

SEXTANTS AND NOONAN/EARHART:

The Pensacola Fred Noonan Sextant and Box and the Amelia Earhart—Fred Noonan Disappearance and Sextant Research on the US Naval Observatory at the US National Archives

by

Lew Toulmin, Ph.D., F.R.G.S.



May 2018

lewtoulmin@aol.com; www.themosttraveled.com
Silver Spring, Maryland

This report includes the following sections:

- Background
- Arguments for and against the relationship theory
- Conclusions re the Pensacola and Niku sextant boxes
- Research undertaken at the US National Archives
- Additional research undertaken
- Annexes:
 - 1: Fred Noonan sextant and box, examination and interview notes
 - 2: Fred Noonan sextant and box, photos
 - 3: Fred Noonan sextant and box, file contents
 - 4: Photos of other sextant boxes and related items
 - 5: US National Archives finding guide to preserved US Naval Observatory historical documents
 - 6: Selected items and cards of interest found at the US National Archives from the US Naval Observatory correspondence documents
 - 7. Email responses to this report and allied briefing
 - 8: Author biography.

Background

TIGHAR is testing the theory that Fred Noonan and Amelia Earhart crashed and died on uninhabited Nikumaroro (“Niku”), ex-Gardiner Island, in what is now the Republic of Kiribati.

One argument for this theory involves a sextant box found on Niku in 1940, near skeletal remains and other apparent castaway debris, at the southeast end of the island. This sextant box has now disappeared, but it was described briefly on 23 September 1940 in a telegram by British colonial official Gerald Gallagher as “Sextant box has two numbers on it 3500 (stencilled) and 1542...” There was no sextant present. No measurements of the box were reported. Gallagher told his superiors that he thought there was some chance that the nearby skeleton was Amelia Earhart.

These two sextant box numbers are the only items approaching a serial number that have been found on Niku. If those two numbers could be tied to Noonan, Earhart or their Lockheed Electra, that would be very convincing evidence that the aviators crashed there.

TIGHAR (The International Group for Historic Aircraft Recovery, which has pursued the Earhart mystery for 30 years) believes that there may be such a tie. TIGHAR believes it likely that the number 3500 is a manufacturing number from the Brandis corporation of New York, which made sextants and sextant boxes for the US Navy and other mariners up through 1922. The number 3500 appears to fit into the Brandis manufacture numbering sequence. (Other sextant manufacturers active in supplying the USN over the years included Buff and Buff, Keuffel and Esser Co (K&E), Warren Knight Co., Pioneer Instrument Co., etc.)

Noonan wrote in a letter in 1935 that on a Pan Am Pacific flight he carried a “Pioneer octant [as his principal tool] with a mariner’s sextant as a “preventer” [or backup]. It appears that this preventer may have been a Brandis nautical sextant, perhaps modified with a bubble attachment to facilitate its use for aviation. (See https://tighar.org/wiki/File:M-130_Clipper_Nav_Station.jpg).

It is also known that Noonan owned for time a nautical sextant that is now in the possession of the National Naval Aviation Museum in Pensacola, Florida. This sextant has the number 3547 written on the outside (as well as the number 173).

It is TIGHAR’s theory that the number 3547 is also a Brandis number, that the Pensacola box once held a Brandis sextant belonging to Noonan, and that Noonan had a collection of such Brandis sextants for use in teaching his students or for his personal use. The fact that the two numbers are close (3500 and 3547), appears to support the argument that Noonan had a group of Brandis sextants, perhaps acquired at the same time, for his collection or teaching.

Therefore there is a theorized numerical link between Noonan’s sextant and box in Pensacola and the sextant box found on Niku in 1940, which supports the argument that Noonan (and Earhart) crashed on Niku.

The primary object of this report is to test that theory by a re-examination of the Pensacola box, and an evaluation of the arguments for and against that theory. (The secondary object of this report is to provide information on research done at the US National Archives to try to locate sextant numbering information from the historic files of the US Naval Observatory.)

Before doing so, one other numbering scheme needs to be discussed briefly. During the period from before World War I until after World War II, the US Naval Observatory (USNO) was tasked with calibrating and inspecting nautical sextants, to ensure that mariners’ instruments were accurate enough to use at sea. The USNO would usually indicate that they had inspected a sextant with a small certificate inside the sextant box (see https://tighar.org/wiki/File:K_and_E_NO_616--6.JPG for an example), and this certificate included the manufacturer’s name and the sextant’s manufacturing number, and the USNO inspection number. (Apparently these certificates could wear off or otherwise disappear on occasion.) Some sextant boxes were marked with a USNO inspection number on the outside with a small plaque (see for example https://tighar.org/wiki/File:K_and_E_NO_616--3.JPG). And often the sextant itself would have its USNO inspection number engraved on it’s arc, with the words “US Navy” and the symbol of “N” surrounded by a tilted square or an “O” (for “NO”); see for example <https://tighar.org/wiki/File:2975engrave.jpg>.

It is TIGHAR’s theory that the second number found on the box on Niku (1542) was likely a USNO inspection/calibration number.

There is a third possible type of number that might perhaps be found on sextants and sextant boxes. This is a USNO, USN or USN Bureau of Aeronautics “inventory number,” which was not encountered by me in the 1909-1925 research, but which appears on a 1928 letter from the US Bureau of Aeronautics to the USNO. This letter refers to the disposal of numerous Brandis-Willson Sextants, and in handwriting beside the typed list are various “Inv #”s, including numbers 1423, 370, 1425, 867, 1231, etc. (To see the letter, which is hard to read, go to: <https://tighar.org/smf/index.php?topic=15.0>, under post 2895 from Martin Moleski.)

Note that photos of various sextant boxes are provided in the annexes. For a reader unfamiliar with sextants and their boxes, it may be helpful to review the photos now, before proceeding.

Arguments For and Against the Relationship Theory

Arguments For. The arguments for the theory that the Pensacola Noonan sextant box previously held a Brandis sextant, and that there is a relation between the Pensacola Noonan box and the Niku box, are as follows:

1. The number 3547 written on the bottom of the Pensacola box falls into a general sequence of Brandis manufacturing numbers, as determined by previous TIGHAR research. See the chart below, which shows the Brandis number sequence, and how 3547 (the theoretical Brandis number on the Pensacola box) and 173 (the theoretical USNO number on the Pensacola box) slots into the sequence. The Pensacola box is the first (#1) box, shown on the extreme left of the series.

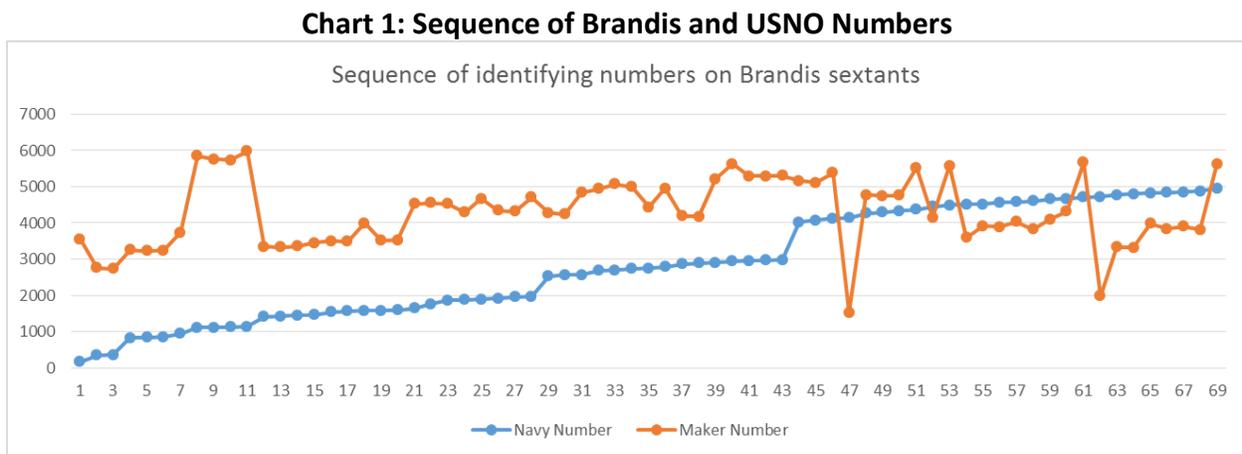


Chart developed by TIGHAR from 69 reviewed sextants with Brandis and USNO numbers (source: Joe Cerniglia)

In this chart the Niku sextant is listed at number 16 (between 15 and 17), and visual inspection shows that the sequence of Brandis (brown) numbers and USNO (blue) numbers is increasing, and the two Niku numbers fit into this general pattern.

2. The fact that the Niku sextant box had the number 3500 on it (which is similar to the number 3547) as reported in 1940 by British officials who found the box.

3. The speculative notion that Noonan acquired a group or “run” (a series) of Brandis sextants with which to teach his students, or perhaps for a collection of his, and these sextants had similar manufacturing numbers.

4. The theory that the Pensacola box once held a Brandis sextant, not the current Ludolph sextant, as evidenced by this statement on the TIGHAR website:

The box in which it [the sextant] was kept appears to be mahogany. A small notch has been crudely cut into the inside rear of the cover. The notch is not required to accommodate the Ludolph sextant.

(See the following url for the above quote:

https://tighar.org/Projects/Earhart/Archives/Research/Bulletins/12_Sextantbox/12_Sextantbox.html)

5. The fact that a black and white picture exists (see annexes) of a navigation station on a Pan Am plane on which Noonan was a navigator, and this picture apparently shows a Brandis marine sextant box, next to an octant aeronautical sextant box. Fred Noonan wrote in 1935 that on Pan Am trans-Pacific flights, “Two sextants were carried, a Pioneer bubble sextant and a mariner’s sextant...as a ‘preventer.’” It is assumed that the word “preventer” means a “back-up.” It is even speculated that the apparent Brandis box in the Pan Am photo could be the box that ended up on Niku. (Unfortunately, there is no stenciled number “3500” on the front, and the sides and bottom of the box are not visible.) (See this TIGHAR page for more details: https://tighar.org/Projects/Earhart/Archives/Research/Bulletins/52_NumbersGame/52_NumbersGame.html)

Arguments Against. The arguments against this theory are as follows:

1. The box in Pensacola (which very clearly belonged to Noonan at one time) currently holds a Ludolph sextant (from Bremerhaven, Germany), not a Brandis (from New York) sextant.

2. Sextants are very delicate and must be held firmly but gently in their boxes to prevent damage on a vessel traversing rough seas. Thus sextant boxes have various pads, projections and blocks to hold the sextant in place, and these fit the particular sextant to the millimeter. Sextants vary in size, shape and design, and a box designed for sextant A will very likely not fit sextant B, unless they are the same make and model, or are altered to fit. There is no evidence that the Pensacola box has been altered (with new pads, blocks or projections) to hold the present Ludolph sextant, instead of a previous Brandis sextant. There are no “shadows” on the wood showing a change of pads or blocks. There is no new, different colored wood in any of the blocks. (For example, see:

https://tighar.org/aw/mediawiki/images/a/a9/Three_sextants.jpg, and

https://tighar.org/wiki/File:Three_sextants_02.jpg which shows (in the left-hand sextant) that

when a Brandis sextant is fitted into a larger box, a lighter colored wood is apparently introduced into the box, to help hold the Brandis and its parts in the “incorrect” box.)

A comparison of a typical Brandis box, handle, and handle blocks with the Pensacola Ludolph box shows that the Brandis handle is shorter and wider than the Ludolph handle. Therefore if a Brandis sextant previously occupied the Pensacola box, it would very likely have had to have had different blocking and padding around the handle, and this would have left “shadows” and perhaps different, new screw holes. It is the handle of the sextant that is the key element in holding the sextant firmly in the box, in most sextant box designs.

It is true that there is a notch in the Pensacola box beside the hinge, that this notch is a bit odd, and is not beautifully made. And this notch seems to be designed to fit the large circular eyepiece in the Ludolph sextant, thus allowing the box to close easily. Does this prove that this box was designed for another sextant, rather than the current Ludolph? An alternate explanation is that perhaps the Ludolph sextant was modified to have a larger circular eyepiece. Or perhaps over time the hinges weakened and the lid top moved slightly? Or perhaps (as raised by Mike Haddock in 2002 in an email on a TIGHAR forum, Ludolph outsourced its box manufacturing (see: https://tighar.org/Projects/Earhart/Archives/Forum/Forum_Archives/200204.txt), and the subcontractor did not do a great job, and the box had to be modified at the factory. I will let the reader decide whether this notch (which can be seen in the photos in the annexes) is enough to prove that the Pensacola sextant box once held a Brandis or other sextant.

Note that the current Ludolph sextant fits nicely in the Pensacola box, and fills up the box. Brandis sextants were generally smaller, had smaller boxes, and would likely have needed less space, not extra space, requiring a notch.

3. The crucial number 3547 (and also the number 173) is written in large letters in a cursive style on the underside of the Pensacola sextant box, in black paint or magic marker or similar. An examination of a spreadsheet list developed by TIGHAR of 69 Brandis sextants showed none that reportedly had similar large cursive writing on the outside of the boxes (although not all objects were analyzable, due to lack of detailed photos on ebay or other sources). Photos of the numbering styles of about half a dozen Brandis sextant boxes by the author revealed that none had cursive large numbering on the outside, and that some of these had printed numbers on the interior of the box, on a USNO certificate, and that most of these certificates gave the manufacturer’s number and all gave the USNO number. The fact is that the handwritten, large number 3547 just does not look like any other Brandis number recorded, and the number 173 does not look like any other USNO number recorded.

4. A TIGHAR statement during previous research was that “of approximately 500 sextant boxes examined in collections in the US and in Britain, this is the only one which features numbers written on the exterior of the box.”

(See:

https://tighar.org/Projects/Earhart/Archives/Research/Bulletins/12_Sextantbox/12_Sextantbox.html) Also note this similar statement, from

https://tighar.org/Projects/Earhart/Archives/Forum/Forum_Archives/200204.txt:

When we first learned about the box found on Niku we had researchers in the U.S. and in Europe look for sextant boxes with numbers - any numbers - stencilled or written on the outside of the box. Of an estimated 500 boxes checked, we found only one that had numbers written on the outside. That was the Ludolph in the U.S. Navy collection that had once belonged to Fred Noonan.

This very impressive level of research supports the idea that the numbers on the exterior of the Pensacola box are outliers, and may have nothing to do with the usual manufacturer's number and USNO number of the sextant inside.

(The same TIGHAR site location notes that the handwriting of the numbers on the Pensacola box is somewhat similar to the handwriting of Noonan, but not enough to draw any conclusions.)

5. The 1940 report on the Niku sextant box stated that one of the numbers, the number 3500, was "stenciled." None of the four numbers found on the Pensacola box is stenciled. Two are written in cursive style, one is printed in large letters, and one is a very small number incised in the wood of the box, apparently with a stylus or similar. (This number, "168," had never before been noticed, until it was spotted by Museum Curator Linn during the 2018 examination.) (For an example of a stenciled number, which is quite large and distinctive, see the annexes.)

Re stenciling, note that in searching the Internet I have found photos of three boxes, apparently all Brandis boxes, which do have stenciling on them. See the annexes.

6. If one ignores the 3547 number, then none of the other three numbers on the Pensacola box (168, 173, or 116) has any apparent relation to the Brandis manufacturing sequence numbering.

7. The measurements of the Pensacola box are 11.5" wide, 13" long, and 5.5" high (as measured by Lew and Susan Toulmin on site). (Note that the accession documents (shown in the annexes below) give similar but not identical figures of 11.75, 13.25, and 5.5 inches.) Thus the Pensacola box is large and rectangular.

The dimensions of the Niku box are, unfortunately, unknown.

The TIGHAR discussion of Brandis sextant boxes states that "the Brandis sextant boxes pictured here are approximately 10" x 10" x 5" "

(see https://tighar.org/wiki/Sextant_box_found_on_Nikumaroro).

A Brandis sextant box was found on line (in March 2018 by the author of this report) at <http://www.fleaglass.com/ads/wwi-us-navy-quartant-sextant-brandis-brooklyn-ny/> , described as a “World War I Brandis sextant, with the box having the dimensions 10.8 x 10.9 x 4.9 inches” and the USNO number of 4516 and the Brandis number 3920.

Therefore it appears that the Pensacola box is rectangular and larger than the usual Brandis box, which is square and smaller.

8. Since the typical Brandis sextant is smaller than the Pensacola box, for the Pensacola box to have held a Brandis sextant at one time, the sequence would apparently have to have been as follows:

- A. The Pensacola box was manufactured originally as a Ludolph or similar large and taller sextant, and it held that large sextant.
- B. The Pensacola box was then modified to hold a smaller, Brandis sextant. This would have likely required some modifications of the box, to firmly hold the Brandis. These needed modifications are not in evidence. During this period, the number 3547 was written on the outside, referring to the Brandis 3547 sextant inside. The same writer also wrote the number 173 (which is clearly in the same hand), possibly referring to the USNO number on the sextant – but the number 173 is rather low and is enough of an outlier that this seems unlikely. (And there is no USNO certificate inside the box with the number 173.) During this period Noonan apparently owned the sextant and box, as part of his theoretical collection of Brandis sextants.
- C. The Pensacola box was then re-modified to firmly hold the current Ludolph sextant. Noonan must have done this, because the donor (W.A. Cluthe) to the museum in Pensacola states that he gave the Ludolph sextant and box intact, as he received them from Noonan, and a comparison of accession documents and 2018 examination show that the sextant has not changed since the Museum received it in 1968.

This unusual and convoluted sequence seems to violate the principles of KISS or Occam’s Razor.

9. The argument is made (see https://tighar.org/wiki/Sextant_box_found_on_Nikumaroro, under the section “The Pensacola Sextant Box”) that “the [Pensacola] box is listed in the table below as a *Brandis (theoretical)* because the box contains modifications that may have been made to accommodate a Brandis bubble sextant.” This statement relates to the fact that in the 1920-30s some nautical sextants were modified to allow for their use in airplanes or airships, and this modification was the addition of a bubble/level device which provided an artificial horizon. See for example the Coutinho pattern sextant with bubble modification at:

<https://sextantbook.com/2016/05/06/a-coutinho-pattern-bubble-sextant/>

But this sextant has a small bubble device added below the filters, which apparently does not impact on the box (which is shown) or require changes in the box’s blocking and padding.

Also see the National Museum of American History collection of Brandis normal and bubble sextants, at: <http://amhistory.si.edu/navigation/maker.cfm?makerid=35>. This collection includes the Brandis nautical sextant #5296 and USNO # 2977 (inspected March 16, 1919), which was used in the historic 1919 first crossing of the Atlantic by NC-4. This sextant (shown at <http://amhistory.si.edu/navigation/object.cfm?recordnumber=451576>) has a long bubble level mounted below the filters to serve as an artificial horizon. It is likely that this level is so long that it would need to be removed before fitting into any Brandis or even other box. (The box is not shown.) Thus this box would likely not need modifications to its padding and blocks.

(Other nautical sextants held by the National Museum of American History have Brandis # 5620 and USNO # 2939 (inspected in 1919); and Brandis # 5760 and USNO # 4705.)

This short review of nautical sextants modified with bubble devices seems to show that no modifications were usually needed, since the device did not impact the box, or the device would be so large that it would have to be removed from the sextant, and held elsewhere in the box.

In any case, no modifications, different colored woods, “shadows” or other indications were observed on the Pensacola box to support the argument that “the box contains modifications that may have been made to accommodate a Brandis bubble sextant.” (See the earlier discussion for points on the “notch” in the Pensacola box.)

10. The numbers 3500 and 3547 are not immediately sequential (compared to, say, 3500 and 3501), and thus the idea that Noonan acquired a “run” of Brandis sextants is weakened.

It appears likely that if Noonan approached the USNO to acquire a group of sextants to set up a navigation school, that given the way in which the USNO dispersed and received sextants to and from hundreds of ships and establishments, that it would be very unlikely that Noonan could acquire a sequential “run” of sextants, even if he insisted on that. No cards were found in which sales of groups of sextants were made to private persons. It is clear that after WW I, the USNO stopped purchasing new batches of sextants, since demand fell off considerably, and there are cards that indicate that the USNO has “enough” sextants and is refusing the requests of manufacturers to supply more.

11. If Noonan’s purpose was to collect a number of sextants for his students, or just for the fun of collecting, it would seem that having a variety of sextant manufacturers, makes and models (and thus a variety of manufacturing numbers) could be just as attractive as having a uniform run of identical sextants.

12. As opined by “Buddy” Macon, Deputy Director of the Museum (see the interview in the annexes), the 3547/173 numbers written in large black letters on the Pensacola sextant box look more like “de-accession” or sale numbers or other numbers written almost carelessly in haste, rather than official numbers carefully put on to indicate the USNO and manufacturer’s

numbers. (Of course it is possible that a careless midshipman or yeoman wrote these numbers on the box, and they do refer to a sextant inside, but it seems quite unlikely.)

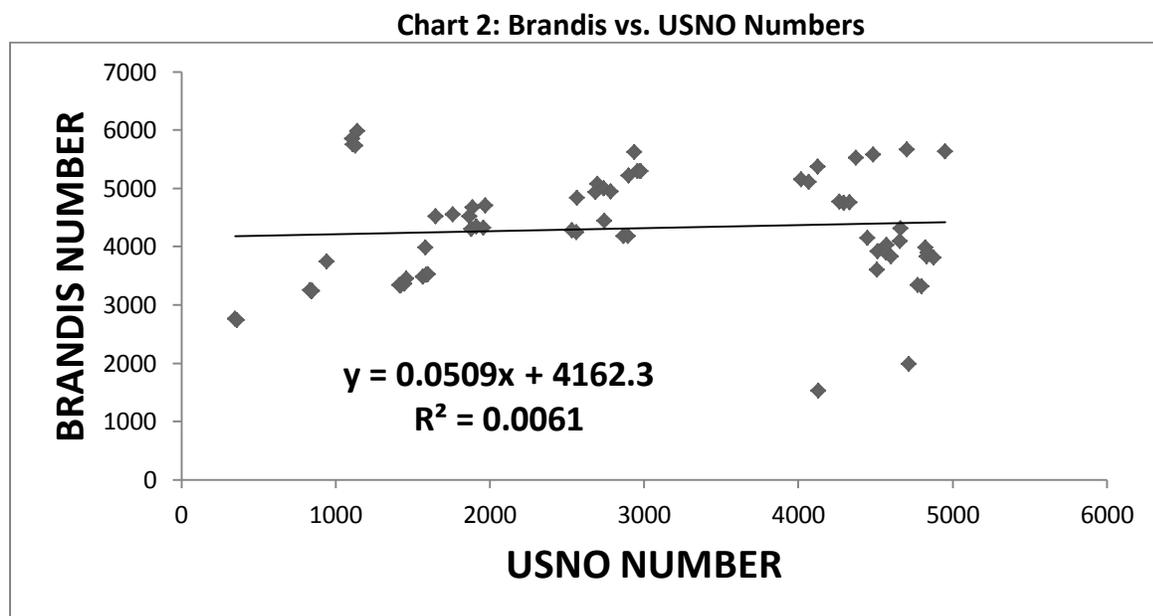
As noted earlier, no other similar large, cursive, handwritten numbers have been found on any other boxes.

13. Even if 3500 on the Niku box does refer to a Brandis number, that would not necessarily mean that the Brandis sextant inside was number 3500 at the time of its arrival on Niku. A review of a spreadsheet of 69 Brandis sextants previously examined by TIGHAR with Brandis and USNO numbers, found that of those 69, about 19 were in the “wrong” box. For example, on ebay a sextant was found with the markings of USNO 945 and Brandis number 3738, but the sextant box was numbered (probably via a USNO certificate) as Brandis number 3268.

Apparently over time and due to use by various officers and perhaps damage to some sextants and some boxes, various Brandis sextants ended up in the “wrong” boxes, but they still fit because they were generally the same make and model type.

14. As found in a 1928 letter (described earlier) to the USNO from the USN Bureau of Aeronautics, there appears to be an “inventory number” system that is different from the USNO and manufacturer’s numbering systems. Hence the Pensacola box may have an inventory number on it.

15. The chart provided earlier purported to show that there might be a relation between the USNO numbers and the Brandis numbers. But a better way to show any such relation is via a scatter chart and a linear regression analysis. This is shown below (with both the Pensacola and the Niku boxes removed, since they are unknown and theoretical).



Here we see that the points are scattered rather randomly, the R-squared is quite low, at less than 0.01, and the trend line is almost flat. Hence there is virtually no relation between the Brandis number and the USNO number. Now that is not entirely unexpected, because it seems likely that as Brandis sextants were bought for the USN, only a sample would have been calibrated and checked and given a USNO number. (To calibrate all of the thousands of sextants would have been a huge job.) Probably as various Brandis sextants were found to be inaccurate after they had been in use for some time, they were sent in to the USNO for repair and re-calibration. So they would receive their USNO number in a random fashion, not related to when the sextant was manufactured.

(But Chart 1 above did show that the Niku box seemed to fit in fairly well with the Brandis sequence.)

Conclusions Re the Pensacola and Niku Sextant Boxes

From the arguments above, it would appear that the preponderance of the evidence is against the theory that the Pensacola box once held a Brandis sextant. Therefore the number 3547 written in large letters on the bottom of the Pensacola box has no relation to Brandis. (It was likely a number placed there for some other reason.) Hence it is only a coincidence that this number 3547 is somewhat similar to the 3500 stenciled number reported on the Niku sextant box. Thus one argument for the Niku hypothesis is weakened or eliminated.

Of course this does not mean that the sextant box found on Niku did not belong to Fred Noonan. It could have been his. It just means that the reported numbering link between the Noonan sextant box in Pensacola and the Niku box is weakened or is non-existent.

And this analysis does not attack the idea that the Niku box was perhaps a Brandis sextant and box. The number 3500 on the Niku box is suggestive of a Brandis sextant and box, as shown by the “pro” Chart 1 provided earlier. And three Brandis sextant boxes have been found with (rare and unusual) large stencilled numbers on the front – see the annexes for photos. (Although note that those stencilled numbers were apparently the USNO numbers, not the Brandis numbers.)

The Pan Am navigation station photo indicates that Noonan likely did have a Brandis sextant as his “preventer” on air flights. Unfortunately, no stenciled number is evident on the front of that box (unlike three rare stenciled Brandis sextant boxes which have been found) – but is possible that “3500” was stenciled elsewhere on that Pan Am box, or on another Brandis that he owned or obtained.

It appears that additional work is needed to find out what the Niku sextant box numbers really mean, and to tie those numbers to Noonan, Earhart, the *Norwich City*, or to other possible visitors to Nikumaroro.

Also note that there are many other items of evidence that point to the likelihood that Noonan and Earhart landed and died on Niku. This weakening of one minor argument does not by any means negate the entire Niku hypothesis.

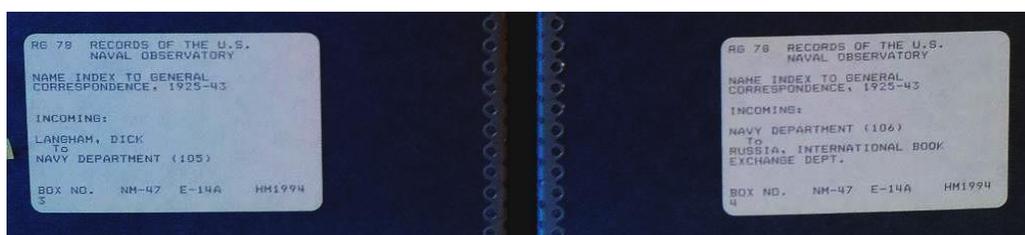
See the annexes for details on the interview and examination, photos of the Pensacola box, and documents in the Pensacola file.

Research Undertaken at the US National Archives

To further study the sextant question, research was done at the US National Archives (NA) in downtown Washington, D.C., focusing on historical records of the US Naval Observatory. From TIGHAR member John Osterhout, it appears that this might have been done before (from <https://tighar.org/smf/index.php?topic=554.50;wap>; date uncertain, possibly 2016):

[TIGHAR] Member Erik Davis has been digging through boxes of Naval Observatory correspondence at the National Archives recently, and has been finding documents that refer to lots of sextants and octants, including documents that rightfully ought to have been filed in Air Force records. He has not yet found anything that relates to Harry Manning or Fred Noonan's instruments, nor anything that relates to the Sextant box found on Gardner, but the kinds of documents he has found so far suggest that he is looking in the right area. It's a daunting task, and my hat's off to him for pursuing it.

Also, on the TIGHAR Forum it appears from pictures and notes that John Osterhout (or Erik Davis did some research at the NA in 2011-12, but apparently did not find anything crucial. (See: <https://tighar.org/smf/index.php?topic=15.0>) The focus of this research appears from the pictures to be actual USNO correspondence (and a few index cards) from 1925 to 1943. See the photo below of two NA boxes apparently searched by Osterhout or Davis.



Unfortunately, no report of any positive or negative results developed by Erik Davis or John Osterhout appears to be present in TIGHAR archives, or elsewhere. Inquires to present TIGHAR staff and members did not yield any information on the outcome of this research, which sounds quite impressive. Attempts to track Davis down were unsuccessful.

Hence I undertook to search the National Archives myself, in November 2017 and March 2018. The experienced NA staffer who assisted me in November in reviewing USNO index/summary cards stated that “no-one has ever asked for those USNO boxes before,” which was interesting.

The NA has a finding guide for the USNO records. NA staff state that any on-line finding guide is not accurate, and only the finding guide to Record Group 78 that should be used is physically present in the NA assistance room on the first floor of the NA in DC. The portion of the accurate guide relating to the USNO is presented in the Annexes, with annotations.

The guide shows that of the hundreds of USNO boxes present at the NA, only a portion are in a reasonably interesting period, of 1909 to 1937. Of these, in the time available I focused on the period 1909 to 1922, assuming that the World War I years, which generated immense naval activity and procurements, would be the most likely to have resulted in USNO records relating to the target sextants (the Niku sextant box and the Pensacola sextant box). (Hence I may have missed a key transaction after 1922.)

I focused on two boxes of the “Index to General Correspondence” that contained 500+ cards labelled “Sextants.” This turned out to not be an index, but rather a summary of thousands of letters, calls, and other communications. Each card was hand-written in tiny cursive letters, often very hard to read, usually two-sided, and usually containing summaries of two to six series of letters/communications per side. For each communication it was usually possible to understand what the transaction was. For example, one card stated, regarding one transaction:

30522 Sextant US Navy #322 Found on pier. Request instructions as to disposition.

*S.O. 3rd Naval Dist. 4/19/18. 3-S-31428-1-W
State above sextant was shipped 10/27/18 on Invoice 1113 – To
S.O. 3rd Naval Dist. 4/24/18*

Interpreting this interesting exchange, it appears that the Third Naval District found a sextant with USNO number 322 on their pier and is asking what to do with it. (Note there is no clear date for the letter and no manufacturing number for the sextant.)

The USNO then replies to the Third Naval District (which perhaps wrote in on 4/19/1918 in a letter numbered 3-S-31428-1-W), and the USNO states that that particular sextant was shipped from the USNO on 10/27/18 per invoice 1113 to the Third Naval District. This USNO letter apparently went out on 4/24/18. The letters “S.O.” may refer to “shipping office” or “shipping officer.” The “30522” at the beginning of the exchange is apparently a numbering system used by the USNO to identify each transaction, so that this card could be used as an index to get back to the original correspondence, if necessary. See the annexes for other examples, some annotated and explained.

Many USNO “Sextant” cards related to the purchase of thousands of sextants by the USNO from various suppliers (including Brandis, but not Ludolph), and rejections, acceptances, bids, prices, etc. Many cards related to the purchase, repair and distribution of sextant lenses and mirrors. Many cards provided information on USN ships and bases (and a few USCG and US Lighthouse Service facilities) requesting that they be supplied with sextants, that existing sextants were not satisfactory and needed replacement, and related matters. A few cards gave

the sextant numbers under discussion, of which only a few were clear on whether the number involved was the manufacturer's number or the USNO calibration number. A very few cards provided clear information on the manufacturer's number and the USNO number for a particular sextant.

One card showed that in 1917 Brandis requested an advance of \$30,000 to speed production of sextants, since the USNO needs were urgent. Failing such an advance, a letter from the USNO to Brandis, confirming their relationship, was requested. This letter would be used in raising funds privately.

A search was done of all "Sextant" cards to see if the target numbers were present. These numbers were:

- Niku sextant box: 3500 (stencilled), 1542
- Pensacola sextant box: 3547, 173, 116, 168

Unfortunately, none of these numbers was found on any of the "Sextant" cards.

In another box, a few cards labeled "Brandis" were found and reviewed, but these did not yield any target numbers; this was general business correspondence.

I also quickly reviewed boxes 16, 17, 18, 19 and 20 from the "Navigational and other instruments: 1909-1925" in USNO "General Correspondence," under Entry 13 (PC-42), thinking that some sextant correspondence summary cards might be in those boxes. In fact, it turned out that these boxes were arranged by subject matter in alphabetical order, so these summary cards dealt with matters such as "compasses," since they were early in the alphabet.

In another box, a "Journal of Administrative Events" relating to the USNO Bureau of Aeronautical Instruments was examined. The hope was that this would prove to be the "Holy Grail" of the search, in that it would be a logbook of all the inflow and outflow of sextants, with each sextant carefully logged in/out with its USNO number and manufacturer's number. Unfortunately, this did not prove to be the case. The journal with its 222 pages and thousands of entries was reviewed on a sample basis, with about 70 pages examined. All pages examined proved to be personnel changes, major purchases, visits, and high level descriptions of correspondence and phone calls. No sextant numbers were found.

The "Holy Grail" -- a comprehensive USNO sextant in/out logbook -- has yet to be found, if it exists or ever existed.

Note a further difficulty. Suppose that the "Holy Grail" logbook was found, and it was, say, established that a Brandis sextant with manufacturer's number 3500 and USNO number 1542 was sent to the USS *Swordfish* on 1/1/19. So this is pretty clearly the Niku box. Could one link this sextant and Fred Noonan? Unfortunately, the USNO only appeared to calibrate sextants for USN and Coast Guard vessels and establishments (and occasionally for the US Lighthouse

Service). No mention of merchant vessels or Merchant Marine vessels was found among the USNO cards. So since Noonan never served on a USN or USCG vessel, there is no way to firmly link the “USS *Swordfish* sextant” with Noonan, unless a transmitting invoice, sales slip, or correspondence was found. There are very few cards in this series that relate to private individuals, and almost none of these relate to disposition – rather they relate to private persons offering to give or sell sextants to the USNO to support the WW I war effort.

Areas for possible future NA research are as follows:

- Review again the 500+ “sextant” summary cards, to see if any key sextant numbers were missed. This is possible, since the cards are so hard to read.
- Review the pre-1909 information and the post-1925 USNO information. (Note that this latter may have already been done by TIGHAR members Davis or Osterhout, but exactly what was searched is not clear).
- Examine, perhaps on a sample basis, the actual underlying correspondence (1909-1925), to see if some or all of the letters contained sextant numbers, and these just did not make it into the letter summary cards.
- Find the subject matter area (in 1909-1925 and later), which may exist, for “Ludolph.”

Additional Research Undertaken

The following additional research was undertaken by the author:

- Reviewing existing TIGHAR information re sextants on the TIGHAR website.
- Asking previous TIGHAR researchers about their findings and research. Apparently none had researched the National Archives (although see the earlier discussion re Erik Davis), and certainly none had published about any negative or positive results from that source. One reported verbally that he understood the USNO was approached in some manner but no reply received.
- Sending an email to the Managing Director of the Ludolph corporation in Bremerhaven, Germany, inquiring about their records and attempting to trace the Ludolph and Niku boxes. (Apparently this had never been done before.) No reply was received.
- Asking the Director of the Pensacola Museum to also send an inquiry to Ludolph. This is still in train.
- Calling the USNO to see if they have logs, records, correspondence, etc. re sextant calibration that might help trace the Niku and Ludolph sextants. The sole library staffer at USNO stated that she would get in touch with their historian, and he or she would get back to me. (She was not aware that the USNO had ever calibrated sextants.) This is still in train.

Annex 1:

Fred Noonan Sextant and Box Examination and Interview Notes

at the National Naval Aviation Museum
Pensacola, Florida
26 February 2018; about 1230 to 1415 pm

Participants:

Llewellyn Toulmin, Ph.D., F.R.G.S., TIGHAR and MAST (Missing Aircraft Search Team), Silver Spring, Maryland
Susan Toulmin, (Library of Congress, retired) Silver Spring, Maryland
Dina G. Linn, Museum Curator
Dr. Robert R. ("Buddy") Macon, Museum Deputy Director (former member of TIGHAR)

Background:

Lew Toulmin had asked for an interview and to examine the sextant formerly owned by Fred Noonan, Amelia Earhart's navigator. This sextant is currently owned by the Museum.

Notes:

Ms. Linn had the sextant ready for examination; Mr. Macon came in briefly at 1240, had a conflicting meeting, then came back in at about 1330 and stayed for the rest of the meeting.

Ms. Linn kindly provided documents from the file associated with the sextant and box, photos were also taken by me. See the annexes.

The box was examined and the following items noted:

1. The box dimensions are 11.5" wide, 13" long, and 5.5" high. It is a dark brown wood, perhaps stained mahogany. The interior is lighter.
2. The box corners have small "finger" or "comb teeth" interlacing. Each finger is horizontal. Each finger is not truly "dovetailed" (with notches shaped like trapezoids). Each finger is a little less than ¼ inch high. (The 1940 British report stated that the Niku box had "dovetailed" joints.
3. As reported in previous reviews, the box has two numbers hand-written on it, these are 3547 and 173, written rather large, freehand in cursive style, in a sort of magic marker black ink, on the bottom of the box. The 3547 number is underlined. On the front of the box is the number 116, also hand-written, in darker ink and harder to see. (See photos below in a separate annex.)

4. Ms. Linn found a number on the box never previously noticed, in small incised writing, about ¼ inch high, on the bottom of the box. This number was 168. (See photos below.) None of the four observed numbers are “stenciled.”
5. There is no US Naval Observatory (USNO) paper certificate or metal plate or stamped number on or in the box, and no evidence that such a certificate or plate or number was ever there.
6. There is no other manufacturer’s or other identification information on the exterior or interior of the box.
7. In the interior of the box, there are various projections made of wood, padded, to hold the sextant firmly in place. There are no “shadows” on the wood, or different colored woods, or other indications that the projections have been moved to accommodate a different sextant, other than the sextant currently in the box. The only possible exception is the small wooden pad, about one inch long, just below the graduated arc of the sextant, when the sextant is in the box. This could be a pad for a missing part of the Ludolph sextant, however. The Ludolph sextant appears to fit perfectly in the box, and to fill the entire box.
8. There is a ring, apparently a sextant telescope clamp ring, which fits into a notch on the hinge part of the box. This ring appears to be missing an interior part. Also, there are three cylinders on the interior side of the box, which should hold sextant parts (likely a telescope(s)), and these are empty and the parts missing.
9. There were very small pieces (smaller than matchhead-sized) bits of apparent plastic or glass in corners of the box. One had four tiny numbers on it. (See photos). It seems possible that these pieces are the broken remains of a lens or filter.
10. There is a previously unreported, possible letter “N” incised in the wood in the bottom of the box. (See photos.)

The sextant was examined and the following items noted:

1. The sextant has the words “W Ludolph G.m.b.H. Bremerhaven” engraved on the graduated arc. (See photos.)
2. The sextant has the serial number “XIX 1090” engraved or stamped on the arc. (See photos.) [This may be an indication that the sextant was manufactured in “XIX,” meaning the year 1919.]
3. There are no other engravings or markings on the sextant; and there is no US Naval Observatory number, certificate, stamp or symbol.
4. The sextant fits snugly in the box, on its projections and pads.
5. There are a few small sextant parts present, but some parts (e.g. telescope and other items that fit into the three small cylinders) are missing. It appears from an early Museum acceptance photo of the box and sextant that these pieces were present when the object was accessioned.

The file on the object was examined at the Museum and later, and the following items noted:

1. The chain of custody of the sextant and box (“the object”), according to the file documents, was:

- A. Fred Noonan. Date or source of acquisition is unknown.
- B. Lt. William A. Cluthe, pilot preparing to join the Pacific Division of Pan American Airways, borrowed the object from Noonan, who was teaching him navigation. Date is unclear, but it appears likely that Noonan and Cluthe were both at PAA at the time.
- C. Apparently Noonan disappeared and Cluthe kept the object.
- D. Cluthe donated the object in June 1968 (via Mr. Jack Green and Bill Hill of the Silver Eagles Organization) to the National Naval Aviation Museum, where it was received by Capt. J. H. McCurtain. It has been in Museum custody since, although it was loaned for several days to TIGHAR many years ago.
- E. Accession information and examination in 2018 shows that sextant and box have not changed since 1968.

2. The chain of custody as described above seems very credible, although the lack of dates is regrettable. There is little or no doubt that the sextant and box belonged to Fred Noonan.

A discussion about the box and sextant made the following points:

1. Mr. Macon speculated that the sextant and box were lent by Noonan to Cluthe for several months in the late 1930s, perhaps just before the disappearance, but there is no hard evidence on this.
2. The question of whether this box ever held a different sextant, perhaps a Brandis sextant, was discussed. Mr. Macon stated that there is no evidence of this, including no evidence of “shadows” or other indications of different projections or blocks to hold a different sized sextant. Hence he had no reason to doubt that the box and sextant were both German – Ludolph.
3. A discussion of “dovetailing” ensued, with Mr. Macon noting that the meaning of that word is unclear, and that what one person calls horizontal “fingers” might well be “dovetailing” to another. (This is important, because correspondence in 1940 about the Niku sextant box indicated that it was “dovetailed.”)
4. Neither Ms. Linn nor Mr. Macon were familiar with US Naval Observatory practices re purchase, acceptance or re-calibration of sextants.
5. The Museum does not have any other original Noonan/Earhart objects or files. The only AE/FN items are publications of TIGHAR.
6. The Museum has not been in touch with or done research on the Ludolph company in Germany which manufactured the sextant (and apparently the box). At Lew Toulmin’s suggestion, Ms. Linn agreed to write to Ludolph on Museum stationery, asking if they had records on this sextant and box, using contact information and an emailed letter supplied by Lew Toulmin. (He had emailed the Managing Director of Ludolph in Bremerhaven about two weeks previously, but had received no reply.)
7. Mr. Macon suggested that a true “sextant expert” be contacted, to see if perhaps this Ludolph sextant was regarded as a top-of-the-line instrument, and that was why Noonan had it.
8. Mr. Macon suggested that the life and service of Noonan might be researched by contacting the flagging authorities of the various vessels he served on.

9. The Museum does not have other sextants or sextant boxes that might be examined for handwritten or other numbers.

10. Mr. Macon noted that he is familiar with cases of missing aircraft which have “flown” underwater for distances of up to about ½ mile, after hitting the water. He suggested that since the Niku/Earhart case involves a supposedly intact plane floating off a reef, then descending perhaps 12000 feet, it may be quite a distance from the departure point.

11. Mr. Macon stated that the large handwritten numbers on the box do not appear to him to be official USN, Ludolph or other accession or official numbers. Instead, they reminded him of numbers that would be quickly scrawled on objects about to be discarded by the USN, as “auction lot numbers” or other numbers for temporary identification and sale.

#end interview#

Annex 2:
Fred Noonan Sextant and Box: Photos
at the National Naval Aviation Museum, Pensacola, Florida
26 February 2018



The sextant box and its handwritten numbers on the bottom,
being examined by Museum Curator Dina Linn;
Ludolph sextant is on the right



Sextant box top, hinge side with one-foot ruler, nickel and penny



Sextant box top, non-hinge-side with one-foot ruler, nickel and penny



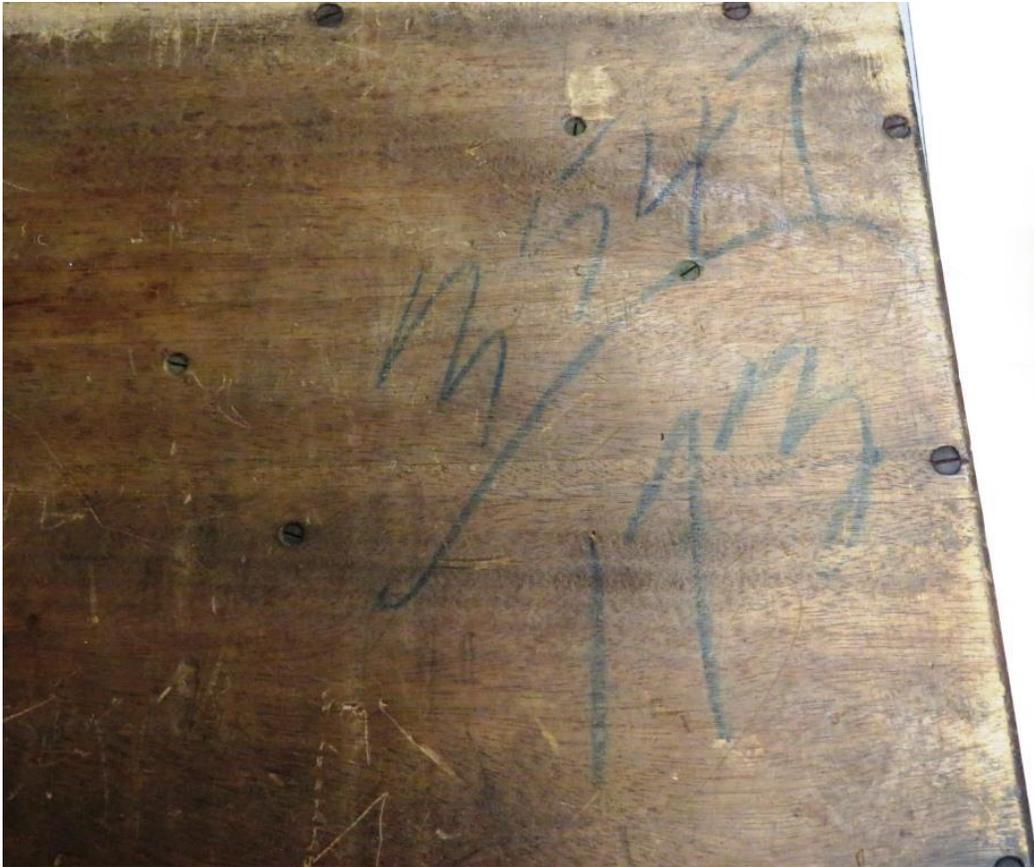
Front of sextant box; note number "116" on left bottom



Close-up of number "116" – apparently made by paint or magic marker or similar



Small upside down "V" apparently incised on edge of box



Closeup of large cursive numbers written on bottom of sextant box: "3547/173"



"Fingers" that hold the sides of the Pensacola box together (not true "dovetails")



Pensacola Ludolph sextant in box; note no “shadows” in evidence



Sextant side of Ludolph box; note no “shadows” or different colored wood in evidence. The “notch” is barely visible on the upper right of the photo, in the right hand side of the box, about two inches below the hinge.



Top side of sextant box; note no “shadows” in evidence. However, the “notch” is visible in the left hand box, on the right hand side, about two inches above the lower hinge.



Different angle of the top of the interior; no “shadows” or USNO certificate in evidence. Note the controversial “notch” in the left side of the box, between the hinges.



Serial number on the graduated arc of the Ludolph sextant: "XIX 1090"



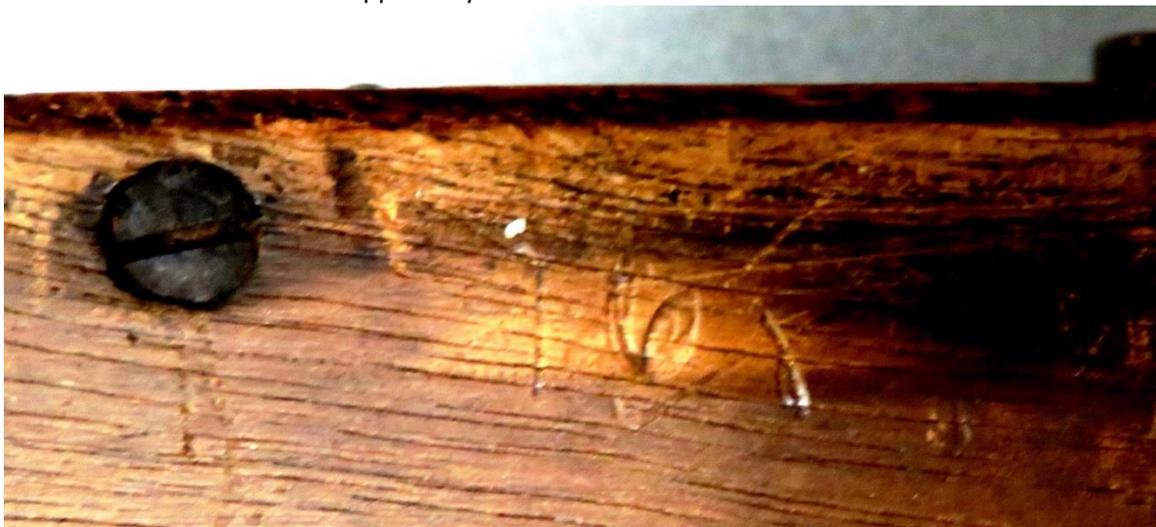
Manufacturer name on sextant's graduated arc:
"W Ludolph G.m.b.H. Bremerhaven"



Small number "2" on filter arm of sextant



Small "N" apparently incised in the wood of the box interior



Apparent small number "168" incised on exterior of sextant box; previously un-recorded



Small fragments of glass or plastic from the box interior;
Note partial red number on center fragment

Annex 3:
Fred Noonan Sextant and Box: File Contents
at the National Naval Aviation Museum, Pensacola, Florida
26 February 2018

6
/

CHECK OFF LIST

DONOR FORM
 Yes No

ACKNOWLEDGEMENT LETTER
 Yes No

PHOTOGRAPH
 Yes No

OBJECT DETAIL SHEET (For each Item)
 Yes No

INVENTORY SHEET
 Yes No

ATTACH LOOSE PAPERS
 Yes No

Checked by: MY

Checked on: 12/2/02

NAME: Frederick J. Noonan
STATION: ...
ITEM: ...
DESCRIPTION: ...
DATE: ...
REMARKS: ...

1968.021.001

4/9/02



1968.021
Lt. William A. Cluthe USNR

Department: Small Artifacts
Object Status: Accessioned
Object name: Sextant - property of Frederick J Noonan
Classification: Equipment-NAVIGATION ITEM
Period: 1919-1945
Description: Nautical sextant - property of Frederick J. Noonan, Co-pilot Navigator on World Flight with Amelia Earhart when lost in the Pacific Ocean. This instrument was borrowed by Lieutenant W.A. Cluthe USNR (Ret), a Pan American World Airways, EX CAP, USN, Number 12, who at that time was studing navigation under Mr. Noonan in preparing for service in the Pacific Division of Pan American Airways, for use in practice practical navigation.

Attributes: -
Dimensions: 12 inches x 10 1/2 inches
Notes: This sextant was presented to the Museum by Mr. Jack Green and Mr. Bill Hill, representing the Silver Eagles Association on June 7, 1968.

[none specified]: NV968021001A; FRONT VIEW [4-09-02]
[none specified]: NV968021001B; SIDE VIEW [4-09-02]
[none specified]: NV968021001C; BACK VIEW [4-09-02]
[none specified]: NV968021001D; SIDE VIEW [4-09-02]
[none specified]: NV968021001E; NAME: W. LUDOLPH G.m.b.H. BREMERHAVEN [4-09-02]
[none specified]: NV968021001F; SERIAL NUMBER: XIX 1090 [4-09-02]
[none specified]: NV968021001G; ACCESSORIES [4-09-02]

Photograph and Digital Image (c) 1996

1968.021.002

4/9/02



Department: Small Artifacts
Object Status: Accessioned
Object name: Container - Wood box
Classification: Equipment-CONTAINERS
Period: 1919-1945
Medium: Wood
Description: Container - Wood box - mkd: 3547/173 on bottom - box used to hold sextant used by F.J. Noonan
Attributes: -
Dimensions: 13 1/4 inches x 11 3/4 inches x 5 1/2 inches
[none specified]: CN968021002A; FRONT VIEW [4-09-02]
[none specified]: CN968021002B; TOP VIEW [4-09-02]
[none specified]: CN968021002C; BOTTOM VIEW #'S 3547 & 173 [4-09-02]
[none specified]: CN968021002D; BACK VIEW [4-09-02]
[none specified]: CN968021002E; INSIDE VIEW (MINUS SEXTANT) [4-09-02-]
[none specified]: CN968021002F; INSIDE VIEW (WITH SEXTANT) [4-09-02]
Donor: LT William A. Cluthe, USN (Ret)
Accession info: Gift; [6/7/68]
Current location: 3221 EAST, ROW 23, SHELF 43 [4/9/02]
Home location: TRANSHIPMENT, R4, NAV [4/9/02]
Alternate Numbers: 968021002

Photograph and Digital Image (c) 1996

Accession number: 968.021.001 Donor ID Number:
Donor First Name: WILLIAM A.
Donor Last Name : CLUTHE

Major Category: EQ Minor Category: NV
Description 1: SEXTANT PROPERTY OF J.H. NOONAN, CO-PILOT-NAVIGATOR ON WORLD
Description 2: FLIGHT WITH AMELIA EARHARDT WHEN LOST IN PACIFIC
Era from: 1957 Era to: 0 Condition:GOOD No. of items: 1

A/C Name: A/C Number: A/C Desig.:
Date Recieved: 06/07/68 MOA1 VAS:A D/Acc Date: / / AFT: N
Last Inventory: 07/29/97 Location: G-08 SEC 1 604 Loc Stat: G-08-1

Acknowledgement letter written ?
EDIT ||<C:>||ARTIFACT ||Rec: 4325/28612 || ||NumCaps

National Museum of Naval Aviation
Accession Information Sheet

Accession number: 968.021.002 Donor ID Number: 1346
Donor First Name: WILLIAM A.
Donor Last Name : CLUTHE

Major Category: EQ Minor Category: CN
Description 1: CONTAINER - WOOD BOX MK'D 3547/173 ON BOTTOM, BOX USED TO
Description 2: HOLD SEXTANT USED BY F.J. NOONAN
Era from: 1957 Era to: Condition:GOOD No. of items: 1

A/C Name: A/C Number: A/C Desig.:
Date Recieved: 06/07/68 MOA1 VAS:A D/Acc Date: / / AFT: N
Last Inventory: 12/08/98 Location: R4-NAV Loc Stat: ST

Acknowledgement letter written ? 1
EDIT ||<C:>||ARTIFACT ||Rec: 28612/28612 || ||NumCaps

National Museum of Naval Aviation
 Accession Information Sheet
 : Accession number: 968.021.001 Donor ID Number: 1346 :
 : Donor First Name: JACK & BILL :
 : Donor Last Name: GREEN & HILL :
 : Minor Category: NV :
 Major Category: ED :
 Description 1: SEXTANT PROPERTY OF ^{F.J.} NOONAN, CO-PILOT-NAVIGATOR ON WORLD
 Description 2: FLIGHT WITH AMELIA EARHART WHEN LOST IN PACIFIC
 Era from: 1957 Era to: 0 Condition: GOOD No. of items: 1
 A/C Name: A/C Number: A/C Desig.:
 : Date Received: 06/07/68 MDA1 VRS:A D/Acc Date: / / AFT: N :
 : Last Inventory: 05/13/97 Location: R4-NAV Loc Stat: BX13 :
 Acknowledgement letter written ?
 EDIT : (C):ARTIFACT : Rec: 4327/22334 : : NumCaps

Add: 968.021.002
 one wooden box ~~is~~ marked 3547/173
 on bottom.
 Box used to hold ~~a~~ sextant used by
 F. J. ~~S.P.~~ NOONAN!

INCOMING ITEM CHECKLIST

Date Received: 4-17-89

Description of Item(s):
SEXANT, S/N # 3767 (1950's)

Name & Address of Donor(s):
DRMO
JAX, FL

Log In: # Assigned
 Accession Log 989.100
 Reproduction Log _____
 Photo Log _____
 Library Log _____

Mark or Tag Item(s) with #:
Photograph: _____
 Polaroid
 Send memo to photo department

Letter of Acknowledgement: _____
Make Records: Accession Card
 Accession Item Card
 Donor Card
 File

Placed in storage (fill out form): EAST ARTIFACTS ROOM

Placed on display (Where?): _____

TO WHOM IT MAY CONCERN

10 June 1968

Navigation Sextant
the sextant
when this

signed the
LT William A. Cluthe, USNR(Ret)
4312 Winding Way
Mobile, Alabama 36609

Dear Lieutenant Cluthe:

This is to acknowledge, with much appreciation, your donation of the navigation sextant once owned by Mr. Frederick J. Noonan.

It was presented to the Naval Aviation Museum by the Silver Eagles organization during its get-together here last week.

We have placed the sextant in secure storage, until such time as we can incorporate it into a meaningful exhibit.

Again, thank you for the contribution, and please feel especially invited to visit our Museum, some time.

Sincerely,

J. H. McCURTAIN
Captain, U. S. Navy(Ret)
Officer in Charge

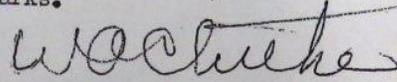
Rec'd
June 10 1968
21

6 June 1968

TO WHOM IT MAY CONCERN:

I, hereby, certify that the accompanying Navigation Sextant was the property of Mr. Frederick J Noonan, who was copilot-navigator on the World flight with Amelia Aerhardt when their plane was lost in the Pacific Ocean.

This instrument was borrowed by the undersigned who at that time was studying navigation under Mr. Noonan in preparing for service in the Pacific Division of Pan American Airways, for use in practice practice navigation. Identification marks are not in evidence, however, the undersigned hereby certifies as to the authenticity of the above remarks.



W. A. Cluthe
Retired Captain, Pan American
World Airways.
Ex. C. A. P. USN, Number 12.

CO
PUBLIC AFFAIRS OFFICE
NAVAL AIR BASIC TRAINING COMMAND
U.S. NAVAL AIR STATION
PENSACOLA, FLORIDA

FOR IMMEDIATE RELEASE

Release No. *CR 122-68*
12 June, 1968

SEXTANT TO MUSEUM--A navigation sextant belonging to Mr. Frederick J. Noonan, copilot-navigator on the world flight with Amelia Earhart when their plane was lost in the Pacific, is presented to the Naval Aviation Museum, Naval Air Station, Pensacola, Fla., by Mr. Jack Green and Mr. Bill Hill, right, representing the Silver Eagles Association. Captain James H. McCurtain, officer in charge of the museum, is at left. The presentation was made June 7.

-30-

(OFFICIAL U.S. NAVAL
PHOTO BY DUANE J.
RICHWINE, PH-1)

Lt. William A. Clarke USNR

Silver Eagles Organization

CHECK ONE LOAN TRANSFER PURCHASE
 GIFT

DESCRIPTION (Include condition when received)
SEXTANT, Navigation (See back of card for more information) in Box

Condition; Good

TO REFINISH FOR DISPLAY MANHOURS	COST	DATE
		7 Jun 1968

LOCATION: **Exhibit Locker #1, Second Shelf**

ITEM: **SEXTANT, Navigation** ACCESSION NO.: **968.21** DATE OF RETURN (If on loan)



NAVY AVIATION MUSEUM ACCESSIONS RECORD
 NAVMUM 5750/1 (4-63)

SOURCE: **Silver Eagles Organization** DATE RECEIVED: **7 June 1968**

CHECK ONE LOAN TRANSFER PURCHASE
 GIFT

DESCRIPTION (Include condition when received)
SEXTANT, Navigation (See back of card for more information) in Box

Condition; Good

TO REFINISH FOR DISPLAY MANHOURS	COST	DATE
		7 Jun 1968

LOCATION: **Exhibit Locker #1, Second Shelf**

ITEM: **SEXTANT, Navigation** ACCESSION NO.: **968.21** DATE OF RETURN (If on loan)





Blowup of the accession photo of the sextant box. Note small pieces on the left, apparently a telescope(s) and other parts that fill three holes; now missing. Note also the interior of the telescope clamp (the round part just in front of the box's hinge), now also missing.

REMARKS (Reference any correspondence relative to this item)

This navigation sextant was the property of Frederick J. Noonan, who was copilot-navigator on the World Flight with Amerila Aerhardt when their plane was lost in the Pacific Ocean. *Amelia Earhart*

This instrument was borrowed by CAPT W.A. Cluthe(Ret), Pan American World Airways, EX CAP, USN, Number 12, who at that time was studying navigation under Mr. Noonan in preparing for service in the Pacific Division of Pan American Airways, for use in practice practical navigation.

Annex 4: Photos of Other Sextant Boxes and Related Items

Below are photos of sextant boxes which throw some light on the theory under discussion.



Stencilled Brandis sextant box, with 882 likely being the USNO number;
This box once held Brandis 3268 but now holds Brandis 3738.

See: <http://gardnerghost.blogspot.com/2017/02/brandis-sextant-taxonomy-part-five-five.html>

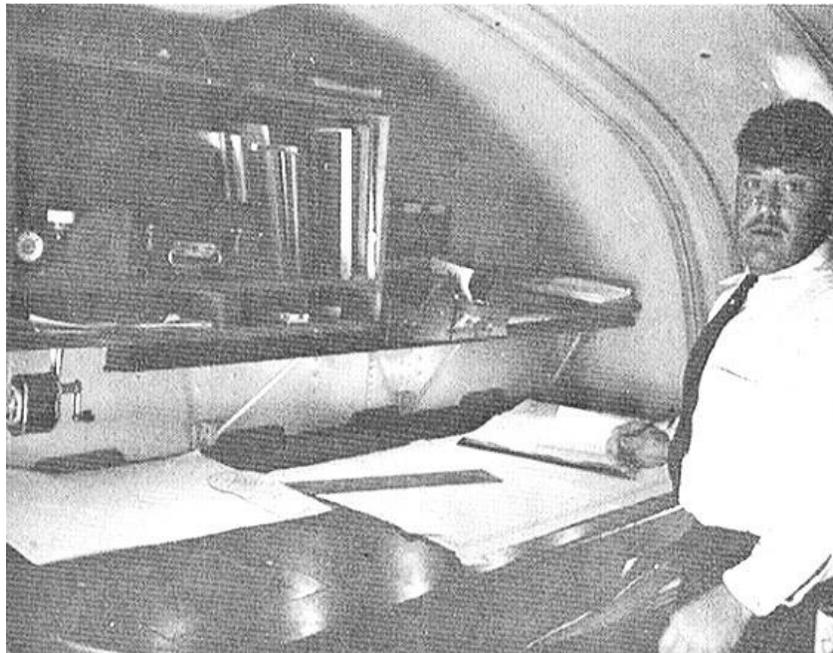


Stencilled Brandis sextant box, with 883 likely being the USNO number;
This box once held Brandis 3657 but now holds Brandis 3692

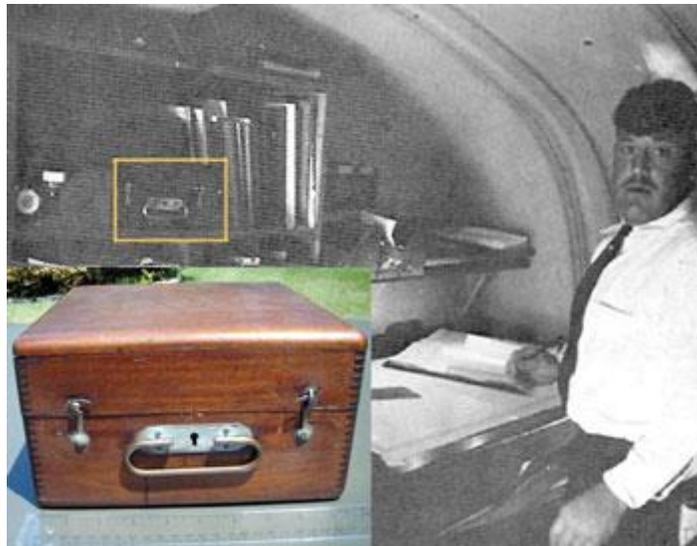
See: <http://gardnerghost.blogspot.com/2017/02/brandis-sextant-taxonomy-part-five-five.html>



Brandis box with possible USNO number 889 stenciled on the front. See: <https://www.ebay.com/itm/Vintage-Antique-US-Navy-SEXTANT-Brandis-Sons-w-Wooden-Box-936-missing-pieces-/391909847255>



The navigation station of the Pan Am M-130.
What may be Noonan's "preventer" Brandis sextant box is in the upper left on top of the shelf. See: https://tighar.org/wiki/Air_Navigation:_State_of_the_Art_in_1937



Earlier photo with Brandis box in insert (from: https://tighar.org/Projects/Earhart/Archives/Research/Bulletins/52_NumbersGame/52_NumbersGame.html)

CERTIFICATE OF INSPECTION.

U. S. NAVAL OBSERVATORY,
Washington, *Apr 20*, 191*8*

Sextant (N) *Brandis* class, *Brandis*

Maker, *Brandis*, maker's No. *4483*

CORRECTION FOR ECCENTRICITY.

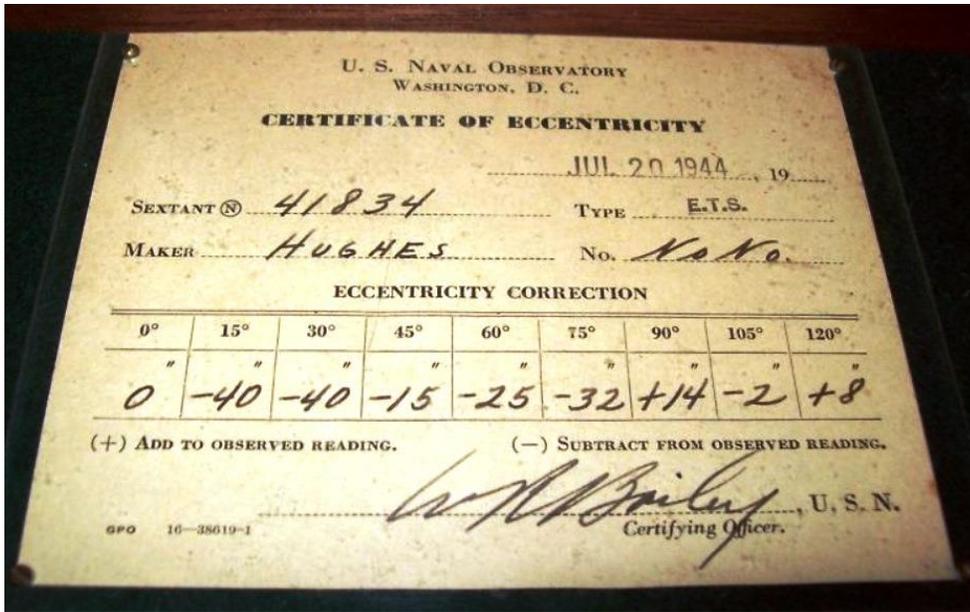
At	0°	10°	20°	30°	40°	50°	60°
Corr.	<i>0</i>			<i>0</i>			<i>0</i>
At	70°	80°	90°	100°	110°	120°	130°
Corr.		<i>0</i>		<i>0</i>		<i>0</i>	<i>0</i>

CONTENTS OF BOX.

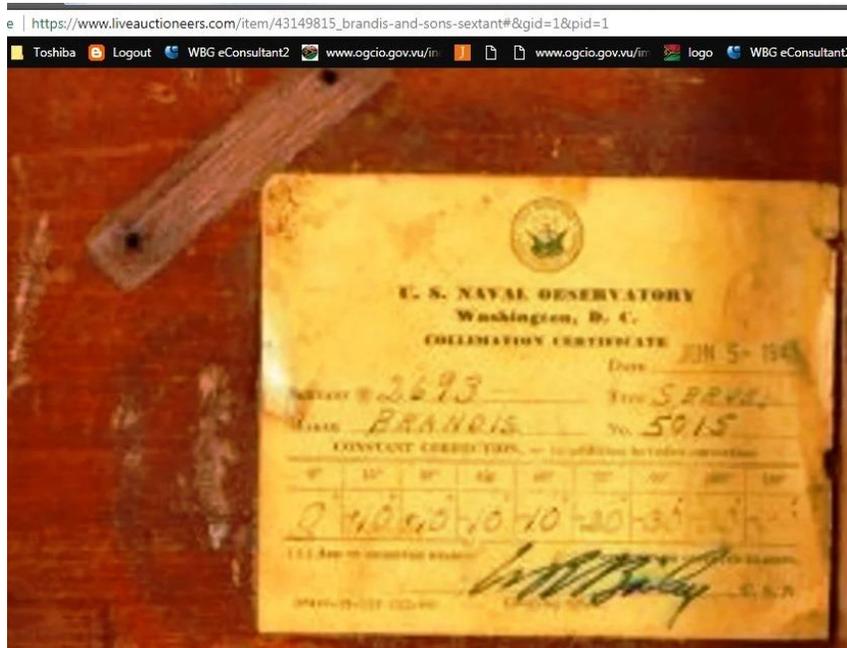
<i>QUANTITY</i>	Spare mirror.	Spare alidade.	Case key.	Adjusting key.	Screw driver.	Spare eyepiece.	Spare alidade.	Spare tel.	Case key.	Illustration.
<i>4</i>										

Inspector *W.A.*

USNO inspection certificate for Brandis sextant number 4483, inspected in 1918



A USNO Certificate of Eccentricity from 1944 for a Hughes sextant.
From tighar.org.



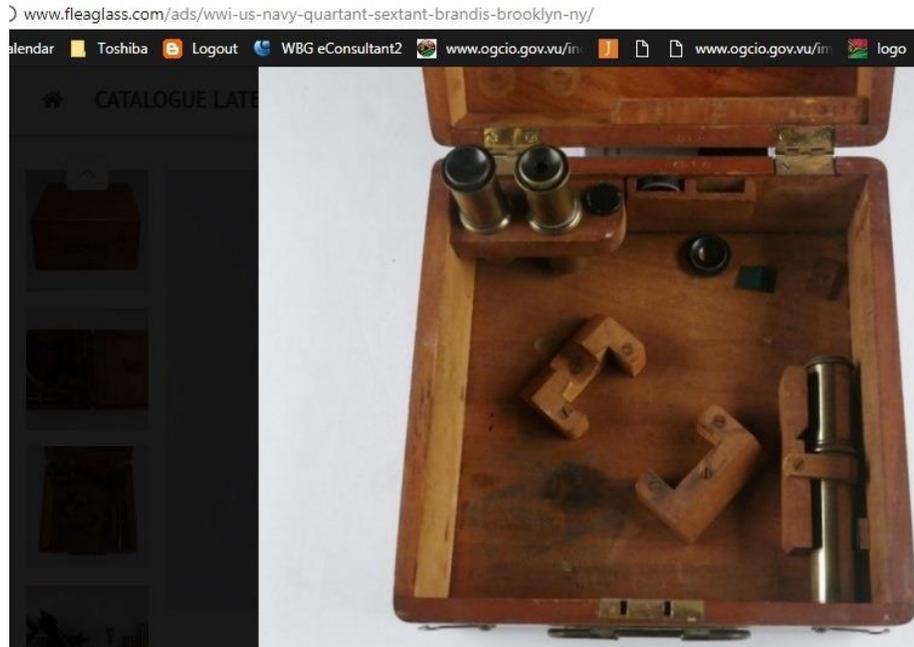
USNO certificate for Brandis sextant 5015 and USNO number 2693.
From liveauctioneers.com.



Box Plaque for Brandis 2763/USNO 348, an Octant



A Brandis sextant box on ebay; note different, trapezoidal shape of the blocking for sextant handle. This is quite a different shape from the long, narrow handle of the Ludolph Pensacola sextant. (This is the same sextant box shown earlier with 889 stencilled on the front.) See: <https://www.ebay.com/itm/Vintage-Antique-US-Navy-SEXTANT-Brandis-Sons-w-Wooden-Box-936-missing-pieces-/391909847255>



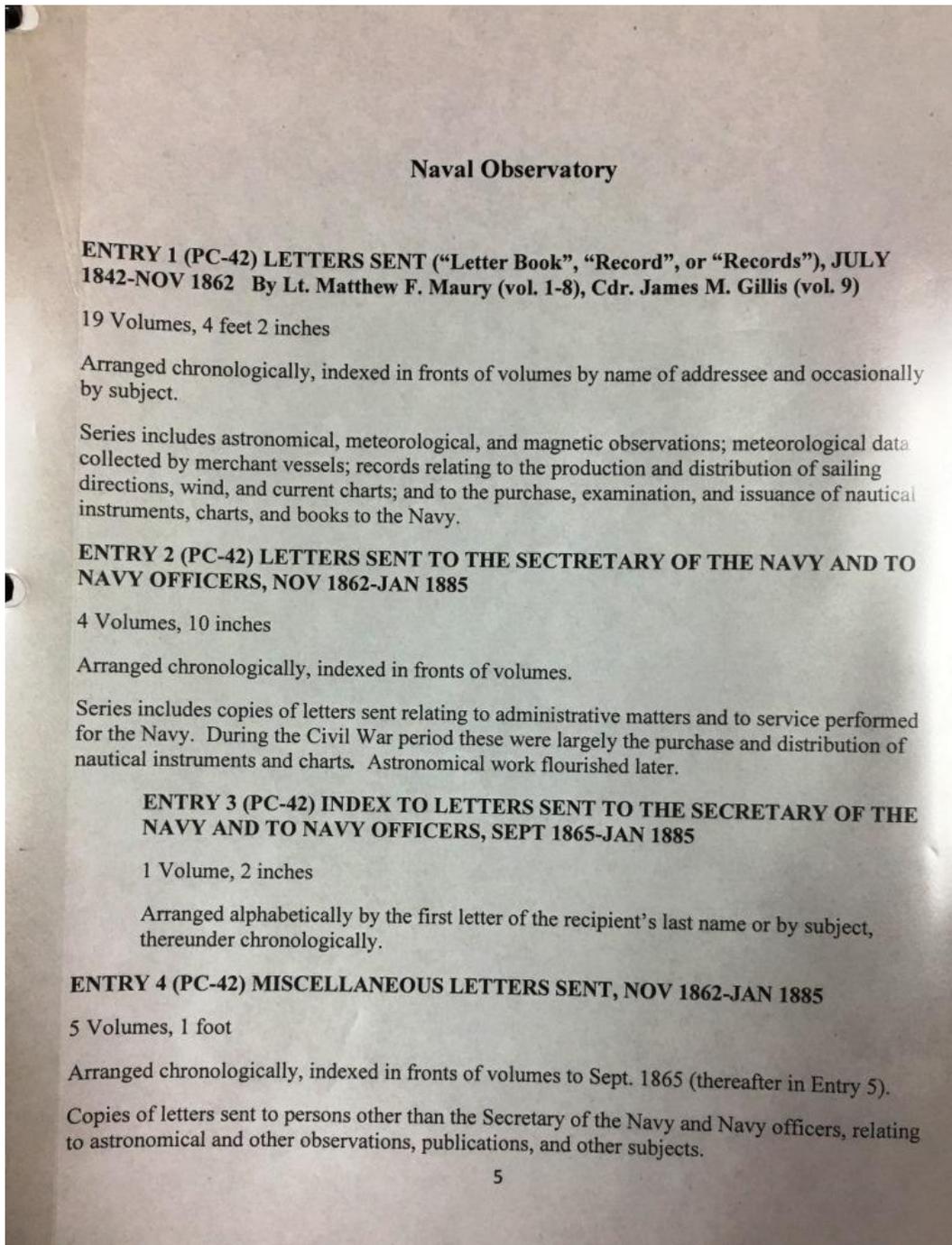
A Brandis sextant box on ebay with a short, wide (but parallel) space for the handle. This shape is also quite different from the Pensacola Ludolph sextant box handle shape.



True dovetailing on a Plath sextant box from ebay; note that the true dovetails are trapezoidal, and are not horizontal “fingers” or “comb teeth.”

Annex 5:

US National Archives Finding Guide to Preserved US Naval Observatory Historical Documents



Note that the boxes listed above are too early to be of interest, and hence were not examined.

**ENTRY 5 (PC-42) INDEX TO MISCELLANEOUS LETTERS SENT, SEPT 1865-
JAN 1885**

1 Volume, 2 inches

Arranged alphabetically by the first letter of addressee's last name or by subject, thereunder chronologically.

ENTRY 6 (PC-42) LETTERS SENT, JAN 1887-DEC 1891, MAR 1893-DEC 1911

50 Volumes, 8 feet

Arranged chronologically, indexed in front of volumes through 1908, thereafter in Entry 13.

Series consists of typed and pressed copies of letters relating to the general work of the Observatory. One volume relates to Observatory Circle (Aug. 1894-July 1899). Two volumes are titled "Efficiency Records" (Dec 1896-June 1911). Volumes from Jan. 1892-Feb. 1893 are missing.

Letters from 1909-1911 are indexed in Entry 13.

ENTRY 7 (PC-42) LETTERS RECEIVED, MAR 1840-JAN 1885 (See Entry 10 for Index)

50 Boxes, 16 feet

Arranged chronologically, indexed by writer's last name.

ENTRY 8 (PC-42) GENERAL CORRESPONDENCE, FEB 1885-JUNE 1888

7 Boxes, 2 feet

Arranged chronologically, letters received are indexed in Entry 10, letters sent are not indexed.

ENTRY 9 (PC-42) LETTERS RECEIVED, JULY 1888-SEPT 1892

11 Boxes, 7 feet

Arranged chronologically, indexed in Entry 10.

ENTRY 10 (PC-42) INDEX TO LETTERS RECEIVED, FEB 1885-SEPT 1892

1 Volume, 3 inches

Arranged alphabetically by first letter of writer's last name (with some subject entries), thereunder chronologically.

ENTRY 11 (PC-42) GENERAL CORRESPONDENCE, OCT 1892-DEC 1908

72 boxes, 14 feet

Arranged chronologically within the following classes:

Note that the boxes listed above are too early to be of interest, except possibly the "Letters Sent through 1911." But even that seems a bit early, and hence these boxes were not examined.

Navy Department; Bureau of Equipment; Bureau of Navigation; Bureau of Supplies & Accounts; Government Printing Office; Nautical Almanac Office; Navy Yards & Stations; US Navy Vessels; Personnel of Naval Observatory; Chronometer Makers; Professor S. J. Brown, Greencastle, IN; Warner & Swasey, manufacturers, Cleveland, OH; and Miscellaneous Correspondence

Indexed, in part, at the beginning of each class.

ENTRY 12 (PC-42) GENERAL CORRESPONDENCE, JAN 1909-APR 1925

289 boxes, 148 feet

Arranged numerically by "key numbers", thereunder serially.

Series is in considerable disorder. Some correspondence bears Navy Filing Manual symbols. It includes a list of "key numbers" and their subjects.

ENTRY 13 (PC-42) CARD INDEX TO GENERAL CORRESPONDENCE, JAN 1909-APR 1925

35 feet, 38 boxes

Series consists of:

1. List of serial numbers assigned to correspondence, showing the "key number" under which it's filed (arranged numerically) Box 1;
- 2) Index for Navigational and other instruments (arranged alphabetically) Boxes 15-24;
- 3) Index for all other subjects (arranged alphabetically) Boxes 2-14 & 25-38.

ENTRY 14 (PC-42) GENERAL CORRESPONDENCE, APR 1925-MAR 1943

108 feet, 259 boxes

Arranged according to classification scheme of the Naval Filing Manual

ENTRY 14A (PC-42) NAME INDEX TO GENERAL CORRESPONDENCE, 1925-1943

6 feet, 11 boxes

Arranged alphabetically by name of person, firm, or organization in two subseries: incoming (5) and outgoing correspondence (6).

ENTRY 14B (PC-42) SUBJECT INDEX TO GENERAL CORRESPONDENCE, 1925-43

14 feet, 20 boxes

7

The listings above do hold boxes of interest. The 289 boxes of "Entry 12 -- General Correspondence -- 1909-1925" were in "considerable disarray," NA only allows about seven boxes at a time to be examined, and the arrangement and indexing was not clear. Hence these boxes were not pulled and examined, on the advice of NA staff. (Researchers are not allowed to go into the stacks and examine the boxes; these must be "pulled" about five times per day for researcher examination.) The focus was on "Entry 12 (PC 42) Index to General Correspondence, 1909-1925, 38 boxes." These were found to be arranged by subject matter, and two areas of interest were two boxes containing 500+ detailed, hand-written cards on "Sextants" and another box containing a few cards on "Brandis." (See the next Annex.)

All other Entries from this page of the Finding Aid were not searched. Note that this means that Correspondence after 1925 was not searched; this might be a significant omission.

Arranged alphabetically by subject in two subseries: incoming and outgoing correspondence.

ENTRY 14C (PC-42) NAME AND SUBJECT INDEX TO PART (1925-29) OF GENERAL CORRESPONDENCE

2 feet, 10 boxes

Arranged according to classification scheme of the Naval Filing Manual (F31 to S24-7).

Entry 14 (A-1) GENERAL CORRESPONDENCE, 1943-1952

105.67 cubic ft., 130 boxes

Box List at K:NWC/NWCT/Finding Aids/ RG 78

Arranged according to the classification scheme of the Naval Filing Manual.

ENTRY 15 (PC-42) TELEGRAMS, JUNE 1886-FEB 1908

1 Letter box (shares box with Entry 16).

Arranged chronologically, indexed in back of volume.

Telegrams received and copies of telegrams sent.

ENTRY 15A DEPARTMENTAL ORDERS, EXECUTIVE ORDERS, AND CIRCULAR LETTERS ISSUED CHIEFLY BY THE SECRETARY OF THE NAVY, DEC. 18, 1893-NOV. 30, 1903

1 Volume, 1 inch *MISSING*

ENTRY 16 (PC-42) INDEX TO ABSTRACT LOGS RECEIVED, 1853-1861

1 Letter box (Shares box with Entry 15)

Arranged alphabetically by initial letter of the ship's name.

Abstract Logs include meteorological data collected by ships. These were assembled by Matthew Fountaine Maury between 1853-1861 and bound in volumes numbered 272-535. Some of the logs listed were transferred to the Weather Bureau (RG 27) where they were renumbered.

ENTRY 17 (PC-42) Various Records of Magnetic Observations, Feb. 1843-Dec. 1896

19.2 cubic ft., 39 Volumes, 16 boxes

Volumes include penciled observations of vertical and horizontal force, of deflections of magnetographs, and reduction of temperature in the magnetic vault. The boxes contain "magnetograms" and other records summarizing these observations (expressed in graphic or statistical form).

Boxes from this page were deemed to early or too late, or clearly not of the right subject, to be of interest. Note that "Entry 14-C, 1925-1929" above was not searched; this could be a significant omission.

ENTRY 18 (PC-42) RECORDS OF ASTRONOMICAL OBSERVATIONS MADE IN AND NEAR WASHINGTON, JUNE 1845-JAN. 1926

146.19 cubic ft., 322 boxes

Records consist of the following groups: (1) observing books containing data and remarks written at the telescope; (2) chronograph tapes (6 3/4" diameter, 1" wide), 1851-70 & sheets (22 1/4" x 13 1/4" and larger), 1860-91 recording graphically the clock time of observations; (3) reductions sheets (19" x 12" and larger), 1845-91, Forms A & B, reducing the instrumental observations to a single time; (4) records relating to clock corrections, thread intervals, precessions, longitude computations, and other matters; and (5) catalogues of stars, including the undated Washington Zone Catalogue and the Transit Circle Star Catalogue, 1872.

Most of these groups of records are classified internally according to the type of telescope used in observations: chiefly mural circle, median circle, transit instrument, 8.5" transit circle, prime vertical transit, and Annapolis transit circle. Many of the records are little more than rough notes and penciled working papers, incompletely labeled and not always clearly identifiable.

ENTRY 19 (PC-42) RECORDS OF THE U.S. NAVAL ASTRONOMICAL EXPEDITION TO THE SOUTHERN HEMISPHERE, AUGUST 1848-APRIL 1861

20 cubic ft., 38 boxes

Arrangement is random. This series is microfilmed on T 54

A printed narrative of the expedition, 1849-52, by Lt. James M. Gilliss, Superintendent of the Expedition, accompanies the records which also include handwritten and press copies of letters sent (August 1848-April 1861) and received (August 1848-December 1859) by him.

Records also include notebooks of telescopic observations, data relating to reductions, differential measures, clock corrections, and determinations of latitude and longitude.

The finished product of the expedition is a card catalog of stars compiled from observations made chiefly in and near Santiago, Chile. The catalog complements the Washington Zone Catalogue (Entry 18) for the Southern Hemisphere.

[Entry 20 (PC-42) Register of Bills Approved, Oct. 1844-June 1852. DISPOSED]

ENTRY 21 (PC-42) COPIES OF ORDERS AND APPOINTMENTS, MAY 1889-OCT. 1912

1.010 cubic feet, 2 boxes

Arranged chronologically, not indexed.

Records include copies of orders attaching, detaching, and retiring naval officers and letters of appointment, extension, promotion, instruction, transfer, acceptance of resignation, and discharge of civilian employees. Also included are letters of resignation from employees and copies of acceptance and letters of office signed by them.

Boxes from this page were deemed to early or too late, or clearly not of the right subject, to be of interest. Hence they were not pulled and searched.

Entry 22B (NM-47) Department of Aeronautical Instruments' Journal of Administrative Events, Sept. 16, 1918-Oct. 3, 1924

1 box, 1 volume

Arranged chronologically

Entry 23 (PC-42) Miscellaneous Unarranged Records, Feb. 1864-Apr. 1867

.720 cubic feet, 1 volume, 1 box

Minutes of the Committees on Publication and Printing, July 1901-March 1906 and on Plan of Work, October 1902-March 1906.

NAUTICAL ALMANAC OFFICE

Entry 24 (PC-42) Letters Received, Mar. 1849-Jan.1885

4.530 cubic feet, 9 boxes

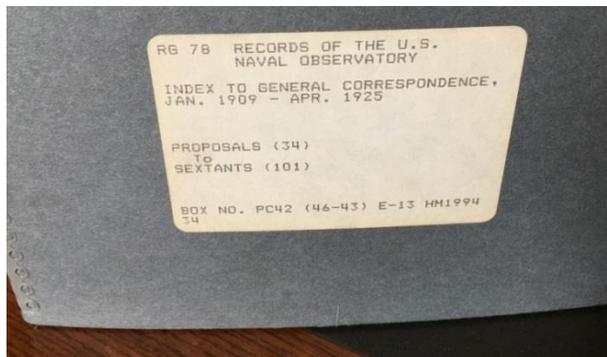
Arranged chronologically

The box from Entry 22-B above, the "Bureau of Aeronautical Instruments, Journal of Administrative Events" was pulled and examined. Unfortunately, this day-by-day account of USNO activities did not appear to drill down to the level of logging in sextants by number; it only occasionally referred to large sextant procurements or other high level sextant matters. Note that only about 70 pages of 222 pages in the Journal were examined, on a random basis. A reading of all the pages was not undertaken. This could be a significant omission. Other boxes from this page were deemed to early, and clearly not of the right subject, to be of interest, and hence were not pulled and searched. Boxes from the Nautical Almanac Office were deemed irrelevant and were not pulled.

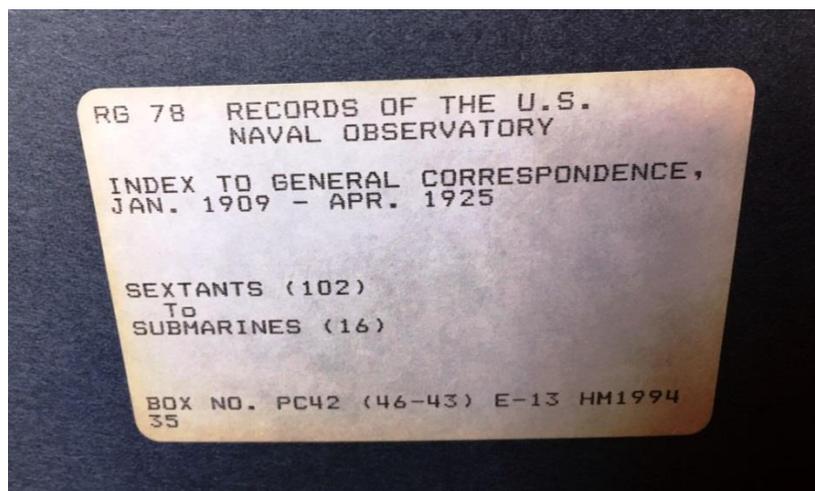
Annex 6:
Selected Items and Cards of Interest Found at the
US National Archives
from the US Naval Observatory Correspondence Documents

Notes:

Any number after the letters "B/L" refers to a Bill of Lading number, not a sextant number
Transactions that begin with an odd word, like "Virginia" or "Des Moines" refer to a ship with that name requesting something, meaning, e.g., "the USS *Virginia* requests repair of 2 sextants"
H.G. = a High Grade sextant, as opposed to a Surveying sextant
NObs or NObsy = US Naval Observatory
Contr. # = Contract number
Repts = Reports that
Shipt. = Shipment
Surv = surveying sextant, as opposed to a H.G. sextant



Box No. 34 – one of two key boxes containing "Sextant" info and numbers



Box No. 35 – one of two key boxes containing "Sextant" info and numbers

(9) 3430 ✓ *Sextants* 9

Report shipt. of new sextant #2582, in place of one that failed to pass - request furnished with abstract of bid on different repairs to insets.
 F. E. Brandis, Sons & Co. 3/19/10.
 Informed sextant 2582 satisfactory, except there are no spare mirrors - vouchers will be for. for the 16 sextants on contr. 99 upon receipt of 1 set spare sextant mirrors 3/16/10.

722 ✓
 Req. 57, Contr. 69 - request inform if F. E. Brandis, Sons & Co. have completed contract for 16 surveying sextants under satisfactory -
 Empire State Surety Co. 4/16/10 - N. P. G. Wash. - 4/18/10.
 Recd. to P. O., Wash., with information delivery under this contract completed Mar 21/10. - 4/19/10.

745 ✓
 Req. 68, cl. 134 - Contr. 12772 - reports shipt. of 2 sets square frame glasses & 20 sets round frame glasses for sextants under for test.
 Stueffel & Esser Co. 3/27/10 - 745 N.
 Informed shade glasses have been examined & found satisfactory will be returned by Expr. at first opportunity - 4/7/10.

First item above: shipment of new sextant #2582, in place of one that failed to pass (inspection), from F. E. Brandis Sons and Co., in 1910

Second item above: F. E. Brandis Sons and Co. has completed a contract for 16 surveying sextants, 1910; note that no sextant or USNO numbers are given.

(14) 8597 ✓ *Sextants* 9

Requests have shipped to L. H. Inspector - Balto., Md. - 1 H.G. Surveying sextant to be paid for by transfer from Appr. General Expense Lighthouse Service, 1912.
 Dept. Commerce & Labor - 11/2/11 - Dept. 11/2/11 - 7014-166.
 Returned to dept. via Gen. S. H., with information sextant was shipped as requested in the 28th of Nov. - 11/29/11.
 Informing of shipment, and forwarding invoice in sextant book - to Light House Inspector, Baltimore - 12/29/11.

8609 ✓
 Minutes - requests repairs to H. G. Sextant #6842 & Surveying Sextant #878.
 C. O. - 11/16/11 - 17 - W. H. - 12 - Comdt. Portsmouth 11/21/11 - 89-2-44
 Returned to Comdt. Portsmouth, approved - 11/28/11. - Rec. No. 1412/11

✓ Hurlmann Sextant - informed one forwarded to final test report.
 To C. O. Delaware - 12/27/11 - 8896.

First item above: USNO is shipping a sextant (no number given) in 1911 as requested to the Lighthouse Inspector in Baltimore, part of the US Lighthouse Service, US Department of Commerce and Labor

Second item above: "Marietta" (probably USS *Marietta*) requests repairs to "H.G." (high grade) sextant # 684 and Surveying Sextant # 878 (unclear if these are manufacturing numbers or USNO numbers)

3/75 ✓
 N.P.O. Mech. Code # 49-254.57-16 Sextants on - ray extension of 10 days
 time in order to get telescopes for through the customs -
 J.E. Brandis, Sons & Co. 7/18/10 - Bu. 546. 7/17/10 - Bu. 571. 7/18/10 - 20800.
 Refd to Bu. 571, recommending request be granted - 7/21/10.

7/6 ✓
 Report shipment of 8 surveying sextants on Contr. # 99 - balance of 8
 will be shipped not later than 3/2 - will forward spare glasses as soon as recd.
 J. E. Brandis, Sons & Co. 7/23/10

7/5 ✓
 Report shipmt of 8 surveying sextants on Contr. # 99 - also of 16 Extra horizon mirror - 16
 indexes will be shipped when recd. from Custom House - request inform Bu. of S. 46.
 of cause of delay in delivery of two theodolites in order to avoid penalties.
 J. E. Brandis, Sons & Co. 3/27/10.
 Informing above mentioned articles recd. & inspection going on - bill
 for payment cannot be paid until receipt of spare index mirrors -
 also that theodolites being furnished in N. P.O. order, not through - will be finally
 3/4/10 - J.E. Brandis, Sons & Co. 3/4/10
 Informing that account of excessive eccentricity, etc.
 3/6/10.

Above: Brandis is shipping various items to the USNO under Contract # 99. No sextant numbers given.

10255 ✓
 State do not manufacture sextants, but carry line of English sextants fitted
 with ordinary tangent screw & clamp - would be glad to submit one for test, etc.
 Informing Bu. will be pleased to receive for trial one of sextants mentioned
 requesting quote price - 5/14/12

10271 ✓
 Virginia - requests authority to invoice back to N. Obs. Surveying Sextant No. 407
 & that one H.G. sextant be sent to replace it -
 C.O. - 5/9/12 - 349-12 - without invoice - 5/16/12
 Authorizing return of above sextant -

10457 ✓
 Virginia - reporting return of Surveying Sextant - @ 407 & requesting
 exchange for H.G. sextant - as soon as possible.
 C.O. - 5/24/12 - 413-12.

Second and third transactions above: Virginia (probably USS *Virginia*) is requesting authority to send to the "N. Obs" (US Naval Observatory) surveying sextant No. 407 for replacement with a H.G. (high grade) sextant. In the third transaction it becomes clear that the sextant in question is USNO number 407, due to the N in a circle, before the number.

2139 ✓
 Reg. 10 - Sextant 9222 - state found socket of female centre not ground perfectly
 true - ground socket cylindrical & made entirely new male centre, etc.
 J. E. Brandis Sons & Co. - 11/25/12
 Informed that sextant will be accepted - 11/30/12.

214 ✓
 Sample sextants with endless screw - request inform if have been reported in -
 also to whom contract was awarded for repairs quoted in by them on Oct. 22.
 J. E. Brandis Sons & Co. - 12/6/12
 Informed reports on sextants not yet received - should take up with
 Gen of S & H. question of award of contract for repairs - 12/11/12.

sextant mirrors - requesting return of certain spare mirrors issued to
 for further test
 to C. O. 's Anethusa, Kearsarge, Virginia & Urban & Arnold, More Is. 1/4/12 - 12240
 Paducah - 12/10/12

First item above: Brandis sextant 9222 has a defect, is being returned, in 1912. 9222 is likely the manufacturer's number, not the USNO number.

22387 ✓
 Schud. 5039, Cl. 41 - report forwarding sample sextant fitted with il-
 luminating device to accompany proposal under.
 Refer to Kuffel & Esser Co. - 12/27/12 - 517/10
 by patent in - 11/3/13.

22388 ✓
 Sample Brandis Sextant, fitted with endless tangent screw - forwards copy
 of report of Sept 7 on & states sextant has been shipped to N. Ols.
 C. O. Cornichout - 12/20/12 - 11-2-5-

22389 ✓
 Wyoming - H. G. Brandis Sextant No. 354 - reports unsatisfactory in cer-
 tain particulars & requests be replaced by another -
 C. O. - 12/23/12 - 520
 Informed H. G. Sextant is being forwarded to to replace above temporarily
 12/29/12
 Drawing attention to above report & requesting estimate for placing last lot of H. G.
 Sextants delivered by them in satisfactory condition - J. E. Brandis Sons & Co. 1/2/13.

Second item above: Brandis is shipping sample sextant in 1912

Third item above: Wyoming (likely USS Wyoming) is requesting high grade Brandis sextant No. 354 be replaced. Unclear if this number is the Brandis or the USNO number. The "No." could refer to "number," meaning manufacturing number, or perhaps it is "NO.," possibly referring to the USNO number.

(37) 1889 ✓ *Sextants* 9.
Culgoa - H.G. Sextant #5220 - @667 - reports ship. to Obs. for repairs under Title P.
 C.O. - 12/29/14 - 770-15.
 authorizing turning above sextant into store at S. Obs. v. exp. "not in stores"
 to cover H.G. Sextant @ 341 now on board - 5/17/15.

1891 ✓
Prarie - H.G. Sextant sent to Obs. for repair - requests are be furnished to
 while under repair.
 C.O. - 12/31/14 -

1902 ✓
Marietta - Sextants, H.G. #6842 + surveying #878 - reports ship. to Obs. for repair
 C.O. - 1/9/15 - 21-4.

First item above: "Culgoa" (likely the USS *Culgoa*, (AF-3) or perhaps the Australian ship HMAS *Culgoa*) reports that it is shipping a high grade sextant (# 5220 (manufacturer's number) and USNO # 667) to the USNO, under Title P, in 1915. It appears that sextant with USNO # 341 was sent in replacement and is "now on board."

Third item above: USS *Marietta* is shipping high grade sextant # 6842 and surveying sextant # 878 to the USNO for repairs.

(58 1/2) *Sextants* 9
 26353 *Count*
 Sextants + Octants - Virginia reports shipped to Obs. 1 octant 5624
 1 sextant 8000 + 1 sextant 8010 all K&E, per request - C.O. 6/27/17
 Forward B&K + invoice covering 1 octant, 1/2 341, + 3 sextants, Nos. 493, 494 + 496
 shipped to Obs. per request, also one of 1/2 341, shipped in accordance with Bu. War. order
 21281 of 12/20/16 - S.O. No. 1, New York, 6/27/17

Submarine Division Sig. attached Fleet - States in forwarding 1 octant # 330 + two
 sextants Nos. 325 + 225 - S.O. - 6/28/17 - 50-17-H

Delaware - 2 octants # 330 + 55 (Ob) nav., and 3 sextants surveying # 390, 391 and 398
 reports forwarded to Obs. and encloses invoice covering, and begs for - C.O. 7/2/17

Rhode Island - Octant 5660 and sextants 361, 376 + 398 - reports forwarded to Obs. - S.O. 7/2/17

Dele. Marine - States she has 3 sextants aboard, 1 octant at S.O. for repairs, hexagons
 returned to C.O. Dele. Marine - 6/29/17 - 493-K - State octant had already been
 returned - 7/2/17

Vermont - reports turned in for ship. sextants N. & E. Nos 18461 @ 454, 9890, @ 9890,
 4950 @ 4950 - C.O. 7/5/17 - 5-10-17

Tacoma - State 2 sextants, # 4275 + # 4231, are being shipped to Obs. - C.O. 7/1/17

Nashville - State 2 sextants, # 307, + # 8659, have been shipped to Obs. - C.O. 7/1/17

Sacramento - Forwarding surveying sextant # 279 via S.O. N. & E. - S.O. Sacramento - 7/2/17

Georgia - Forward invoice for sextant # 5562 + Octant # 303, shipped to Obs. - P.O. - 7/4/17

Radical - Invoice for sextant No. 274, being sent to Obs. via S.O. Postamped - C.O. - 7/13/17 - 3004

Raleigh - State surveying sextant # 18461 turned over to S.O. Boston for ship. to Obs. - C.O. 7/1/17

100 sextants borrowed from Naval Academy - State cannot be returned
 by 3/1/18 as promised. - To Sup't, Naval Academy, 10/17/17 - State sextants may
 be retained until Obs. can replace them. - Naval Academy - 10/20/17

Forward duplicate set of expenditure inv. covering sextants # 659 + 307 which were
 turned into the Station New Orleans on 7/14/17 to ship to Obs. request if sextants have be
 recd. - C.O. - 6/2/18

Transaction above relating to "Vermont" – USS *Vermont* reports it is shipping sextants in 1917 to the USNO, these are K&E sextants numbered: 18461 (manufacturer number)/454 (USNO number); 9890/9840; and 4950/4950 (sic – likely an error).

Other transactions above: numerous ships are sending in numbered sextants to USNO as USA is active in WW I; 100 sextants are borrowed from US Naval Academy and cannot be returned by promised date of March 1918.

(59) 9

Sextants

Sextants - informing reqn. for 200 surveying has just been made out -
 Sextant mirrors - requests start delivery of an contract soon as practicable.
 To Buff & Buff Mfg. Co. 6/20/17 - 26420 =

Sched. 1283 1/2 for above sextants - forwarded 3 proposals for for recommendation -
 Bu. Bldg. 6/25/17 - Returned, recommending award to John Wilson Co. - To
 Bu. for R. - 6/26/17
 Request inform on to award made under above schedule - K. & C. Co.
 7/2/17 - 633-B - state their time of delivery, some too long. - To K. & C. Co. 7/6/17
 suggest change in shape of rib of sextant frame & submit samples showing
 proposed change - Buff & Buff Mfg. Co. 7/20/17 - state changes in satisfactory to Chief
 To Buff & Buff Mfg. Co. 7/23/17
 refers to small sample sextant left at Obs. & offers to make certain changes to
 meet Navy specifications - John Wilson Co. - 7/19/17 -

26575 Quote from letter of Russian Naval Attache of 7/2/17, requesting aid in securing
 sextants for ships bought by Russian Govt. - request data for reply.
 Director of Naval Intelligence 7/2/17 - 14285
 State Bu. Nav. can supply above 6 sextants - To Director Naval Intelligence - 7/10/17 -

First group of items above: purchasing of sextants from Buff and Buff Manufacturing in 1917; no sextant numbers shown.

Second group of items above: in 1917 the Russian Naval Attache requests six sextants for ships Russia has just bought; apparently USNO will supply these via the US Director of Naval Intelligence.

(85) 2 9

Sextants

9573 S.C. 339 - Telescopic eyepiece for sextant
 too small. Request an additional one.
 Navata Phila. - 2/26/18 - (tel) 18026
 2026. Sextant should be returned to Obs. - Sextant will be shipped
 to replace it. - To Navata Phila. - 2/27/18 - (dispatch) 14427 -

Sub. Chasers - 10 sextants forwarded to Norfolk for -
 confirming phone conversation re issue of 29611
 To S. O. Norfolk - 2/22/18

reporting issue of sextant	667	S. C. 132	S. O. Norfolk - 2/28/18 - 336332/32-S
"	674	" S. C. 219	S. O. Norfolk - 2/27/18 - 336332/289-S
"	668	" S. C. 189	S. O. Norfolk - 3/15/18 - 336332-S
"	669	" S. C. 221	
"	671	" S. C. 136	
"	959	" S. C. 135	S. O. Norfolk - 3/1/18 - 336362
"	317	" S. C. 133	
"	317	" S. C. 133	S. O. Norfolk - 3/2/18 - 336332-S
"	670	" S. C. 248	
"	672	" S. C. 232	
"	673	" S. C. 125	S. O. Norfolk - 3/12/18 - 336332 - (Card 84)
"	1084	" S. C. 192	
"	806	" S. C. 134	
"	727	" S. C. 131	

Second group of items above: Various sub-chasers ("S.C.") at Norfolk are sending 10 sextants (and one octant) with USNO numbers listed, to the USNO. Manufacturer's numbers not given.

3/18/94 German vessels - 5 sextants taken from are in possession of customs of Honolulu, Hawaii - Does Dept desire them?

10313 - arrange to secure sextants & deliver to Mare Co. - To Navata, Pearl Harbor - 7/15/18 - Telegram.

19083 - 2 sextants suitable for use turn into store. If requiring repairs send to Mare Co. - Navata Mare Island - 11/18/18 - (Recap letter)

3/18/99 U.S.S. Des Moines - State forwarded 2 sextants Nos. 364 & 367 to N. Obs. on 6/29/18 for repairs request, he ret'd by 19th of July.

State, regarding ship to Mare Island, sextants received, advise disposition - Navata, Mare Island Cal. - 11/13/18 (Tel) -

First group above: Five sextants seized from German vessels in 1918 are in Honolulu, does USNO desire them?; USNO replies.

Second group: USS Des Moines forwards 2 sextants, Nos. 364 and 367 to USNO in 1918 for repairs.

1082 et al

32613 Sextants

Referring to U.S.S. Fish Hawk letter, Bu. is informed 3 sextants covered by Survey Report #3 sextants returned in to Norfolk Yd. Request by food by Obs for further a/cpt. to vessel - U.S.C. - 1/7/19 -

Math. referred to in letter 15/19 - was shipped to Obs. 2/26/19 - 3225 - S.O. Norfolk Yd. - 1/24/19 - 26432 -

Request return H.G. Sextant "Stackpole 373" to Obs. or its present location reported to Obs. if same has been issued. - To S.O. Navy Yd. Phila. - 2/6/19.

Request return H.G. Sextant "Ludolph 7223" to Obs. or its present location reported to Obs. if same has been issued. - To S.O. Navy Yd. N.Y. - 2/6/19 -

Referring to Obs. letter of 2/6/19, Bu. is advised H.G. Sextant Stackpole 373 was received to U.S.S. Medicinoford 12/9/18 on invoice 209468 - Navy Yd. Phila. - 2/10/19 -

U.S.S. Fish Hawk - Information is requested as to what disposition has been made of sextants belonging to ship & shipped to Obs. by S.O. Navy Yd. Norfolk for repairs. - C.O. - 5/20/19.

Request information regarding sextants belonging to U.S.S. Fish Hawk. - To Obs. - 5/27/19 -

Re sextants 1223 & 724986 request when will be returned. #1454 will be invoice to store - C.O. Fish Hawk - 2/23/20 - 223-119

Third item above: USNO requests return of H.G. sextant "Stackpole 373" to USNO from Philadelphia.

Fourth item above: USNO requests return of high grade sextant "Ludolph 7223" to USNO from NY Navy Yard; this is apparently the only reference found to a Ludolph sextant in these files.

(178) ✓ *Sextants* T 9
 ✓ 4507 ✓ USS Wainwright - (62) Vessel has 1 sextant in need
 of repairs. Req instructions re how to buy -
 Co. - 1/17/22 - 29
 Ref. above - Wtd. to exchange sextant for similar one at Charleston
 Yd. - Same to be shipped to Osgy - Co. - O.R.O. - 1/19/22 -

✓ 45180 ✓ USS Wm Jones - Repairs to Sextant #1608 - (Pa Nav) (Star
 5522) Req resilver mirrors -
 Co. - 1/14/22. Comdr Distr. Div. 33 - 1/22 - 1 used -

Second item above: USS William Jones requests repair (resilvering mirrors) to its Sextant # 1608, with possible USNO number 55-22 or 5522

(152) ✓ *Sextants* 9
 ✓ 30208 Request if can send sextant to Osgy. to be certificated
 Capt. Walter N. Marshall - 12/6/19 -
 allowing return of 12/6/19. Is not permit sextants, if belonging to
 private individuals. Is Capt. Walter N. Marshall - 12/11/19.

✓ 30247 Sextant #1158 pawned by a seaman - recovered from a Dia-
 mont, of the Terminal Loan Office - request disposition -
 Comdt. 12 Nav. Dist. - 12/3/19 -
 request deliver sextant referred to in above entry, to S. O. Navy Yd Mare Do.
 or Comdt 12th Naval Dist. - 12/15/19.

First item above: Capt. Walter Marshall, a private citizen, requests in 1919 that USNO certifies and calibrates his sextant. USNO replies that USNO cannot perform that function for private individuals

Second item above: In 1919, Sextant # 1158 "pawned by a seaman, recovered from ?? Diamont...request disposition"

Thus another sextant went missing – but the sextant went found and the story had a happy ending; maybe this one will too!

Annex 7: Email Responses to Report and Allied Briefing

The following substantive responses were received from three TIGHAR members re this report and the associated PowerPoint briefing (given at the Earhart/Noonan Symposium at the TAC Conference in Eugene Oregon in May 2018).

From Ric Gillespie, TIGHAR, May 9, 2018

Hi Lew,

Thanks for sending your presentation and report. I agree with the problems you describe with the Pensacola sextant and box.

My present take on the Pensacola Ludolph is that it is a red herring. I think the similarity of the handwritten 3547 to the stenciled 3500 on the Niku box is simply coincidence and, as you point out, there is no evidence that the Ludolph box ever held a Brandis sextant. Noonan probably acquired the Ludolph during his long nautical career. The Brandis box on the shelf in the PanAm clipper navigation room photo was probably also Noonan's personal property. The primary navigation instrument aboard the aircraft, the bubble octant beside it on the shelf, almost certainly belonged to the airline. Noonan did not own a bubble octant, as evidenced by the necessity of borrowing one from the Navy prior to the first Earhart world flight attempt.

Pan American's policy was for new pilots to first serve as navigators and radio operators before graduating to second pilot and eventually captain. While employed by Pan American, Noonan gave informal instruction in navigation to new hires like Cluthe. Noonan probably loaned his Ludolph to Cluthe to practice with some time in late 1936. Before Cluthe could return it, Noonan had left the airline, signed on with Earhart, and subsequently disappeared.

Noonan did, supposedly, intend to open a navigation school but I know of no evidence that he started buying up sextants for that purpose. The evidence is strong that Noonan used a Brandis sextant as his "preventer" and that the Niku box was a Brandis box. We don't need the Pensacola box. Trying to link it to Brandis is like trying to pound a square peg into a round hole and only diminishes our credibility.

The hypothesis that the Niku box was a Brandis box is falsifiable if a Brandis box marked 3500/1542 turns up in somebody's collection or on eBay.

The hypothesis that the Niku box was a Brandis box belonging to Noonan would be greatly supported if we could find some record that Noonan owned Brandis 3500/1542.

Ric

From: Mike Silvert

Subject: Re: paper/presentation on sextant box research re Amelia Earhart/Fred Noonan

Date: May 9, 2018 at 8:52:07 PM MDT

To: lewtoulmin@aol.com, Andrew McKenna

I read this with interest and would like to share my fuzzy memories about the stenciled numbers on the outside of the box.

When I saw the slide of the stencil numbers, I had a case of deja vue and tried to remember where I had seen stenciling like that when I served in the US Navy. I'll have to do more research on this and hopefully find a photo(s) but I believe that these sextants may have been used for training navigation to officers and possibly Quartermasters (Navigation specialty) like myself. The stenciled numbers were used to keep track of who was in possession of the particular sextant during training and had no other significant factor regarding the make/model or repair record. If memory serves me correctly, a similar stencil was on the stock of the rifles we did parade drills with from the Armory at Great Lakes Naval Training Center, near Chicago.

As I said, my memory is a bit fuzzy but this may shed some light on those stencils and their relevance or lack thereof.

Mike Silvert

On Wednesday, May 9, 2018, 2:42:23 PM EDT, Andrew McKenna wrote:

Lew

Thanks for this. I wish I could have been at the symposium, sigh, next time.

I would agree that your examination of the Pensicola box would argue that it probably did not hold a Brandis Sextant, and that the hand written numbers are likely something else besides Maker / Navy numbers, although it is an odd thing that they do fit the pattern to some degree. Perhaps once again a red herring led us to pursue research that ended up being productive even if the original idea turned out to be wrong

I don't recall that TIGHAR ever suggested Noonan wanted or procured a series of sextant that were in numerical order, but maybe I'm wrong about that. I don't think that would be likely, or even possible for Noonan to accomplish through the Navy. Maybe through Brandis, but not the Navy.

Also, I think we've had the impression that at the end of the war, the Navy gathered up all these sextants and disposed of them in some kind of fire sale. However, apparently many of these sextants were issued during WWI to the Merchant Marine fleet and at the end of the war, the Navy simply abandoned the sextants to those ships. Noonan, being a Merchant Mariner, may have acquired his nautical sextants through Merchant Marine channels rather than the Navy. Might be interesting to hunt the #s of the sextants issued to ships he worked on.

I think there is something that you've missed about the numbers. I don't know if this brought up during the symposium, but I want to point out that **Brandis stenciled their numbers on the inside of the box near the hinge**, while the Navy seems to have stamped numbers there as well. See the photo in your presentation of the Brandis sextant with matching box numbers, attached here. The Brandis number 3987 is stenciled near the hinge, not on the outside of the box.

When I think of the stenciled number 3500 from the Nikumaroro Box, I think of this small number inside the box, not a big number on the outside of the box. The fact that the Niku box 3500 was stenciled (apparently unusual enough to get mentioned), and there was also a second number, would argue that the Niku box was in fact a Brandis, and probably from the Navy inventory, as not only does the number sequence fit the pattern, but we know that is how Brandis and the Navy numbered their boxes. 3500, if it is a Brandis number, would not be seen on the outside of the box in the Pan Am photo. Evidently the calibration sticker was missing from the Niku box.

One more thing, I have four Brandis sextants and each one has a different frame style (one is left handed), and a different size, so one size does not fit all. Two of these Brandis Sextants have boxes, including the box with 883 stenciled on the outside that you have a photo of in your presentation. That box is 8" by 7" by 5", and also has a Brandis number stenciled inside near the hinge #3657 while holding sextant #3692. This is a smaller sextant than the typical Navy Survey sextant, and it is unclear that the 883 is a Navy number, but we have presumed that. Note that none of the boxes with numbers stenciled on the outside have 4 digits while most of the Navy calibration numbers are 4 digits. I think they may have been numbered for some reason other than by the Naval Observatory. The sextant in the 883 box does not have a USN number etched on the arc or anywhere else, does not have a calibration sticker or the remains of a calibration sticker in the lid of the box, and does not have a number imprinted into the wood of the box the way other sextants in the Navy inventory do. We should look to see if any of the boxes with numbers stenciled on the outside have Navy numbers etched on the sextants, or Naval calibration stickers, or Navy numbers stamped near the hinges.

The two sextants I have with Navy numbers are both larger, and although they have different frame styles, either will fit snugly in a Brandis box that is 9.75" x 9.75" x 5.5". That box also has a Brandis number stenciled, and a Navy number imprinted, near the right hinge that match the sextant it holds, Brandis # 4297/ Navy #1880.

I hope this helps our understanding. Would be nice to find the NO calibration records.

Best

Andrew McKenna

Annex 8: Author Biography

Dr. Llewellyn "Lew" Toulmin is a co-founder of the private Missing Aircraft Search Team and a member of TIGHAR. He has searched for missing aircraft, persons, plantations, towns, caves and battlefields in Vanuatu, Malaysia, Thailand, Kiribati, Canada and seven US states. He holds an M.P.A. from the Maxwell School of Syracuse University and a Ph.D. in public administration and economics from American University. In his professional capacity as a consultant in telecommunications policy and e-government, he has advised 20 US Federal agencies and 30 developing countries. He is the travel, adventure and exploration editor and columnist for the *Montgomery Sentinel* of Maryland, and has traveled to 145 of the 196 countries on Earth. He is a Fellow of the Royal Geographical Society, a Fellow of The Explorers Club, a member of the Cosmos Club, and the former chair of the Section on Emergency Management and National Security of the American Society for Public Administration.

#end report#