William G. Broughton: One Radio Ham

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I. Introduction

This paper presents an account of one radio ham, William G. Broughton. I present this work in the context of current work on the amateur, and give brief biographies of both William G. Broughton and his father, Henry P. Broughton. I present the logbook as a historical tool for understanding the life of a ham, and show evidence of use for both technical, ham-related use of the logbook, and use for other aspects of a ham's life. I then track one particular story through the logbook.

I look at the role of the entries in the logbook in Broughton's identity creation, and identify "ham identity" as distinct from but related to "technical identity" (Haring 2002) and "geek identity". (Dunbar-Hester 2002) I then briefly compare the Broughtons' situation to the "freer men" that Haring identifies in (2003). I identify some further directions for research, and finally draw some conclusions.

II. Background: Literature on the Amateur

The history of the amateur radio movement in the United States has been well documented; most notably by Susan Douglas in her book *Inventing American Broadcasting*, although Clinton B. DeSoto's 1936 history of the movement, *200 Meters & Down* (republished in 1981 and 2001) has a good deal of in-the-moment historical detail. In addition, Kirsten Haring's 2002 doctoral thesis, *Technical Identity in the Age of Electronics* is an excellent introduction to amateur radio in the 20th century within the context of other technical amateur disciplines; in addition, her 2003 Technology & Culture paper *The "Freer" Men of Ham Radio* looks at ham radio as a

male culture in the home, and was useful in understanding this aspect of amateur radio. Christina Dunbar-Hester (2003) has also done significant amounts of work on the culture of present-day low-power FM broadcasting, which have informed this piece.

What I hope to contribute to the literature on amateurs in technology is a the view of a single ham: an focused and in-depth approach. Susan Douglas's and Kristen Haring's work both provide excellent across-the-board views of the field: I hope that by looking at the field from the viewpoint of one solid, reliable, dedicated but essentially ordinary ham, I can provide a bottom-up contribution that brings individual agency to the study of what is fundamentally an area of individual and amateur effort and application.

Much as Haring's work does, this application, in the manner of structuration theory (Giddens 1984), provides counterpoint to many of the histories of the field in its recognition of individual agency.

III. The Broughtons: To the End of WWII

A. Brief Biographies

William Broughton's father, Henry Primm Broughton, was born July 7

1865. After graduating from Cornell in 'the mechanical and electrical course' in 1890, he was Nikola Tesla's assistant for Tesla's five-day St. Louis demonstration of electrostatic lighting experiments, including one of the first examples what was later characterized as radio communication. He was an enthusiastic radio amateur, held a large number of radio licenses over time and died in 1959 at the age of 94.

William Gundry Broughton, the focus of this paper, was born on February 22, 1902. Broughton erected his first wireless station in the summer of 1914, and put up his first aerial in August of that year. In September 1919, William Broughton started classes at Cornell University, and graduated with the degree of Electrical Engineer in June 1924. He joined the General Electric Company on September 9, 1924, and spent the next two years taking electrical and business courses with General Electric. He joined the AC Engineering department, and spent World War II working on radio for General Electric: the photo above is from January 1943, and shows Broughton in a radio test car for experimental FM emergency radio communication. After the war, he became District Sales Manager for GE, based in Schenectady NY. In 1964, he donated his archive – some one hundred linear feet of papers – to Cornell.

B. The Beginnings of a Ham

William Broughton first became interested in 'wireless' in the summer of 1914, at the age of twelve. He wrote a letter to his father about his new hobby:

> Dear Father: - John Allman and I became interested in a phamphlet *[sic]* that showed how to make a "Wireless" without any expense. Well, we put up a "Wireless" that was much better than this phamphate [sic] told how to make, however, this pamphlet is guilty for our sets. The sets we have are so much better than this phamplet [sic] described that we think we have might good stations. We have been pretty busy lately so we haven't had time to talk much but the fever is not dying by any means and am hearing Lake Boats[1] all the time and pretty soon I expect to be able to read the messages they send out. I think my station's a little better than John's but we both have a good amount of fun. Yours truly, Bill. *[Box 38/undated]*

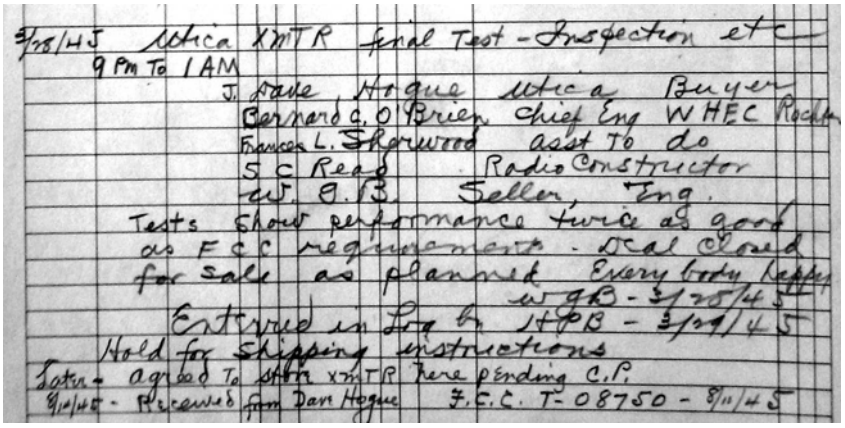
At the beginning of the next summer, Broughton received his Amateur Radio Operator's License, Second Class, and his First Class license by the end of the summer – the first of many radio licenses he'd receive as time went on. However, when the United States entered World War I, Broughton, like all other amateurs, had to dismantle his station. He remained off the air until January 1920, when he applied for a license for his new station at Cornell in Ithaca, New York, as well as one for his now-modified station back home in Kirkland, Illinois.

Broughton continued his professional interest in radio throughout the inter-war years, working for General Electric on radio sets for airplanes for the Navy as well as

[1] Boats on Lake Michigan; the Broughtons were living in northwestern Illinois at the time.

other facets of radio. He also continued his amateur involvement with a variety of sets and callsigns over time. When the United States entered World War II in 1941, the Navy once again took over the airwaves and the Department of Commerce shut down amateur radio. (S. Douglas 1987) It took only slightly over a month for Broughton to have himself appointed a member of the *Communications Agency – Schenectady County Consolidated County Office of Civilian Protection*, and apply to the FCC for a 2½ meter operating license for emergency communication. It's clear that his father, Henry Broughton, was also highly involved in this radio station, but was stalled by the FCC-required proof of American citizenship. Birth records in the rural United States in 1865 were sporadic and unreliable, and the archives contain a significant amount of correspondence regarding Henry's attempts to confirm his citizenship. However, he was ultimately successful and in 1943 both Broughtons started the emergency radio station WKNT-5.

Henry and William ran WKNT-5 throughout World War II, relaying messages and providing part of the origins of the Schenectady Emergency Broadcast Network, eventually sponsored by the Red Cross when the war was over. In 1945, with the cessation of the Emergency Broadcast Network, WKNT-5 was shut down. William proudly notes in the log:


3/18/45 Final WKNT-5 test-inspection etc.
9PM to 1 AM

J. Dave, Hogue Utica	Buyer
Bernard C. O'Brien	Chief Eng WHEC Roch'ter
Frances L Sherwood	Asst to do [ditto]
S.C. Read	Radio Constructor
W. G. B.	Seller, Eng.

Tests show performance twice as good as FCC requirements. Deal closed for sale as planned. Everybody happy.

WGB – 3/20/45

[remained skipped]
[Box 21]

IV. Logbooks

A particular story is told by the log books central to amateur radio. Much in the way Latour described a laboratory as a device for turning funding into published papers, (Latour 1987) amateur radio is a hobby for filling up log books, one penciled line at a time. By the mid-twenties, the Amateur Radio Relay League [a major ham organization] was producing a standard spiral-bound logbook that continues almost

unchanged to this day.[2] The Broughton archive contains over sixty consecutively numbered logbooks detailing thousands and thousands of contacts.

A. What's in William Broughton's logbooks?

1. Radio contacts

Broughton's earliest log books (I-IV) read more like a diary, with details of holidays and school work interspersed with plans to build more elaborate 'rigs', and lists of contacts made over the radio. A typical log entry from one of these (Log II, Box 21) reads:

> Jan 1, 1920. Didn't get up until 3pm today so didn't get 9zs or naa. *[Both of these are call signs for other amateurs].* Seems to be fine night outside but there is quite a little Irn *[interference]*, especially a load roar from the power lines. Was unable to get maa at 9ppm for some unknown reason. Guess I'll quit + study for my operator's license exam which I intend to take in Chicago tomorrow. H*[ea]*rd: - mar, maj, nah, nkb, wie, kihg.[3]

As time went on, logbooks became more standardized, and by the mid-twenties the Amateur Radio Relay League produced a standard logbook. As such,

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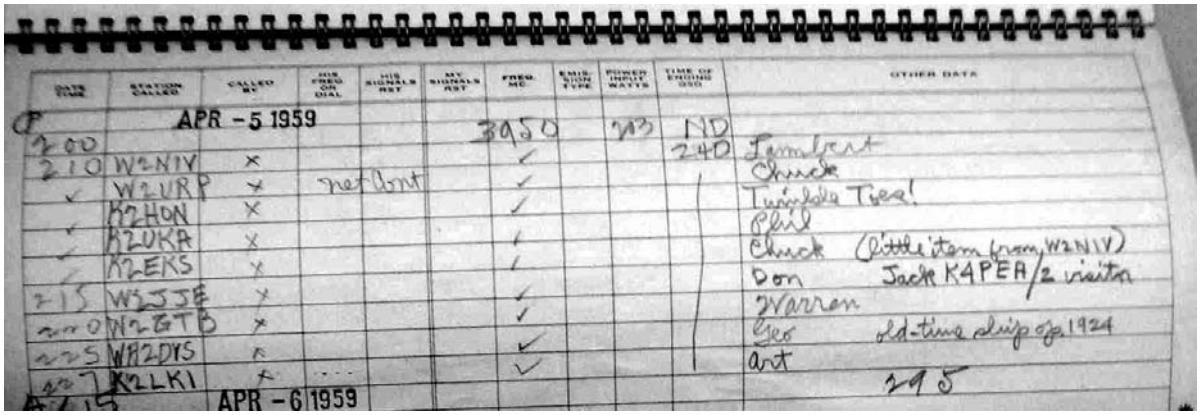
[2] These paper, spiral-bound logbooks have recently been replaced for many hams with computerized systems that allow for automatic verification of radio contacts, for contests, licensing, and the like. The software is sold under claims such as "based on the structure of the ARRL logbook many us have used over the years", but, as I think will become clear, may be missing much of the functionality of the traditional logbook in that they do not allow for documenting other aspects of a ham's life.

[3] This, and all subsequent logbook entries, are from Box 21 of the William G. Broughton archive at Cornell.

Broughton's use of logbooks became far more systematic and rigorous. Here's an entirely typical entry from 1959:

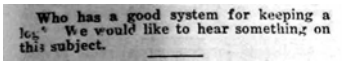


DATE TIME	STATION CALLED	CALLED BY	HIS FREQ OR DIAL	HIS SIGNALS RST	MY SIGNALS RCT	FREQ. MC.	EMIS-SION TYPE	POWER INPUT WATTS	TIME OF ENDING QSO	OTHER DATA
200						3950		213	ND	
210	2WNIV	x				√			240	Lambert
√	W2URP	x	net	cont		√				Chuck
√	K2HON	x				√				Twinkle Toes!
√	K2UKA	x				√				Phil
√	K2EKS	x				√				Chuck (little item from W2NIV)
215	W2JJE	x				√				Don Jack K4PEA/2 visitor
220	W2GTB	x				√				Warren
225	WA2DYS	x				√				Geo old time ship op. 1924
227	K22KI	x				√				Art

From the left, the columns list the time, the station that was heard calling, who called them (in this case, the Xs refer to Broughton himself, some columns of technical information that are skipped, a column for the frequency (here all 3950kHz), emission

type (skipped here; presumably voice), input power in watts (213 on the first line, which is him setting up, so he knows what his own input power is), the time that the call ended, and the person's name and occasionally other data. In this case, the calls all ended at the same time, 2:40pm, suggesting that this is a "conference call" of some kind. In fact, corresponding the "station called" lines with other log book entries with more information suggests that this was a Schenectady County Emergency Net weekly drill, which happened every Sunday at 2pm.[4]

Hams were required by the Department of Commerce and later by the FCC to keep detailed logbooks, but it took time for the structure of the logbook to become standardized. In August 1920, QST, a ham magazine, printed this in their STRAYS column:


Who has a good system for keeping a log? We would like to hear something on this subject.

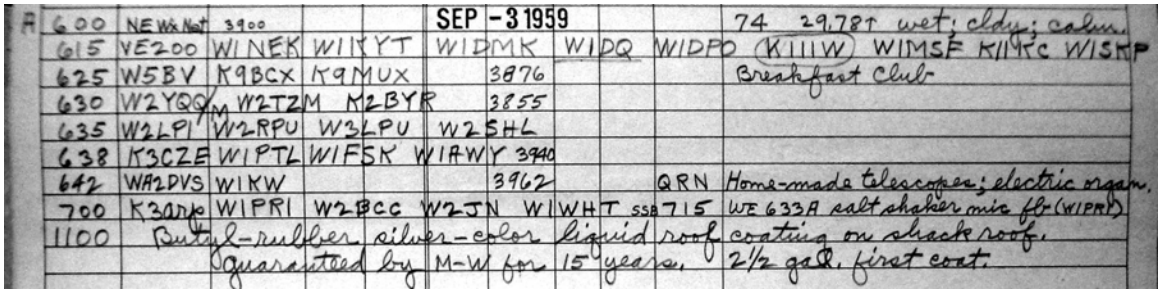
"Who has a good system for keeping a log? We would like to hear something on this subject." *(QST August 1920 p8)*

It's clear that their call for systems was successful, as evidenced by the almost completely unchanged format of the ARRL Logbook ever since, and still available through their website (www.aarl.org).

[4] In the interests of space and clarity, future glosses of logbook entries will omit the full column listings with headers.

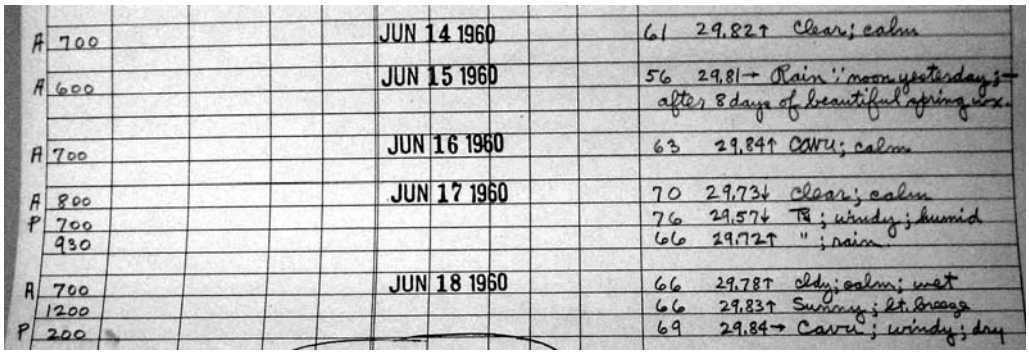
2. Other material

What seems interesting to me is not the repetitive filling out of the boxes on the form, but rather the way that Broughton ignores the boxes. The logbook does not just document Broughton's ham radio contacts, but documents Broughton's life and identity as an amateur – and beyond. The vast majority of entries are either documentation of contacts, as we have seen above, but a significant number of entries concern difficulties with or modifications to his equipment or ham shack:



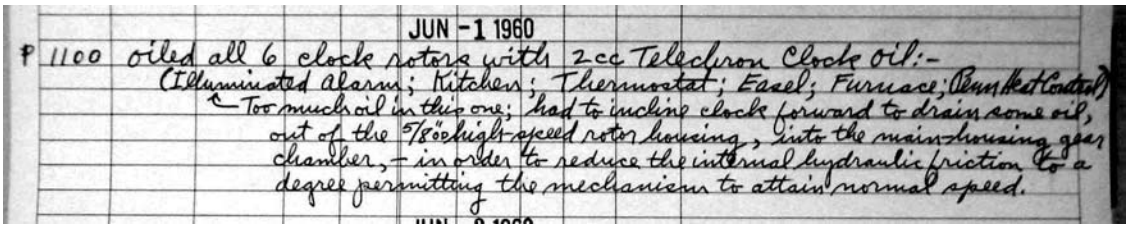
[bottom two lines after several lines of radio contacts:]
1100: Butyl-rubber silver color liquid roof coating on shack roof.
Guaranteed by M-W for 15 years. 2½ gall. first coat.

weather reports:



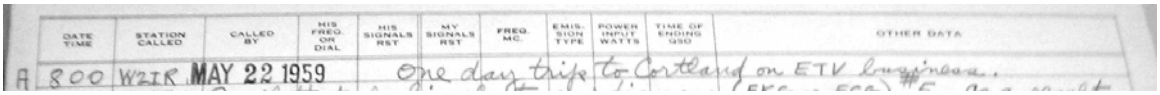
A 700	JUN 14 1960	61 29.82↑ clear;calm
		…[several skipped]…
A 700	JUN 18 1960	66 29.78↑ cldy; calm; wet
1200		66 29.83↑ Sunny; lt breeze
P 200		69 29.84→cavu [clear air, visibility unlimited]; windy; dry

repairs to the house:

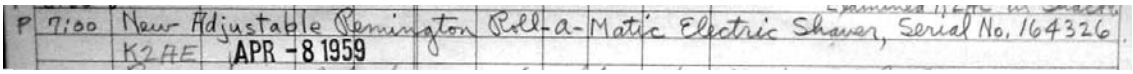

JUN –1 1960

P 1100 oiled all 6 clock rotors with 2 cc Telechron Clock oil: -
(Illuminated alarm; kitchen; Thermostat; Easel; Furnace; Penn Heat Control)
↑Too much oil in this one; had to incline clock forward to drain some oil, out of the 5/8"OD high-speed rotor housing, into the main housing gear chamber, - in order to reduce the internal hydraulic friction to a degree permitting the mechanism to attain normal speed.

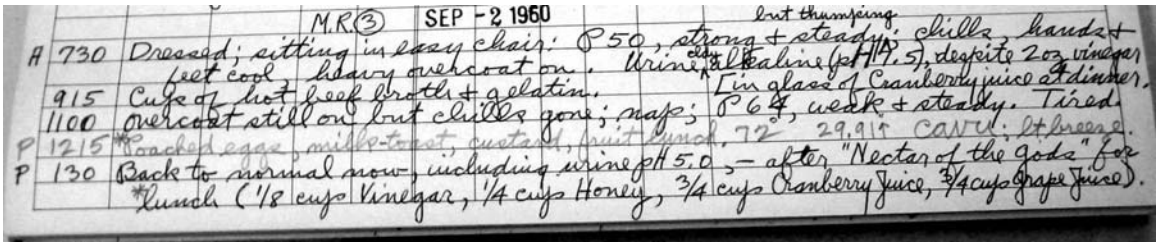
traveling:


A800 W2IR MAY 22 1959 One day trip to Cortland on ETV business

purchases:


P 7:00 New Adjustable Remington Roll-a-Matic Electric Shaver, Serial No. 164326

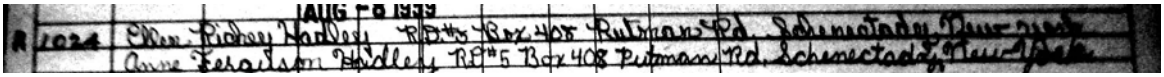
his or his father's medical conditions:


M.R.(3) SEP –2 1950

A 730 Dressed; sitting in easy chair: P 50, strong + stead but thumping; chills, hands + feet cool, heavy overcoat on. Urine vry*[?]* alkaline (pH 7.5) despite 2oz vinegar [in glass of cranberry juice at dinner.
915 Cup of hot beef broth + gelatin.
1100 Overcoat still on but chills gone; nap; p 64, weak + steady. Tired.
P1215 *Poached eggs, milk-toast, custard, fruit lunch, 72° 29.91↑ *cavu; lt breeze.*

P130 Back to normal now, including urine pH 5.0, - after “Nectar of the Gods” for *lunch (1/8 cup Vinegar, ¼ cup Honey, ¾ cup Cranberry Juice, ¾ cup Grape Juice)

Similarly, it was common for visitors to the shack – or even just to the house - to sign in to the logbook:



AUG –6 1959

A 1024 Ellen Sidney Karley, RD#5, Box 408 Rutman Rd, Schenectady, New York
Anne Ferguson Hurley, RD#5 Box 408 Rutman Rd, Schenectady, New York

These examples, and the many others in the archive, point to a flexible approach, a reinterpretation of the role that a logbook plays. In many ways, this use of the logbook is perhaps the strongest expression of William’s ham identity. The logbook serves as diary, as archive, as legal document, as guest book, but the action of using the log book for that purpose confirms each time William’s ham identity.

B. Logbooks in context

An interesting comparison is to look at the process of increasing uses of forms in JoAnne Yates’ *Control through Communication* (1993). She documents the transition of three large railway companies from an informal system of information dispersal and storage to a formalized system of forms, reports and memos in the late 1800s and early 1900s. The evidence she refers to shows a continual process of increasing control by the bureaucratic structure. She mentions the iterative development of forms, and reprints a selection from *Factory*, August 1917, which

shows such an iteration taking place, (p84) but doesn't document the many ways in which forms are invariably filled in in a way that the original designer never anticipated. In Broughton's archive, we see the opposite process taking place: he starts with a systematized and pre-ruled form, and proceeds to use it in any way he wishes – including the way ordained by the form itself. He is, of course, an individual, but this individually is asserted over the larger system of which he is a part.

Another way to understand this process is to look at Foucault's *Discipline and Punish.* (1977), in which he introduces a comparison between the mortification of the body by public execution and the mortification of the soul by the penal time-table:

> We have, then, a public execution and a time-table. They do not punish the same crimes or the same type of delinquent. But they each define a certain penal style. *(8)*[5]

Foucault, at least, recognizes the importance of transgressive behaviors: he looks at illegality is a tool given to the lower classes as a (controllable) way to show dissent. William's use of the logbook for more than FCC-sanctioned (and column-heading-sanctioned) uses seems like a restatement of his ham identity: he is not just a ham when he is using the radio, but a ham twenty-four hours of the day. It is this transcendence of the grid plane of the log book that for me underscores Broughton's ham identity as distinct and extending beyond any FCC regulation.

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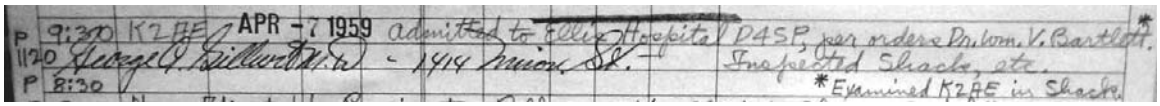
[5] It might be better to go back and look at Foucault's stuff on exam scheduling etc as a tool to discipline students.

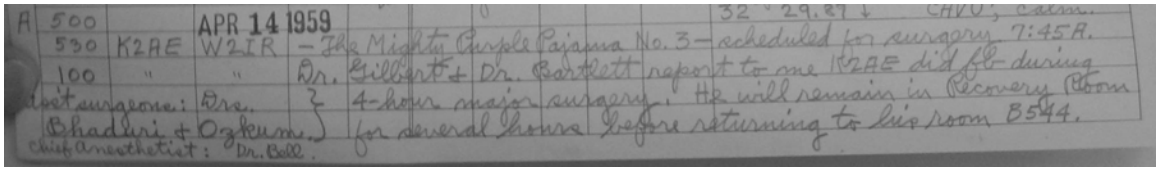
C. A Logbook Tells Tales: One Story

Logbooks tell tales. Not just about ham radio, but, as I intend to show here, about the lives of the people involved in them. This is one story told in William Broughton's logbook, about his father, Henry Broughton.



P 9:30 K2AE APR-7 1959 Admitted to Ellis Hospital D4SP, per orders Dr. Wm. V. Bartlett*
1120 George A. Gillwater - 1414 Union St. -- Inspected Shack, etc.
P 8:30 *Examined K2AE in Shack

In April of 1959, George Gillingworth MD "examined K2AE in shack", and Henry Broughton was admitted to Ellis Hospital, and spent the next day having tests and examinations. (These clippings are also available as full pages in Appendix C.) K2AE is the callsign of Henry Broughton; as we will see here, William Broughton often refers to his father as K2AE, and to himself, in the third person, as W2IR, his callsign.



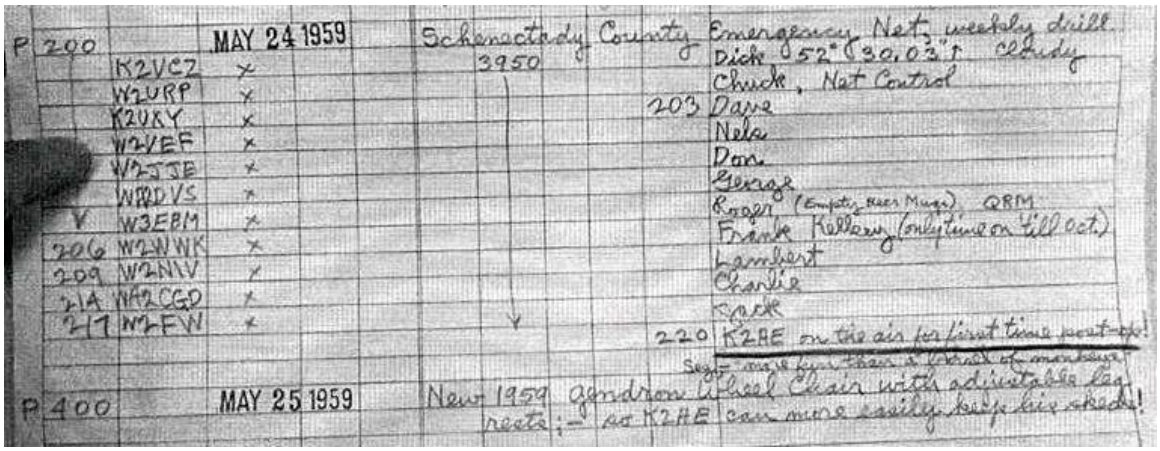
A 500 APR 14 1959 32° 29.27↓ CAVU[6]; calm.
530 K2AE W2IR – The Mighty Purple Pajama No. 3 – scheduled for surgery 7:45A.
100 " " Dr. Gilbert + Dr. Barlett report to me K2AE did fb[7] during
Unit surgeons: Drs. 4-hour major surgery. He will remain in Recovery Room
Bhaduri + Ozkumi for several hours before returning to his room B544.
Chief Anesthetist: Dr. Bell

Henry had surgery on the 14th of April ,1959. He returned home the next day, and, eight days later, he was able to eat breakfast at the kitchen table:

A 800 K2AE May 23 1959 First post-op bkfast at his usual place at kitchen table

[6] Clear And Visibility Unlimited

[7] fb: "Fine Business" so "did well" or "did fine"



P 200 May 24 1959 Schenectady County Emergency Net, weekly drill

K2VCZ x 3950 Dick 52° 30,03 ↑ Cloudy

W2URP x Chuck, Nat Control

[8 lines skipped]

217 W2FW x Jack

200 K2AE on the air for first time post-op!

Says "more fun than a barrel of monkeys"

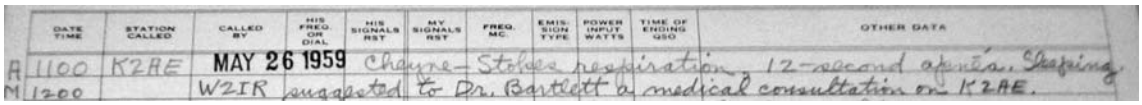
P 400 May 25 1959 New 1959 Gendron Wheel Chair with adjustable leg rests;- so K2AE can more easily keep his skeds!

On the 24th of May, K2AE was able to get back on the air again for the first time since his surgery, right after the Schenectady County Emergency Net weekly drill.

He says it is "more fun than a barrel of monkeys." On the 25th of May, a new wheelchair arrives; William Broughton notes that it's so "*K2AE can more easily keep his skeds*."[8]

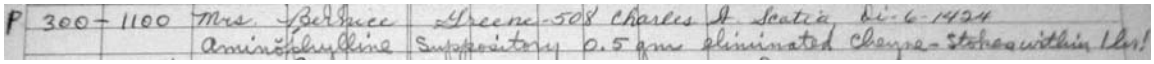
[8] His regular radio contacts, as part of the Schenectady County Emergency Net.]

His regular radio contacts, as part of the Schenectady County Emergency Net.



A 1100 K2AE MAY 26 1959 Cheyne-Stokes respiration 12-second apnea. Sleeping.
M 1200 W2IR suggested to Dr. Bartlett a medical consultation on K2AE.

On the 26th of May, 1959, Henry Broughton goes into Cheyne-Stokes respiration[9], and William Broughton suggests to the doctor that a medical exam may be in order.

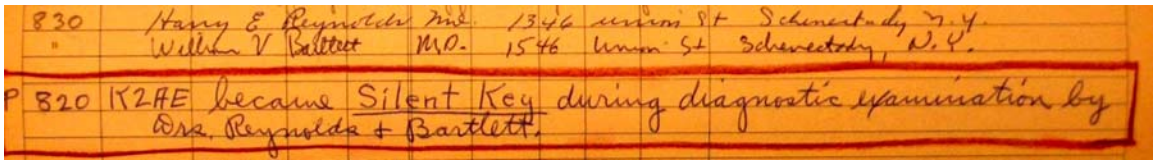


P 300- 1100 Mrs. Bernice Greene – 508 Charles St. Scotia Ri-6-1424
Aminophylline Suppository 0.5gms elmininated Cheyne-Stokes within 1hr!

Later on that day, a nurse arrives, who administers aminophylline, a drug that relaxes the lungs to make it easier to breathe. This solves Henry's breathing problem.

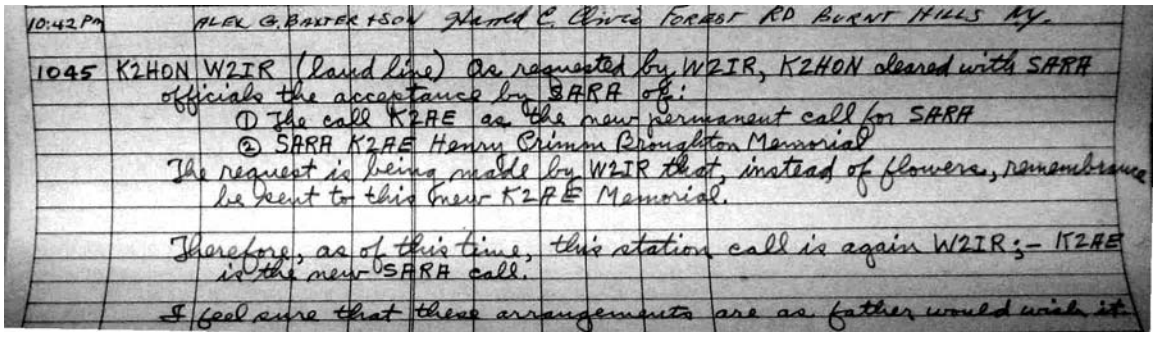
[9] Cheney-Stokes respiration is alternate periods of deep and shallow breathing. It is a classic sign of heart failure.

Five and a half hours after Mrs. Greene arrives, Drs. Reynolds and Bartlett sign into the log book. Once they have left, William Broughton fills in the time, and he records his father's death, circling the entry in red.



830 Harry E. Reynolds MD. 1346 Union St, Schenectday N.Y.
" William V Bartlett MD. 1346 Union St, Schenectadt N.Y.
P 820 K2AE became Silent Key during diagnostic examination by Drs. Reynolds & Bartlett

When a ham radio operator passes away, he is said to become a "silent key": his telegraph key, used for sending Morse code over the airwaves, becomes silent.


10:42 PM ALEX G. BAXTER + SON Harold C. Clived FOREST RD BURNT HILLS NY.

1045 K2HON W2IR (land line) As requested by W2IR, K2HON cleared with SARA officials the acceptance by SARA of:
① The call K2AE as the new permanent call for SARA
② SARA K2AE Henry Primm Broughton Memorial
The request is being made by W2IR that, instead of flowers, remembrances be sent to this new K2AE Memorial.

Therefore, as of this time, this station call is again W2IR; - K2AE is the new SARA call.

I feel sure that these arrangements are as father would wish it.

1042 PM Alex G. Baxter + Son Harred C. Clived Forest Rd, Burnt Hills N.Y.

1045 K2HON W2IR (land line) As requested by W2IR, K2HON cleared with SARA officials the acceptance by SARA of:

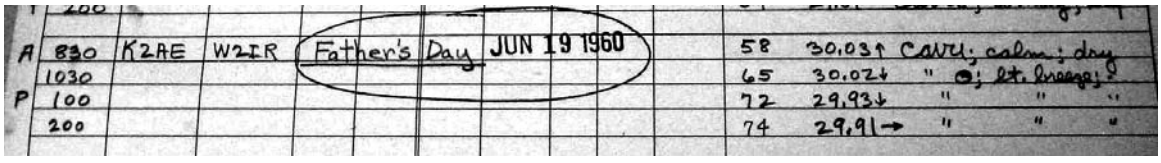
1. The call K2AE as the new permanent call for SARA
2. SARA K2AE Harry Primm Broughton Memorial

The request is being made by W2IR that, instead of flowers, rememberances be sent to this new K2AE Memorial.

Therefore, as of this time, this station call is again W2IR; - K2AE is the new SARA call.

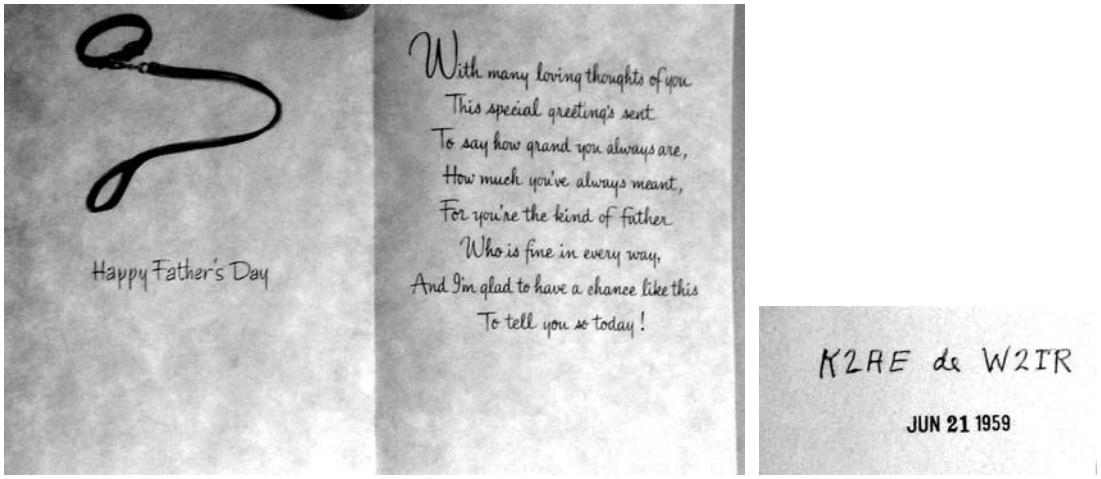
I feel sure that these arrangements are as father would wish it.

At 10:42, the undertaker signs into the log book. As soon as he has left, Broughton calls the head of the Schenectady Area Radio Association and arranges for the transfer of the K2AE callsign to SARA in perpetuity.


A 830 K2AE W2IR Father's Day JUN 19 1960 58 30.03↑ CAVU; calm; dry
1030 65 30.02↓ " ○; lt. haze;
P 100 72 29.93↓ " " "
200 74 29.91→ " " "

In June of 1959, a month after his father's death, Broughton notes Father's Day in his log without further comment beyond circling the entry. In the archives (not the log),

we can see he also writes a Father's Day card to his father. He addresses the envelope, but doesn't write on the card. The envelope says "K2AE de[10] W2IR" and a date stamp.



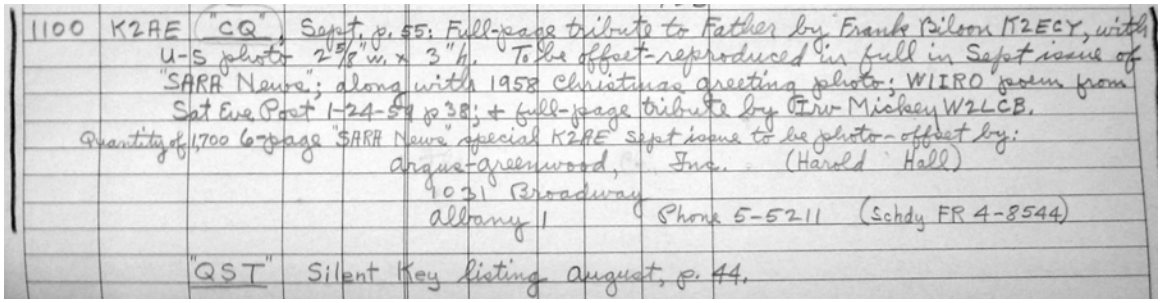
Inside, the message reads

> Happy Father's Day "With many loving thoughts of you/ This special greeting's sent/To say how grand you always are/How much you've always meant/For you're the kind of Father/Who is fine in every way/And I'm glad to have a chance like this/To tell you so today!".

It's a message that seems particularly painful in the circumstances.

In August, plans are finalized for a special issue of *CQ - The Schenectady Amateur Radio Association News* in memorium for Henry:

[10] Hams frequently use de to mean "from", probably originally from the French or Spanish word *de*, or "from". It's shorter than "from" and thus easier to send in morse code.


1100 K2AE "CQ", Sept. p. 55: Full-page tribute to Father by Frank Biloon K2ECY, with U-S photo 2 5/8" w. x 3" h. To be offset-reproduced in full in Sept issue of "SARA News"; along with 1958 Christmas greeting photo; W1IRO poem from Sat Eve Post 1-24-59 p38; + full-page tribute by Irv Mickey W2LCB.
Quantity of 1,700 6-page "SARA News" special K2AE Sept issue to be photo-offset by:
Argus-Greenwood, Inc. (Harold Hall)
1031 Broadway
Albany 1 Phone 5-5211 (Schdy FR 4-8544)

"QST" Silent Key listing August, p. 44.

1100 K2AE "CQ", Sept. p. 55: Full-page tribute to Father by Frank Biloon K2ECY, with
U-S photo 2 5/8" w x. 3 " h. To be offset-reproduced in full in Sept issue of
"SARA News"; along with 1958 Christmas greeting photo; W1IRO poem from
Sat Eve Post 1-24-59 p38; + full-page tribute by Irv Mickey W2LCB.
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Argus-Greenwood, Inc. (Harold Hall)
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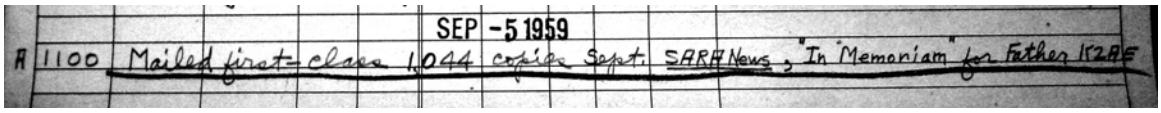
Albany I Phone 5-5211 (Schdy FR 4-8544)

"QST" Silent Key listing August, p. 44


SEP -5 1959
A 1100 Mailed first-class 1,044 copies Sept. SARA News, "In Memoriam" for Father K2AE

A 1100 Mailed first-class 1,044 copies Sept. Sara News, "In Memorium" for Father K2AE

In September, Broughton mails out copies of the Henry P. Broughton Memorial issue of *CQ - The Schenectady Amateur Radio Association News* to Henry's extensive Christmas card mailing list.

Through the pages of this logbook, we can track Henry's sickness, surgery, return from hospital, his final brief return to ham radio, and death, as well as the transfer of his callsign to SARA and the memorial issue of the newsletter. Other parts of the log – not necessarily shown here, for reasons of space – document the

establishment of the Henry P. Broughton Memorial Fund, which later turned into a scholarship fund for young Schenectady-area hams.[11]

The log also shows William Broughton's feelings of loss for his father: Father's Day noted and underlined in the log, another noted and underlined entry when a ham mentions that William Broughton sounds like his father. When William Broughton opens his car door and it is hit by a passing car, he mentions in the log how *"K2AE frequently warned me of the hazards of using the left door into passing traffic: - here is an example of the wisdom of this council."* (Feb 4 1960) It is impressive how extensively this seemingly official, tightly categorized form is used to document a clearly powerful, and painful, and ultimately human and non-technical event.

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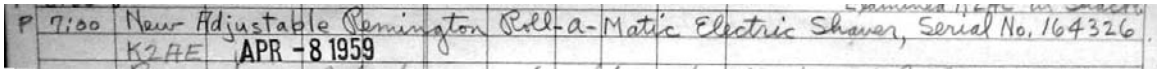
[11] I would be remiss not to point out that Henry and William Broughton were responsible for what continue to be generous scholarship funds after their deaths. The 1998 issue of the American Amateur Radio League (http://www.arrl.org/arrlletter/98/980821/) reports on the transfer of the now $100,000-seeded Henry Broughton K2AE Memorial Scholarship to the auspices of the AARL. There is also a "William G. Broughton Fellowship for Excellence" award at the Schenectady High School and the "William G. Broughton Fellowship in Creative Expression" at Murray State, in Kentucky. (I don't currently understand that one.) In 2002, the William G. Broughton Charitable Private Foundation gave $50,000 for scholarships at Schenectady Community College.

V. Analysis: Identity

A. Ham Identity *vs.* Technical Identity and Geek Identity

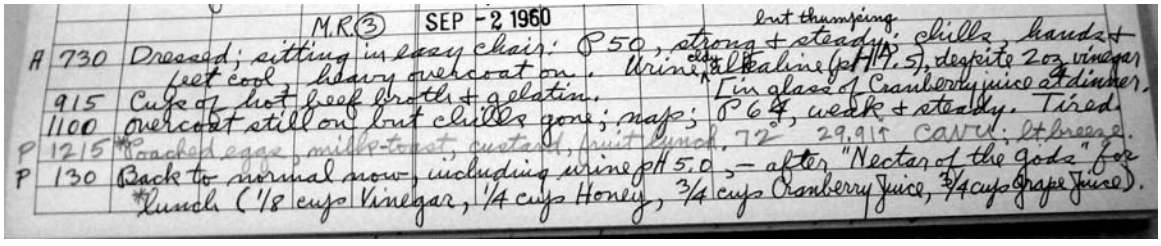
Dunbar-Hester's notion of "geek identity" (Dunbar-Hester, 2003, currently in progress) is based on the self-definition of her highly technologically literate subjects, who have claiming the perhaps disparaging term as their own, hosting "Geek Nights" at their houses to build and troubleshoot technological equipment. Her subjects self-identify as geeks.

It's interesting to note how even Broughton's record of his purchase of a shaver reflects his 'geek identity', with full product name and serial number.



P 7:00 New Adjustable Remington Roll-a-Matic Electric Shaver, Serial No. 164326

His own medical records recorded in the log seem to reflect a similar, arguably geeky, attention to numerical detail, resplendent with temperatures, pulse rates, and even urine pH.



M.R.(3) SEP –2 1950

A 730 Dressed; sitting in easy chair: P 50, strong + stead but thumping; chills, hands + feet cool, heavy overcoat on. Urine vry*[?]* alkaline (pH 7.5) despite 2oz vinegar [in glass of cranberry juice at dinner.

915 Cup of hot beef broth + gelatin.
1100 Overcoat still on but chills gone; nap; p 64, weak + steady. Tired.
P1215 *Poached eggs, milk-toast, custard, fruit lunch, 72° 29.91↑ *cavu; lt breeze.*
P130 Back to normal now, including urine pH 5.0, - after "Nectar of the Gods" for *lunch (1/8 cup Vinegar, ¼ cup Honey, ¾ cup Cranberry Juice, ¾ cup Grape Juice)

It seems as if Broughton's notion of his own identity seems to correspond closely with Dunbar-Hester's notion of geek identity. Broughton's self-image also corresponds well with Haring's notion of "technical identity" as discussed above.

But I question to what degree either Broughton would identify with the non-ham examples both authors use. In particular, I would argue that "ham identity" has certain characteristics that distinguish it from either.

For example, there is a commitment to public service, to the community and to the nation, that is a key part of what makes hams hams. It is hard to imagine the American computer hacker community answering a call from the United States government for assistance in the event of war, in the manner of the ham radio community answering a call for radiomen in both World Wars, as documented in the pages of QST, the ham magazine. More than anything else, that reflects a change in attitudes of the public towards government in general, but the point remains. Even today, there is a commitment in the ham community to public service, particularly as it applies to providing communication in emergencies and natural disasters, such as through the Radio Amateur Civil Emergency Service. The recent focus on 'homeland security' has been used by amateur radio as a chance to emphasize this part of their role, as shown by this excerpt from a webpage by Tony Curtis, radio ham, professor of

Mass Communication at the University of North Carolina at Pembroke, and editor of Space Today Online, an newsmagazine about space and astronomy.

> Ham radio is essential to homeland security in the United States. Our service is a dispersed and decentralized communications system that can't be shut down by terrorist attack. While public safety agencies rely on central dispatch stations, amateur radio operators can go on the air just about anywhere anytime. Hams are trained communicators with technical knowledge that prepares them to put their stations on the air at remote sites quickly, creating makeshift facilities when needed. Amateur radio operators don't have to wait for technicians to arrive to repair equipment or re-program computers. Hams can do it themselves on the fly.
>
> http://www.spacetoday.org/k3rxk/EmergencyComms.html (2003)

Compare this response to the hacker community. Hackers see themselves very differently with respect to the government.

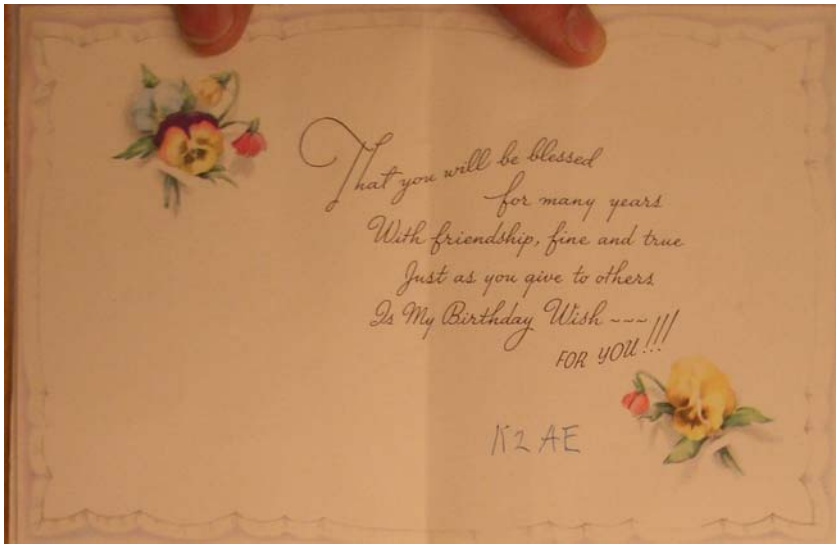
There's also a commitment to education and training that is an intrinsic part of amateur radio. The FCC's licensing structure creates the conditions for formalized transfer of knowledge to new generations of hams: nearly all local radio clubs provide classes for different levels of licensing, and work with local youth groups, such as boy and girl scouts. It is this formalized nature of information transfer that characterizes ham radio: as I have asserted elsewhere (Kaye 2004), transfer of information for education is a characteristic of hacker/tinkerer societies, as a transfer mechanism in their reputation economies, but rarely with this degree of formality.

There is a formalized element of community in ham society which seems significantly different from that in other amateur situations: one aspect is clearly the intrinsic role of communication as the aim of the amateur radio. However, there is a shared history of battles over the airwaves, originally with the Navy and in the last

fifty years with the FCC, and with others who have an interest in being allocated sections of the spectrum: the military, CB radio in the seventies, and those interested in increased spectrum space for cellular telephones, packet radio, and wireless computer networking.

There is further an element of local community that is important to the ham. For a long time, the limited broadcast range defined natural areas of focus, particularly when controlled by maximum wattages under FCC regulations. Modern equipment has made broadcast and receiving ranges effectively infinite, to the degree that some radio hams have taken to deliberating imposing limitations on the use of their equipment as so to increase the sensation of competition. However, the focus on emergency preparedness against natural or man-made disasters seems to encourage thinking locally, which manifests itself in other ways, such as the role of the local radio club. It seems reasonable, then, to propose ham identity as something unto itself – and furthermore, something that extends beyond the technical.

For example, both Broughton's use of their 'official' callsigns to refer to each other in casual written communication.



This is the inside of a birthday card Henry Broughton gave to William Broughton in 1950. The envelope just says "W2IR", and, in a different pen (presumably added later) "'50". Inside, Henry has signed the card, *K2AE.* The archives are rife with examples like this; birthday cards, Christmas cards, and throughout the logbooks. It's interesting to note that William refers to himself as W2IR in the logbook. This may be encouraged by the format of the logbook, which has a column labeled "FROM" – except that when Broughton is calling out, he generally just writes an X in that column. There are also numerous examples in the archives of notes and cards to and from both Broughtons in which they refer to themselves and each other this way, in both handwritten and typewritten notes. This particular aspect of technical identity deserves deeper study.

B. A Male Identity: The Absence of Women

William's father and Henry's wife, Jane Tinkham Broughton dies in 1948; one is left with the impression that she is in some ways a bit player in the family, at least as far as ham radio is concerned and as documented in William Broughton's archive. She is not involved with ham radio, and so much of William and Henry's relationship is mediated through the medium that it seems as if she becomes left out of the intimacy that develops. Now, that may be an artifact of the archive, which privileges relationships documented on paper, or an artifact of my focus on the radio as a means of transmission, but it's an impression that seems reasonably coherent across different media: I was only able to find one photograph of her, with a paired photograph of Henry, unlike the many photographs of both William and Henry spread throughout the archive. The archive contains a collection of birthday and father's day cards, invariably addressed or signed "W2IR" or "K2AE" as appropriate: with the exception of letters to both parents during William's time at Cornell, there is little evidence of correspondence between William and his mother.

The archive also contains a collection of love letters from various relationships William was involved with, from the 1930s to the 1950s. The five or six relationships seem to have much in common. Many of the letters rebuke William for not spending enough time on the relationship, for not calling, for not writing enough. It seems that one aspect of this distance was William's devotion to his parents: one letter from "Ruthie" from the late forties says:

It is clear that you are never going to marry me, or not for a long time, as you always give the best of everything to your mother and father. (Box 38)

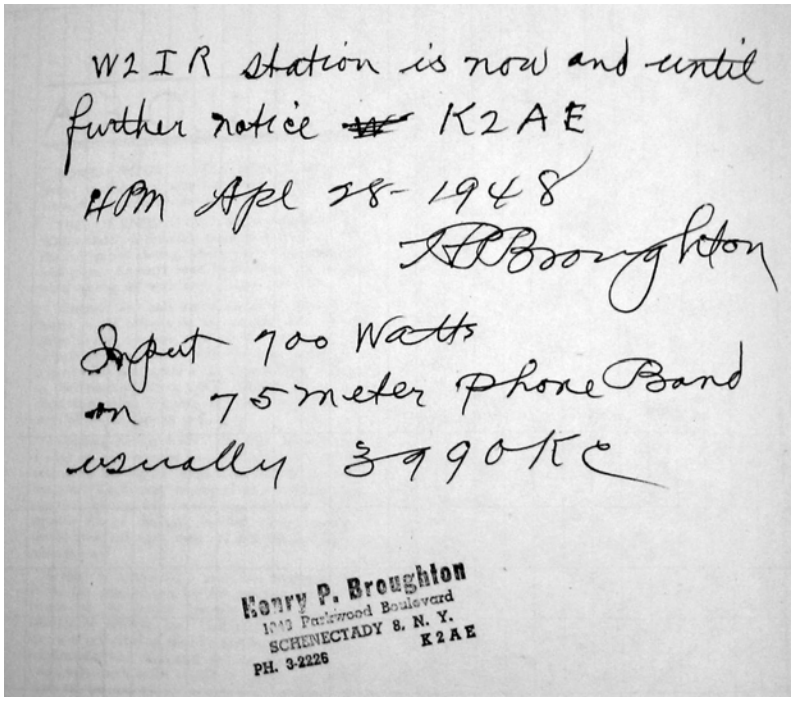
Perhaps this indicates that William's mother was more significant in his life than the archive has led us to believe. But it also seems clear that his devotion to ham radio was a significant time sink. In the early forties, William was visiting the General Electric company store – where employees could purchase products for 65 cents on the dollar -- for some electronic component or other more than once a week. (Box 103) It seems it was more a matter of where his priorities lay.

Haring's 2003 paper *The "Freer Men" of Ham Radio* documents mid-century hams' use of their technology and culture to provide social and spatial distance from their wives. The 'ham shack' – be it a separate building as implied by the name, or just a corner of a basement, attic, or spare room – provided isolation from the immediate surroundings of the domesticated, feminine household. This is similar to the approach taken by Kleif & Faulkner in their (2002) explanation of men's use of and relationship to technology. The Broughtons' bachelor existence for the last decade of Henry's life was perhaps the ideal ham situation, without interference and with another ham for company. Haring notes the elegant parallel between Virginia Woolf's prescription of "a room with a lock on the door" for the woman writer with the FCC's cold war era licensing rules, which included a pledge by the amateur that "the station will be under my exclusive control" and "the equipment will be inaccessible to unauthorized persons." Sharing a house with only another licensed

ham neatly solved at least the latter problem. Perhaps the Broughtons were the "Free-est Men" of Ham Radio.

VI. Further Research Directions

In April 1948, Henry transferred his callsign K2AE to his son, William.


W2IR station is now and until further notice ~~W~~ K2AE
HPB Apl 28- 1948
H P Broughton
Input 100 Watts
on 75 meter Phone Band
usually 3990 Kc
Henry P. Broughton
1012 Parkwood Boulevard
SCHENECTADY 8, N. Y.
K2AE
PH. 3-2226

It's not clear to me why this occurred, or what this meant, but I believe it is important. What does it mean to transfer a callsign this way, when, as we've seen, so much of both father and son's notion of themselves is wrapped up in their amateur identity, residing in the callsign? Furthermore, Henry Broughton continued to refer to himself as K2AE in correspondence after this date, such as the 1950 birthday card above.

A second avenue for further research is both Broughton's adoption of the radio callsign as a nickname – for themselves, and for each other, in domains far beyond the purpose for which the FCC, at least, originally assigned the callsign. Clearly, the Broughtons' own identities as hams was important to them. But ham callsigns changed over time: the Henry P. Broughton Memorial issue of the Schenectady Area Radio Association newsletter (Biloon 1959) notes that over his life as a ham, Henry Broughton held the callsigns 9SD, W9SD, 9JM, 8NJ, and W2OIV before K2AE. After WWI, William wrote to the Secretary of Commerce asking for the return of his pre-WWI callsign – and was rejected, clearly to his disappointment. The role of names and naming has been studied in anthropology: perhaps this would provide an avenue for deeper understanding.

Finally, I think there are two theoretical directions this work could continue. The first focuses around Foucault's *Discipline and Punish*, and the tension between the cellular organization of the log book and the uses to which it is put; the second involves a deeper understanding of the role of the individual in science and technology, much as Giddens provided for the field of sociology with his structuration theory.

VII. Conclusions

It is my sincere hope that the role of the amateur/tinkerer/hacker will become more recognized in the field of science and technology studies.[12] Haring's work is a forerunner in the field, and it is my hope that the session Josh Greenberg and I are organizing at 4S in August will provide an opportunity for discussion and discourse around the topic – and, I particularly hope, an edited volume or special issue of an appropriate journal on the role of amateurs.

I further hope that this piece of research can contribute to this emerging field in a novel manner: there is an opportunity to understand the ham in historical context through the logbook, which, while it may provide an uneven view of the ham's activities, is a significant historical resource. I do feel that there is a theoretical construct missing from the field of science of technology studies to explain the role of the individual in technology: it's possible that this should be Gidden's structuration

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[12] A couple more references have since come to light, which I need to understand properly before putting in here. But this is a good place to put them for now so I don't loose track. They include

- Yuzo Takahashi, "A Network of Tinkerers" Technology and Culture 41 (2000) 400-484
- Josh Greenberg's thesis (Ch. 1)
- O'Connell in Technology and Culture
- Ruth Oldenzeil's article on a GM competition for boys in "Boys and their Toys", Rpt from T+C Jan 1997
- Helen Mialet's beautiful article in SSS on Hacking and Mr. X

theory (1984), but it may be that S&TS needs a 'local' reading to understand the role of the amateur with respect to, for example, ANT and SCOT.

In addition to the importance of the logbook in the documentation of a ham's life, I hope to have also shown that ham identity is different in significant ways from technical and geek identity: perhaps the most significant component is simply that the hams in question identity themselves as hams first, and geeks or technologists second. I also hope to have shown an alternative – and, indeed, perhaps further underscored – Haring's notion of hams as "freer men".

Above all, the experience of historical archive work has been a learning experience: I am glad I took the opportunity to dive into an entirely new way of doing research, rather than the (extremely tempting) option of comparing a few books and preparing a bibliography. Reading through this paper, I am in some ways disappointed that I was not able to spend as much time developing the ideas behind it as I had hoped: in particular, I feel that Foucault has a great deal to offer in understanding Broughton's use of the log book for purposes other than that intended by the FCC, and I feel I was not able to do it justice. But above all, I feel that this assignment has been successful, and I feel proud of a new understanding of the role of the amateur.

Acknowledgements

This paper benefited more than anything else from extensive comments and suggestions from Professor Ron Kline, for whose Spring 2004 class this was originally

a final paper. The paper was originally inspired by a remark by Josh Greenberg at Simeon's on the Ithaca Commons on September 1st 2003, the first day I met him, about the fact that S&TS didn't seem to understand hacking. I've benefited from conversations about this paper with Josh, Tarleton Gillespie, Phoebe Sengers, Janet Vertesi, Shay David, Lisa Onaga, Allan Dafoe and Cristina Dunbar-Hester. I was initially inspired by mentions of Broughton in Kristen Haring's excellent and very readable dissertation (2002). I'd also like to thank Chris Hunter, Director of Archives at the Schenectady Museum and George H. Williams at the Schenectady Area Radio Association for their help in finding out how to pronounce Broughton. (It's Brow-ton.)

References

Biloon, Frank, K2ECY. (1959). The Mighty Purple Pajama III: Henry P. Broughton, K2AE. CQ, The Newsletter of the Schenectady Area Radio Association. Henry P. Broughton Memorial Issue (55) September, 1959.

Broughton, William G. Cornell Archive #2341. Notably

- Box 2: Early correspondence, diaries, letters
- Box 11: General Electric training courses
- Box 12: Universal aircraft radio equipment: WGB's war work
- **Box 21: Log books.**
- Box 24: 200 Meters & Down and other books
- Box 25: Jane Tinkham Broughton papers; Henry Broughton citizenship papers
- Box 37, 38: Personal letters (love letters, etc)
- Box 59, 60: Early correspondence, diaries, letters.
- Box 103 (one of them): Cornell photos (1920s), Tesla photos/documents
- Box 105: cancelled checks and bills, 1935-40 or so.
- Box 107: Cornell alumni materials; GE Ham News Society

Continelli, Bill, W2XOY. (1996, 2001) The Wayback Machine: The History of Amateur Radio #1-14. Originally written for the Schenectady Amateur Radio Club; available at www.ham-shack.com/history01.html, history02.html, etc.

DeSoto, Clinton B. (1936; 1981, 2001) 200 Meters and Down: The Story of Amateur Radio. American Amateur Radio League Press. Broughton Collection, Box 24.

Douglas, George H. (1987) The Early Days of Radio Broadcasting. McFarland & Co., Publishers, Jefferson, North Carolina and London.

Douglas, Susan. (1987) Inventing American Broadcasting 1899-1922. John Hopkins University Press, Baltimore and London.

Dunbar-Hester, Cristina. (2003) Geeks, Meta-Geeks, and Gender Trouble: Activism, Identity, and FM Radio. DRAFT – DO NOT CITE OR CIRCULATE. (I'm only citing a little bit here. Forgive me Cristina. But it's just so good.)

Haring, Kristen. (2002) Technical Identity in the Age of Electronics. Ph.D Dissertation, Harvard University.

Haring, Kristen. (2003) The "Freer Men" of Ham Radio. How a Technical Hobby Provided Social and Spatial Distance. *Technology and Culture* 44(4) 734-761.

ezproxy.library.cornell.edu:2208/journals/technology_and_culture/v044/44.4haring.pdf

Foucault, Michel. (1977). Discipline and Punish: The Birth of the Prison. Trans. Alan Sheridan. New York: Vintage, 1977, pp. 3-8

Giddens, Anthony. (1984) The Constitution of Society. University of California Press.

Kaye, Joseph 'Jofish'. (2004) Hacking: An understudied practice in STS. Final Paper, STS.525. Available at www.jofish.com/writing

Kleif, Tine and Faulkner, Wendy. (2002) Boys and their Toys: Men's Pleasures in Technology. Wie natürlich ist Geschlecht? Gender und die Konstruktion von Natur und Technik. U. Pasero and A. Gottburgsen. Wiesbaden, Westdeutscher Verlag. 8. www.rcss.ed.ac.uk/sigis/public/backgrounddocs/BOYS_AND_THEIR_TOYS-ZIF8.rtf

Latour, Bruno. (1987) Science in Action. Harvard University Press, Cambridge MA.

Yates, JoAnne. (1993) Control Through Communication: The Rise of System in American Management. Johns Hopkins University Press, Baltimore MD.

APPENDIX A: A Slightly Longer History of Amateur Radio in the United States [13]

The Beginning, the *Titanic*, and The Radio Act of 1912

Amateur radio began in the United States around the turn of the century. Radio communication had been demonstrated before this point, but it was in these first few years that amateur radio became a force distinguishable from the commercial companies, notably the British company Marconi, their German competitors Telefunken, and the American competition: De Forest and White, and Fessenden, Given and Walker. They were also easily distinguishable from the other significant force on the airwaves: the Navy. The airwaves were getting crowded – notably due to the technical limitations of the equipment being used at the time.

The dominant – indeed, the only – technology for radio transmission at the time was the spark-gap transmitter. This basically produced a controlled amount of static. An idea of the effect can be produced by listening to an AM radio, and then turning on an appliance – an electric shaver, or a vacuum cleaner, say. Spark sets would produce a high voltage inside a spark coil, which would jump across a gap, which was coupled to an antenna. The wireless operator would key this signal on and off to produce the code. The key technical problem with this was the high

[13] Which Is Not Particularly Edited Yet, But I Just Can't Bring Myself To Throw It Away But I'm Going To Do So Before This Gets Even Close To Being Publishable But In The Meantime It's Not Bad And Sort Of Interesting But Under Referenced And Not Really Edited, Did I Mention That?

bandwidth of the signal produced. Continelli (2001, #1) suggests that a "state of the art" 1906 transmitter operating on 400 meters (750 khz) would actually generate a signal from about 250 meters (1200 khz) to 550 meters (545 khz) – and transmitters were no better. Producing a signal that wide meant that a great deal of power was necessary, and that a signal produced at a supposedly given frequency would go only a short distance.

This was particularly relevant in the case of ships, with their antenna lengths restricted to frequencies between 450 and 600 meters (666 to 500khz). You'll note from above that one spark station could easily take up this entire spectrum, and as such it was necessary for all other stations in the area to cooperate and politely stand by while others were transmitting. This was frequently not the case: there was competition between commercial stations who had no wish for their competitors to get their message through, and frequent from the Navy who felt they had a right to own the airwaves to transmit important official messages. Susan Douglas (1987) quotes the Navy Department's 1909 *Annual Report* as complaining about the increasing numbers of "seemingly semi-intelligent and wholly irresponsible operators" who "at any time through carelessness or stupidity may render hopeless the case of a shipwreck." They used this as fuel for their argument for "laws governing the conduct of all wireless stations" to be passed. (S. Douglas 210)

The 1910 Wireless Ship Act was passed in response to this perceived cacophony on the airwaves, spurred on by the collision of the *Republic* and the

Florida in January 1909, in which amateur radio operator Jack Binns received the *Republic*'s distress call and alerted the authorities, saving hundreds of lives. It stated that any large ship must have a radio and operator on board. In the circumstances, this was relatively uncontroversial, but the same cannot be said for other radio-relate bills that worked their way through Congress at the time.

The Greene Bill in the House, and the similar Depew Bill in the Senate had similar aims: to regulate use of the airwaves by allocating different wavelengths to amateurs and the government, the Federal licensing of companies and operators, and a ban on the transmission of fraudulent messages. They were both attempts to secure the priority of governmental messages over amateur; both failed to be passed.

It took the sinking of the *Titanic* in April of 1912 to spur Congress to pass a coherent wireless bill. Confusion reigned after the sinking. The *California* was less than twenty miles from the *Titanic*, but the sole wireless operator was sleep at the time, and as the ship was passing through the same ice field as the *Titanic* the captain had shut down the ship's engines for safety, depriving the radio of power. The *Lena* was just 30 miles from the *Titanic*, but unequipped with a radio. The first ship to answer the call was the German liner the *Frankfurt.* While the *Frankfurt* wireless operator was informing his captain, the *Carpathia* and Cape Race chimed in – in fact, it was a lucky fluke that the *Carpathia*'s wireless operator had returned to his post when he did to hear the *Titanic*'s mayday. When the *Frankfurt* operator came back to get more information, the *Titanic*'s radio operator, Jack Phillips tapped back "SHUT

UP, SHUT UP, YOU FOOL. STAND BY AND KEEP OUT." The *Titanic,* the *Carpathia* and Cape Race all used Marconi stations – the operators being paid by Marconi, not by the shipping companies themselves – and the *Frankfurt* used their German competitor, Telefunken. (Continelli #2)

But the true impetus for wireless reform occurred on the ground. An unidentified amateur claimed to have heard the news that the *Titanic* was moving safely towards Halifax, which propagated to the press: a later explanation that perhaps two messages, "Are all *Titanic* passengers safe?" and "Towing oil tank to Halifax" had been combined was generally seen as unsatisfactory. Other wireless messages appeared, stating that all passengers were safe and the ship was being towed in. However, these were not coming from the *Carpathia*. For one thing, her wireless only had a range of 150 miles. For another, the *Carpathia* wireless operator only made a few transmission to the *Olympic*, in which he tapped out the list of survivors, some coded messages from Bruce Ismay, President of White Star Lines, and then shut down. The White Star Line was insisting everyone was safe, despite having received full details from the *Olympic*: it took amateur operator David Sarnoff who detected the *Olympic*'s faint signals and broke the story.

The hearings back in New York revealed the cause of this radio silence: Marconi himself had made an agreement with the New York Times for an exclusive story, and had sent wireless messages to the *Titanic*'s surviving radio operator Harold Bride and the *Carpathia*'s Harold Cottam saying "MARCONI COMPANY TAKING

GOOD CARE OF YOU – KEEP YOUR MOUTH SHUT – HOLD YOUR STORY – YOU WILL GET BIG MONEY – NOW CLEAR". As such, Marconi was presented at the hearing by the chairperson Senator William A. Smith as a man willing to subjugate the public good to his desire for a monopoly over wireless equipment and broadcasting spectrum.

With this story behind him, Senator Smith introduced a bill in the Senate that became the Radio Act of 1912, ordering all large ships to have a radio with auxiliary power supply and continuous operator coverage. To limit the Marconi Company's control over the airwaves, it would now be necessary to acquire licenses from the Secretary of Commerce for any radio use. Each government, marine or commercial station would be authorized a specific wavelength, power level and hours of operation. Given that it was a "well known fact" that only long wavelengths were useful, amateurs were banished to below 200 meters, where it was believed they would be able to communicate no more than 25 miles at a time – ironically giving the amateurs the chance to develop short wave radio, with ranges far exceeding anything possible at the time.

WWI & Post WWI

With the outbreak of WWI, the Chief Radio Inspector of the Department of Commerce closed all radio stations for transmitting or receiving until further notice. At the same time, however, the Navy realized that they had a shortage of qualified radio operators, and contacted H.P. Maxim, head of the Amateur Radio Relay League

and editor of ham journal QSP, asking for his help in locating 500 amateur volunteers in the next ten days. This call, and subsequent ones, were successful: by the close of hostilities in 1917, an estimated 3000 of the 6700 Navy radiomen in service had been drawn from the ranks of radio amateurs. (DeSaul, Continelli #4)

A series of bills and debates in the Senate and in the House ensued as the Navy and the amateurs battled it out for control of airspace. Secretary of the Navy Josephus Daniels encouraged the passage of the Poindexter Bill in the Senate and the Alexander Bill in the House, both of which kept control of the airwaves in the hands of the Navy despite the end of the war. After those failed, the Navy dragged its feet on relinquishing their control over the spectrum until Senator Greene brought up a motion questioning their delays. On September 26th, 1919, the Naval Communication Service announced the removal of all restrictions on amateur use of radio, returning to the terms of the 1912 Radio Act.

In 1921, the Directory of Naval Communications and Hiram Percy Maxim started the Navy Communications Reserve: an organization aimed at having a supply of educated and willing radiomen available to the Navy in the event of war. However, the flip side of this arrangement was that the amateurs had an opportunity to define themselves as not just casual hobbyists, but as a technological elite and an asset to the nation. The role of hams became less fundamental on the airwaves, as the change to continuous wave technology and the rise of commercial and semi-commercial broadcasting became the primary issues of the airwaves. The Department

of Commerce tried to shore up the Radio Act of 1912 with regulations in 1922 and 1924, but these functioned only as of a gentleman's agreement, without official penalties or legal strength if they were challenged. 1926, an Illinois District Court decreed that there was no Federal Law to permit the Secretary of Commerce to regulated the airwaves, and radio disintegrated into a free-for-all. The Radio Commission acted quickly to bring order to the chaos and the resulting Radio Act of 1927 that gave the Federal Radio Commission power to classify and regulate all aspects of radio stations, complete with criminal penalties for violations. Amateurs were left alone at the bottom of the airwaves: compared to the commercial broadcasters, they were seen as law-abiding and good citizens, which would stand them in good stead.

This identity was strong enough to enable the United States delegation to the International Radiotelegraphic Convention in Washington DC to persuade the other delegates to greatly enlarge the proposed global allocation of the radio spectrum to amateurs. While they had to, eventually, accept a reduction in amateurs' bandwidth of about a third, the result was overall positive, and gave international recognition to the ham radio movement.

APPENDIX B: WWII & Radio Amateurs: Through the Pages of QST

Amateur was FCC order no. 99, effective June 8th 1942: Registration of Radio Amateurs Not Licensed; the second, and culminating event was FCC order no. 101, effective June 19th 1942. *Ordered*

(a) every holder of an amateur radio station license in possession of a radio transmitter

(b) every other person or organization in possession of a radio transmitter which is owned by a holder of an amateur license

apply for registration of such transmitter with the Commission not later than August 25th, 1942. Each transmitter to be separately registered. All application forms to be returned to the Secretary, Federal Communication Commission, Washington DC.

It is further ordered that every holder of an amateur radio station license who neither owns nor has an amateur radio transmitter in his possession shall so report to the Commission, in writing, and shall notify the Commission of his present address not later than August 25th, 1942, and any change of address within 5 days.

The first thing that the researcher going through the WWII issues of *QST, Devoted Entirely To Amateur Radio* notices is that the magazine exists. The FCC banned all amateur radio transmission or reception from 1942 to 1946, and yet for four years the magazine managed to find enough to write about – and enough advertising revenue – to continue publishing with no appreciable change in size or

format. This is particularly interesting when compared to the fate of *QST* over the course of WWI, when it was suspended from October 1917-May 1919.

QST's preparation for WWII is clear from the Twenties onwards, and becomes even more clear from the beginning of the Forties. The war has begun in Europe in earnest, and despite initial attempts at maintaining neutrality, it is clear that the United States was inevitably going to be involved in the conflict. *QST* puts a great deal of effort into framing amateur radio in general and amateur radio operators in specific as a great asset to the nation. The editorial column, *It seems to us…* is full of enigmatic hints about how the leaders of the amateur radio movement are meeting with top officials in Washington about topics that are so secret they cannot even be hinted at in print, but clearly concern the utility of amateur radio to national defense.

In February of 1940, *QST* begins the monthly publication of *Naval Communication Reserve Notes,* a column written by a different officer in the Naval Communication Reserve each month. Each column typically begins with some topic showing the importance of amateur radio to the navy, continues with the importance of the navy to amateur radio, and concludes with an injunction for hams to join up.

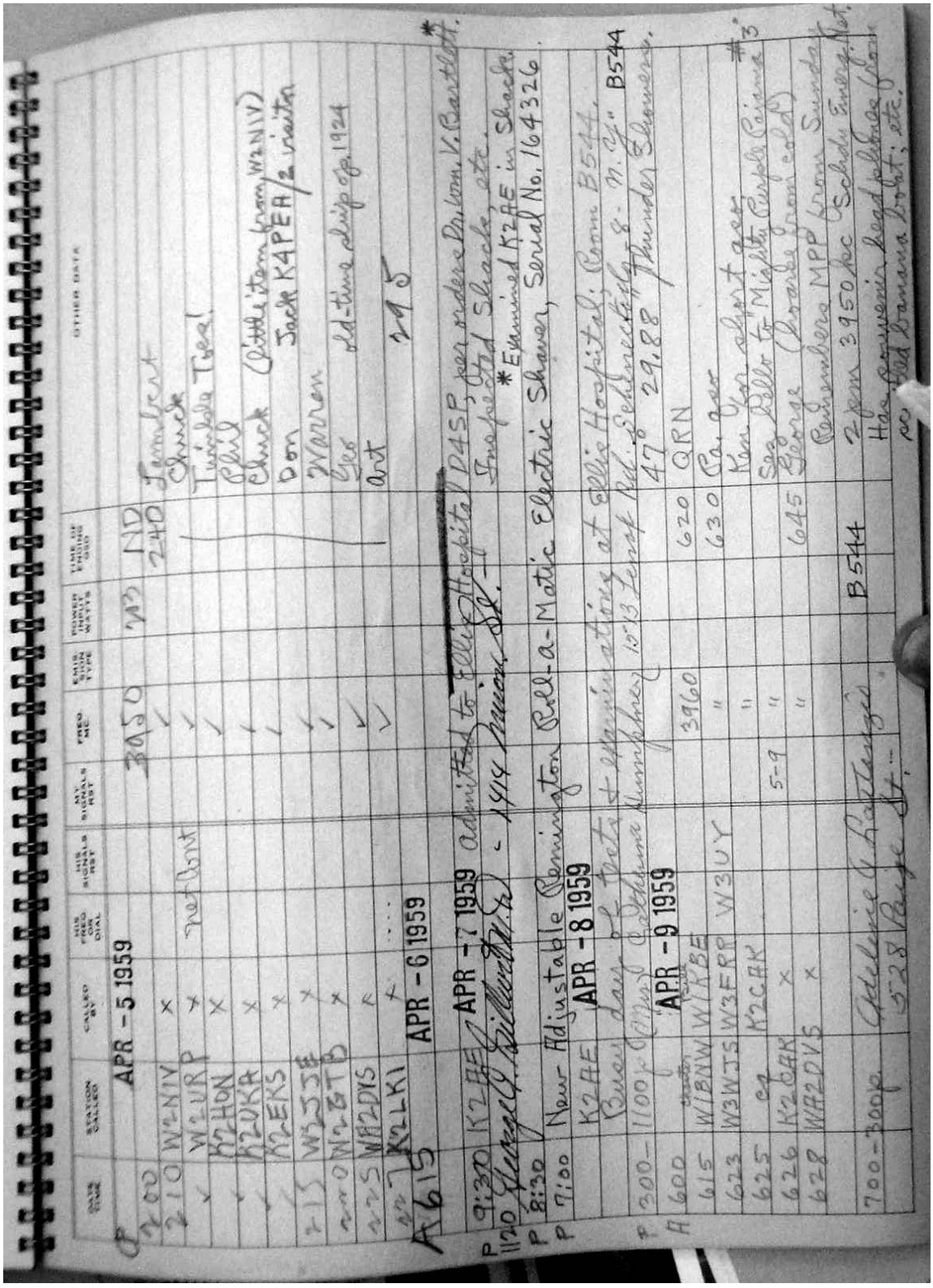
It is clear that both the Navy and the Amateur Radio Relay League are doing their best to prevent a repetition of the animosity between the two organizations in the first two decades of the century: a typical column is "The Navy and the Amateur" by Lt.-Cmdr. John L. Reinartz, from September 1940:

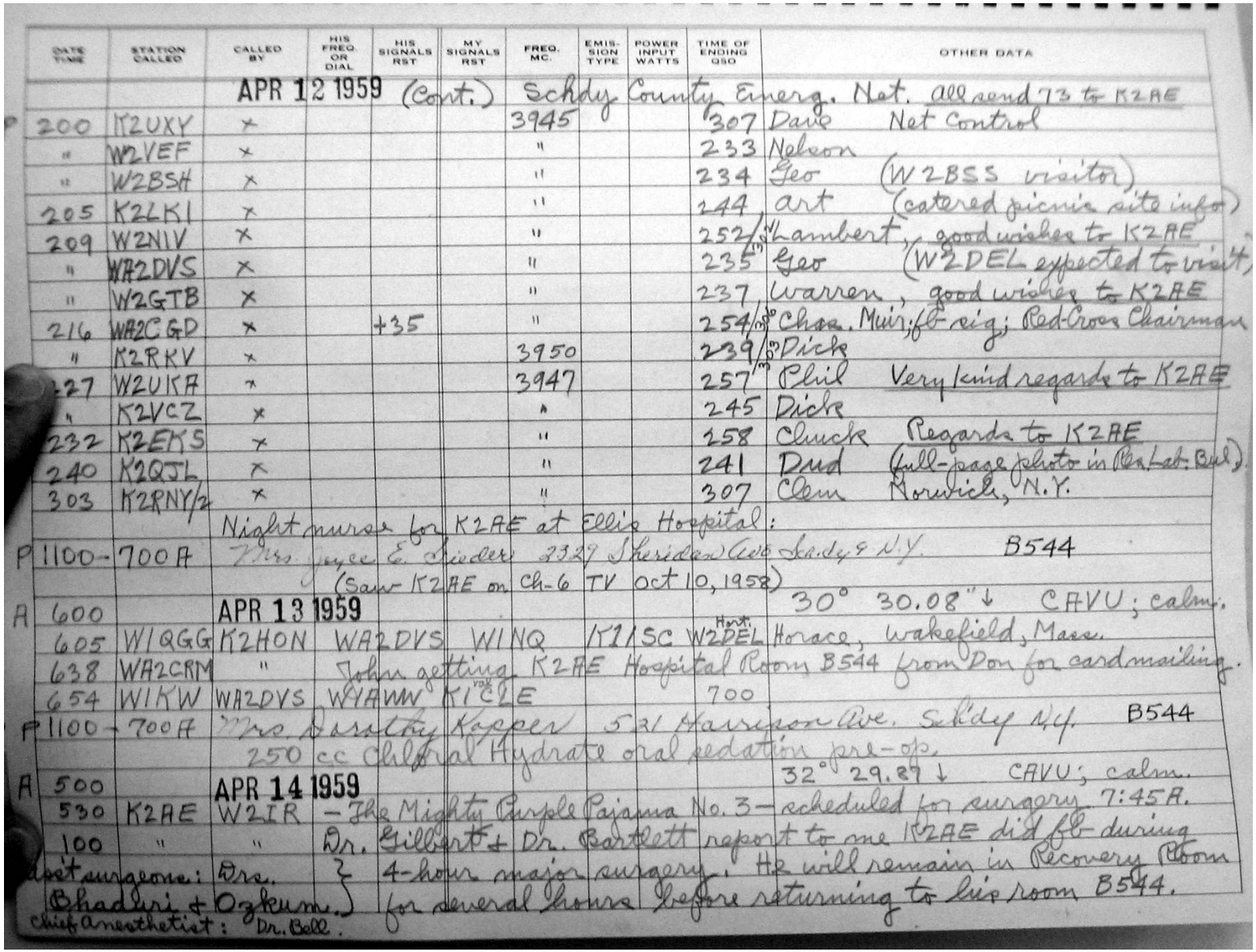
"Ever since the first World War showed the value of the American radio amateur to the Military Services of the United States, the amateurs have had in the U.S. Navy a friend who has stood them in good stead… Particularly does it harbor a warm spot in its heart for the American amateurs who have done so much to point out the usefulness of those higher frequencies previously assumed to have no military or commercial value."

After lauding the Reserve and amateur contributions to it, the article finishes:

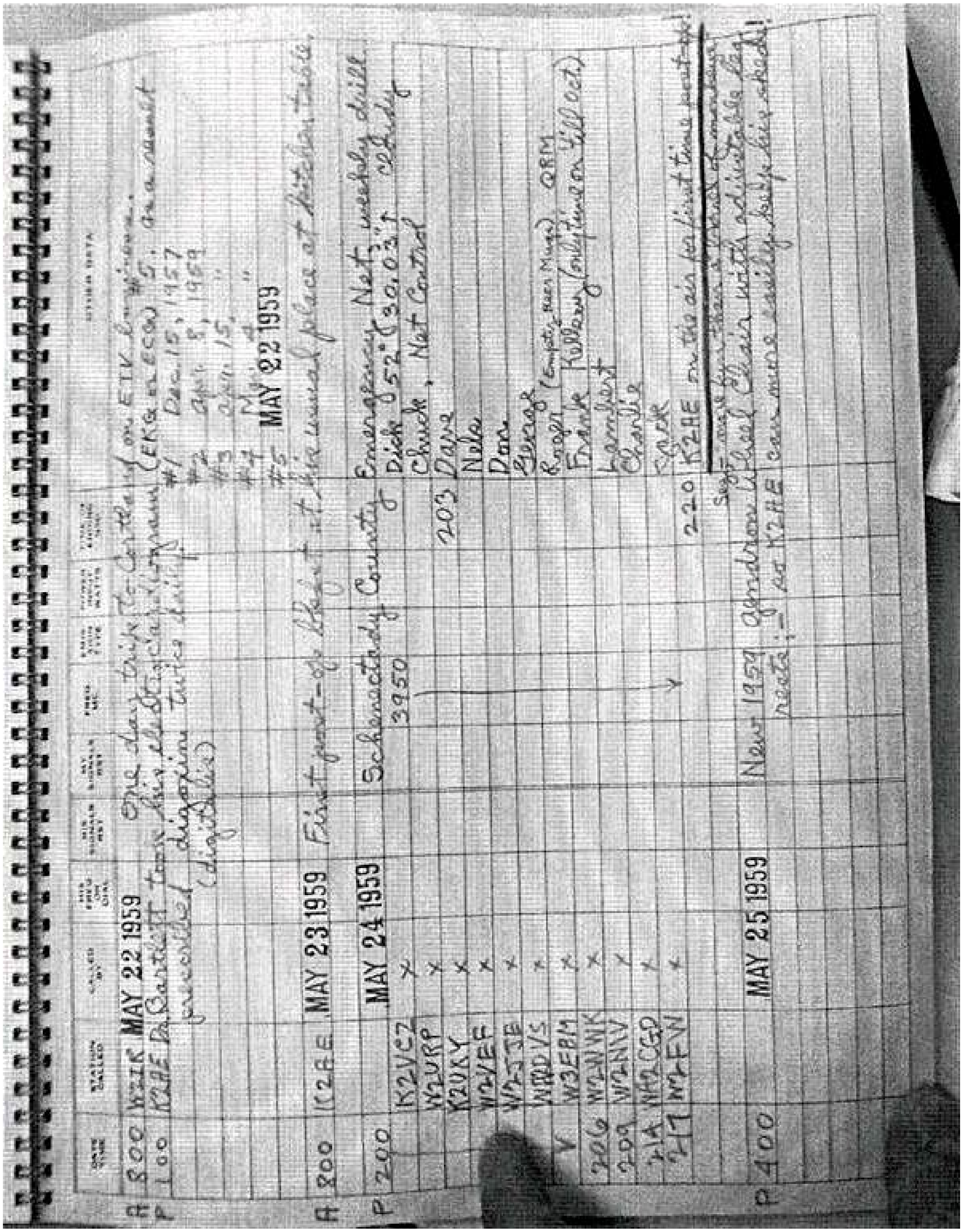
"The time has now come when the American radio amateur who has not affiliated himself with one of the military services of the United States should make an endeavor to do so, for he is peculiarly fitted for the duties of communication as no other citizen is…"

APPENDIX C: Broughton's Logbook – selected pages April-May 1959

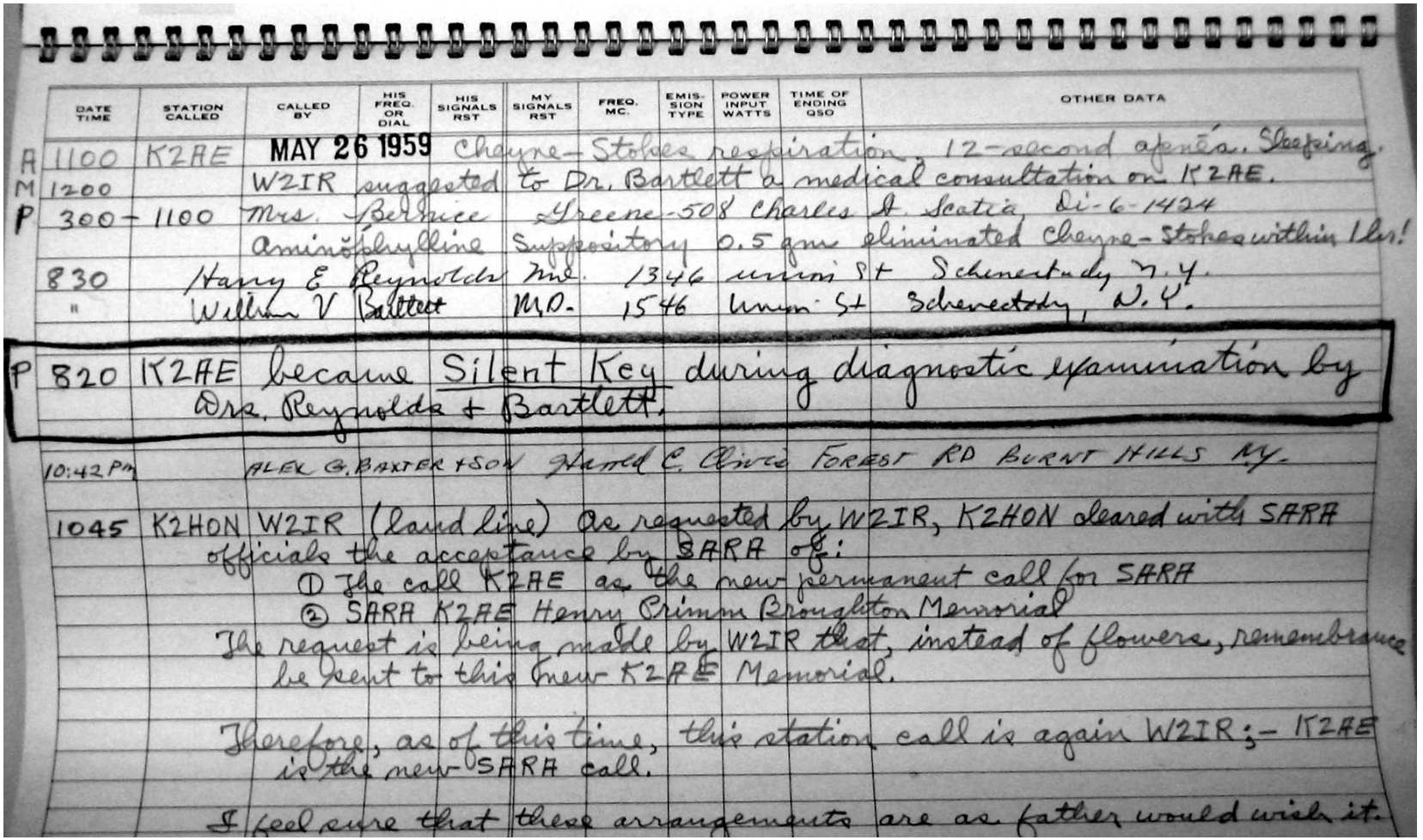




DATE TIME	STATION CALLED	CALLED BY	HIS FREQ. OR DIAL	HIS SIGNALS RST	MY SIGNALS RST	FREQ. MC.	EMISSION TYPE	POWER INPUT WATTS	TIME OF ENDING QSO	OTHER DATA
		APR 12 1959 (Cont.)				Schdy County Emerg. Net. all send 73 to K2AE				
200	K2UXY	X				3945			307	Dave Net Control
"	W2VEF	X				"			233	Nelson
"	W2BSH	X				"			234	Geo (W2BSS visitor)
205	K2LKI	X				"			244	art (catered picnic site info)
209	W2NIV	X				"			252/3½	Lambert, good wishes to K2AE
"	WA2DVS	X				"			235/3½	Geo (W2DEL expected to visit)
"	W2GTB	X				"			237	Warren, good wishes to K2AE
216	WA2CGD	X		+35		"			254/3½	Chas. Muir, ft-rig; Red Cross Chairman
"	K2RKV	X				3950			239/3½	Dick
227	W2UKA	X				3947			257	Phil Very kind regards to K2AE
"	K2VCZ	X				"			245	Dick
232	K2EKS	X				"			258	Chuck Regards to K2AE
240	K2QJL	X				"			241	Dud (full-page photo in Rx Lab: Bul)
303	K2RNY/2	X				"			307	Clem Norwich, N.Y.
		Night nurses for K2AE at Ellis Hospital:								
P 1100-700A		Mrs. Joyce E. Snider 2329 Sheridan Ave Schdy 8 N.Y. B544								
		(Saw K2AE on Ch-6 TV Oct 10, 1958)								
A 600		APR 13 1959								30° 30.08" ↓ CAVU; calm.
605	W1QGG	K2HON	WA2DVS	WINQ	K1ASC	W2DEL Hrst.				Horace, Wakefield, Mass.
638	WA2CRM	"	John getting K2AE Hospital Room B544 from Don for card mailing.							
654	W1KW	WA2DVS	WYAWW	K1CLE via					700	
P 1100-700A		Mrs Dorothy Kapper 521 Harrison Ave. Schdy N.Y. B544								
		250 cc Chloral Hydrate oral sedation pre-op.								
A 500		APR 14 1959								32° 29.87 ↓ CAVU; calm.
530	K2AE	W2IR	- The Mighty Purple Pajama No. 3 - scheduled for surgery 7:45A.							
100	"	"	Dr. Gilbert + Dr. Bartlett report to me K2AE did fb during							
Asst surgeons:		Drs.	4-hour major surgery. He will remain in Recovery Room							
(Bhadri + Ozkum.)			for several hours before returning to his room B544.							
Chief Anesthetist:		Dr. Bell.								



A 800	W2IK	MAY 22 1959	One day trip to Cortland on ETV [illegible].
P 100	K2AE		Dr. Bartlett took his electrocardiogram (EKG or ECG) #5. As a result prescribed digoxin twice daily (digitalis). #1 Dec. 15, 1957; #2 Apr. 8, 1959; #3 Apr. 15, "; #4 May 4 "; #5 MAY 22 1959
A 800	K2AE	MAY 23 1959	First post-op [illegible] at his usual place at kitchen table.
P 200		MAY 24 1959	Schenectady County Emergency Net, weekly drill. 3950
	K2VCZ	x	Dick 52° (30.03") cloudy
	W2URP	x	Chuck, Net Control
	K2UKY	x	203 Dave
	W2VEF	x	Nela
	W2JJE	x	Don
	W2DVS	x	George
	W3EBM	x	Roger (Empty Beer Mugs) QRM
206	W2WWK	x	Frank Kelleavy (only time on till Oct.)
209	W2NIV	x	Lambert
214	WA2CGD	x	Charlie
217	W2FW	x	Jack
			220 K2AE on the air for first time post-op!
P 400		MAY 25 1959	New 1959 Gendron Wheel Chair with adjustable leg rests; so K2AE can more easily keep his skeds!



DATE TIME	STATION CALLED	CALLED BY	HIS FREQ. OR DIAL	HIS SIGNALS RST	MY SIGNALS RST	FREQ. MC.	EMISSION TYPE	POWER INPUT WATTS	TIME OF ENDING QSO	OTHER DATA
A 1100	K2AE	MAY 26 1959								Cheyne-Stokes respiration. 12-second apnea. Sleeping.
M 1200		W2IR								suggested to Dr. Bartlett a medical consultation on K2AE.
P 300-1100		Mrs. Bertrice								Greene-508 Charles St. Scotia, Di-6-1424
		Aminophylline								Suppository 0.5 gms eliminated Cheyne-Stokes within 1 hr!
830		Harry E Reynolds			Md.	1346				Union St Schenectady N.Y.
"		William V Bartlett			M.D.	1546				Union St Schenectady, N.Y.
P 820	K2AE	became Silent Key during diagnostic examination by Drs. Reynolds + Bartlett.								
10:42 PM		ALEX G. BAXTER + SON								Harold E. Price FOREST RD BURNT HILLS N.Y.
1045	K2HON	W2IR (loud line) Are requested by W2IR, K2HON cleared with SARA officials the acceptance by SARA of: ① The call K2AE as the new permanent call for SARA ② SARA K2AE Henry Primm Broughton Memorial. The request is being made by W2IR that, instead of flowers, remembrance be sent to this new K2AE Memorial. Therefore, as of this time, this station call is again W2IR;- K2AE is the new SARA call. I feel sure that these arrangements are as father would wish it.								