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PROBLEMS INVOLVED IN MOBILIZATION OF CIVIL AVIATION

1431

19 February 1953

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Brigadier General Milton W. Arnold, USAF (Ret.), Vice President in charge of Operations and Engineering, Air Transport Association of America, was born in Troup County, Georgia, in 1907. He studied at the Georgia Institute of Technology, 1924-1927 and was graduated from the U. S. Military Academy, 1931. He was also graduated from the Advanced Flying School, Kelly Field, Texas, 1932. In 1937 he received his M.S. degree from the California Institute of Technology. General Arnold advanced through the grades to Brigadier General in 1945. He was in charge of the development of the North Atlantic ferry route in 1942 and of planning and operations of around-the-world flights in 1943. In 1945 he became chief of staff of the Air Transport Command, Washington, D. C. He was a member of the President's Special Board of Inquiry on Air Safety in 1947. He holds the following decorations: Silver Star, Legion of Merit, Distinguished Flying Cross with three Oak Leaf clusters, Bronze Star Medal, Air Medal with four Oak Leaf clusters (United States), Croix de Guerre with palm (France and Belgium) and Distinguished Flying Cross (Great Britain). He is an associate fellow of the Institute of Aeronautical Science. General Arnold has been in his present position with the Air Transport Association of America since 1946.

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PROBLEMS INVOLVED IN MOBILIZATION OF CIVIL AVIATION

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**GENERAL GREELEY:** Time was when the flying machine was considered a toy in the hands of irresponsible young men and eccentric scientists. It had a highly dubious value as a military weapon and no commercial value whatever. Today it is hard to believe these facts that existed so short a time ago, yet I think you will all agree that those ideas were widespread just a few short years ago.

Civil aeronautics has now taken its place alongside the other means of transportation, that is ocean shipping and the railroads. In other words, we can now say that civil aeronautics and air transportation are among the three and not an also ran in the transportation problems that this country will be faced with in a mobilization.

I think our speaker is well known to many of you. Like many others in his field, he is a young man with an enviable record of military service. His subject today is "Problems Involved in Mobilization of Civil Aviation." It is a great pleasure to present the Vice President in charge of Operations and Engineering, Air Transport Association of America, General Milton W. Arnold.

**GENERAL ARNOLD:** Thank you, General Greeley. Gentlemen: It is a great privilege to be here and talk with you today. I would like to start into the problem which intrigues me and one to which I have been exposed and which I hope you will assist us with as part of the industrial mobilization power of American under an all-out war so that we can find some of the solutions to the problem.

The United States is now engaged in mobilizing its industrial and military might for defense. Unlike the armies in medieval times, when campaigns were often decided by skillful deployment of small bands of mercenaries who "lived off the land" they occupied, modern armies depend for their lifeblood on the industrial might of their homeland. In modern war every citizen has a part, and survival may be dependent on industrial might even more than on good generals and soldiers. In other words, today, defensive might is virtually synonymous with industrial might.

We all know how World War II caught the Nation napping. The early months of World War II demonstrated forcefully that the industries on which national defense depends, especially the transportation network, cannot be left for development until war begins. They must be potentially "in being," ready for use, and with plans for their employment.

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This means that mobilization plans must be made in peacetime to enable us to expand our production of munitions and other essential equipment as rapidly as possible after war begins. Industrial mobilization in peacetime is futile if it cannot be carried out according to plan when the emergency comes. Thus, it can be seen that mobilization must be a continuing part of our economy and not merely an emergency measure--a problem which must be merged with our economic system as a whole.

That the Congress is alive to the necessity of integrating mobilization into the Nation's economic program on a long-term basis is evident in the progressive increase in appropriations for national defense during the past few years. This is a very sound trend. In the past we waited until the war was upon us before preparing to meet it. Then our preparations were frantic. After the war we demobilized and seriously weakened our defenses. Hence, each generation saw a sudden radical shift from producing peacetime goods to producing military supplies; then later saw an abrupt return to producing goods for peace.

It may be that this "on-again off-again" process is over. It may be that we are now beginning to realize that the business of defense--of mobilization--should be given just as constant and stable a place as other businesses in the national economy. If this is so--and I think it is--then we have come a long way from the apathy which characterized the Nation just prior to World War II.

As an indication of the disinclination on the part of the public to "face facts" at that time, I should like to tell you a story. Some of you may recall the story. It happened in 1940. Possibly some of you had the same experience I did.

Mr. H. G. Wells, the noted writer, was invited, of all things--something I have never quite understood--to be the guest speaker in San Antonio of the American Association of Brewers. There was quite a party. Maybe General Hovey remembers it. I was fortunate enough to be on the guest list and to be invited to several of the nice parties. There were probably 2,000 people there. They brought choruses from New York city; they had famous name bands. It was a very splendid thing for a lieutenant to be invited to those parties. I had a wonderful time.

During one of the discussions, the friend who had been kind enough to invite me said that Mr. Wells was going to speak the next morning at 10 o'clock at the hotel. I had heard nothing about it. I think there was hardly anything in the San Antonio papers. I decided it might be a good opportunity to listen to Mr. Wells because I thought he was a famous man; I admired his writings. I went to the meeting and Mr. Wells gave a very serious talk.

At that time, as you will appreciate, the British Empire was engaged in the war. Mr. Wells' whole talk was astounding. I remember it quite

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well. He prophesied, in 1940, the role of Russia almost to the day in what has happened today. He prophesied that atom bomb. He prophesied the role of aviation in the world to come. He said that, if aviation was allowed to develop in an unlimited manner with these other developments, it would be a tool for the destruction of civilization. I hope that Mr. Wells' prophecy in regard to the latter is not so accurate as those other two.

There are probably 40 people out of the 2,000 who came to that meeting. I recall that after the discussion Mr. Wells invited people to come up and question him or to ask questions from the floor. Not one question was asked in regard to the fate of the world or what he had prophesied. The only question was, "How do the British react to the rationing of beer?" I think that is significant of the attitude of the American public in 1940.

I am sure that I do not have to urge the point that America is in no such state of complacency today. Never again will the Nation be allowed to wait for two or three years behind the barriers of the Atlantic and the Pacific before becoming aroused and mobilized to joint our allies in a system of common defense. That the people have accepted the fact of Selective Service as well as they have is evidence that the necessity of a fluid state of mobilization is beginning to sink into the public consciousness.

With that background, I would like to delve specifically into what the air industry, the scheduled airlines, the nonscheds, the private pilot, the corporation pilots have in store and what is possible from that industry as a system of transportation. It is my conviction that the next war will be even more dependent on fluid movement and that time will be more precious. Consequently, I believe very seriously that we must depend a great deal more on air transportation.

I am not advocating--no one, I believe, in his right mind can ever advocate--that the bulk of our cargo can be carried by air in replacement of ships or the railroads. That is not the point. But as a specific point, let us take the situation of whether it is economical, not deal with the matter in terms of dollars but from a war standpoint. If we have a requirement for a certain type of logistic support, if we are deficit in that, it makes no difference whether it costs 50 cents a ton to move it or a half cent a ton to move it, we must have it available.

Such was the condition in World War II. Our life line for engine repair was in India. It worked both ways. We attempted to produce engines here and overhaul them in India by filling a pipeline aboard ships and sending them to India, establishing the life line. We found it took exactly 10 times as many engines to fill that pipeline as it would to overhaul those engines in Miami, Florida, put them aboard air transport, and move them to India. Of course, it is costly if we visualize moving

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them by air from Miami, Florida. But the Pratt-Whitney and Wright engine people were overloaded and could not produce 10 times the number of engines. The airplanes were grounded. So it becomes a necessity, a requirement. That is an integral part of what I speak of as air transportation. Today we are producing 12 times the cargo and passenger-miles as were produced in 1940.

The story of the realization of the necessity of having a civil group as an adjunct to the military in case of all-out war was conceived by people who were in the military services and had left and were in the field of air transportation. In 1947 a letter was addressed to the then Secretary of Defense, the late Honorable James Forrestal, requesting that a joint group be set up to develop a mobilization support unit and to develop a stand-by group which would be available for immediate requirement of World War III.

Realizing what happened in World War II; namely, that a considerable number--approximately 65 percent--of the available aircraft were commandeered and they remained for many weeks on fields because they were not able to fly the distances--they were not properly modified--this was an attempt to modify the aircraft and to have them available within 24 hours.

Since that time there are many things that have happened. I, fortunately or unfortunately, have been associated with the various phases of the development of that particular plan. From the standpoint of achievement, I think possibly we would still be in the doldrums had it not been for the Korean war. But the appreciation for the requirements was immediately forced upon us after Korea in the fact that the military services required some 60-odd transports immediately, and it was a crash program.

One of the first things that was required was 100 radar technicians in Korea. They were brought out of Oklahoma City, and some 40 hours later they were in Tokyo. This is the type of transportation that is so necessary from the standpoint of immediate requirement.

The problem developed finally in the issuance of a plan known as the CRAF Plan--Civil Air Reserve. That was issued jointly by the Secretary of Commerce and the Secretary of Defense. Briefly that was the result or the final implementation of the Congressional Air Board and the board known as the Presidential Air Board back in 1947. Mr. Finletter, Mr. Brewster, and Mr. Henshaw were associated with those boards of air inquiry.

The number of aircraft recommended by these boards for the operation of civil defense for logistic support of the services was in round numbers approximately 5,000. I believe from the standpoint of more realistic figures it is appreciated that those were a little high. Roughly, let me talk in terms of 1,400 aircraft. That is the number of aircraft today

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that are owned and operated by the civil scheduled carriers. There are approximately 250 more 4-engine aircraft on order to be produced and delivered within the next two years.

But speaking in terms of 1,400, the plan was developed under the National Security Resources Board as a joint group with the three services, the State Department, and the Department of Commerce, CAB, in an effort to analyze the capabilities of carriers and to come up with a workable plan of modifying the aircraft; also to develop stand-by contracts, to solve the manpower problem, to solve the priorities problem, the maintenance problem, and the use of overhauling facilities.

All of those parts were put together and as a result of these studies a report known as the "Douglas Report," that was issued, all the board individuals were cleared for top secret. There were five members of that board who were given top secret clearances, and the general logistics planning of the Joint Chiefs of Staff was made available to those individuals.

The requirements stated by these groups were put together and the CRAF Plan was the result. This plan visualizes approximately 300 4-engine transports in use by the services. The records of the civil carriers were analyzed and an attempt was made to cut out what we call "nonproductive stops" in order to make more aircraft available.

The overhaul facilities of the airlines were analyzed; the potential from the standpoint of manpower was analyzed; and we came out roughly with approximately 350 to 400 4-engine aircraft which would be required as an adjunct to the military services.

Without going into a lot of, let us say, differences that were resolved or going over a lot of "water over the dam," one of the first things that was resolved and which took approximately two years--and possibly in the minds of some, it is still not dead--was the question of determining how would these aircraft be utilized. There were those in the services who insisted that these aircraft should be commandeered and militarized, that the crews should be militarized, and I guess one would naturally think that those in the industry would feel otherwise. Well, we did. And in all sincerity I believe those people who advocated a contract operation of the 350 or 400 aircraft were thinking in terms of, it made no difference as to which side of the fence they were on in an all-out war, and the chances are those individuals will be back in the services during an all-out emergency.

The immediate problem comes up as a misunderstanding on the part of the services. We employ an airline pilot. He gets 14 to 18 thousand dollars a year. Furthermore, aircraft like trains or vessels cost money to operate; one to two dollars per airplane-mile. I think it is not a matter of dollars and cents since there are some very good answers to all of these questions of costs.

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The contracts are subject to renegotiation. If anyone got away with any money on contracts, particularly on the aviation transport side of it, I would be quite surprised because I was on the other side of the picture in World War II. Today the contracts for the Korean lift civil operations are subject to renegotiation. The Civil Aeronautics Board, for your information, requires a thorough and complete analysis of financial status and every expenditure of every carrier. There is probably no industry in the world which lives so completely in a goldfish bowl as does the scheduled air industry of America. All expenditures made by every carrier are available in the Economics Section of the Civil Aeronautics Board and is public property. So from the standpoint of the economy, I think it is a rather loose statement to say that it is a matter of making money. Certainly I don't think that will hold up in an all-out war.

Then the question comes up as to why should it be on contract and not military. In all fairness--and it is not criticism of the military services--I think, if we have a transportation organization, that organization is developed to produce efficiently more transportation ton-miles than are the services, for the simple reason that the services are not organized to perform that way. It is not the objective of the services. It is no criticism of MATS, and I think that MATS and the Navy Air Support do a very efficient job.

But even from the money standpoint--and possibly there are those who will disagree with me--I defy anyone to show me figures of cost in the military services that cannot possibly be shown to have assumptions or errors; particularly do I know that is true in the Air Force. I don't know the financial arrangements in the Navy or the Army as well, but I know from the other side of having tried to produce records and to substantiate costs and to present those to congressional people in World War II. There are so many hidden costs, it is impossible to give actual figures. But I think we can show actual costs in the operation of civil air transportation. Today the average costs of the industry are approximately 49 and a fraction cents per ton-mile. This amount is for combined express, mail, and passenger service. So it was finally decided to utilize contract operations.

The airlines on the other side were contending that the militarizing of various routes was a matter which should be decided by a joint group and should not be placed under the responsibility of the military services. The whole problem was compromised. The military services officially agreed that a contract operation should be developed and in turn the civil industry agreed that it was not practical to get into the security problems, and it is the determination of a commander as to whether or not a route should be militarized for security. Those were probably the most difficult points that were resolved in discussions which extended over a period of three years.

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Today the plan is in the phase of development; that is, modifying 350-odd aircraft in order that those aircraft will be immediately available in an all-out war. Where they fly will be a determination of the Secretary of Defense. Specific crews will be assigned to each aircraft in the stand-by phase.

Now in attempting to use these 1,400 aircraft, we get into a problem of attempting to carry a greater load factor with the remaining aircraft in the civil economy. We have operations which will be required between Detroit and New York, and Washington and the west coast, and over the various airline segments of the civil route pattern. We know from World War II that there will be added loads. We have in our hands 1,400 aircraft. We are going to take 350 of those out for contract operation which will be primarily overseas. Naturally, the only answer as to how to produce more route miles and more cargo and passenger-miles with the residual equipment--namely 1,050--is to increase utilization and fly around the clock and to have a priority system.

I think it was rather amusing, as the difference in positions, it was one of the most difficult things for the industry to sell the military services that the military should run the priority system. For some reason which I have never quite understood, it was the misconceived idea by some persons in the Defense Department that a priority system meant that M.P.'s were physically taking civilians off the airplanes, and putting in the seats persons who were in uniform. The Secretary's office said, "We don't want to get into that problem because of civil relations."

It is mainly because the system of priorities must be integrated in the international field as well as in the domestic field. If the State Department, for example, has an individual who is in Kansas City whom they think they need immediately in Paris during World War III--or some other place, perhaps in the Orient--that individual should be able to go to a priorities board which would have the responsibility of clearing his passage from Kansas City to New York and to his foreign destination. Otherwise, he would get into the complicated process of being thrown off the airplane in New York and having to appeal to another group.

A control priorities board was set up under the Secretary of Commerce and the Secretary of Defense. The individual in charge of the administration of priorities would be a civilian and his deputy would be a general or flag officer. The deputy then would issue orders for priorities by putting on his military hat, under the authority of the Secretary of Defense. This coordinated plan has been developed and generally accepted for the administration of priorities.

I thought that you would be rather interested in the fact that it is peculiar at times how one gets on different sides in a particular problem. So this was one of the unusual ones in which the industry was attempting and finally solved the problem by insisting that the military services should run that particular phase.

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There are many facets to the problem and many of them have not been solved. But I think probably one of the most interesting ones--and I would like to take a few minutes to give you some of the background on it--is the problem of manpower. Here is an example of the problem which I have attempted to portray (charts 1 and 2, following pages) the problem of manpower. It is my feeling that the happy, proper, and efficient solution of manpower is the most important problem of the CRAF Plan.

In a discussion several years ago on the question of manpower, several interesting matters came to light. General Hershey was not there; his deputy was there. The chairman of the National Security Resources Board was there and the chairman of the Munitions Board was there. So I think there was a fairly representative policy-making group and the open discussion was on the problem of, what are we going to do about manpower in an all-out war after realizing the experiences we had in World War II? Various aviation representatives brought up the problem of having dealt with over 2,000 different draft boards in World War II. There was the problem of Joe Smith who was born, let us say, in Enid, Oklahoma. He has been living in Los Angeles since he was 21 years of age. He is an experienced machine lathe operator. He votes in Enid, Oklahoma. He has not been seen in Oklahoma for years but he registers there and his draft registration is in Enid.

Consequently, there is no appreciation of the fact that Joe Smith is a very vital part of the, let us say, aircraft X production line for the making of aircraft or he would be equally important for tanks or any other particular requirement that was vital in the war effort. The draft board members look at the fact that they remember Joe Smith and Bill Smith who is his cousin, and they remember other people who are now clerking in a local store, and another man who is a farmer. It goes back to the concept--as explained to us--of 1776 that each man has the inalienable right to defend his country, and it is determined by those citizens of Enid, Oklahoma, whether he shall or shall not be in the armed services. There were people who felt we had progressed since 1776. I honestly don't know the answer to the problem but that was the general concept.

The suggestion was made that an attempt be made to develop tentative legislation which would set up categories of selection, a determination of particular requirements, and the total amount of availability of skilled professions.

At that time--I can't speak for it now--those policy-making groups in 1948 stated flatly that they did not think it was feasible and they felt that the present system would have to operate in World War III.

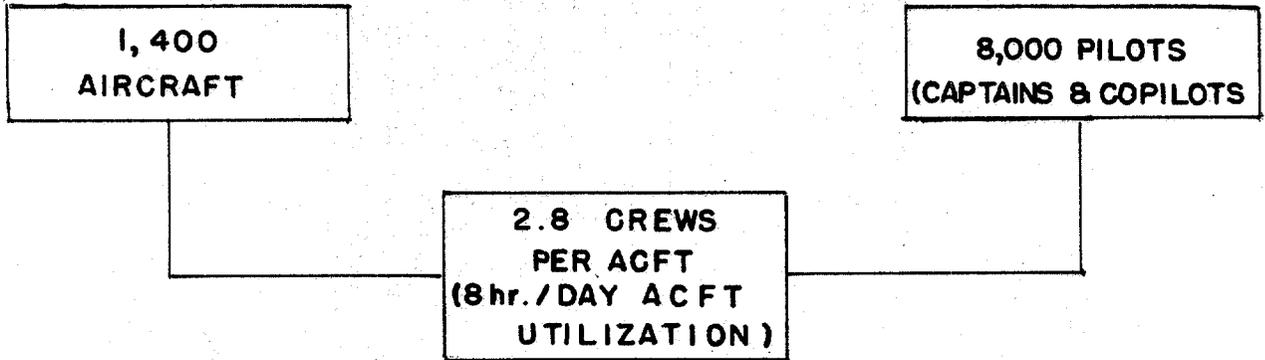
Now in attempting to give you the personnel problem here, I think probably there is a real problem in many industries. We are not any closer to the solution of the personnel problem in the airlines today than we were in 1948. We are going ahead with modifying the airplane

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CHART 1

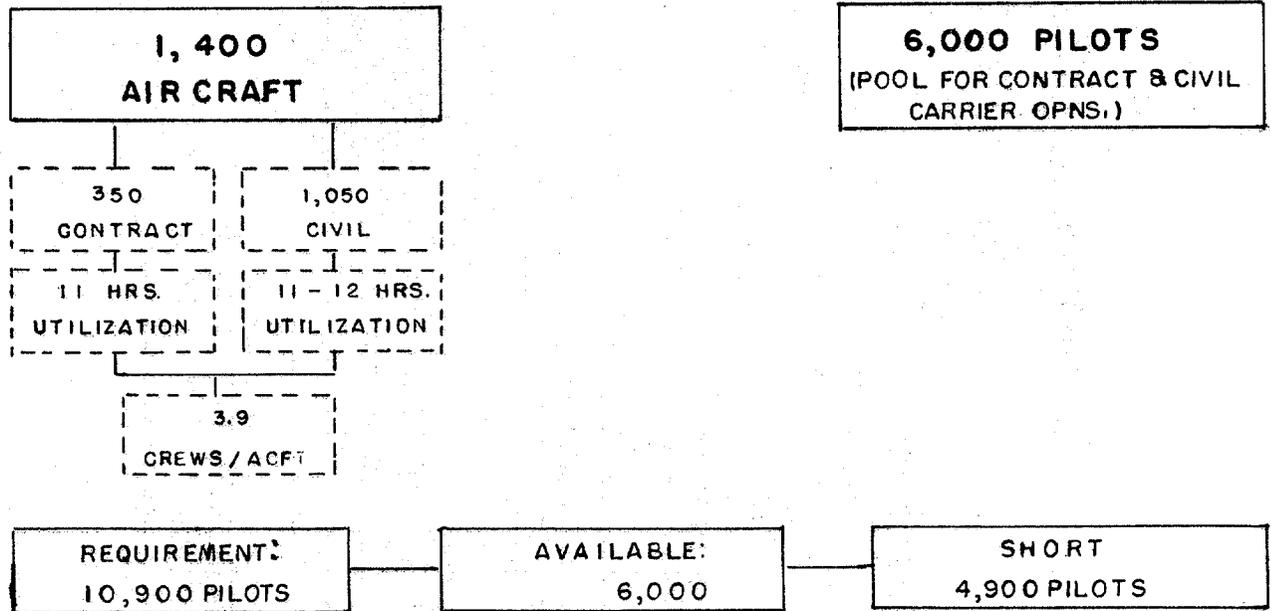
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# PERSONNEL PRESENT // GRAY PERIOD



## ALL-OUT MOBILIZATION

43% PILOTS IN RESERVE (Active  
(Inactive))  
EST. 25%-30% WILL BE CALLED



MECHANICS FOR LINE MAINTENANCE AND OVERHAUL // EQUAL % SHORTAGE DUE  
PRIMARILY TO DRAFT.

ELECTRICAL & INSTRUMENT SPECIALIST AND COMMUNICATIONS SPECIALISTS //

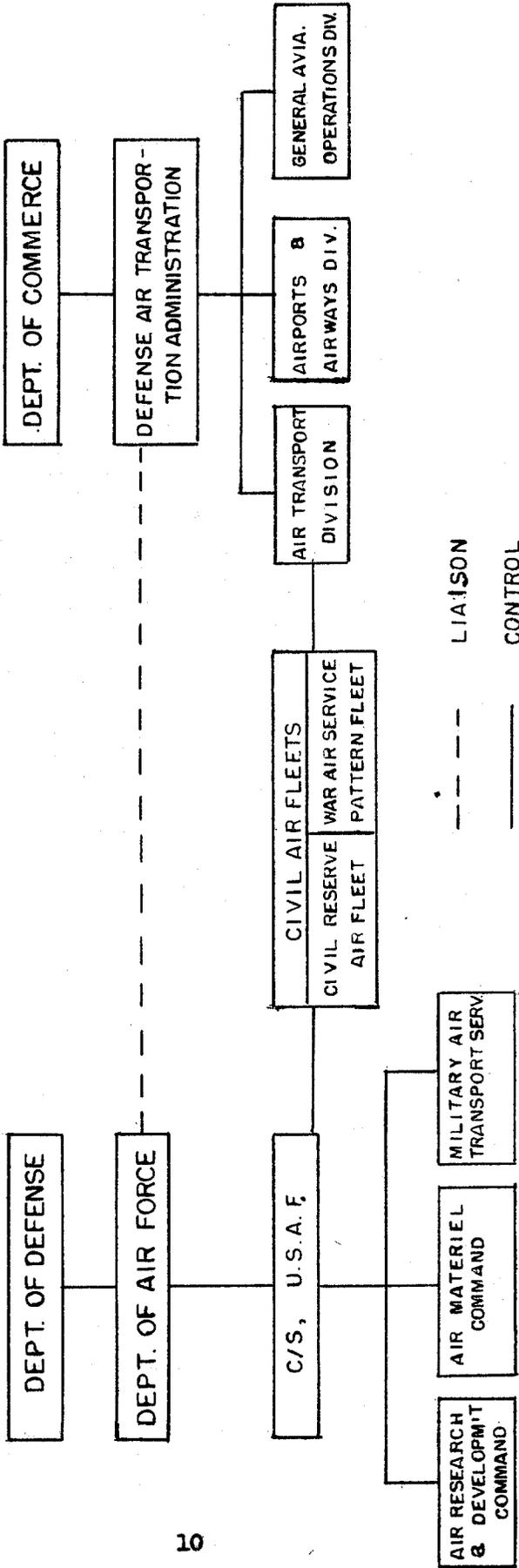
GREATER SHORTAGE DUE TO DRAFT & RESERVE RECALL.

CHART 2

# NATIONAL ORGANIZATION FOR CIVIL AIR TRANSPORT

**DEPT. OF DEFENSE**  
RESPONSIBILITIES FOR IMPLEMENTATION  
OF CIVIL RESERVE AIR FLEET PLAN

**DEPT. OF COMMERCE**  
RESPONSIBILITIES FOR CIVIL AVIATION  
MOBILIZATION



since this program requires time. Whether the military take these civil aircraft and put them in the pool with MATS aircraft or whether the airlines operate these civil aircraft under contract has no bearing on the necessity of modifying them.

The airlines have approximately 8,000 pilots. It takes from a year to two years, as a minimum, to train a pilot. What about training surplus pilots? It is very costly and for various reasons it is not too practical as an answer to the manpower problem.

Secondly, it is a question of how long will this gray period last? Will it last a year or 15 years? The airlines get into the problem of having excess personnel and also the problem of the payment of those surplus individuals.

Now approximately, as stated, 48 percent of the pilot group--I will use that as an example--are in the Reserve. The main problem is with the Air National Guard and the Air Force. Let us assume that 25 percent, not 48 percent, of them will be called. You may say, "Those could be deferred." Our experience with deferment is that it doesn't work that way.

Let us take as an example the Korean situation and certainly we can assume that all-out war in an all-out mobilization will be more difficult to solve than was the manpower problem at the outbreak of war in Korea. Approximately 35 air traffic controllers from one Civil Aeronautics Administration (CAA) region were called to active service in the Air National Guard and the Air Force in the United States in 1951. It practically crippled the Air Traffic Control in the Texas, Oklahoma, New Mexico area. Under instrument conditions the strategic Air Force had to cancel innumerable training flights. It has taken us--meaning military and civil interests--over a year to get 50 percent of those people back into their jobs. It takes approximately two or three years to train a traffic controller to condition himself to take over control of traffic at one of the CAA centers. So that here is an example parallel to the manpower problem which is facing the airlines today in attempting to implement the CRAF Plan.

We need more people; yet we will have fewer people to do the job. We come out with a net shortage of about 4,000 pilots, assuming no attrition whatever and assuming the facts I have stated.

In the field of electronics, it is even worse. The minimum I believe, of any organization that I know of today, have approximately 75 percent of their electronics people, radar and communications, in the Reserve. And the requirements of the services in that particular field is even more critical than in the pilot category. Again, we are counting people twice.

In the field of mechanics, I think we are concerned more with the draft than we are with the reserve program.

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It is not fair and it is not proper, and in all conscience you cannot approach an individual in the airline business or the telephone business and say to him, "Now your business is going to be more important than serving in the armed forces. You are 45 years of age and you are not going to be subject to the draft and you could be doing the same job here, which is more important." Then you are getting into the problem of determining what is best for the individual and you are affecting his rights to serve his country.

You are also affecting his participation in the retirement plan for Reserve officers, and assuming that his employer does not have a retirement plan, that individual has created a specific amount of military retirement credits thereby assuring his family of certain economic advantages. Consequently, it is difficult to solve from an economic as well as from a patriotic view point.

Leaving the most difficult problem that we have faced in the CRAF Plan, today we have not solved the problem of the determination of cost. We have had difficulties in our discussions of why a DC-6 from X airlines should cost more than a DC-6 from Y airlines. That is a question. It has been progressing, and so far in 1953 we are not any nearer to stand-by contracts for the payment of the services of the aircraft or for training facilities than we were in 1947. But I think we are to be complimented as a nation that we are getting airplanes ready. They will be ready and available with long-range fuel tanks, communications equipment so that in 24 hours those aircraft will be available.

If and when we can solve the problems, particularly the manpower problem, the contracts can always be negotiated as a final solution.

Gentlemen, thank you very much for your attention. I appreciate the privilege and honor of talking with you, and I hope you can assist us as a small segment of the industry of this Nation in possibly suggesting some solutions to these particular problems. Thank you.

**QUESTION:** General Hershey stood where you are and his question was "Where are we going to get all of our people?" The head of one industry pleaded, "What about our industry?" The head of another industry said his was the most important, "You can't draft our men." Those are good points. We would like to hear a little more about what can we do? How are we going to do it? How can we determine who are the vital people? It is your turn to bleed.

**GENERAL ARNOLD:** I can't answer that any better than your friends or acquaintances on that particular problem. I think you hit on some of the difficulties. We had the same problem as the Secretary of the Air Force, the Secretary of the Army, the Secretary of the Navy, and members of the CAB who attempted to solve the problem. As I recall, Mr. Finletter's statement on this problem was along the same vein as stated by you. He

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said, "About 25 percent of the production capacity of United States Steel is for mobilization. It has been their contention that all those people must be deferred." I happen to know of the critical condition of our communications system. If the Bell Telephone System broke down, possibly it would be of more serious consequence to the economy of the Nation than if the airlines didn't operate. Possibly an analysis of the determination of the time required for training and the particular availability of those skills could be developed. Possibly it will never be done.

If we could catalog the number of people in the Reserves, there is not even much hope of that. From the standpoint of the over-all manpower, we all appreciate that, I think it is, through 1960 there will be fewer people in this country between the ages of 20 and 30 than there were in 1940 because that will include the babies who were born during the depression. There were a greater number of children born in this country in comparison with the population between 1945 and 1950, but until 1960 we are at the bottom of the well. Of the Nation's 140 million people, we have a smaller percentage of people in the 20- and 30- year bracket, and will have for another seven or eight years, and yet our manpower requirement is greater.

The complexity of aviation requires more people; more airplanes; more manpower to keep the planes in the air. Certainly we know the problems of building a tank or an airplane require more manpower hours than for the same piece of equipment in World War II. Honestly, I don't know the answer either.

QUESTION: Are you protected in any way with the draft boards for any critical parts of the industry?

GENERAL ARNOID: We are protected only with about, I think, 20 other industries by the statement that we are in a preferred category, which means nothing from the standpoint of deferment because we are competing with practically 70 percent of the whole industry of the Nation.

QUESTION: You have indicated that the industry is aware of its shortages. What is industry doing to hire women or handicapped people for those ground spots, maintenance operations, control, and what are they doing in considering women as copilots and crew members.

GENERAL ARNOID: Well, that latter one amuses me--a mixed crew on an airplane; that one is a little difficult for me to conceive.

But in regard to the particular problem of using handicapped people, we have been one of those industries who have sponsored that program and have attempted to use those people. Rightly or wrongly, of 35 industries, we have the twenty-sixth worst accident rate on the ground of any other industry--not in the air, but on the ground; people running into propellers,

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carts running into them--partly due to noise on the ramp. I think those who had the problem of ground safety in the Air Force and possibly in the Navy had the same problem. It can be cut drastically. We have concern about using handicapped people in that particular field. In the white collar jobs it can be done and possibly in overhaul shops but not on the flight line.

Under the present laws actually passed by Congress for the utilization of pilots, Decision 83, the only way we can employ 20 percent more pilots is to buy more equipment. We are attempting to do that and to continue to increase our jobs, but if you get more equipment, the manpower backup is relatively no greater.

The second problem involved is having mechanics, pilots, and communications people in excess is that you have a responsibility to the stockholders. We have responsibility to the CAB that if our direct costs show a padding of excess people, we are criticized and those particular costs are disallowed. Our costs are very closely scrutinized by the CAB.

The CAB in informal discussions gave us the nod to go ahead and get another 5 percent or 10 percent excess personnel but from the efficiency of the airlines, I don't think it is the answer.

QUESTION: Our group has two questions: First, you have indicated that the aircraft that can be used for overseas transportation, 300-some-odd, have communication equipment. Does that include identification and military navigation types so they can be integrated into the activity of the services? And, second, what compensations are in this plan to give these commercial pilots when they fly in the combat areas?

GENERAL ARNOLD: Considerable foresight has been given to that by the Navy and the Air Force in solving that particular problem. These two services, the CAA, and ourselves sat down and determined the communications; also the specific frequency requirement worldwide. We laid out the program and have stated the requirements: navigation equipment; transceivers, also the various combinations of crystals. We have even identified the crystals and earmarked them. That equipment is all GFE. These costs are included in the program of, I think, 90 million dollars that was appropriated to the Air Forces. We are attempting to put in complete crystal coverage that will allow each aircraft, to fly the Pacific, the Atlantic, or Africa, both VHF and low frequency.

That equipment is assigned to the company. Every six months it is required to bench test it. A security officer is responsible. I think this phase has been very thoroughly analyzed.

Now the other question was in regard to what happens to contract personnel in flying in war zones. The general idea was that the contract operation would be conducted over, let us say, the main supply lines and

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from these terminal points troop carrier and MATS or the Tactical Support units would distribute it from the main supply positions. Let us assume there is active warfare between ground and air units on the continent of Europe. We will assume that bases would be in the British Isles and therefore the contract operation would flow from this country to the British Isles; and from the British Isles the distribution would be MATS or tactical support air units.

Under emergency conditions a commander may dispatch contract aircraft and crews into an active zone. This has been visualized under what has been termed a War Risk Insurance Plan; also the protection of contract personnel if they become POW's.

QUESTION: I would like to pursue that subject a little further on keeping these flyers in civilian status. We have tried that in the Navy. Unfortunately, it didn't work too well. We are now trying to develop Merchant Marine Reserves, to put people in the Merchant Marine Reserve and recall them in time of war. I wonder why that wouldn't work for these civil pilots. Then you wouldn't have the confusion of whether they would go into combat areas, where they would stop, extra compensation.

GENERAL ARNOLD: Civil aviation may be wrong and possibly the people responsible in the government agencies who have thought about this problem may be wrong but we do not think that a Merchant Marine Reserve of the air is the answer. Rightly or wrongly--and there are those who differ with it--the industry feels that once we get into a government strait jacket we than become a quasi governmental body and we are attempting to keep aviation as a private industry in this country. I don't think we will change merely because it appears to be the solution to the problem during a war.

With regard to your particular statement, my experience was just to the contrary, having been on both sides, in the Tactical Combat Unit and also the Air Transport Command, where I served as a Regular officer. I don't think it is any more difficult. I found I had more problems with combat crews than I had with contract crews. I think airline pilots are highly professional people and I don't think all of the difficulties that are assumed are quite real problems; but that is just my opinion.

QUESTION: I would like to go back to your point on your pilot situation. I believe that recently all your Air Force Reserve pilots were screened. Some of them were in the ready Reserve and some were relieved of their commissions. I was wondering how many of those people elected to drop their Reserve commissions and go back into straight civilian status. Further, I believe there is quite a considerable source of World War II pilots available in the country today. Many of them have dropped their Reserve commissions. They have served in a war and would not be eligible for immediate recall or draft due to their age, but they still have quite a potential as pilots. As you know, we are putting them

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back into combat aircraft. They have been 30 days with the Air Force now and they have proved out very well. We have had some who expressed a fear of flying. They don't have commissions and probably will never have commissions. Fear of flying probably wouldn't enter into it. Would you comment on bringing those pilots back, please?

GENERAL ARNOLD: That problem is one which is very real. To give an example of active and inactive status, practically all the airline pilots if they were given a choice have maintained their Reserve status. I think that the level of intelligence is such that they have considerable pride in maintaining it, and some of the airlines have sponsored Reserve units. One of the most active I know of in MATS is on the west coast. So from the standpoint of dropping out or going into the inactive Reserves, only a small number have exercised this change.

Now in regard to the availability of the manpower, prior to 1951, we only took pilots with a minimum of 1,500 to 2,000 actual hours. Today we are glad to take copilots with 200 hours. We can't find the more experienced. Prior to 1950 it was not unusual for airlines to have copilots, with 3,000 or 4,000 hours. That day is past.

Now as to your particular remarks on all these people who are available from World War II. We can't find those people and neither can the services. I am not being facetious, but let me give you an example. This is no criticism. It is just one of those things in the general system of doing things.

There have been many Reserves names called for active duty who have been dead for a few years. You know that. This is the problem with the records. I have considerable misgiving about going out and taking those pilots who have not flown and who have had no inclination to fly, who are now 38, 40, and 45 and put them through a refresher course with a million dollars worth of equipment. I don't agree with that. I don't think it will work. But that is again just my opinion on it. I think the time consumed in attempting to find these people would be so great that we would be well in the war before we located them.

QUESTION: General, my group would like to know a little more about the modification program. What is involved in it? How much weight is being added to the airplane in peacetime? Who is going to pay for carrying that weight around?

GENERAL ARNOLD: Approximately 30 to 50 percent of the actual aircraft in the CRAF Plan are now going through modification. As to the weight and who is paying for the modification, the modification is based on a service directive--not on contract--on a complete cost analysis. The main modification of the aircraft involves putting in power cables for communications and brackets for the carriage of communications equipment. We have arranged it so it will not be necessary to put in long-range fuel tanks in the

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aircraft. There is a sufficient number of aircraft that have long-range tanks. The weight is between 30 and 40 pounds, depending on the operation.

QUESTION: I believe you said a pilot would cost 16,000 dollars. We have some pilots in our little group here and their ears went up. We may have some retired men tomorrow. But the thought was there that you didn't want to militarize but rather contract with the Government. Would the airline insist that the pilots receive pay for flying overseas and still have MATS operating and being paid at armed forces pay?

GENERAL ARNOLD: Yes. This is one of the age-old ones. Yes, it is even a little more than I told you. The average pay domestically is about 17,000 dollars for captains. Some of them in the international service are getting a little more probably. But the pay of a captain, first pilot, is around 11,000 to 13,000 dollars domestically on the DC-3 with local service airlines. That is rather staggering to the military. We have a first lieutenant or a captain who is flying the same equipment and the question always arises.

The best example that I can give you--I brought them along but I won't go into them--I was in MATS and ATC and it took us four years to get up to about 60 or 70 percent of the utilization of the contract operation. I am attempting to say that it is cheaper, assuming that the airlines pay higher salaries than the military, because we can produce more ton-miles and have the ability to do the job quicker than the military services.

If you believe that transportation must deliver something rapidly, I believe you will agree that contract service can deliver it quicker and do a more expert job.

I was interested in the North Atlantic areas during World War II. We were building bases in Greenland. I had buck sergeants running bulldozers who were getting 54 dollars a month, as I recall, in those days, and the contractor had dish washers getting 150 dollars a week. But that was a contract operation and I don't think anybody else could have built those bases, except a contract operator. It was a contract under the Corps of Engineers and those people were particularly put in there to do the job. That is the best answer that I can give.

Unfortunately, there is considerable misunderstanding and confusion on the problem of costs. First, let me say that the military people are making a mistake by comparing costs per ton-mile or costs per passenger-mile against these same costs in the airline business since costwise, military service cannot compete with private industry and the delivery of goods in wartime is not primarily a matter of cost. The prime basis, I believe, should be efficiency. But to spell out the problem of costs--first, it is a simple matter to develop the cost per airplane mile of an airline, or the cost per ton-mile or the cost per passenger-mile. We

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take the total expenditures for the year which includes rental of buildings, salaries, amortization of equipment, direct and indirect costs which include such things as salaries, gasoline, oil, landing fees, ground handling, advertising, insurance, legal fees, state and Federal taxes and city taxes--in other words, every service or article that is purchased, and we divide the total number of revenue passenger-miles and the total number of revenue cargo miles by costs of operation. This gives us a definite cost for producing the passenger-mile and producing the ton-mile; (Also from these figures we can get either the profit or the loss after subtracting any other additional income. This is the only real way in which costs can be developed.)

I will admit the military services have progressed considerably in the problem of cost control but still there is no bookkeeping method easily available for the determination of costs. No one is assuming that we should place a cost figure upon the Strategic Air Command operations or any other unit, but since the military services consistently raise the problem of costs of airline lift versus military lift and seem to be confused about what are real costs, let us take a hypothetical case. Let us use MATS. Let's assume that MATS has 90 cargo aircraft in the fleet, and there are a total of 10 other aircraft for training and miscellaneous operation. Let us divorce the special missions section and eliminate this since all of us appreciate that this unit is an exceedingly high-cost operation and no one disagrees that it is a military necessity to move high government officials expeditiously during peacetime or wartime. First thing that has to be done is that appropriations be broken down and allocated to MATS or else we would have to determine the cost through some such laborious bookkeeping method as follows: Take the total number of persons in MATS' strength and the salaries paid these individuals for each month and total them up. We would also have to assume or calculate the percentage of retired pay that these total persons accrue in a year, since this is a cost too. This same cost is figured in the airlines. We would have to add all operating costs, maintenance of buildings and certainly amortization of equipment must be figured since, if an airplane is destroyed, it must be replaced. Aircraft manufacturers and engine manufacturers are not in the habit of giving away airplanes. They cost money. Either landing fee assessments should be charged or a proration of the operating costs of the air fields should be charged, which would include the bases regularly used in the routes over which these 100 airplanes operate. Included in the personnel strength would be the medical detachment, engineers, support crews and all the accessory services which are comparable to a commercial operation. Also a portion of the total cost of Air Materiel Command, legal and supply functions would have to be assigned, as well as a proration of the general hospitals which serve both Air Force and the Army personnel. These costs would have to be assigned to MATS since they come out of the total budget. If all these costs are added, which would include indirect and direct operating costs, without regard to taxes and insurance, (as there is no means of determining these for the services unless an arbitrary figure is assigned, but these

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are not actual costs so let us eliminate those) and we divide into the sum the total number of revenue cargo miles and passenger revenue miles generated by these total 100 aircraft, we come out with true costs.

I well appreciate from having attempted to work out costs of this nature that it is almost an impossible task. I also know from cursory examinations that the costs are greatly in excess of airline costs for the simple reason that a military organization cannot be streamlined in the same manner that a civilian organization is. Further proof of this is a remark made recently by Admiral Ramsey, former chief of the Bureau of Aeronautics (Navy), at an Institute of Aeronautical Sciences meeting at which he stated that in the thirties a law was passed which required the Navy to build 10 percent of its airframes at the Philadelphia Aircraft Factory in order that the Navy could compare the costs of airframe production against the procurement of airplanes from aircraft manufacturers. Admiral Ramsey stated that to the best of his knowledge he would never have been able to find or figure out actual costs of anything that was ever produced in the Philadelphia Navy Aircraft Factory. I don't think anyone in his right mind could contend that the supply division of the Air Materiel Command can distribute aircraft parts as cheaply as can Sears-Roebuck for the very simple reason that the Air Materiel Command Supply Division has an objective different from that of Sears-Roebuck. If the Air Force can generate aircraft cheaper and if the Air Materiel Command can distribute goods cheaper, then I think it follows that we should nationalize all industry for the simple reason of economy.

The proper basis of comparison is whether the airline contract services generate a greater productivity with their airplanes than does MATS with an equal number of aircraft, since we believe that supply is a critical problem in the service and efficiency in combat is the payoff. If and when MATS can generate an equally efficient lift with the same number of aircraft as the contract service, then and only then should we attempt to determine whether or not these contract services should be militarized. Then some of the deciding factors of militarization would be the relative flexibility and the security problem which, from my experience, does not exist, but let us assume that the military insist there is a security problem with contract operations and costs. These would be the determining factors, assuming that MATS has attained an equal efficiency. During four years of operation of ATC, the comparable efficiency attained was relatively 70 percent that of airline operation. This is considering C-47's, C-46's, C-87's, and C-54's.

Let's not be guided by the fact that any given employee of an airline gets a few thousand dollars more than a comparable person in the service as a means of determining costs. Why this argument continues to raise its head really amazes me. As stated previously, if we decided the problem of contract operation versus military operation on costs, certainly the military would have no case. The airlines are willing to admit and agree

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with a determination to be based upon efficiency. This is placing ourselves in a position of agreeing with the objective of the military services, namely, winning a war. Let me give another example of the problem of supply. In the winter of 1943 in Europe I was forced to put up bombers with gunners and other crew members not equipped with winter flying gloves. In fact, flight suits were not even adequate. Waist gunners stood at open windows for several hours on missions and were subjected to temperatures of -20°, -30°, -40° and occasional missions in -50° and -60° weather. During the winter of 1943-1944, we suffered 1 to 8 percent casualties from frostbite. Some of the frostbite cases required amputation of hands and feet. We certainly cannot place a cost upon the adequacy or inadequacy of the supply system that failed to give us proper equipment. From a cost standpoint, if the gloves had cost one dollar or 1,000 dollars or the distribution had cost one dollar per ton or 50 dollars per ton it would have been a saving to the Government as well as carrying out our objective of equipping our people in the most efficient manner and preserving their health to the maximum extent. I cannot honestly state that the lack of the gloves prolonged the war, but certainly we all appreciate that ground forces, sea forces, and air forces can execute and bring about a victory quicker and with fewer losses if individuals can perform their duties in the most efficient manner. Certainly we cannot win wars without ammunition or bombs. Hence, the proper method of determining a cargo supply system is its ability to produce the greatest amount of tonnage with the minimum number of units. If the day ever comes in which industry can get an understanding of this particular problem within the armed services, it will be a great accomplishment.

QUESTION: Our group would like to know a little bit more about the participation of nonscheds in those figures 1,400 and 350.

GENERAL ARNOID: Yes. Included in that are all nonscheduled aircraft. In other words, an attempt has been made to utilize all available aircraft. I think there are something like 30 or 40 aircraft in the pool. As a matter of fact today there are more corporation-owned aircraft than nonscheds and the scheduled. There are over 2,500 known transports. All those aircraft have been earmarked and numbered. There are several aircraft owned by the CAA. They are also in this plan. All of those groups have been brought into it.

QUESTION: In the case of the employment of commercial airline facilities, what type of organization do you contemplate for the scheds on freight, a military or civilian controlled unit or a unit similar to WSA during the war?

GENERAL ARNOID: In regard to the carriage of freight, the general agreement has been that the military services will carry the heavy equipment; by that I mean floor loadings, 300 to 400 pounds per square foot. The average commercial liner is between 70 and 100 pounds. Heavy cargo

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of the general bulky, heavy concentrated variety would be carried by MATS, commercial craft would carry personnel and light cargo. It is assumed the cargo flow would be the same as with personnel from the standpoint of movement from the depots, such as Newark or a similiar place on the east coast. There you would stockpile cargo and operate in the same way perhaps that you do operate to Korea--60 commercial airplanes, some capable of carrying personnel in bucket seats, cargo carriers, some primarily cargo, some primarily passenger. Then the Joint Chiefs of Staff through the Requirements Branch, Transportation Group, determines the logistic support that will be operated over that particular route. I believe the tonnage is assigned by the month.

MR. HILL: General Arnold, you have really given us a great deal of help this morning in our research on the mobilization of the aircraft industry. You have given wings to our thoughts and we are getting on the target. We appreciate very much your coming down here and answering our questions. On behalf of the faculty and students, thank you very much.

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