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<IAN ELVINS PFENNIGWERTH, sworn: [2.05pm]

<EXAMINATION BY CMDR RUSH:

CMDR RUSH: Q. Could you state your full name and address and occupation to the Commissioner, please?

A. Yes, my full name is Ian Elvins Pfennigwerth. I live at [REDACTED]

[REDACTED] As my occupation, I suppose I'm an historian these days - a failed retiree, anyway.

THE PRESIDENT: I know what it's like.

CMDR RUSH: Q. Dr Pfennigwerth, prior to your engaging in your interest in retirement of history, were you a member of the Royal Australian Navy?

A. Yes. I joined the Navy as a Cadet Midshipman in 1958 and I resigned as a Captain in August 1992.

Q. Over that period of time, did you have various seagoing, staff and overseas appointments?

A. Yes, I did.

Q. Did your career finish with you serving for a period of time as the Director of Naval Intelligence?

A. Yes. I was Director of Naval Intelligence for two years between 1987 and 1989. When I returned from China, where I was a Defence Attache for two years, they had created a job which had the title of DNC for IEW, which was Director of Naval Intelligence, Communications, Electronic Warfare, Security and something else - oh, Computers as well, which I held until I resigned from the Navy.

Q. Dr Pfennigwerth, you have obviously obtained a doctorate. Can you indicate to the Commissioner where the doctorate was obtained from and what the thesis giving rise to the doctorate involved?

A. Certainly. The PhD was awarded by the University of Newcastle in 2005. My thesis was the "Contribution of Intelligence to RAN Operations 1939 to 1972".

Q. Over your career and since, have you had a particular interest in intelligence and have you researched that topic as it involves Naval communications and, indeed, other forms of communications in the intelligence environment?

1 A. I've researched to the depth which was necessary to
2 prove my thesis, but I have not done any deep research into
3 communications per se, only as it affected the matters
4 touched on by my thesis.

5
6 Q. As a consequence of contact being made with you by the
7 Commission of Inquiry, did you prepare a report for the
8 Commission of Inquiry that involved your opinion in
9 relation to voice radio transmission from *HMAS Sydney*,
10 Allied direction-finding capability in 1941, Australian
11 coast watching in 1941 and the decoding of German messages
12 in 1941?

13 A. I did.

14
15 CMDR RUSH: Sir, can I, firstly, tender the letter to
16 Dr Pfennigwerth of 3 March 2009 from LCDR Harper at
17 CORR.011.0167 and the response of Dr Pfennigwerth at
18 CORR.020.0179.

19
20 **EXHIBIT #233 LETTER TO DR PFENNIGWERTH DATED 3/3/2009 FROM**
21 **LCDR HARPER, BARCODED CORR.011.0167; RESPONSE OF**
22 **DR PFENNIGWERTH, BARCODED CORR.020.0179**

23
24 CMDR RUSH: Q. Were you also asked for a further opinion
25 in relation to HF/DF capability in correspondence from
26 myself of 26 February 2009 - that letter, sir, is at
27 EML.005.0291 - and did you respond, Dr Pfennigwerth, with
28 your answers to various questions raised in that
29 correspondence on 9 March 2009?

30 A. Yes, I did.

31
32 CMDR RUSH: I tender those two documents, sir.

33
34 **EXHIBIT #234 LETTER FROM CMDR RUSH TO DR PFENNIGWERTH DATED**
35 **26/2/2009, BARCODED EML.005.0291; OPINION OF**
36 **DR PFENNIGWERTH IN RELATION TO HF/DF CAPABILITY, DATED**
37 **9/3/2009, BARCODED CORR.020.0182**

38
39 CMDR RUSH: Q. Dr Pfennigwerth, may I firstly ask for
40 your opinion as to the voice communications of *HMAS Sydney*.
41 Could we go to CORR.020.0179. Before it comes up, I can
42 ask you these questions. You referred to "TBS", or talk
43 between ships. From your understanding and research, did
44 you form any view as to whether that capacity was fitted to
45 *HMAS Sydney* in 1941?

46 A. I would be almost certain that TBS was not fitted in
47 *HMAS Sydney*. I say that because TBS really was introduced

1 to the RAN at the time of the battle of Savo Island in
2 August 1942, and it was after that that RAN ships began to
3 acquire this equipment from the Americans.
4

5 Q. In the second paragraph under "Voice Radio in
6 *HMAS Sydney*", you state:
7

8 *I think it unlikely that any of Sydney's*
9 *transmitters had an R/T capability for*
10 *technical reasons to do with frequency*
11 *stability, the bandwidth required for voice*
12 *transmission and the means of modulating*
13 *with voice the continuous wave (CW)*
14 *transmitted.*
15

16 What are you driving at there, in terms that the layman
17 might understand?

18 A. The frequency spectrum we all use is divided into
19 bands for administrative and operational reasons. These
20 bands have characteristics, so it is often said that the
21 frequency spectrum runs from sound to light, which it does,
22 so that our seeing is part of the electromagnetic spectrum,
23 as are all kinds of communication, including voice
24 communications. So we're talking now and my voice is
25 putting about 3,000Hz at its top range. If I screamed, it
26 would probably get higher than that.
27

28 In order to transmit the human voice on a radio
29 signal, you need to modulate that signal. We all know the
30 terms "AM", amplitude modulation, and "FM", frequency
31 modulation, and they have their purposes. That means that
32 the signal, the carrier wave, for this intelligence needs
33 to be very stable before the modulation is applied.
34

35 As I've said in my response, I have no knowledge of
36 the radio equipment, the transmitting equipment, on board
37 *HMAS Sydney II*. All I have is the Olson book, and I don't
38 recognise the names of those transmitters at all, but
39 I would be very surprised if any of them were capable of
40 being modified in order to modulate voice on to the carrier
41 wave.
42

43 There are several reasons, other operational reasons,
44 why that was not a high priority, one of which was that
45 before we had a high level of sophistication in tuning our
46 equipment, the art - and it was an art - of tuning a radio
47 to a particular frequency was one that had to be constantly

1 practised. In other words, they were not frequency stable.
2 If it's not stable, it's very hard to modulate them and
3 very hard for the intelligence to get through.
4

5 On the other hand, if you are talking about a very
6 narrow band of intelligence, such as in a morse code
7 transmission, where essentially you're breaking the carrier
8 wave for a dit or a da, and then it starts again, that is
9 a very narrow band of information and a comparatively low
10 data rate, of course, but it can be tracked through fading
11 and it can be heard much better than the human voice.
12

13 So while Navies generally were involved in
14 communication that involved morse code, or codes similar to
15 morse, in the case of the Japanese, that was the favoured
16 method. It required less technologically advanced
17 equipment on board the ships; it was easier for the people
18 to maintain; it didn't go bad - if it went did, you
19 couldn't fix it in those days, but morse code transmissions
20 were very simple and the equipment that transmitted them
21 was simple as well.
22

23 So the reasons why there was no great rush to get into
24 voice radio, or radio telephony, as it was called, changed
25 later in the War as the advantages of using voice,
26 particularly in tactical situations where you were fighting
27 a battle, became very clear and very important. There was
28 then impetus to get this equipment on board ships. But at
29 the time, in 1941, we hadn't got to that stage. I'm not
30 sure if I have explained all the questions you were asking.
31

32 Q. You do refer in the second-last line there to the
33 ability to transmit morse in encoded messages and that that
34 quality was not available initially in R/T.

35 A. Yes, that is another clear advantage. What term did
36 I use - "code" or "encipher"? I had better be careful
37 here. Encode a message. Well, the same applies to
38 enciphered messages. Whichever way the information in the
39 message was concealed by a code, which is basically
40 substitution of a phrase by, say, a five-letter or
41 five-numeral group, or it was passed through an electronic
42 system like Enigma, where you changed the order of the
43 letters in each particular word to something completely
44 different - whichever - that could very easily be sent by
45 morse code.
46

47 Voice, in those days, I think I'm right in saying,

1 could not be encoded. We had to really wait until
2 digitisation before that became possible. So if you had
3 classified information to pass between ships, then you
4 preferred to do it, in fact you were required to do it, so
5 far as you could, in an encoded or enciphered fashion,
6 which meant that morse code was clearly - let's not get the
7 two things mixed up. Morse is a code in the sense that you
8 translate letters into a series of dots and dashes, but
9 there's no security attached to that. The coding is done
10 as a separate issue by coders, who mix up what is being
11 sent, hopefully to conceal it from the enemy.

12
13 Q. You were also asked to comment on the Allied DF,
14 direction-finding, capability in 1941. You refer there to
15 a system which was a Pacific DF network set up by
16 Commonwealth Navies and controlled from the Far East
17 Combined Bureau in Singapore. Can you enlighten us
18 a little bit in relation to what the system was, who was
19 involved, where it was in Australia and what the element of
20 control in Singapore was?

21 A. Yes. The British, in the 1920s, became concerned
22 about their ability to monitor what the Japanese Navy was
23 doing, and their concern took two forms. One was, as my
24 book suggests, that they began to pay a lot of attention to
25 the decoding of Japanese Naval messages, in other words,
26 breaking codes.

27
28 The second form was that, as technology advanced, it
29 became possible to track ships by their radio transmissions
30 by direction-finding them, DF-ing them, but also using
31 other methods. With the invention of the cathode ray tube,
32 cathode ray oscilloscope, you could then project on
33 a screen the waveform of the transmitter itself. That was
34 called TINA in the British terminology.

35
36 That enabled you to say two things: firstly,
37 transmitters, like everything else, have their own
38 characteristics, some of them distinctive. So you might be
39 able to say that that particular transmitter is on *Musashi*,
40 has always been on *Musashi*, has always been identified as
41 being on that ship. So when we see that waveform on
42 a screen, that transmission is from *Musashi*.

43
44 They also discovered that operators of morse code have
45 what was known in the trade as a fist, that is, a special
46 way of sending morse. Although training was designed to
47 eliminate those peculiarities which could identify an

1 individual operator, nevertheless, sailors being sailors,
2 they were proud of their capability and they would almost
3 always finish with a little flourish or there would be
4 a special way they made their As or their Ts or something
5 like that. Now, that could be seen on an oscilloscope and
6 they could say, "Right, that operator is also associated
7 with various flagships", so they could say that probably he
8 is part of the Admiral's staff, and if that different fist
9 or distinctive fist showed up on another ship, you could
10 say that it's probable that the Admiral has shifted his
11 flag to a different ship.

12
13 All this collectively was called traffic analysis. So
14 there are two forms of radio intelligence: one was the
15 direction in which the transmitter lay from a receiving
16 shore station, but also the characteristics of
17 a transmission itself, quite apart from the code. In fact,
18 traffic analysis became an increasingly important way of
19 getting intelligence on what the Japanese Navy was doing.

20
21 That's a very long-winded introduction, but because of
22 these characteristics that were discovered and the fact
23 that trials showed that in order to track Japanese Navy
24 ships across the Pacific you needed a number of radio
25 intercept stations, receiving stations, to listen in on
26 Japanese transmissions - or anybody else's, for that
27 matter - these needed to be geographically separated
28 because of the vagaries of HF as a medium of transmission.

29
30 I'll explain that, if you'd like. Because of that, it
31 was necessary to have a number of geographically separated
32 stations, not necessarily close to Japan but certainly
33 forming a network, so that if a transmission was made, then
34 the chances were that one of the stations in one area would
35 receive that particular signal.

36
37 These were networked, or netted, from a control
38 station, and the British were running the show, they
39 controlled that, and they set up the initial control
40 station in Hong Kong, but that was later moved to Singapore
41 when the Japanese invaded the Chinese mainland opposite
42 Hong Kong. They needed to get these people out from under
43 the Japanese threat.

44
45 Now, the stations were in - before they were kicked
46 out, Shanghai, was certainly one; Hong Kong clearly was the
47 key to the system. As well as that, there were receiver

1 stations established in Borneo, I think one in Sabah; one
2 was certainly in Kuching; we have mentioned Singapore,
3 Kranji W/T- it is still there, I think; and it became
4 necessary to have stations in this part of the world and
5 the British Admiralty prevailed on the RAN to establish
6 three stations, which were at Harman in Canberra,
7 Coonawarra in Darwin and initially Jandakot in Western
8 Australia. As well as that, there were stations
9 established in New Zealand, Awarua - two I think - and I'm
10 fairly sure there was one in Fiji as well, the idea being
11 that if a Japanese ship transmitted, the signal would come
12 to earth somewhere and one of those stations would pick it
13 up.

14
15 THE PRESIDENT: Q. Would they all be listening on
16 different frequencies?

17 A. Yes, they would, because of the geographic separation,
18 time of day, latitude issues, weather issues. They would
19 be capable of receiving a certain band of frequencies only.
20 So a signal sent on 5MHz from a Japanese battleship would
21 not be received by all those stations, but it might be
22 received by three or two, or maybe only one. On the other
23 hand, if the ship was transmitting on 10MHz, then it might
24 be heard by six stations. So, yes, a bank of receivers was
25 manned on the most likely frequencies for receiving
26 Japanese transmissions.

27
28 CMDR RUSH: Q. Dr Pfennigwerth, as a consequence of
29 receipt of the signals, were the signals received but also
30 was there a capacity in relation to identifying where the
31 signals geographically were sent from?

32 A. Yes. There is a system called single station
33 location, but it is probably not necessary to go into that.
34 Generally speaking, a fix or a cut is established when two
35 DF stations receive the same message. In those days, it
36 was done by direction of arrival, so you took a bearing.
37 Depending on how accurate the bearing was, obviously, you
38 got a cut, but the cut was surrounded by an ellipse of some
39 size. So two cuts might give you an ellipse which would be
40 100 miles high and 200 miles wide, so quite a large area.

41
42 The size of that area could be reduced if you got more
43 than two cuts. So three would be great; four would be
44 excellent. The way you communicated this information was
45 through a network of generally landlines, but not always,
46 connecting these stations to the hub in Singapore. Can
47 I just add that Australia did have a TINA station, and that

1 was at Harman, so if a signal was received at Harman, then
2 the ability was there, theoretically, for them to identify
3 the transmitter and the person, telegraphist, sending the
4 signal.

5
6 Q. We have heard during the course of the hearings of the
7 Commission of Inquiry the term "radio silence".

8 A. Yes.

9
10 Q. Was it that capacity to pick up signals and identify
11 location which brought about an aspect of the need for
12 radio silence?

13 A. Yes, it did. There was also a cultural thing about
14 radio silence, and that was that you assumed that the
15 commanding officer knew what he was doing and didn't need
16 to be told all the time. While ships were maintaining
17 radio silence, it didn't mean they weren't receiving
18 messages; it just meant that they weren't sending anything.

19
20 The appreciation that during the First World War both
21 sides had used DF against each other led to the belief that
22 you should say as little as possible. The silent service,
23 if you like, made manifest. The idea was that you
24 transmitted as little as possible, and what you did was
25 terse. So that was a characteristic of Naval
26 communications. Radio silence was a fact of life, and most
27 people learned to live with it.

28
29 It meant that you couldn't transmit, but cruisers, for
30 example, had aircraft, which could be despatched ashore
31 with messages, so it didn't mean they were incommunicado;
32 it just meant that they weren't using their radios.

33
34 Q. In that paragraph, you also refer to the RAAF being in
35 the process of commissioning a series of coastal HF/DF
36 sites around Australia:

37
38 *... and as I have now learned, the*
39 *Department of Civil Aviation (DCA) was also*
40 *commissioning DF sites in various*
41 *localities. So far as I am aware, the DCA*
42 *sites were not networked (or even*
43 *constructed) by November 1941 ...*
44

45 The first question I have is, what is the difference
46 between an HF/DF and a DF capability?

47 A. It simply refers to the frequency band in which you

1 want to receive the signals. I'm sorry, I might have to
2 give you another physics lesson.
3

4 The radio frequency we use runs, effectively, from
5 what's called very low frequency - there is extra low
6 frequency, but, effectively, very low frequency - which is
7 used, for example, from Harold E Holt in Western Australia
8 to communicate with submarines, and the radio waves
9 penetrate the surface of the water so can be heard by
10 a submerged submarine, right up to EHF, which is used in
11 spacecraft and radar activities but can also be used for
12 communication.
13

14 The bands we're talking about were generally in the
15 MFHF field. So what are we talking about there? It's
16 basically 300kHz through to 30MHz. What would be a good
17 analogy? AM radio operates at MF. If you listen to
18 a Sydney radio station, then you're listening to the ground
19 wave of a station operating that frequency band.
20

21 The problem with the physics of communications is that
22 the lower the frequency, the longer the wavelength, and
23 that has importance because it affects your capability of
24 radiating that intelligence, because you need a huge
25 antenna. The lower the frequency, the bigger the antenna
26 has to be.
27

28 So at the time we're talking of, ships had begun to
29 concentrate their attention on frequencies where it was
30 reasonable for them to provide a reasonable antenna length.
31 So we're talking about MFHF.
32

33 HF was generally used by the Navy because its ground
34 wave gave you almost a certain ground wave coverage of
35 50 miles in any direction. It could, on occasions,
36 depending on the time of day and the frequency and all
37 those sorts of things, give you 150 miles, and it was
38 fairly reliable and the technology wasn't challenging.
39

40 MF was normally used on land stations where you could
41 put up a big stick with an antenna with a piece of wire
42 stuck in it. So the reason for HF was that that was the
43 mode of communications used by ships, increasingly aircraft
44 and mobile stations generally - because it was physically
45 reasonable to erect an antenna to send the message and
46 receive a message.
47

1 Q. You say there that, as far as you are aware, the DCA
2 sites were not networked or constructed by November 1941?

3 A. The letter I received, or Mr Lander's report, was the
4 first time I knew there was one. I surmise that it has to
5 do simply with aircraft safety. Aircraft would send their
6 positions, presumably routinely, on their flights, and they
7 would be DF-ed by the DCA stations. Whether they were
8 networked or not I'm not sure. If they were, I don't know
9 where the network control was. Perhaps Sydney. I don't
10 know.

11

12 Q. I'll come to that in a little bit more detail a little
13 later. If I could ask that we go to 0180, under the
14 heading "Decoding German messages", you refer to a huge
15 amount of misunderstanding and misinformation in relation
16 to this point. You are specifically referring to, I think,
17 a submission from Mr Kennedy and a conversation you had had
18 with him. I just want to pick up a couple of the dot
19 points. Enigma code or Enigma machines is probably a name
20 that we're familiar with. You indicate that it was not the
21 only system that was used by the Germans.

22 A. No it wasn't. It was the main one. Enigma was
23 a cipher machine. In other words, it was one of these
24 devices whereby, by changing the position between
25 electrical contacts, you changed the letter A to the letter
26 X this minute and Z the next minute and C the next minute.
27 So it made it very difficult to break.

28

29 The way this was done in the German system was by
30 rotors, and in fact there were Allied systems that is
31 followed this. You had, I think, six rotors that were
32 used, and by changing the settings on the rotors for the
33 day and inserting them in the machine, you changed what was
34 happening to the message. Obviously, that can be made more
35 secure if you add more rotors, and in fact the German Navy
36 did add another rotor, so they had a seven-rotor system.

37

38 It was daily changing, so an operator would have to
39 change the settings on those rotors each day and put them
40 in correctly, hopefully applying the changes correctly. It
41 has been known not to happen. Because of the large need
42 for this system, there were, I think - I did some
43 research - 170 separate Enigma-based systems, so breaking
44 one didn't mean that you had broken the others. In fact,
45 that was also compounded by the fact that there were some
46 systems that you really needed to get into much more
47 urgently than you did others.

1
2 I think I quoted the example of the system used by the
3 German High Command for submarines. That was obviously
4 a very, very important cipher to break, so it received
5 a lot of attention from both sides of the Atlantic. At
6 many stages of the War, it was being broken relatively
7 quickly. But, at the same time, there were stages where it
8 wasn't broken for a week, or something like that.

9
10 So the public view that once you've pushed the button
11 and you get the message out and you can read it, that's the
12 problem gone away, is quite incorrect. The problem
13 continued until the last day of the War.

14
15 There were other codes as well. So Enigma would be
16 used - variations on the Enigma technology would be used
17 for important, longer-term messages. For messages in
18 between ships manoeuvring in a fighting situation, you
19 would use a brevity code, which is not meant to last any
20 time at all, but you don't want the guy knowing you're
21 turning to 180 and you're about that launch torpedoes, so
22 you have a little code that conceals that. But it only
23 needs to conceal that until the torpedoes have been
24 launched, so it's a short-term code. As well as that,
25 there were codes which are like --

26
27 Q. Could I perhaps stop you. You make reference in your
28 second dot point to:

29
30 *Raiders like Kormoran employed a system and*
31 *code known as Kurtzsignal ...*

32
33 A. Yes.

34
35 Q. What is the nature of that?

36 A. This is a transmission system, a modulation system.
37 I was just going to introduce that. If you were a raider
38 and you needed more ammunition, and you needed to fuel by
39 27 May, or something like that, you would use a brevity
40 code, and, "Need more ammunition" might be BZQ, or
41 something like that. In other words, it is simply a way of
42 compressing the information. Kids sending text messages
43 use much the same system now. So there was no concealment
44 in the sense that it was a code. It was a brevity code,
45 simply.

46
47 Then to conceal it, to keep it safe, it was sent in

1 various systems, but "Squash" was an Allied equivalent,
2 where you simply compressed the message down to a very
3 small but very compact ball of information and you squirted
4 it off extremely quickly, so it's very difficult to
5 intercept because the transmission is so short.
6

7 The information contained in the message is not huge,
8 but it tells the German Admiralty that you need more
9 ammunition, you need more fuel by 28 May, which is all you
10 needed to say, and the brevity of the message was what
11 protected it from intercept, because you had to be right on
12 the frequency, right on the mark. By the time the message
13 had gone, all you would know would be that there was
14 a transmission, but there was in no sense any way of
15 copying it down or anything like that.
16

17 THE PRESIDENT: Q. Did it also protect you from
18 direction-finding?

19 A. Largely, yes, because if you can't be intercepted, you
20 can't be DFed.
21

22 CMDR RUSH: Q. You make two comments concerning it. In
23 the third dot point, you say:
24

25 *As the signal was very difficult to*
26 *intercept and there were very few messages*
27 *sent, this system was essentially*
28 *unbreakable.*
29

30 A. Yes.
31

32 Q. In the final dot point on that page, you say:
33

34 *The Enigma cipher developed for use by*
35 *raiders was Aussheimish, which remained*
36 *unbroken at the war's end, probably because*
37 *it was a low priority cipher, with very few*
38 *intercepts to use to attack it ...*
39

40 A. Yes. Breaking a code or cipher requires there to be
41 a certain number of messages in that particular code or
42 cipher to be examined. As raiders were told not to
43 transmit unless they really needed to and as there were
44 relatively few raiders, Aussheimish was also used for other
45 purposes, but generally speaking the level of traffic was
46 so low that it was very difficult to assemble a sufficient
47 pile of intercepts for it to be attacked.

1
2 Of course, later, as the German Aussheimish operations
3 were wound up, then it became less necessary. The raiders
4 were never the same level of threat as the Luftwaffe or the
5 German submarine attacks in the Atlantic and Indian Oceans.
6

7 THE PRESIDENT: Q. An examination of the German records
8 has disclosed that whilst there were a considerable number
9 of messages sent to *Kormoran* through October and November,
10 the last message the *Kormoran* sent to Germany was on
11 26 October.

12 A. Yes, that's what I would expect. Their orders were
13 very clearly to stay concealed. That was their weapon, if
14 you like. That was their advantage over everything else.
15

16 CMDR RUSH: Q. Then you were also provided with
17 a statement that Mr Reginald Lander made to the
18 Parliamentary Inquiry.
19

20 CMDR RUSH: I don't think I have tendered this. It is
21 EML.005.0293.
22

23 **EXHIBIT #235 STATEMENT TO PARLIAMENTARY INQUIRY BY**
24 **MR REGINALD LANDER, BARCODED EML.005.0293**
25

26 CMDR RUSH: Q. You were asked to provide comment in
27 relation to it, but if I can perhaps put the substance to
28 you. Mr Lander indicates at paragraph 2:
29

30 *I was a civilian, at the time, working for*
31 *the Civil Aviation Department which at that*
32 *particular time was controlled by the Post*
33 *Master General (PMG). I was engaged in*
34 *this facility --*
35

36 which he indicated was at the Qantas Empire Airways Base at
37 Rose Bay --
38

39 *with employees from AWA and Civil Aviation*
40 *Department, testing the high frequency*
41 *direction finding equipment and calibrating*
42 *it, testing the remote control system*
43 *between Holsworthy Remount Depot and*
44 *Rose Bay. I was backward and forward*
45 *between the two bases at all times.*
46

47 He advised that it was at this point that he was told by

1 the officer-in-charge, John Christie, the radio chief
2 stationed at Mascot Aerodrome, that there was a German
3 raider on the west coast operating outside Fremantle,
4 moving up and down the coast, or so they thought,
5 transmitting on a certain frequency each night, making
6 a rendezvous with Danzig radio.

7
8 There are a number of aspects to that, but in relation
9 to a raider or Danzig radio, how would that be worked out?
10 A. I don't know where that came from. I know where
11 Danzig is. That's where my family came from. It's in
12 North Germany on the Baltic. It's now part of Poland, of
13 course. I do not know where the raiders would have sent
14 their messages to, but I think I know that the major German
15 overseas transmitter was in Hartz Mountains in what used to
16 be East Germany, so it's possible that there was a receiver
17 site at Danzig, but I don't know, and I don't know why
18 *Kormoran* would have been sending messages to arrange
19 a rendezvous. As I've explained, that's what the
20 Kurtzsignal system was about.

21
22 Q. You make the comment at CORR.020.0183, in the fourth
23 paragraph:

24
25 *Whether Kormoran was, in fact, transmitting*
26 *regularly to a supposed supply ship during*
27 *her patrol off Western Australia seems to*
28 *me to be highly unlikely. It would have*
29 *been quite contrary to her instructions*
30 *and, according to Wesley Olson [Bitter*
31 *Victory, P176] she had replenished from the*
32 *supply vessel Kulmerland between 16 and*
33 *26 October and was stored with 'enough*
34 *supplies ...*

35
36 On the basis of the Kurtzsignal, which you've discussed,
37 and the cipher code of Aussheimish which was used, do you
38 have any opinion as to the likelihood of that signal being
39 sent at midnight on a nightly basis?

40 A. I think it's most unlikely. I think that's most
41 unlikely. I did think about this. I can't see any reason
42 why that would have been done. It was my impression that
43 I got from somewhere that the rendezvous were set by
44 Germany. The ships had to be at a particular position
45 between a series of times and dates, and that was the way
46 it was done. It was all organised from shore, not from the
47 ships.

1
2 I can't find any reason why *Kormoran* would want to
3 send messages every night. She may have sent one that
4 said, "I can't make the rendezvous", for example; you might
5 expect that. But why every night for a series of nights,
6 I have no idea. I couldn't think that that would happen.
7

8 Do you want me to deal with the question of whether it
9 was possible that it was being intercepted?
10

11 THE PRESIDENT: I think we now know that it just didn't
12 happen.
13

14 CMDR RUSH: We do have the transmission, sir.
15

16 Q. The question of whether it's possible to be
17 intercepted?

18 A. If she was trying to communicate with Danzig radio,
19 then you're talking about quite a complex physical problem.
20 To communicate with Germany - we're midnight here, so 10pm
21 off the West Australian coast - at 2 or 3 o'clock in the
22 afternoon in Germany, you're travelling from summer to
23 winter, you're travelling from night to day, your frequency
24 choice is going to be different from the one that you would
25 use if you were going to simply talk to another merchant
26 ship that's a reasonable distance from you. So I think the
27 frequency chosen would be wrong. I don't know that. There
28 would be ways of working that out.
29

30 Similarly, I think it would be unlikely that you would
31 be able to - I mean, you would need to be within about
32 150 miles of RAAF Pearce, which seems to me to be a bit
33 scary for a raider, and whether that same frequency you're
34 communicating with to Danzig is going to reach the east
35 coast of Australia and be intercepted at Holsworthy seems
36 to me equally questionable. It might possible; I don't
37 know. It doesn't sound right to me.
38

39 THE PRESIDENT: Q. I think we know, don't we, now that
40 the Germans did have pre-determined meeting points; each
41 had a code and a name, and latitude and longitude were
42 given, and there was an arrangement that they would turn up
43 at, whatever it was, 4 o'clock every day and then go away
44 if no-one was there, and they received signals from Germany
45 telling the two different ships that they would meet on
46 a given day at one of those nominated places. They just
47 didn't communicate between each other.

1 A. That's clearly the safest and most secure way of doing
2 it. Then you don't have to transmit at all, unless, in an
3 emergency, you couldn't make the rendezvous for some
4 particular reason. I just found this to be very difficult
5 to believe, although, as I suggested, perhaps Mr Lander was
6 engaged in a trial of some kind where a transmitting
7 station was operating off the Western Australian coast and
8 they had chosen a frequency so it would be intercepted by
9 both Pearce and Holsworthy, as you would in a trial.
10 There's no point having a trial if you're not going to
11 intercept the signal. But I couldn't see that it would be
12 *Kormoran*.

13

14 Furthermore - I'm not sure if you want me to go on.
15 Do you want me to finish there?

16

17 CMDR RUSH: Q. Yes, if you've finished.

18

19

20 Q. You perhaps raised something along those lines at
21 0184, in the second paragraph, where you used what
22 Mr Lander said in his submission to the Parliamentary
23 Inquiry. You said:

24

25 *... I do not understand his statement that*
26 *"They operated on, to the best of my*
27 *memory, 6.540 Megacycles". DF stations do*
28 *not transmit, and to monitor only one*
29 *frequency is illogical.*

30

31 A. Yes, I puzzled over this, because he was now talking
32 about later in the War where the Air Force had established
33 a number of intercept stations, mainly for use in
34 anti-submarine work along the east coast. I don't know,
35 but unless the Imperial Japanese Navy 8th Fleet only ever
36 operated on that frequency, which seems unlikely, there
37 would be no point for a station to be fixed on that
38 particular frequency, because time of day and latitude and
39 longitude issues mean that you would use a different
40 frequency to communicate to your base, wherever you were.

41

42 The only thing I could think was that maybe that was
43 a "telling" frequency, a frequency which netted the
44 stations, and that's what they transmitted on. But, of
45 course, the receiving station would try not to transmit,
46 because if you transmit, it's bad for your reception. So
47 I didn't follow that at all.

1
2 Q. There are two further matters which you conclude in
3 answering specific questions at 0185, Dr Pfennigwerth. The
4 first one is at (c), where you say:

5
6 *Exactly what was happening at Rose Bay is*
7 *unclear, but I think it highly unlikely*
8 *that a DCA station would have been tasked*
9 *with intercepting raider transmissions.*
10 *The target transmissions were probably from*
11 *a non-military station as part of the*
12 *trial.*

13
14 Why do you say that a DCA station would be unlikely to be
15 tasked with being involved in a raider transmission?

16 A. I couldn't see the reason why it would be, because, by
17 then, we had a perfectly efficient Naval system set up.
18 The second point was that this was classified information.
19 The intercepts, DFs and particularly the traffic analysis
20 were highly classified. They were not shared routinely
21 around the Navy. Very few people had access to this
22 information, for the obvious reason that the fewer people
23 that knew about it, the less chance there was of it getting
24 to the enemy.

25
26 So whilst these were not the most closely guarded
27 secrets, they certainly weren't tossed around lightly.
28 There might have been an occasion where a DCA station was
29 particularly well located to listen out on a frequency
30 which was of interest, but you wouldn't tell them what it
31 was. You would tell them, "This frequency is of interest.
32 Report any activity on it." I can't see that the Navy or
33 another authority would hand this information willy-nilly
34 over to DCA station so that it became common knowledge, as
35 it seems to have been.

36
37 Both Mr Christie and Mr Lander were civilians, so
38 I don't quite see how they would have been entitled to have
39 access to it, when many Naval personnel with perhaps
40 a higher need didn't have access to it. It just doesn't
41 sound right to me.

42
43 THE PRESIDENT: Q. The signal sent by *Kormoran*, by the
44 way, on 26 October was received at a radio station called
45 Norddeich in Germany.

46 A. Yes. It's near the Hamburg area, I think. That still
47 exists today. It would be possible to find out where that

1 is. So, yes, he was in fact using the frequency to enable
2 it to get to Germany.

3
4 CMDR RUSH: Q. I have three questions unrelated to what
5 we have been talking about, Dr Pfennigwerth. You
6 researched and then wrote a book concerning CAPT Eric Nave,
7 entitled "A Man of Intelligence". CAPT Nave, I think then
8 CMDR Nave, in 1941 was based, as I understand it, in
9 Melbourne?

10 A. Yes.

11
12 Q. In what organisation in Melbourne and who was the
13 organisation answerable to?

14 A. He was working in an organisation called the Special
15 Intelligence Bureau, which was an amalgam of code-breaking
16 activities which had been conducted by the Australian Army
17 in Sydney and the RAN's own indigenous capability. He
18 concentrated this activity in Melbourne, which was, in
19 those days, the Defence Headquarters, in fact, in Victoria
20 Barracks, until they were kicked out when they got too big.

21
22 He reported to the Director of Naval Intelligence,
23 CMDR Long. Messages were intercepted on his behalf both by
24 the Naval network - Harman, Coonawarra and Jandakot - and
25 also by an Army station at Park Orchards in Melbourne. The
26 targets were codes used by diplomatic missions,
27 particularly, obviously, the Japanese merchant ship
28 traffic, and, interestingly, consular traffic from South
29 America, which was being intercepted very freely. That
30 indicates the physical bit - you can receive stuff from
31 South America in Melbourne quite easily.

32
33 He was still an officer of the Royal Navy, having
34 transferred. He was instructed on codes and given the
35 information from the British on codes. By this time,
36 November 1941, because of the cooperation between the
37 British and the Americans, particularly in the Far East, he
38 was getting access to some American intercepts as well -
39 codes they had broken that he could work on. It was quite
40 a big organisation.

41
42 Q. Was his organisation under the control or the
43 direction of the FECB in Singapore?

44 A. Effectively, yes, yes, although there was a strong
45 sense of independence in SIB.

46
47 Q. It has been suggested in evidence to the Commission of

1 Inquiry that after the engagement between *Sydney* and
2 *Kormoran*, CMDR Nave, in some manner or another, made
3 communication with a journalist in Singapore, a Mr Bernard
4 Hall, who was responsible for an article that appeared on
5 I think 8 December 1941 in the Daily Express in the United
6 Kingdom. It is unknown how that communication would have
7 taken place, but having regard to the man you researched,
8 is that the sort of manner in which he would operate?

9 A. No, I don't think so. His downfall in his own
10 organisation - he was kicked out of his own organisation by
11 the Americans in 1942 - came from his adherence to the
12 rules that he had learned, and that was that he worked for
13 the Australian Chief of Naval Staff.

14
15 THE PRESIDENT: Q. He wasn't going to tell anybody else
16 anything?

17 A. He wasn't going to tell anybody else. So I would find
18 that extremely unlikely. I have, for example, been
19 accosted by people who said that they lived in Adelaide -
20 the Nave family was from Adelaide - and they got a phone
21 call from CMDR Nave after *Sydney* was sunk telling them
22 exactly that. Again, I just find that so totally unlikely.
23 After all, nobody knew *Sydney* was sunk, so how would he
24 have known? He would have been very reticent to talk to
25 any journalist about the work that he did.

26
27 CMDR RUSH: I have no further matters, sir. May
28 Dr Pfennigwerth be excused?

29
30 THE PRESIDENT: Yes. Thank you very much, doctor. You
31 have been a great help.

32
33 <THE WITNESS WITHDREW

34
35 CMDR RUSH: Sir, that concludes the evidence today.
36 Professor Frame will be the witness tomorrow.

37
38 THE PRESIDENT: Very well, I will adjourn until 10am
39 tomorrow.

40
41 **AT 3PM THE COMMISSION WAS ADJOURNED**
42 **TO TUESDAY, 21 MARCH 2009 AT 10AM**

43
44
45
46
47