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## TRAFFIC CONTROL ON THE ACTIVE BUT NON-AIRLINE AIRPORT

By FRED L. SMITH\*

It is perhaps just as well that I had no opportunity to discuss the exact wording of the topic suggested by your very able President, Mr. Morris of Connecticut, because it gives me an opportunity to remove right at the start one of the commonest misconceptions of airport traffic control and the activities of the Airways Operation Division.

Whether Mr. Morris meant to do so or not, he leaves the impression that there are at least two different kinds of airport traffic control, one for the air carrier airports and another for the non-air carrier airports. May I state right at the beginning that Air Traffic Rules and suggestions to local agencies operating airports take into account the kinds of operation conducted at the airport, based on ground facilities and the equipment of aircraft which use the airport, rather than kinds of operation based upon the service rendered or the activity pursued. This distinction may not seem particularly significant at first. It is made, however, to emphasize the fact that John Jones, private pilot, has just as much right and is just as welcome to use airway facilities as any air carrier or military pilot.

I am sure that you all realize the necessity for guarding against any false notions as to the availability of airway facilities to various classes of operators, notions which may be quite plausible because of the fact that some services have been used almost exclusively to date by air carriers. Actually, if John Jones has the equipment and the proven ability he is less restricted than the air carrier. If I mention air carrier operations, it will be only because such operations are either actually or potentially part of the traffic which must be provided for at any active airport. Really, the only difference air carrier traffic makes in the picture is that such traffic is much more regular than any other with which we are concerned.

Since there is a rather universal lack of understanding of the functions performed by the Airways Operation Division of the Authority, I believe I should explain the Division organization briefly before discussing airport traffic control at a particular kind of airport.

The Airways Operation Division now functions along 3 definite lines, namely, (1) it maintains its far-flung communications network which covers practically every designated airway. This work is the responsibility of the Communications Section of the Division; (2) it exercises airway traffic control over approximately 50% of the civil airway system. The Airway Traffic Control Section, through its 12 centers approves flight plans, issues traffic clearances, and keeps aircraft separated vertically, horizontally, or spaced along the airway at adequate time intervals so as to remove the very real collision hazard which would exist if the airways were used haphazardly when the visibility is restricted. It is important to note that the extent of airway traffic control varies normally with the visibility and while occasionally it may extend to the airports

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it does not ordinarily do so; (3) it oversees airport traffic control, an activity which is carried on by personnel hired by the agencies operating the airports and certificated by the Authority. As airmen, such personnel must observe applicable rules and regulations issued by the Authority. The fact remains, however, that the successful functioning of the Airways Operation Division depends very greatly upon the degree of cooperation furnished by states and local subdivisions in supplying airport traffic control.

What is Airport Traffic Control? What peculiarly local service does it perform? What services can or does it provide which are not available or which can not appropriately be furnished by other agencies? I think we are all interested in the answers to such questions, especially when we take stock of the tremendous growth of regulatory activities and the constant additions being made to ground personnel and equipment in order to expedite aircraft movements.

Keeping in mind what we said about airway traffic control above, airport traffic control might be defined as that traffic control which is necessary to eliminate or reduce the collision hazard naturally present in the vicinity of airports when the traffic is relatively heavy, (a condition which normally exists only during very good weather and with which airway traffic control, if available, is not equipped to cope).

Airport traffic control provides all necessary control of aircraft taxiing on the airport as well as the control exercised over aircraft in flight in the immediate vicinity of the airport (within a radius of 3 miles of the center of the airport). A radio-equipped airport traffic control station functioning with radio-equipped aircraft gives pilots almost limitless service as they taxi about the airport. I am sure that we all appreciate the helpfulness of information about other aircraft, trucks, stakes, holes, ruts, soft spots and other actual or potential obstructions to the rapid movement of traffic, especially when such information is being broadcast by an alert tower operator. Incoming pilots can be told where to taxi to get certain services and, what is more important, how to get there without tying up all other traffic.

Airport traffic control provides the order in which planes are to take off whenever any such action is necessary and, of course, it must provide decisions as to whether a plane about to take-off should be held for one which is about to land. Airport traffic control is necessary to arrange a landing sequence if two or more pilots wish to land at approximately the same time. Airport traffic control can save time of pilots equipped to use local control facilities by eliminating circling the airport before landing and by permitting unconventional turns by pilots leaving the airport. It enables the airport manager, through his control tower operators, to exercise effectively any restriction of operations which may be necessary for disciplinary, business, safety or any other reasons. It enables the airport manager to give all pilots using the airport altimeter settings, time checks, radio checks, latest surface winds, weather reports, and information relative to an aircraft or any of its major parts such as the landing gear in case there is anything unusual about its appearance or manner of functioning. It gives the airport manager an opportunity to tell incoming pilots of any last minute changes in the availability of certain portions of the airport which might not be noticed. It enables the airport manager to inform incoming pilots of glider activities, model flying, or any other similar activity which may be taking place on or adjacent to the runway to be used. In short, airport traffic control permits the airport manager to make the greatest possible use of the facilities under his care.

In many respects, the air-traffic control-tower operator serves as an extra pair of eyes for the pilot, particularly when the control tower operator's field of vision includes portions of the airspace which cannot be seen by the pilot. The added safety by the exercise of airport traffic control is therefore very obvious.

In all of the foregoing respects, airport traffic control is purely local. In addition to these services, however, airport traffic control provides services which are not available or which cannot be appropriately furnished by other agencies. For instance, in airway traffic control areas, it is necessary for the airway traffic control center to relay traffic clearances, instructions, and traffic information through the airport control tower, when the airplane is on the airport. This procedure is practically a necessity from a standpoint of complete airway traffic control and yet under the present system federal employees responsible for airway traffic control can only hope that local agencies will find it possible to furnish the facilities which are so necessary to complete the traffic control picture.

Air-traffic control-tower operators relay flight plans, position reports and pilots' reports of unanticipated changes in the weather. Just recently the Weather Bureau sent out a request to airport managers that their control tower operators serve as lookouts for the Weather Bureau to report unexpected changes in the weather which might not be observed immediately by Weather Bureau personnel. The assistance given airway traffic control by control tower operators is a service which could not be performed by any other agency, especially when the airplane is on the airport. At such times the pilot must be tuned to the airport control tower frequency and hence whatever information or instructions airway traffic control has for the pilot must come through the tower. Insofar as the assistance given to the Weather Bureau is concerned, it is obvious that no other personnel are in a position to keep track of changes in the local weather as well as the tower operators.

I think it is quite obvious that airport traffic control begins with the generally applicable rules found in federal Civil Air Regulations governing landing and take-off procedures. These rules, supplemented if necessary by additional local rules, form the basis for traffic control at every airport or landing field. In many instances, these rules provide all the traffic control that is necessary. It is unfortunate, however, that airport traffic is extremely sporadic, and furthermore, that the amount of traffic which can be handled safely varies greatly with weather conditions. I am sure that you all realize the significance of the effect of weather conditions at our major terminals where arrivals and departures at the rate of 50 to 100 an hour in good weather are slowed down to a rate of from 2 to 5 or 6 an hour when instrument flight procedures must be followed. Thus, I am sure that no one will question the statement that because of the likelihood of a collision hazard, whether it result from the presence of a large number of aircraft or a comparatively few operating when the weather is unfavorable, airport traffic control should be available at many points although it may not be exercised continuously or for extended periods during the 24 hours except at a comparatively few places. When we speak of the difference between airport traffic control at a large terminal like Chicago or Newark and active airports at which there is no air carrier traffic, it is obvious that the differences are differences in *degree* rather than *kind* of control. In other words, there is every justification for continuous active control at the large terminal, while at the smaller airport active control may be justified only occasionally.

Airport traffic control at an active airport should provide the following services:

1. Radio communications between the airport and aircraft on the ground on the airport or in the air in the vicinity of the airport.
2. Visual signals, light, flag and panel if necessary, for communication with aircraft not equipped with radio on the airport or in the vicinity of the airport.
3. All the equipment necessary to enable the operator to give the pilots of aircraft information on the wind, direction and velocity, altimeter setting, and, of course, a structure from which an operator can observe traffic so as to be in a position to give pilots correct information or instructions relative to the use of the airport.

Radio is included without qualification because of the fact that while the equipment is rather expensive, the major cost in the use of radio is in the salaries of operators. If the radio is used by someone who is ordinarily occupied at other duties, no additional salaries are involved and hence we can make such a recommendation without feeling that we are proposing an utterly impossible increase in airport costs. It is wiser to encourage the installation of radio even though it may be used by a part time operator rather than to have airport agencies postpone the installation of radio until they feel they can assign operators to airport traffic control duties exclusively. As is true in so many other activities, the value of any one radio set, whether in an airplane or on the ground, depends entirely upon the number of stations with which contacts may be made. The more ground stations with which the pilot can communicate, the more valuable radio equipment is to him and hence to any other pilot who might be a potential user of such equipment.

It is difficult to over emphasize the desirability of encouraging more extensive use of radio, particularly by the non-scheduled civil pilot. If the pilot has radio, he can keep track of the weather as he flies along his course and thus can either avoid bad weather areas or plan his flight with airway traffic control so that it can be coordinated with other aircraft movements. Finally, even though a pilot wants no part of instrument flying, use of radio gives him an informal schooling in instrument flying procedures so that he will be better prepared to follow such procedures at a later date if he chooses to qualify for such operation.

The pilot who does not have radio is always apt to get in trouble with the weather because he is inclined to push ahead to find out for himself just how bad the weather is and consequently he frequently gets into spots where it seems wiser to forge ahead than to turn back. Such operations are hazardous not only to the pilot resorting to such practices but to all other users of the airspace.

It should be noted at this point that we do not discourage airport traffic control by the use of lights and visual signals only, although I am sure we all appreciate the limitations of such a service. We do feel, however, that if funds are available for the salaries of operators assigned to traffic control exclusively, it should be possible to make this service still more worth while by the comparatively modest expenditure necessary for an airport transmitter, and a few receivers. Incidentally, the cost of the radio equipment should not exceed \$1,500.00 to \$2,000.00, if no fancy work is involved. Here again we have tried to be realistic in making recommendations to local communities and have recommended the installation of equipment which would work and which was relatively inexpensive rather than to encourage high priced installations. In other words, we appreciate the fact that cities and local agencies generally are

in about the same position as individuals. We might like to have Packard automobiles but the fact remains that most of us have to be satisfied with Fords and Chevrolets.

I don't believe that it is necessary to discuss in detail visual signals because, after all, they are relatively simple in construction and operation. The most important consideration is that they be as simple as possible and, of course, absolutely uniform. A misunderstood signal cannot be explained in time to do any good insofar as any particular operation is concerned.

In making recommendations relative to traffic control at different airports, we have tried very seriously to avoid over-selling airports as to the need for traffic control. We believe that air traffic control is somewhat analagous to surface control in many respects. Everyone of us has stormed and fumed about traffic lights set out in the middle of the country, perhaps at some isolated cross-road at which converging traffic can be seen for half a mile on either side and at which there is relatively little traffic, except, perhaps, on Sunday afternoon. Most of us realize that some ambitious salesman sold a county or township on the need of such a light because of some one accident which occurred and which might be duplicated at any time, light or no light. However, even when the occasion for installing such a light is not subject to question, I believe that we all have felt that it would be so much better if the light were operated only when traffic warranted operation or at least only on days or parts of days when the traffic warranted such operation, rather than to have it going day and night throughout the week, retarding traffic when there was no earthly need of the light. Naturally, we hope to avoid similar mistakes with respect to airport traffic control.

I do not want to close this discussion without anticipating what is probably the foremost question in your mind as to airport traffic control, namely, how such an activity should be financed. I think we are all agreed that the assumption of the entire burden by the local agency as is done at present is one of those circumstances which everyone recognizes as unfair but one which has not yet been straightened out. If the federal government operated all the airport traffic control stations, I am sure that no local agency would object from the financial standpoint. However, in going over the questionnaires somewhat reflectively, I could not help but notice that some of the older airport managers seem to sense a result not entirely pleasing to local agencies. "Whoever controls the traffic rules the airport" is a statement whose truth is almost self evident and hence I doubt very much whether cities which have really prided themselves in their local airport development will be willing to turn over the operation of the airports, lock stock and barrel, to the federal government unless the federal government wishes to take over the whole system, land, hangars and all the responsibilities and headaches which go with the construction, maintenance and operation of an airport.

I see no good reason why there should be any argument over a proper sensible division of authority over air traffic when we have managed under our present form of government to arrive at some fair and satisfactory division of authority with respect to so many other activities. The answer, of course, must be provided by the Congress which will undoubtedly rely very largely upon the course of action recommended by the Authority and your organization.

I should, however, like to present briefly a solution suggested by Major Albert Edson of Boston. His suggestion is that a local facility could be operated on very much the same basis as caretaker personnel serving in conjunction with National Guard Air Corps units at 19 different cities at the present time. As

you may know, all the airplanes, armament, radio, and similar equipment used by National Guard units is furnished by the federal government. The caretakers are under the supervision of the local commander of the National Guard or a member of his immediate staff, and while the National Guard commander is responsible to the federal government in many respects, actually in supervising the caretakers, he is functioning as a local civilian or representative of the state at least 6 days out of 7 and hence we have almost a perfect parallel for a setup in a control tower in which federally paid operators might function under an airport manager hired by the city.

I have had ten years experience with the same sort of setup myself and can speak from personal experience as to the smoothness with which such a system works and the fairness of any such plan.

I regret to state that our limited experience with the promotion of airport traffic control has shown that local agencies have not become especially worried about the traffic problem until one or a number of accidents have occurred. It is our hope that in this new field of activity we can encourage the reasonable extension of this service in time to avoid the re-enactment of the history of motor traffic in which very few aids have been installed until the need was proven by a series of accidents. Aircraft accidents are too costly to permit us to follow such a procedure.

A report of the Air Safety Board under date of September 24, covering 117 aircraft accidents, showed that 18 of the accidents were classified as taxiing accidents and the note indicated that 18 ground accidents and mishaps were not included.

While we do not know the exact nature of any of these accidents, I want you to remember the figures because occasionally we find people who attempt to minimize the importance of airport traffic control because they feel that traffic is not yet a problem. Actually, it is one of the major causes of accidents. It does not take much imagination, therefore, to visualize its importance in the near future as air carrier, military and private flying continue to expand.

Airport traffic control is worthwhile even if considered only from the standpoint of its convenience. In contributing to the prevention of accidents it performs a service whose value cannot be measured in dollars and cents. It should be exercised whenever necessary.

In conclusion I should like to present some figures taken from the traffic control questionnaires filled out in connection with the airport survey.

For purposes of analysis, we separated the airports into 5 groups, Group A consisting of control airports at which local traffic control is exercised, Group B, control airports without local traffic control, Group C, all other airports with local traffic control, Group D, airports not included in A, B and C but at which scheduled stops were made for air mail, and Group E, all other airports or landing fields from which we received answers.

The answer to question 7, which was "If you do not exercise airport traffic control, would you set up airport traffic control at your airport if you could have it?" was answered affirmatively by all but 2 of the control airports in Group B and by approximately 2/3's of the airports in Groups D and E. It appears that this question was answered very honestly and that there was no particular misunderstanding in view of the fact that by far the major number of answers from Groups D and E were to the effect that control was merely desirable or necessary only part of the time.

80 per cent of those who said they would not install airport traffic control gave us their reason that they did not consider traffic control necessary at their

particular airports.

It should be noted again that approximately 50 per cent of the airports from which we received questionnaires were not even air mail stops and hence a considerable number of airports and landing fields were included at which there was very little traffic.

The answers to question 8 are of basic significance. We asked whether airport traffic control was considered a local function, a federal function, or one which should be part federal and part local. Opinion was rather evenly divided in some respects. In attempting to arrive at some conclusions, I compared the number of those who considered airport traffic control federal and local plus those who considered it purely local, to those who considered it altogether federal. It is interesting to note that replies from Group C (airports at which control had been established without any urging from us) only 2 of the 10 stated that airport control was a federal function. Even in Group B, practically one-half indicated there should be local or part local participation. Of Groups A, B and C 57 per cent voted for local or federal plus local. Note the definite stand for local participation at airports at which control is now exercised and the gradually increasing percentages for federal operation where the question is more academic than real. Perhaps the most significant result, however is that 328 of 368, or practically 90 per cent, consider airport traffic control either partially or entirely a federal function.

SUMMARY OF TRAFFIC CONTROL QUESTIONNAIRE (1938)

	A	B	C	D	D	E	E	Total A-B-C	ALL
6. Is your airport served by a federal radio range designed to direct aircraft to it?.....	22	29	5	74		21		56	151
.....NO	5	2	5		56		150	12	218
7. If you do not exercise airport traffic control, would you set up airport traffic control at your airport if you could have it?.....		29		50	42	15	90	29	226
.....NO		2		20	16	6	57	2	101
a. If so, do you consider airport traffic control at your airport—									
Merely desirable .....		9		10	11	6	52	9	88
Necessary part of the time.....		12		31	23	5	31	12	102
Necessary at all times.....		7		9	8	4	7	7	35
b. If not, would you object because you believe that airport traffic control is not necessary at your particular airport, or.....		2		11	16	6	48	2	83
You consider airport traffic control unnecessary at any airport, or....								3	3
You think the federal government should exercise whatever airport traffic control is necessary.....					8		5		13
8. Do you consider airport traffic control a local function, or.....	8	4	4	4	3	2	14	16	39
A federal function, or.....	11	16	2	47	29	12	76	29	193
One which should be part federal and part local? .....	8	11	4	23	22	7	60	23	135
Per cent federal and local plus local....	59	48	80	36	46	43	49	57	47
Per cent federal and local plus federal..	70	87	60	95	94	95	91	76	89



	A	B	C	D	D	E	F	Total A-B-C	ALL
c. If you consider it a federal function, do you think—									
There should be no airport traffic control except where the federal government puts it in operation, or	1	11	2	33		42		14	89
That any city should be permitted to exercise airport traffic control with certified operators if the federal government did not choose to operate a local station?.....	9	4		30		32		13	75
d. If you believe airport traffic control should be part local and part federal do you think that—									
Only local men should handle non-interstate traffic when contact flight is possible.....									
YES	4	5	2	17		32		11	60
NO		2	1	4		8		3	15
At most airports a local man on duty during the daytime would be all that was necessary .....									
YES	4	5	2	20		38		11	69
NO		2	1	1		2		3	3
That the major job is									
FEDERAL	3	4	1	11		13		8	32
LOCAL	1	2	2	10		21		5	36