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TRANSCRIPT OF OFFICE OF COMMUNICATION SECURITY CONFERENCE

SUBJECT: Replacement of the Combined Cipher Machine

Date: 22 December 1952

Time: 1000 - 1200

Place: Room 19232

Present:	Office
Col. A. L. Pachynski	C/SEC
Lt. Col. H. J. Revane	C/SEC
Dr. R. H. Shaw	C/SEC
Mr. T. R. Chittenden	C/SEC
Mr. W. F. Friedman	CONS
Mr. J. H. Douglas	P/P
Col. W. A. Shaw	LOG
Cdr. J. T. Pendergrass	TECH
Dr. H. J. Stukey	OPNS
Mr. F. Raven	OPNS
Mr. J. R. Chiles	R/D
Maj. W. M. Hamilton	Army
Mr. A. W. Small	Army
Mr. R. Battey	Army
Mr. D. Wolfand	Army
Capt. R. L. Taylor	Navy
Maj. E. J. Giese	Air Force

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COL. PACHYNSKI: The purpose of this conference, gentlemen, is to present to you the Director's position in respect to a paper which we recently received from the British Chiefs of Staff. Have you seen that?

MAJ. GIESE: I saw it upstairs.

COL. PACHYNSKI: Just to make sure everyone understands the position of the British in this matter I will read the paper over. It shouldn't take too long.

Col. Pachynski read the proposal to the U.S. Joint Chiefs of Staff which is contained in Memorandum SM-130952 dated 28 May 1952.

COL. PACHYNSKI: The paper was forwarded to the Director of the National Security Agency by the Joint Chiefs of Staff for comment and recommendations. We have held a series of meetings on this subject within the Agency and have prepared a reply for the Director which reflects his position in this matter.

Copies of the proposed reply were distributed.

COL. PACHYNSKI: I might mention that copies of the reply will be forwarded concurrently with the referral to JCS to members of AFSAC for their information.

MR. FRIEDMAN: I wish the British would stick to one handle for their designation of their body. I notice in the paper which you have just read that they refer to themselves as the United Kingdom Chiefs of Staff. I suppose in this paper we should use the same designation. I suggest that in the final version we make it the U.K. Chiefs of Staff throughout.

DR. SHAW: How did all that POLLUX get into this paper?

COL. PACHYNSKI: The British referred to it as POLLUX, to the system.

DR. SHAW: It places a certain amount of strain on us--the gradual introduction of POLLUX/ADONIS, reaching completion within six months after the original target date of 1 January 1955. That is in paragraph 4.

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MR. FRIEDMAN: Is that agreed?

DR. SHAW: There has never been any question about it.

MR. FRIEDMAN: I notice that the U.K. paper doesn't say anything about ADONIS. They talk about POLLUX. Maybe we should say nothing in the paper about POLLUX being inadequate now.

DR. SHAW: It is not a question of it being inadequate now. It never was adequate. They were given a system with encrypted indicators for the purpose of permitting just that distinction.

MR. FRIEDMAN: What is the name?

DR. SHAW: ADONIS.

MR. FRIEDMAN: Is there an agreed paper which states that?

DR. SHAW: There has been a considerable exchange of JCS papers, subject: ADONIS.

MR. FRIEDMAN: The one you read talks about POLLUX. It doesn't mention ADONIS. Maybe we should explain in that paragraph why we use ADONIS and then simply use ADONIS and not say POLLUX after that paragraph.

DR. SHAW: I think something like that should be done. It is confusing an issue which shows signs of becoming clear.

MR. FRIEDMAN: I thought at least one of the U.S. Services said that they would adopt the AFSAM 7, provided they could send traffic with plain indicators. Is that no longer true?

DR. SHAW: It is still true but it has no bearing on this problem. It is not conceivable as a replacement for the CCM.

MR. FRIEDMAN: For the CCM purposes it is ADONIS.

CAPT. TAYLOR: What are the relative security merits of BRUTUS and ADONIS in general terms?

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MR. FRIEDMAN: I will let the 41 people speak on that.

DR. SHAW: That depends on how general you want to be.

CAPT. TAYLOR: Within ten per cent of infinity. What do you mean by saying that the things that are wrong with BRUTUS will be improved by ADONIS?

DR. SHAW: There is the possibility of incorporating the rotor-off feature. There is a whole facet which is exploitable on BRUTUS that is not exploitable on ADONIS.

CAPT. TAYLOR: What do you think about the plugboard proposition?

DR. SHAW: I am strictly in favor of it.

CAPT. TAYLOR: My understanding of it is that it is a feasible modification engineering-wise. What effect does that have on the security of BRUTUS? Does it make it comparable to ADONIS?

DR. SHAW: Oh, yes. Off the cuff I would say, without having prepared any studies on the subject, that BRUTUS with the plugboard would be more secure than ADONIS without it.

CAPT. TAYLOR: What are the aspects with regard to BRUTUS and ADONIS? It says in here that the U.S. Services have agreed to the POLLUX/ADONIS principle. We are adopting that as a basic statement. My recollection is that while it is an essentially correct statement, it is only half a statement in that the statement was that we would test both BRUTUS and POLLUX, the AFSAM 7 and 47, and then make a determination. That was the basic plan if I remember correctly. The U.S. would make the determination and inform the British. What puzzles me here is the practical aspect, the production aspect. It is stated in here that we can get the new one much faster than BRUTUS. Why is that?

MR. FRIEDMAN: The contractor handling that is the Teletype Corporation, and I think they are a little behind on it.

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LT. COL. REVANE: First of all one is under development. Dick, isn't it the 47?

MR. CHILES: The 47 is behind the 7 as far as I know.

CAPT. TAYLOR: Wouldn't readjustment of the priority take care of this difference?

LT. COL. REVANE: We are talking about two things now.

MR. CHILES: It wouldn't be for about a year in production and quantity.

LT. COL. REVANE: The paper here deals with systems. You are talking about equipment. If ADONIS were adopted, it is my understanding that the joint crypto plan would be the 47.

CAPT. TAYLOR: The 36-point rotor 47?

LT. COL. REVANE: That is at least two years behind the AFSAM 7. There is no intention to force the 7 upon the Navy in place of the 47B.

CAPT. TAYLOR: I was curious about whether it wouldn't be possible to start out with BRUTUS with a readjustment of the priorities and have a modification in the form of the 26 by 26 plug. That is the next machine for use with the modification and would come out around 1958 or 1960. That would be a still better overall equipment, accepting a minor reduction in security in the meantime.

MR. FRIEDMAN: As I understand, the introduction of plugboards in the BRUTUS models now would necessitate fairly complete changes in design. Isn't that right, Dick?

MR. CHILES: In the 47 I think if they are able to get thin separators, they might have enough room to put a plug in the 47. The big trouble comes in with the 329, the thing that is going into the 2900.

CAPT. TAYLOR: Have you seen the Conley 50-point plug?

MR. CHILES: Yes. In the 329 thing that is going in there isn't any place to get the necessary connection using the output side of the plug, of the basket. You would have to

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make the thing. We have talked this over with BUSHIPS. It seemed to be the general consensus that if it were to be incorporated, it would have to be a change in the 2900 itself. We would have to make the plugboard a part of the 2900.

MR. SMALL: Where it plugs into the print-wheel mechanism?

MR. CHILES: Yes, on the 2900. If it were done on the 2900, I think this would mean calling them back and rehabilitating them. I should think that would be a two-year rehabilitation program.

MR. FRIEDMAN: You mentioned the Conley type of thing. I think I have seen one of those, but this isn't exactly what we mean by a plugboard.

CAPT. TAYLOR: But it would accomplish a similar purpose. What you are talking about engineering-wise is still a little better. Theoretically it seems to be feasible. Instead of a flock of plugs, you put the Conley plug on the inside. On the outside you have a pluggable board like you do on an IBM set-up. You have the cross wires. You have to change the plug not from the inside but from the outside. That idea merits some consideration. It might be an answer to this problem before we jump off on another one.

COL. PACHYNSKI: This is nothing more than a general statement in detail that we are discussing here in this decision. Any action to press for the use of the BRUTUS system as an interim measure would be contrary to the objective which has been set up by the U.S. Services to provide for a completely compatible system, a new system in the U.S. Services. Now if BRUTUS is used as an interim system, then we get into the same rat race which the Director is strenuously opposed to and which we have had in the past and have in the present where you have to provide for compatibility for a non-crypto security equipment through use of an improvised basket system.

The production possibly of the AFSAM 7, plus the fact that the Army and Air Force both are extremely desirous of having the equipment in their hands and placed in operation,

would provoke such a situation. The Director's view is that it would compound past felonies made in this respect, so he feels we should now get off on the right foot. We are in an advantageous position with respect to the AFSAM 7 production picture. It is one equipment that does two things. One is that it meets the requirements from the standpoint of the military characteristics of the Air Force and the Army. It can be made available within a date that is pretty close to 1 January 1955 for Combined and NATO use.

MR. CHITTENDEN: I would like to comment on that as to cost. By 1960 the cost of doing what Capt. Taylor suggests, of stepping into a better system by going through the BRUTUS phase first would be about $150,000,000. To go to a better system now with ADONIS would cost about $84,000,000.

CAPT. TAYLOR: I have a question on security. Is BRUTUS considered more or less secure than the CCM?

DR. SHAW: More, certainly. Immeasurably more.

CAPT. TAYLOR: What level of security are you trying to provide? The highest level, or are you trying to provide intermediate levels in BRUTUS or ADONIS, either one?

COL. PACHYNSKI: By level what do you mean?

CAPT. TAYLOR: The class of holder. For example, do you want the type of security which you would expect for communication with a Class 5 holder or a Class 6 holder? Do you want it for high command or for the operational level?

DR. SHAW: At the present time the CCM, HERMES, is being used for substantially all combined communications. In general systems and in high command systems we have to have Class 3 and Class 5. The idea is to replace that system. We have to have something to take Class 5.

CAPT. TAYLOR: That will be made available in the ECM, the 889?

MR. FRIEDMAN: For certain high command systems?

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CAPT. TAYLOR: How about for certain high command communications?

DR. SHAW: That is Class 6 and 7.

MR. FRIEDMAN: COMINT?

DR. SHAW: It amounts to Class 7 and part of Class 6. We take out the COMINT material.

MR. BATTEY: While we are on the subject of security, I would like to inquire about the British implication that the AFSAM 7 isn't as secure as it should be. In one part of their paper they say to increase the security. Is that worth commenting on in replying to the British?

MR. FRIEDMAN: If we had it to do over again, we probably would have included provision for plugging of the AFSAM 7.

DR. SHAW: I sincerely trust that future editions of the 7 will have it.

MR. CHITTENDEN: I would like to point out for Mr. Battey's peace of mind that a change has been made in the number of rotors per set which should overcome that objection.

DR. SHAW: It won't overcome it, but it ameliorates it.

MR. BATTEY: Is that situation worthy of making a comment on to the British? Apparently at the present time they don't feel satisfied on the security of the 7.

MR. CHILES: I think it depends on how much detail you want to go into in a paper of this sort to solve the major problem. The implication in this paper certainly is that the security of the ADONIS system as it will be put forth will be adequate for the length of time that we intend to to be.

MR. FRIEDMAN: I think Mr. Battey's point is a good one. It wouldn't hurt to put in the paper recognition of their comment and go on and say with a view to improving the system that we agree that probably at this time we will have to increase the number of rotors per set. That should

improve the situation. It won't go as far as the plugboard would. I think that also we should take occasion to point out that much as the cryptographic experts approve the use of plugboards, the operators disapprove. At present U. S. operators highly disapprove the use of plugboards. It slows up the thing. It is a source of error. It creates pandemonium when you are set up for a day's period and a message comes in for the preceding period. All in all if we could avoid it, we would like to avoid it for the sake of the operators.

CAPT. TAYLOR: That is a good question, the degree of pandemonium. Up until now the operators have not been too seriously considered. It is our feeling that many of the arrangements now in effect are unnecessarily confusing and too complicated for the type of operators we have in the field. One of the things which we are very uneasy about now is the rotatable notch ring idea which I think has worse disadvantages than the plugboard. I don't know the relative merits of the plugboard.

The security question is an interesting one. We are still reluctant to believe that AJAX is as insecure as it is stated to be. We are more inclined to approach that thing from a practical production viewpoint than from a security viewpoint. Assuming that this is the case, BRUTUS has adequate security, maybe not as much security as you would have by some other means but adequate security, we might get ourselves into an engineering and production hole that makes it impossible to supply BRUTUS. Let me ask also why the insistence on this solution here. Are we going to put them in an impossible position?

MR. FRIEDMAN: Put the British in an impossible position?

CAPT. TAYLOR: Yes, engineering and production-wise. They have gotten themselves an adaptor for use with TYPEX, but they haven't done much of anything else. What are we doing to help them out by this solution?

LT. COL. REVANE: I would have to go back to the staff study to answer that. We worked up the estimated cost of financing BRUTUS for use of the U.S. forces alone, not U.K. or NATO. For the first year of the war it would require about 13,760 various types of adaptors and machines.

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There are certain things to be considered. On the AFSAM 47 there would be 5,000 each for the first year of the war. More would be required for full mobilization than for the first year of the war. That accounts for the higher cost. For the U.S. forces it would be 35.1 million dollars. On the AFSAM 7, 2,000 each is carried in that figure. On the AFSAM 429 basket, the 329, it is 800 each. Then on top of that you have the rehabilitation costs, costs for spare parts for all the various types of adaptors and machines. Full mobilization requires 12,642 various types. In addition to the 13,000, you have the rotor problem compounded. Then you have spare parts and rehabilitation costs. A lot of the machines will be ten years or more old.

CAPT. TAYLOR: Won't the rotor problem be simplified with 26-point rotors rather than 36-point rotors?

LT. COL. REVANE: I don't think so. Under the concept of ADONIS you have 36-point rotors throughout. Logistically for the users of Combined and NATO systems we will only supply them with one type of rotor. For NATO when you get into that, under the BRUTUS concept we considered that the U.K. would supply themselves BRUTUS-wise. So it comes up to a grand total cost to the U.S. of 83.3 million dollars, whereas based on ADONIS/BRUTUS, the grand total to the U.S. for full mobilization for the first year of the war is 61.7 million dollars. Adding the U.K.-NATO forces in there, it comes to 84.8 million dollars. The grand total cost to the U.S. forces for the first year of the war going to ADONIS is only 29.6 million dollars as compared to 35.1 million dollars for BRUTUS for the first year of the war. That is about 6 million dollars difference for the first year of the war. Engineering-wise and logistic-wise the AFSAM 7 is in production now.

Lt. Col. Revane spoke off the record.

CAPT. TAYLOR: If you felt the 47 would be all right.....

LT. COL. REVANE: You mentioned the practical aspects of this thing. A lot of development would have to be done on the various types of machines to go to BRUTUS. One of the biggest jobs would be for the AFSAM 7. You don't have anything at all on that.

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MR. CHILES: They have done some work on it. It would be a long way away.

LT. COL. REVANE: You haven't even gotten out of the development stage.

MR. CHILES: It is a matter of trying to get a satisfactory rotor that will fit into the space available in the 7. With the separators you would not be able to accommodate the BRUTUS. One of the serious things is that if we went to BRUTUS and used that adaptor in the 7, the plugboard situation there becomes extremely difficult. There wouldn't be the space available that there would be in the 47 to accomplish that end, the output plugboard. With the 7 adaptor to have it work BRUTUS, that is the thing that is a long way away. On the 47 I believe the last estimate was that it would start in production in January, 1954. That is about all I was going to say. The 329 runs about the same.

MR. CHITTENDEN: It depends on the engineering space for the plugboard in the 329.

MR. CHILES: As far as the 329 goes, we won't be able to put the plugboard in that as far as we know at the present time. It would be a matter of adding it in the machine itself, to the basic machine, the 2900.

CAPT. TAYLOR: Speaking of a solution based on practical aspects, I gathered that it has to be compatible with the 7's that are going to be used by two of our Services.

COL. PACHYNSKI: Going back to the question about the British development position in this matter, there is also attached to this communication from the British Joint Chiefs of Staff a second paper of which you are probably aware. It has to do with replacement of the Combined Cipher Machine. They point out that they want to add other things. They state that in view of the above production-quantity requirements for each of the Commonwealth nations concerned, the U.S. may be required to provide all the equipment, which would be as follows. They add them all up. The total comes to 6,540. That total represents 4,200 for the Navy, 1,390 for the Army, and 950 for the Air Force. We recognize the development position of the British. We recognize the requirements

for the machines that we would have to furnish if they did go the AFSAM 7. In the reply it is specifically stated that based upon the belief that the AFSAM 7 will be satisfactory equipment, and that the necessity may exist for the U.S. to produce equipments to meet all requirements, action is being taken to increase production capabilities for the AFSAM 7.

CAPT. TAYLOR: Could I digress for a moment and ask how you all feel about giving machines to the South African Government and on what basis it is to be done? That came up in the JCEC Panel not long ago. The British Joint Services Mission seems to be strongly in favor of such an action.

COL. PACHYNSKI: I don't believe that we have had any strong feeling or any objection to such an action. Certainly if the Italians, the Greeks, the Turks, and a few others get them, I think they are entitled to them.

CAPT. TAYLOR: We have had a little reluctance about it. They want to include Ceylon and Pakistan as well as South Africa in their request for the same types of crypto systems that were being used for NATO.

MR. CHITTENDEN: The South Africans did hold the CCM during the war.

DR. SHAW: The only remarks which I heard on the subject were from various representatives of the British Admiralty. They found it necessary in order to have South African ships working with their fleet.

MR. WOLFAND: They wanted us to release that to six countries. For Ceylon and Pakistan they just wanted us to give them training editions.

CAPT. TAYLOR: Originally they wanted us to give them the device and the training editions. They wanted us to give them the device and the system.

MR. WOLFAND: Only the training editions. The South Africans want us to give them the operational system as well. They point out in their paper that they intend to give the South Africans an intra-British machine which they think has greater security than the BRUTUS.

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CAPT. TAYLOR: That was just a digression.

MR. SMALL: If the British could show us some manner in which they could build a pluggable output into our machine, would that in any way make BRUTUS acceptable to us? If we gave the reasons we give here, this would then not hold. Would we then have to fall back on some other reasons than those given here?

LT. COL. REVANE: On that question from the production standpoint if they come up and say that they can give us BRUTUS with a plugboard before we can get out the AFSAM 7, I think they probably would be in a very good position. I don't think it is possible from what our own production people know about the situation. How do you feel, Col. Shaw?

COL. SHAW: I don't know anything about the British capacity to do this. From our point of view the rehabilitation, calling in enough equipments to get plugboards on, is an exceedingly wasteful time factor.

LT. COL. REVANE: The only equipments which we have for NATO are the 1700s and the SIGRODS. We don't have anything in stock that we could make BRUTUS machines out of. We would have to haul the machines out and bring them back. That means going out of communication.

MR. SMALL: As far as we from the Army are concerned, we are here to listen to the Director's position and are not to make any statements on our own. We are just here to listen and to join in the discussion for information purposes. The thought that I had here was to reiterate our historic stand, that we would like to see the 7. What it will be when the paper comes out hasn't been decided. We know there is a lot of reluctance to the pluggable input, that it would not be put on BRUTUS as far as this paper goes.

MR. CHILES: It says that it will delay it.

DR. SHAW: Is there any possibility that BRUTUS without the plugboard would get out before the 7?

MR. CHILES: What is your schedule?

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COL. SHAW: The 26-point 7 without plugboards?

MR. CHILES: No, it cannot.

COL. SHAW: Putting the plugboard in it delays it further.

LT. COL. REVANE: The 7 is the quickest if it is satisfactory, if the service test is satisfactory. It is the quickest way to do it. As I tried to point out a while ago, the development of the adaptor to make the Army and Air Force equipment work on BRUTUS is not even finished.

CAPT. TAYLOR: You can't change the priority of the task at this point so as to bring BRUTUS out in time to meet the British request here?

MR. CHILES: The priority of the 47 and the 429 are already at the top. We have suspended everything else.

CAPT. TAYLOR: Supposing you abandon the 7 for the time being and concentrate on the 47, can you bring it out in time?

MR. CHILES: I don't think the two conflict actually. The 47 is being done by Teletype and it is true that they are subcontracting some of the other production to the same company that is doing the 7, Burroughs. I think the thing has been set up essentially with Burroughs. I am not sure.

MR. CHITTENDEN: They are.

CAPT. TAYLOR: To concentrate on ADONIS here doesn't affect production one way or the other of the 47. Is that right?

MR. CHITTENDEN: The 47B now hinges on the rapidity with which the engineering could be performed.

CAPT. TAYLOR: It doesn't impinge on the priority on the 47 either. Is that correct?

MR. CHITTENDEN: The two are not in conflict.

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CAPT. TAYLOR: There is no way to bring the 47 out faster?

MR. CHILES: Not unless we can jack up Teletype.

CAPT. TAYLOR: I wanted to get your views on it. I notice, Colonel, that you have a number of experts in the security of these devices around here. Two of them I recognized. In Undersea Warfare one is anti-fax and the other is pro-fax. I wondered if you would ask them their views on the security aspects of these devices.

MR. RAVEN: I would want a further definition of anti and pro.

CAPT. TAYLOR: Pro is the prosecution of one's own sub-campaign. Anti means countering the other fellow's.

MR. RAVEN: I am here as 02's representative. I probably would be classed as anti.

DR. STUKEY: I am here as Shaw's tentative relief.

CAPT. TAYLOR: I would like to hear their views on the devices if they have studied them.

COL. PACHYNSKI: They worked on the problem together. It seems to me they ought to speak with one voice on it.

CAPT. TAYLOR: On the security aspect you said, Bob, you don't consider BRUTUS sufficiently secure for NATO use.

DR. SHAW: The thing is this. If you put in a machine now or in 1955 which will be used for ten years, the machine you put in for ten years which has to operate on anything so hot as classified traffic has to be such that when it goes out of operation ten years from 1955 the last message you sent in is still secure for a substantial length of time.

CAPT. TAYLOR: It ought to be, yes.

DR. SHAW: Under the circumstances the 7 with encrypted indicators, which is the ADONIS, is better than the 47 26-point rotor machine with encrypted indicators, which is BRUTUS and which would be 15 years from production.

The 47 with the encrypted indicators, which is the 26-point BRUTUS as we now have it, will very likely be readable. The 7 I expect will not.

CAPT. TAYLOR: Don't you propose in ten years to have a completely new one?

DR. SHAW: You still have to be able to read the last message sent in the old system. We don't contemplate that we will get into the sort of fix we are in now. At least I hope we will not get into a situation where the system on which we have been depending fails before there is a replacement.

CAPT. TAYLOR: Maybe, Bob, on the concept that they have failed, that is where we stand.

DR. SHAW: Is it the official position of the U.S. Navy that the AJAX has not failed?

CAPT. TAYLOR: We are not convinced of it. As a matter of fact, as I understand it, and I am not an expert in the field myself, we have serious doubts as to the validity of the so-called doublet attack.

DR. SHAW: I have no doubt.

MR. FRIEDMAN: The only comment I could make on that is that there is unanimity on that technical point between the responsible authorities in the U.S. and in the U.K. That means that there are at least a couple of dozen technically qualified experts who agree as against what has the U.S. Navy.

CAPT. TAYLOR: We propose in justification of the statement that we have a reservation on that point to submit officially a comment and a detailed evaluation which I believe has been circulated informally to some of you here already.

MR. FRIEDMAN: I have seen the paper. I got it today.

MR. SMALL: Is there any chance that you could send me the paper?

CAPT. TAYLOR: Sure. We would be glad to send it around. Most of us who looked at the paper which I am talking about are not qualified to say ourselves whether or not it is correct. We have to rely on opinion of one of our qualified experts, Capt. Safford. We intend to submit that for

critical analysis to see whether or not indeed it is valid. We will officially submit it to the Director, National Security Agency, for his comments and criticism. When we get the ultimate response from the Director, NSA, that it is invalid and that the original evaluation of the doublet attack is indeed correct, we will of course abide by that decision. Until such time as he has actually critically examined this piece of paper we still have some reservations.

DR. SHAW: It seems to me that the U.S. Navy has no choice in this situation except to recommend complete suspension of everything we have talked about here this morning.

CAPT. TAYLOR: We are making no recommendations here this morning at all.

MR. SMALL: The Army felt sometime ago when it went before AFSAC two years ago, when the problem of BRUTUS came up, the Army felt that perhaps the ECM should be given to the British. We felt the 7 should be made the CCM eventually. Our reasons then are the same as they would be now. That isn't an official statement. The 9 is coming along. There are two very strong reasons tending toward ADONIS rather than toward your machine. We still want to win the next war. We want the one that looks best at that time. Those are the two strongest reasons as far as I can see. I notice that neither of them shows up in this paper. I don't know whether the Director wants to take it into account. It will have the same rotors as the 9 and will make our training problem and our logistics problem easier. It might also allow giving encrypted indicators to low echelons. Those are two important reasons for the Army to want the 7.

LT. COL. REVANE: I would like to make a prediction anyway that with the simple 7 and the 9 coming into use you are going to be enciphering your indicators.

MR. SMALL: That was a factor in favor of the 7.

MR. RAVEN: I am in complete agreement with Bob. I personally feel that for the long-range haul that he is talking about that the 47 certainly will not make it. In my own mind I have some doubts that the 7 will make it. I think the 7, with reservations on it, is the slightly more secure machine. There is marginal security. We are playing in decimal points here.

MR. FRIEDMAN: As to the point which Al raised about why we don't mention these things and he brings in the AFSAM 9, I didn't know that the British were in on the AFSAM 9.

MR. WOLFAND: Yes.

MR. CHILES: They were not interested in it from their connection with the combined replacement.

LT. COL. REVANE: We are getting off the problem. The problem is to replace the CCM as quickly as possible.

DR. SHAW: That is the point that was just raised. Does it need replacing?

LT. COL. REVANE: We are faced with this situation. The British say that it needs replacement and we agree with them.

CAPT. TAYLOR: For the purposes of this paper dealing with the British Cypher Policy Board and its responsibilities we have said that the CCM is insecure and that it does need replacing. I quite agree that one must address himself to that portion of the problem. I think that the question of the relative security is something of a side issue. That makes it so very difficult. You have to drop everything that you have already done. The evaluation of the AJAX system two years ago completely disrupted the cryptographic planning. Whether or not it is too late to do anything about that I don't know. I bring that matter up as something to consider. The British, however, seem to have written the strongest memorandum I have ever read from them on any subject. They have the bit in their teeth. I am not prepared here to say one way or the other that we go along with them. We are inclined to agree with them. I do certainly have the feeling that Frank Raven's statement about the degree of security, which I described as being within ten per cent of infinity, is a pertinent factor. The length of use is certainly a pertinent factor. There is a period of time during which the last message should not be readable. True.

MR. FRIEDMAN: With reference to the question of AJAX, delaying answering this until that has been settled, I don't see how we can do that very well. The British are

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pressing, and we are subjected to a delay of a couple of days in forwarding the paper to JCS. To answer a question of the kind that you bring up would introduce a delay of several weeks, if not months.

CAPT. TAYLOR: I don't propose that you delay on that basis. I merely state that we are going to make such a proposal.

MR. FRIEDMAN: The crux of the problem is getting it officially agreed. We have officially agreed on the insecurity of AJAX and have officially agreed on the necessity for a quick replacement. There is need on the part of the British to have a firm determination made so they can get started. It seems to me to dictate this kind of a response.

CAPT. TAYLOR: Perhaps so. Really the only ground that it could be handled on is the practical ground as to which could be gotten first and cheapest.

MR. FRIEDMAN: The answer to that is very clear. It is the ADONIS, the AFSAM 7.

CAPT. TAYLOR: I am inclined to regard the security aspects as a side issue.

LT. COL. REVANE: In going back into this thing even before the so-called doublet attack came up there was an attempt to replace the CCM.

CAPT. TAYLOR: That is correct.

DR. SHAW: It was established without regard for the doublet attack on 3 October 1947.

LT. COL. REVANE: It is a side issue. We have to replace the CCM whether this other thing came up or not.

CAPT. TAYLOR: Quite true.

LT. COL. REVANE: We feel that this is a practicable program. We feel that as far as the Navy is concerned it will not interfere with your operational requirements for the 47B

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because even the Navy would be asked to carry the AFSAM 7 as soon as possible, as soon as it is available. As soon as you have the AFSAM 47B, you would send the 7s back to us. Then we would give them out to meet other requirements. As far as your budget is concerned, as far as the Navy is concerned, you won't ever budget for the AFSAM 7.

CAPT. TAYLOR: You have heard the old arguments that we have beat over and over again, the question of space, its importance upon the number of rotors that we can carry on ships, and the number of machines which we can carry on ships.

LT. COL. REVANE: The baskets and rotors going into BRUTUS are somewhat bigger than the 7. As far as space, there isn't a lot of difference between carrying a big basket or something the size of the 7.

MR. FRIEDMAN: May I suggest, Mr. Chairman, in order to get on with this now I would like to ask the Army if they have any comments on the paper, whether there are any factual errors or ambiguities that we can straighten out. We would like to have the help of the Services on this paper so that we get it straight. I would like to have the Air Force make similar comments. We will make the change about POLLUX/ADONIS. We will introduce a single sentence to explain that.

COL. PACHYNSKI: There is one thing I would like to ask in respect to your question about the British point about the security of the AFSAM 7. You don't feel, I take it, that the comment made on the security of BRUTUS versus the so-called POLLUX/ADONIS in this proposed paper is sufficiently covered?

MR. BATTEY: They do indirectly. My only thought was that since the British made a specific point to question the security of the 7, our paper might be a little stronger if we reaffirmed our own belief that it would be adequately secure.

MAJ. HAMILTON: Isn't that taken care of in the last sentence of paragraph 4 of the enclosure?

MR. SMALL: Does it say it is better than BRUTUS with enciphered indicators?

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MR. BATTEY: I will pass that comment along as something to think about. I am not decided in my own mind. If you think it would make a stronger paper, I would suggest putting it in.

LT. COL. REVANE: There is another aspect which is not to be overlooked. Besides the security aspect there is the operational requirement to get some machines out for NATO and for Combined Communications purposes.

CAPT. TAYLOR: I think that it is a mistake to do this on the basis of security requirements, on the basis of relative security. I doubt very much that we can get the people to agree to paragraph 3 here.

MR. CHITTENDEN: What do you think is the most practical basis?

CAPT. TAYLOR: Which one can you get out first and cheapest?

MR. CHITTENDEN: This paper does represent an indication of what we can get.

CAPT. TAYLOR: I am not in position to accept or to reject this paper at this meeting.

MR. FRIEDMAN: You aren't supposed to. We wanted to have some help. If you felt that there were any mistakes in here, we don't want to forward any papers with mistakes in them.

CAPT. TAYLOR: Paragraph c goes back to our action of last year on the basic plan which said, "Go ahead with the thing. We will test them and will take the one which proves to be the best." Apparently that is still going to be the one. This gives the impression that it has already been determined from these tests that the 7 is quite satisfactory and therefore the British planning should be based on the ADONIS system.

MR. FRIEDMAN: I think you are right.

LT. COL. REVANE: I don't think there is anything in the paper which says that anyone, the British, the Navy, or anyone else has to take the AFSAM 7 with the ADONIS principle.

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MR. FRIEDMAN: The 47B.

LT. COL. REVANE: Or build a different machine altogether than either one of them.

CAPT. TAYLOR: The 47B, we don't know just where we stand on the 47B yet.

MR. CHILES: It is a long way off. The work on that hasn't progressed as rapidly as we had hoped it would, primarily because of the emphasis on the 47 and the 329. We wanted to get those out first. As far as I know, up at Teletype all they have done is to make some rather extensive tests on the 36-point rotors to see if they are going to run into any trouble as far as construction and resistance went, etc. The last report I saw on that was that they had run the 47 printer for 100 hours continuously without error. That is the 36-point rotor maze.

MR. WOLFAND: You could say pretty safely that the 47B would be about a year behind the 47 production-wise?

MR. CHILES: It will be a year or 18 months behind the 47 at least. Teletype estimates two years. It depends on how tests on the rotors work out. If they have to develop a new rotor, it will be delayed longer.

CAPT. TAYLOR: The paper here doesn't say so. We strongly believe that the 7 will be the thing. It says in paragraph 5, "Based upon the belief that the AFSAM 7 will be satisfactory equipment, and that the necessity may exist for the U.S. to produce equipments to meet all requirements, action is being taken to increase production capabilities for the AFSAM 7." First of all we believe it is the 7 that we ought to go ahead with. This says in paragraph 6, "Therefore, the U.S. Joint Chiefs of Staff believe that consideration of BRUTUS as a replacement for the CCM should be suspended until completion of service testings of the AFSAM 7."

Fair enough. That seems to go back to the original idea of testing them and taking whichever one proves to be the more satisfactory all things considered. I don't see in any place in here where there is any statement as to the date when the decision on whether or not the 7 satisfactorily meets the service test might be expected. The

last I heard on the thing was that such a decision probably had been overtaken by events due to difficulties in production of both of these devices. There was informal agreement between the Director and one of the Navy members, Captain Howeth, that they would render a decision by 1 January 1953. It appears as though that is impossible now. Assuming this solution as stated here should be the one that we should take, what then would one expect in the way of a date for determination of satisfactory service testing of the 7?

MR. FRIEDMAN: Col. Shaw, when will the pre-production models all be off the line and sent out?

COL. SHAW: You are getting about 25 in January. In February you will get 50.

MR. WOLFAND: Production models?

COL. SHAW: These are on the production line. In March you will get 100. I would like to make one point clear. In the start of the production line you don't get real production models until after quite a few have proved all the tools. You can't prove all the tools on a couple of hundred instruments. Our rate really doesn't begin to accelerate until the end of April.

MR. FRIEDMAN: The question Capt. Taylor raised was, "When can we expect a decision to be made upon the service testing of the pre-production models?" Shall we say the first of March, the first of April, the first of May, or what?

COL. SHAW: I don't know how long the service testing takes. If you get 200 by March, how many will you need for service testing and how long will it take?

MR. CHITTENDEN: No one can say just the specific date on which we will have the complete number of equipments for service test and the tests completed. The Army and the Navy have waived service test to get the production underway. It is not proposed by them that they conduct formal service tests. There is no sense in stopping action until the service test is completed and the equipment evaluated and rejected or accepted. They are taking the equipments as they become available from the production line and putting them through various operational tests and evaluating them that way. We have just completed the airborne test on the production model of the 7. It was highly successful.

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CAPT. TAYLOR: What you are doing at the present is all on faith completely. You recognize the need for service test. All your plans are based on the success of those tests. If the tests fail, where are we?

MR. SMALL: Gen. Canine could probably state a date if you demand an answer.

MR. FRIEDMAN: The paper is not complete without a statement of the date because the British will say, "About how long can we be expected to sit here and wait?"

CAPT. TAYLOR: This paper asks the British to withhold their decision to do something right away.

MR. CHITTENDEN: We promised them by 1 January 1953 we would have a decision.

MR. FRIEDMAN: We ought to give them another date.

CAPT. TAYLOR: Somebody has to make a decision right or wrong to go one way or the other. Postponement of the decision makes all the planning extremely difficult. Presenting them with a pre-conceived plan of what is intended is all very well if you are sure of your ground and the thing turns out well. If it doesn't, you are in a very bad spot. It is for that reason that we have taken the view that if you are going to bet on an untried horse, you ought to bet on the tried and proved principle which the British have stated in their paper. The Navy certainly hopes that the commitments in favor of the 7 will be successful. Someplace along the line and very soon a decision has to be made. You can't keep putting off the evil date. This paper should reflect that. Some place in writing that should be made. As of that date we have to make up our minds which way we are going to jump.

MR. CHITTENDEN: That date is still 1 January 1953. I believe this reply to the British was an effort to extend it, to extend it and confirm it.

CAPT. TAYLOR: We are about to decide on the 7. We can't really decide.

MR. CHITTENDEN: Turning the paper around, it says that the U.S. Services have decided that ADONIS is what should be used. We still have a reservation that the specific

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embodiment which the 7 offers is going to be completely successful initially. That is what this paper says. It talks about a principle.

LT. COL. REVANE: It has to say more than that because the British want a decision on a replacement for the CCM, either BRUTUS or ADONIS.

CAPT. TAYLOR: It goes back to the memorandum which says, "Let's submit both of the best equipments for test. We will get their comments and will make a decision as to which one it will be." The memorandum says in paragraph 6, "Therefore, the U.S. Joint Chiefs of Staff believe that consideration of BRUTUS as a replacement for the CCM should be suspended until completion of service testings of the AFSAM 7." It doesn't say reject it. It says suspend it until service test of the 7, leaving room for the position that if the 7 fails we have to do some other planning. I think the Director should either make his decision now or say that the thing is in a state of flux and he thinks he can give a decision by 1 May. He says, "I will make a decision by 1 May." Stop putting it off.

MR. SMALL: Notice the reference in paragraph 2, line 6. Could we say that service test will be initiated on 1 March?

MR. CHILES: To pick a date would depend on what you mean by service testing. If you mean what the Army means, it would be one date. If you mean what the Navy means, it would be another.

MR. SMALL: What do we mean?

CAPT. TAYLOR: I don't mean when I suggest that we pick a date for service test that it has to be a complete service test. We recognize the imponderables there. I do think the Director should pick a date, a reasonable estimate of the time in which we think we will have enough information on which to make a decision.

MR. CHITTENDEN: The date of the decision is based on the best information available.

MR. SMALL: We ought to state instead when we are to begin service test.

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MR. CHITTENDEN: Since we are dealing with variables and imponderables, I think it is better to pick a date for the decision rather than pick a date for service testing because that will depend on what you mean by service test, what will be accomplished when the service test evaluation is complete. I think the idea of a date for the decision is a fine idea.

MR. FRIEDMAN: I disagree violently with indicating that a decision will be made by the Director on 1 April 1953.

MR. SMALL: A decision to do what, Sir?

MR. FRIEDMAN: We will decide on the basis of test that we will go ahead with the AFSAM 7, ADONIS.

MR. SMALL: I wondered what the alternative was.

MR. FRIEDMAN: If the testing should turn out to be unfavorable to the machine, it is obvious that we would have to delay still further to try to step up ERUTUS production.

MR. SMALL: It might show that we should extend it. I am curious about whether that would be one of the alternatives.

MR. CHITTENDEN: There would be two to make. The decision is that ADONIS is the superior system from the standpoint of security, from the standpoint of cost, and from the standpoint of production. The only thing which is left out of that picture, the only factor which we don't have to make this picture complete and which we recognize in this paper, is the workability, the acceptability of the two equipments which are embodiments of ADONIS, the 7 and the 47B. These are the only things which we lack in presenting to the Director the facts on which to make a decision now. If we limit the decision to 1 April for an evaluation of a specific equipment, we will not be in much better position on 1 April than we are in right now.

If we say that the Director's decision should be confined to a decision of principle, then the paper is adequate. The British may ask us to determine a principle, to make a decision on principle because they realize as we do that they probably will have to have a different embodiment from the principle than we will have. Avoidance on a

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decision of principle prevents anybody from moving toward getting a production embodiment. I believe we have sufficient information available now to make a decision far shorter than April 1.

MR. RAVEN: I am a little confused here. The basic issue which is at stake here is a very, very simple one. The basic issue is, "Will the AFSAM 7 work or won't it work?" Will we know by the first of April that it is a sound mechanical device or won't we? As far as the ADONIS principle and the POLLUX principle, that is just extra. That will be gingerbread on top of the basic issue.

LT. COL. REVANE: Suppose we change the paper right now to say that we are going to the ADONIS principle? What have we lost? We have to go to them anyhow?

MR. FRIEDMAN: That is paragraph 1b.

CAPT. TAYLOR: I don't think we have lost anything.

LT. COL. REVANE: Let's say we are going to ADONIS.

MR. FRIEDMAN: Refer to paragraph 1b. It says, "The U.S. Services have agreed that the POLLUX/ADONIS crypto-principle will be adopted at an early date as a basic system for U.S. Joint communications, if service tests prove the AFSAM 7 satisfactory."

I don't see that the tag end belongs there. The POLLUX/ ADONIS principle will be the basic system. What has the service test on the AFSAM 7 got to do with it?

MR. WOLFAND: Read the introduction to AFSAC 1277.

MR. CHITTENDEN: We have agreed upon a plan which results in the U. S. Services saying that they would use the 36-point rotors.

MR. RAVEN: The 36-point rotors are a long way from the ADONIS/POLLUX crypto-system.

Mr. Chittenden read paragraphs 1a, b, and c from the proposed plan.

MR. CHITTENDEN: We are putting the U.S. agreed plan into effect. We are proposing that the British accept it for Combined Communications. We are proposing that you accept

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the ADONIS crypto-principle for Combined Communications. Then in the specific embodiments there are technical problems that we have to overcome. Capt. Taylor has pointed that out. We can't overcome those until we have settled on a principle. We are able to do that now. The facts are available to give to the Director. Those facts Col. Shaw has presented very well. Lt. Col. Revane has presented them very well. They are security, cost and production. We could take out the portion of the paper dealing with the AFSAM 7 and its inability to operate.

MR. FRIEDMAN: There is inconsistency between 1b and 1c. In 1b we say that the U.S. Services have agreed on the POLLUX/ADONIS crypto-principle as the basic system. With that in mind it means 36-point rotors with a certain type of motion for the rotors, etc. Then in 1c it says in referring to the AFSAM 7 and AFSAM 47 that the choice between these two equipments was to be contingent upon the results of the service testing and further security studies. Am I wrong in saying that if ADONIS has been agreed upon, then the AFSAM 47 is out? If you are going to talk about anything,you talk about the AFSAM 47B.

LT. COL. REVANE: Further security studies show the ADONIS to be the more desirable.

CAPT. TAYLOR: That is where I take the position that I am not definitely convinced of it. Probably the degree of difference in security is not sufficiently great to override the question as to whether or not the embodiment of the principle that will work on one can be gotten out more cheaply and more quickly than the other one under consideration.

LT. COL. REVANE: You are talking about BRUTUS, not BRUTUS with the plugboard.

CAPT. TAYLOR: If BRUTUS with the plugboard could be gotten out, I would say that we ought to go along with the British and decide on it.

MR. CHITTENDEN: That is the very point. Our study of production and cost shows that isn't true.

CAPT. TAYLOR: How about if there was equality between them from the standpoint of production and workability?

COL. PACHYNSKI: Speaking of the aspects of the device, I would say security makes the deciding difference. Is the security aspect sufficiently great to be the deciding factor in this paper? I don't think it is. I would think Mr. Friedman is quite right in saying that he is certain the British will be very quick to pick that out.

MR. FRIEDMAN: Omit paragraph 1b. Go on from 1a to 1c. It reads logically. It disposes of the question of service testing first and then the security studies. It winds up by giving reasons for adopting POLLUX/ADONIS and says that we can do that within a reasonable approach to the target date. It says that we are taking steps to increase the production capabilities and we ask them to hold up their decision until then. I think we should give a date.

MR. SMALL: What it really amounts to is a statement to the British that we have the thing in hand. In the light of certain factors it is impossible to talk turkey on the first of January. Don't be concerned about it until such and such a time when we feel we will be able to make a decision. For your information we are leaning heavily towards ADONIS at this time. That is what in fact you are saying.

CAPT. TAYLOR: I think it would be better than this paper right now.

MR. FRIEDMAN: Of course Tom says that we could make a statement in here now.

MR. CHITTENDEN: What is the difference between going three quarters of the way out on a limb that won't support your weight and going all the way out?

MR. FRIEDMAN: There is the possibility that tests such as are going to be made on the 7 might prove that it doesn't work or doesn't stand up.

LT. COL. REVANE: What you are doing is what you are going to do regardless of how we write this paper. We are going through service testing of the 7. We are building the 47. We are going ahead with the building of the 47. We are going ahead with the adaptors.

MR. RAVEN: That is the 47?

LT. COL. REVANE: As it is in production today.

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CAPT. TAYLOR: All planning so far has been based on the concept that the 7 is going to be workable, that the principle of the 7 and the modified 47 will be satisfactory. They have done a certain amount of development on the 47. The modified version of it is ready. There is no difference in what they are going to do, but only in the way they say it.

MR. CHITTENDEN: What you say is true. The British don't know that. They are going one direction with all their might and we are going in another. We have told them we are going to go in the same direction as they are.

LT. COL. REVANE: They will have to have either the 7 or 47. We don't care which it is.

MR. CHITTENDEN: We will give them an answer believing that we can back it up.

CAPT. TAYLOR: The Director will be in a very bad spot if the 7 should fail. He is going to have to rely on a certain amount of testing which he has to do. He is going to have to rely on that because plans point in the direction that the testing is going to be successful.

LT. COL. REVANE: He is covered on the thing. He has let the Navy go ahead with the 47, to the development of an adaptor for the 2900. If it fails, he has one alternative then, to put those out. We probably ought to say, "To replace the CCM by 1 January 1955."

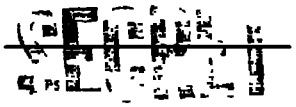
CAPT. TAYLOR: I think you should say that here.

LT. COL. REVANE: As of this date, all of the evidence is in favor of saying that we are going to ADONIS. There is a possibility that may never come about. The probability is that it will come about.

CAPT. TAYLOR: Then you should say so.

MR. CHITTENDEN: I agree.

MR. FRIEDMAN: I think that is right. A limited number of them will be made available to the U.K. as soon as possible. Can't we give some kind of a date there too?



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MR. CHITTENDEN: They have one now. We saw it. We ran 50,000 operations on it.

MR. FRIEDMAN: Someone was misleading me then.

MR. CHITTENDEN: Several people sweated out that thing.

MR. FRIEDMAN: I am glad to know that. Maybe we could tell them that we will make so many available to them by such and such a date. In another place you can give them a date when the Director is going to make a decision.

MR. CHITTENDEN: If you are going to do that, it seems wise to adjust the paper by eliminating paragraphs 1 and 2 completely. After a brief introduction, start the paper with paragraph 3 and go through paragraph 4. Eliminate 5 and 6. The Director should come out with a statement as to what the program is and as to what his decision is, as to the way to do it.

LT. COL. REVANE: When caught, punt. I think that is what we should do.

CAPT. TAYLOR: What happens to the paper? It is a JCS paper which is referred to the Services.

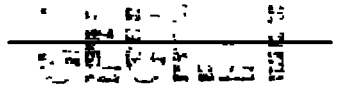
MR. WOLFAND: You will get it at four o'clock one afternoon for answer by six o'clock.

CAPT. TAYLOR: The general opinion in my organization now is that they are going along with the British paper. If certain specific statements were made, based on evidence available and at hand now, and if the Director of NSA would take the responsibility for those statements, they might say, "All right. Fall back on the 47 if the 7 fails."

MR. WOLFAND: We have a joint agreement on that.

LT. COL. REVANE: I can't see why the Navy or anybody else would object to this plan. We have already agreed that it would be the course of action. We haven't reached the point of no return yet, completion of service testing of the 7.

CAPT. TAYLOR: Off the record.



MR. CHITTENDEN: That point is an excellent one. The paper should come out and say what the U.S. position now is. It should say it without equivocation.

COL. PACHYNSKI: I think we should take cognizance of Capt. Taylor's point and get together later and see what can be done about insuring that it is in there. Is there anything else from the Army?

MR. SMALL: I have a little thought. It is not disclosure of the ECM principles. Disclosure of the details of the ECM principles would be more nearly accurate in the last page in the fifth line up from the bottom.

CAPT. TAYLOR: The difference between principles or details dictates that decision.

MR. WOLFAND: Wouldn't it be wise to include in the paper some considerations of logistics in that the British have included them in their paper by saying they can't possibly have their people hold two machines? In our consideration of the use of the AFSAM 7, as Mr. Small brought out earlier, we might want one rotor throughout the Services if we could possibly have it. If BRUTUS were adopted for Combined use and we had the AFSAM 7, for intra-Army use we would have to have two separate kinds of baskets and rotors. I was wondering if some point couldn't be made in reply to back up our logistics requirements just like the British have indicated in there.

CAPT. TAYLOR: I think that is important as far as the Navy is concerned.

MR. CHITTENDEN: More stress ought to be given to the cost of production in that the production costs whether paid for by the U.S. or anybody else might be cheaper this way or that way.

MR. WOLFAND: Did they indicate that they could make an adaptor for a cipher machine to operate with ADONIS or BRUTUS?

MR. FRIEDMAN: The TYPEX.

COL. PACHYNSKI: They haven't done anything about ADONIS.

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LT. COL. REVANE: I don't know how much detail we have to tell the British Chiefs of Staff. We don't know whether they are telling us the scoop or not. Just tell them what we are going to do, that they can't carry two machines.

MR. CHILES: The U.S. Joint Chiefs of Staff don't tell the U.K. Chiefs of Staff what they are going to do.

MR. CHITTENDEN: We are working towards agreement here. We have to give them the same arguments with regard to our present viewpoint which would then persuade them to the same point of view. We arrived at it after some soul searching. It should save them the time of digging it out themselves. We could put it in the paper.

MR. FRIEDMAN: Right after present paragraph 3 which will read the same. I think the next paragraph could bring out the logistics considerations that Dave has mentioned. It would help to bolster our position.

LT. COL. REVANE: We don't know enough about the British situation. They are talking about difficulties in production. In the later paper they are talking about building a national machine and want to know what principle to use in it. Are they going to take the AFSAM 7 or build a new machine? Are they going to keep another machine for national use? Are they going to carry two machines? When we get into logistics, they could rebutt us every time they turn around.

MR. CHITTENDEN: We could tell them of the logistics points which appeal to us from the U.S. side.

MR. FRIEDMAN: They have expressed interest in the AFSAM 9, haven't they? So it would be to their advantage from the point of view of going to a single rotor type, for interchangeability.

CAPT. TAYLOR: Take the position that we are going to tangle on the AFSAM 9 in the Navy. They are going ahead with the 2308.

MR. FRIEDMAN: It is a powerful argument in favor of the 47B.

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CAPT. TAYLOR: By this time next year we should know whether we are going to have the AFSAM 9 or not. The British know that there is possibility of error. They want to know which way the cat is going to jump. If that proves to be wrong, we will have to straighten it out. They want to push the cat down the fence along with the 47. The Navy wants to push the cat down the 47 fence. The Director of the National Security Agency supports the idea of going to the 7. It is just that simple. Someone has to make a decision.

MR. FRIEDMAN: All right.

MAJ. GIESE: If you want a positive statement, I think I can give it to you. We concur essentially with the position taken by the Agency. It might be a good point to say something to the British that there are certain expenses. I am not sure that the Director could commit himself positively at this time. I think the British will want some hardware. If they want hardware from us and production is lagging on the 7, I think that is a shot in the arm.

Col. Pachynski and Mr. Friedman spoke off the record.

MR. CHITTENDEN: The ECM has a long and tight string attached to it. They are to come back. They are not for intra-national use.

COL. PACHYNSKI: Mr. Douglas and Lt. Col. Revane can take this in hand and put in the changes that have been discussed here.

MR. FRIEDMAN: I want to thank the Service representatives for coming here and helping us.

MR. SMALL: Would it be possible to have a preview of the final paper so that we can get started?

COL. PACHYNSKI: We will send you copies as soon as it is run off.