Mann, who attended an ARISS introductory talk at Johnson Space Center (JSC) and voiced interest in doing ARISS contacts in the future.

Boe and Ferguson, along with Josh Cassada, Victor Glover, Michael Hopkins, KF5LJG, and Sunita Williams, KD5PLB, will also be on the commercial spacecraft on later trips following the first test flights.

Behnken earned his license with help from the ARISS team at JSC in 2005. Hopkins got his license in 2011 and made ARISS school contacts in early 2014. Within the Amateur Radio community, however, he may be best known for installing the ARISS Ham Video system in 2014, shortly before wrapping up his ISS duty tour. Glover has been studying for his ham radio license at Johnson Space Center with a little mentoring from ARISS team member Kenneth Ransom, N5VHO. Cassada spoke in person to students taking part in an ARISS contact at an ISS education conference in 2016, at the time telling the ARISS team that he wanted to get his ham radio license. Williams has supported a large number of ARISS contacts on the ISS throughout her career. Read more.

Dave Popkin, W2CC/AAR2BU, Receives Presidential Lifetime Achievement Award

A New Jersey radio amateur and Military Auxiliary Radio System (MARS) member has received a Lifetime Achievement Award from President Donald Trump. ARRL Charter Life Member Dave Popkin, W2CC/AAR2BU, was recognized for his extraordinary contributions as a MARS volunteer.

"On behalf of a grateful nation, I thank you for your lifetime of service to your fellow Americans and those most in need," President Trump said. "Through at least 4,000 hours of service, you have ensured the continuation of America's unparalleled commitment to improving the lives of others. You have served as a model of the American spirit. Your many hours of service have strengthened the bonds of cooperation and trust that bring people together, while helping to address some of the greatest challenges of our time."

MARS Region 2 Director Carver Washburn, W2TFM/AAA2RD, said Popkin's "long and distinguished" history as a volunteer extends over 56 years with US Army MARS, averaging some 2,000 hours a year.

"Dave is particularly noted for his MARS leadership roles, mentoring, and training initiatives," Washburn noted. "It all started with his inspiration and his motivation to take positive action that, to this day, has fundamentally enhanced the ability of [the Department of Defense] to achieve its goals under the most dire of circumstances, such as occurred in Puerto Rico during Hurricane Maria in September 2017."

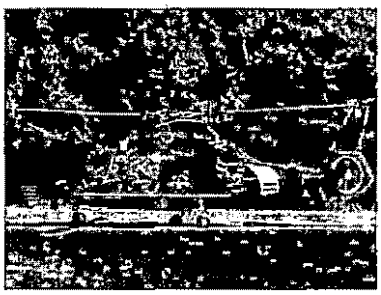
Washburn said Popkin served as net control for MARS radio nets in Region 2, and has served as MARS New Jersey State Director.

"Also evident were his unique talents to train and mentor these team members, substantially expanding the strength of the organization," Washburn said. "Dave made a difference in innovative ways through this role. He worked on the HQ senior staff for many years as well. Chief Army MARS Paul English and I are most grateful for his long and valued MARS service."

Dave Popkin, W2CC, with his Presidential Lifetime Achievement Award.

A former FCC field inspector who also served as an ARRL Official Observer, Popkin has made similar contributions to Amateur Radio, Washburn said, citing Popkin's years of leadership with the New Jersey Phone Net and with the Englewood Cliffs (New Jersey) Amateur Radio Club's ARRL Field Day operation. Read more. -- *Thanks to Carver Washburn, W2TFM/AAA2RD*

In Brief...



For the second year in a row, members of the Clallam County ARES group took part in an "active shooter" training exercise. The Clallam County Sheriff's Department conducts training each year to educate as many first responders as possible in the proper techniques of conducting operations during these incidents, including neutralizing the threat, evacuating victims, reuniting families of victims, and offering counseling. Safety is a major concern during these exercises. The latest exercise on August 10 included participation by corrections officers, tribal police, sheriff deputies, ambulance crews, county fire personnel, and even the US Coast Guard. ARES personnel provided communication between the instructors and locations being used so that all regular communications among the various agencies could proceed without interruption by training-related traffic. ARES establishes communication between the command instructors and all remote locations during the drill, including the hospitals, the reunification center, the emergency operations center, and other sites. During this exercise, the Coast Guard responded to pick up a victim for transport to the hospital 35 miles away. "This is a great opportunity for ARES to get more experience and training and to hopefully be more prepared for the next event, whatever it may be," said ARES Assistant Emergency Coordinator Joe Wright, KG7JWW.

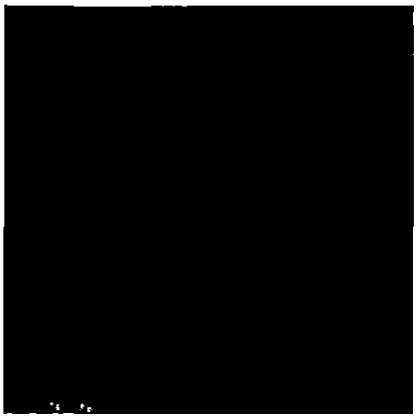
AMSAT has issued the second call for papers for the 2018 AMSAT-NA Annual Meeting and Space Symposium. The event is set for November 2 - 4 at the US Space and Rocket Center in Huntsville, Alabama. Proposals for papers, symposium presentations, and poster presentations are invited on any topic of interest to the Amateur Satellite community. Send a tentative presentation title and abstract as soon as possible, with final copy by October 15 for inclusion in the printed *Proceedings*. -- *Thanks to* AMSAT News Service

Reorganized and updated FCC Personal Radio Services (PRS) Part 95 rules have been published in *The Federal Register*. Among other things, the PRS covers the Family Radio Service (FRS), General Mobile Radio Service (GMRS), and the Citizens Band Radio Service (CBRS). The revised rules allot additional FRS channels and increase the power on certain FRS channels from 0.5 W to 2 W. FRS channels are in the 462.5625 - 462.7250 MHz range. Effective September 30, 2019, it will be illegal to manufacture or import handheld portable radio equipment capable of operating under FRS rules and under other licensed or licensed-by-rule services. The FCC no longer will certify FRS devices that incorporate capabilities of

GMRS capabilities or of other services. Existing GMRS/FRS combination radios that operate at power levels of less than 2 W ERP will be reclassified as FRS devices; existing GMRS/FRS radios that operate above that power level will be reclassified as GMRS devices, requiring an individual license. Radios that can transmit on GMRS repeater input channels will continue to be licensed individually and not by rule. Once the new rules are effective, CBers will be allowed to contact stations outside of the FCC-imposed -- but widely disregarded -- 155.3-mile distance limit.

The K7RA Solar Update

Tad Cook, K7RA, Seattle, reports: Solar activity is still very weak -- and should get weaker, at least until 2020, when we will probably reach the bottom of Solar Cycle 24. This week's average sunspot number was 3.4, based on a sunspot number of 12 on August 14 and 15. Average solar flux edged down, from 69.7 to 68.7. Geomagnetic indicators were higher, with average daily planetary A index shifting from 5.7 to 6.9, and mid-latitude A index from 6.9 to 7.3.



Predicted solar flux is 69 on August 16-23; 70 on August 24 - September 5; 68 on September 6-18, and 70 on September 19-29.

Predicted planetary A index is 12, 15, 8, 5, 15, and 12 on August 16-21; 5 on August 22 - September 2; 12, 8, 5, 5, 10, 8, and 8 on September 3-9; 5 on September 10-11; 12, 15, 8, 5, 15, and 12 on September 12-17; 5 on September 18-28, and 8 on September 29.

Sunspot numbers for August 9 were 0, 0, 0, 0, 0, 12, and 12, with a mean of 3.4. The 10.7-centimeter flux was 70.3, 69.5, 67.4, 68.1, 67.8, 68.7, and 68.8, with a mean of 68.7. Estimated planetary A indices were 5, 4, 11, 5, 5, 4, and 14, with a mean of 6.9. Estimated mid-latitude A indices were 6, 4, 11, 6, 6, 6, and 12, with a mean of 7.3.

Send in your reports or propagation observations.

Just Ahead in Radiosport

- August 18 -- Feld Hell Sprint
- August 18-19 -- SARTG WW RTTY Contest
- **August 18-19 -- ARRL 10 GHz and Up Contest (CW, phone, digital)**
- August 18-19 -- Russian District Award Contest (CW, phone)
- August 18-19 -- Keyman's Club of Japan Contest (CW)

- **August 18-19 -- North American QSO Party (SSB)**
- August 18-19 -- CVA DX Contest (CW)
- August 19 -- SARL HF Digital Contest
- **August 19 -- ARRL Rookie Roundup (RTTY)**
- August 20 -- Run for the Bacon QRP Contest (CW)
- August 22 -- SKCC Sprint (CW)

See the ARRL Contest Calendar for more information. For in-depth reporting on Amateur Radio contesting, subscribe to *The ARRL Contest Update* via your ARRL member profile email preferences.

Upcoming ARRL Section, State, and Division Conventions

- August 18-19 -- Southeastern Division Convention, Huntsville, Alabama
- August 19 -- Kansas State Convention, Salina, Kansas
- August 24-26 -- West Virginia State Convention, Weston, West Virginia
- August 31-September 2 -- Roanoke Division Convention, Shelby, North Carolina
- September 1 -- Pennsylvania State Convention, Uniontown, Pennsylvania
- September 7-9 -- New England Division Convention, Boxborough, Massachusetts
- September 7-9 -- Northwest APRS Convention, North Bend, Washington
- September 8 -- Kentucky State Convention, Shepherdsville, Kentucky
- September 8 -- Virginia Section Convention, Virginia Beach, Virginia
- September 14-16 -- W9DXCC Convention, Schaumburg, Illinois
- September 15 -- Wyoming State Convention, Rock Springs, Wyoming
- September 16 -- Southern New Jersey Section Convention, Mullica Hill, New Jersey
- September 21-22 -- W4DXCC/SEDCO Convention, Pigeon Forge, Tennessee
- September 21-23 -- Rocky Mountain Division Convention, Albuquerque, New Mexico

- September 22 -- Washington State Convention, Spokane Valley, Washington
- September 28-29 -- Wisconsin State Convention, Milwaukee, Wisconsin
- September 28-30 -- Mid-Atlantic States VHF Conference, Bensalem, Pennsylvania
- September 29 -- North Dakota State Convention, West Fargo, North Dakota

Find conventions and hamfests in your area.

ARRL -- Your One-Stop Resource for Amateur Radio News and Information

- Join or Renew Today! ARRL membership includes *QST*, Amateur Radio's most popular and informative journal, delivered to your mailbox each month.
- Listen to *ARRL Audio News*, available every Friday.

Subscribe to...

- *NCJ -- National Contest Journal.* Published bimonthly, features articles by top contesters, letters, hints, statistics, scores, NA Sprint, and QSO parties.
- *QEX -- A Forum for Communications Experimenters.* Published bimonthly, features technical articles, construction projects, columns, and other items of interest to radio amateurs and communications professionals.

Free of charge to ARRL members...

- Subscribe to the *ARES E-Letter* (monthly public service and emergency communications news), the *ARRL Contest Update* (bi-weekly contest newsletter), Division and Section news alerts -- and much more!

- Find ARRL on Facebook! Follow us on Twitter and Instagram!

The ARRL Letter is published Thursdays, 48 times each year. ARRL members may subscribe at no cost or unsubscribe by editing their Member Data Page as described at http://www.arrl.org/arrlletter/.

ARRL—The national association for AMATEUR RADIO™
225 Main Street
Newington, Connecticut 06111 -1494 USA
860-594-0200

www.arrl.org

DOCUMENT

Porter, Gail (Fed)

From: Materese, Robin (Fed)
Sent: Tuesday, September 04, 2018 11:24 AM
To: Gomez, Gabriella N. (Fed)
Cc: Huergo, Jennifer (Fed); Porter, Gail (Fed); Stein, Ben (Fed)
Subject: RE: Articles about WWV and We the People petition

Hi Gabby,

Please include this in tomorrow's clips... as long as it didn't make it into today's clips. (I haven't had a chance to review today's clips yet.)

https://swling.com/blog/2018/08/astronomers-organizing-to-save-wwv/

Thanks,

Robin

DOCUMENT

Porter, Gail (Fed)

From: Porter, Gail (Fed)
Sent: Tuesday, September 04, 2018 11:19 AM
To: Materese, Robin (Fed); Stein, Ben (Fed)
Cc: Huergo, Jennifer (Fed)
Subject: RE: Articles about WWV and We the People petition

Yes. Should be included in clips please.

From: Materese, Robin (Fed)
Sent: Tuesday, September 04, 2018 10:56 AM
To: Stein, Ben (Fed) <benjamin.stein@nist.gov>
Cc: Porter, Gail (Fed) <gail.porter@nist.gov>; Huergo, Jennifer (Fed) <jennifer.huergo@nist.gov>
Subject: Articles about WWV and We the People petition

FYI. Should we include either of these in clips and/or share with someone at DOC? FYI, the petition already has 14,665 signatures.

https://swling.com/blog/2018/08/astronomers-organizing-to-save-wwv/
https://petitions.whitehouse.gov/petition/maintain-funding-nist-stations-wwv-wwvh

DOCUMENT

Porter, Gail (Fed)

From: Materese, Robin (Fed)
Sent: Tuesday, September 04, 2018 10:56 AM
To: Stein, Ben (Fed)
Cc: Porter, Gail (Fed); Huergo, Jennifer (Fed)
Subject: Articles about WWV and We the People petition

FYI. Should we include either of these in clips and/or share with someone at DOC? FYI, the petition already has 14,665 signatures.

https://swling.com/blog/2018/08/astronomers-organizing-to-save-wwv/
https://petitions.whitehouse.gov/petition/maintain-funding-nist-stations-wwv-wwvh

DOCUMENT

Porter, Gail (Fed)

From: Lowe, John P. (Fed)
Sent: Wednesday, September 05, 2018 11:24 AM
To: Williams, Carl J. Dr. (Fed); Olthoff, James K. (Fed); Porter, Gail (Fed)
Subject: Fw: News Clips from Wednesday, September 5, 2018

From: Ost, Laura M. (Fed)
Sent: Wednesday, September 5, 2018 9:57 AM
To: Oates, Chris (Fed); Lowe, John P. (Fed)
Subject: FW: News Clips from Wednesday, September 5, 2018

Astronomers organizing to save WWV
Swling
The main point of this blog entry: astronomers have been asked to sign the White House petition to maintain NIST stations funding.

****

Laura Ost
NIST Boulder Director of Media Relations
National Institute of Standards and Technology
325 Broadway
Boulder, CO 80305
303-497-4880
lost@nist.gov
Find NIST on

DOCUMENT

Porter, Gail (Fed)

From: Newman, Michael E. (Fed)
Sent: Friday, August 17, 2018 9:48 AM
To: Porter, Gail (Fed)
Cc: Huergo, Jennifer (Fed)
Subject: Another Pickup of NIST Radio Stations Story

Gail,

I'm not putting this in clips since this is just a rehash of the original article for which you requested a correction. Just thought you might want to contact this pub with the same request.
NIST FY 2019 Budget Would Eliminate WWV and WWVH
eHam.net
NIST said eliminating funding currently "supporting fundamental measurement dissemination" would include putting WWV and WWVH off the air for a savings of $6.3 million.

Thanks!
Mike

****

Michael E. Newman
Senior Communications Officer
Public Affairs Office
National Institute of Standards and Technology
100 Bureau Dr, Stop 1070
Gaithersburg, MD 20899-1070

Phone: (301) 975-3025
Fax: (301) 963-1479
E-mail: michael.newman@nist.gov
Twitter: @MENewman17

****

DOCUMENT

Porter, Gail (Fed)

From: Newman, Michael E. (Fed)
Sent: Tuesday, August 21, 2018 9:26 AM
To: Porter, Gail (Fed)
Subject: News Articles on Radio Stations

What Will You Do If WWVB Goes Silent?
Hackaday
By NIST's own estimates, over 50 million timepieces of some form or another automatically synchronize their time using the digital signal that's been broadcast since 1963.

The Death of Old Time? – NIST Cutting WWV
Inside GNSS
All that is set to change. The Commerce Department's proposed budget for 2019 eliminates NIST broadcast time services in an effort to cope with draconian budget cut to the agency.

****

Michael E. Newman
Senior Communications Officer
Public Affairs Office
National Institute of Standards and Technology
100 Bureau Dr, Stop 1070
Gaithersburg, MD 20899-1070

Phone: (301) 975-3025
Fax: (301) 963-1479
E-mail: michael.newman@nist.gov
Twitter: @MENewman17

****

DOCUMENT

Porter, Gail (Fed)

From: Queen, Michael (Fed)
Sent: Tuesday, August 21, 2018 10:15 AM
To: Porter, Gail (Fed)
Subject: WWV Inquiries

Hi Gail,

I have 4 more WWV/WWVH inquiries. 3 from Friday, 1 from today.

Sincerely,

Michael Queen

Office Manager
NIST Public Affairs Office
Building 101, Room A903, MS 1070
(301) 975-8535

Porter, Gail (Fed)

From: Esser, Mark (Fed)
Sent: Wednesday, August 22, 2018 11:34 AM
To: Porter, Gail (Fed); Huergo, Jennifer (Fed)
Subject: Tweet forwarded by @usnistgov

@usnistgov thanks! Can you please also confirm that NIST FY 2019 budget request would NOT eliminate WWVB?

Original Tweet: https://twitter.com/jastapleton/status/1032266857418567681

Sent via TweetDeck

Porter, Gail (Fed)

From: Porter, Gail (Fed)
Sent: Wednesday, August 22, 2018 12:41 PM
To: Esser, Mark (Fed); Huergo, Jennifer (Fed)
Subject: RE: Tweet forwarded by @usnistgov

Got it. I was just explaining that it might take more time than is comfortable to reply because we have to work this out with a number of people.

From: Esser, Mark (Fed)
Sent: Wednesday, August 22, 2018 12:39 PM
To: Porter, Gail (Fed) <gail.porter@nist.gov>
Subject: RE: Tweet forwarded by @usnistgov

I wasn't planning on replying without guidance. Frankly, I wouldn't know what to say.

I first confirmed to him that WWVB was the station that broadcast signals to his alarm clock. This is a follow up to that.

From: Porter, Gail (Fed)
Sent: Wednesday, August 22, 2018 12:37 PM
To: Esser, Mark (Fed) <mark.esser@nist.gov>; Huergo, Jennifer (Fed) <jennifer.huergo@nist.gov>
Subject: RE: Tweet forwarded by @usnistgov

Mark:
Please hold off on replying for a bit. I'm working on a short reply to NPR right now with a bunch of NIST managers/experts that may also be helping in writing a Twitter response.
Gail

From: Esser, Mark (Fed)
Sent: Wednesday, August 22, 2018 11:34 AM
To: Porter, Gail (Fed) <gail.porter@nist.gov>; Huergo, Jennifer (Fed) <jennifer.huergo@nist.gov>
Subject: Tweet forwarded by @usnistgov

@usnistgov thanks! Can you please also confirm that NIST FY 2019 budget request would NOT eliminate WWVB?

Original Tweet: https://twitter.com/jastapleton/status/1032266857418567681

Sent via TweetDeck

DOCUMENT

Porter, Gail (Fed)

From: Materese, Robin (Fed)
Sent: Thursday, August 23, 2018 10:54 AM
To: Porter, Gail (Fed)
Subject: FB and radio stations

Hi Gail,

Someone sent the following message to us via FB: Any truth to petitions circulating about NIST shutdown?https://petitions.whitehouse.gov/petition/proposed-shutdown-nists-wwv-and-wwvh-radio-stations

Do you want to go in directly to reply?

-- Robin

DOCUMENT

Porter, Gail (Fed)

From: Esser, Mark (Fed)
Sent: Thursday, August 23, 2018 11:10 AM
To: Porter, Gail (Fed); Huergo, Jennifer (Fed)
Cc: Stein, Ben (Fed); Materese, Robin (Fed)
Subject: FB inquiry concerning WH petition to not shut down time broadcasts

Hi,

We received an inquiry regarding the veracity of the idea that NIST may shut down its radio stations. The inquirer included a link to a WH petition asking that that not happen: https://petitions.whitehouse.gov/petition/proposed-shutdown-nists-wwv-and-wwvh-radio-stations.

This follows on the heels of the Twitter inquiry we received the other day.

Please advise.

Thank you.

Mark Esser
Writer/Editor
NIST Public Affairs Office
100 Bureau Drive, MS 1070
Gaithersburg, MD 20899
P: 301-975-8735

DOCUMENT

Queen, Michael (Fed)

From: Queen, Michael (Fed)
Sent: Monday, August 13, 2018 10:14 AM
Subject: News Clips from Monday, August 13, 2018

Good Morning. Here are today's news clips.

These clips provide a snapshot of the media's news coverage related to NIST.
For a look at the news NIST is currently promoting, please visit www.nist.gov.
To view previous news clips, visit the NIST in the News forum on the NIST intranet.

Laser Ranging Can 'See' 3D Objects Melting In Fires
Product Design & Development
Researchers at the National Institute of Standards and Technology (NIST) have used a laser detection and ranging (LADAR) system to image three-dimensional (3D) objects melting in flames. The method could offer a precise, safe and compact way to measure structures as they collapse in fires.

LIDAR looks inside fires to help measure structural collapse
The Engineer (UK)
Described in *Optica*, the US National Institute of Standards and Technology (NIST) demonstration used a commercial LIDAR system to map distances to objects melting behind flames that produced varying amounts of soot.

How to help your medical devices meet the UL (and FDA) standard
Security Boulevard
Known vulnerability testing focuses on platform and dependency weaknesses. It involves testing software for vulnerabilities that have already been discovered in products, third-party libraries, and some open source libraries and that are in the National Vulnerability Database (NVD). The NVD is augmented with additional analysis, a database, and a fine-grained search engine, according to NIST, the National Institute of Standards and Technology.

'12345' Is Really Bad: Your Ultimate Guide to Password Security
PC Magazine
The National Institute of Standards and Technology no longer recommends changing passwords every 90 days.

The deep clean: Companies must take measures to safely dispose of data-rich equipment
Crain's Cleveland Business
Although the level of end-of-service data sanitization is industry dependent, the National Institute of Standards and Technology (NIST) offers basic guidelines on what organizations can do to protect themselves.

US House candidates vulnerable to hacks
The Star Online (Malaysia)
A team of four independent researchers led by former National Institutes for Standards and Technology (NIST) security expert Joshua Franklin concluded that the websites of nearly one-third of US House candidates, Democrats and Republicans alike, are vulnerable to attacks.

RoboCup 2018 - S&T Test Methods Used to Evaluate Rescue Robots
Officer.com
Robots in the Public Safety category, RoboCup Rescue, were once again judged according to standards developed by the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) and the National Institute of Standards and Technology (NIST).

NIST FY 2019 Budget Would Eliminate WWV and WWVH
ARRL (American Radio Relay League) News
The National Institute of Standards and Technology (NIST) FY 2019 budget request includes shutting down "NIST radio stations in Colorado and Hawaii" — in other words, WWV and WWVH.

Queen, Michael (Fed)

From: Queen, Michael (Fed)
Sent: Monday, August 13, 2018 4:48 PM
To: Porter, Gail (Fed)
Subject: WWV & WWVH

Hi Gail,

Could I get an official statement about that article you mentioned this morning? We've got 6 e-mails about it (2 Saturday, 3 Sunday, 1 today). I have them with an "Orange Category" marker and flag in the inquiry inbox if you want to look at them.

Sincerely,

Michael Queen

Office Manager
NIST Public Affairs Office
Building 101, Room A903, MS 1070
(301) 975-8535

DOCUMENT

Queen, Michael (Fed)

From: Queen, Michael (Fed)
Sent: Tuesday, August 21, 2018 10:15 AM
To: Porter, Gail (Fed)
Subject: WWV Inquiries

Hi Gail,

I have 4 more WWV/WWVH inquiries. 3 from Friday, 1 from today.

Sincerely,

Michael Queen
Office Manager
NIST Public Affairs Office
Building 101, Room A903, MS 1070
(301) 975-8535

DOCUMENT

Queen, Michael (Fed)

From: Porter, Gail (Fed)
Sent: Friday, August 24, 2018 6:04 PM
To: Chambers, Alicia M. (Fed)
Cc: Queen, Michael (Fed)
Subject: RE: NIST Control Correspondence 18-000127-N

The letter I just sent you as an email to Mr. Budd will also work for this letter. Thanks,
Gail

From: Chambers, Alicia M. (Fed)
Sent: Friday, August 24, 2018 4:23 PM
To: Porter, Gail (Fed) <gail.porter@nist.gov>
Cc: Queen, Michael (Fed) <michael.queen@nist.gov>
Subject: NIST Control Correspondence 18-000127-N

Good Afternoon,

Kevin stated that you are working on a response as you received an inquiry about this recently. Would you mind sending a final version of your response so that I can prepare a response letter for this for you? Thank you.

Subject: WWV and WWVH

Assignment:

1. Draft a response for Walt Copan's signature.
2. Send electronic version to nistcounsel@nist.gov and nistexecsec@nist.gov for e-review prior to printing and routing. Once you receive e-review/comments, please print and route for signature.
3. CD-15 should include:
    a. OU Clearance
    b. H. Wixon
    c. K. Kimball
    d. J. Schufreider
    e. W. Copan
    f. A. Chambers

Due Date: September 7, 2018

Attachments: Incoming letter

If you have any questions, please let me know.

Thank you.

Alicia Chambers
Office of the Director
Administrative Specialist to the NIST Chief of Staff

DOCUMENT

Burrus, James N. (Fed)

From: NIST Tech Beat <subscriptions@service.govdelivery.com>
Sent: Tuesday, July 24, 2018 2:46 PM
To: Burrus, James N. (Fed)
Subject: The Shape In Water, Seeing Through Fire, Hawaii Radio

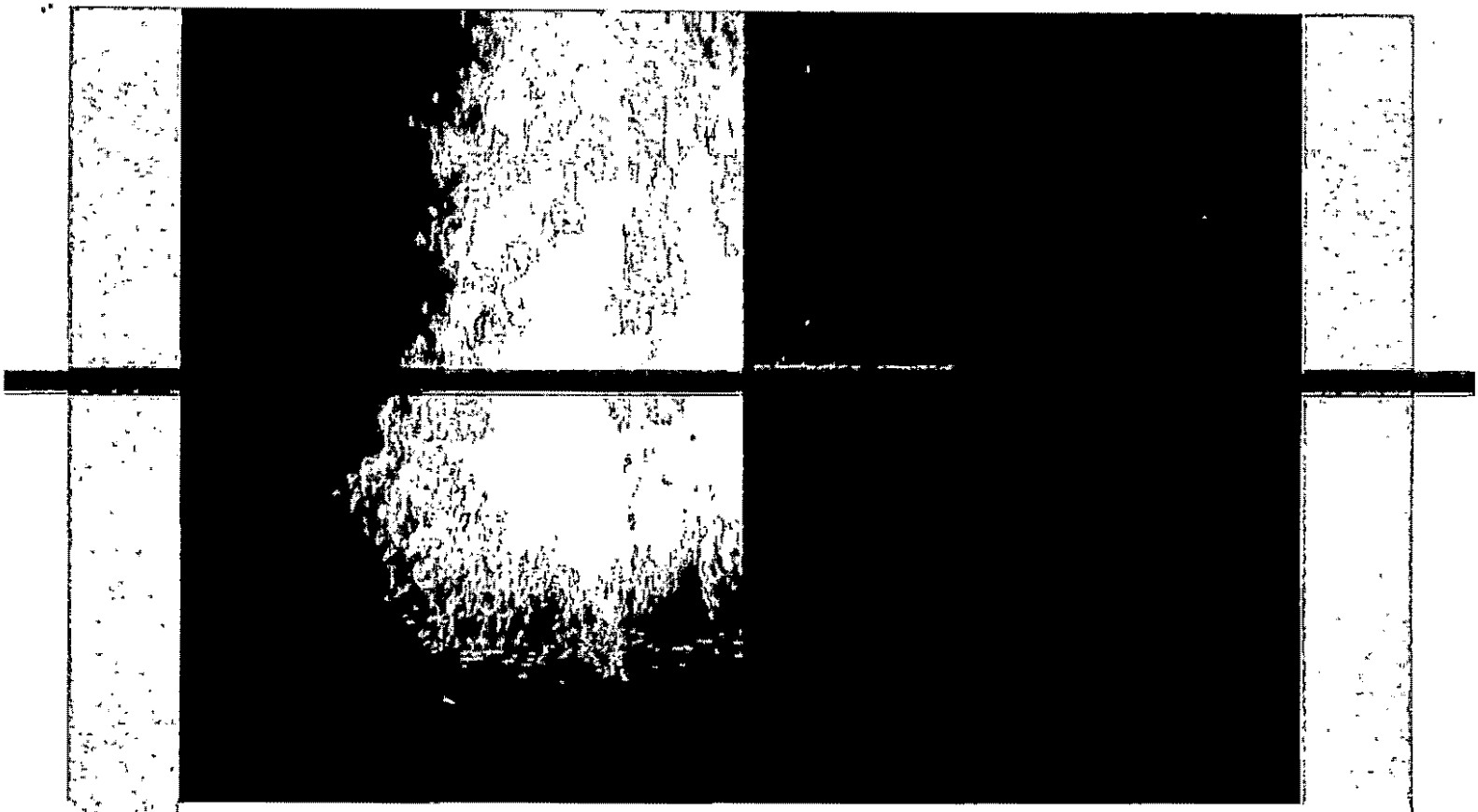
Follow Up Flag: Follow up
Flag Status: Flagged

View This as a Webpage

NIST TECHBEAT

A Biweekly News Digest From The National Institute of Standards and Technology

July 24, 2018



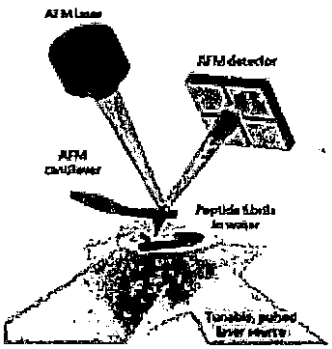
NIST Unblinded Me with Science:
A New Application of Blue Light Sees Through Fire

READ MORE

NIST Builds Statistical Foundation for Next-Generation Forensic DNA Profiling

New data enables scientists to calculate matches between DNA samples procured with the latest technology.

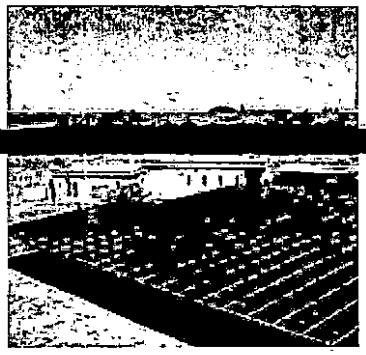
READ MORE



The Shape in Water: First Nanoscale Measurements of Biomolecule Folding in Liquid

NIST-developed method could provide new insights into Alzheimer's and other diseases.

READ MORE



Time on the Beach: Working at NIST Hawaii

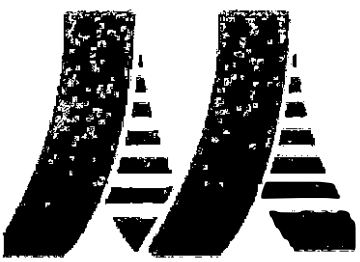
radio station that broadcasts time, frequency and weather information.

READ MORE

NIST Seeks Information on the Semiconductor Industry Workforce

Your feedback is welcome on the scope and sufficiency of efforts to educate, train and attract a workforce for a strong domestic semiconductor industry.

READ MORE



REMADE Institute Announces First Projects to Reuse, Recycle and Remanufacture Materials

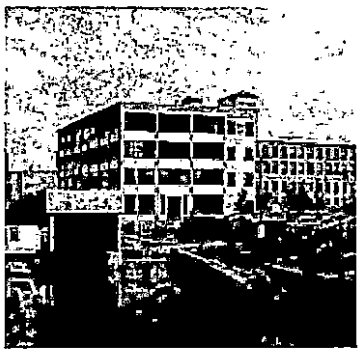
From our partners at Manufacturing USA: new projects address technologies for reducing costs of processing materials such as metals, fibers, polymers and electronic waste.

READ MORE

SURFing from Susceptometers to Skyrmions: The Making of a Neutron MANiAC

A student transforms from a neutron newbie to a measurement maven during his summers at NIST.

READ MORE



New Manufacturing R&D Center Weaves Together Textiles and Electronics

From our partners at Manufacturing USA: Massachusetts celebrated the grand opening this month of the UMass Lowell Fabric Discovery Center.

READ MORE

Serving the Nation Through Science

A desire to blend research and public service drew NIST lab executive Michael Fasolka to the agency in 2000 through the NIST NRC Postdoctoral Research Associateships Program.

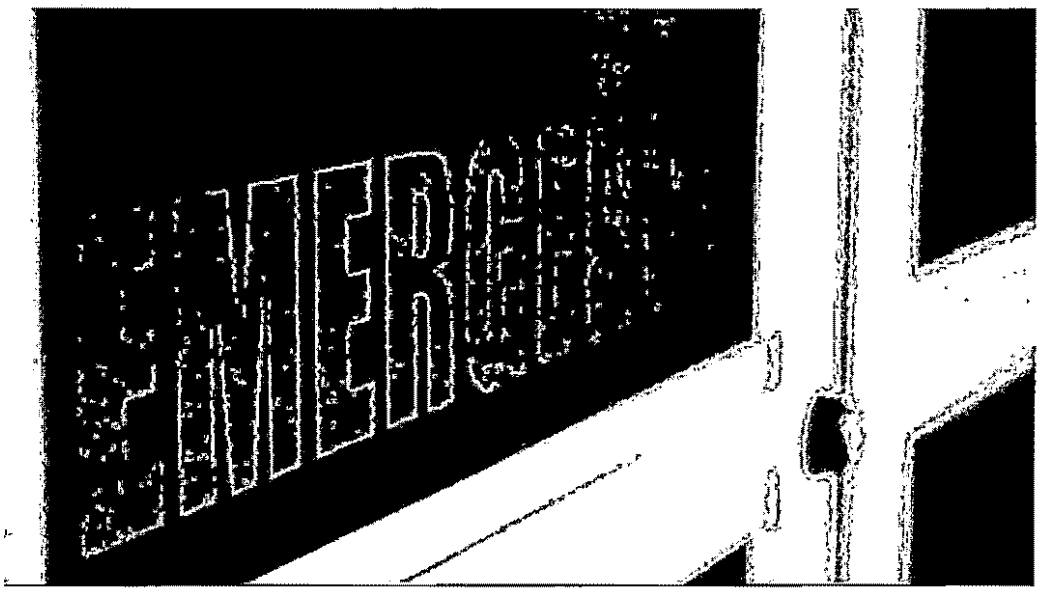
READ MORE

Workshop:
Controlled Unclassified Information Security Requirements

At NIST's Gaithersburg, Maryland, campus on October 18, an informational workshop will provide an overview of Controlled Unclassified Information (CUI) and related topics. The workshop is co-hosted by NIST, the Department of Defense and the National Archives and Records Administration. In-person registration closes on October 11, 2018.

FEATURED VIDEO

When Disaster Happens, Will Your Community Be Prepared?



Is your community taking all the steps it can to protect itself from natural hazards and recover from disasters? In this video, find out about the flexible and adaptable resources from NIST's Community Resilience program that will help put your community on the path toward greater resilience.

Learn About NIST's Community Resilience Program

CONNECT WITH US

NIST National Institute of Standards and Technology U.S. Department of Commerce

Subscriber services: Manage preferences Unsubscribe from TechBeat Help

Received this email from a friend? Subscribe here

If you have questions or problems with the subscription service, please contact subscriberhelp.govdelivery.com.
Technical questions? Contact inquiries@nist.gov. (301) 975-NIST (6478).

GOVDELIVERY

This service is provided to you at no charge by National Institute of Standards and Technology (NIST). 100 Bureau Drive, Stop 1070 · Gaithersburg, MD 20899 · 301-975-6478

DOCUMENT

Burrus, James N. (Fed)

From: Queen, Michael (Fed)
Sent: Monday, August 13, 2018 8:14 AM
Subject: News Clips from Monday, August 13, 2018

Good Morning. Here are today's news clips.

These clips provide a snapshot of the media's news coverage related to NIST.
For a look at the news NIST is currently promoting, please visit www.nist.gov.
To view previous news clips, visit the NIST in the News forum on the NIST intranet.

Laser Ranging Can 'See' 3D Objects Melting In Fires
Product Design & Development
Researchers at the National Institute of Standards and Technology (NIST) have used a laser detection and ranging (LADAR) system to image three-dimensional (3D) objects melting in flames. The method could offer a precise, safe and compact way to measure structures as they collapse in fires.

LIDAR looks inside fires to help measure structural collapse
The Engineer (UK)
Described in *Optica*, the US National Institute of Standards and Technology (NIST) demonstration used a commercial LIDAR system to map distances to objects melting behind flames that produced varying amounts of soot.

How to help your medical devices meet the UL (and FDA) standard
Security Boulevard
Known vulnerability testing focuses on platform and dependency weaknesses. It involves testing software for vulnerabilities that have already been discovered in products, third-party libraries, and some open source libraries and that are in the National Vulnerability Database (NVD). The NVD is augmented with additional analysis, a database, and a fine-grained search engine, according to NIST, the National Institute of Standards and Technology.

'12345' Is Really Bad: Your Ultimate Guide to Password Security
PC Magazine
The National Institute of Standards and Technology no longer recommends changing passwords every 90 days.

The deep clean: Companies must take measures to safely dispose of data-rich equipment
Crain's Cleveland Business
Although the level of end-of-service data sanitization is industry dependent, the National Institute of Standards and Technology (NIST) offers basic guidelines on what organizations can do to protect themselves.

US House candidates vulnerable to hacks
The Star Online (Malaysia)
A team of four independent researchers led by former National Institutes for Standards and Technology (NIST) security expert Joshua Franklin concluded that the websites of nearly one-third of US House candidates, Democrats and Republicans alike, are vulnerable to attacks.

RoboCup 2018 – S&T Test Methods Used to Evaluate Rescue Robots
Officer.com
Robots in the Public Safety category, RoboCup Rescue, were once again judged according to standards developed by the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) and the National Institute of Standards and Technology (NIST).

NIST FY 2019 Budget Would Eliminate WWV and WWVH
ARRL (American Radio Relay League) News
The National Institute of Standards and Technology (NIST) FY 2019 budget request includes shutting down "NIST radio stations in Colorado and Hawaii" — in other words, WWV and WWVH.

DOCUMENT

Burrus, James N. (Fed)

From: Gomez, Gabriella N. (Fed)
Sent: Monday, August 27, 2018 7:18 AM
Subject: News Clips from Monday, August 27, 2018

Good Morning. Here are today's news clips.

These clips provide a snapshot of the media's news coverage related to NIST.
For a look at the news NIST is currently promoting, please visit www.nist.gov.
To view previous news clips, visit the NIST in the News forum on the NIST intranet.

Tech Industry Pursues a Federal Privacy Law, on Its Own Terms
New York Times
The administration said it intended to have an outline of potential rules by the end of the year. But the timeline could easily be pushed back, as numerous agencies may be involved, including the Commerce Department, the Federal Trade Commission, and the National Institute for Standards and Technology.

What Closing A Government Radio Station Would Mean For Your Clocks
National Public Radio
But a 2019 budget proposal for NIST would close WWV, WWVH in Hawaii and WWVB, which syncs up the time for about 50 million radio-controlled clocks, wristwatches and appliances. Thomas Witherspoon wrote about this on his shortwave listener website, SWLing.com. He joins us from the studios of the CBC in Quebec City.

Time running out on atomic clock station in Fort Collins
Biz West
The National Institute for Standards & Technology based in Boulder may close its time-signal radio station in Fort Collins that broadcasts time and frequency information from its atomic clock in Boulder as part of agency-wide proposed budget cuts.

Senators Stuck in Washington Focus on Elections
NextGov
Whitehouse also urged a major review of the National Institute of Standards and Technology's cybersecurity framework for industry to see if it needs updating.

Hackers Swipe Data On 2 Million T-Mobile Subscribers
Forbes
While that doesn't jive with advice from the NIST (the National Institute of Science and Technology, which no longer deems scheduled changes a best practice), it's certainly a good move following a security incident such as this one.

NIST requests comments on preliminary cloud security practice guide
Inside Cybersecurity (reply for text)
The National Institute of Standards and Technology's National Cybersecurity Center of Excellence announced Friday it is accepting comments on a preliminary draft of a "trusted cloud" cybersecurity practice guide.

New Cybersecurity Law Aims to Help Small Businesses
Fosters.com
This week, the president signed into law the NIST Small Business Cybersecurity Act, S.770. This legislation was originally introduced as the Main Street Cybersecurity Act.

Residents seek answers amid Satellite Beach water concerns
Spectrum News (Channel 13 in Orlando, FL)
According to National Institute of Standards and Technology, West Indian manatees, sea turtles, dolphins and alligators also tested positive for the chemicals.

No, a Teen Did Not Hack a State Election
ProPublica
Josh Franklin, an elections expert formerly at the National Institute of Standards and Technology and a speaker at Def Con, called the websites "fake."

Helping the microchip industry go with the flow
Space Daily
A new study by scientists at the National Institute of Standards and Technology (NIST) has uncovered a source of error in an industry-standard calibration method that could lead microchip manufacturers to lose a million dollars or more in a single fabrication run.

NIST Seeking Comment on E-Commerce Security Practice Guide
MeriTalk
The National Institute of Standards and Technology's (NIST) National Cybersecurity Center of Excellence (NCCoE) is seeking comments on a draft practice guide that explores how multifactor authentication can help reduce fraudulent online purchases.

NIST Publication of STR Sequence Frequency Data Paves Way for NGS in Forensics
Genome Web
In an effort to spur the adoption of next-generation sequencing in forensics, the National Institute of Standards and Technology has published US population sequence data for 27 autosomal short tandem repeats, including the 20 core loci used in the Federal Bureau of Investigation's Combined DNA Index System (CODIS) database.

Everything worth knowing about ... Quantum entanglement
Astronomy Magazine
If you find this very weird and counterintuitive, you're not alone. "I find this very weird and counterintuitive," says [Peter] Bierhorst, a postdoc at the National Institute of Standards and Technology. Albert Einstein felt the same way. Unfortunately for them, experiments have finally showed beyond a reasonable doubt that entanglement exists.

Blocking compromised passwords: How and why to do it
Help Net Security
The challenge with blocking compromised passwords is that you need a continuously updated list of vulnerable passwords to compare user passwords against, which NIST does not provide.

'Squid-inspired' programmable biomaterial switches between insulating and cooling
Market Business News
The invention is the result of a collaboration between the University of Virginia (UVA), Pennsylvania State University, the University of Maryland, and the National Institute of Standards and Technology, all in the United States.

NIST Study Reveals How to Advance Nanoparticle Manufacturing
AZO Nano
"We looked at the big picture of nanoparticle manufacturing to identify problems that are common for different materials, processes and applications. Solving these problems could advance the entire enterprise." Samuel Stavis, NIST physical scientist and lead author

Porter, Gail (Fed)

From: Gomez, Gabriella N. (Fed)
Sent: Monday, August 27, 2018 9:18 AM
Subject: News Clips from Monday, August 27, 2018

Good Morning. Here are today's news clips.

These clips provide a snapshot of the media's news coverage related to NIST.
For a look at the news NIST is currently promoting, please visit www.nist.gov.
To view previous news clips, visit the NIST in the News forum on the NIST intranet.

Tech Industry Pursues a Federal Privacy Law, on Its Own Terms
New York Times
The administration said it intended to have an outline of potential rules by the end of the year. But the timeline could easily be pushed back, as numerous agencies may be involved, including the Commerce Department, the Federal Trade Commission, and the National Institute for Standards and Technology.

What Closing A Government Radio Station Would Mean For Your Clocks
National Public Radio
But a 2019 budget proposal for NIST would close WWV, WWVH in Hawaii and WWVB, which syncs up the time for about 50 million radio-controlled clocks, wristwatches and appliances. Thomas Witherspoon wrote about this on his shortwave listener website, SWLing.com. He joins us from the studios of the CBC in Quebec City.

Time running out on atomic-clock station in Fort Collins
Biz West
The National Institute for Standards & Technology based in Boulder may close its time-signal radio station in Fort Collins that broadcasts time and frequency information from its atomic clock in Boulder as part of agency-wide proposed budget cuts.

Senators Stuck in Washington Focus on Elections
NextGov
Whitehouse also urged a major review of the National Institute of Standards and Technology's cybersecurity framework for industry to see if it needs updating.

Hackers Swipe Data On 2 Million T-Mobile Subscribers
Forbes
While that doesn't jive with advice from the NIST (the National Institute of Science and Technology, which no longer deems scheduled changes a best practice), it's certainly a good move following a security incident such as this one.

NIST requests comments on preliminary cloud security practice guide
Inside Cybersecurity (reply for text)
The National Institute of Standards and Technology's National Cybersecurity Center of Excellence announced Friday it is accepting comments on a preliminary draft of a "trusted cloud" cybersecurity practice guide.

New Cybersecurity Law Aims to Help Small Businesses
Fosters.com
This week, the president signed into law the NIST Small Business Cybersecurity Act, S.770. This legislation was originally introduced as the Main Street Cybersecurity Act.

Residents seek answers amid Satellite Beach water concerns
Spectrum News (Channel 13 in Orlando, FL)
According to National Institute of Standards and Technology, West Indian manatees, sea turtles, dolphins and alligators also tested positive for the chemicals.

No a Teen Did Not Hack a State Election
ProPublica
Josh Franklin, an elections expert formerly at the National Institute of Standards and Technology and a speaker at Def Con, called the websites "fake."

Helping the microchip industry go with the flow
Space Daily
A new study by scientists at the National Institute of Standards and Technology (NIST) has uncovered a source of error in an industry-standard calibration method that could lead microchip manufacturers to lose a million dollars or more in a single fabrication run.

NIST Seeking Comment on E-Commerce Security Practice Guide
MeriTalk
The National Institute of Standards and Technology's (NIST) National Cybersecurity Center of Excellence (NCCoE) is seeking comments on a draft practice guide that explores how multifactor authentication can help reduce fraudulent online purchases.

NIST Publication of STR Sequence Frequency Data Paves Way for NGS in Forensics
Genome Web
In an effort to spur the adoption of next-generation sequencing in forensics, the National Institute of Standards and Technology has published US population sequence data for 27 autosomal short tandem repeats, including the 20 core loci used in the Federal Bureau of Investigation's Combined DNA Index System (CODIS) database.

Everything worth knowing about ... Quantum entanglement
Astronomy Magazine
If you find this very weird and counterintuitive, you're not alone. "I find this very weird and counterintuitive," says [Peter] Bierhorst, a postdoc at the National Institute of Standards and Technology. Albert Einstein felt the same way. Unfortunately for them, experiments have finally showed beyond a reasonable doubt that entanglement exists.

Blocking compromised passwords: How and why to do it
Help Net Security
The challenge with blocking compromised passwords is that you need a continuously updated list of vulnerable passwords to compare user passwords against, which NIST does not provide.

'Squid-inspired' programmable biomaterial switches between insulating and cooling
Market Business News
The invention is the result of a collaboration between the University of Virginia (UVA), Pennsylvania State University, the University of Maryland, and the National Institute of Standards and Technology, all in the United States.

NIST Study Reveals How to Advance Nanoparticle Manufacturing
AZO Nano
"We looked at the big picture of nanoparticle manufacturing to identify problems that are common for different materials, processes and applications. Solving these problems could advance the entire enterprise." Samuel Stavis, NIST physical scientist and lead author

DOCUMENT

Porter, Gail (Fed)

From: Gomez, Gabriella N. (Fed)
Sent: Wednesday, September 05, 2018 9:55 AM
Subject: News Clips from Wednesday, September 5, 2018
Attachments: 3207E.PDF

Good Morning. Here are today's news clips.

These clips provide a snapshot of the media's news coverage related to NIST.
For a look at the news NIST is currently promoting, please visit www.nist.gov.
To view previous news clips, visit the NIST in the News forum on the NIST intranet.

Federal agency to establish privacy framework
The Hill
"Consumers' privacy expectations are evolving at the same time that there are multiplying visions inside and outside the U.S. about how to address privacy challenges," Naomi Lefkovitz, NIST senior privacy policy advisor and lead for the project, said in the release.

The section about NIST (very last one) in the Washington Post *is just a link to the Nextgov article below it.*
The Cybersecurity 202: Five Eyes demand for encryption workarounds raises stakes for tech companies
Washington Post
"The Commerce Department division that developed a 2014 cybersecurity framework for industry will begin work on a privacy framework to help companies protect the personal information of customers and employees," Nextgov's Joseph Marks reported on Tuesday.

NIST's Next Framework Focuses on Protecting Consumers' Privacy
Nextgov
The privacy framework will be modeled on the process of public meetings and feedback mechanisms NIST used to develop its cybersecurity framework, the institute said in a fact sheet.

Snapshot of upcoming botnet mitigation 'roadmap' affirms focus on tackling government systems first
Inside Cybersecurity
Ensuring government leads by example is a priority for officials constructing a strategy document, or "roadmap," for implementing action items to mitigate botnet attacks, according to [NIST's Tim Polk], who said a very early draft of the roadmap is being circulated ...

NIST developing 'voluntary privacy framework' for managing risk
Inside Cybersecurity (reply for text)
[NIST] announced today that it is developing a voluntary privacy framework to help organizations manage risks, with NIST aiming to collect input at an October conference in Texas.

NIST Begins Development of Privacy Framework
MeriTalk (blog)
[NIST] is taking the first steps to develop a privacy framework that balances risk and protections, the agency announced on Tuesday.

NIST Shows Enhanced Tc in Electroplated Rhenium
Superconductor Week (see p. 9 of attached PDF)
A [NIST] research team has demonstrated that electroplated rhenium (Re) films in multilayers with noble metals such as copper, gold and palladium have an enhanced Tc compared to other methods of preparing Re.

Astronomers organizing to save WWV
Swling

The main point of this blog entry: astronomers have been asked to sign the White House petition to maintain NIST station's funding.

Hampton Roads regional flood forecasting project wins national award
HNNDaily
The project was initially funded by [NIST] via a Replicable Smart City Technologies grant. The installation of an additional six sensors over the coming weeks is being funded through an award from Natural Resources Defense Council.

Delaware Business Now
delawarebusinessnow.com
NIIMBL is important because biopharma manufacturing is moving into a new era as breakthroughs are made on specialized treatments for cancer and other diseases that may make current practices and technology obsolete.

DOCUMENT

Burrus, James N. (Fed)

From: Gomez, Gabriella N. (Fed)
Sent: Wednesday, September 5, 2018 7:55 AM
Subject: News Clips from Wednesday, September 5, 2018
Attachments: 3207E.PDF

Good Morning. Here are today's news clips.

These clips provide a snapshot of the media's news coverage related to NIST.
For a look at the news NIST is currently promoting, please visit www.nist.gov.
To view previous news clips, visit the NIST in the News forum on the NIST intranet.

Federal agency to establish privacy framework
The Hill
"Consumers' privacy expectations are evolving at the same time that there are multiplying visions inside and outside the U.S. about how to address privacy challenges," Naomi Lefkovitz, NIST senior privacy policy advisor and lead for the project, said in the release.

The section about NIST (very last one) in the Washington Post *is just a link to the Nextgov article below it.*
The Cybersecurity 202: Five Eyes demand for encryption workarounds raises stakes for tech companies
Washington Post
"The Commerce Department division that developed a 2014 cybersecurity framework for industry will begin work on a privacy framework to help companies protect the personal information of customers and employees," Nextgov's Joseph Marks reported on Tuesday.

NIST's Next Framework Focuses on Protecting Consumers' Privacy
Nextgov
The privacy framework will be modeled on the process of public meetings and feedback mechanisms NIST used to develop its cybersecurity framework, the institute said in a fact sheet.

Snapshot of upcoming botnet mitigation 'roadmap' affirms focus on tackling government systems first
Inside Cybersecurity
Ensuring government leads by example is a priority for officials constructing a strategy document, or "roadmap," for implementing action items to mitigate botnet attacks, according to [NIST's Tim Polk], who said a very early draft of the roadmap is being circulated ...

NIST developing 'voluntary privacy framework' for managing risk
Inside Cybersecurity (reply for text)
[NIST] announced today that it is developing a voluntary privacy framework to help organizations manage risks, with NIST aiming to collect input at an October conference in Texas.

NIST Begins Development of Privacy Framework
MeriTalk (blog)
[NIST] is taking the first steps to develop a privacy framework that balances risk and protections, the agency announced on Tuesday.

NIST Shows Enhanced Tc in Electroplated Rhenium
Superconductor Week (see p. 9 of attached PDF)
A [NIST] research team has demonstrated that electroplated rhenium (Re) films in multilayers with noble metals such as copper, gold and palladium have an enhanced Tc compared to other methods of preparing Re.

Astronomers organizing to save WWV
Swling

The main point of this blog entry: astronomers have been asked to sign the White House petition to maintain NIST stations funding.

Hampton Roads regional flood forecasting project wins national award
HNNDaily
The project was initially funded by [NIST] via a Replicable Smart City Technologies grant. The installation of an additional six sensors over the coming weeks is being funded through an award from Natural Resources Defense Council.

Delaware Business Now
delawarebusinessnow.com
NIIMBL is important because biopharma manufacturing is moving into a new era as breakthroughs are made on specialized treatments for cancer and other diseases that may make current practices and technology obsolete.

DOCUMENT

Porter, Gail (Fed)

From: Lowe, John P. (Fed)
Sent: Wednesday, July 11, 2018 4:18 PM
To: Esser, Mark (Fed); Okayama, Dean T. (Fed); Olthoff, James K. (Fed)
Cc: Nobleman, Andrew L. (Fed); Stein, Ben (Fed); Materese, Robin (Fed); Porter, Gail (Fed); Huergo, Jennifer (Fed)
Subject: Re: Posting "Time on the Beach: Working at NIST Hawaii" on NIST's external blog

Looks good Mark.

From: Esser, Mark (Fed)
Sent: Wednesday, July 11, 2018 3:34 PM
To: Okayama, Dean T. (Fed); Lowe, John P. (Fed); Olthoff, James K. (Fed)
Cc: Nobleman, Andrew L. (Fed); Stein, Ben (Fed); Materese, Robin (Fed); Porter, Gail (Fed); Huergo, Jennifer (Fed)
Subject: Posting "Time on the Beach: Working at NIST Hawaii" on NIST's external blog

Jim, John and Dean,

I hope you are well. I read Andrew's fantastic article about WWVH in Connections, and I thought it would be a great story for subscribers to our external blog, Taking Measure, to learn about.

I tightened up the article up a little and made it more in line with our external style. Please take a day or so to look at the attached, and let me know if you have any comments or concerns.

I'm looking to publish this next Tuesday.

Thanks!

Best,

Mark Esser
Writer/Editor
NIST Public Affairs Office
100 Bureau Drive, MS 1070
Gaithersburg, MD 20899
P: 301-975-8735

DOCUMENT

Porter, Gail (Fed)

From: Esser, Mark (Fed)
Sent: Wednesday, July 11, 2018 3:34 PM
To: Okayama, Dean T. (Fed); Lowe, John P. (Fed); Olthoff, James K. (Fed)
Cc: Nobleman, Andrew L. (Fed); Stein, Ben (Fed); Materese, Robin (Fed); Porter, Gail (Fed); Huergo, Jennifer (Fed)
Subject: Posting "Time on the Beach: Working at NIST Hawaii" on NIST's external blog
Attachments: Time on the Beach_mde_JLH.docx

Jim, John and Dean,

I hope you are well. I read Andrew's fantastic article about WWVH in Connections, and I thought it would be a great story for subscribers to our external blog, Taking Measure, to learn about.

I tightened up the article up a little and made it more in line with our external style. Please take a day or so to look at the attached, and let me know if you have any comments or concerns.

I'm looking to publish this next Tuesday.

Thanks!

Best,

Mark Esser
Writer/Editor
NIST Public Affairs Office
100 Bureau Drive, MS 1070
Gaithersburg, MD 20899
P: 301-975-8735

DOCUMENT

Porter, Gail (Fed)

From: Okayama, Dean T. (Fed)
Sent: Wednesday, July 11, 2018 5:04 PM
To: Esser, Mark (Fed); Lowe, John P. (Fed); Olthoff, James K. (Fed)
Cc: Nobleman, Andrew L. (Fed); Stein, Ben (Fed); Materese, Robin (Fed); Porter, Gail (Fed); Huergo, Jennifer (Fed); wwvh
Subject: Re: Posting "Time on the Beach: Working at NIST Hawaii" on NIST's external blog

Mark,

Looks good... the only comment is we don't provide earthquake alerts. The geophysical alert is in reference to activity from the sun.

https://www.swpc.noaa.gov/products/geophysical-alert-wwv-text

Aloha, Dean

From: Esser, Mark (Fed)
Sent: Wednesday, July 11, 2018 9:34:01 AM
To: Okayama, Dean T. (Fed); Lowe, John P. (Fed); Olthoff, James K. (Fed)
Cc: Nobleman, Andrew L. (Fed); Stein, Ben (Fed); Materese, Robin (Fed); Porter, Gail (Fed); Huergo, Jennifer (Fed)
Subject: Posting "Time on the Beach: Working at NIST Hawaii" on NIST's external blog

Jim, John and Dean,

I hope you are well. I read Andrew's fantastic article about WWVH in Connections, and I thought it would be a great story for subscribers to our external blog, Taking Measure, to learn about.

I tightened up the article up a little and made it more in line with our external style. Please take a day or so to look at the attached, and let me know if you have any comments or concerns.

I'm looking to publish this next Tuesday.

Thanks!

Best,

Mark Esser
Writer/Editor
NIST Public Affairs Office
100 Bureau Drive, MS 1070.
Gaithersburg, MD 20899
P: 301-975-8735

Porter, Gail (Fed)

From: Wilkinson, Richard (Fed)
Sent: Friday, July 06, 2018 3:34 PM
To: Stoughton, Jason C. (Fed); Porter, Gail (Fed)
Subject: FW: Thank you

Jason and Gail,

Here's a nice email from the chief of the Hawaii radio station.

Richad

From: Okayama, Dean T. (Fed)
Sent: Friday, July 06, 2018 3:22 PM
To: Wilkinson, Richard (Fed) <richard.wilkinson@nist.gov>; Takamatsu, Dean T. (Fed) <dean.takamatsu@nist.gov>; Fujita, Chris J. (Fed) <chris.fujita@nist.gov>; Ochinang, Adela Mae P. (Fed) <adele.ochinang@nist.gov>; Lowe, John P. (Fed) <john.lowe@nist.gov>; Oates, Chris (Fed) <chris.oates@nist.gov>
Cc: Nobleman, Andrew L. (Fed) <andrew.nobleman@nist.gov>
Subject: Re: Thank you

Andrew and Richard,

Thanks for the great article about our station.

The best kept secret is out...

Aloha, Dean

From: Wilkinson, Richard (Fed)
Sent: Friday, July 6, 2018 7:11:08 AM
To: Okayama, Dean T. (Fed); Takamatsu, Dean T. (Fed); Fujita, Chris J. (Fed); Ochinang, Adela Mae P. (Fed); Lowe, John P. (Fed); Oates, Chris (Fed)
Cc: Nobleman, Andrew L. (Fed)
Subject: Thank you

Dean, Dean, Chris, Adela Mae, John, and Chris,

Greetings from Public Affairs. We've posted Andrew Nobleman's article about WWVH and its staff on NIST's internal website at https://inet.nist.gov/nist-connections/time-beach-working-nist-hawaii.

Since Andrew is on leave today, I thought I'd send you this FYI about the article posting.

Thanks for working with Andrew on this article, and thank you for your work for NIST and the nation.

Richard
Public Affairs
301-975-5040

Time on the Beach: Working at NIST Hawaii

The National Institute of Standards and Technology (NIST) has campuses in Maryland, Colorado, South Carolina and Hawaii.

Now, I know what you're thinking, "Hawaiian campus? How do I get a job at NIST?"

Perhaps calling it a "campus" is a bit of an exaggeration. Ensconced within the U.S. Navy's Pacific Missile Range Facility on the western Hawaiian island of Kauai (pronounced ka-why-ee), sits one of NIST's shortwave radio stations, perhaps best known by its call sign, WWVH.

Kauai is a beautiful and remote island with unique climate diversity. In the middle of the island, you have one of the wettest places on Earth, Mount Waialeale (pronounced why-ah-lay-ah-lay), which receives an average of 1148 centimeters (452 inches) of rain per year. Twenty-five kilometers away, the island's western coast gets a mere 56 cm (22 inches) of rain per year. This is where you will find the NIST radio station.

WWVH's main objective is to broadcast Coordinated Universal Time (UTC)—the official time for the entire planet—throughout the Pacific region. Those signals help their audience coordinate, calibrate and synchronize their clocks and equipment, which are vital to telecommunications, internet connections and a whole host of other services.

In addition to accurate time and frequency information, the station also broadcasts weather alerts and reports of earthquakes and other geophysical activity.

"At the tone ..."

From Alaska to Australia and from California to China, if you tune your receiver to WWVH, you'll hear Jane Barbe speaking to you. If you don't already know her by name, you may know her voice. It was her recorded voice that in past decades told callers who left their phones off the hook for too long (ask your parents), "If you'd like to make a call, please hang up and try again. If you need help, hang up and then dial your operator."

Although Barbe died in 2003, her beloved voice lives on.

WWVH actually broadcasts her voice using several different frequencies: 2.5, 5, 10 and 15 megahertz. The different frequencies cast a wide net, so that users of the broadcast will receive a signal regardless of interference from mountains, atmospheric activity or the time of day. This technique allows users to always have access to the correct time as well as the other information provided by WWVH.

WWVH's sister station, WWV, broadcasts out of Ft. Collins, Colorado. Both stations broadcast on the same frequencies. While WWVH uses Barbe's voice, WWV uses that of former San Francisco radio host Lee Rodgers, who died in 2013. If the ionospheric conditions are just right, users can hear both stations. In addition to using different voices, WWVH and WWV make their announcements at different time intervals to prevent overlap and confusion.

Why Hawaii?

In 1947, NIST determined it needed to create a second station to supplement WWV and expand its coverage area to the Pacific rim. The WWVH broadcast station was originally built at Kihei on the

Hawaiian island of Maui in 1948. After 20 years, however, the encroaching ocean began damaging the property and equipment. So, in 1971 WWVH moved nearly 322 km (200 miles) west to its current home on Kauai. This more-westerly location proved to be ideal, as it allowed the station's signal to reach even more distant locales.

At one point, there were nine employees at WWVH, including an on-site groundskeeper for the station's 12 hectares (30 acres). Back then, the station was manned around the clock, but automation has whittled the staff down to four, who are now responsible for all station and land maintenance.

Taken together, engineer Dean Okayama, electrical technician Dean Takamatsu, electrical technician Chris Fujita, and administrative assistant Adela Mae Ochinang, have nearly 100 years of experience operating the facility.

In addition to the staff on location, John Lowe, leader of the Time and Frequency Services Group at NIST's Boulder, Colorado, campus, manages WWVH and WWV as well as the long-wave station WWVB, which is also in Fort Collins.

The pros and cons of 'paradise'

"Oh, you're going to go out to Hawaii. Lucky you, you get the easy work," is something Lowe has heard often from his fellow NISTers. He says he seldom explains the intense labor he puts in while on Kauai because people don't believe him anyway. He comes to the station at least once every two years, and the staff capitalizes on the extra set of hands by saving challenging projects for his visits.

In addition to Lowe's visits, there is a yearly rotation of staff between WWV and WWVH for continuity purposes in case of an emergency. Fujita says the exchange "usually involves more work at the Kauai location than the Ft. Collins location due to shorthandedness on Kauai, but nothing a few beers can't fix after work."

The marine environment, while great for beach relaxation, poses a constant challenge for the station. The salty air and heat have literally caused the transmitters to catch fire! One time when that happened, the naval base's fire department was alerted before the radio station staff was. Unfortunately, the firefighters put out the fire with a dry chemical agent, a corrosive material that rendered the transmitter useless. Shortly after replacing that transmitter, its backup failed. Fujita says, "It feels like we're chasing transmitters. Once you replace one, it seems like you have to replace another."

Despite all the staff's projects and problems, they maintain a 98 percent on-air rate, which, according to Lowe, is amazingly good. Someone is always on call, and it's all-hands-on-deck during inclement weather, such as the April 14-15, 2018, monster storm that deluged the northern part of the island with 127 cm (50 inches) of rain in 24 hours, but which thankfully spared the area around WWVH. Checks are done daily to ensure the broadcasts are in close agreement with the UTC.

For Okayama, these major responsibilities translate into passion for the job. If Monday is a holiday, he has to be reminded on Friday not to come in.

For the staff, the work is both fascinating and challenging. But what about all the fun that comes with working right next to a Hawaiian beach?

Surf's up?

When the clock strikes noon, Fujita packs up his gear and walks down to the beach carrying a surfboard to catch some killer waves. He and Takamatsu have been excitedly eyeing the waves since the moment they walked in that morning.

At least that's what would happen on TV.

The reality is much more in line with what happens at the other NIST locations: You go to the lunchroom to eat your packed lunch. When Okayama is asked if they spend their lunch break on the beach, he laughs. "It's like asking someone who lives next to Disneyland if they go every day," he says. "We don't eat outside and lay under the palm trees. It's hot and humid. There are bugs flying around."

You would expect Lowe to soak up some rays during lunch on his occasional visits, but he is adamant that he runs for the air conditioning when the clock strikes noon. He believes it's a unique place to work, but the blistering sun isn't exactly comfortable.

Not to say that no one has ever surfed during lunch. Fujita tried it once, but says, "It's too cumbersome to go to the beach at lunch. To change and get all your stuff ready, walk to the beach, wax the board, maybe get one or two waves, then come back and shower. It's cutting it close."

The Kauai life

Outside of work, life on Kauai is generally more laid back than the mainland or even the larger islands of Hawaii.

Although it sounds great, living in a tropical paradise is not for everyone. Many of those who move to Hawaii succumb to "rock fever," the claustrophobia that comes from being on a small island.

Fujita and Ochinang were both born on Kauai, and though they left for a few years, coming back was easy. Okayama and Takamatsu are both from Honolulu, which is on the island of Oahu, the third largest Hawaiian island. Still, they seem to have acclimated well to life on a tinier island. Kauai reminds Okayama of a quieter Oahu in the 1960s, when his family used to camp peacefully under the stars at the beach. Takamatsu's father was from Kauai, so in a way, it feels like he's returned to his roots.

The Kauai lifestyle and close working quarters have created a family atmosphere. They all take care of each other and no one wants to leave. Ochinang has been at WWVH for 35 years and doesn't plan on going anywhere. "Sometimes people joke around," she says, "but sorry, this is a good place to work and I'm not retiring anytime soon!"

So, if you want a job there, you'll have to hang up and try again later.

A visit from the boss

In its entire history, WWVH had never had a visit from the director of NIST. But that changed on March 7, 2018, when newly minted NIST director Walter Copan and his wife, who were on a long-planned Hawaiian vacation, took the opportunity to stop by the site.

"The WWVH team are truly NISTers, and they are our ambassadors of metrology on America's westernmost shores," says Copan. "The WWVH team was also recognized by a 2008 NIST Bronze Medal, now on display in their entrance hallway, for the development and installation of a new antenna array

by the employees themselves. Their work is a true example of the NIST values, which include perseverance and inclusivity."

It was a great experience to interact with the NIST director, says Ochinang. Copan shared with them his vision for NIST's future and some interesting things about himself, like the fact that he is a trained opera singer.

When asked if they took advantage of the extra body to get more work done, Fujita says, "We did not subject the NIST director to intense manual labor, no. That wouldn't be good ... especially not on his first visit." Fujita adds that, since the Copans' vacation was not a government-sponsored trip, "We would have to reimburse him for work performed."

I guess they'll have to wait until Lowe is back in town.

DOCUMENT

Porter, Gail (Fed)

From: Queen, Michael (Fed)
Sent: Monday, August 13, 2018 10:14 AM
Subject: News Clips from Monday, August 13, 2018

Good Morning. Here are today's news clips.

These clips provide a snapshot of the media's news coverage related to NIST.
For a look at the news NIST is currently promoting, please visit www.nist.gov.
To view previous news clips, visit the NIST in the News forum on the NIST intranet.

Laser Ranging Can 'See' 3D Objects Melting In Fires
Product Design & Development
Researchers at the National Institute of Standards and Technology (NIST) have used a laser detection and ranging (LADAR) system to image three-dimensional (3D) objects melting in flames. The method could offer a precise, safe and compact way to measure structures as they collapse in fires.

LIDAR looks inside fires to help measure structural collapse
The Engineer (UK)
Described in *Optica*, the US National Institute of Standards and Technology (NIST) demonstration used a commercial LIDAR system to map distances to objects melting behind flames that produced varying amounts of soot.

How to help your medical devices meet the UL (and FDA) standard
Security Boulevard
Known vulnerability testing focuses on platform and dependency weaknesses. It involves testing software for vulnerabilities that have already been discovered in products, third-party libraries, and some open source libraries and that are in the National Vulnerability Database (NVD). The NVD is augmented with additional analysis, a database, and a fine-grained search engine, according to NIST, the National Institute of Standards and Technology.

'12345' Is Really Bad: Your Ultimate Guide to Password Security
PC Magazine
The National Institute of Standards and Technology no longer recommends changing passwords every 90 days.

The deep clean: Companies must take measures to safely dispose of data-rich equipment
Crain's Cleveland Business
Although the level of end-of-service data sanitization is industry dependent, the National Institute of Standards and Technology (NIST) offers basic guidelines on what organizations can do to protect themselves.

US House candidates vulnerable to hacks
The Star Online (Malaysia)
A team of four independent researchers led by former National Institutes for Standards and Technology (NIST) security expert Joshua Franklin concluded that the websites of nearly one-third of US House candidates, Democrats and Republicans alike, are vulnerable to attacks.

RoboCup 2018 - S&T Test Methods Used to Evaluate Rescue Robots
Officer.com
Robots in the Public Safety category, RoboCup Rescue, were once again judged according to standards developed by the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) and the National Institute of Standards and Technology (NIST).

NIST FY 2019 Budget Would Eliminate WWV and WWVH
ARRL (American Radio Relay League) News
The National Institute of Standards and Technology (NIST) FY 2019 budget request includes shutting down "NIST radio stations in Colorado and Hawaii" — in other words, WWV and WWVH.

DOCUMENT

Porter, Gail (Fed)

From: National Institute of Standards and Technology (NIST) <subscriptions@service.govdelivery.com>
Sent: Tuesday, July 17, 2018 3:02 PM
To: Porter, Gail (Fed)
Subject: Time on the Beach: Working at NIST Hawaii

Time on the Beach: Working at NIST Hawaii

The National Institute of Standards and Technology (NIST) has campuses in Maryland, Colorado, South Carolina and Hawaii.

Now, I know what you're thinking, "Hawaiian campus? How do I get a job at NIST?"

Perhaps calling it a "campus" is a bit of an exaggeration. Ensconced within the U.S. Navy's Pacific Missile Range Facility on the western Hawaiian island of Kauai (pronounced ka-why-ee), sits one of NIST's shortwave radio stations, perhaps best known by its call sign, WWVH.

Read More

You are subscribed to receive updates to Electronics & Telecommunications, Information Technology, Physics or the Taking Measure blog from the National Institute of Standards and Technology (NIST).

Questions? Contact Us

STAY CONNECTED:

SUBSCRIBER SERVICES:
Manage Preferences | Unsubscribe | Help

If you have questions or problems with the subscription service, please contact subscriberhelp.govdelivery.com.
Technical questions? Contact inquiries@nist.gov. (301) 975-NIST (6478).

This service is provided to you at no charge by National Institute of Standards and Technology (NIST). 100 Bureau Drive, Stop 1070 · Gaithersburg, MD 20899 · 301-975-6478

Porter, Gail (Fed)

From: Porter, Gail (Fed)
Sent: Thursday, May 24, 2018 12:20 PM
To: Wilkinson, Richard (Fed)
Subject: RE: Hawaii article we'll run on the internal website
Attachments: WWVH Story (Submission Draft) v02 AN 2 comments from Dean O_GP.docx

Sorry. See attached.

From: Wilkinson, Richard (Fed)
Sent: Thursday, May 24, 2018 12:16 PM
To: Porter, Gail (Fed) <gail.porter@nist.gov>
Subject: RE: Hawaii article we'll run on the internal website

Those are copyedits from Hawaii staff.

We, of course, edited the piece quite a bit. But it was well written by Andrew, with a nice blend of information and personal detail.

(If, when you say "See a question or two and a few copyedits" you mean some questions and edits that you added, then you didn't attach the file with your questions and edits.)

Richard

From: Porter, Gail (Fed)
Sent: Thursday, May 24, 2018 10:57 AM
To: Wilkinson, Richard (Fed) <richard.wilkinson@nist.gov>
Subject: RE: Hawaii article we'll run on the internal website

Very nice piece. How much did you have to edit it? See a question or to and a few copyedits.

Thanks,
Gail

From: Wilkinson, Richard (Fed)
Sent: Thursday, May 24, 2018 9:49 AM
To: Porter, Gail (Fed) <gail.porter@nist.gov>
Subject: Hawaii article we'll run on the internal website

I believe I've already sent you this article we'll be running on the Hawaii campus. John Lowe likes it a lot.

Richard

DOCUMENT

Porter, Gail (Fed)

From: Wilkinson, Richard (Fed)
Sent: Thursday, May 24, 2018 9:49 AM
To: Porter, Gail (Fed)
Subject: Hawaii article we'll run on the internal website
Attachments: WWVH Story (Submission Draft) v02 AN 2 comments from Dean O.docx

I believe I've already sent you this article we'll be running on the Hawaii campus. John Lowe likes it a lot.

Richard

DOCUMENT

Porter, Gail (Fed)

From: Wilkinson, Richard (Fed)
Sent: Thursday, May 24, 2018 3:49 PM
To: Porter, Gail (Fed)
Subject: RE: Hawaii article we'll run on the internal website

Gail,

I got the answers to the questions you asked in the WWVH article. I asked the woman there what her formal title is, and she said it's "secretary." Also, I asked the other questions you asked, and updated the article.

I'm going to let Jason handle the question of asking Andrew if he got permission from his boss to write for Connections.

Richard

From: Porter, Gail (Fed)
Sent: Thursday, May 24, 2018 12:20 PM
To: Wilkinson, Richard (Fed) <richard.wilkinson@nist.gov>
Subject: RE: Hawaii article we'll run on the internal website

Sorry. See attached.

From: Wilkinson, Richard (Fed)
Sent: Thursday, May 24, 2018 12:16 PM
To: Porter, Gail (Fed) <gail.porter@nist.gov>
Subject: RE: Hawaii article we'll run on the internal website

Those are copyedits from Hawaii staff.

We, of course, edited the piece quite a bit. But it was well written by Andrew, with a nice blend of information and personal detail.

(If, when you say "See a question or two and a few copyedits" you mean some questions and edits that you added, then you didn't attach the file with your questions and edits.)

Richard

From: Porter, Gail (Fed)
Sent: Thursday, May 24, 2018 10:57 AM
To: Wilkinson, Richard (Fed) <richard.wilkinson@nist.gov>
Subject: RE: Hawaii article we'll run on the internal website

Very nice piece. How much did you have to edit it? See a question or to and a few copyedits.

Thanks,
Gail

From: Wilkinson, Richard (Fed)
Sent: Thursday, May 24, 2018 9:49 AM
To: Porter, Gail (Fed) <gail.porter@nist.gov>
Subject: Hawaii article we'll run on the internal website

I believe I've already sent you this article we'll be running on the Hawaii campus. John Lowe likes it a lot.

Richard

DOCUMENT

Porter, Gail (Fed)

From: Porter, Gail (Fed)
Sent: Thursday, May 24, 2018 4:20 PM
To: Wilkinson, Richard (Fed)
Subject: RE: Hawaii article we'll run on the internal website

Okay. Thanks.

From: Wilkinson, Richard (Fed)
Sent: Thursday, May 24, 2018 3:49 PM
To: Porter, Gail (Fed) <gail.porter@nist.gov>
Subject: RE: Hawaii article we'll run on the internal website

Gail,

I got the answers to the questions you asked in the WWVH article. I asked the woman there what her formal title is, and she said it's "secretary." Also, I asked the other questions you asked, and updated the article.

I'm going to let Jason handle the question of asking Andrew if he got permission from his boss to write for Connections.

Richard

From: Porter, Gail (Fed)
Sent: Thursday, May 24, 2018 12:20 PM
To: Wilkinson, Richard (Fed) <richard.wilkinson@nist.gov>
Subject: RE: Hawaii article we'll run on the internal website

Sorry. See attached.

From: Wilkinson, Richard (Fed)
Sent: Thursday, May 24, 2018 12:16 PM
To: Porter, Gail (Fed) <gail.porter@nist.gov>
Subject: RE: Hawaii article we'll run on the internal website

Those are copyedits from Hawaii staff.

We, of course, edited the piece quite a bit. But it was well written by Andrew, with a nice blend of information and personal detail.

(If, when you say "See a question or two and a few copyedits" you mean some questions and edits that you added, then you didn't attach the file with your questions and edits.)

Richard

From: Porter, Gail (Fed)
Sent: Thursday, May 24, 2018 10:57 AM

To: Wilkinson, Richard (Fed) <richard.wilkinson@nist.gov>
Subject: RE: Hawaii article we'll run on the internal website

Very nice piece. How much did you have to edit it? See a question or to and a few copyedits.

Thanks,
Gail

From: Wilkinson, Richard (Fed)
Sent: Thursday, May 24, 2018 9:49 AM
To: Porter, Gail (Fed) <gail.porter@nist.gov>
Subject: Hawaii article we'll run on the internal website

I believe I've already sent you this article we'll be running on the Hawaii campus. John Lowe likes it a lot.

Richard

NIST Connections

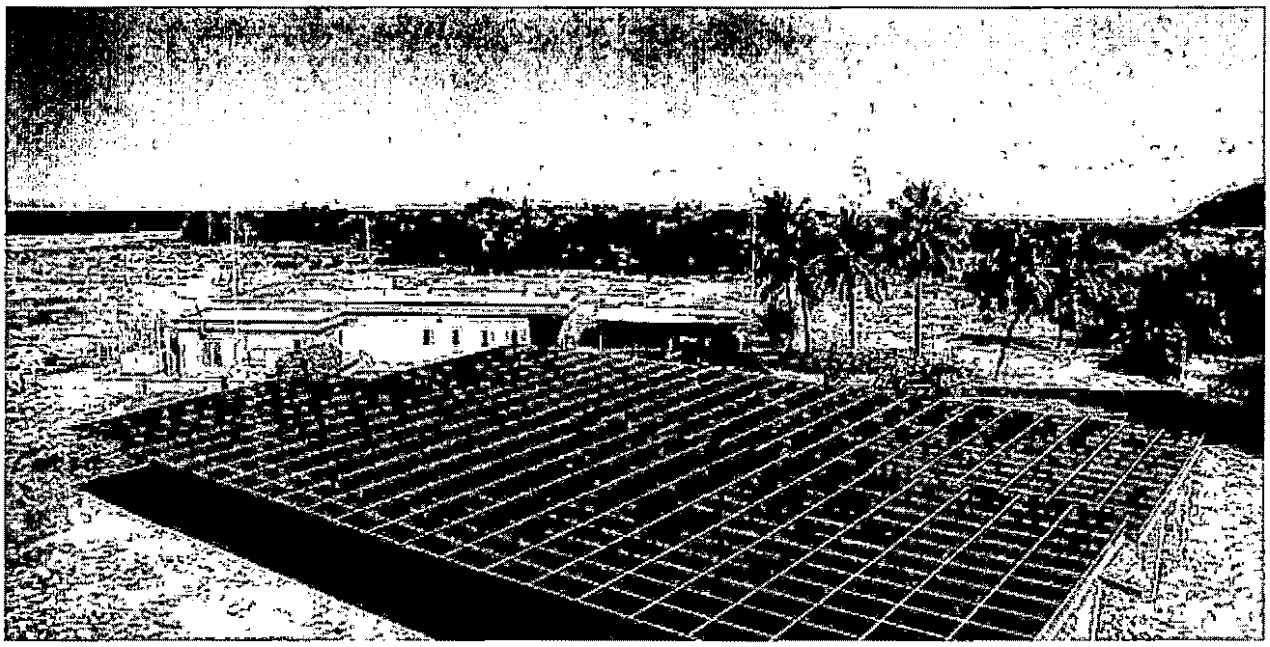
News, Information and Insight for NIST Employees and Associates

Safety at NIST: 10 Years After the Plutonium Incident

Safety at NIST has come a long way since 2008 and we can still get better.

A Q&A with Eric Lin on His Goals for MML

Lin took the helm of MML in early 2018. We talk with him about his vision for the lab, tech transfer, and basketball.



Time on the Beach: Working at NIST Hawaii

Just four NIST staff members operate NIST's WWVH radio station in Kauai, a beacon of time for nearly half the planet.

A Massive New Solar Array Coming This Year

Bigger than 11 football fields, the new array will provide 4 percent of NIST Gaithersburg's energy and over $3.5 million in savings.

The Tangled Tale of NIST's Newton Apple Tree

The tree from which the theory of gravity descended has more than a few descendants of its own.

Do You Want to Write for NIST Connections?

The NIST Public Affairs Office is currently hiring for a writer-editor to join the internal communications group.

To learn more and apply visit USAJobs.gov.

Applications must be submitted to USAjobs.gov by July 23, 2018.

NIST IN THE NEWS

CNET:

Forget bitcoin. The US government is building a better nickel

Science and Technology Research News:

NIST Researchers Simulate Simple Logic for Nanofluidic Computing

Inside Science:

A Quantum Way to Synchronize Atomic Clocks

Science Magazine:

Why are countries creating public random number generators?

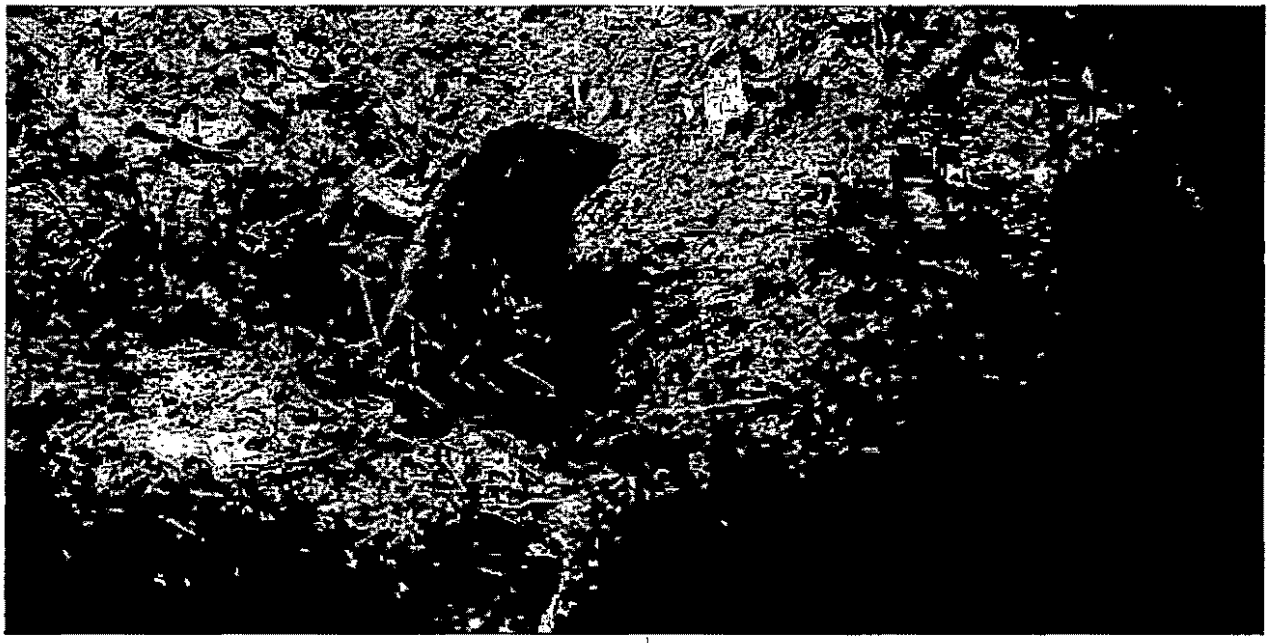
Science Magazine:

Quantum physics gets attention—and brighter funding prospects—in Congress

But wait, there's more science!

Visit the NIST in the News forum on the NIST intranet for more.

AROUND CAMPUS



A young groundhog ventures out of its burrow in the lawn next to the Gaithersburg-campus Administration Building in June. NIST staff frequently stop in the windowed hallway to see what the little guys are up to.

UPCOMING EVENTS

Town Hall Meeting

July 12

Please join us for a Town Hall meeting with NIST Director Walter Copan. The town hall will cover a number of subjects including an update on NIST's budget and priorities, recognition of recent staff accomplishments, and the Return on Investment (ROI) initiative.

Allen V. Astin: A Legacy of Integrity

July 31

Allen Astin served as director of NBS from 1951 to 1969, making him the second-longest-serving director in NIST's history. But it was his leadership of the agency through the tumultuous AD-X2 battery-additive scandal that solidified his and NIST's reputation for honesty and integrity. Come hear his sons, **John Astin** and **Alexander Astin**, share their stories about NBS in the mid-20th century and what it was like when their father was fired and then reinstated for his refusal to alter NBS results.

Did you miss a NIST event?

Visit NISTube to view previous NIST talks and events.

ANNOUNCEMENTS

From the Public Affairs Office:

New Peer Appreciation Forum

From the Office of Information Systems Management:

New Service Desk (CIC and iTAC) Operational Hours

From the NIST Library:

Newton's Apple Tree is featured in Atlas Obscura

From the Physical Measurement Laboratory:

Call for Volunteers for Vision Experiments on Color Perception and LED Lighting

Looking for more stories?

Visit NIST Connections on the NIST intranet to read more.

Contact *NIST Connections*

Editor: Richard Wilkinson

Director of Internal Communications: Jason Stoughton

NIST Connections is produced by the NIST Public Affairs Office

Porter, Gail (Fed)

From: Okayama, Dean T. (Fed)
Sent: Wednesday, July 11, 2018 5:59 PM
To: Esser, Mark (Fed); Lowe, John P. (Fed); Olthoff, James K. (Fed)
Cc: Nobleman, Andrew L. (Fed); Stein, Ben (Fed); Materese, Robin (Fed); Porter, Gail (Fed); Huergo, Jennifer (Fed); wwvh
Subject: Re: Posting "Time on the Beach: Working at NIST Hawaii" on NIST's external blog

The term space weather is probably more accurate.

https://www.nist.gov/pml/time-and-frequency-division/time-services/wwv-and-wwvh-digital-time-code-and-broadcast-format

Aloha, Dean

From: Esser, Mark (Fed)
Sent: Wednesday, July 11, 2018 11:09:50 AM
To: Okayama, Dean T. (Fed); Lowe, John P. (Fed); Olthoff, James K. (Fed)
Cc: Nobleman, Andrew L. (Fed); Stein, Ben (Fed); Materese, Robin (Fed); Porter, Gail (Fed); Huergo, Jennifer (Fed); wwvh
Subject: RE: Posting "Time on the Beach: Working at NIST Hawaii" on NIST's external blog

Dean,

Great! I will fix that. Seeing as I mistakenly thought "geophysical activity" referred to earthquakes, can I make it "solar activity" or "space weather"?

mde

From: Okayama, Dean T. (Fed)
Sent: Wednesday, July 11, 2018 5:04 PM
To: Esser, Mark (Fed) <mark.esser@nist.gov>; Lowe, John P. (Fed) <john.lowe@nist.gov>; Olthoff, James K. (Fed) <james.olthoff@nist.gov>
Cc: Nobleman, Andrew L. (Fed) <andrew.nobleman@nist.gov>; Stein, Ben (Fed) <benjamin.stein@nist.gov>; Materese, Robin (Fed) <robin.materese@nist.gov>; Porter, Gail (Fed) <gail.porter@nist.gov>; Huergo, Jennifer (Fed) <jennifer.huergo@nist.gov>; wwvh <wwvh@nist.gov>
Subject: Re: Posting "Time on the Beach: Working at NIST Hawaii" on NIST's external blog

Mark,

Looks good... the only comment is we don't provide earthquake alerts. The geophysical alert is in reference to activity from the sun.

https://www.swpc.noaa.gov/products/geophysical-alert-wwv-text

Geophysical Alert - WWV text | NOAA / NWS Space Weather ...

www.swpc.noaa.gov

The geophysical alerts provide information about the current conditions for long distance HF radio communications. The alerts use a standardized format and terminology and includes:

Aloha, Dean

From: Esser, Mark (Fed)
Sent: Wednesday, July 11, 2018 9:34:01 AM
To: Okayama, Dean T. (Fed); Lowe, John P. (Fed); Olthoff, James K. (Fed)
Cc: Nobleman, Andrew L. (Fed); Stein, Ben (Fed); Materese, Robin (Fed); Porter, Gail (Fed); Huergo, Jennifer (Fed)
Subject: Posting "Time on the Beach: Working at NIST Hawaii" on NIST's external blog

Jim, John and Dean,

I hope you are well. I read Andrew's fantastic article about WWVH in Connections, and I thought it would be a great story for subscribers to our external blog, Taking Measure, to learn about.

I tightened up the article up a little and made it more in line with our external style. Please take a day or so to look at the attached, and let me know if you have any comments or concerns.

I'm looking to publish this next Tuesday.

Thanks!

Best,

Mark Esser
Writer/Editor
NIST Public Affairs Office
100 Bureau Drive, MS 1070
Gaithersburg, MD 20899
P: 301-975-8735

DOCUMENT

Porter, Gail (Fed)

From: wwv
Sent: Thursday, August 23, 2018 5:40 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: Google Alert - WWV

From: Google Alerts <googlealerts-noreply@google.com>
Sent: Tuesday, August 14, 2018 2:00 AM
To: wwv <wwv@nist.gov>
Subject: Google Alert - WWV

WWV

As-it-happens update · August 14, 2018

NEWS

NIST FY 2019 Budget Would Eliminate **WWV** and WWVH

ARRL

NIST said eliminating funding currently "supporting fundamental measurement dissemination" would include putting **WWV** and WWVH off the air for a ...

Flag as irrelevant

DOCUMENT

Porter, Gail (Fed)

From: wwv
Sent: Thursday, August 23, 2018 5:49 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: Google Alert - WWV

From: Google Alerts <googlealerts-noreply@google.com>
Sent: Tuesday, August 21, 2018 11:09 PM
To: wwv <wwv@nist.gov>
Subject: Google Alert - WWV

WWV

As-it-happens update · August 22, 2018

NEWS

Concern Rising within Amateur Radio Community over **WWV**-WWVH Shut Down Proposal

ARRL

ARRL members and Amateur Radio clubs are expressing increased concern over the inclusion of **WWV** and WWVH on a list of proposed cuts in the ...

Flag as irrelevant

The Death of Old Time? – NIST Cutting **WWV**

Inside GNSS

NIST radio station **WWV** has a long and storied history that dates back to the very beginning of radio broadcasting. The call letters **WWV** were ...

What Will You Do If WWVB Goes Silent? - Hackaday

Full Coverage

Flag as irrelevant

NIST Slashes Measurement Budgets

EE Times

The FY2019 budget includes the shutting down of time and frequency standard broadcasts from Ft. Collins, Colorado (**WWV**) and Kaua'i, Hawaii ...

Flag as irrelevant

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-0001

This letter is an interim response to your September 9, 2018 Freedom of Information Act (FOIA) request, Log # DOC-NIST- 2018-002060, to the National Institute of Standards and Technology (NIST) for:

> FIRST, I request a copy of each memo or report at NIST discussing the potential shutdown of the WWV and WWVH shortwave radio time signals operated by NIST in Boulder, Colorado.
>
> SECOND, I also request a copy of emails at the applicable offices of NIST that mention WWV and/or WWVH. By applicable offices of NIST I mean:
>
> NIST Office of the Director
> NIST Time and Frequency Division (Boulder, Colorado)
> NIST Public and Business Affairs Office
> Boulder Public Affairs (Boulder, Colorado)

NIST has conducted a search of our files and located some of the records responsive to your FOIA request. Enclosed you will find eighteen (18) responsive documents consisting of eighty (80) pages that are being released in their entirety.

NIST is continuing the process of searching for additional documents related to your request.

Thank you for your patience. We will continue to send you releasable documents on a rolling basis as they become available.

Sincerely,

CATHERINE FLETCHER Digitally signed by CATHERINE FLETCHER
Date: 2020.07.30 14:30:53 -04'00'

Catherine S. Fletcher
Freedom of Information Act Officer

Enclosures

NIST

From: Okayama, Dean T. (Fed)
To: Oates, Chris (Fed)
Cc: wwvh
Subject: RE: Civility Training
Date: Tuesday, January 02, 2018 12:52:57 PM

Chris,

How will this work for the Hawaii station?

Aloha, Dean

From: Oates, Chris (Fed)
Sent: Tuesday, January 2, 2018 8:21 AM
To: Division 6
Subject: Civility Training

Hi all,

Happy New Year greetings to all! During the past year I have, on occasion, used the Division Chief soapbox to encourage our folks to offer a counterweight to the incivility, alternative facts, etc. that we see so visibly in our public discourse these days. I have exhorted you to go out of your way to support your colleagues and to be on the lookout to make that extra effort to lift up those around you.

Included in this vision is of course "Civility", that is, treating other people fairly and generously. In the professional workplace it is not always clear which types of behavior, even well-intentioned, are appropriate. Jeremy Lawson, from NIST Ethics, is providing training on his importance issue in January:

Civility at Work: Why, When & How

In this hour-long workshop, we'll:

* Discuss what's at stake if civility thrives or erodes at work
* Evaluate how workplace norms, life changes, and professional training complicate matters
* Share practices, rituals, and habits that make respect easier to give and receive

The purpose of this training is to have a dialog on positive behavior at work.

There will be two opportunities to attend this training on January 11th
1:30 PM – 2:30 PM both in rooms 1-1103/05
3:00 PM – 4:00 PM

I strongly encourage folks to attend one of these sessions. I have heard good things about the training, as it guides you on what to do, not just on what not to do. Jeremy does a good job and is extremely responsive to questions. Please feel free to contact me with any questions.

Just to keep track of expected numbers, please let Katy know if and when you plan to attend. I hope to see many of you there!

I wish a happy, healthy New Year to you and yours, full of kindness and civility!

Chris

Dr. Chris Oates, Chief

Time and Frequency Division
Physical Measurement Laboratory
National Institute of Standards and Technology
Boulder, CO 80305
303-497-7654

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: closure question response
Date: Tuesday, September 18, 2018 11:40:41 AM
Attachments: Official response to closure questions.docx

From: Nelson, Glenn (Fed)
Sent: Thursday, August 23, 2018 9:08 AM
To: Deutch, Matthew J. (Fed); Sutton, Douglas (Fed); Yates, William (Fed)
Cc: Nelson, Glenn (Fed); Lowe, John P. (Fed)
Subject: closure question response

John asks that we use the attached response to questions about closure.

Glenn Nelson
Electronics Technician
National Institute of Standards and Technology
Radio Stations WWV/WWVB
5701 N. Hwy 1
Fort Collins, CO 80524
Tel: 303-497-3914, x4036
Alt: 970-484-2372, x4036

NIST has a long-standing history of providing time and frequency services through our radio stations and we appreciate that many people use these services. NIST's WWV is the longest continuously-operating radio service in the U.S. At the same time, the proposed NIST budget for FY 2019 required difficult choices about budget priorities.

The President's full NIST FY 2019 budget request to the Congress is available at the link below, including a brief description of why the shutdown of NIST's time and frequency radio stations is proposed. The proposal includes shutdown of NIST's three radio stations, WWV, WWVH, and WWVB, which communicate with consumer clocks, watches, broadcasting systems and other devices. It is important to note that no changes to NIST services have occurred, and if the proposal were to be implemented, public notice would be provided.

http://www.osec.doc.gov/bmi/budget/FY19CBJ/NIST_and_NTIS_FY2019_President's_Budget_for_508_comp.pdf. See page NIST-25.

Here is a link to the NIST Budget Table for the FY2019 Presidential Request.

Also, for context, it may be helpful to view links to press releases issued in May and June 2018 by the U.S. House of Representatives and the Senate Committees on Appropriations about the FY2019 budget process.

House

Senate

D. Time Uncertainty of Received Radio Signals

The NIST radio stations are used primarily for time-of-day information, since most applications requiring precise time synchronization now rely on GPS, which can provide time synchronization uncertainties much smaller than 1 μs, whereas the practical limit for the NIST stations is typically about 1 ms. This section takes a brief look at the time synchronization uncertainty of the received NIST radio signals, and the factors that limit the uncertainty. It also discusses their measurement uncertainties when used as a time interval reference.

1. Received Time Uncertainty of WWV and WWVH

In the 1950's, prior to the availability of LF and satellite timing signals, WWV and WWVH were routinely used for time synchronization experiments and remote clock comparisons, and uncertainties as small as 0.1 ms were reported under "ideal" conditions [78]. These measurements required considerable effort, including detailed studies of HF propagation, particularly knowing how many times the signal was refracted off the ionosphere as it traveled the path between the transmitter and receiver. Several methods of using the signals for time synchronization with uncertainties of < 1 ms have been described in detail in previous NBS/ NIST publications [73, 74]. These methods require the audio output of a shortwave receiver, an oscilloscope, knowledge of the propagation delay, and in some cases, other pieces of standard test equipment. The OTM is synchronized with the start of the 5 ms duration tone (1000 Hz on WWV, 1200 Hz on WWVH) that occurs every second. This tone, known as the seconds tick, is preceded by 10 ms of silence and followed by 25 ms of silence. The silence before and after the pulses makes it easier to identify the seconds tick (Figure 2.6).

Once better time transfer signals became available and atomic clocks were introduced, little attention was paid to HF signals as a precision time synchronization source. The fundamental limitations of HF signals made them unsuited for synchronizing the best clocks [58], and better results could be obtained with less effort using other techniques. Today, most customers who use WWV or WWVH for time synchronization have modest requirements, and make no attempt to calibrate the signal path. Since the signals travel at the speed of light, the time is late by roughly 3.3 ms per 1000 km of signal path. For customers within the continental United States or near Hawaii, this means that the time uncertainty should be < 15 ms. If a customer chooses to calibrate the path delay, they can use software that computes the distance between the transmitter and their receiver. Even then, the practical limit for this path delay estimate is about 1 ms, and customers would need to be aware of changing HF propagation conditions to consistently obtain 1 ms uncertainty over all but the shortest paths. Therefore, customers who depend upon 1 ms time synchronization would probably choose another signal source.

WWV and WWVH are still commonly used as references for time interval measurements, particularly by state and industrial metrology laboratories that calibrate stopwatches and timers, since they supply the only precision audio time signals available in the United States. The audio tones from the stations are used as the signal to manually start and stop the device under test, and the uncertainty contributed by WWV/WWVH is insignificant when compared to human reaction time [57].

THE ACCURACY OF SKY-WAVE DELAY MEASUREMENTS*

By K. W. G. HARROD, B.Sc.(Eng.), Associate Member.†

(*The paper was first received 16th January, and in revised form 3rd March*, 1947.)

SUMMARY

The paper describes an experimental investigation of the limitations imposed by the ionosphere upon the accuracy of sky-wave path-time measurements.

The measurements were made at intervals between August, 1942, and the middle of 1944, covering the frequency range 2–16 Mc/s, and consisted of observations at vertical incidence and at oblique incidence over ranges up to 6 000 km.

The limiting accuracy of path-time measurement at vertical incidence was found to be of the order of ± 5 μsec, while at oblique incidence it was in the region of ± 10 to ± 20 μsec under normally favourable conditions.

The instrumental techniques involved in the various phases of the work are briefly described, and the probable mechanism of the short-period variations about the mean path-time is discussed.

(1) INTRODUCTION

The curves conventionally used for the presentation of ionospheric data show the mean about which the measured values vary in a random manner. This paper describes an investigation of the effect of these random variations upon the accuracy of short-period measurements of sky-wave path-time.

Early in the war it was realized that the measurement of path-times and of path-time differences might have an important bearing on navigational problems, but the author was denied access to information concerning such systems as Loran until the work here described was well advanced.

At vertical incidence, the time measured was that elapsing between the transmission of a pulse and its return from the ionosphere, while at oblique incidence, over ranges up to the order of 6 000 km, the difference between diverse paths was measured. The frequency range covered was 2–16 Mc/s, and, since few suitable pulse transmissions were available, it became necessary to develop a system using the build-up transients of dots from commercial morse transmitters.

(2) INSTRUMENTAL REQUIREMENTS

It was considered that the path-time variations to be measured would be of the order of magnitude of ± 10 μsec, so it was necessary for the instrumental errors to be considerably less than 10 μsec. The measuring technique was continually under review, and it is felt that the instrumental accuracy was limited by the discrimination available on the cathode-ray tube.

(2.1) Receiver

The receiver must satisfy the following conditions:

(*a*) The input/output characteristic must be linear over a range of 30 db to avoid changes of transient shape with fading.

(*b*) Condition (*a*) must be satisfied at all settings of the gain control.

(*c*) The build-up curve must be smooth, as any ringing might lead to ambiguous results.

(*d*) A suitable output must be available for connection to an oscilloscope.

(*e*) It must be possible to monitor the signal aurally without affecting the measurements.

A commercial communication receiver was used as a basis on grounds of availability. It was found necessary to provide a special i.f. amplifier for the measuring channel to satisfy the requirements stated, the receiver providing the intermediate frequency for aural monitoring and the h.f. amplifiers and frequency changer being common to both channels. Although considerable attention was devoted to screening and decoupling, it was found impossible to vary the gain over a large range without modifying the build-up curve. Consequently the valves were operated at constant gain and the level was controlled by means of an input attenuator. The output stage was designed to deliver about 150 volts to a diode to provide the required range of linearity.

(2.2) Measuring Circuits

The range of frequencies covered was 2–16 Mc/s, and previous experience indicated that it would not be possible to use a receiver bandwidth greater than 5–6 kc/s if the effects of jamming were to be minimized. Such a bandwidth corresponds to a build-up time of about 200 μsec and a total transient of about 500 μsec duration with unit step-function input. It was necessary to measure to a small fraction of this transient time to obtain the required discrimination; it was therefore necessary to identify some point on the transient that would not be obscured by fading.

The point chosen was the maximum of the pulse, and was identified as the intersection of the first time-derivative and a datum line at zero amplitude. This presentation on a 12-in cathode-ray tube with a 400-μsec sweep permitted a discrimination of ± 2 μsec. In the case of measurements of the difference of arrival times over diverse paths, the sense of one signal was reversed, permitting identification of the two traces, and the allocation of a sign to the time differences as shown in Fig. 1.

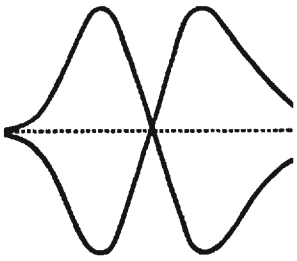


Fig. 1.—Two signal traces with datum line and time scale.

The measuring circuits were changed for different phases of the work and are described briefly in the appropriate Sections of the paper, but it can be assumed that in all cases the overall accuracy was well within ± 10 μsec, including the effect of all variations in tripping mechanisms and time-base velocity, and variations with receiver gain.

(3) PULSE TRANSMISSIONS AT VERTICAL INCIDENCE

In this case the time elapsing between the transmission of a pulse and its return from the ionosphere was measured on a number of fixed frequencies.

* Radio Section paper.

† Marconi's Wireless Telegraph Co. Ltd.

The transmitter was located about three miles from the receiving site from which it was controlled, a 50-μsec pulse of 1 kW peak power being radiated upon receipt of a triggering impulse.

(3.1) Time Measuring Circuits

The measuring circuits were based on the *h'f* equipment* existing at Great Baddow with modifications to give greater discrimination.

A 3-kc/s oscillator, together with a chain of multivibrators, provided outputs at frequencies of 25 c/s, 50 c/s and 3 kc/s.

The 25-c/s output was used to trigger the transmitter.

The 3-kc/s output was used to trigger the main time-base.

The 50-c/s output was mixed with a voltage derived from the mains to produce an output that was used to control the frequency of the 3-kc/s oscillator by means of a reactance valve, thus locking the entire equipment to the mains frequency.

The 50-c/s output also drove a separate multivibrator, giving a "mark" of 5 millisec and a "space" of 15 millisec, the output of which was used for three purposes:

(*a*) To trigger an auxiliary time-base, the output of which was superimposed on the signal or Y-deflection to produce an open raster.

(*b*) To light up the tube twice per transmission, the first time to produce the signal trace, and the second time to produce a datum line.

(*c*) To key a 30-kc/s oscillator from which "blackout" pulses were derived to give a time or height scale.

The overall instrumental stability was checked by observations of the ground ray, which appeared steady to considerably better than 5 μsec.

(3.2) Results Obtained on Pulses at Vertical Incidence

The observations were made at Great Baddow between August 18th and October 13th, 1942, during which time much E_s (sporadic E) ionization* was present.

The following programme was adopted, observations being made for five minutes every hour:

(*a*) *Daylight Odd Hours:*

(i) On the ordinary ray at the minimum height between regions F_1 and F_2 if this were observable.

(ii) If (i) were impossible owing to E_s-ionization, measurements were made on 4–5 Mc/s.

(*b*) *Daylight Even Hours:*

On region E between 2 and 2·5 Mc/s.

(*c*) *Night Time:*

On the F-region ordinary ray at a frequency where the split was about 50 km wide.

Observations were made at 10-sec intervals with the help of a warning note superimposed on the audio-frequency monitoring circuit, a total of 8 776 observations being obtained on region E and 7 676 on region F.

Distribution curves, showing the variations about the mean path-time, were prepared for each set of observations on region E. These sets were then added together to give the final distribution curve.

Before repeating this process with the F-region echoes it was necessary to eliminate the effects of long-period variations.

The final distribution curves are shown in Fig. 2, and Fig. 3 shows the percentage of all observations which fell within a given time of the mean. It will be seen that there is very little difference between the results for regions E and F. Both distribution curves are slightly asymmetrical, showing a tendency towards negative variations with 60% of the observations within 5 μsec of the mean path-line.

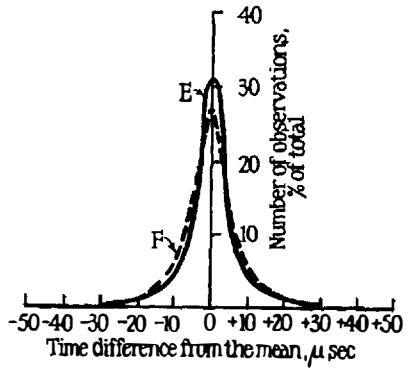


Fig. 2.—Distribution of observations for vertical incidence.

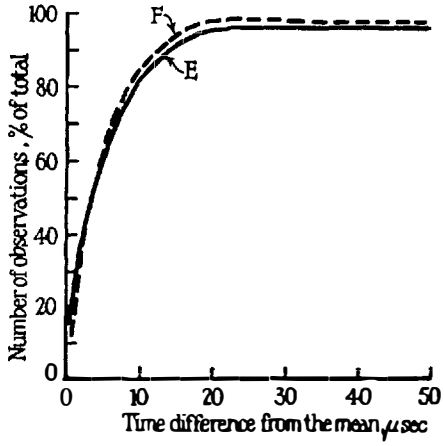


Fig. 3.—Percentage of observations within a given time-difference, for vertical incidence.

Consideration of the separate sets of observations showed that, although the average spread was small and there were occasions when the echoes would remain steady within 3 μsec, there were nevertheless periods during which rapid variations over a range of $\pm$ 40 μsec were observed. These large variations were usually, but not necessarily, associated with fades. In the case of E-region echoes, large spreads were nearly always associated with E_s-ionization, although they might be observed on frequencies below the critical for normal E-region ionization, in which case it is difficult to decide in which class the echo should be considered to fall. E_s-ionization did not always cause large deviations, in fact the steadiest set of observations recorded were taken on E_s-ionization at 5·0 Mc/s at about 1700 hrs on September 5th, 1942. Of the 94 readings, 64 showed the same value of path-time and 27 were different by + 3 μsec.

(4) PULSE TRANSMISSIONS AT OBLIQUE INCIDENCE

Because of the distances involved in the oblique-incidence tests, it was necessary to dispense with a connection between the transmitter and the receiver, and it was consequently impossible to measure the actual path-time.

The method adopted was to measure the difference between the arrival times at two aerials 400 m apart, the signals being fed through coaxial cables to two receivers similar to that used for the vertical-incidence measurements.

(4.1) Time-Measuring Circuits

The technique evolved for the measurements depended upon the fact that the pulses had a steady repetition rate. A 50-kc/s

* See TREMELLEN, K. W., and COX, J. W.: *Journal I.E.E.*, 1947, **94**, Part IIIA, p. 200.

oscillator and a chain of dividing multivibrators provided frequencies of 50 kc/s, 100 c/s and 50 c/s. The driving frequency was variable over a small range by means of a reactance valve.

The 100-c/s output was used to drive a triggered time-base at twice the pulse-repetition frequency, while an electronic switch interchanged the connection between the receivers and the oscilloscope once per pulse. A further electronic switch removed the signal-deflection voltage from alternate strokes of the time base to produce the following sequence of superimposed traces:

(*a*) Picture from signal channel 1.
(*b*) Noise-free datum line.
(*c*) Picture from signal channel 2.
(*d*) Noise-free datum line.

Brilliance modulation derived from the 50-kc/s oscillator was applied to strokes (*b*) and (*d*) to provide a time scale, the resulting picture being similar to Fig. 1.

When it was known that the transmitted pulses were derived from the British grid system, the 50-c/s output was combined with a voltage from the supply mains in such a way that a control voltage for the reactance valve was obtained to lock the entire apparatus to the mains in a "spongy" manner. The picture was centred on the screen by means of a phase control between the mains and the "spongy lock," with a fine control consisting of a variable delay between the 100-c/s output and the time base.

When the received signals were not locked to the mains, a manually controlled voltage replaced the output from the "spongy lock."

(4.2) Results obtained on Pulses at Oblique Incidence

The observations were made between March 26th and April 14th, 1943, at Bedell's End, near Chelmsford. Snap readings taken at 10-sec intervals are plotted in Fig. 4 to show

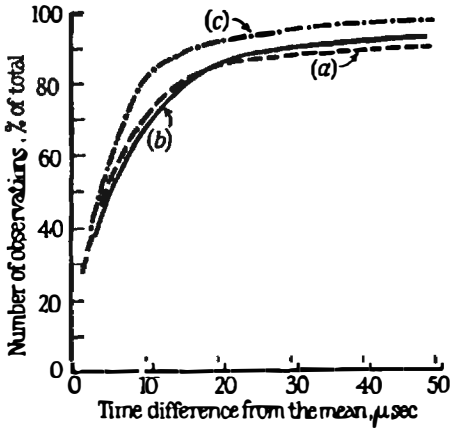


Fig. 4.—Percentage of observations within a given time-difference, for pulses at oblique incidence.

(*a*) 4·3 Mc/s; E-layer; 700 km.
(*b*) 8·6 Mc/s; E-layer; 900 km.
(*c*) 8·6 Mc/s; F-layer; 900 km.

the percentage falling within a given time-difference from the mean path-time.

A record was also made of the number of observations spoiled by jamming, and of the occasions when no observations were possible for other reasons. There were three causes, other than jamming, of failure to obtain observations:

(*a*) One or both channels fading out.
(*b*) Change of received-pulse shape causing loss of discrimination.
(*c*) Change of received-pulse shape giving ambiguous readings.

The percentages in Fig. 4 were calculated relative to the total number of observations free from jamming.

Two transmissions were used. The first was from Rechlin near Berlin at a distance of 900 km on a frequency of 8·6 Mc/s; this gave 1 180 observations on the E region and 720 on the F region. The second, being available through the co-operation of the National Physical Laboratory, was from Burghead, Scotland, at a distance of 700 km on a frequency of 4·3 Mc/s, and gave 845 observations on the F region.

It will be seen from Fig. 4 that 50% of the observations were within 5 μsec and between 70% and 80% within 10 μsec of the mean path-time on both transmissions.

(5) MORSE TRANSMISSIONS AT OBLIQUE INCIDENCE

As mentioned in Section 1, the lack of suitable pulse transmissions for further investigations necessitated the development of a technique for deriving the required information from commercial morse transmissions.

The beginning of a morse character, if differentiated twice, presented the same picture as the differentiated pulse.

(5.1) Time-Measuring Circuits

The non-cyclic nature of morse transmissions necessitated the triggering of the time base by the signal. A tripping circuit was designed to operate early on the leading edge of the dot, and was fed with the outputs of both receivers in diversity. Time-constants in the tripping circuit were arranged to minimize the possibility of false operation by noise and by the sidebands of signals on adjacent channels.

The signals being non-cyclic, it was impracticable to compare alternate signals as in the pulse tests. This difficulty was overcome by the use of an electronic switch to interchange the signal channels at 25 kc/s, the traces being caused to appear as broken lines.

After about 5 millisec the time base repeated its sweep without Y-deflection to trace a datum line with 100-kc/s blackout pulses applied to provide the time scale, each cycle of traces appearing as in Fig. 5. Since the frequency of the switching

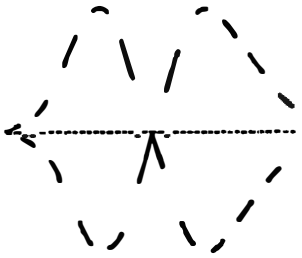


Fig. 5.—One cycle of traces with high-speed interlacing.

was in no way related to the signal-repetition rate, the traces tended to appear continuous with high-speed morse.

This system of presentation was satisfactory for strong signals over ranges up to about 1 500 km, but at greater distances, where the pattern became more complex owing to the echoes being more numerous and closer together, the results were too confused to be read with sufficient accuracy. This was particularly noticeable on transmissions from Beirut at 3 400 km distance, only about 30% of the observations being usable, and it became apparent that high-speed interlacing of the traces could not be used on long-range signals.

(5.2) Results on Morse Transmissions at Oblique Incidence

The results obtained during this phase of the work, from September 15th to November 5th, 1943, are shown in Fig. 6, and consist of measurements on signals from the following stations:

Station	Frequency, Mc/s	Distance, km
Berne, HBC ..	9	730
Nauen, DFG ..	5·45	850
Madrid, EAM2 ..	9·772	1 300
Beirut, ODD ..	16·075	3 400

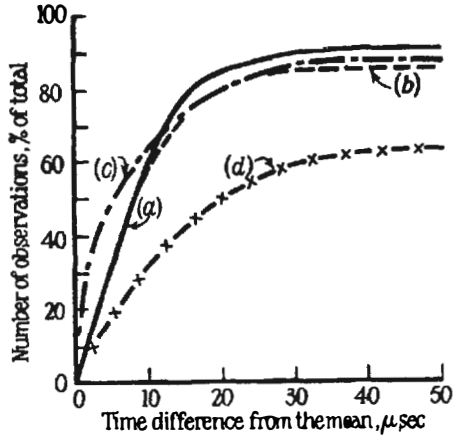


Fig. 6.—Percentage of observations within a given time-difference, for morse transmissions at oblique incidence.
(*a*) Berne, 730 km, 6·4% unusable observations.
(*b*) Nauen, 850 km, 9·7% unusable observations.
(*c*) Madrid, 1 300 km, 0·4% unusable observations.
(*d*) Beirut, 3 400 km, 34·0% unusable observations.

Since it was known that the information obtained from a step on a morse dot was a function of the phase and amplitude of the change in signal relative to the signal already existing, the observations were confined to the first element of the signal to arrive, with the effect that the signal/noise ratio was poor when the first signal element was small. It had previously been shown, however, in a direction-finding application, that the correct phase relationship could be preserved during the transient build-up by removing the carrier by suitable means,* and it was thought that similar considerations would apply to arrival-time measurements.

This view was justified by the results of experiments, at present unpublished, made upon artificially-produced complex signals having the delay-time, phase and amplitude of the second-arriving signal element all independently variable. It was found that, with the carrier present, the timing errors on the second-arriving element could be, at worst, of the same order as the receiver build-up time. With the carrier suppressed, provided the first and second elements were sufficiently spaced to be completely resolved by the receiver, it was found that the first element had no influence on the timing of the second.

(6) IMPROVED APPARATUS FOR MEASUREMENTS ON MORSE TRANSMISSIONS AT OBLIQUE INCIDENCE

To minimize the difficulties arising from the complexity of signals arriving from long distances, the measuring gear was completely re-organized.

(6.1) Carrier Suppression

The i.f. amplifiers were modified to provide, in addition to the normal rectified output, a signal obtained by rectifying after suppression of the carrier. The suppression was performed by bridged-T filters, giving a response proportional to frequency deviation from mid-band.

When the carrier is suppressed, the transients corresponding to the various arriving elements of the signal appear as a train of pulses, and, provided that these are sufficiently far apart to be resolved by the receiver, it is permissible to measure the path-time difference on elements subsequent to the first.

The suppressed-carrier technique is inapplicable to transmissions having appreciable frequency modulation, but shallow, low-frequency amplitude modulation is not unduly objectionable. It is of the utmost importance that the receivers should be accurately tuned to suppress the carrier, and a monitor tube was provided on each channel to facilitate this. Double-beam tubes were used with the Y_1 and Y_2 plates connected together, the resulting traces appearing as in Fig. 7.

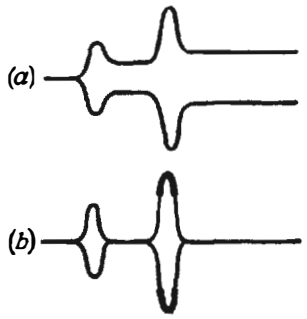


Fig. 7.—Monitor-tube traces with carrier suppression.
(*a*) Incorrectly tuned.
(*b*) Correctly tuned with strobe marker on second-arriving signal.

(6.2) Tripping Circuits

One of the difficulties experienced in the earlier observations was that both the signals moved about on the screen, making it difficult at times to measure the difference between them. This difficulty was minimized by the use of a trip that was operated by the waveform displayed on the screen, using the output of only one channel. The trip was arranged to operate as the input voltage passed through zero, this being at the reference time taken for the measurements. It will be apparent that if the time-base stroke were rigidly related to the reference time on one channel, it would then be sufficient to place the trace corresponding to the other channel on the screen by means of a suitable delay network and observe its movement.

Such a technique would demand exceptional stability from the tripping circuit, and it would also be necessary to provide some datum mark on the time-base sweep, relative to which the movement of the trace could be measured. It was decided to delay the picture corresponding to the tripping channel in order to produce the datum mark, thereby preventing the tripping-circuit stability from entering directly into the measurement. This arrangement is more fully described in Section 6.3.

A further facility provided in the tripping circuit was a gating mechanism which permitted the operation of the main time-base by the signal element chosen for measurement. The monitor tubes were provided with a time base that was always operated by the first element to arrive, and which had a low-speed sweep so that all the elements were displayed. A strobe marker on the monitor tube of the tripping channel indicated which element was being used to trip the main time-base (see Fig. 7).

The tripping circuit actually used information derived from both the normal and suppressed-carrier outputs of the i.f. amplifier, and it was found possible to obtain very considerable protection against false operation by noise and by key clicks from transmitters on adjacent frequencies. This improved tripping circuit had no influence on the quantities to be measured, but it removed some of the uncertainties, and considerably reduced the strain on the operators.

* British Patent No. 570566.

(6.3) Interlacing

The signal voltages were passed through delay networks as follows, before being applied to the main and monitor tubes:

Channel 1.—200 μsec to allow the new trip to operate.

Channel 2.—600 μsec to provide a suitable displacement between the signals.

A circuit was arranged to produce pulses to trigger the time base three times:

(*a*) To view channel 1.

(*b*) To view channel 2.

(*c*) To produce a datum line with a time scale.

The first of these pulses was initiated by the trip, and the second occurred after a period that was adjusted (with the aid of a local signal) to be equal to the difference between the delays on the two channels. It will be apparent that variations in the period between the first two pulses would appear as path-time variations in the results, but tests on this portion of the apparatus showed that the drift over a four-hour period after warming up was less than 5 μsec. Since it was possible to check the timing at intervals, no significant errors should arise from the use of this technique. The third pulse followed after about 5 millisec, but in this case the timing was not important.

Corresponding to the three traces, an electronic switch interchanged the signal channels or provided a noise-free base line as required.

The picture on the measuring tube was obtained either by double differentiation of the normal i.f. output or by single differentiation of the suppressed-carrier output, and appeared as in Fig. 1. Measurements were made in successive groups, using each method of presentation, and were plotted separately.

(7) FURTHER TESTS ON MORSE TRANSMISSIONS AT OBLIQUE INCIDENCE

The first series of observations was made on VPT, Malta, on 10·55 Mc/s at 2 080 km distance. The second series was made on various transmitters near New York, a number of transmitters being necessary as none was found sufficiently free from jamming to be used alone for the duration of the observations. The stations were WBG8, 13·75 Mc/s; WKS, 16·285 Mc/s; WCP, 15·565 Mc/s; WQU, 13·855 Mc/s; WAE, 15·675 Mc/s; WML, 14·740 Mc/s; WDU, 14·695 Mc/s.

The observations on the New York stations were plotted together (Fig. 8), the mean distance being 5 540 km. The results obtained from Malta were similar, but are not shown.

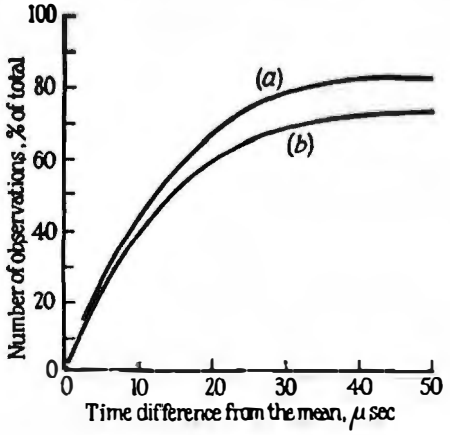


Fig. 8.— Percentage of observations within a given time-difference, for signals from New York.

(*a*) Carrier suppressed, 17% unusable observations.
(*b*) Normal output, 27% unusable observations.

These results show the effect of carrier suppression; the major consequence is the reduction of the number of observations classified as unusable. The slight improvement in distribution is thought to be due to the facility of being able to select a strong echo in the presence of a weak first-arriving echo.

(8) SUMMARY OF RESULTS

The object of the series of experiments was to determine the limit imposed by the transmission path upon the accuracy of timing the passage of the signal from transmitter to receiver. The results are summarized in the following Table, in which the fourth column shows the departure from the mean observed path-time within which 50% of the observations lay.

Transmitter	Distance, km	Frequency, Mc/s	50%-spread time, μsec
Pulse			
Chelmsford ..	0	Various	5
Burghead ..	700	4·3	5
Rechlin ..	900	8·6	7
Morse			
Berne ..	730	9·0	8
Nauen ..	850	5·45	8
Madrid ..	1 300	9·772	5
Malta ..	2 080	10·55	11
New York ..	5 540	13–16	12

It should be noted that these results were obtained in conditions in which the transmissions concerned could reasonably be expected to provide signals of commercial standard. If continuous watch had been maintained on any one transmitter on a fixed frequency, or if ionospheric conditions had been abnormally disturbed, the figures in the last column of the Table would certainly have been appreciably greater.

In the case of Malta and New York the figures quoted are for carrier suppression. The results for Beirut were eliminated because there was no time to repeat the measurements with the carrier suppressor in operation. In the case of diverse paths (oblique incidence), the figures are for a receiver spacing of 400 m, and while there is no certainty that the errors would not increase with greater spacing it is most improbable that they would decrease.

(9) INTERPRETATION OF RESULTS

Although the following conclusions are based mainly on the measurements described above, they are, of course, influenced by general familiarity with ionospheric measurements. The conception of the mechanism of the apparent path-time variations and assessment of their possible magnitude is considerably influenced by the previously mentioned experiments with artificially produced complex signals.

It seems certain that the observed variations of path time do not represent fluctuations of the true height of the ionosphere. Even a 1-km variation (6·7 μsec at vertical incidence) would represent many wavelengths, and it is extremely unlikely that such variations could take place with the observed rapidity while still maintaining sufficient phase coherence in the signal to return even an approximation to a single pulse.

In nearly all cases where there were large spreads of path time the reason, quite clear to the observer, was that the received pulse was complex, the signal maximum being the resultant of several incompletely resolved component peaks. Independent fading of these peaks and changes of phase between them produced large variations in the position of the signal maximum, and in some cases produced several maxima. When the received pulse was

not visibly complex it was not easy to be certain of the mechanism. It may well be that the mechanism was in essence the same, though on a different scale, for there was no clear division of the results into those with large and those with small spreads of path time; the results were smoothly graded from one extreme to the other.

When the component peaks are visible it is easy to think of the fading and changes of phase causing a transfer of the pulse maximum from one signal element to another, and it is then evident, from the random nature of these changes, why the path-time distribution curves should be nearly symmetrical about the mean. When separate pulses are not apparent, however, the change of pulse shape, although essentially the same as in the previous case, may be thought of as being produced by the fading of the sidebands independently of the median frequency. In this connection it may be noted that there was a slight tendency towards negative deviations from the mean path-time in the vertical-incidence measurements, and it was found that, if one sideband were suppressed by mis-tuning the receiver, the pulse appeared always to be delayed, whichever sideband was suppressed.

In the absence of precise knowledge of the mechanism of apparent variation of ionosphere height, it was not possible to predict the oblique-incidence variations exactly from consideration of the results at vertical incidence. Thus, if the overlapping signal elements were considered to derive from true reflections at the heights found at vertical incidence, then relative displacement of the elements would be less at oblique incidence than at vertical incidence, and the variations of path-time of the pulse would be smaller. If, however, the variations were considered as being produced by the cumulative distortion of the pulse in its passage through a dispersive medium, it might be expected that, at oblique incidence, with a longer path in the ionosphere, the distortion and the variations would be greater. Whichever of these possible mechanisms was accepted it might be expected, as was later substantiated, that the variations at oblique and vertical incidence would be of the same order of magnitude.

The preceding argument applies to errors caused by the complexity of a nominally simple echo from one layer, and takes no account of possible echoes from other paths because, at vertical incidence and at short oblique ranges, these separate echoes are completely resolved by the receiver and cause no interference. As the distance increases, however, the time interval between pulses arriving by different paths decreases until ultimately the receiver is unable to resolve them, and interference takes place. The distance at which this effect occurs is a function of the bandwidth of the receiver, and, with that used for the measurements, is about 1 500–2 000 km.

The interference betwen echoes is not, of course, a function of distance alone, but also depends on the conditions of the ionosphere. It was noticed during the observation of signals from New York on 13–16 Mc/s that, at about noon (G.M.T.), the echo pattern appeared simple (i.e. without component peaks) and the path time was very stable. This fact, coupled with the results on signals from Madrid, suggests that, as the distance increases, the path time of the pulse becomes more stable, thus lending support to the concept involving a number of reflections which have less effect on the stability of path time as the range increases.

The various conditions encountered may be summarized as follows:

(*a*) A single pulse, provided care is taken with the tuning, will give measurements of path time within about 5 μsec of the mean at vertical incidence and at oblique incidence at short ranges. This is considered to be the limiting accuracy permitted by the ionosphere and cannot be reduced significantly by increasing the receiver bandwidth. This view is supported by the results obtained with Loran, in which the same order of limiting accuracy is obtained with an appreciably greater bandwidth than that used in the measurements discussed in this paper. As the range increases, the received pulse appears to become more complex, but the effects of this complexity are counteracted by reduction in the time difference between the component elements.

(*b*) Multiple echoes separated by less than the receiver build-up time may produce ambiguities and errors of the order of half the build-up time.

(*c*) Multiple echoes separated sufficiently to be resolved by the receiver will, in the case of pulses, each yield results as good as a single echo. In the case of morse signals with the carrier suppressed, the conditions may be considered the same as for pulses. Without carrier suppression, measurements on signal components other than the first to arrive may be in error to the extent of approximately half the build-up time of the receiver.

At oblique incidence, the overall error of timing on short observations, allowing for the transmission path, noise and instrumental errors, is unlikely to be less than about 10–20 μsec, relative to the mean, depending upon the range and the ionospheric conditions prevailing at the time.

It is appreciated that the method of presentation, chosen initially to provide high discrimination in the vertical-incidence tests, suffers from the disadvantage that the reference point occurs some 200 μsec after the commencement of the build-up curve, and is thus liable to be modified by interference between overlapping component elements of the received signals. Obviously the earlier the arbitrarily-chosen reference point, the less the possibility of interference from a subsequent signal element, but, with a receiver bandwidth of the order of 5 kc/s, it is difficult to choose a point early on the build-up curve that is independent of amplitude changes and which yields adequate discrimination.

It is attractive to consider extending the differentiating process because each differentiation produces an earlier intersection of the datum line, but it is found that, in practice, the ambiguities are difficult to resolve.

When it is desired to measure the time difference between two signals, the technique of matching the leading edges of the pulses by superposition can yield good discrimination provided the amplitudes are matched satisfactorily. This presentation does not permit the allocation of sense to small variations about the mean, and the method of obtaining gain control requires care if instrumental errors are to be eliminated. The method is advantageous in the case of multiple signal-elements which are too close together to be resolved by the receiver, but does not appear to have any appreciable influence upon the limiting accuracy obtained with a simple echo.

(10) ACKNOWLEDGMENTS

The work described was carried out on behalf of the Admiralty in the Research Division of Marconi's Wireless Telegraph Co. Ltd., and the author's thanks are due to both for permission to publish the paper.

The author also acknowledges his indebtedness to those who continually provided encouragement and assistance, especially Messrs. S. B. Smith, J. D. Peat, J. Vickers, J. W. Cox and W. O. Agar.

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Count down timer for WWV
Date: Tuesday, September 18, 2018 11:56:00 AM

From: Lowe, John P. (Fed)
Sent: Wednesday, January 31, 2018 3:46 PM
To: Porter, Gail (Fed)
Cc: Deutch, Matthew J. (Fed); Sutton, Douglas (Fed)
Subject: Count down timer for WWV

Hi Gail,
As a follow up to our conversation, we plan to host an event at the radio station as a culmination of the countdown timer. This would be a media invited event with dignitaries and historical stories celebrating the 100th anniversary of the WWV radio station. The staff would like to get a small countdown timer on the radio station website to start gaining publicity for the event.
Your permission please,
John

From: Puhl, James (Fed)
To: Spicer, James L. (Fed)
Cc: Oates, Chris (Fed); Lowe, John P. (Fed); Okayama, Dean T. (Fed); pml.it; Peppler, Trudi K. (Fed)
Subject: January 2018 IT Inventory Report of Critical Issues for Group 688-40 - IMMEDIATE ACTION NEEDED ON OVERDUE ISSUES
Date: Friday, January 05, 2018 5:21:07 PM

SUMMARY REPORT FOR PML 688-40 (Property Tag or ID : Hostname : Critical Vulnerability Count)

WARNING: Overdue issues will trigger a status change to OU Reject and block network access if the deadline passes without resolution. To avoid this you must update your spreadsheet to clearly indicate how the issue has been resolved.
Overdue Issues
935891 :688sdmaclap : 1

TOTAL, OVERDUE AND NEW
pml688096 :688gateclock : 2
935891 :688sdmaclap : 1
pml688064 :wwv-149 : 1

Hello Jim,

Critical IT Inventory issues are now posted in your Elwood folder. The issues will be found in a file named PML-688-40-180105.critical.xlsx.

My records indicate you have unresolved critical issues from last month's report. For reported issues with a status of “overdue”:

1. Be sure to write in the spreadsheet column under “Note Actions Here” by COB Fri 12-Jan-2018. You must indicate how action is being taken to resolve the issue. A message without resolution, such as “looking into it” or “emailing user” will not be sufficient.

2. If it’s something we have discussed by other methods and it’s not noted in there, please remind me by adding the note there.

If the deadline passes with still no resolution, then the system will be removed from the network. This will happen automatically through NAC if enabled on that subnet, otherwise a message will go out to the division chief asking that they confirm the system is taken out of service until the issues can be resolved. I know this will be an unwelcome disturbance on many levels, and I’m hoping this action will not be needed. Please act now to resolve those overdue issues!

The new criticals are due by COB Fri 2-Feb-2018. As always, I am happy to assist you should you need additional guidance to address your inventory issues. Please ask me!

Thanks,

Jim

****

James Puhl, GSEC
PML Deputy IT Security Officer
NIST Physical Measurement Laboratory
Bldg. 221/ Room B246 (M/S 8400)
Phone: 301-975-5581
Email: puhl@nist.gov

****

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Google Alert - WWV
Date: Tuesday, September 18, 2018 12:00:01 PM

From: wwv
Sent: Thursday, August 23, 2018 5:48 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: Google Alert - WWV

From: Google Alerts <googlealerts-noreply@google.com>
Sent: Tuesday, August 21, 2018 11:09 PM
To: wwv <wwv@nist.gov>
Subject: Google Alert - WWV

WWV

As-it-happens update · August 22, 2018

NEWS

Concern Rising within Amateur Radio Community over **WWV**-WWVH Shut Down Proposal

ARRL

ARRL members and Amateur Radio clubs are expressing increased concern over the inclusion of **WWV** and WWVH on a list of proposed cuts in the ...

Flag as irrelevant

The Death of Old Time? – NIST Cutting **WWV**

Inside GNSS

NIST radio station **WWV** has a long and storied history that dates back to the very beginning of radio broadcasting. The call letters **WWV** were ...

What Will You Do If WWVB Goes Silent? - Hackaday

Full Coverage

Flag as irrelevant

NIST Slashes Measurement Budgets

EE Times

The FY2019 budget includes the shutting down of time and frequency standard broadcasts from Ft. Collins, Colorado (**WWV**) and Kaua'i, Hawaii ...

Flag as irrelevant

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed); Reidy, Anne M. (Fed)
Subject: WWVB Timing Project
Date: Monday, April 16, 2018 4:32:12 PM
Attachments: WWVBphase parts list.xlsx

Anne and Chris,

I've been attempting to get funding for a WWVB back up to GPS project for a few years now with no luck yet. However, I think there are a few things I can do now with a bit of funding (<$10k). Attached please find a breakdown of items. Please let me know if there is available funding to be placed in 6884100 for me to proceed. I would be happy to discuss this project further if you want more details.

Thanks for the consideration,

John

L-400B Antenna	$189.00	https://www.lfengineering.com/products.cfm
USRP N210	$1,896.00	https://www.ettus.com/product/details/UN210-KIT
LFRX	$83.00	https://www.ettus.com/product/details/LFRX
SRS PRS10	[illegible]	http://orders.thinksrs.com/OnlineOrders/SRSOrders.ht[illegible]?EPricePrdGrp=PRS10
SRS PRBB	[illegible]	http://orders.thinksrs.com/OnlineOrders/SRSOrders.ht[illegible]?EPricePrdGrp=PRS10
SRS PRPS	[illegible]	http://orders.thinksrs.com/OnlineOrders/SRSOrders.ht[illegible]?EPricePrdGrp=PRS10
SRS PRHS	[illegible]	http://orders.thinksrs.com/OnlineOrders/SRSOrders.ht[illegible]?EPricePrdGrp=PRS10
Intel PRO/1000 NIC	$33.69	https://www.amazon.com/Intel-1000-Dual-Server-Adapter/dp/B000BMZHX2
OptiPlex 7050	$1,349.00	http://www.dell.com/en-us/work/shop/desktop-and-all-in-one-pcs/optiplex-7050-tower/spd/optiplex-7050-desktop/s012o7050mtus
External Hard drive	$49.99	https://www.amazon.com/Elements-Portable-External-Drive-WDBUZG0010BBK-WESN/dp/B06VVS7S94
GPS receiver	$750	http://www.jackson-labs.com/assets/uploads/main/Fury_Flyer.pdf
GPS antenna kit	$75	http://www.jackson-labs.com/index.php/products/gps_antenna_kit/

Total	$6,287
Travel expenses	$1,000 - 2,000

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Google Alert - WWV
Date: Tuesday, September 18, 2018 12:04:25 PM

From: wwv
Sent: Thursday, August 23, 2018 5:40 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: Google Alert - WWV

From: Google Alerts <googlealerts-noreply@google.com>
Sent: Tuesday, August 14, 2018 2:00 AM
To: wwv <wwv@nist.gov>
Subject: Google Alert - WWV

WWV

As-it-happens update · August 14, 2018

NEWS

NIST FY 2019 Budget Would Eliminate **WWV** and WWVH

ARRL

NIST said eliminating funding currently "supporting fundamental measurement dissemination" would include putting **WWV** and WWVH off the air for a ...

Flag as irrelevant

Receive this alert as RSS feed

Send Feedback

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Google Alert - WWVB
Date: Tuesday, September 18, 2018 12:00:42 PM

From: wwv
Sent: Thursday, August 23, 2018 5:46 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: Google Alert - WWVB

From: Google Alerts <googlealerts-noreply@google.com>
Sent: Tuesday, August 21, 2018 12:19 AM
To: wwv <wwv@nist.gov>
Subject: Google Alert - WWVB

WWVB

As-it-happens update · August 21, 2018

NEWS

What Will You Do If WWVB Goes Silent?

Hackaday

But **WWVB** on the other hand is used by millions of Americans every day. By NIST's own estimates, over 50 million timepieces of some form or another ...

Flag as irrelevant

You have received this email because you have subscribed to **Google Alerts**.

Unsubscribe

Receive this alert as RSS feed

Send Feedback

From: Ochinang, Adela Mae P. (Fed)
To: Spicer, James L. (Fed); Okayama, Dean T. (Fed)
Cc: Oates, Chris (Fed)
Subject: Re: 862061 - On Site Yet?
Date: Tuesday, June 05, 2018 2:43:10 PM

Yes it's on site @ WWVH

Aloha,
Adela Mae P. Ochinang
NIST-WWVH
adele.ochinang@nist.gov
(808) 335-4361
(808) 335-4747 FAX

From: Spicer, James L. (Fed)
Sent: Tuesday, June 5, 2018 9:58 AM
To: Okayama, Dean T. (Fed); Ochinang, Adela Mae P. (Fed)
Cc: Spicer, James L. (Fed); Oates, Chris (Fed)
Subject: 862061 - On Site Yet?

Adela,

Has this computer arrived on site for Dean O? It showed up in the property inventory under someone else's name. If it is on site, I will start the transfer process to Dean.

862061	DELL INC.	T5810	WORKSTATION/DISK UNIT	T5810	7FMVBH2	1/24/2017	1370.04	LOMAX JOHN T NIST104811

Aloha!

Jim

Regards,

Jim Spicer
IT Specialist/Property Custodian/Division Safety Representative
National Institute of Standards & Technology
Time & Frequency Division
Time and Frequency Services Group
MS 847.00
325 Broadway, Room# 4013
Boulder, CO 80305-3337
(303) 497-5306 (office)

From: Oates, Chris (Fed)
To: Ochinang, Adela Mae P. (Fed); Spicer, James L. (Fed)
Cc: Novick, Andrew (Fed)
Subject: RE: Property - Last Effort
Date: Wednesday, May 30, 2018 1:53:00 PM

Thanks, Adela!

Dr. Chris Oates, Chief

Time and Frequency Division
Physical Measurement Laboratory
National Institute of Standards and Technology
Boulder, CO 80305
303-497-7654

From: Ochinang, Adela Mae P. (Fed)
Sent: Wednesday, May 30, 2018 1:50 PM
To: Spicer, James L. (Fed) <james.spicer@nist.gov>
Cc: Oates, Chris (Fed) <chris.oates@nist.gov>; Novick, Andrew (Fed) <andrew.novick@nist.gov>
Subject: Re: Property - Last Effort

I have completed WWVH Property Inventory.

One notation: NIST #930603 Defibrillator, Lifepak 500, S/N 31344751 was returned on 11/26/2011 to NIST-Boulder for Disposal.

It was replaced on 11/15/2011 with Semi-Automatic External Defibrillator, Defibtech DDU-2300, S/N 40005411.

Sorry. Thank you.

Aloha,

Adela Mae P. Ochinang
NIST-WWVH
adele.ochinang@nist.gov
(808) 335-4361

(808) 335-4747 FAX

From: Spicer, James L. (Fed)
Sent: Tuesday, May 29, 2018 11:07 AM
To: Ochinang, Adela Mae P. (Fed)
Cc: Oates, Chris (Fed); Novick, Andrew (Fed)
Subject: RE: Property - Last Effort

Adela,

Thank you. Good luck in the excessing process. That will help keep things from getting cluttered!

I should have given you more specifics on this deadline. When we talked on the phone a while back, I believe I said that we needed to finish by the end of May but it would have been a better reference to see it in writing. I'll try to make sure you have plenty of time and a deadline next year.

Have a good morning!

Regards,

Jim Spicer
IT Specialist/Property Custodian/Division Safety Representative
National Institute of Standards & Technology
Time & Frequency Division
Time and Frequency Services Group
MS 847.00
325 Broadway, Room# 4013
Boulder, CO 80305-3337
(303) 497-5306 (office)

From: Ochinang, Adela Mae P. (Fed)
Sent: Tuesday, May 29, 2018 3:03 PM
To: Spicer, James L. (Fed) <james.spicer@nist.gov>
Cc: Oates, Chris (Fed) <chris.oates@nist.gov>; Novick, Andrew (Fed) <andrew.novick@nist.gov>
Subject: Re: Property - Last Effort

Good morning:

I will try my best and get it to you by tomorrow.

We are in a process of "cleaning up shop" and excessing property.

In the future, can you please give me a deadline date instead of "can you please work on this as time permits."

Thank you.

Aloha,

Adela Mae P. Ochinang
NIST-WWVH
adele.ochinang@nist.gov
(808) 335-4361
(808) 335-4747 FAX

From: Spicer, James L. (Fed)
Sent: Tuesday, May 29, 2018 10:32 AM
To: Ochinang, Adela Mae P. (Fed)
Cc: Spicer, James L. (Fed); Oates, Chris (Fed)
Subject: FW: Property - Last Effort

Adele,

I need to enter as many of the remaining assets as possible by COB today. When can you get the inventory completed for HI?

Regards,

Jim Spicer
IT Specialist/Property Custodian/Division Safety Representative
National Institute of Standards & Technology
Time & Frequency Division
Time and Frequency Services Group
MS 847.00
325 Broadway, Room# 4013
Boulder, CO 80305-3337
(303) 497-5306 (office)

From: Spicer, James L. (Fed)

Sent: Friday, May 25, 2018 4:57 PM
To: Spicer, James L. (Fed) <james.spicer@nist.gov>
Cc: Spicer, James L. (Fed) <james.spicer@nist.gov>; Novick, Andrew (Fed) <andrew.novick@nist.gov>
Subject: Property - Last Effort
Importance: High

Adele,

Last attempt to find this missing property is greatly appreciated.

Regards,

Jim Spicer
IT Specialist/Property Custodian/Division Safety Representative
National Institute of Standards & Technology
Time & Frequency Division
Time and Frequency Services Group
MS 847.00
325 Broadway, Room# 4013
Boulder, CO 80305-3337
(303) 497-5306 (office)

From: Lowe, John P. (Fed)
To: Bollinger, John R. (Fed)
Cc: Komloske, Brenda (Fed); Honeycutt, Dorene (Fed); Reidy, Anne M. (Fed); Oates, Chris (Fed)
Subject: SCMMR request for WWVH
Date: Monday, January 29, 2018 11:28:57 AM
Attachments: 688DivisionScanner@nist.gov_20180125_155302.pdf

John,

Attached please find a SCMMR request for the WWVH radio station. We have an estimate for this project I can send to you also. Please let me know if this is what you need for now and thank you.

John Lowe
Deputy Division Chief
Time and Frequency

Appendix C – SCMMR Proposed Project Submittal Check Sheet

It is the intent that this form be used to submit projects to be considered for the SCMMR funding process. Please fill in the basic information required to start the review process. Please submit the form to the individual designated for review at your site.

Project Title: WWVH Communications with PMRF Dispatch

Check the appropriate box or boxes:

[X] Alarms/ Fire Safety	[ ] Central Utilities
[ ] Air Filtration and Exhaust	[ ] Site Utilities
[ ] Hazardous Materials	[ ] Energy/Water Conservation
[ ] Mechanical/Electrical	[ ] Civil/Site
[ ] Structural	[ ] Architectural
[ ] Accessibility	[ ] Studies

Brief Description of the Problem/Deficiency to be addressed:

WWVH (Building 800) on the Pacific Missile Range Facility (PMRF) at Barking Sands utilizes direct buried copper wire for fire alarm communication with the PMRF Dispatch Center to receive emergency response. This direct buried copper wire was installed around 1971 (47 years ago). The Barking Sands Navy Base has experienced total failure of similar direct buried copper wire installations for Navy occupied buildings that are not as old and have been performing replacement of direct buried copper wire with fiber communications for Navy occupied PMRF buildings. Direct bury of copper wire leaves it exposed in the soil and to the elements and therefore experiences corrosion and decay over time. The direct buried copper wire for WWVH is at high risk for possible failure and loss of emergency communications with the PMRF Dispatch Center due to its age. Without emergency response communication at WWVH, there is a serious potential for loss of certificate of occupancy for the building by the PMRF fire department.

Please identify the deficiency issue: (Check one)

Capacity – Enhance Research	Capacity – Enhance Support	Capacity – Enhance Reliability of Systems	
Building Integrity – Appearance	Building Integrity - Beyond Rated Life	Building Integrity – Reliability	
Code Compliance – Accessibility	Code Compliance – Building Code	✓ Code Compliance – Life Safety Code, OSHA	Environmental Compliance – Air/Water

Operations – Energy Efficiency	Operations – Maintenance	Operations – Security	

Brief Description of the Proposed Solution:

A new building is being built near WWVH (Building 800) and the utility construction includes installation of new fiber for connection and communication to PMRF Dispatch Center. This fiber utility installation will include a new fiber junction vault at the road or drive leading to WWVH. Installing a new fiber connection from WWVH (Building 800) to the new fiber junction vault (approximately 600 feet) to replace the existing direct buried copper wire will eliminate the current risk. The existing WWVH fire alarm panel used for dispatch communications will also need replaced with one that is listed for use with the Honeywell panel at PMRF Dispatch.

The existing direct buried copper wire is also used for telephone communications at WWVH (Building 800). Replacing the copper wire with fiber will allow for improved telephone service to WWVH as the existing telephone communications at WWVH are less than satisfactory.

Current internet service at WWVH is via satellite service. The introduction of fiber communications will make it possible to change the internet service from satellite to fiber communications as well.

There have been preliminary discussions with the PMRF Dispatch Center Base Communications Supervisor to determine the Navy's ability to perform this work since they have been performing similar work for other buildings that are Navy occupied on the PMRF property. The Base Communications Supervisor indicates they can do this work except for providing a new panel inside the building to communicate with the Dispatch Center via the fiber. Preliminary cost estimate is less than $50,000.00.

Your contact information: Name: John Lowe Extension: 5453 (Boulder)

Division: 688

Division Chief Concurrence: Ch. W Date 1/25/19

Additional information:

(Please attach any supporting documentation you may have):

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: WWV 100th Anniversary
Date: Tuesday, September 18, 2018 11:57:35 AM

From: Sutton, Douglas (Fed)
Sent: Tuesday, January 2, 2018 12:36 PM
To: Lowe, John P. (Fed); Burrus, James N. (Fed)
Cc: Deutch, Matthew J. (Fed)
Subject: RE: WWV 100th Anniversary

John

That's the idea. Oct 1st 2019 would be a day of celebration, such as a ribbon cutting or etc.... That day would be the main event day.
There are other smaller milestones that could be celebrated later, such as; earlies date known of a audio broadcast or.....

From: Lowe, John P. (Fed)
Sent: Tuesday, January 02, 2018 10:29 AM
To: Sutton, Douglas (Fed) <douglas.sutton@nist.gov>; Burrus, James N. (Fed) <james.burrus@nist.gov>
Cc: Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>
Subject: Re: WWV 100th Anniversary

I believe her point is just that....the count down timer has to lead to some event. Not just a notation to the 100th anniversary. The count down leads to an event, a ribbon cutting, a celebration...a physical event that occurs at the end of the count down...

From: Sutton, Douglas (Fed)
Sent: Tuesday, January 2, 2018 12:03 PM
To: Lowe, John P. (Fed); Burrus, James N. (Fed)
Cc: Deutch, Matthew J. (Fed)
Subject: RE: WWV 100th Anniversary

John

I was talking with Matt and Glenn and we thought that the countdown time would count down to Oct 1 2019, a 100 years after the WWV call letter were issued.
Other scheduled celebrations would occur following the end of the countdown timer.
Your thoughts are welcome.

Douglas

From: Lowe, John P. (Fed)
Sent: Tuesday, January 02, 2018 9:39 AM
To: Sutton, Douglas (Fed) <douglas.sutton@nist.gov>; Burrus, James N. (Fed) <james.burrus@nist.gov>
Cc: Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>
Subject: Re: WWV 100th Anniversary

I have a request in concerning the count down timer with Gail Porter. One thing she expressed is that the countdown had to culminate into some event. What would be the event??
John

From: Sutton, Douglas (Fed)
Sent: Tuesday, January 2, 2018 11:25 AM
To: Burrus, James N. (Fed)
Cc: Deutch, Matthew J. (Fed); Lowe, John P. (Fed)
Subject: RE: WWV 100th Anniversary

Jim

I was wondering if you had heard anything for the Public Affairs Web guru's on our count down timer?

Now that it is January, I plan on moving ahead with planes associated with the 100 year celebration.

Thanks for your help.

Douglas
NIST Radio

From: Burrus, James N. (Fed)
Sent: Thursday, December 07, 2017 12:20 PM
To: Sutton, Douglas (Fed) <douglas.sutton@nist.gov>; Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>; Lowe, John P. (Fed) <john.lowe@nist.gov>; Nelson, Glenn (Fed) <glenn.nelson@nist.gov>; Yates, William (Fed) <william.yates@nist.gov>
Cc: Novick, Andrew (Fed) <andrew.novick@nist.gov>; Lombardi, Michael A. (Fed) <michael.lombardi@nist.gov>
Subject: RE: WWV 100th Anniversary

Doug, et.al.,

The countdown clock is a great idea on several levels. Each division is in charge of the Web content about that division on the NIST website, so getting this put on the Time and Frequency home page shouldn't be a problem. The only question would be how it would be presented, size, position on the page, etc. I will contact our Public Affairs Web guru for some guidance about this, as well as possibly getting it included on the NIST Home Page as well (maybe as the anniversary gets closer).

As John Lowe mentioned in his email, he discussed this with my boss, Public Affairs Director Gail Porter. I will bring this up with her after the holidays when she's not crazy busy.

As far as the celebrations planned, I would like to have a teleconference meeting at some point with everyone on this email (and Chris Oates, too, if he wants to be included) and whomever else should be included to come up with a plan for getting the word out.

Just off the top of my head, these elements would be good to collect and have available for media interested in covering this:

- **Photos (current AND historic) of the radio station, the equipment that runs it, the Atomic Clock(s) and time scale.**

- **Video, too, to the extend we have that. And any vintage film/video would be nice also;**

- **How the WWV signal was used in the "early days," and how it is**

used today; how the signal has evolved over the years (original signal strength, changes in how the broadcast propagates, the new phase modulations scheme, etc.);

- Who and what uses this signal from early days to today (commercial radio stations, military, wall clocks, etc.);

- And artifacts as they are available. For example, the radio-corrected pendulum clock we have here in Boulder, old receivers, new phase-modulation receivers, etc.

And anything else that could visually tell the story of the history of the broadcast, how it was used and who made use of it.

I know that there are a lot of "old guys" that have been here for a tour who told me stories of tuning into WWV (B and H) in their capacities as Navy communications officers. Stories like that would be good to have as well as any other anecdotes.

Those are just my first thoughts on this. As for media, it would be nice to be able to set up some tours of the radio station, when and if that is convenient.

This is a fun and interesting story to tell; I'm looking forward to helping get the word out.

Jim

James Burrus
Outreach Coordinator;
AV and Conference Services Group Leader
NIST Boulder Labs
325 Broadway
MC 107.02, Room 1D 115
Boulder, CO 80305
w) 303-497-4789
c) 720-982-6222
james.burrus@nist.gov

From: Sutton, Douglas (Fed)
Sent: Thursday, December 07, 2017 11:42 AM
To: Burrus, James N. (Fed) <james.burrus@nist.gov>; Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>; Lowe, John P. (Fed) <john.lowe@nist.gov>; Nelson, Glenn (Fed) <glenn.nelson@nist.gov>; Yates, William (Fed) <william.yates@nist.gov>
Cc: Novick, Andrew (Fed) <andrew.novick@nist.gov>; Lombardi, Michael A. (Fed) <michael.lombardi@nist.gov>
Subject: RE: WWV 100th Anniversary

Jim

We are looking for a countdown timer to be placed on our website to lead us up to the day that Radio Station WWV will officially celebrate its 100th year of existence.

For example:
http://wpfruits.com/preview/?demo=offer-countdown-timer

We are making plans to celebrate on this day and scheduling special events to take place leading up to the big day.

Events such as media, pictures, video, interviews, special broadcasts.
I'm sure we will think of more.

Douglas Sutton
NIST Radio

From: Burrus, James N. (Fed)
Sent: Tuesday, December 05, 2017 3:03 PM
To: Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>; Lowe, John P. (Fed) <john.lowe@nist.gov>; Sutton, Douglas (Fed) <douglas.sutton@nist.gov>; Nelson, Glenn (Fed) <glenn.nelson@nist.gov>; Yates, William (Fed) <william.yates@nist.gov>
Cc: Novick, Andrew (Fed) <andrew.novick@nist.gov>; Lombardi, Michael A. (Fed) <michael.lombardi@nist.gov>
Subject: RE: WWV 100th Anniversary

I'm happy to help. Just let me know what you need/want.

Jim Burrus

From: Deutch, Matthew J. (Fed)

Sent: Monday, December 04, 2017 3:31 PM
To: Lowe, John P. (Fed) <john.lowe@nist.gov>; Sutton, Douglas (Fed) <douglas.sutton@nist.gov>; Nelson, Glenn (Fed) <glenn.nelson@nist.gov>; Yates, William (Fed) <william.yates@nist.gov>
Cc: Novick, Andrew (Fed) <andrew.novick@nist.gov>; Lombardi, Michael A. (Fed) <michael.lombardi@nist.gov>; Burrus, James N. (Fed) <james.burrus@nist.gov>
Subject: RE: WWV 100th Anniversary

Howdy John,
Thank you for looking into this for us.
I don't think we ever heard anyone deny the request per se, but Pam C. just passed on to us in the email that you saw that gave the impression that PIO was not excited about the idea.
We will restart the process.
Thanks,
Matt

From: Lowe, John P. (Fed)
Sent: Monday, December 04, 2017 3:23 PM
To: Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>; Sutton, Douglas (Fed) <douglas.sutton@nist.gov>; Nelson, Glenn (Fed) <glenn.nelson@nist.gov>; Yates, William (Fed) <william.yates@nist.gov>
Cc: Novick, Andrew (Fed) <andrew.novick@nist.gov>; Lombardi, Michael A. (Fed) <michael.lombardi@nist.gov>; Burrus, James N. (Fed) <james.burrus@nist.gov>
Subject: WWV 100th Anniversary

Hi Folks,
I have had a conversation with Gail Porter who is the Group Leader for the Public Information Office concerning the 100th Anniversary of radio station WWV. She was unaware of the countdown clock controversy but she believes that we can work this out. Does anyone know who it was that denied us a countdown clock? They are hesitant to grant countdown clocks to things that do not have a big event at the end of the countdown. It might be best to start again and ask the Public Information Office for help in staging and advertising and planning the event and then the countdown may naturally fall out of the cooperation. She is now aware of our desires and believes that "time" and the "radio stations" are a big selling point to the general population and we will be able to make this work.
So please try again and start putting together plans, activities, dignitaries and a guest list etc...etc...and approach again...Jim Burrus (cc'd) can be helpful in regards to liaison to Gaithersburg.

John

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: WWV 100th Anniversary
Date: Tuesday, September 18, 2018 11:57:17 AM

From: Burrus, James N. (Fed)
Sent: Tuesday, January 9, 2018 12:57 PM
To: Deutch, Matthew J. (Fed); Lowe, John P. (Fed); Sutton, Douglas (Fed)
Subject: RE: WWV 100th Anniversary

I'm not sure what the options are for such an "event." But I did think of this:

What if we put together some kind of illustration that shows how far into space the WWV signal has traveled over 100 years. Just tossing that out there…

Jim Burrus

From: Deutch, Matthew J. (Fed)
Sent: Tuesday, January 02, 2018 4:17 PM
To: Lowe, John P. (Fed) <john.lowe@nist.gov>; Sutton, Douglas (Fed) <douglas.sutton@nist.gov>; Burrus, James N. (Fed) <james.burrus@nist.gov>
Subject: RE: WWV 100th Anniversary

I'm open to ideas. Douglas was looking at what other groups have done for 100th annv.

From: Lowe, John P. (Fed)
Sent: Tuesday, January 02, 2018 9:39 AM
To: Sutton, Douglas (Fed) <douglas.sutton@nist.gov>; Burrus, James N. (Fed) <james.burrus@nist.gov>
Cc: Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>
Subject: Re: WWV 100th Anniversary

I have a request in concerning the count down timer with Gail Porter. One thing she expressed is that the countdown had to culminate into some event. What would be the event??
John

From: Sutton, Douglas (Fed)
Sent: Tuesday, January 2, 2018 11:25 AM
To: Burrus, James N. (Fed)
Cc: Deutch, Matthew J. (Fed); Lowe, John P. (Fed)
Subject: RE: WWV 100th Anniversary

Jim

I was wondering if you had heard anything for the Public Affairs Web guru's on our count down timer?

Now that it is January, I plan on moving ahead with planes associated with the 100 year celebration.

Thanks for your help.

Douglas
NIST Radio

From: Burrus, James N. (Fed)
Sent: Thursday, December 07, 2017 12:20 PM
To: Sutton, Douglas (Fed) <douglas.sutton@nist.gov>; Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>; Lowe, John P. (Fed) <john.lowe@nist.gov>; Nelson, Glenn (Fed) <glenn.nelson@nist.gov>; Yates, William (Fed) <william.yates@nist.gov>
Cc: Novick, Andrew (Fed) <andrew.novick@nist.gov>; Lombardi, Michael A. (Fed) <michael.lombardi@nist.gov>
Subject: RE: WWV 100th Anniversary

Doug, et.al.,
The countdown clock is a great idea on several levels. Each division is in charge of the Web content about that division on the NIST website, so getting this put on the Time and Frequency home page shouldn't be a problem. The only question would be how it would be presented, size, position on the page, etc. I will contact our Public Affairs Web guru for some guidance about this, as well as possibly getting it included on the NIST Home Page as well (maybe as the anniversary gets closer).

As John Lowe mentioned in his email, he discussed this with my boss, Public Affairs Director Gail Porter. I will bring this up with her after the holidays when she's not crazy busy.

As far as the celebrations planned, I would like to have a teleconference meeting at some point with everyone on this email (and Chris Oates, too, if he wants to be included) and whomever else should be included to come up with a plan for getting the word out.

Just off the top of my head, these elements would be good to collect and have available for media interested in covering this:

- Photos (current AND historic) of the radio station, the equipment that runs it, the Atomic Clock(s) and time scale.

- Video, too, to the extend we have that. And any vintage film/video would be nice also;

- How the WWV signal was used in the "early days," and how it is used today; how the signal has evolved over the years (original signal strength, changes in how the broadcast propagates, the new phase modulations scheme, etc.);

- Who and what uses this signal from early days to today (commercial radio stations, military, wall clocks, etc.);

- And artifacts as they are available. For example, the radio-corrected pendulum clock we have here in Boulder, old receivers, new phase-modulation receivers, etc.

And anything else that could visually tell the story of the history of the broadcast, how it was used and who made use of it.

I know that there are a lot of "old guys" that have been here for a tour who told me stories of tuning into WWV (B and H) in their capacities as Navy communications officers. Stories like that would be good to have as well as any other anecdotes.

Those are just my first thoughts on this. As for media, it would be nice to be able to set up some tours of the radio station, when and if

that is convenient.

This is a fun and interesting story to tell; I'm looking forward to helping get the word out.

Jim

James Burrus
Outreach Coordinator;
AV and Conference Services Group Leader
NIST Boulder Labs
325 Broadway
MC 107.02, Room 1D 115
Boulder, CO 80305
w) 303-497-4789
c) 720-982-6222
james.burrus@nist.gov

From: Sutton, Douglas (Fed)
Sent: Thursday, December 07, 2017 11:42 AM
To: Burrus, James N. (Fed) <james.burrus@nist.gov>; Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>; Lowe, John P. (Fed) <john.lowe@nist.gov>; Nelson, Glenn (Fed) <glenn.nelson@nist.gov>; Yates, William (Fed) <william.yates@nist.gov>
Cc: Novick, Andrew (Fed) <andrew.novick@nist.gov>; Lombardi, Michael A. (Fed) <michael.lombardi@nist.gov>
Subject: RE: WWV 100th Anniversary

Jim

We are looking for a countdown timer to be placed on our website to lead us up to the day that Radio Station WWV will officially celebrate its 100th year of existence.

For example:
http://wpfruits.com/preview/?demo=offer-countdown-timer

We are making plans to celebrate on this day and scheduling special events to take place leading up to the big day.

Events such as media, pictures, video, interviews, special broadcasts.
I'm sure we will think of more.

Douglas Sutton
NIST Radio

From: Burrus, James N. (Fed)
Sent: Tuesday, December 05, 2017 3:03 PM
To: Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>; Lowe, John P. (Fed) <john.lowe@nist.gov>; Sutton, Douglas (Fed) <douglas.sutton@nist.gov>; Nelson, Glenn (Fed) <glenn.nelson@nist.gov>; Yates, William (Fed) <william.yates@nist.gov>
Cc: Novick, Andrew (Fed) <andrew.novick@nist.gov>; Lombardi, Michael A. (Fed) <michael.lombardi@nist.gov>
Subject: RE: WWV 100th Anniversary

I'm happy to help. Just let me know what you need/want.

Jim Burrus

From: Deutch, Matthew J. (Fed)
Sent: Monday, December 04, 2017 3:31 PM
To: Lowe, John P. (Fed) <john.lowe@nist.gov>; Sutton, Douglas (Fed) <douglas.sutton@nist.gov>; Nelson, Glenn (Fed) <glenn.nelson@nist.gov>; Yates, William (Fed) <william.yates@nist.gov>
Cc: Novick, Andrew (Fed) <andrew.novick@nist.gov>; Lombardi, Michael A. (Fed) <michael.lombardi@nist.gov>; Burrus, James N. (Fed) <james.burrus@nist.gov>
Subject: RE: WWV 100th Anniversary

Howdy John,
Thank you for looking into this for us.
I don't think we ever heard anyone deny the request per se, but Pam C. just passed on to us in the email that you saw that gave the impression that PIO was not excited about the idea.
We will restart the process.
Thanks,
Matt

From: Lowe, John P. (Fed)
Sent: Monday, December 04, 2017 3:23 PM
To: Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>; Sutton, Douglas (Fed) <douglas.sutton@nist.gov>; Nelson, Glenn (Fed) <glenn.nelson@nist.gov>; Yates, William (Fed) <william.yates@nist.gov>
Cc: Novick, Andrew (Fed) <andrew.novick@nist.gov>; Lombardi, Michael A. (Fed)

<michael.lombardi@nist.gov>; Burrus, James N. (Fed) <james.burrus@nist.gov>
Subject: WWV 100th Anniversary

Hi Folks,
I have had a conversation with Gail Porter who is the Group Leader for the Public Information Office concerning the 100th Anniversary of radio station WWV. She was unaware of the countdown clock controversy but she believes that we can work this out. Does anyone know who it was that denied us a countdown clock? They are hesitant to grant countdown clocks to things that do not have a big event at the end of the countdown. It might be best to start again and ask the Public Information Office for help in staging and advertising and planning the event and then the countdown may naturally fall out of the cooperation. She is now aware of our desires and believes that "time" and the "radio stations" are a big selling point to the general population and we will be able to make this work.
So please try again and start putting together plans, activities, dignitaries and a guest list etc...etc...and approach again...Jim Burrus (cc'd) can be helpful in regards to liaison to Gaithersburg.

John

From: Lowe, John P. (Fed)
To: Reidy, Anne M. (Fed)
Cc: Lowe, John P. (Fed); Oates, Chris (Fed)
Subject: SCMMR request for WWVH
Date: Thursday, January 25, 2018 2:38:59 PM
Attachments: 688DivisionScanner@nist.gov_20180125_155302.pdf
Copy of WWVH Estimate from Dan Works.xlsx

Anne,

Attached please find documentation pertaining to a SCMMR request for an upgrade to the WWVH fire alarm communications line. Also attached is the PMRF labor estimate for this work. This will be for FY 19. I have coordinated this with:

Brian O. Thompson, PE
Fire Protection Engineering Specialist
Office of Facilities & Property Management
Safety, Health & Compliance Group

Once you have reviewed this we are to submit this to John R. Bollinger, OFPM/Capital Asset Management and Facilities Planning Group Leader.

Let me know if/when I should submit this or that you will. I also need to let Jim Olthoff know as he is on the SCMMR review board. Or maybe Chris wants to inform him. Please let me know.

John

From: 688DivisionScanner@nist.gov <688DivisionScanner@nist.gov>
Sent: Thursday, January 25, 2018 5:53PM
To: Lowe, John P. (Fed)
Subject: Scanned image from MX-M363N

Reply to: [illegible]
Device Name: Not Set
Device Model: MX-M363N
Location: Not Set

File Format: PDF MMR(G4)
Resolution: [illegible]

Attached file is scanned image in PDF format
Use Acrobat(R)Reader(R) or Adobe(R)Reader(R) of Adobe Systems Incorporated to view the document
Adobe(R)Reader(R) can be downloaded from the following URL
Adobe, the Adobe logo, Acrobat, the Adobe PDF logo, and Reader are registered trademarks or trademarks of Adobe Systems Incorporated in the United States and other countries

https://na01.safelinks.protection.outlook.com/?
http%3A%2F%2Fwww.adobe.com%2F&data=02%7C01%7C[illegible]lowe%40nist.gov%7Ca9aa94556dc84522ed1208[illegible]&sdata=z4DRHPgVDsxwnfIKEA2o2Ff%2B[illegible]&reserved=0

Appendix C – SCMMR Proposed Project Submittal Check Sheet

It is the intent that this form be used to submit projects to be considered for the SCMMR funding process. Please fill in the basic information required to start the review process. Please submit the form to the individual designated for review at your site.

Project Title: WWVH Communications with PMRF Dispatch

Check the appropriate box or boxes:

[X] Alarms/ Fire Safety	[ ] Central Utilities
[ ] Air Filtration and Exhaust	[ ] Site Utilities
[ ] Hazardous Materials	[ ] Energy/Water Conservation
[ ] Mechanical/Electrical	[ ] Civil/Site
[ ] Structural	[ ] Architectural
[ ] Accessibility	[ ] Studies

Brief Description of the Problem/Deficiency to be addressed:

WWVH (Building 800) on the Pacific Missile Range Facility (PMRF) at Barking Sands utilizes direct buried copper wire for fire alarm communication with the PMRF Dispatch Center to receive emergency response. This direct buried copper wire was installed around 1971 (47 years ago). The Barking Sands Navy Base has experienced total failure of similar direct buried copper wire installations for Navy occupied buildings that are not as old and have been performing replacement of direct buried copper wire with fiber communications for Navy occupied PMRF buildings. Direct bury of copper wire leaves it exposed in the soil and to the elements and therefore experiences corrosion and decay over time. The direct buried copper wire for WWVH is at high risk for possible failure and loss of emergency communications with the PMRF Dispatch Center due to its age. Without emergency response communication at WWVH, there is a serious potential for loss of certificate of occupancy for the building by the PMRF fire department.

Please identify the deficiency issue: (Check one)

Capacity – Enhance Research	Capacity – Enhance Support	Capacity – Enhance Reliability of Systems	
Building Integrity – Appearance	Building Integrity - Beyond Rated Life	Building Integrity – Reliability	
Code Compliance – Accessibility	Code Compliance – Building Code	✓ Code Compliance – Life Safety Code, OSHA	Environmental Compliance – Air/Water

Operations – Energy Efficiency	Operations – Maintenance	Operations – Security	

Brief Description of the Proposed Solution:

A new building is being built near WWVH (Building 800) and the utility construction includes installation of new fiber for connection and communication to PMRF Dispatch Center. This fiber utility installation will include a new fiber junction vault at the road or drive leading to WWVH. Installing a new fiber connection from WWVH (Building 800) to the new fiber junction vault (approximately 600 feet) to replace the existing direct buried copper wire will eliminate the current risk. The existing WWVH fire alarm panel used for dispatch communications will also need replaced with one that is listed for use with the Honeywell panel at PMRF Dispatch.

The existing direct buried copper wire is also used for telephone communications at WWVH (Building 800). Replacing the copper wire with fiber will allow for improved telephone service to WWVH as the existing telephone communications at WWVH are less than satisfactory.

Current internet service at WWVH is via satellite service. The introduction of fiber communications will make it possible to change the internet service from satellite to fiber communications as well.

There have been preliminary discussions with the PMRF Dispatch Center Base Communications Supervisor to determine the Navy's ability to perform this work since they have been performing similar work for other buildings that are Navy occupied on the PMRF property. The Base Communications Supervisor indicates they can do this work except for providing a new panel inside the building to communicate with the Dispatch Center via the fiber. Preliminary cost estimate is less than $50,000.00.

Your contact information: Name: John Lowe Extension: 5453 (Boulder)

Division: 688

Division Chief Concurrence: Ch. W Date 1/25/19

Additional information:

(Please attach any supporting documentation you may have):

WWVH COMM UPGRADE LABOR ESTIMATE 1/9/18 #18-002060_(OU-680)-(INT.#2) #14

POSITION	GRADE	TASK	HOURS	RATE PER HR.	TOTAL
BASE COMMUNICATIONS SUPERVIS	MA-5	Manage and supervise project	5	$76.00	$380.00
OPERATOR		Mobilize & demobilize equipment and materials (2 people x 1 hr = 2 mhs)	2	$75.00	$150.00
LABORER		Mobilize & demobilize equipment and materials (2 people x 1 hr = 2 mhs)	2	$75.00	$150.00
TDWR SUPERVISOR	MA-5	Schedule and manage project and order materials	10	$76.00	$760.00
EQUIPMENT OPERATOR	D861	Trench and cover from new handhole to B800	4	$73.50	$294.00
LABORER	D847	Trench and cover from new handhole to B800	4	$56.00	$224.00
EQUIPMENT OPERATOR	D861	Excavate for pull boxes	2	$73.50	$147.00
LABORER	D847	Excavate for pull boxes	2	$56.00	$112.00
EQUIPMENT OPERATOR	D861	Place rock for pull box base	1	$73.50	$73.50
LABORER	D847	Place rock for pull box base	1	$56.00	$56.00
EQUIPMENT OPERATOR	D861	Install new pull boxes	4	$73.50	$294.00
LABORER	D847	Install new pull boxes	4	$56.00	$224.00
EQUIPMENT OPERATOR	D861	Install pvc conduit in trench (1 person x 12 hrs = 12 mhs)	12	$73.50	$882.00
LABORER	D847	Install pvc conduit in trench (2 people x 12 hrs = 24 mhs)	24	$56.00	$1,344.00
DUMP TRUCK OPERATOR	D873	Haul waste material/water truck (1 person x 4 hrs = 4 mhs)	4	$73.00	$292.00
DUMP TRUCK OPERATOR	D873	Transport pull boxes from vendor to PMRF (1 person x 4 hrs = 4 mhs)	4	$73.00	$292.00
DUMP TRUCK OPERATOR	D873	Pick up pea gravel (1 person x 4 hrs = 4 mhs)	4	$73.00	$292.00
BASE COMMUNICATIONS TECHNICI	T-5L	Order materials (1 person x 3 hrs = 3 mhs)	3	$65.00	$195.00
BASE COMMUNICATIONS TECHNICI	D817	Mobilize & demobilize equipment and materials (2 events x 5 techs x 1 hr = 10 mhs)	10	$75.00	$750.00
BASE COMMUNICATIONS TECHNICI	D817	Install inner duct from B800 to new Comm. Bldg. (5 techs x 5 hrs = 15 mhs)	15	$75.00	$1,125.00
BASE COMMUNICATIONS TECHNICI	D817	Install fiber cable and copper cable from new Comm Hut to B800 (5 techs x 3 hrs = 25 mhs)	25	$75.00	$1,875.00
BASE COMMUNICATIONS TECHNICI	D821	Terminate copper cable at B800 (2 tech x 2 hrs = 2 mhs)	2	$81.03	$162.06
BASE COMMUNICATIONS TECHNICI	D821	Splice copper cable (1 tech x 3 hrs = 3 mhs)	3	$81.03	$243.09
BASE COMMUNICATIONS TECHNICI	D821	Splice fiber cable at new Comm. Bldg. (1 tech x 3 hrs = 3 mhs)	3	$81.03	$243.09
BASE COMMUNICATIONS TECHNICI	D817	Install fiber patch panel in B800 (2 tech x 1 hr = 2 mhs)	2	$75.00	$150.00
BASE COMMUNICATIONS TECHNICI	D821	Splice fiber cable at B800 (1 tech x 3 hrs = 3 mhs)	3	$81.03	$243.09
BASE COMMUNICATIONS TECHNICI	D821	Test copper cable end to end (2 techs x .5 hr = 1 mh)	1	$81.03	$81.03
BASE COMMUNICATIONS TECHNICI	D817	Transfer copper service to new cable (1 tech x 2 hrs = 2 mhs)	2	$75.00	$150.00
BASE COMMUNICATIONS TECHNICI	D821	Test fiber cable end to end (2 techs x 2 hrs = 4 mhs)	4	$81.03	$324.12
BASE COMMUNICATIONS TECHNICI	D817	Install cable racks in 2 new hand holes (2 techs x 1 hr x 2 holes = 4 mhs)	4	$75.00	$300.00
BASE COMMUNICATIONS TECHNICI	D817	Remove old cable copper cables from B800 & B802 (3 techs x 2 hr = 6 mhs)	6	$75.00	$450.00

WWVH COMM UPGRADE LABOR ESTIMATE 1/9/18 #18-002060_(OU-680)-(INT.#2) #14

BASE COMMUNICATIONS TECHNICI	D817	Rack and label cables in hand holes (2 techs x 1 hrs = 2 mhs)	2	$75.00	$150.00
BASE COMMUNICATIONS TECHNICI	T-5	Tone and locate cables prior to digging (2 techs x 2 hrs = 4 mhs)	4	$64.00	$256.00
BASE COMMUNICATIONS TECHNICI	T-5	Update GDM and Manhole Drawings (1 tech x 4 hrs = 4 mhs)	4	$64.00	$256.00
DRAFTING		Update GDM and Manhole Drawings (1 tech x 4 hrs = 4 mhs)	4	$75.00	$300.00
TELECOMM DATABASE MANAGER	MA-5	Update Cairs Database	3	$70.00	$210.00
PLUMBER	PW-4	Tone and locate water lines prior to digging (2 techs x 2 hrs = 4 mhs)	4	$62.00	$248.00
ELECTRICIAN	PW-4	Tone and locate cables prior to digging (2 techs x 2 hrs = 4 mhs)	4	$62.00	$248.00
		TOTAL LABOR	197		**$13,925.98**
		TOTAL MATERIALS			
		GRAND TOTAL			

WWVH COMM UPGRADE LABOR ESTIMATE 1/9/18 #18-002060_(OU-680)-(INT.#2) #14

PMO FY18	G&A	Total
6.70%	3.24%	
$25.46	$13.14	$418.60
$10.05	$5.19	$165.24
$10.05	$5.19	$165.24
$50.92	$26.27	$837.19
$19.70	$10.16	$323.86
$15.01	$7.74	$246.75
$9.85	$5.08	$161.93
$7.50	$3.87	$123.38
$4.92	$2.54	$80.97
$3.75	$1.94	$61.69
$19.70	$10.16	$323.86
$15.01	$7.74	$246.75
$59.09	$30.49	$971.59
$90.05	$46.46	$1,480.51
$19.56	$10.09	$321.66
$19.56	$10.09	$321.66
$19.56	$10.09	$321.66
$13.07	$6.74	$214.81
$50.25	$25.93	$826.18
$75.38	$38.89	$1,239.27
$125.63	$64.82	$2,065.45
$10.86	$5.60	$178.52
$16.29	$8.40	$267.78
$16.29	$8.40	$267.78
$10.05	$5.19	$165.24
$16.29	$8.40	$267.78
$5.43	$2.80	$89.26
$10.05	$5.19	$165.24
$21.72	$11.21	$357.04
$20.10	$10.37	$330.47
$30.15	$15.56	$495.71

WWVH COMM UPGRADE LABOR ESTIMATE 1/9/18 #18-002060_(OU-680)-(INT.#2) #14

$10.05	$5.19	$165.24	
$17.15	$8.85	$282.00	
$17.15	$8.85	$282.00	
$20.10	$10.37	$330.47	
$14.07	$7.26	$231.33	
$16.62	$8.57	$273.19	
$16.62	$8.57	$273.19	
$933.04	**$481.43**	**$15,340.45**	**TRUE**
		$19,584.17	
		$34,924.62	

WWVH COMM UPGRADE ANNEX 21 MATERIAL ESTIMATE 1/9/18

ITEM	QTY	PRICE SOURCE	UNIT PRICE	TOTAL	PMO FY18 6.70%	G&A 3.24%	Total
PVC-40 4"x 10' CONDUIT	108	ALPHA ELECTRIC	$ 27.37	$ 2,955.42	$198.01	$102.17	$3,282.97
PVC-40 LB	1	ALPHA ELECTRIC	$ 50.16	$ 50.16	$3.36	$1.73	$105.41
PVC-40 4" 90 DEGREE SWEEP	2	ALPHA ELECTRIC	$ 14.27	$ 28.54	$1.91	$0.99	$45.71
PVC-80 4"x10' CONDUIT	2	ALPHA ELECTRIC	$ 39.48	$ 78.96	$5.29	$2.73	$126.46
2'x4' CONCRETE PULLBOX W/COVER	2	Kaiwa Co.	$ 3,500.00	$ 7,000.00	$469.00	$242.00	$11,211.00
MAXCELL	1200	Exsell Sales	$ 2.80	$ 3,360.00	$225.12	$116.16	$3,704.08
Fiber Patch Panel 24 Strand Capacity	1	Warehouse	$ 160.00	$ 160.00	$10.72	$5.53	$336.25
Coupler Panel SC/SM low density	4	Warehouse	$ 24.00	$ 96.00	$6.43	$3.32	$129.75
Connector, SM, SC, 900um, Anerobic	30	Warehouse	$ 10.25	$ 307.50	$20.60	$10.63	$348.98
Fiber Optic Cable, 12 SM	1400	Warehouse	$ 1.15	$ 1,610.00	$107.87	$55.66	$1,774.68
Copper Cable 50 Pair	1400	Residual	$ -	$ -	$0.00	$0.00	$0.00
Cable Racks for hand holes, 18"	4	Historical	$ 10.21	$ 40.84	$2.74	$1.41	$55.20
Step, 6 inch, for cable racks	4	Historical	$ 3.21	$ 12.84	$0.86	$0.44	$17.35
50 Pair Protector Block	1	Warehouse	$ 115.00	$ 115.00	$7.71	$3.98	$241.68
Protector Module	50	Warehouse	$ 3.20	$ 160.00	$10.72	$5.53	$179.45
Freight	1	Historical	$ 250.00	$ 250.00	$16.75	$8.64	$525.39
Misc. Hardware	1	Historical	$ 250.00	$ 250.00	$16.75	$8.64	$525.39
MATERIALS TOTAL				**$16,475.26**		**TOTAL WITH PMO/G&A**	**$22,609.76**

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: WWV 100th Anniversary
Date: Tuesday, September 18, 2018 11:49:01 AM

From: Burrus, James N. (Fed)
Sent: Tuesday, January 9, 2018 2:08 PM
To: Sutton, Douglas (Fed); Lowe, John P. (Fed)
Cc: Deutch, Matthew J. (Fed)
Subject: RE: WWV 100th Anniversary

Maybe we could hold a "rededication" ceremony, kind of like renewing your vows (for married folks). Gives you a chance to talk about what it was 100 years ago and the advances in time measurement and technology up to today and into the future.

Jim

From: Sutton, Douglas (Fed)
Sent: Tuesday, January 02, 2018 10:37 AM
To: Lowe, John P. (Fed) <john.lowe@nist.gov>; Burrus, James N. (Fed) <james.burrus@nist.gov>
Cc: Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>
Subject: RE: WWV 100th Anniversary

John

That's the idea. Oct 1st 2019 would be a day of celebration, such as a ribbon cutting or etc.... That day would be the main event day.
There are other smaller milestones that could be celebrated later, such as; earlies date known of a audio broadcast or.....

From: Lowe, John P. (Fed)
Sent: Tuesday, January 02, 2018 10:29 AM
To: Sutton, Douglas (Fed) <douglas.sutton@nist.gov>; Burrus, James N. (Fed) <james.burrus@nist.gov>
Cc: Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>

Subject: Re: WWV 100th Anniversary

I believe her point is just that....the count down timer has to lead to some event. Not just a notation to the 100th anniversary. The count down leads to an event, a ribbon cutting, a celebration...a physical event that occurs at the end of the count down...

From: Sutton, Douglas (Fed)
Sent: Tuesday, January 2, 2018 12:03 PM
To: Lowe, John P. (Fed); Burrus, James N. (Fed)
Cc: Deutch, Matthew J. (Fed)
Subject: RE: WWV 100th Anniversary

John

I was talking with Matt and Glenn and we thought that the countdown time would count down to Oct 1 2019, a 100 years after the WWV call letter were issued.
Other scheduled celebrations would occur following the end of the countdown timer.
Your thoughts are welcome.

Douglas

From: Lowe, John P. (Fed)
Sent: Tuesday, January 02, 2018 9:39 AM
To: Sutton, Douglas (Fed) <douglas.sutton@nist.gov>; Burrus, James N. (Fed) <james.burrus@nist.gov>
Cc: Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>
Subject: Re: WWV 100th Anniversary

I have a request in concerning the count down timer with Gail Porter. One thing she expressed is that the countdown had to culminate into some event. What would be the event??
John

From: Sutton, Douglas (Fed)
Sent: Tuesday, January 2, 2018 11:25 AM
To: Burrus, James N. (Fed)

Cc: Deutch, Matthew J. (Fed); Lowe, John P. (Fed)
Subject: RE: WWV 100th Anniversary

Jim

I was wondering if you had heard anything for the Public Affairs Web guru's on our count down timer?

Now that it is January, I plan on moving ahead with planes associated with the 100 year celebration.

Thanks for your help.

Douglas
NIST Radio

From: Burrus, James N. (Fed)
Sent: Thursday, December 07, 2017 12:20 PM
To: Sutton, Douglas (Fed) <douglas.sutton@nist.gov>; Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>; Lowe, John P. (Fed) <john.lowe@nist.gov>; Nelson, Glenn (Fed) <glenn.nelson@nist.gov>; Yates, William (Fed) <william.yates@nist.gov>
Cc: Novick, Andrew (Fed) <andrew.novick@nist.gov>; Lombardi, Michael A. (Fed) <michael.lombardi@nist.gov>
Subject: RE: WWV 100th Anniversary

Doug, et.al.,
The countdown clock is a great idea on several levels. Each division is in charge of the Web content about that division on the NIST website, so getting this put on the Time and Frequency home page shouldn't be a problem. The only question would be how it would be presented, size, position on the page, etc. I will contact our Public Affairs Web guru for some guidance about this, as well as possibly getting it included on the NIST Home Page as well (maybe as the anniversary gets closer).
As John Lowe mentioned in his email, he discussed this with my boss, Public Affairs Director Gail Porter. I will bring this up with her after the holidays when she's not crazy busy.
As far as the celebrations planned, I would like to have a teleconference meeting at some point with everyone on this email (and Chris Oates, too, if he wants to be included) and whomever else should be included to come up with a plan for getting the word out.

Just off the top of my head, these elements would be good to collect and have available for media interested in covering this:

- **Photos (current AND historic) of the radio station, the equipment that runs it, the Atomic Clock(s) and time scale.**

- **Video, too, to the extend we have that. And any vintage film/video would be nice also;**

- **How the WWV signal was used in the "early days," and how it is used today; how the signal has evolved over the years (original signal strength, changes in how the broadcast propagates, the new phase modulations scheme, etc.);**

- **Who and what uses this signal from early days to today (commercial radio stations, military, wall clocks, etc.);**

- **And artifacts as they are available. For example, the radio-corrected pendulum clock we have here in Boulder, old receivers, new phase-modulation receivers, etc.**

And anything else that could visually tell the story of the history of the broadcast, how it was used and who made use of it.

I know that there are a lot of "old guys" that have been here for a tour who told me stories of tuning into WWV (B and H) in their capacities as Navy communications officers. Stories like that would be good to have as well as any other anecdotes.

Those are just my first thoughts on this. As for media, it would be nice to be able to set up some tours of the radio station, when and if that is convenient.

This is a fun and interesting story to tell; I'm looking forward to helping get the word out.

Jim

James Burrus
Outreach Coordinator;
AV and Conference Services Group Leader
NIST Boulder Labs
325 Broadway
MC 107.02, Room 1D 115
Boulder, CO 80305
w) 303-497-4789
c) 720-982-6222
james.burrus@nist.gov

From: Sutton, Douglas (Fed)
Sent: Thursday, December 07, 2017 11:42 AM
To: Burrus, James N. (Fed) <james.burrus@nist.gov>; Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>; Lowe, John P. (Fed) <john.lowe@nist.gov>; Nelson, Glenn (Fed) <glenn.nelson@nist.gov>; Yates, William (Fed) <william.yates@nist.gov>
Cc: Novick, Andrew (Fed) <andrew.novick@nist.gov>; Lombardi, Michael A. (Fed) <michael.lombardi@nist.gov>
Subject: RE: WWV 100th Anniversary

Jim

We are looking for a countdown timer to be placed on our website to lead us up to the day that Radio Station WWV will officially celebrate its 100th year of existence.

For example:
http://wpfruits.com/preview/?demo=offer-countdown-timer

We are making plans to celebrate on this day and scheduling special events to take place leading up to the big day.

Events such as media, pictures, video, interviews, special broadcasts.
I'm sure we will think of more.

Douglas Sutton
NIST Radio

From: Burrus, James N. (Fed)
Sent: Tuesday, December 05, 2017 3:03 PM
To: Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>; Lowe, John P. (Fed) <john.lowe@nist.gov>; Sutton, Douglas (Fed) <douglas.sutton@nist.gov>; Nelson, Glenn (Fed) <glenn.nelson@nist.gov>; Yates, William (Fed) <william.yates@nist.gov>
Cc: Novick, Andrew (Fed) <andrew.novick@nist.gov>; Lombardi, Michael A. (Fed) <michael.lombardi@nist.gov>
Subject: RE: WWV 100th Anniversary

I'm happy to help. Just let me know what you need/want.

Jim Burrus

From: Deutch, Matthew J. (Fed)
Sent: Monday, December 04, 2017 3:31 PM
To: Lowe, John P. (Fed) <john.lowe@nist.gov>; Sutton, Douglas (Fed) <douglas.sutton@nist.gov>; Nelson, Glenn (Fed) <glenn.nelson@nist.gov>; Yates, William (Fed) <william.yates@nist.gov>
Cc: Novick, Andrew (Fed) <andrew.novick@nist.gov>; Lombardi, Michael A. (Fed) <michael.lombardi@nist.gov>; Burrus, James N. (Fed) <james.burrus@nist.gov>
Subject: RE: WWV 100th Anniversary

Howdy John,
Thank you for looking into this for us.
I don't think we ever heard anyone deny the request per se, but Pam C. just passed on to us in the email that you saw that gave the impression that PIO was not excited about the idea.
We will restart the process.
Thanks,
Matt

From: Lowe, John P. (Fed)
Sent: Monday, December 04, 2017 3:23 PM
To: Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>; Sutton, Douglas (Fed) <douglas.sutton@nist.gov>; Nelson, Glenn (Fed) <glenn.nelson@nist.gov>; Yates, William (Fed) <william.yates@nist.gov>
Cc: Novick, Andrew (Fed) <andrew.novick@nist.gov>; Lombardi, Michael A. (Fed) <michael.lombardi@nist.gov>; Burrus, James N. (Fed) <james.burrus@nist.gov>
Subject: WWV 100th Anniversary

Hi Folks,
I have had a conversation with Gail Porter who is the Group Leader for the Public Information

Office concerning the 100th Anniversary of radio station WWV. She was unaware of the countdown clock controversy but she believes that we can work this out. Does anyone know who it was that denied us a countdown clock? They are hesitant to grant countdown clocks to things that do not have a big event at the end of the countdown. It might be best to start again and ask the Public Information Office for help in staging and advertising and planning the event and then the countdown may naturally fall out of the cooperation. She is now aware of our desires and believes that "time" and the "radio stations" are a big selling point to the general population and we will be able to make this work.
So please try again and start putting together plans, activities, dignitaries and a guest list etc...etc...and approach again...Jim Burrus (cc'd) can be helpful in regards to liaison to Gaithersburg.

John

From: Sokolowski, Daniel J. (Fed)
To: Walrond, Stanford (Frank) (Fed)
Cc: Spicer, James L. (Fed); Oates, Chris (Fed)
Subject: FW: Contract for 926576
Date: Wednesday, June 06, 2018 9:58:07 AM
Attachments: 16-04107 SOW for Frank Walrond.pdf
image002.png
image004.png

Hi Frank,

Please see the attached SOW for the generator install which is related to 926576. When consulting John Gabriel about how this battery charger would be handled, I was told that it would be "excessed in place." Please review the SOW (Section 3.2.3.1) and remove the item from division 688's "outstanding inventory." I do not feel that a CD-52 is appropriate base on the form presenting these categories "Lost, stolen, destroyed, damaged, sacrificed or unserviceable property." As none of these apply, I do not feel it appropriate. This $800 item purchased in 2000 appears to have a depreciable cost of $775.00 over an 18 year lifespan (which is 8 years over the manufacturer's suggested use), the item is currently valued at $43.05. If we go by the manufacturers expected asset lifespan the item was worth $0.00 in 2010. Please let me know if you require further information or I can help clarify the situation. Otherwise, please remove the item from inventory and let us know when that has been accomplished. Thanks!

-Daniel

Daniel Sokolowski
PML Operations Project Manager, COR II
daniel.sokolowski@nist.gov
Work: 303-497-4515
Cell: 720-899-7839

PML
PHYSICAL MEASUREMENT LABORATORY

NIST
National Institute of Standards and Technology
U.S. Department of Commerce

From: Spicer, James L. (Fed)
Sent: Tuesday, June 05, 2018 2:36 PM
To: Sokolowski, Daniel J. (Fed) <daniel.sokolowski@nist.gov>
Cc: Spicer, James L. (Fed) <james.spicer@nist.gov>; Oates, Chris (Fed) <chris.oates@nist.gov>
Subject: Contract for 926576

Daniel,

You asked me not to submit a CD-52 for the Onan Battery Charging Station, property# 926576, that the contractor removed from Ft. Collins as part of the contract to install a new charging station. Do you have an update on how to handle this asset? This is still on our outstanding inventory and we need to get this resolved so we can get it off of our inventory list.

Regards,

Jim Spicer
IT Specialist/Property Custodian/Division Safety Representative
National Institute of Standards & Technology
Time & Frequency Division
Time and Frequency Services Group
MS 847.00
325 Broadway, Room# 4013
Boulder, CO 80305-3337
(303) 497-5306 (office)

SPECIFICATIONS
Generator & Automatic Transfer Switch (ATS) Upgrade

1.0 BACKGROUND:
The National Institute of Standards and Technology (NIST) maintains the standards for time and frequency for most users in the United States. NIST provides a variety of services designed to deliver time and frequency signals to the people who need them. The signals are broadcast via several mediums, including high and low frequency radio, the Internet, and telephones lines. These signals are used to synchronize millions of clocks every day, throughout the United States and around the world.

2.0 PURPOSE:
NIST Time and Frequency Radio Station WWV requires a new Emergency back-up generator and automatic transfer switch. The current generator and transfer switch has become unreliable. In case of loss of commercial power, the new units will supply standby power to the building. ~~and equipment.~~ Our group depends on the standby emergency power to fulfill our mission. Equipment must be able to tolerate the unique pulsating load imposed by the WWV transmitters.

3.0 STATEMENT OF WORK (SOW)

3.1 GENERAL:

3.1.1 Other than ordering and delivering equipment & supplies no work may begin on the site until January 3rd 2017.

3.1.2 All work must be completed and inspected for operational reliability before March 17th 2017.

3.1.3 Equipment installation will require connections to the building electrical distribution equipment. This equipment may be de-energized for no more than 16 hours total, consisting of two consecutive days of 8 hour periods during normal working hours. Power must be restored in between these outages. The power outages must be coordinated with the COR no less than 14 days prior to the proposed outage. Any additional coordination with outside utility companies is the sole responsibility of the contractor.

3.1.4 A kick-off meeting will be required for contractor principles within 30 days of award.

3.1.5 An equipment removal & installation plan must be presented at the kick-off meeting for approval before work may proceed.

3.1.6 A safety plan including a Job Hazard Assessment (JHA) must be presented at the kick-off meeting for approval before work may proceed.

3.1.7 Any equipment, materials, or debris removed from the site in reference to the SOW will be disposed of by the contractor in accordance with federal and local disposal regulations.

3.1.7.1 All equipment removed and installed will need to fit through an 8' tall & 9' wide garage door

3.1.8 Any visits to the site must be coordinated with the COR and Radio Station staff. Deliveries will be made to 5701 N HWY 1 Fort Collins Colorado, 80524

3.1.9 All materials necessary to complete the project will be on-site on or before January 3rd 2017.

3.1.10 Two copies of all maintenance and operational manuals will be provided for each piece of purchased equipment and shall be provided to the COR.

3.1.11 NIST anticipates that the generator and all other components will be capable of safely providing emergency backup power within 3 weeks or less from the start of work.

3.2 ~~DELIVERABLES:~~ SPECIFIC:

3.2.1 Generator Guidelines

3.2.1.1 250 Kw diesel powered commercial standby generator set 120 / 208 Volt, 60Hz, 3 phase (Cummins QSL9-G7 series, model DQDAA or equivalent) and fit inside designated footprint (119" long, 50" wide, 70" high).

3.2.1.2 Alternator must be rated for 60 Hz, of the 12 Lead reconnectable type and include extended range and increased motor starting (IMS) capability. Due to the pulsating load, alternator must be sized such that temperature rise will not exceed 80 degrees C at 290 kW.

3.2.1.3 Generator engine shall be capable of producing at least 464 HP at 4900 feet elevation, at 40 degrees C ambient temperature.

3.2.1.4 The engine starting voltage shall be 24 volts DC.

3.2.1.5 Equipment must include manufacturer recommended engine starting batteries.

3.2.1.6 Equipment must meet NFPA 110 Level 1 requirements for single step load shifting.

3.2.1.7 Equipment must include automatic starting and stopping capability accessible from the ATS.

3.2.1.8 Equipment must include local controls for Generator Off, On, and automatic mode.

3.2.1.9 Equipment must provide local display for fault history, start attempts/starts/runtime hours, and load percentages.

3.2.1.10 Equipment must include internal protection for overcurrent and short circuit events, phase fault, over- and under-voltage and frequency events, and shutdown for reverse power events.

3.2.1.11 Equipment must include a side Inlet, end outlet muffler with 6" ASA Flanges

3.2.1.12 Equipment must include 120 volt AC, Single Phase coolant heater

3.2.1.13 Equipment must include Vibration Isolators: Seismic-2000LB Rated Load

3.2.1.14 Equipment must include A remote annunciator/display (part of Cummins PCC-2100 control system, or equivalent), to be mounted in the hallway adjacent to the generator room

3.2.1.15 Equipment must include 4" NPT to 6" ASA Conversion pipe package (required for Cummins generator)

3.2.1.16 Equipment must include Slip On exhaust connector (required for Cummins generator)

3.2.1.17 Equipment must include a Factory Certified Test Record

3.2.2 Automatic Transfer Switch (ATS) Guidelines

3.2.2.1 1000 AMP Transfer Switch (Cummins OTEC 1000 amp or equivalent)

3.2.2.2 Transfer switch must be from the same manufacturer as the generator and be fully compatible

3.2.2.3 Transfer switch must include user accessible dry contacts indicating switch is in emergency position

3.2.2.4 Transfer switch must include user accessible dry contacts indicating switch is in normal position

3.2.2.5 Transfer switch must include a generator exercise Clock, without switching the

load

3.2.2.6 Enclosure: Type 1, interior

3.2.2.7 Transfer switch must be 120 / 208 Volt, 60 Hz, 3 phase

3.2.2.8 Transfer switch must fit inside existing equipment footprint of 45" wide X 36" deep

3.2.3 Generator & ATS Installation Guidelines

The contractor shall:

3.2.3.1 Remove old Generator, Transfer Switch, and all associated components from service and dispose or reutilize at their discretion in compliance with federal or state (whichever is more stringent) (Caterpillar Generator Model D343 Series A, Engine Serial No. 62B845. Generator is 110" long, 50" wide, 70" high)(custom-built switch made by Electrical Equipment and Engineering Company and existing electrical connections. Switch is 36" deep, 45" wide, and 90" tall and weighs approximately 700 pounds).

3.2.3.2 Install new 250kW Generator and new compatible 1000-amp Transfer Switch.

3.2.3.3 Increase wall opening size for generator exit cooling if necessary. The size of the exit cooling opening must meet manufacturer's recommendations. The current exit cooling opening is in a wall made of eight-inch concrete cinder block.

3.2.3.4 Run new electrical cable through code compliant conduit between electrical panels and Transfer Switch, based on manufacturers recommendations and NEC codes.

3.2.3.5 Run new control wire between generator and transfer switch, based on manufacturers recommendations.

3.2.3.6 Connect diesel fuel lines and exhaust pipe

3.2.3.7 Perform post-installation operational test including load bank test and certify that equipment is performing to specifications in the presence of the COR.

4.0 250 Kw diesel generator set and a 1000 Amp automatic transfer switch.

One 250 Kw commercial standby electric generator set and installation:
a. Diesel powered
120 / 208 Volt, 60 Hz, 3 phase
The contractor shall remove existing Caterpillar Generator Model D343 Series A, Engine Serial No. 62B845. Generator is 110" long, 50" wide, 70" high.
b. , 3 wire
c. Meet size requirements 119" L X 50" W X 74" H.
d. The contractor shall remove existing Caterpillar Generator Model D343 Series A, Engine Serial No. 62B845
e. The Contractor shall properly dispose of old equipment.
f. The contractor shall install new generator
g. The Contractor shall remove and install units through an 8 foot high and 9 foot wide garage door

One 1000 AMP commercial power Transfer Switch and installation:
h. 120 / 208 Volt, 60 Hz, 3 phase, 3 wire
i. Meet size requirements 67" H X 30" W X 19" DTransfer switch must fit inside existing equipment footprint of 45" wide X 36" deep
j. The contractor shall remove existing Electrical Equipment and Engineering Company custom built switch made by Electrical Equipment and Engineering Company and existing electrical connections. Switch is 36" deep, 45" wide, and 90" tall and weighs approximately 700 pounds.
The contractor shall install new transfer switch and electrical connections.
Electrical outages: Equipment installation will require connections to the building electrical distribution equipment. This equipment may be de-energized for no more than 16 hours total, consisting of two 8 hour periods during normal working hours. The power outages must be coordinated with the COR not less than 14 days prior to the proposed outage.
The contractor shall provide an equipment removal and installation plan, a Job Hazard Analysis (JHA), and a material delivery schedule.
The contractor shall provide a list of three references of previous jobs completed, including contact information.
k.

TECHNICAL SPECIFICATIONS:
Generator and Transfer Switch purchase only:

A. Generator 250 Kw commercial standby generator set:(Cummins QSL9 G7 series, model DQDAA or equivalent):
- Alternator shall be rated for 60 Hz, of the 12 Lead reconnectable type and include extended range and increased motor starting (IMS) capability. Due to the pulsating load, alternator must be sized such that temperature rise will not exceed 80 degrees C at 290 kW.
Generator engine shall be capable of developing at least 464 50 HP at 1500 meters4900 feet elevation, at 40 degrees C ambient temperature
The engine starting voltage shall be 24 volts DC
- Equipment shall include appropriate engine starting batteries
- Equipment shall meet NFPA 110 Level 1 requirements for single step load shifting
- Equipment shall include automatic remote starting and stopping capability
- Equipment shall include local controls for Generator Off, On, and automatic mode
- Equipment shall provide local display for fault history, start attempts/starts/runtime hours, and load percentages

- Equipment shall include internal protection for overcurrent and short circuit events, phase fault, over- and under-voltage and frequency events, and shutdown for reverse power events
- Critical Equipment shall include a Muffler: Sside Inlet, eEnd oOutlet muffler with 6" ASA Flanges
- The equipment shall include:
  - User configured Genset status relays
  - Low voltage terminal box
  - 120 volt AC, Single Phase coolant heater
  - Slip On exhaust connector
  - Vibration Isolators: Seismic 2000LB Rated Load
  - A remote annunciator/display (part of Cummins PCC 2100 control system, or equivalent), to be mounted in the hallway adjacent to the generator room
  - 4" NPT to 6" ASA Conversion pipe package (required for Cummins generator)
  - Slip On exhaust connector (required for Cummins generator)
  -
  - Factory Certified Test Record
- The contractor shall perform post-installation operational test including load bank test and certify that equipment is performing to specifications.

B. Transfer Switch 1000 AMP: (Cummins OTEC 1000 amp or equivalent)

- Transfer switch must be from the same manufacturer as the generator and be fully compatible
- 3 Poles
- Auxiliary relay: Switch in emergency postion 24VDCTransfer switch must include user accessible dry contacts indicating switch is in emergency position
- Auxiliary relay: Switch in normal position 24VDC Transfer switch must include user accessible dry contacts indicating switch is in normal position
- Transfer switch must include a generator exercise Clock Exercise, External, without switching the load
- Cabinet TypeEnclosure: Type 1, interior

TECHNICAL SPECIFICATIONS
Generator and Transfer Switch Installation

Contractor shall install new 250kW Generator and new compatible 1000 amp Transfer Switch.

- Coordinate complete job with the Daniel SokolowskiCOR and Radio Station Staff
- Unload the generator and transfer switch at job site located at: 5701 N HWY 1 Fort Collins Colorado, 80524
- Remove and properly dispose of old Generator and Transfer Switch
- Concrete saw larger hole for new generator exit cooling. Increase wall opening size for generator exit cooling if necessary. The size of the exit cooling opening must meet manufacturer's recommendations. The current exit cooling opening is in a wall made of eight inch concrete cinder block.
- Run new electrical cable between from electrical panels andto Transfer Switch and back, based on manufactures recommendations and NEC codes.
- Run new control wire between generator and transfer switch, based on manufactures recommendations and NEC codes.
- Install new Generator and Transfer Switch
- Secure Generator and Transfer Switch to Concrete floor, Core drill concrete
- Wire in the Generator, Transfer Switch and control wiring
- Connect Diesel fuel lines and exhaust pipe
- Confirm proper operation with CORDaniel Sokolowski and Radio Station Staff

Due to space availability the new units will need to occupy the same approximate foot print as the old units being removed. Therefore, the new units will need to be physically close to the same size as the old unit. Sizes noted under Deliverables

DELIVERABLES & PAYMENT SCHEDULE

Number/ Reference	Description	Format	Quantity	Due Date	Payment Schedule
1/ 3.1.4	Kick-Off Meeting	In Person	Once for Contractor Principles	Within 30 days of Award	-
2/ 3.1.6	Job Hazard Assessment	In Person	Once	Kick-Off Meeting	-
3/ 3.1.6	Safety Plan	In Person	Once	Kick-Off Meeting	-
4/ 3.1.5	Equipment Removal & Installation Plan	In Person	Once	Kick-Off Meeting	-
5/ 3.2.1	250 Kw Diesel Generator (Cummins QSL9-G7 series, model DQDAA or equivalent)	In Person	Once	No later than 01/03/2017	-
6/ 3.2.2	1000 AMP Automatic Transfer Switch (Cummins OTEC 1000 amp or equivalent)	In Person	Once	No later than 01/03/2017	-
7/ 3.1.9	All other Materials necessary for the complete installation of the specified generator and transfer switch	In Person	Once	No later than 01/03/2017	-
8/ 3.2.1.17	Factory Certified Test record for generator	In Person	Once	Prior to installation of generator	-
9/ 3.1.10	Operation & Maintenance manuals	In Person	Once	No later than date of installation	-
10/ 7.0	Final Acceptance Testing	In Person	Once	No later than 3/17/2017	-

5.0 TECHNICAL CONSIDERATIONS:

No permitting is required. Work to be coordinated with COR, station personnel and local utility if necessary.

6.0 GOVERNMENT FURNISHED PROPERTY OR INFORMATION:

N/A

7.0 INSPECTION AND ACCEPTANCE:

7.1 The Government inspection and acceptance period will be ten (5) days.

7.2 In addition to the inspection and acceptance terms articulated in 52.212-4, the Government reserves the right to perform such performance tests and evaluations as defined below to verify specified system performance. Such tests and evaluations, if performed, shall be conducted within the environment that the generator & transfer switch is to be operated. The Contractor has the right to be present during the tests and evaluations, if performed, at the Contractor's expense.

7.3 All components will be visually inspected upon receipt by the COR for observable damages and flaws. If damages and/or flaws are observed, these components will be returned to the Contractor at the Contractor's sole expense. The COR will notify the Contractor via email, within five (5) business days of observing the damage that the components are being returned. If damages and/or flaws are not observed, the components will be installed by the contractor. If components fail to be fully operational and/or do not demonstrate operation to the minimum specifications, the non-functional components will be returned to the Contractor at the Contractor's sole expense. The COR will notify the Contractor via email, within five (5) business days of observing the damage.

7.4 The acceptable equipment and installation shall meet all technical specifications. Installation shall meet all required electrical, building, and Government Codes. Final inspection will be conducted by NIST within two weeks after project is complete.

8.0 ATTACHMENT:

8.1 The following attachment is hereby provided as an attachment. The purpose of the attachment is to reference and provide specification requirements to the Contractor.

8.2 All attachments included in this solicitation are owned by the Government and shall not be reproduced, released, distributed, or otherwise utilized for any purpose other than submission of a quotation and the execution of the required work without the prior written approval of the NIST Contracting Officer.

8.2.1 Attachment 1: OK6010_DB_27nov12.zip

~~**DELIVERABLE SCHEDULE:**~~
~~8 weeks after receipt of the order (ARO) for equipment delivery and 60—90 days for installation.~~

9.0 ~~*(NOTE: the generator will need to be installed during cold weather for station equipment cooling purposes. Station personnel request that the job begin no earlier than Jan. 3, 2016 and be completed by Mar. 17, 2016.)*~~

~~**INSPECTION AND ACCEPTANCE:**~~
~~The acceptable equipment shall meet all technical specifications. Installation shall meet all required electrical, building, and Government Codes. Final inspection will be conducted by the NIST EMSS Department within two weeks after project is complete.~~

PAYMENT SCHEDULE:

9.1 The Contractor shall be paid, in accordance with Net 30-day payment terms, upon receipt and acceptance of a proper invoice for the entire purchase order, in accordance with the following schedule.

9.1.1 The contractor shall provide an appropriate payment schedule

10.0 PROVISIONS

52.204-7 – System for Award Management
52.204-16 – Commercial & Government Entity Code Reporting
52.204-17 – Ownership or Control of Offeror
52.204-18 – Commercial & Government Entity Code Maintenance
52.209-11 - Representation by Corporations Regarding Delinquent Tax Liability or a Felony Conviction under any Federal Law
52.212-1 – Instructions to Offerors-Commercial Items
52.212-3 – Offerors Representations and Certifications-Commercial Items
52.214-35 – Submission of Offers in U.S. Currency
52.225 -1 – Buy American - Supplies
52.225-18- Place of Manufacture
52.203-98 - Prohibition on Contracting with Entities that Require Certain Internal Confidentiality Agreements—Representation (DEVIATION 2015-02)
Prohibition on Contracting with Entities that Require Certain Internal Confidentiality Agreements—Representation (FEB 2015)

(a) In accordance with section 743 of Division E, Title VII, of the Consolidated and Further Continuing Resolution Appropriations Act, 2015 (Pub. L. 113-235), Government agencies are not permitted to use funds appropriated (or otherwise made available) under that or any other Act for contracts with an entity that requires employees or subcontractors of such entity seeking to report fraud, waste, or abuse to sign internal confidentiality agreements or statements prohibiting or otherwise restricting such employees or subcontractors from lawfully reporting such waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.

(b) The prohibition in paragraph (a) of this provision does not contravene requirements applicable to Standard Form 312, Form 4414, or any other form issued by a Federal department or agency governing the nondisclosure of classified information.

(c) *Representation.* By submission of its offer, the Offeror represents that it does not require employees or subcontractors of such entity seeking to report fraud, waste, or abuse to sign internal confidentiality agreements or statements prohibiting or otherwise restricting such employees or subcontractors from lawfully reporting such waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.

(End of provision)

11.0 CLAUSES

52.204-13 – System for Award Management
52.212-4 – Contract Terms and Conditions-Commercial Items
52.212-5 – Contract Terms and Conditions Required to Implement Statutes or Executive Orders-Commercial Items
52.219-6 – Notice of Total Small Business Set Aside (June 2003) (15 U.S.C. 644)
52.219-28 - Post Award Small Business Program Representation (Apr 2009) (15 U.S.C. 632(a)(2)).
52.222-3 – Convict Labor (June 2003) (E.O. 11755)
52.222-19 – Child Labor – Cooperation with Authorities and Remedies (Jan 2014) (E.O. 13126)
52.222-21 – Prohibition of Segregated Facilities (Feb 1999)
52.222-26 – Equal Opportunity (Mar 2007) (E.O. 11246
52.222-36 – Affirmative Action for Workers with Disabilities (Oct 2010) (29 U.S.C. 793)
52.222-50 – Combatting Trafficking in Persons (FEB 2009) (22 U.S.C.7104(g))
52.233-3 – Protest After Award (AUG 1996) (31 U.S.C. 3553)
52.233-4 – Applicable Law for Breach of Contract Claim
52.223-18- Encouraging Contractor Policies to Ban Text Messaging while Driving (Aug 2011) (E.O 13513)
52.225-1 – Buy American Act – Supplies (Feb 2009) (41 U.S.C. 10a-10d)
52.225-13 – Restrictions on Certain Foreign Purchases (June 2008)(E.O.'s, proclamations, and statues administered by the Office of Foreign Assets Control of the Department of the Treasury
52.232-33 – Payment By Electronic Funds Transfer – System for Award Management (Jul 2013) 931 U.S.C. 3332)
52.225-25 – Prohibition on Contracting with Entities Engaging in Certain Activities or Transactions Relating to Iran – Representations and Certifications
52.232-39 – Unenforceability of Unauthorized Obligations
52.232-40 – Providing Accelerated Payments to Small Business Contractors
52.247-35 – FOB Destination, within Consignee's Premises
52.203-99, Prohibition on Contracting with Entities that Require Certain Internal Confidentiality Agreements (DEVIATION 2015-02)

PROHIBITION ON CONTRACTING WITH ENTITIES THAT REQUIRE CERTAIN INTERNAL CONFIDENTIALITY AGREEMENTS (FEB 2015)

(a) The Contractor shall not require employees or subcontractors seeking to report fraud, waste, or abuse to sign or comply with internal confidentiality agreements or statements prohibiting or otherwise restricting such employees or subcontractors from lawfully reporting such waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.

(b) The contractor shall notify employees that the prohibitions and restrictions of any internal confidentiality agreements covered by this clause are no longer in effect.

(c) The prohibition in paragraph (a) of this clause does not contravene requirements applicable to Standard Form 312, Form 4414, or any other form issued by a Federal department or agency governing the nondisclosure of classified information.

(d)(1) In accordance with section 743 of Division E, Title VII, of the Consolidated and Further Continuing Resolution Appropriations Act, 2015 (Pub. L. 113-235), use of funds appropriated (or otherwise made available) under that or any other Act may be prohibited, if the Government determines that the Contractor is not in compliance with the provisions of this clause.

2) The Government may seek any available remedies in the event the contractor fails to comply with the provisions of this clause.

(End of clause)

Assurance by Corporations Regarding an Unpaid Delinquent Tax Liability or a Felony Conviction Under Any Federal Law (Class Deviation) (March 2015)

1) In accordance with Sections 543 and 544 of Public Law 112-55 Commerce, Justice, Science, and Related Agencies Appropriations Act 2012, Title V (General Provisions) none of the funds made available by that Act may be used to enter into a contract with any corporation that-

a) Was convicted of a felony criminal violation under any Federal law within the preceding 24 months, unless the agency has considered suspension or debarment of the corporation and made a determination that this further action is not necessary to protect the interests of the Government.

b) Has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability, unless the agency has considered suspension or debarment of the corporation and made a determination that this further action is not necessary to protect the interests of the Government.

2) By accepting this award or order, in writing or by performance, the offeror/contractor assures that-

a) The offeror/contractor is not a corporation convicted of a felony criminal violation under a Federal law within the preceding 24 months.

b) The offeror/contractor is not a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

(End of clause)

The following provisions and clauses apply to this acquisition and are hereby incorporated by reference. All CAR clauses may be viewed at http://www.ecfr.gov

1352.201-70 – Contracting Officers Authority
1352.209-73 – Compliance with the Laws (APR 2010)
1352.209-74 – Organizational Conflict of Interest
1352.246-70 – Place of Acceptance

12.0 NIST LOCAL

12.1 Billing Instructions

(a) NIST prefers electronic Invoice/Voucher submissions and they should be emailed to INVOICE@NIST.GOV.
(b) Each Invoice or Voucher submitted shall include the following: (1) Contract Number. (2) Contractor Name and Address. (3) Date of Invoice. (4) Invoice Number. (5) Amount of Invoice and Cumulative Amount Invoiced to-date. (6) Contract Line Item Number (CLIN). (7) Description, Quantity, Unit of Measure, Unit Price, and Extended Price of Supplies/Services Delivered. (8) Prompt Payment Discount Terms, if Offered. (9) Any other information or documentation required by the contract.

(c) In the event electronic submissions are not used, The Contractor shall submit an original invoice or voucher in accordance with the payment provisions of this contract to: NIST: Accounts Payable Office 100 Bureau Drive, Mail Stop 1621 Gaithersburg, MD 20899-1621 (End of clause)

INSTRUCTIONS:

System for Award Management-

In accordance with FAR 52.204-7, the awardee must be registered in the system for award management (www.sam.gov) prior to award. Refusal to register shall forfeit award.

Due Date for Quotations

Offerors shall submit their quotations so that NIST receives them not later than 12:00 PM Mountain Time on August 26, 2016. FAX quotations shall not be accepted. E-mail quotations shall be accepted at Marc. Zurasky@nist.gov. Please reference the RFQ number in the subject line of email communications. Offerors' quotations shall not be deemed received by the Government until the quotation is entered in the e-mail box set forth above.

Because of heightened security, electronic delivery methods are the preferred method of delivery of quotes. If quotes are hand delivered, delivery shall be made on the actual due date. 48 hours (excluding weekends and holidays) prior notice shall be provided to Marc Zurasky, Contract Specialist on 303-497-3246.

ADDENDUM TO FAR 52.212-1 INSTRUCTIONS TO OFFERORS – COMMERCIAL ITEMS (ADDENDUM)

(1) GENERAL INSTRUCTIONS:

A. Period for Acceptance of Offers. Quotations shall remain valid for acceptance for a minimum of 90 days from receipt of quotation.

B. Quotations are expected to conform to solicitation provisions and be prepared in accordance with this section. To aid in evaluation, a quotation shall be clearly and concisely written as well as being neat, indexed (cross-indexed as appropriate) and logically assembled. All pages of each part shall be appropriately numbered and identified with the name of the offeror, the date, and the solicitation number. A one-page transmittal letter signed by an individual authorized to commit the organization shall be transmitted with the quotation to the Government. Each quotation shall be on 8 and ½-inch x 11-inch paper, in a commercially standard font, not smaller than 12-point font. Each page in the quotation shall be separately numbered.

(2) QUOTATION CONTENT:

A. Technical Quotation: ***No pricing information shall be included in the technical quotation.*** The technical quotation must include the following:

General Work Plan - The Quoter shall provide sufficient information to demonstrate his understanding of the requirements, providing a detailed plan for the removal, installation, and necessary operational shutdowns. The plan must fully describe a technical approach for each of the task areas in the quotation, and must indicate how the Quoter will execute the tasks described in the Statement of Work.

Qualifications/Past Experience – The Quoter shall describe his experience and qualifications to perform the same or similar services.

Past Performance –The Quoter must provide a list of 3-5 references within the last 7 years(name of company/ordering entity, contact person, contact information: email address, phone number, etc.) to whom the same or similar products have been provided. Include a contract/purchase order number, description of the work performed, including similar specifications and quantity delivered.

B. **Price Quotation*: Must include the following:***

1. Completed price quotation.
2. Completed SF1449 **including** Offeror's DUNS no., citizenship status and point of contact information with name, telephone number and email address. The person signing the SF1449 shall have the authority to commit the offeror to all of the provisions of the quotation, fully recognizing that the Government has the right, by the terms of the solicitation, to make an award without further discussion if it so elects.
3. Signed amendments to the solicitation, if any are issued.
4. Completed FAR 52.212-3, Offeror Representations and Certifications.

5. Acceptance of terms (Addendum to FAR 52.212-1 (b)(11)): This is an Open-Market Combined Synopsis/Solicitation for equipment as defined herein. The Government intends to award a Purchase Order as a result of this Combined Synopsis/Solicitation that will include the terms and conditions that are set forth herein. In order to facilitate the award process, ALL quotes shall include a statement regarding the terms and conditions herein as follows:

> The offeror shall state "The terms and conditions in the solicitation are acceptable to be included in the award document without modification, deletion, or addition."
>
> OR
>
> The offeror shall state "The terms and conditions in the solicitation are acceptable to be included in the award document with the exception, deletion, or addition of the following:
>
> Offeror shall list exception(s) and rationale for the exception(s)
>
> Please note that this procurement is not being conducted under the GSA Federal Supply Schedule (FSS) program or another Government-Wide Area Contract (GWAC). If an offeror submits a quotation based upon an FSS or GWAC contract, the Government will accept the quoted price. However, the terms and conditions stated herein will be included in any resultant Purchase Order, not the terms and conditions of the offeror's FSS or GWAC contract, and the statement required above shall be included in the quotation.

6. Price - The Government contemplates award of firm-fixed purchase order as a result of this solicitation.

(End of Provision)

QUOTATION EVALUATION:

Evaluation Factors

Award shall be made using a tradeoff process to the offeror whose quotation represents the best value to the Government. The Government will evaluate quotations based on the following evaluation criteria: 1) Technical Approach/Capability 2) Past Experience, 3) Past Performance and Price. All evaluation factors other than cost or price, when combined, are—approximately equal to cost or price. The Giverrmment may consider award to other than the lowest priced offeror or other than the highest technically rated offeror.

1. Technical Approach/Capability: Evaluation of technical approach/capability shall be based on the information provided in the quotation. Technical capability will be evaluated to determine the Quoter's overall understanding of the work, risks involved, and proposed methodology for production. Quotations that do not demonstrate the proposed equipment meets all requirements, will not be considered further for award. If an offeror does not indicate whether its proposed equipment meets a certain minimum requirement, NIST will determine that it does not.

2. Past Experience – Past experience will be evaluated to determine the degree of experience the Quoter has in providing comparable PCBs. Evaluation will focus on the process and specifications as required by the statement of work.

1. Past performance will be evaluated to determine the overall quality of the final product, and the Quoter's history of meeting the required quality and delivery schedules. Evaluation of past performance will be based on the references provided and/or the Quoter's recent and relevant procurement with NIST, and/or NIST affiliates.

Price: The Government will evaluate price for reasonableness.

1352.233-70 AGENCY PROTESTS (APR 2010)

(a) An agency protest may be filed with either: (1) the contracting officer, or (2) at a level above the contracting officer, with the appropriate agency Protest Decision Authority. See 64 Fed. Reg. 16,651 (April 6, 1999)

(b) Agency protests filed with the Contracting Officer shall be sent to the following address:

NIST/ACQUISITION MANAGEMENT DIVISION
ATTN: JO-LYNN DAVIS, CONTRACTING OFFICER
100 Bureau Drive, MS 1640
Gaithersburg, MD 20899

(c) Agency protests filed with the agency Protest Decision Authority shall be sent to the following address:

NIST/ACQUISITION MANAGEMENT DIVISION
ATTN: HEAD OF THE CONTRACTING OFFICE (HCO)
100 Bureau Drive, MS 1640
Gaithersburg, MD 20899

(d) A complete copy of all agency protests, including all attachments, shall be served upon the Contract Law Division of the Office of the General Counsel within one day of filing a protest with either the Contracting Officer or the Protest Decision Authority.

(e) Service upon the Contract Law Division shall be made as follows:

U.S. Department of Commerce
Office of the General Counsel
Chief, Contract Law Division
Room 5893

Herbert C. Hoover Building
14th Street and Constitution Avenue, N.W.
Washington, D.C. 20230.
FAX: (202) 482-5858

1352.233-71 GAO AND COURT OF FEDERAL CLAIMS PROTESTS (APR 2010)

(a) A protest may be filed with either the Government Accountability Office (GAO) or the Court of Federal Claims unless an agency protest has been filed.
(b) A complete copy of all GAO or Court of Federal Claims protests, including all attachments, shall be served upon (i) the Contracting Officer, and (ii) the Contract Law Division of the Office of the General Counsel, within one day of filing a protest with either GAO or the Court of Federal Claims.
(c) Service upon the Contract Law Division shall be made as follows:

U.S. Department of Commerce
Office of the General Counsel
Chief, Contract Law Division
Room 5893
Herbert C. Hoover Building
14th Street and Constitution Avenue, N.W.
Washington, D.C. 20230.
FAX: (202) 482-5858

(End of clause)

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: WWV telephone time of day announcement
Date: Tuesday, September 18, 2018 12:09:58 PM

From: Nelson, Glenn (Fed)
Sent: Tuesday, May 29, 2018 3:22 PM
To: Lowe, John P. (Fed)
Cc: Deutch, Matthew J. (Fed); Okayama, Dean T. (Fed); Sutton, Douglas (Fed); Yates, William (Fed)
Subject: WWV telephone time of day announcement

Hi John and all,

The latest draft of the text for the proposed Telephone Time of Day announcement follows, for your comment. Text in red was added.

"Your attention please: the WWV audio signal is available via telephone.

The audio signal heard on the WWV radio broadcast is available by telephone, including all time, time code, audio frequency and announcement information heard on the broadcast. The audio signal is available at area code 303, 499-7111. To repeat, the WWV audio signal is available at 303-499-7111."

After your approval, we'll get this on the air this week.

Glenn

From: Ochinang, Adela Mae P. (Fed)
To: Spicer, James L. (Fed)
Cc: Oates, Chris (Fed); Novick, Andrew (Fed)
Subject: Re: Property - Last Effort
Date: Wednesday, May 30, 2018 1:51:27 PM
Attachments: 05302018_WWVH PROPERTY.pdf

I have completed WWVH Property Inventory.

One notation: NIST #930603 Defibrillator, Lifepak 500, S/N 31344751 was returned on 11/26/2011 to NIST-Boulder for Disposal.
It was replaced on 11/15/2011 with Semi-Automatic External Defibrillator, Defibtech DDU-2300, S/N 40005411.

Sorry. Thank you.

Aloha,

Adela Mae P. Ochinang
NIST-WWVH
adele.ochinang@nist.gov
(808) 335-4361
(808) 335-4747 FAX

From: Spicer, James L. (Fed)
Sent: Tuesday, May 29, 2018 11:07 AM
To: Ochinang, Adela Mae P. (Fed)
Cc: Oates, Chris (Fed); Novick, Andrew (Fed)
Subject: RE: Property - Last Effort

Adela,

Thank you. Good luck in the excessing process. That will help keep things from getting cluttered!

I should have given you more specifics on this deadline. When we talked on the phone a while back, I believe I said that we needed to finish by the end of May but it would have been a better reference to see it in writing. I'll try to make sure you have plenty of time and a deadline next year.

Have a good morning!

Regards,

Jim Spicer
IT Specialist/Property Custodian/Division Safety Representative
National Institute of Standards & Technology
Time & Frequency Division
Time and Frequency Services Group
MS 847.00
325 Broadway, Room# 4013
Boulder, CO 80305-3337
(303) 497-5306 (office)

From: Ochinang, Adela Mae P. (Fed)
Sent: Tuesday, May 29, 2018 3:03 PM
To: Spicer, James L. (Fed) <james.spicer@nist.gov>
Cc: Oates, Chris (Fed) <chris.oates@nist.gov>; Novick, Andrew (Fed) <andrew.novick@nist.gov>
Subject: Re: Property - Last Effort

Good morning:

I will try my best and get it to you by tomorrow.

We are in a process of "cleaning up shop" and excessing property.

In the future, can you please give me a deadline date instead of "can you please work on this as time permits."

Thank you.

Aloha,

Adela Mae P. Ochinang
NIST-WWVH
adele.ochinang@nist.gov
(808) 335-4361
(808) 335-4747 FAX

From: Spicer, James L. (Fed)
Sent: Tuesday, May 29, 2018 10:32 AM
To: Ochinang, Adela Mae P. (Fed)

Cc: Spicer, James L. (Fed); Oates, Chris (Fed)
Subject: FW: Property - Last Effort

Adele,

I need to enter as many of the remaining assets as possible by COB today. When can you get the inventory completed for HI?

Regards,

Jim Spicer
IT Specialist/Property Custodian/Division Safety Representative
National Institute of Standards & Technology
Time & Frequency Division
Time and Frequency Services Group
MS 847.00
325 Broadway, Room# 4013
Boulder, CO 80305-3337
(303) 497-5306 (office)

From: Spicer, James L. (Fed)
Sent: Friday, May 25, 2018 4:57 PM
To: Spicer, James L. (Fed) <james.spicer@nist.gov>
Cc: Spicer, James L. (Fed) <james.spicer@nist.gov>; Novick, Andrew (Fed) <andrew.novick@nist.gov>
Subject: Property - Last Effort
Importance: High

Adele,

Last attempt to find this missing property is greatly appreciated.

Regards,

Jim Spicer
IT Specialist/Property Custodian/Division Safety Representative
National Institute of Standards & Technology
Time & Frequency Division
Time and Frequency Services Group
MS 847.00
325 Broadway, Room# 4013
Boulder, CO 80305-3337
(303) 497-5306 (office)

2018

Barcode #	Manufacturer	Model Numb	Description	Model Nan	Stock Num	Serial Number	Acquisition D	Unit Prices	Asset Valu
839441	MICROWAY	AMD OPTE	ADP SUPPORT EQUIPMENT			18749	6/4/2010	2551.59	2551.59
639442	MICROWAY	AMD OPER	ADP SUPPORT EQUIPMENT			18730	6/4/2010	2551.59	2551.59
639446	MICROWAY	AMD OPER	ADP SUPPORT EQUIPMENT			18717	6/7/2010	2551.59	2551.59
639447	MICROWAY	AMD OPER	ADP SUPPORT EQUIPMENT			18753	6/7/2010	2551.59	2551.59
639448	MICROWAY	AMD OPER	ADP SUPPORT EQUIPMENT			18732	8/7/2010	2551.59	2551.59
639449	MICROWAY	AMD OPER	ADP SUPPORT EQUIPMENT			18752	6/7/2010	2551.59	2551.59
639450	MICROWAY	AMDOPER	ADP SUPPORT EQUIPMENT			18734	6/7/2010	2551.59	2551.59
639451	MICROWAY	AMDOPER	ADP SUPPORT EQUIPMENT			18750	6/7/2010	2551.59	2551.59
639452	MICROWAY	AMD OPTE	ADP SUPPORT EQUIPMENT			18754	6/10/2010	2551.59	2551.59
639453	MICROWAY	AMD OPTE	ADP SUPPORT EQUIPMENT			18736	6/10/2010	2551.59	2551.59
852014	DELL INC.	LATITUDE E	COMPUTER, LAPTOP	LATITUDE		1W8MKN1	9/24/2010	1825.68	1825.68
855804	DELL INC.	OPTIPLEX 9	COMPUTER, DESKTOP	OPTIPLEX 9010		FSVDRW1	3/17/2013	1427.84	1427.84
858084	DELL INC.	OPTIPLEX 9	COMPUTER, DESKTOP	OPTIPLEX 9010		FZTKDX1	6/18/2013	1105.27	1105.27
858085	DELL INC.	OPTIPLEX 9	COMPUTER, DESKTOP	OPTIPLEX 9010		FZTJDX1	6/18/2013	1105.27	1105.27
857369	DELL INC.	OPTIPLEX 9	COMPUTER, DESKTOP	OPTIPLEX 9010		7W7S9Y1	8/29/2013	1423.17	1423.17
860217	DELL INC.	DEL210ADE	LAPTOP COMPUTER			CYS6092	3/3/2016	1802.86	1802.86
900237	ELCOM BAUER	710	TRANSMITTER			150	4/28/1990	54002	54002
900238	ELCOM BAUER	710	TRANSMITTER			151	4/28/1990	54002	54002
900239	ELCOM BAUER	710	TRANSMITTER			152	4/28/1990	54002	54002
900923	ARBITER SYSTEMS INC	1026B	RECEIVER, WIRELESS			87	4/25/1998	4095	4095
905584	HEWLETT-PACKARD DEVELC	5061A	SIGNAL GENERATOR			2248A02165	4/25/1998	37330	37330
905593	HEWLETT-PACKARD DEVELC	5061A	SIGNAL GENERATOR			1236A00601	4/25/1998	11525	11525
905879	HEWLETT-PACKARD DEVELC	5060A	CALIBRATOR, FREQUENC	5060A		504-00058	10/1/1986	15614	15614
905684	HELBER	124	AMPLIFIER			3	10/1/1986	11833	11833
905685	HELBER	124	AMPLIFIER			2	10/1/1986	11833	11833
908902	AOA	GPS	RECEIVER, WIRELESS			A0A57	4/29/1995	8758	8758
908938	AUSTRON, INC.	1203	AMPLIFIER			1	4/28/1990	2712	2712
908939	AUSTRON, INC.	1203	AMPLIFIER			2	4/28/1990	2712	2712
908940	AUSTRON, INC.	1203	AMPLIFIER			3	4/28/1990	2712	2712
908958	HEWLETT-PACKARD DEVELC	4245L	COUNTER, FREQUENCY			520-05842	4/28/1988	4266	4266
908962	HEWLETT-PACKARD DEVELC	115BR	ELECTRICAL AND ELECTRONIC PROPERTIES			32000129	4/25/1998	2756	2756
908966	ZETA LABORATORIES	8534	LABORATORY EQUIPMENT AND SUPPLIES			3	4/28/1988	3315	3315
908967	ZETA LABORATORIES	5 CHANNEL	LABORATORY EQUIPMENT AND SUPPLIES			1	4/28/1988	3315	3315
908968	ZETA LABORATORIES	5 CHANNEL	LABORATORY EQUIPMENT AND SUPPLIES			2	4/28/1988	3315	3315
908973	SULZER LABS., INC.	D5	SIGNAL GENERATOR			21	4/28/1992	3500	3500
908976	BIG JOE CALIFORNIA, INC.	21-A-76	HOIST			67764	4/25/1998	500	500
908977	GENERIC MANUFACTURER	220	LATHES			2123	4/25/1998	1300	1300
908978	GENERIC MANUFACTURER	TER25KC5(	LABORATORY EQUIPMENT AND SUPPLIES			27109	10/1/1986	5063	5063
909000	DATUM-EFRATOM TIME & FR	9850	SIGNAL GENERATOR			23	10/1/1986	2500	2500
909001	DATUM-EFRATOM TIME & FR	9850	SIGNAL GENERATOR			15	4/28/1988	19000	19000
909014	TEKRAN INSTRUMENTS COR	R399	RECEIVER, WIRELESS			1	4/28/1988	5117	5117
909020	TRACOR	599H	RECEIVER, WIRELESS			350	4/25/1998	4775	4775
909021	TRACOR	599H	RECEIVER, WIRELESS			351	4/25/1998	4775	4775
909023	AUSTRON, INC.	2000C	RECEIVER, WIRELESS			II8499	4/28/1988	6567	6567
909045	DATUM-EFRATOM TIME & FR	FRK-L	SIGNAL GENERATOR			250/1800	4/28/1988	3376	3378
909046	HEWLETT-PACKARD DEVELC	5061A	SIGNAL GENERATOR			920-00322	4/28/1989	14504	14504
909047	HEWLETT-PACKARD DEVELC	5061A	SIGNAL GENERATOR			924-00332	4/28/1989	14504	14504
909048	HEWLETT-PACKARD DEVELC	5081A	SIGNAL GENERATOR			924-00333	4/28/1989	28384	28384
912276	SEARS, ROEBUCK AND CO.	917.2535	GARDEN TRACTORS			1238S05759	11/2/1988	1458.09	1458.09
912497	HEWLETT-PACKARD DEVELC	1651A	ANALYZER			2814A01266	9/26/1988	4182.8	4182.8
912498	PACE, INC.	MBT210	MISCELLANEOUS WELDING, SOLDERING, AND			465	10/6/1988	956.05	956.05
912742	HARBOR FREIGHT TOOLS	GENERIC -	MACHINE TOOLS, PORTABLE			DFLT_912742	2/6/1991	182.33	182.33
912748	AMFAC DISTRIBUTION, KAUA	1198SR	DRILL, ELECTRIC			0601198734ZS	4/11/1991	151.8	151.8
912751	HEWLETT-PACKARD DEVELC	54502A	OSCILLOSCOPE			2934A05021	8/12/1991	6654.21	6654.21
912757	BROTHER INDUSTRIES, LTD.	PT-10	PRINTER, LABEL	P-TOUCH		M09914630	10/7/1991	160.21	160.21
913156	HEWLETT-PACKARD DEVELC	4193A	IMPEDANCE METER			2206J00359	4/25/1998	7056	7056
913664	INGERSOLL-RAND	71T2	COMPRESSOR, AIR			30T637181	7/13/1989	3475	3475
913929	BALL-EFRATON	FRK-H	OSCILLATOR			12417	7/20/1989	7650	7650
915003	PANASONIC CORPORATION (	RQ-2850	TAPE RECORDER			9EBCA25349	12/13/1990	135	135
918235	HEWLETT-PACKARD DEVELC	5061	COUNTER, FREQUENCY			2840A00569	3/7/1991	41500	41500
917560	SKUTCH ELECTRONICS	AS-1501	RECORDER			9205217	4/25/1998	330.59	330.59
917562	DILLON, INC.	AP	DYNAMOMETER			D921524	4/25/1998	536.67	536.67
917563	DILLON, INC.	AP	DYNAMOMETER			AP921759	4/25/1998	536.67	536.67
917571	MICRO EXPRESS	ME486DX2-	MICROCOMPUTER			DFLT_917571	4/25/1998	2000	2000
917574	GRAINGER	YT30G	PAINT SPRAYING EQUIPMENT - Compressor			4930000296	5/9/1998	650	650
917578	PRODELIN CORPORATION	1246-240	ANTENNA			DFLT_917576	9/23/1993	3615.38	3615.38
917580	HONEYWELL, INC.	D3-110000-	RECORDER, STRIP CHART			32104946-002	5/9/1998	3395	3395
917598	SONY ELECTRONICS INC.	SSC-M374	CAMERA, STILL PICTURE			12733	6/10/1996	537.62	537.62
919195	FREQUENCY AND TIME SYST	07655-501	METER, FREQUENCY			919195	6/9/1993	38292	38292
920322	PELCO	PS7-24	SCANNER			3543-5I	6/5/1996	173	173
920323	PELCO	MPS524DT	CONTROL UNIT			0537-5I	6/5/1996	131	131
920324	PELCO	VX504HX	LABORATORY EQUIPMENT AND SUPPLIES			6577-5I	6/5/1996	430	430
920340	CRAFTSMAN	919.1652	COMPRESSOR, AIR			9703012417	11/5/1997	314.99	314.99
921137	ZEOS INTERNATIONAL, LTD.	PANTERA	COMPUTER, DESKTOP	PANTERA		10121907	8/16/1995	1502.75	1502.75
921138	ZEOS INTERNATIONAL, LTD.	PANTERA	COMPUTER, DESKTOP	PANTERA		10121910	8/16/1995	1502.75	1502.75
921140	ZEOS INTERNATIONAL, LTD.	PANTERA	COMPUTER, DESKTOP	PANTERA		10122573	8/16/1995	1502.75	1502.75
921142	ZEOS INTERNATIONAL, LTD.	PANTERA	COMPUTER, DESKTOP	PANTERA		10121973	8/16/1995	1502.75	1502.75
922390	SILICONRAX	486 DX2-66	PERSONAL COMPUTER			DFLT_922390	9/16/1996	1135	1135
922716	SILICONRAX	486 DX2 66	PERSONAL COMPUTER			DFLT_922716	11/18/1996	1135	1135

925364	SENTRY GROUP	1250	SAFE, COMBINATION, SECURITY			V272856	3/18/1999	89.96	89.96
925374	BOBCAT COMPANY	763	LOADER/BACKHOE			512259163	9/19/2001	22374.42	22374.42
926391	SEARS, ROEBUCK AND CO.	2871320	BATTERY CHARGING EQUIPMENT			DFLT_926391	7/21/1999	89.99	89.99
926392	SEARS, ROEBUCK AND CO.	2871320	BATTERY CHARGING EQUIPMENT			DFLT_926392	7/21/1999	89.99	89.99
926393	ZOOM	2.976E+09	BINOCULARS			DFLT_926393	7/21/1999	79.96	79.96
926396	SEARS, ROEBUCK AND CO.	910838	SAW, ELECTRIC			DFLT_926396	7/21/1999	64.99	64.99
926723	INTEL CORPORATION	CELERON 4	PERSONAL COMPUTER			DFLT_926723	10/21/1999	769	769
926788	PANASONIC CORPORATION (	PV-9455S	VIDEO CASSETTE RECORDER/PLAYER			J9MA1156	2/21/2000	119.88	119.88
926816	NIST	466-C	PERSONAL COMPUTER			34.90301.00.926	12/21/1999	637.96	637.96
926817	NIST	466-C	PERSONAL COMPUTER			34.90301.00.926	12/21/1999	637.96	637.96
928859	HEWLETT-PACKARD DEVELC	5061A	SIGNAL GENERATOR			2428A02287	9/21/2001	14500	14500
928860	HEWLETT-PACKARD DEVELC	5061B	CALIBRATOR	5061B		2840A00697	1/1/2008	4000	4000
928966	PANASONIC CORPORATION (	WV-CU151	CONTROLLER, ELECTRICAL			79R03673	11/19/2001	750	750
929135	HEWLETT-PACKARD DEVELC	1200 SERIE	PRINTER, LASER	1200 SERIES		UPCB902484	10/21/2002	379	379
929136	SONY ELECTRONICS INC.	HDR-X200	RECORDER, DIGITAL			0100797F2	9/21/2002	1520.6	1520.6
929137	ICOM AMERICA, INC.	IC-R10	RADIO AND TELEVISION COMMUNICATION EQU			10202	9/21/2002	419.95	419.95
929138	CRAFTSMAN	917.27495	GARDEN TRACTORS			01102A002483	9/21/2002	2419.88	2419.88
929139	RADIO SHACK	PRO-93	SCANNER			C030994	10/21/2002	279.99	279.99
929140	SONY ELECTRONICS INC.	DCR-TRV27	CAMERA, VIDEO	DCR-TRV27		397890	9/21/2002	1226.93	1226.93
929143	PANASONIC CORPORATION (	WV-CS854	VIDEO CAMERA			06A00725	7/21/2001	1439	1439
929144	DELL INC.	INSPIRON 8	COMPUTER, LAPTOP	INSPIRON 8000		26314060465	6/21/2001	2688	2688
929474	HEWLETT-PACKARD DEVELC	5071A	FREQUENCY INSTRUMEN	5071A		3249A00754	8/22/2002	10000	10000
929845	DELL INC.	H6CBS11	PERSONAL COMPUTER			H6CBS11	8/27/2002	1703.52	1703.52
930115	KENMORE	253-634623	REFRIGERATOR			BA314101105	9/21/2003	479.99	479.99
930117	SONY ELECTRONICS INC.	SLV-D300P	VIDEO CASSETTE RECOR	SLV-D300P		393907	9/21/2003	189.99	189.99
930118	MILLER ELECTRIC MFG CO.	251	ELECTRIC ARC WELDING EQUIPMENT			UNKNOWN	9/25/2003	1884.54	1884.54
930119	CANON U.S.A., INC.	MULTIPASS	FACSIMILE MACHINE			UZH14109	8/21/2003	399.98	399.98
930603	MEDTRONIC, INC.	LIFEPAK 50	DEFIBRILLATOR	LIFEPAK 500		930603	9/21/2003	3465	3465
932697	TEKTRONIX, INC.	TDS3054B	OSCILLOSCOPE, PORTAB	TDS3054B		B030442	5/17/2005	10221.32	10221.32
932699	SONY ELECTRONICS INC.	CYBERSHO	CAMERA, DIGITAL	CYBERSHOT DSC-T1		1546401	2/7/2005	474.99	474.99
932701	SONY ELECTRONICS INC.	DCR-HC40	VIDEO CAMERA			395174	9/11/2004	569.99	569.99
932702	TIMING SOLUTIONS CORP.	4032A	AMPLIFIER			136862/136863/	5/17/2005	7074.99	7074.99
932703	ALLIED MACHINERY	GT48-02	LAWN MOWER			12-01173	5/17/2005	3060	3060
933007	DELL INC.	OPTIPLEX G	COMPUTER, DESKTOP	OPTIPLEX GX620		CQBN581	11/1/2005	1991.14	1991.14
933008	DELL INC.	OPTIPLEX G	COMPUTER, DESKTOP	OPTIPLEX GX620		52WQ981	11/1/2005	1991.14	1991.14
933009	DELL INC.	OPTIPLEX G	COMPUTER, DESKTOP	OPTIPLEX GX620		32WQ981	11/1/2005	1991.14	1991.14
933391	VIZIO INC.	E20F	TELEVISION			LFMBBAI15472	9/11/2008	458	458
933395	OLYMPUS AMERICA INC.	STYLUS 850	CAMERA, DIGITAL	STYLUS 850 SW		E995310S9	7/11/2008	299.99	299.99
934800	NIST	WWVHSTA	ANTENNA, RADAR			934800	1/1/2008	634055.23	634055.2
935298	SYMMETRICOM, INC.	5071A-C001	OSCILLATOR			US49352622	7/30/2010	51232.7	51232.7
935306	BROTHER INDUSTRIES, LTD.	MFC-9840C	MULTIFUNCTION FAX/PRIN	MULTI-FUNCTION CE		U61874F0J5291	9/8/2010	950.79	950.79
935900	BROTHER INDUSTRIES, LTD.	MFC-9460C	PRINTER			U62511G1J1991	9/12/2011	549.99	549.99
936366	FLIR SYSTEMS, INC.	FLIR 17	VIDEO CAMERA			470027747	1/10/2012	1685.78	1685.78
936475	BROTHER	MFCL9550	PRINTER			U637B7C6J302	7/19/2016	799.99	799.99
936632	SPECO TECHNOLOGIES	CVC5835DN	CAMERA SYSTEM			42472364526	1/11/2013	375.92	375.92
936633	SPECO TECHNOLOGIES	CVC5835DN	CAMERA SYSTEM			42472364525	1/11/2013	375.92	375.92
936634	SPECO TECHNOLOGIES	CVC5835DN	CAMERA SYSTEM			42472364527	1/11/2013	375.92	375.92
936635	SPECO TECHNOLOGIES	CVC5835DN	CAMERA SYSTEM			42472364528	1/11/2013	375.92	375.92
936636	SPECO TECHNOLOGIES	CVC5835DN	CAMERA SYSTEM			42472364523	1/11/2013	375.92	375.92
936655	SHARP CORPORATION	MX-M264N	COPIER, OFFICE			MXM264NP1	9/7/2012	2848.8	2848.8
937419	JOHN DEERE	GENERIC -	GARDEN TRACTORS			1LV4066RHEH1	2/6/2015	46910.42	46910.42
NIST93145	KUBOTA TRACTOR CORPOR	RTV900	GROUND EFFECT VEHICLES			50669	6/13/2006	13975	13975

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-0001

This letter is a third interim response to your September 9, 2018 Freedom of Information Act (FOIA) request, Log #DOC-NIST-2018-002060, to the National Institute of Standards and Technology (NIST) for:

> FIRST, I request a copy of each memo or report at NIST discussing the potential shutdown of the WWV and WWVH shortwave radio time signals operated by NIST in Boulder, Colorado.
>
> SECOND, I also request a copy of emails at the applicable offices of NIST that mention WWV and/or WWVH. By applicable offices of NIST I mean:
>
> NIST Office of the Director
> NIST Time and Frequency Division (Boulder, Colorado)
> NIST Public and Business Affairs Office
> Boulder Public Affairs (Boulder, Colorado)
>
> I limit this request to records dated between January 1, 2018 and the present.

NIST has conducted a search of our files and located some of the records responsive to your FOIA request. Enclosed you will find fourteen (14) responsive documents consisting of twenty-four (24) pages that are being released in their entirety. There is one (1) document consisting of two (2) pages that is being released with redaction pursuant to FOIA exemption 5 U.S.C. § 552 (b)(4), thirty-one (31) documents consisting of fifty-three (53) pages that are being released with redaction pursuant to FOIA exemption 5 U.S.C. § 552 (b)(6) and one (1) document consisting of one (1) page that is being released with redaction pursuant to FOIA exemption 5 U.S.C. § 552 (b)(4) and FOIA exemption 5 U.S.C. § 552 (b)(6).

Exemption (b)(4) of the FOIA (5 U.S.C. Section 552(b)(4)) exempts from disclosure "trade secrets and commercial or financial information obtained from a person and privileged or confidential." A number of records located either originated from or pertained to outside entities and contained information considered to be privileged or proprietary by the entities. Those records, or portions thereof, are being withheld from disclosure pursuant to exemption (b)(4) of the FOIA.

NIST

Exemption (b)(6) of the FOIA (5 U.S.C. Section 552(b)(6)) exempts from disclosure "personnel and medical files and similar files the disclosure of which would constitute a clearly unwarranted invasion of personal privacy.

NIST is continuing the process of searching for additional documents related to your request.

Thank you for your patience. We will continue to send you releasable documents on a rolling basis as they become available.

Sincerely,

CATHERINE FLETCHER Digitally signed by CATHERINE FLETCHER
Date: 2020.10.09 14:32:08 -04'00'

Catherine S. Fletcher
Freedom of Information Act Officer

Enclosures

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw:
Date: Tuesday, September 18, 2018 12:04:14 PM
Attachments: image001.png

From: wwv
Sent: Thursday, August 23, 2018 5:40 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW:

From: Matt Aaron (b) (6) [redacted]
Sent: Tuesday, August 14, 2018 7:02 AM
To: wwv <wwv@nist.gov>
Subject:

Is there someone working on making sure you all don't stop transmitting?

--
Thanks,
Matt Aaron
--
CE The Dave Ramsey Show
(b) (6) [redacted]

--
MSDN (MSDN) Microsoft Developers Network
SBE (Society of Broadcast Engineers) Member#21808

CBNT (Broadcast Networking Technologist)Certification#80679
RSI "Safety Awareness"

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: WWV
Date: Tuesday, September 18, 2018 12:07:57 PM

From: Angelo v(b) (6) [redacted]
Sent: Thursday, August 16, 2018 8:34 PM
To: Lowe, John P. (Fed)
Subject: WWV

Hello please dont shut down WWV keep it funded!I use it to set my clocks and for checking radios and test equipment! Would be a big loss not to have it around.Angelo

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Form submission from: NIST.Gov Feedback
Date: Tuesday, September 18, 2018 12:04:46 PM

From: wwv
Sent: Thursday, August 23, 2018 5:39 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: Form submission from: NIST.Gov Feedback

-----Original Message-----
From: Corey, Pamela L (Fed)
Sent: Monday, August 13, 2018 12:55 PM
To: wwv <wwv@nist.gov>
Subject: FW: Form submission from: NIST.Gov Feedback

Hi Guys,

We received the following feedback. Do you wish to respond?

Thanks,
Pam

-----Original Message-----
From: no-reply@nist.gov <no-reply@nist.gov>
Sent: Monday, August 13, 2018 10:37 AM
To: do-webmaster <do-webmaster@nist.gov>
Subject: Form submission from: NIST.Gov Feedback

Submitted on Monday, August 13, 2018 - 10:37 Submitted by user: Anonymous Submitted values are:

Feedback Category: Comment

Please provide as much detail as possible within your comment below: Keep WWV and its sister station. All of my clocks are linked to WWV to keep time. As an amateur radio operator the accurate frequency allows me to check equipment from time to time. Others also use this service. Please reconsider the move to shut them down.

Your email address (optional): (b) (6) [redacted]

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Future status of WWVB
Date: Tuesday, September 18, 2018 12:01:09 PM

From: Michael Arnold (b) (6)
Sent: Monday, August 20, 2018 4:31 PM
To: Nelson, Glenn (Fed); Deutch, Matthew J. (Fed); Lombardi, Michael A. (Fed); Lowe, John P. (Fed); Sutton, Douglas (Fed); Yates, William (Fed); Okayama, Dean T. (Fed)
Subject: Future status of WWVB

Gentlemen,

I was saddened to see the announcement of the budget mandated plan to cease operation of WWV and WWVH. One item of great concern is the status of WWVB on 60 kHz. Please let me know whether or not WWVB will continue to operate to support the millions of devices that depend on it.

As a long time radio enthusiast and amateur radio operator, WWV has been an invaluable resource for me through the years. I hate to think that the transmitters will go silent, but I understand that with new time and frequency technology, that the value of WWV and WWVH on HF has diminished. I was looking forward to the 100th year celebration in October of next year.

Thank you to all of you who continue to keep us on time and on frequency!

Regards,

Michael S. Arnold
Amateur Radio Callsign
Nashville, TN
(b) (6)

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Shut down of WWV
Date: Tuesday, September 18, 2018 12:02:58 PM

From: wwv
Sent: Thursday, August 23, 2018 5:43 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: Shut down of WWV

From: Paul Bacina (b) (6)
Sent: Friday, August 17, 2018 12:23 PM
To: wwv <wwv@nist.gov>
Subject: Shut down of WWV

Dear NIST Person,

I use WWV several times a year to calibrate my watches and clocks.

I use the time signal and a voice recorder to document celestial shots and sightings.

I would find the lose of the WWV signal very inconvenient.

Thanks for your attention.

Paul Bacina

TOMORROW:

One of the greatest labor saving devices especially when you are retired.

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: FY 2019 Budget Request
Date: Tuesday, September 18, 2018 11:33:42 AM

From: Burrus, James N. (Fed)
Sent: Wednesday, September 5, 2018 2:28 PM
To: Lowe, John P. (Fed)
Subject: FW: FY 2019 Budget Request

John,
This fellow is from Citizen Watch Co. and they make radio receive watches and clocks.
He called me and asked about the difference between WWV and WWVB, hence my question to you. If you wouldn't mind answering his question below as well as the difference between the two, that would be great.

Thanks,
Jim

From: Vic Caballero <vcaballero@citizenwatch.com>
Sent: Wednesday, September 5, 2018 8:45 AM
To: Burrus, James N. (Fed) <james.burrus@nist.gov>
Cc: Huergo, Jennifer (Fed) <jennifer.huergo@nist.gov>; Porter, Gail (Fed) <gail.porter@nist.gov>
Subject: RE: FY 2019 Budget Request

Hello James,

I want to thank you for your phone call yesterday. I understand that you cannot release any specifics on the Budget Request but our talk it did put myself and my colleagues at easy.

While researching yesterday I had missed an important fact that I would like to ask. The WWVB station generates the signal we are focused on. I would think that this station along with the WWV station are grouped together under the possible closing option, but I would like to make sure. The website article on NIST.gov mentions the "radio stations in Colorado".

Is there a possibility that the closing of the WWV would not affect the WWVB or would they equally be affected?

Best regards,

Vic Caballero ¦ Technical Manager, After Sales Service

Citizen Watch Company of America, Inc.

1000 W. 190th St., Torrance, CA, 90502

Tel: (212) 497-7300 ext. 3879

Email: vcaballero@citizenwatch.com

www.citizenwatch.com

CITIZEN - BETTER STARTS NOW

From: Burrus, James N. (Fed) <james.burrus@nist.gov>

Sent: Friday, August 31, 2018 12:42 PM

To: Vic Caballero <vcaballero@citizenwatch.com>

Cc: Huergo, Jennifer (Fed) <jennifer.huergo@nist.gov>; Porter, Gail (Fed) <gail.porter@nist.gov>

Subject: RE: FY 2019 Budget Request

Dear Vic,

I have forwarded your inquiry to my boss, Gail Porter, who is the point of contact for information about this matter. She, or one of her colleagues, will contact you with information about this next week.

Sincerely,
Jim Burrus

James Burrus
Outreach Coordinator;
AV and Conference Services Group Leader
NIST Boulder Labs
325 Broadway
MC 107.02, Room 1D 115
Boulder, CO 80305
w) 303-497-4789
c) 720-982-6222
james.burrus@nist.gov

From: Vic Caballero <vcaballero@citizenwatch.com>

Sent: Friday, August 31, 2018 10:54 AM

To: Burrus, James N. (Fed) <james.burrus@nist.gov>

Subject: FY 2019 Budget Request

Hello James,

My name is Victor Caballero and I am with Citizen Watch of America.

I would like to ask you questions regarding the FY 2019 Budget release information. More specifically the section regarding the WWV Colorado radio station shutdown.

We hear at Citizen have products that rely on that radio signal and would like to prepare accordingly if the shutdown is to occur. Any information you may provide will be greatly apricated, but we would like to focus on dates and plans.

If you would like we could set up a meeting to have a phone call to discuss these issues.

Best regards,

Vic Caballero ¦ Technical Manager, After Sales Service

Citizen Watch Company of America, Inc.
1000 W. 190th St., Torrance, CA, 90502
Tel: (212) 497-7300 ext. 3879
Email: vcaballero@citizenwatch.com
www.citizenwatch.com

CITIZEN - BETTER STARTS NOW

From: [illegible]
To: Oates Chris (Fed)
Subject: w Citizen Input WWV/WWVB/WWVH
Date: Tuesday September 18 2018 11 35 19 AM

From: Oates Chris (Fed)
Sent: Tuesday September 4 2018 10:03 AM
To: Lowe John P. (Fed)
Subject: FW: Citizen Input: WWV/WWVB/WWVH

Fyi

Dr. Chris Oates, Chief

Time and Frequency Di ision
Physical Measurement Laboratory
National Institute of Standards and Technology
Boulder CO 80305
303- 97-765

From: Porter Ga l (Fed)
Sent: Monday September 03 2018 10:26 AM
To: Boehm Jason (Fed) <jason.boehm@nist.gov>; Oates Chris (Fed) <chris.oates@nist.gov>; Kimbal l Kevin A (Fed) <kevin.kimball@nist.gov>; Balicao Francisco (Fed) <francisco.balicao@nist.gov>; Schufreider James R. (Fed) <[illegible]@nist.gov>
Cc: Huergo Jennifer (Fed) <jennifer.huergo@nist gov>
Subject: Fwd: Citizen Input: WWV/WWVB/WWVH

FYI. See below one of the more detailed responses from a concerned citizen who wrote to Walt to complain about possible shutdown of the NIST radio stations

I have received approximately 50 email inquiries on this topic from citizens from our pub ic inquiry email referrals from emails to Walt and referrals from Time and Frequency staff

I aLso have received about 3 news media inquiries including NPR which did a piece on Weekend Edition and an inquiry from the National Association of Broadcasters

Thanks
Gail

Begin Forwarded Message

> **From:** "David Crawford" [redacted]
> **Subject:** Re: Fwd: WWV/WWVB/WWVH
> **Date:** 03 September 2018 06:31
> **To:** "Porter Gail (Fed)" <gail.porter@nist.gov>
> **Cc:** "Copan Walter G. (Fed)" <walter.copan@nist.gov>

Director Porter

Thank you for your timely and courteous reply

Respectfully I understand the typical workings and perceived sensitivity of the PPBE process but the real potential problem being created is technical in nature. I have observed in my own workplace that sometimes business offices in charge of developing budget proposals don't always communicate adequately with their engineers with regard to technical impact created by their decisions.

There are probably at least hundreds of thousands of the following type devices in use in the country as an example

https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.amazon.com%2FCrosse-Technology-404-1235UA-SS-UltrAtomic-Stainless%2Fdp%2FB01CCHXTE2%2Fref%3Dsr_1_3%3Fie%3DUTF8%26qid%3D1535976748%26sr%3D8-3%26keywords%3Dwifi%2Bwall%2Bclock&data=02%7C01%7Cgail.porter%40nist.gov%7Cf5e765ee256549fdc76508d611a17eb6%7C2ab5d82fd8fb4797a93e054655c61dec%7C1%7C0%7C636715782639632879&sdata=626P95K2KmKmvqKqfEjKgNpeagE1g%2Fwmwlb3cHSw%3D&reserved=0

As the Amazon sales page suggests the products are not all consumer-grade but are widely used institutionally

Under the NIST budget proposal you render these already-deployed devices inoperable when you turn off WWVB. The station and the receivers collectively constitute a long-established operational system of which NIST operates and maintains a mere subset [illegible] [redacted] [illegible] is "what are we supposed to do now?" [illegible] public well-being [illegible] that NIST prepare a recommendation for practical alternate technical means for the [illegible] truly exist.

WWVB technology may be older and lack post-modernist bling but it is effective and a bargain for providing standard time synchronization within the NIST mission. Its low frequency signal penetrates areas inaccessible to GPS timing and the wireless internet-of-things NTP clock product market is not sufficiently developed to provide equal service in terms of either cost or capability. Some advance warning might a low replacement products to be created and matured but 2 or 3 months of wider advance public knowledge of the shutdown isn't sufficient

I look forward to reading that technical recommendation

Sincerely

David E. Crawford
Indian River City Florida

On 2018-09-03 06:11 Porter Gail (Fed) wrote:
> Mr. Crawford:
> Dr. Copan has asked me to respond to your inquiry
>
> Thanks for your concern about the continued operation of NIST's radio stations
>
> The President's FY2019 budget does propose the shutdown of NIST's three time and frequency radio stations However no changes
> to NIST services have occurred
>
> We will not know if the stations can continue operations until the U.S. Congress passes an FY 2019 budget for NIST and it is
> signed by the President.
>
> It would not be appropriate for NIST to comment on the internal process used in preparing the Administration's budget proposal
>
> Sincerely
> Gail Porter
> Director Public Affairs
> National Institute of Standards and Technology
>
>
> -----Original Message-----
> From: David Crawford [redacted]
> Sent: Friday August 31 2018 9:59 AM
> To: inquiry <inquiry@nist.gov <mailto:inquiry@nist.gov>>
> Cc: wwv <wwv@nist.gov <mailto:wwv@nist.gov>>; Copan Walter G. (Fed) <walter.copan@nist.gov <mailto:walter.copan@nist.gov>>
> Subject: WWV/WWVB/WWVH
>
> Good morning
>
> What is your current status with regard to NIST plans to proceed with a rumored shutdown of the subject time and frequency stations?
>
> If the shutdown is proceeding what is the NIST guidance regarding use or replacement of existing devices relying on the WWVB
> time reference (clocks watches and higher end systems)? That would include things like compact clocks on the interior of
> buildings in which GPS signals cannot be received reliably and thus would have no alternative means of radio-based time
> synchronization
>
> From at least an anecdotal perspective seeing how the number of such WWVB-dependent devices [illegible]
> [illegible] what would be the NIST rationale for terminating the service? How would NIST
> determine the actual user population for an "open loop" system like WWVB?
>
> Did the PPBE/2019-budget guidance to terminate the service originate at the "working level" (i.e. branch etc.) or was it as a
> result of some specific strategic guidance from either NIST upper management or even higher than the agency?
>
> Thanks in advance for your kind response
>
> Sincerely
>
> --

> David E. Crawford
> Wilson River City Florida
> United States of America
> 28.51 N 80.58 W

From: Lowe, John P. (Fed)
To: Light, Kelsey E. (Fed)
Cc: Oates, Chris (Fed)
Subject: Re: Visiting Boulder for WWVB Data Collection
Date: Tuesday, March 13, 2018 10:31:48 AM

Thanks. We are good. Took him around yesterday and heading to the station tomorrow.

From: Light, Kelsey E. (Fed)
Sent: Tuesday, March 13, 2018 12:27 PM
To: Lowe, John P. (Fed)
Cc: Oates, Chris (Fed)
Subject: FW: Visiting Boulder for WWVB Data Collection

Hi John,

While I was not able to set up a lab tour for (b) (6) [redacted] since his schedule changed and he was not able to come out, I thought it might be good for me to share the information that I received back from our different group leaders that I had reached out to for [redacted]. I still have not been able to check in with Chris to see if he would like to be part of this for your guest, but I have included him in this email in case he is available or would like to be part of this.

- Matthew Hummon (part of our Atomic Devices & Instruments – Group 90 -NIST on a chip) said that he was available any time this week for lab tours.
- Josh Savor said that he is available all week except for Thursday afternoon
- John Bollinger (Ion Storage – quantum computing) said that he was available Wednesday March 14 is open except possibly 12:30 - 1:30 PM, John's available Thursday after 1:30 PM and finally Friday lunch time and afternoon look good as well.

If you need more specific recommendations for projects within the different groups, please let me know and thank you for your time.

Sincerely;
Kelsey Light

From: Light, Kelsey E. (Fed)
Sent: Monday, March 12, 2018 11:32 AM
To: Lowe, John P. (Fed) <john.lowe@nist.gov>
Subject: RE: Visiting Boulder for WWVB Data Collection

Hi John,

Douglas actually ended up canceling his plan to come out. And I have not yet talked to Chris about this today.

Sincerely;
Kelsey Light

From: Lowe, John P. (Fed)
Sent: Monday, March 12, 2018 11:17 AM
To: Light, Kelsey E. (Fed) <kelsey.light@nist.gov>
Subject: Fw: Visiting Boulder for WWVB Data Collection

Hi Kelsey,
Were you able to put together a tour??
John

From: Andrew Novick <novick@nist.gov>
Sent: Friday, March 9, 2018 6:37 PM
To: Lowe, John P. (Fed)
Cc: Croissant, Kevin
Subject: Re: Visiting Boulder for WWVB Data Collection

John,

Kelsey L. is trying to coordinate some lab tours for (b) (6) [redacted].
I told her about Kevin being in town and to let you know if she schedules something maybe Kevin can get in on it.

Andrew

On 3/8/2018 9:23 AM, Croissant, Kevin wrote:

> Hi John,
>
> My bags are packed, I'm ready to go!
> The 12th and 13th work equally well for me, I still do not have any plans for the week besides WWVB experiments and analyzing data. Early in the morning would not be good for me, since I'm 2 hours ahead of you and will probably be slightly jetlagged.

One question, by any chance do you guys have a spare Stanford Research Systems PRS10 Rubidium oscillator? I am bringing one of ours, but in case there's any issue getting it working or it is damaged in transit, I don't have a backup for that part of my system (I have spares of everything else.) I'm also working with a GNSS lab in the CU Boulder's aerospace engineering department who may have an extra oscillator, but they haven't gotten back to me yet.

Thanks,
Kevin

From: Lowe, John P. (Fed) <john.lowe@nist.gov>
Sent: Tuesday, February 27, 2018 5:21:48 PM
To: Croissant, Kevin
Cc: Novick, Andrew (Fed); Deutch, Matthew J. (Fed)
Subject: Re: Visiting Boulder for WWVB Data Collection

Hello Kevin,
I look forward to meeting with you. That week is pretty wide open. Lets plan on getting together the 12th or 13th for a tour of the Boulder facility and we can then arrange a trip up to the station north of Ft. Collins. My office number is 303 497-5453 and my cell is (b) (6) .
John

From: Croissant, Kevi[redacted]
Sent: Tuesday, February 27, 2018 5:16 PM
To: Lowe, John P. (Fed)
Subject: Visiting Boulder for WWVB Data Collection

Hi John,

I am going to be bringing my WWVB data collection system to Boulder during the week of March 12th to collect groundwave-only WWVB data for several days as reference data. Once it's set up and recording, I should be able to leave it alone and it will record & process automatically. If it's possible, I'd really like to visit NIST Boulder and also the WWVB station in Fort Collins that week. We can also talk about potential collaboration while I'm there.

I'll be in Boulder from Saturday March 10 (arrive in DEN @ 9AM local) till Saturday

March 17 (depart DEN @ 11:22AM local). I'll be staying in Boulder and also have a rental car reservation. I'll be staying at and doing the data collection at the house of a faculty member of University of Colorado Boulder. Boulder is ideal for this since we're multiple wavelengths away from the transmitter, but outside of the near-field and guaranteed to be getting groundwave.

Let me know what your availability looks like that week. Besides setting up the system on Saturday March 10 and disassembling it on Friday, I don't currently have any plans for the week.

Thanks,
Kevin

--
Kevin Croissant
Undergraduate Research Assistant
Avionics Engineering Center | Russ College of Engineering

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: WWVB
Date: Tuesday, September 18, 2018 12:07:30 PM

From: F. B. Cullom (b) (6) [redacted]
Sent: Thursday, August 16, 2018 8:03 PM
To: Lowe, John P. (Fed)
Subject: WWVB

John,

With the elimination of the WWV and WWVH operating budget for FY 2019, will WWVB be affected? Since this provides the primary time and frequency standard for the US, it's elimination will have a large impact on industrial calibration labs.

Thank you,
F. B. Cullom

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Future of WWVB and Radio Clocks and Watches
Date: Tuesday, September 18, 2018 11:36:25 AM

From: Lombardi, Michael A. (Fed)
Sent: Tuesday, September 4, 2018 12:44 AM
To: Lowe, John P. (Fed)
Subject: Fw: Future of WWVB and Radio Clocks and Watches

From: John Dellinger (b) (6) [redacted]
Sent: Wednesday, August 29, 2018 1:59 PM
To: Lombardi, Michael A. (Fed)
Subject: Future of WWVB and Radio Clocks and Watches

Michael, I am the proud owner of 2 radio controlled clocks and a wrist watch which are extremely reliable. I have heard that WWVB might not operate beyond 2018 and wonder what happens if that is true? Will my time devices become obsolete? I surely hope not.

Regards,

John Dellinger

(b) (6) [redacted]

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: rumor control
Date: Tuesday, September 18, 2018 12:00:25 PM

From: wwv
Sent: Thursday, August 23, 2018 5:47 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: rumor control

From: Roy Dugger <rdugger@cityofsantamaria.org>
Sent: Tuesday, August 21, 2018 12:04 PM
To: wwv <wwv@nist.gov>
Subject: rumor control

Hi folks,

Are the time broadcasts and facilities (WWV, WWVB, WWVH) planned to continue operation and maintenance or are they slated to be discontinued?

I find the broadcasts beneficial for syncing our clocks in our EOC as well checking HF radio propagation and HF radio/antenna function.

Thank you for the service!!

-
Roy

Roy Dugger
Emergency Services Specialist
City of Santa Maria Fire Dept.
(805) 925-0951 x:2334
rdugger@CityofSantaMaria.org

"To provide the highest quality service in the most efficient, cost-effective, and courteous manner possible."

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: NIST proposed budget cuts affecting the broadcasts
Date: Tuesday, September 18, 2018 11:37:20 AM

From: (b) (6) [redacted]
Sent: Thursday, August 30, 2018 11:47 AM
To: Lowe, John P. (Fed)
Subject: NIST proposed budget cuts affecting the broadcasts

Hi John,
We haven't communicated in a while and I hope all is well at your end, other than what I have in the subject line here…
Where do things stand with this proposed budget cut? What are the chances of getting at least 5 more years of life out of the WWVB station, allowing for products based on this to still be marketable? I'm pretty sure that fewer people/products actually rely on WWV.

(b) (4) [redacted]

I look forward to hearing from you.

Thanks,
Oren

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Question about time services
Date: Tuesday, September 18, 2018 11:36:46 AM

From: Arnold Evans (b) (6) [redacted]
Sent: Monday, September 3, 2018 10:53 PM
To: Lowe, John P. (Fed)
Subject: Question about time services

Mr. Lowe,

I recently became aware that the current budget request by the NIST calls for the shutdown of WWV, WWVH and WWVB. What I'm curious about is whether this request would also end the web clock, telephone time service, the Internet Time Service and the Automated Computer Time Service?

Thank you,
Arnold Evans
Plano, Texas

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Join The Fight To Save WWV, WWVH & WWVB!
Date: Tuesday, September 18, 2018 11:31:05 AM

From: George Foss (b) (6)
Sent: Tuesday, September 11, 2018 2:26 PM
To: Lowe, John P. (Fed); George Foss
Subject: Fw: Join The Fight To Save WWV, WWVH & WWVB!

John,

I just signed these petitions. George Foss (visited you in the lab last December; sent you my thesis of 50 years ago on the topic.)

On Tuesday, September 11, 2018 1:34 PM, C. Crane Company <enews@ccrane.com> wrote:

Join The Fight To Save WWV, WWVH & WWVB!

Sign the petition to save these nearly 100 year old radio stations that may be cut in next year's budget.

The NIST (National Institute of Standards and Technology) has proposed cutting their radio stations WWV, WWVH, and WWVB from their budget next year meaning all three stations are in danger of being shut down. We've heard from our friends in the field that shortwave radio listeners are gutted by the idea of losing WWV and WWVH–both stations are staple references for listeners and hams alike.

"Tens of thousands of radio amateurs and other users of the shortwave spectrum rely on these stations as sources of accurate time and precise frequency measurement, as well as a wealth

of propagation data." – CQ Amateur Radio.

The loss of WWVB would mean that all of the atomic clock-synchronized time pieces out there in North America (clocks, watches, weather stations, etc.) would stop synchronizing and automatically changing from DST to standard time.

Two petitions have been started on the White House's "We the People" petition site calling for restoration of funding for these two essential radio stations. **Each needs at least 100,000 electronic signatures by September 15th** to generate a response from the White House. C. Crane urges you to sign one or both petitions and to contact your representatives in Congress to explain the need for these stations to continue to operate. Let's make sure our voices are heard. Please share this with anyone who might be able to help.

Maintain funding for NIST stations WWV & WWVH — **Sign Here**

The Proposed Shutdown of NIST's WWV and WWVH Radio Stations — **Sign Here**

Read More About The Petitions

If you have any questions, please give us a call at 1-800-522-8863 or send us an email to customerservice@ccrane.com.
Customer Support hours: Monday - Friday 8:15am - 5pm PT.

C. Crane, Inc.
172 Main Street
Fortuna, CA 95540-1816

Are you on social media?
Join us on:

View in Browser

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Request for WWVB Information
Date: Tuesday, September 18, 2018 12:01:22 PM

From: wwv
Sent: Thursday, August 23, 2018 5:46 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: Request for WWVB Information

From: (b) (6) [redacted]
Sent: Monday, August 20, 2018 8:47 AM
To: wwv <wwv@nist.gov>
Cc: (b) (6) [redacted]
Subject: Request for WWVB Information

Dear Sir/Madame,

With all the talk over the 2019 Whitehouse budget proposal aimed at closing down the NIST radio stations in Colorado and Hawaii, I have a simple question that many folks that I know would like an answer to.

QUESTION: Is WWVB (time signals) part of the closings?

That would have an impact on my father, age 95 with Parkinson's Disease but still living in an apartment by himself, relies on WWVB signals to adjust his five (5) "atomic" clocks, especially at the start and close of Daylight Savings Time (DST). Due to his unsteady hands, he can no longer adjust the clocks himself. This is just one scenario of the impact if WWVB is included in the budget request for cuts.

Thank you for your time (pun intended) and assistance!

Respect fully yours,

(b) (6) [redacted]

<>><< . . . <>><< . . . <>><<

(b) (6) [redacted]
[redacted]
[redacted]
United States of America

(b) (6) [redacted]
[redacted]
[redacted]
[redacted]
[redacted]

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: protesting elimination of WWV time signals on radio frequencies
Date: Tuesday, September 18, 2018 12:06:23 PM

From: Roger Jeanfaivre (b) (6) [redacted]
Sent: Thursday, August 16, 2018 6:31 PM
To: Lowe, John P. (Fed)
Subject: protesting elimination of WWV time signals on radio frequencies

Good evening:

I was just reading the latest weekly news letter from the ARRL in Newington, CT. It's my understanding that your new budget for FY 2019, includes possible elimination of time generated signals via radio frequencies. This is very disturbing to me!! I'm a sightless person, a radio ham since 1960, and make use of these radio transmissions to set my clocks, watches, and other time devices. I strongly offer my objection, and if there is somebody else to write to, please net me know?

thanks
Roger
ham radio call [redacted]
Skywarn Coordinator for Hartford and Tolland Counties to NWS Norton, MA
Note: I reside in Wethersfield, CT

From: (b) (6)
To: Oates, Chris (Fed)
Subject: Poor WWVB 60 KHz Signals in The San Francisco Bay Area
Date: Monday, February 26, 2018 11:47:07 AM

Chris

Can you put me in touch with your Guru for WWVB 60 KHz?

I live in the San Francisco Bay Area. Reception of WWVB 60 KHz has always been poor here. I recently designed and built a tunable VLF radio that tunes from 1 KHz to 500 KHz. I frequently use WWVB 60 KHz as a quick radio performance check.

For the last month or so (January and February of 2018) the WWVB 60 KHz signal has been very very weak here in the San Francisco Bay Area.

THE WWVB 60 kHz signal has been so poor that I thought there was something wrong with my newly constructed radio. After extensive testing, I am satisfied that the radio is still working as designed.

Is there anything different with your transmitter of late?

To better understand the propagation of the WWVB transmitter, are there any articles you can direct me to?

What presents the greatest attenuation of your transmitter signal? (The D and E and F layers, Weather, the RF path over the ground, RF noise etc).

Is there a small chance that you could add a parasitic element to your antenna to increase the signal here in the San Francisco Bay Area? ☺

Thanks

Regards

Jim P

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Letter of Concern
Date: Tuesday, September 18, 2018 12:03:09 PM

From: wwv
Sent: Thursday, August 23, 2018 5:42 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: Letter of Concern

From: VORW Info <vorwinfo@gmail.com>
Sent: Friday, August 17, 2018 3:26 AM
To: wwv <wwv@nist.gov>
Subject: Letter of Concern

Dear WWV Staff,

My name is John Jurasek and am located in Florida in the United States of America. I have been a listener of WWV since 2014 and the broadcasts on 5000 kHz, 10000 kHz and 15000 kHz have been incredibly important to me, not only for calibrating the time on instruments but also for the weather reports after the top of the hour - especially considering my location near the coast.

After reading about the budget issues I was dismayed to see that WWV will be leaving the airwaves - I'm certain you've received a number of letters already expressing protest, and I understand that your budget has been cut significantly which leaves little to work with.

All I can hope for, I suppose, is for a compromise at the very best. In today's day and age the broadcasts on 2500 kHz, 20000 kHz and 25000 kHz can easily be discontinued due to poor propagation and the noise floor in most areas. I just hope your other transmissions can find a way to remain on the air.

It may not be much at this point but I manage a Radio Show on shortwave stations WRMI, WBCQ and WINB as well as a YouTube Channel with 1 million subscribers known as "TheReportOfTheWeek" and a portion of my audience are shortwave listeners - many listen to shortwave regularly and certainly share the same feelings I do regarding the cutback.

In the end - I know not much can be done but I hope with sincerity for the best,

John Jurasek (VORW Radio Int.)

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Budget and WWV
Date: Tuesday, September 18, 2018 12:05:00 PM

From: wwv
Sent: Monday, August 13, 2018 2:00 PM
To [redacted]
Cc: Lowe, John P. (Fed)
Subject: RE: Budget and WWV

Howdy Kenneth,
Thank you for your e-mail, and thank you for using the radio stations.
I am starting to receive e-mails from other people concerned about the proposed budget and the impact on WWV, WWVH, and WWVB services.
First of all I would say that it is just a proposed budget, and the one that gets past most likely will look different.
Second of all I have to be careful about what advice I give since I am not allowed to advocate for the station. I will contact the broadcast manager and see what advice or comment I am allowed and I will get back to you.
Thank you for your concern and your time.
Best Regards,
Matt Deutch
WWV,WWVB

From: [redacted]
Sent: Monday, August 13, 2018 9:47 AM
To: wwv <wwv@nist.gov>
Subject: Budget and WWV

I just read about how an upcoming financial budget would effect future broadcast of WWV/WWVH.
As an Amateur Radio Operator it saddens and disappoints me. I use WWV to correct clocks in my Radio Station
as well as use the signals to check the calibration accuracy of my receivers.
I also have several "Atomic Clocks" and a Watch that uses 60KHz for time correction and wondered if the
60KHz time data would no longer be available.

If you can offer where I can write to express my opposition to this budget concerning how it would effect
WWV/WWVH, please forward whom I should be directing my concerns to.

Thank you and good luck,

Kenneth Klimasewski
Amateur Radio Station: [redacted]
[redacted]
[redacted]

From: Stephenson, Katy (Fed)
To: Oates, Chris (Fed)
Subject: FW: Please send me a copy of SP960-14
Date: Monday, August 20, 2018 10:56:22 AM

FYI
I'll send the publication and forward to Andrew Novick to answer his question, but just wanted to let you know that I received this.

Thanks!
Katy… :)

From: (b) (6) [redacted]
Sent: Monday, August 20, 2018 7:40 AM
To: Stephenson, Katy (Fed) <kathryn.stephenson@nist.gov>
Subject: Please send me a copy of SP960-14

With all the current talk about the WWV/WWVH budget cuts
I thought I would enjoy reading this book.

I have several "Atomic" clocks as well as a Watch that use 60KHz to time accuracy.

I would like to understand more about how this works.

Would you know if what I believe is WWVB (60KHz) would be effected should WWV/WWVH cease operating.

As a Amateur Radio Operator I use this server to verify the calibration of my transmitters and receivers.

I also use the service to help with HF propagation over the frequency range 2.5-25MHz.

Thank you,

(b) (6) [redacted]

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Please Keep WWV and WWVH on the Air
Date: Tuesday, September 18, 2018 12:00:12 PM

From: wwv
Sent: Thursday, August 23, 2018 5:48 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: Please Keep WWV and WWVH on the Air

From: Dick Lamb (b) (6) [redacted]
Sent: Tuesday, August 21, 2018 12:39 PM
To: wwv <wwv@nist.gov>
Subject: Please Keep WWV and WWVH on the Air

I often tune to WWV/WWVH for a frequency standard and also for the propagation reports. I can't accept that the tiny savings from discontinuing this service ($6.3 million according to the ARRL website) would be more than a trivial consequence to the overall NIST budget. For the many radio enthusiasts and others who depend on WWV and WWVH, I urge you not to discontinue this important service.

Richard Lamb
Amateur callsign [redacted]
[redacted]
[redacted]

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Question about WWV second pulses
Date: Tuesday, September 18, 2018 4:27:02 PM

From: Bill Liles (b) (6)
Sent: Friday, May 25, 2018 9:21 AM
To: Lowe, John P. (Fed)
Subject: Re: Question about WWV second pulses

John, thanks for the references you listed below. I read them and some of their references.

I am actually looking at the 100 Hz pulses. Can I assume the same timing tolerance for then as the 1000 Hz pulses, namely < 100 ns?

The documents kept discussing the 1000 Hz pulses with very little on the 100 Hz pulses.

I do like the trick of looking for the second zero crossing and might change to that instead of the leading edge.

Thanks,
Bil

On Wed, May 23, 2018 at 8:24 AM Lowe, John P. (Fed) <john.lowe@nist.gov> wrote:

> "The seconds pulses on the WWV broadcast consist of a 5 ms burst of 1000 Hz. The beginning of the pulse is the on-time marker (OTM) for that second. The first pulse of each hour is an 800 ms pulse of 1500 Hz; the first pulse of each minute is an 800 ms burst of 1000 Hz. No pulse is present on the 29^{th} and 59^{th} second of each minute. The pulse is preceded by 10 ms of silence, and followed by 25 ms of silence, to make it easier to discern the "tick".
>
> All time, time interval, and audio signals on the broadcast are derived from the WWV Time Scale, an ensemble of cesium clocks located at the radio station. All timing signals are accurate to well under 100 ns of UTC(NIST), and audio frequencies accurate to a similar level.
>
> The received accuracy of WWV signals is limited by the instability of the propagation path; using computer software to calculate the path delay, the best timing uncertainty to be obtained is about 1 ms; without the calculations, the uncertainty is less than 15 ms within the continental US (or near Hawaii, if receiving WWVH).

Since the received uncertainty of the WWV signals is much greater than any uncertainty in the signals as transmitted, the seconds pulses are considered to be essentially on time with respect to UTC(NIST) when they leave the antenna. The signal has been advanced from the transmitter to the antenna such that the UTC on time signal is accurate (<100nS) at the antenna. The same uncertainties apply to WWVH, however the audio tone frequencies are slightly different; see the publications below for more info.

References can be found in NIST publication SP-432, 2002 Guide to NIST Time and Frequency Services, pages 40 and 51, and NIST publication SP250-67, NIST Time and Frequency Radio Stations: WWV, WWVH, and WWVB, p. 142 (attached). "

From: Bill Liles (b) (6)
Sent: Tuesday, May 22, 2018 11:47 AM
To: Lowe, John P. (Fed)
Subject: Question about WWV second pulses

John, sorry to bother you but I could just not find the correct document.

I am trying to find the tolerance for the start of the second pulses. I am sure it is very tight and far smaller than I can measure but I am going to try an experiment that uses interpulse timing and I just know that someone somewhere will say that the effect is due to the tolerance built into WWV.

Any chance you can just point me to the correct reference document?

Thank you.

BTW, we are already planning a collect using WWVB during the 2024 solar eclipse.

Bill Liles

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Raw WWV information request
Date: Tuesday, September 18, 2018 11:46:52 AM
Attachments: Harrold 1947 Accracy of sky-wave delay measurments.pdf

---

From: Bill Liles (b) (6) [redacted]
Sent: Monday, July 16, 2018 12:58 PM
To: Nelson, Glenn (Fed)
Cc: Deutch, Matthew J. (Fed); Lowe, John P. (Fed)
Subject: Re: Raw WWV information request

Glenn, thanks so much for the recording. I will let you know how the processing goes.

I have attached the original paper dealing with Morse Code signals. Their purpose was to improve navigation systems. My intent is to improve understanding of the dynamics of the ionosphere. Through I am curious if they had good clocks at the time, how much better they could have done.

Again, thank you.
Bill

On Mon, Jul 16, 2018 at 11:55 AM, Nelson, Glenn (Fed) <glenn.nelson@nist.gov> wrote:

> Bill,
>
> Attached please find an audio file with the portion of the WWV broadcast you requested.
>
> It was recorded earlier this morning (16 July 2018) from the broadcast. A few seconds on either side of the announcement are included for your reference, including our 100 Hz time code.
>
> I edited it using Audacity, and saved it as a .wav file. The original recording was done in mp3 format, 32 kbits/s, 24000 Hz.
>
> Please email or call with any questions or comments.
>
> I would be interested in taking a look at the paper you mentioned, re: historical efforts to

accomplish what you are doing now. WWV was on the air during WWII, but not with time information.

Sincerely,

Glenn Nelson
Electronics Technician
National Institute of Standards and Technology
Radio Stations WWV/WWVB
5701 N. Hwy 1
Fort Collins, CO 80524
Tel: 303-497-3914, x0

From: Bill Liles [mailto:(b) (6) [redacted]
Sent: Friday, July 13, 2018 12:30 PM
To: Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>
Cc: Nelson, Glenn (Fed) <glenn.nelson@nist.gov>

Subject: Re: Raw WWV information request

Matt, yes, we only need the phase "at the tone."
Bill

On Fri, Jul 13, 2018 at 2:01 PM Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov> wrote:

> Yes, it is true that when he says “at the tone” it is the same every minute. I made my own assumption that you had data for a certain day or hour that you wanted the whole announcement for to compare to. So do you just need the phrase “at the tone”?
>
> **From:** Bill Liles [mailto (b) (6) [redacted]
> **Sent:** Friday, July 13, 2018 11:26 AM
> **To:** Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>
> **Cc:** Lowe, John P. (Fed) <john.lowe@nist.gov>; Nelson, Glenn (Fed) <glenn.nelson@nist.gov>
>
> **Subject:** Re: Raw WWV information request
>
> John, thanks for forwarding my email and Matt, thanks for the information.
>
> I might have made a faulty assumption. I assumed the the first part of the voice track announcing the time at the tone was always from the same voice file. The actual vocalized

time changes for each minute changes but the first part stays constant. Is that assumption not true.

If the assumption is true, I only need that recording, so the current recording is fine.

The time between the second tic marks are not always a second. The ionosphere puts different amounts of delay between the pulses. Also the frequency is slightly modified by Doppler due to changes in the ionosphere. Also these effects are frequency dependent.

We are actually trying to use the inter-second delta time to try to understand the ionosphere better to include Traveling Ionispheric Disturbances (TIDs).

As far as we can tell, this was last done during WWII on the delta time between dits and dahs of machine sent Morse Code. After the war many other methods were developed so this technique was dropped. But today, with inexpensive SDRs and computers, we are wondering what we can do today.

There are no high speed Morse Code transmitters today on 24/7. But there is WWV that is very precise in time and frequency, which is better than the transmitters of WWII.

If you would like to read the paper that discusses the WWII effort, I can send the reference. I assume that NIST has access to the IEEE database.

As my original email stated, the tic marks are narrow band signals which limits our time accuracy. High bandwidth signals are better, which is why have the voice file would be useful.

And thanks for thinking this request is not strange. Now I am curious about the requests that you think are strange.

Again, thanks so much for considering this.
Bill

On Fri, Jul 13, 2018 at 12:12 PM Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov> wrote:

> Howdy Bill,
> This is not a strange request at all, we get many requests for the voice announcements for various reasons. The person who diligently records those announcements is out of the office today, but will be in on Monday. Is there a certain date or time of day you are interested in?
> If you have the time I would be interested in knowing more about your study of the

ionosphere. I receive a lot of inquiries from WWV users that ask me propagation questions. I have some rule-of-thumb knowledge about propagation that I picked up as a SWL in my teenage years, but would always like to learn more. Being on the transmitting end of a HF signal does not give us any exposure to propagation.
Best Regards,
Matt Deutch
WWV

From: Lowe, John P. (Fed) today
Sent: Friday, July 13, 2018 9:52 AM
To: Bill Liles (b) (6) ; Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>
Subject: Re: Raw WWV information request

Bill,
I believe Matt and his staff at the WWV radio station should be able to supply you with the requested voice file. I appreciate your understanding that we would like the files to remain under restricted control.
Regards,
John

From: Bill Liles (b) (6)
Sent: Friday, July 13, 2018 9:08 AM
To: Lowe, John P. (Fed)
Subject: Raw WWV information request

John, this might be one of the strangest requests for WWV data that you have received.

I am currently working with a bunch of folks (MIT Haystack, UMassBoston, Univ of Bath) to do studies of the ionosphere using the delta time between the second tic marks of WWV.

As you know, those tic marks are very narrow band and thus limited to the processing that we can do.

We were wondering how we could get the advantage of wide bandwidth signals. Our thought was if we could get a copy of the file of the voice message repeated every minute. That voice has more bandwidth.

The question is if it possible to obtain a copy of the standard repeated part of the voice file? We realize that there could be restrictions on it such as we could not give copies to anyone else and control access to the file so no one posts a copy on the web, etc.

Of course, we will give credit to NIST in any papers or other public forums.

Thanks for considering this strang request.

Bill Liles

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Shut down of WWV and WWVH
Date: Tuesday, September 18, 2018 12:09:27 PM

From: Bill Liles (b) (6)
Sent: Monday, August 13, 2018 7:48 AM
To: Lowe, John P. (Fed)
Subject: Shut down of WWV and WWVH

John, I was sad to read of the proposed NIST budget plan to shut down these transmitters. I realize that the experiments that I and others do using them cannot justify the costs but still find them very useful.

What was not clear from the news sources was if WWVB was also included in the shutdown plans. Could you please let me know, if you are allowed to. Plans are underway for the next solar eclipse over the US in 2014 using WWVB and WWV. We will have to rework plans with NSF if those transmitter signals will not be available.

Hope you and your team can stay employed.

Thank you.

Bill Liles

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Media Request // Honolulu Civil Beat
Date: Tuesday, September 18, 2018 11:33:14 AM

From: Lowe, John P. (Fed)
Sent: Wednesday, September 5, 2018 6:26 PM
To: Brittany Lyte
Subject: Re: Media Request // Honolulu Civil Beat

Hi Brittany,
I enjoyed our conversation. Here is the link to the radio station services:
https://www.nist.gov/pml/time-and-frequency-division/time-services

Click on WWVH for more information concerning the station there in Hawaii.
Regards,
John Lowe
Station Manager
303 497-5453

Time and Frequency Services | NIST

www.nist.gov

The Time and Frequency Services group distributes standard time and frequency signals generated by the Coordinated Universal Time scale, UTC(NIST), maintained at the NIST laboratories in Boulder, Colorado. UTC(NIST) is

---

From: Brittany Lyte <blyte@civilbeat.org>
Sent: Wednesday, September 5, 2018 5:42 PM

To: Lowe, John P. (Fed)
Subject: Media Request // Honolulu Civil Beat

Hi John,

My name is Brittany Lyte and I'm a reporter at Honolulu Civil Beat in Hawaii. I'm interested in learning about the function of the WWVH radio station in Kekaha, Hawaii (Kauai), as well as how technology has changed things over time. I stumbled on some information online about how the station is possibly slated to be shut down on NIST's FY 2019 budget proposal, and so I've been reading up and trying to learn more about what goes on there. I lived on Kauai for years but never knew about WWVH. Would you be able to educate me on this? I called the folks in Kekaha and they told me to get in touch with you for more info about what goes on there.

Thanks very much!
Brittany

--
Brittany Lyte
Reporter, Honolulu Civil Beat
808-367-2305
blyte@civilbeat.org
twitter.com/blyte

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Federal Budget
Date: Tuesday, September 18, 2018 12:02:05 PM

From: wwv
Sent: Thursday, August 23, 2018 5:45 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: Federal Budget

From: Thomas Mahnke (b) (6) [redacted]
Sent: Monday, August 20, 2018 7:41 AM
To: wwv <wwv@nist.gov>
Subject: Federal Budget

Dear Sir/Madam:

I read that the Federal Budget for 2019 has withdrawn funding for radio stations WWV and WWVB. Does this mean the end of your time and frequency broadcasts?

Thanks in advance
Thomas Mahnke
Caledonia, WI
(b) (6) [redacted]

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Ending?
Date: Tuesday, September 18, 2018 12:03:18 PM

From: wwv
Sent: Thursday, August 23, 2018 5:42 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: Ending?

From: Computer Services <compserviceshhi@aol.com>
Sent: Thursday, August 16, 2018 9:17 PM
To: wwv <wwv@nist.gov>
Cc: wwvh@inst.gov
Subject: Ending?

Hello,

Am I hearing correctly or a rumor that you are ending WWV & WWH in 2019? When in 2019 this going to happen?
I been picking you up on 5 & 15 MHz a lot & sometimes on 25 MHz .
I hope this is not going to happen as I use it to keep my clocks tunes correctly.

Thanks
Mike.

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: WWV and WWVH shutting down???
Date: Tuesday, September 18, 2018 12:01:45 PM

From: wwv
Sent: Thursday, August 23, 2018 5:45 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: WWV and WWVH shutting down???

From: ronnie miller (b) (6) [redacted]
Sent: Monday, August 20, 2018 8:30 AM
To: wwv <wwv@nist.gov>
Subject: WWV and WWVH shutting down???

Matt, I heard a rumor that there is an effort to de-fund WWV ? For heaven's sake, what is going on? I use WWV on a regular basis, to determine propagation conditions on the various frequencies, and as a frequency standard to keep my amateur equipment exactly on frequency. I hope this is a false rumor, but if not please let me know if there is anything I can do to help keep WWV on the air.

Ronnie V Miller - [redacted]

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Importance of WWV
Date: Tuesday, September 18, 2018 12:01:34 PM
Importance: High

From: wwv
Sent: Thursday, August 23, 2018 5:45 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: Importance of WWV

From: Sutton, Douglas (Fed)
Sent: Monday, August 20, 2018 8:30 AM
To: wwv <wwv@nist.gov>
Subject: FW: Importance of WWV
Importance: High

From: Douglas Oakman <oakmande@plu.edu>
Sent: Saturday, August 18, 2018 8:27 PM
To: Sutton, Douglas (Fed) <douglas.sutton@nist.gov>
Subject: Importance of WWV
Importance: High

Dear Douglas, I suppose you've been getting messages about the termination of WWV/H. I'd like to urge that NIST reconsider as so many of us want alternatives with "radio internet-free." I am an ARES officer here in WA state, and while we use the internet frequently, we also want radio-to-radio options as well. It seems to me a similar logic applies to a national time and frequency reference. If you are not the proper person to whom to write, could you direct me to the appropriate person. Thanks for your work there on behalf of all citizens of good will. Douglas E. Oakman

Douglas E. Oakman, Ph.D.
Department of Religion
Pacific Lutheran University

Tacoma, WA 98447

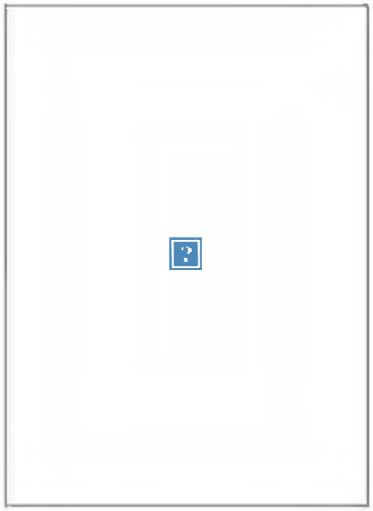
From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Report that WWV, WWVH and WWVB will cease operations
Date: Tuesday, September 18, 2018 12:05:13 PM

From: torr286@aol.com <torr286@aol.com>
Sent: Wednesday, August 22, 2018 3:40 PM
To: Lowe, John P. (Fed)
Subject: Report that WWV, WWVH and WWVB will cease operations

Good afternoon, Mr. Lowe!

I am a member of the Board of Directors of the National Association of Watch and Clock Collectors (NAWCC). Recently, I was told that NIST is considering, in its 2019 budget, discontinuing the operations of WWV, WWVH, and WWVB.

The report cited this link: https://www.nist.gov/director/fy-2019-presidential-budget-request-summary/fundamental-measurement-quantum-science-and



Fundamental Measurement, Quantum Science and Measurement ...

www.nist.gov

At the heart of NIST's mission is the dissemination of the fundamental units of measurement (the International System...

The news about NIST radio stations is listed under the subheading: **Illustrative program reductions in FY 2019**

To your knowledge, is this true? As I'm sure you know, the standard time and frequency signals broadcast by those three stations enjoy widespread use. On perhaps a mundane level, literally millions of "radio controlled" clocks and watches rely on WWVB for their accuracy. As one who uses these kinds of timepieces, if WWVB ceases operations, what will I do to keep my clocks keeping correct time?

There are some 14,000 members of NAWCC worldwide who will be very interested.

Thank you for your help!

Best regards,

Tim Orr
Director, National Association of Watch and Clock Collectors
Boulder CO
720-552-4477

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: WWV
Date: Tuesday, September 18, 2018 12:11:17 PM

From: Lombardi, Michael A. (Fed)
Sent: Monday, February 26, 2018 12:08 PM
To: Lowe, John P. (Fed); Deutch, Matthew J. (Fed)
Subject: FW: WWV

Could one of you please respond?

From: Rob Parker (b) (6) [redacted]
Sent: Thursday, February 22, 2018 7:28 AM
To: Lombardi, Michael A. (Fed) <michael.lombardi@nist.gov>
Subject: WWV

Hello there

I got this email address from the Web as a possible contact for WWV. If you are no longer involved with them please discard this message, or forward it to anyone who you feel might be able to help.

Basically I am very interested in making a private visit to WWV.

My interest in timing began long ago when I listened to Short Wave transmissions in the U.K. (including of course WWV). Later I became professionally interested in transmitting accurate timing information over relatively short distances. In particular I was involved in the the design of the timing network for the 27km. Large Hadron Collider at CERN in Geneva, Switzerland.

As I will be visiting Colorado in March I wondered if public visits were available, and if so who can I contact to get further details?

I sincerely hope you can help me in this matter, as it would be a great honour for me to see the station.

Best Regards

Dr Rob Parker

retired Telecommunications Section Leader, CERN.

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: IEEE Spectrum request: Interview about proposed end to WWV stations?
Date: Tuesday, September 18, 2018 11:59:10 AM

From: Lowe, John P. (Fed)
Sent: Tuesday, September 18, 2018 12:34 PM
To: Julianne Pepitone
Subject: Re: IEEE Spectrum request: Interview about proposed end to WWV stations?

Julianne,
I am available now if you would like to call, otherwise we can wait until this afternoon.
John

From: Lowe, John P. (Fed)
Sent: Monday, September 17, 2018 2:31:40 PM
To: Julianne Pepitone
Subject: Re: IEEE Spectrum request: Interview about proposed end to WWV stations?

That is the correct number.

From: Julianne Pepitone (b) (6) [redacted]
Sent: Monday, September 17, 2018 10:46 AM
To: Lowe, John P. (Fed)
Subject: Re: IEEE Spectrum request: Interview about proposed end to WWV stations?

Hi John,

Looking forward to our call at 2pm MT tomorrow. I wanted to see if (303) 497-5453 is the best number to reach you then. Could you let me know when you have a moment?

Thanks again for being willing to chat,
Julianne

On Fri, Sep 14, 2018 at 5:16 PM, Julianne Pepitone (b) (6) [redacted] wrote:

> Hi John, that works perfectly. What's a good time to call you on Tuesday at 2p Mountain time? Thanks!

Sent from mobile

On Sep 14, 2018, at 4:42 PM, Lowe, John P. (Fed) <john.lowe@nist.gov> wrote:

> Hi,
> Tuesday at 2 pm MT would work for me.
> OK?
> John

From: Julianne Pepitone (b) (6) [redacted]
Sent: Friday, September 14, 2018 2:14 PM
To: Lowe, John P. (Fed)
Subject: IEEE Spectrum request: Interview about proposed end to WWV stations?

Dear John,

I'm a freelance writer working with IEEE Spectrum, and Stephen Cass shared your contact information with me. I'm working on an article about NIST's proposed budget cuts that would bring an end to WWV, WWVH, and WWVB -- and what could happen if those cuts do come to pass.

I understand that you're the manager of all three stations and that you also worked on the signal upgrade five years ago that could create the potential for more robust messaging (i.e. emergency messages).

I wondered if you might be willing to speak with me both about the stations generally, and about this untapped potential. If you are: e're hoping to post something on Spectrum's site soon, so might you be available on Monday or perhaps Tuesday? I'd love to set up ~20 minutes at your convenience.

Thanks for your consideration and hope to speak with you soon,
Julianne Pepitone
[redacted]

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: NIST WWVB Possible Shutdown
Date: Tuesday, September 18, 2018 12:08:33 PM
Attachments: image001.png
image002.png
image003.png
Importance: High

From: Rodney Beare (b) (4)
Sent: Monday, August 13, 2018 11:11 AM
To: Lowe, John P. (Fed)
Subject: FW: NIST WWVB Possible Shutdown

Hi John
Would you please comment to the stuff being posted on Facebook as to NIST being closed? Thanks for your help.

Cordially,

Rodney Beare
Product Specialist
La Crosse Technology
2809 Losey Blvd South
La Crosse, WI 54601
(b) (6)

From: Gregory Pizl
Sent: Monday, August 13, 2018 10:00 AM
To: Allan McCormick (b) (4); Santiago Perdomo (b) (4); Diane Keller (b) (4); Rodney Beare (b) (4); Mardi Parker (b) (4)
Subject: NIST WWVB Possible Shutdown
Importance: High

Good Morning,

I don't want to spread panic, especially if this isn't true, but we did have a Facebook user pose the following question over the weekend:

> NIST is turning off the WWVB signal next year. What is LaCrosse going to do about all the radios and weather stations that use WWVB to set their clocks?

The guy cited first, an article here: https://swling.com/blog/2018/08/nist-fy2019-budget-includes-request-to-shutdown-wwv-and-wwvh/

Then the full budget proposal here:
http://www.osec.doc.gov/bmi/budget/FY19CBJ/NIST_and_NTIS_FY2019_President's_Budget_for_508_comp.pdf

He calls out a paragraph on page 25 – The attached image

I obviously didn't read through the report so I have no idea if these lines were possibly taken out of context, but I figured I'd pass this along to see if indeed we need to look into this further.

Please let me know if/how you'd like me to respond publically on Facebook.

Thanks,

Gregory Pizl II
Video Producer
La Crosse Technology
(b) (6) [redacted]
gregory@lacrossetechnology.com

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: The quantum line has been put out there...
Date: Thursday, August 23, 2018 10:51:18 AM

I understand NIST is cutting WWV funding to focus more on "Quantum
> Science".
>
> Quantum Science is possibly a very misguided field, and much money is
> being wasted on it. Hundreds of millions of dollars are being spent
> on the - I claim highly misguided - field of Quantum Computers for
> instance. Spending tax money on it at this time is highly
> questionable if my objections have merit.
>
> Here are some links to my objection:
>
> https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.f
> acebook.com%2Fgroups%2F133024270656352%2Fpermalink%2F274890186469759&a
> mp;data=02%7C01%7Cwwv%40nist.gov%7Cd361eeadce4244683d2c08d609054373%7C
> 2ab5d82fd8fa4797a93e054655c61dec%7C1%7C0%7C636706315545175170&sdat
> a=GhPUiMuFn%2FI0C7Q%2F4wEvfieZ8PoO0rxEEDypq6OOJgY%3D&reserved=0
>
> https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.f
> acebook.com%2Fmukesh.prasad.351104%2Fposts%2F10102063555769494&dat
> a=02%7C01%7Cwwv%40nist.gov%7Cd361eeadce4244683d2c08d609054373%7C2ab5d8
> 2fd8fa4797a93e054655c61dec%7C1%7C0%7C636706315545175170&sdata=WSnR
> b4t6QJAWkR%2BaWS2oM2XZnyT68muxkxOE7wj%2F7W0%3D&reserved=0
>
> https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.f
> acebook.com%2Fgroups%2F133024270656352%2Fpermalink%2F312585429366901&a
> mp;data=02%7C01%7Cwwv%40nist.gov%7Cd361eeadce4244683d2c08d609054373%7C
> 2ab5d82fd8fa4797a93e054655c61dec%7C1%7C0%7C636706315545175170&sdat
> a=Wnf33rHs7Ryal2z3KkTNuVtvsHRT%2FtW1TiBzSru1unM%3D&reserved=0
>
> Regards,
>
> Mukesh Prasad
> Englewood, CO

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: NIST Radio Station WWV 100-year Anniversary
Date: Tuesday, September 18, 2018 12:03:55 PM

From: wwv
Sent: Thursday, August 23, 2018 5:41 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: NIST Radio Station WWV 100-year Anniversary

From: Sutton, Douglas (Fed)
Sent: Tuesday, August 14, 2018 1:38 PM
To: wwv <wwv@nist.gov>
Subject: FW: NIST Radio Station WWV 100-year Anniversary

From: Ken Reitz <ks4zr1@gmail.com>
Sent: Tuesday, August 14, 2018 12:02 PM
To: Sutton, Douglas (Fed) <douglas.sutton@nist.gov>
Subject: Re: NIST Radio Station WWV 100-year Anniversary

Hi Doug --

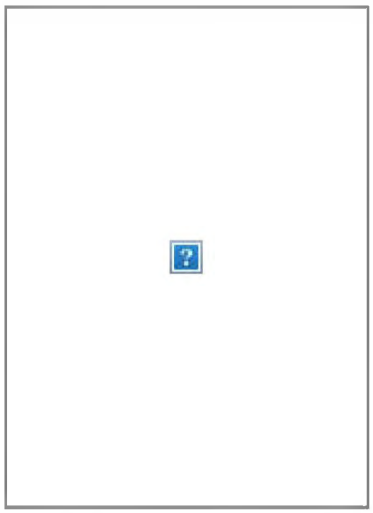
With the prospects for defunding WWV and WWVH in the 2019 FY federal budget, will NIST still be celebrating WWV's 100-year anniversary October 1, 2019? Best regards, Ken

Ken Reitz KS4ZR
Publisher, Managing Editor
The Spectrum Monitor

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: WWVB shutdown?
Date: Tuesday, September 18, 2018 11:43:14 AM

From: H. Robinson (b) (6) [redacted]
Sent: Thursday, August 16, 2018 9:14 AM
To: Lowe, John P. (Fed)
Subject: WWVB shutdown?

Hi John,
I just found this URL on NIST's 2019 budget request.
https://www.nist.gov/director/fy-2019-presidential-budget-request-summary/fundamental-measurement-quantum-science-and



Fundamental Measurement, Quantum Science and Measurement ...

www.nist.gov

At the heart of NIST's mission is the dissemination of the fundamental units of measurement (the International System...

It mentions the shutdown of the radio service in Colorado and Hawaii.

It sounds like a bad idea.

Is there anything you can say about this?

Hugh Robinson

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: WWV Shutdown??
Date: Tuesday, September 18, 2018 11:59:47 AM

From: wwv
Sent: Thursday, August 23, 2018 5:48 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: WWV Shutdown??

From: Sutton, Douglas (Fed)
Sent: Wednesday, August 22, 2018 10:38 AM
To: wwv <wwv@nist.gov>
Subject: FW: WWV Shutdown??

From: Dan Romanchik KB6NU <cwgeek@kb6nu.com>
Sent: Wednesday, August 22, 2018 5:59 AM
To: Sutton, Douglas (Fed) <douglas.sutton@nist.gov>
Subject: WWV Shutdown??

Mr. Sutton—

As you probably know, there's been a big reaction to the report that NIST plans to cut the 2019 budget by $6.3 million by shutting down "NIST radio stations in Colorado and Hawaii." I'm trying to write a blog post about this. From your point of view, how serious is this?

73!

Dan KB6NU

CW Geek, Ham Radio Instructor
Author of the "No Nonsense" amateur radio license study guides
Read my ham radio blog at http://www.kb6nu.com

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: WWV and WWVH
Date: Tuesday, September 18, 2018 12:02:44 PM

From: wwv
Sent: Thursday, August 23, 2018 5:44 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: WWV and WWVH

-----Original Message-----
From: Bob (b) (6) [redacted]
Sent: Sunday, August 19, 2018 8:23 AM
To: wwv <wwv@nist.gov>
Subject: WWV and WWVH

there are a number of facebook sites toting that both WWV and WWVH may be shut down for various reasons, including budget. I cannot find anything on your site confirming this...what is the real story please.

thanks and best wishes

Bob Romano [redacted]

former (b) (6) [redacted]

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: NIST 2019 Budget Cuts
Date: Tuesday, September 18, 2018 12:07:03 PM

From: Sutton, Douglas (Fed)
Sent: Tuesday, August 21, 2018 10:56 AM
To: Deutch, Matthew J. (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: NIST 2019 Budget Cuts

Gentleman

Since we were told not to elaborate on the 2019 Presidential budget and the purposed station shutdown.
Could either one of you help Mr. Rowe

Thanks
Douglas

From: Martin Rowe <martin.rowe@aspencore.com>
Sent: Tuesday, August 21, 2018 8:36 AM
To: Sutton, Douglas (Fed) <douglas.sutton@nist.gov>
Subject: NIST 2019 Budget Cuts

Dear Mr. Sutton,

I recently heard about NIST's reduced FY 2019 budget and plan to write a new piece for EE Times about how it might impact engineering activity. I have a few questions.

- What is the motivation of shutting down WWV and WWVH? Is WWVB going to remain in operation? What are the implicates of closes the stations?
- Do we still need WWV and WWVH given that many systems rely on GPS and internet time services?
- Regarding the $3.5M cut to Lab to Market, what percentage of the FY 2018 budget is that amount? What is the anticipated impact of that cut in industry?
- Are there any cuts to calibration services? NIST is, after all, the top of the calibration

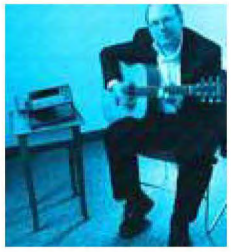
chain. How might such cuts affect turnaround time? Are there can calibrations that NIST will no longer perform?

- What is the percentage of 2018 budget for the -$4.1 million in R&D targeting application of NIST quantum breakthroughs to applied measurement needs? What impacts might we expect?

I'm available any time through Thursday, but would very much like to post something this week (I'm off Friday). Please feel free to call or email.

Thanks and regards,

Martin Rowe
Senior Technical Editor, Test & Measurement
+1-718-360-2348
martin.rowe@aspencore.com
EDN Test & Measurement Design Center
EE Times Test & Measurement DesignLine
@measurementblue
@TMW_Community



From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: WWV Termination
Date: Tuesday, September 18, 2018 12:03:44 PM

From: wwv
Sent: Thursday, August 23, 2018 5:41 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: WWV Termination

From: Karl Shumaker (b) (6) [redacted]
Sent: Wednesday, August 15, 2018 4:06 PM
To: wwv <wwv@nist.gov>
Subject: WWV Termination

Any truth that you may cease HF ops on WWV and WWVH?

Respectfully,

Karl Shumaker
Whiteville, TN
[redacted]
Sent from Yahoo Mail on Android

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: WWV Shutdown?
Date: Tuesday, September 18, 2018 12:02:33 PM
Attachments: image002.png

From: wwv
Sent: Thursday, August 23, 2018 5:44 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: WWV Shutdown?

From: Simopoulos, Gregory N <Gregory.N.Simopoulos@delphi.com>
Sent: Sunday, August 19, 2018 2:48 PM
To: wwv <www@nist.gov>
Subject: WWV Shutdown?

I have heard that the government is looking to shutdown WWV.

Is this true, or just a rumor?

Thank you very much,

Greg Simopoulos

Gregory Simopoulos
Sr. Systems Engineer
Advanced Powertrain Electronics
Electrification & Electronics

Delphi
Technologies

2151 E. Lincoln Rd.
Kokomo, IN 46902
U.S.A

gregory.n.simopoulos@delphi.com
+1 765.451.6928 Office

****

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Shutdown of NIST radio stations WWV WWVB and WWVH
Date: Tuesday, September 18, 2018 12:02:21 PM

From: wwv
Sent: Thursday, August 23, 2018 5:44 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: Shutdown of NIST radio stations WWV WWVB and WWVH

-----Original Message-----
From: sean traverse (b) (6) [redacted]
Sent: Sunday, August 19, 2018 6:40 PM
To: wwv <wwv@nist.gov>
Cc: (b) (6) [redacted]
Subject: Shutdown of NIST radio stations WWV WWVB and WWVH

Why is NIST considering shutting down these radio stations many listeners depend on these radio stations to set their watches and clocks and to get propagation forecasts I really hope NIST can reconsider shutting down these radio stations and keeping these radio stations on the air I was listening to Glenn Hauser and he mentioned that these radio stations were to be shut down in fiscal year 2019-2020 why is there any announcements about NIST shutting down these radio stations personally I keep the stations on the air permanently Sent from my iPhone

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: THE DEFUNDING OF WWV
Date: Tuesday, September 18, 2018 11:36:59 AM

From: Dennis Vagedes (b) (6)
Sent: Monday, September 3, 2018 1:46 PM
To: Lowe, John P. (Fed)
Subject: THE DEFUNDING OF WWV

Good day Mr. Lowe

WWV is the oldest continuously broadcasting time and frequency standard station in the United States, with the first broadcast in May of 1920. WWV not only provides propagation reports and marine weather storm warnings it is also a scientific and educational resource. WWV is also vital to the telecommunications world wide.

In closing I implore you to reconsider defunding WWV.

Thank you

Dennis Vagedes
Villa Hills Ky,

From:	[illegible]
To:	[illegible]
Subject:	[illegible]
Date:	[illegible]

From: Tom Van Baak <tvb@LeapSecond.com>
Sent: Monday, August 13, 2018 9:23 AM
To: Lowe, John P. (Fed); Lombardi, Michael A. (Fed)
Subject: Fw: About the recent NIST thread(s)

Hi John, Mike,

[illegible]

[illegible]

[illegible]

[illegible]

Thanks
/tvb

-----Original Message-----
From: "Tom Van Baak" <tvb@LeapSecond.com>
To: [illegible]
Sent: Monday, August 13, 2018 6:01 AM
Subject: [time-nuts] About the recent NIST thread(s)

[illegible]

[illegible]

> In the event that some useful NIST T&F service is actually on the chopping block, we time nuts could be a resource to help influence budget gladiators or to explain to the public just what these magic services are and why they were / are still important. I'd rather list members use their time to compose accurate, informative and appealing testimonials about how well NIST serves the community -- or how NIST could better serve the community in the future -- than for members to use this mailing list to cry Henny Penny [1]
>
> [illegible] [2]
>
> [illegible] [3] [illegible]

> Thanks,
> /tvb
> https://na01.safelinks.protection.outlook.com/?url=http%3A%2F%2Fleapsecond.com%2Ftime-nuts.htm&data=02%7C01%7Cjohn.lowe%40nist.gov%7Ce83a39bdb88c4186252b08d6011ff036%7C2ab5d82fd8fa4797a93e054655c61dec%7C1%7C0%7C636697634018594561&sdata=gvwwE26Ku8hd4e2SVFOzC3Ag7IfWe40Azetc%2FA3L0s%3D&reserved=0
>
>
> [1] aka https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fen.wikipedia.org%2Fwiki%2FChicken_Little&data=02%7C01%7Cjohn.lowe%40nist.gov%7Ce83a39bdb88c4186252b08d6011ff036%7C2ab5d82fd8fa4797a93e054655c61dec%7C1%7C0%7C636697634018594561&sdata=[illegible]&reserved=0
>
> [2] e.g.
> https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fswling.com%2Fblog%2F2018%2F08%2Fnist-fy2019-budget-includes-request-to-shutdown-wwv-and-wwvh%2F&data=[illegible]&reserved=0
> https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fforums.qrz.com%2Findex.php%3Fthreads%2F2019-budget-proposes-shutting-down-wwv-wwvh.[illegible]&data=[illegible]&reserved=0
> https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.reddit.com%2Fr%2Famateurradio%2Fcomments%2F96fy9m%2Fbudget_proposal_to_shut_down_wwv_wwvh_time%2F&data=02%7C01%7Cjohn.lowe%40nist.gov%7Ce83a39bdb88c4186252b08d6011ff036%7C2ab5d82fd8fa4797a93e054655c61dec%7C1%7C0%7C636697634018594561&sdata=rTTUZFIHbY5vE%2FSowTAN[illegible]G7V[illegible]QXxL8kJId4LzvY9C%3D&reserved=0
> https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.reddit.com%2Fr%2Fshortwave%2Fcomments%2F96dyr%2Fnist_fy2019_budget_includes_request_to_shutdown%2F&data=02%7C01%7Cjohn.lowe%40nist.gov%7Ce83a39bdb88c4186252b08d6011ff036%7C2ab5d82fd8fa4797a93e054655c61dec%7C1%7C0%7C636697634018594561&sdata=[illegible]&reserved=0
>
> [3] [illegible]
>
>

> time-nuts mailing list -- time-nuts@listsfebo.com
> To unsubscribe, go to https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Flists.febo.com%2Fmailman%2Flistinfo%2Ftime-nuts_lists.febo.com&data=02%7C01%7Cjohn.lowe%40nist.gov%7Ce83a39bdb88c4186252b08d6011ff036%7C2ab5d82fd8fa4797a93e054655c61dec%7C1%7C0%7C636697634018594561&sdata=n5UZRi[illegible]4o0xw0RgQ43kpKghMmehDrpI5POmRLWTPEY%3D&reserved=0
> and follow the instructions there

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: WWV/WWVH - a new film! (documentary)
Date: Tuesday, September 18, 2018 11:32:44 AM

From: Lowe, John P. (Fed)
Sent: Monday, September 10, 2018 2:14 PM
To: (b) (6) [redacted]
Subject: Re: WWV/WWVH - a new film! (documentary)

Mr. Webb,
I am the station manager for all of the NIST radio stations. I can be the contact for your project.
Regards,
John Lowe
303 497-5453

From: Lombardi, Michael A. (Fed)
Sent: Monday, September 10, 2018 2:01 PM
To: Lowe, John P. (Fed)
Subject: FW: WWV/WWVH - a new film! (documentary)

Hi John,

It's probably best if you respond to this one.

Thanks,

Mike

From: John Webb (b) (6) [redacted]
Sent: Sunday, September 09, 2018 5:31 PM
To: Lombardi, Michael A. (Fed) <michael.lombardi@nist.gov>
Subject: WWV/WWVH - a new film! (documentary)

Mr. Lombardi,

I'm a ham and a filmmaker,, wonder if I can reach out to you on a film project I'm working on about WWV and WWVH history? "The Heartbeat of America"… (working title)

Worried it may not be around much longer and hoping I may be able to bring attention to the issue. Thank you for your service, been reading your material for research.

Your an expert obviously…

I just came off a four year job about Los Alamos Lab - biographical film on Dr. Raemer Schreiber, so seeking something new and exciting and NIST / WWV / WWVH time and freq could be it!

My contact if interested or spread the word! Working with Ray Novak N9JA from Icom America on it!

My call - [redacted] (since 1976)

My latest project - halflfieofgenius.com

business site - 7land.com

Cell (b) (6) [redacted]

Sincerely,

John Webb
producer/editor

From: Weller, Robert
To: Deutch, Matthew J. (Fed); Porter, Gail (Fed)
Cc: Burrus, James N. (Fed); Oates, Chris (Fed)
Subject: RE: "19 budget and WWV(B)
Date: Friday, August 31, 2018 9:27:52 AM

Thanks, Matt.

==

Hello Ms. Porter:

Can you say whether the proposed de-funding of WWV and WWVH also includes WWVB?

Thanks,

Robert D. Weller
Vice President, Spectrum Policy

National Association of Broadcasters
1771 N Street NW
Washington DC 20036
Phone 202 429 5397
nab.org

Follow NAB on Twitter, Instagram and LinkedIn
Become a fan of NAB on Facebook

From: Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>
Sent: Friday, August 31, 2018 11:10 AM
To: Weller, Robert <rweller@nab.org>; Oates, Chris (Fed) <chris.oates@nist.gov>; Burrus, James N. (Fed) <james.burrus@nist.gov>
Cc: Porter, Gail (Fed) <gail.porter@nist.gov>
Subject: RE: '19 budget and WWV(B)

Howdy Mr. Weller,
We have been asked not to comment on the budget. Instead we have been asked to forward all of the requests for information to Gail Porter. She is being CCed in this e-mail.
Thank you for using the NIST radio stations.
Best Regards,
Matt Deutch
WWV/WWVB

From: Weller, Robert <rweller@nab.org>
Sent: Friday, August 31, 2018 8:21 AM
To: Oates, Chris (Fed) <chris.oates@nist.gov>; Burrus, James N. (Fed) <james.burrus@nist.gov>; Deutch, Matthew J. (Fed) <matthew.deutch@nist.gov>
Subject: '19 budget and WWV(B)

Gents,

Do you know whether the proposed de-funding of WWV and WWVH also includes WWVB?

The published budget extract is less than clear, as it mentions only "radio stations in Colorado and Hawaii."

Thanks for any clarification you might offer.

Bob W.

Robert D. Weller
Vice President, Spectrum Policy

National Association of Broadcasters
1771 N Street NW
Washington DC 20036
Phone 202 429 5397
nab.org

Follow NAB on Twitter, Instagram and LinkedIn
Become a fan of NAB on Facebook

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Will TMAS and WWVB continue service?
Date: Tuesday, September 18, 2018 11:35:36 AM

From: Lombardi, Michael A. (Fed)
Sent: Tuesday, September 4, 2018 12:45 AM
To: Lowe, John P. (Fed)
Subject: Fw: Will TMAS and WWVB continue service?

From: Dana Whitlow (b) (6) [redacted]
Sent: Monday, August 27, 2018 3:32 PM
To: Lombardi, Michael A. (Fed)
Subject: Will TMAS and WWVB continue service?

Hello Michael,

You may recall me from the Arecibo Observatory about 1-1/2 years ago- I retired in Dec 2016 and
moved to Kerrville, Texas. I was, among other things, the "Keeper of The Clock" and it was at my instigation that the AO first picked up the TMAS service.

The "Time-Nuts" email discussion group has recently been boiling over with discussions about NIST's FY2019 budget request. The trigger for this was a paragraph on page NIST-25 of the request, in which it is stated that the broadcast time dissemination services from Fort Collins "would be terminated" under the new budget.

But it's a bit ambiguous: Would this cut include WWVB? And on a closely-related topic, is TMAS also at risk?

I can say that even the loss of just WWV & WWVH would make a lot of people unhappy. It seems to me that in the event of nuclear war or another "Carrington event" by the sun, the HF broadcasts would remain as the most likely time services of any accuracy to recover in a reasonable amount of time (meaning without major reconstruction of ground level infrastructure and/or satellite constellations, both of which would take weeks to even

get started and months-years to reasonably complete).

Thanks much,

Dana Whitlow

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Atomic clock signal
Date: Tuesday, September 18, 2018 11:38:10 AM

From: Zaky (b) (6)
Sent: Friday, August 24, 2018 4:09 PM
Subject: Atomic clock signal

NIST has a long-standing history of providing time and frequency services through our radio stations and we appreciate that many people use these services. NIST's WWV is the longest continuously-operating radio service in the U.S.

At the same time, the proposed NIST budget for FY 2019 required difficult choices about budget priorities.

The President's full NIST FY 2019 budget request to the Congress is available at the link below, including a brief description of why the shutdown of NIST's time and frequency radio stations is proposed. The proposal includes shutdown of NIST's three radio stations, WWV, WWVH, and WWVB, which communicates with consumer clocks, watches, broadcasting systems and other devices.

Is it true that the atomic clock signal might stop being transmitted in the future?
Do GPS time signals get their clocks synchronized through NIST ?
If this happens. This is very serios and alarming

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: Shutdown of WWV/WWVH
Date: Tuesday, September 18, 2018 12:03:33 PM

From: wwv
Sent: Thursday, August 23, 2018 5:41 PM
To: Porter, Gail (Fed)
Cc: Lowe, John P. (Fed)
Subject: FW: Shutdown of WWV/WWVH

From: Steve Zalewski (b) (6) [redacted]
Sent: Thursday, August 16, 2018 1:27 PM
To: wwv <wwv@nist.gov>
Subject: Shutdown of WWV/WWVH

August 16 2018

It has come to my attention that NIST has announced plans to shut down time signal radio stations WWV and WWVH.

This a FOOLISH decision, as people around the world rely on these signals for the correct time and many scientific, military, broadcast, ham radio operators, transportation carriers, navigators on ships at sea, and many other users would be severely effected. The minimal cost savings of $6 million dollars is a drop in the bucket, in comparison to other federal programs, that cost significantly more and are NOT being cut. Welfare for the greedy rich is a perfect example. If WWV/WWVH are shut down your staff will lose their jobs, at WWV/WWVH. I urge you to give serious consideration to keep WWV/WWVH on the air.

Thank you for reading my email.

Steve Zalewski,

(b) (6) [redacted]

From: Lowe, John P. (Fed)
To: Oates, Chris (Fed)
Subject: Fw: shutdown of wwv
Date: Tuesday, September 18, 2018 11:35:01 AM

From: Lowe, John P. (Fed)
Sent: Tuesday, September 4, 2018 4:02 PM
To: jimzoerb
Subject: Re: shutdown of wwv

This is in the Presidential budget, not the congressional budget just as it was last year.

From: jimzoerb (b) (6) [redacted]
Sent: Tuesday, September 4, 2018 3:18 PM
To: Lowe, John P. (Fed)
Subject: shutdown of wwv

when will the shut down happen?
Is this decision final?

erb
[redacted]