Rogues in the Air: An Ethnomethodology of 'Conflict' in Socially Organised Airspace

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Abstract

This paper analyses aspects of socially organised conflict from an ethnomethodological point of view. In particular it examines the accomplishment of activities between civil and military Air Traffic Control operations at London's Air Traffic Control Centre. It will be shown how civilian controllers orient to, take account of, and manifest the interface of military and civilian operations in such a way as for that interface to be perceived and treated by controllers themselves as conflictual. Examples will be taken from observed decision making relating to military 'rogue' planes. Some remarks as to the history of ethnomethodological examination of 'accomplished' conflict are made and proposals for the respecification of conflict as an analytic object for the sociology of work exposited.

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1. Introduction

Our rationale, in this paper, is to examine notions of conflict in the context of the sociology of work from a point of view not normally associated with such concepts; to whit, that of ethnomethodology. This concept is of course a key issue for sociology in general, but perhaps nowhere more so than in the sociology of work, which has been replete with examples of theoretical orientations to conflict and its transformations since the time of Marx. The occurrence of conflict in the workplace as a specific form, though deriving largely from Marx's original insights into the social relations of production, has been examined largely from within labour relations theory and the sociology of organisations in such a way as to preclude the examination of conflict as a phenomenon; that is, one that is examined for its processual or self explicative character. Rather, as Bittner (1965: 239-255) points out in the context of the study of organisations, such concepts can be viewed as normative constructs for analysing compliance, wherein the existence of rules assumes a correspondence

between those rules and behaviour. Similarly, with the closely related sociology of work, arguments may be set up so as to bring control, or the minimisation of conflict, to centre stage. This is nowhere more evident than in the work of Braverman (1974). Braverman's thesis, that technological development represented a new context for control through the mechanism of de-skilling, became the dominant focus of analysis in the following years, exemplified by the proliferation of empirical studies and by the progressive conceptual reformulation that produced reskilling, enskilling and ultimately flexibility and post- Fordism. Embodied in all of these, we would argue, were analytic assumptions about both the nature of 'skill' and its relationship to technology which in turn defined the relationship between power, conflict, and new technology as a domain assumption of the sociology of work.

Nevertheless, by the late 1980s the sociology of work had apparently broken up into disparate elements: Wood for example was able to note that there had been a moving away from the issue of control central to Braverman's thesis towards such things as the social construction of skill, tacit knowledge and the sexual division of labour (1987: 3-24). The impetus for this fragmentation came initially from the recognition that Braverman's conception of skill elided some serious methodological and classificatory problems (see Penn 1989); but secondly and, we would argue more profoundly, from developments in the sociology of science and technology predicated on a 'knowledge' perspective which quite radically transformed assumptions about what 'skill' could be said to be. A central feature of that perspective was the recognition that 'formal' descriptions of scientific theory failed to encompass the work of science (Lynch, 1982: 499-534; 1985; 1990a;1990b; Livingstone 1986; Garfinkel, Lynch & Livingstone 1981: 131-158) and that methodical analysis of how science was done elicited knowledge and skills that were not derivable from theoretical views of science. Informed by ethnomethodology, a similar conception of tacit skills and knowledge has been evolved to explain the 'failure' of expert systems and multi- user software in the work setting (for an introduction see: Collins 1987; Bannon & Bodker, in press;

Bannon & Schmidt 1991: 3-17). A clear implication of this argument is of course that the same critique of 'formal' conceptions of skill could be applied to any work setting. There is no reason to assume that the skills offered by those employed in particular work settings are adequately conceptualised by generally available categories, and at the very least that adequacy cannot be demonstrated until such time as a contextual and empirical grounding for such categories is provided. Rather, it is always possible, and we believe likely, that those skills will prove both to be substantially richer and more subtly deployed than conventional skill classifications might make evident when examined in that context. By way of example, as Suchman (1983: 320-328; 1987; 1989; Suchman & Wynn, 1984: 133-154) points out even in the apparently routine context of office work, tacit skills of great complexity are in fact deployed.

Nevertheless, despite the fact that such approaches may afford valuable new insights into the practice of work, it seems to us that one still searches hard for studies of actual work, for examinations of the ordinary skills and practical reasoning that goes to make up the way work is experienced by those doing it, and for a careful examination of what those skills consist in. Equally, it would seem that ethnomethodology represents an obvious and natural perspective to deploy in such studies, but it remains the case to our knowledge that with a few honourable exceptions, only a handful of analysts have done so. The so-called 'Ethnomethodological studies of work' launched with the publication of Garfinkel's edited collection under the same title in 1986 has not lead to any large output of research findings (exceptions include Anderson et al, 1987; 1990; Baccus, 1986: 20-59; Button & Harper, forthcoming; Harper, 1988: 297-306; Harper, 1989a: 73-87; 1989b; Lynch, 1982: 499-534; 1984: 67-86; 1988a: 265-89; 1988b: 201-34; 1990a; 1990b). One reason for this may be that ethnomethodology has been perceived as

ignoring those issues of power and conflict that are close to the heart of those trained in labour process theory[1].

Our point is that the fragmentation we refer to above, wherein the unique inadequacy, so to speak, of conceptual frameworks governing the nature of skill has been progressively exposed,[2] has not been paralleled by a similar treatment or reconsideration of what power and conflict in the work setting actually might mean; that is, as a contingent and accountable feature of the work setting. Where 'Bravermania' led to an examination of the degree to which managerial control could be enhanced by technological solutions to 'skill', and reached the largely unsurprising conclusion that skill was a somewhat polymorphous concept, and above all a contingent one, the post-Braverman era has not been accompanied either by a similar consideration of notions of power, hierarchy, and dominance, nor of conflict. It is our purpose to examine the latter through methodical treatment of the accountable features of a setting which manifest occurrent phenomena as 'conflict' or otherwise, rather than presupposing the existence of conflict as a generic 'structure'. Ultimately, even if it can be demonstrated, as it has to at least our satisfaction, that deterministic notions of technological impact are of little theoretical or empirical value, the view remains that the work deriving from it is somehow consequential because it is 'about' power and conflict. In other words, the concepts continue to resonate in ways that emphasise their status as explanatory 'structures'.

To say that ethnomethodology ignores power and conflict is, of course, a misconception predicated on that view from orthodoxy. Conventional notions of power and conflict are inconsistent with the ethnomethodological program not because ethnomethodology is incapable of dealing with exercises of power, or with occurrences

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[1] For a discussion of the relationship of ethnomethodology to the rest of sociology see Button, (ed) 1991.

2 See for example the burgeoning literature on Computer Supported Cooperative Working.

of conflict but because ethnomethodology is founded differently, and takes as it's starting point the visibly processual character of social activity. Viewed ethnomethodologically both power and conflict, like all social phenomena, cannot be seen as anything but the results of those processes, and cannot thus be the explanation of those processes- they constitute accomplishments which must be an accountable feature of the activities in question. Their status as structuring principles is thus deeply problematised if nothing else because instances where conflict does occur and instances where it does not must be treated as the same order of phenomenon.

Our interest in this paper is to deal specifically with conflict as a phenomenon, and to explicate the very different conclusions one must reach about the nature of conflict when viewed in this way. Put simply, it is not our task to attempt to define what conflict is or provide a theoretical account of its occurrence and resolution. To do so would be to presuppose the phenomenon to be investigated. Rather, our aim is to examine the work setting in such a way as to illustrate how members come to recognise potential conflicts in Air Traffic Control and to examine how their resolutions can be understood as features of a highly context sensitive accomplishment. To paraphrase Lynch (1985), in dealing with conflict in Air Traffic Control we are specifically not elaborating upon the situated use of generic 'structures', and most certainly not recapitulating sociology's extrinsic interest in work. Our task is not to demonstrate how ethnomethodology can incorporate 'structured' notions of conflict, but to show how conflicts may or may not be part of a description which is uniquely adequate to the setting, or how conflicts and their resolution constitute part of the 'just what' of the work which makes it that work and not some other. In other words, the existence of conflict or otherwise is a product of how people come to recognise and define such situations and what they decide to do about them. This is in no way to deny the possibility that the dispersal of interests and authority within an organization may indeed create arenas in which conflicts may be enacted, but to argue that the status of the phenomenon is produced out of members' reasoning. Thus, if it is the case that

issues of conflict have not been significant topics of ethnomethodological inquiry to date, then it may be contingent on the fact that they were not features in the settings of those inquiries- that members may or may not, according to their reasoning about situations, negotiate conflicts away. This paper will attempt to remedy that fundamental misconception about what an ethnomethodological study of conflict might look like by analysing the realities of an organisational setting from within which conventional sociologies might derive arguments about internal conflict. The organizational locus is that of Air Traffic Control, and specifically the way in which the formal division of the National Air Traffic Services section (NATS) into military and civil areas of responsibility, and the concomitant division of British airspace into two areas of control with separate responsibility and differing ideas about priority might be seen as potentially inviting conflict within the organisation in circumstances where there is transgression. Our task in describing the way in which these transgressions are dealt with is to ask what it is about the phenomenon under investigation that makes them self- evidently 'conflicts', 'potential conflicts' or say 'consensus' (though we do not wish to imply that these are necessary correlates nor mutually exclusive categories). We would argue that it is necessary to demonstrate how these transgressions arise and are resolved in the controlling of airspace and to further show how they constitute an accountable feature of, and a practical problem for, civilian Air Traffic Controllers (controllers) at London's Air Traffic Control Centre (LATCC).

We do this by looking at how controllers recognise, define and resolve 'problem aircraft'. These are sometimes referred to by controllers themselves as rogue planes. Our particular concern will be rogue military aircraft[3]. We sahll show how this recognition, definition and resolution is achieved by reference to, and as a manifestation of internal organisational differences between the two sides of the

[3] A focus on problem resolution can often provide an access to tacit reasoning processes in ethnomethodological enquiries: recollect for example , Garfinkel's notorious breeching experiments, but also Lynch's focus on 'problems' in the biochemistry lab.

National Air Traffic Services (NATS): the military and civil[4]. We will examine the processual characteristics endemic in relations between civilian controllers and the unit set up to help facilitate joint military and civil ATC, the London Joint Operations unit (or LJO). Our goal is to specify both the reasoning that underscores controllers ability to distinguish military 'rogue' planes, and their ability to resolve problematic occurrences that arise as a consequence of joint operations through knowledge of internal organisational differentiation. To achieve our aim, it will be necessary to elicit the general character of the work setting in which controlling as a practical activity takes place; to describe the relationship between the military and civil operations at LATCC; and to identify the 'routine troubles' which emerge as a consequence of the division of the terrain in that way.

2.1 The organisation of ATC at the London Air Traffic Control Centre

Despite some substantial media coverage of 'air misses' it remains the case that there has not been a mid air collision involving aircraft under guidance of controllers in the UK for at least twenty five years. Yet routinely and virtually every day there are troubles or potential conflictions[5] in the air which controllers have to resolve or sort out with great speed. From the outside it is difficult to appreciate the overwhelming importance of safe and speedy expedition. Greatly enhanced aircraft performance and the sheer weight of traffic through the sectors at busy times mean that a minute, and on

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[4] Coincidentally, ATC has become the topic of considerable public concern recently as the result of some well publicised near misses and the ever increasing delays in air travel invariably blamed on air traffic control restrictions. Much of the information provided to the public has come from the media and has tended to be at best superficial, at worst distorting with the intention of causing scandal. Without wishing to sound to pompous this chapter hopes to provide some counterbalance to the excesses of media coverage by providing a more factual account upon which legitimate and justified public interest can develop.

[5] Evidently, conflicts in the air do not in themselves constitute social conflicts. For this reason we distinguish between them by using controller terminology, i.e. Conflictions.

occasions seconds, can be a long time in Air Traffic Control. The absence of any mid air collision is testament to the success with which controllers manage this, and to the extraordinary complexity of the knowledge and skills they bring to their task, and the artfulness or craftsmanship they continually display. Nevertheless, a casual look at the Manuals of Air Traffic Services gives the impression that rules and procedures are heavily circumscribed and constrained. Consistent with the ethnomethodological program, the existence of that artfulness in the context of enormously detailed rules demonstrates the interpretive flexibility of rules - as controllers themselves recognise.

Transcript 1

Observer — It fascinates me how everybody knows what's being talked about, yet when you analyse the language it's amazingly vague.

Controller — Which is quite strange ... when you see the Manual, and it's quite specific about what you should say, and, depending on who's here, between each other it's amazing what kind of ambiguities are actually possible but never occur, although when you get someone who isn't familiar the possibilities are quite frightening.[6]

Thus, where Air Traffic Control can be described as a 'rule governed system' what is particularly interesting from our point of view is the way in which controllers orient to those rules. As we shall see, this is nowhere more evident than in the knowledge controllers bring to problems which potentially involve mutual accomplishment between military and civil controllers, and the reasoning procedures that must be brought to bear to effect their resolution.

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[6] An issue we propose to examine in a later paper is that of 'tacit knowledge', which implies a distinction between that knowledge which is available to members in an articulated form and that knowledge which is not. From our studies, which include not only Air Traffic Control, but Police Organisations, Foam Composite Manufacturers and Information Technology Research Labs, there is no such clear distinction in practice.

The vast part of British airspace is controlled from LATCC. The civilian part of that airspace is configured, or 'sectorised' into blocks of sky controlled by individual controllers. The physical layout of the civilian operations room at LATCC reflects that organisation, divided as it is into suites, each served conventionally by two radars, each governing one sector. Civilian controllers are then responsible for managing the streams of traffic which flow into and out of each sector.[7] Traffic through the sectors is normally routed from beacon to beacon.[8] Nearly all traffic, at least during the day,[9] goes along a handful of routes in any airspace sector, and controllers ensure that this traffic is separated by altering the height, speed and trajectory of the aircraft of their control. The upshot of their decision making is a steady, regular succession of air traffic movements along a particular route, and a seamless turntaking at the junctions of these routes.

The work of controlling involves the use of two immediate sources of information with which the maintenance of continuous separation is achieved. These are, respectively, the radar screens and the Flight Progress Strips (FPS). The radar screens display a computer processed image of the 'actual' positions of aircraft relative to each other, consisting of a series of data blocks containing Callsign, 'squawk code', and present height of each aircraft, along with a 'tail' which gives an approximate indication of direction of flight. Lest it be thought that the radar represents in some

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[7] The interpretive flexibility of rules can be demonstrated at this point. Although the rules make it clear that a controller is responsible for all traffic within the sector, the reality is that de facto control of aircraft within the sector is accomplished by controllers according to principles of mutual convenience. It is not that unusual for an aircraft to traverse a sector without the sector controller talking to it to any significant degree.

[8] Most beacons today are part of the Very High Frequency omnidirectional range navigation system (VOR) which both allows aircraft to 'fix' precisely onto the next beacon on their route, but equally force aircraft onto routes which follow the VOR transmitters.

[9] At night, when there are effectively no military operations to take account of, 'direct routing' means that aircraft can fly along paths that could not be countenanced in the daytime.

sense the dominant resource for controlling, it should be stressed that the FPS's, (strips of paper specifying amongst other things the Callsign of an aircraft, its squawk code, the aircraft's route designated by the navigational markers through which it will fly, point and time of entry into a sector and estimated time of arrival at certain navigational markers within it, and destination or point of exit[10]) are absolutely central to the routine task of controlling civilian aircraft (see Hughes et al 1991; Harper et al 1989). For, where the radar screen gives for the most part a reliable picture of where aircraft are relative to each other at any given moment, what it does not do is provide a 'picture' of what they will be doing. That picture derives from the organisation of the strips, and from the information that is printed and written on them (Harper et al, ibid). Information is available in addition however, from human resources, and it's exchange through the co- ordinating work that is done is both a routine feature of controlling and of critical importance to it. Coordination takes place in several different ways, but includes at a minimum coordination between controller and pilot; between controller and controller; between controller and other personnel on the suite; and finally with and through coordination with military ATC whether it be the London Joint Operations (LJO) or military operations control. This coordination is evidently vital to the safe passage of aircraft through the sectors, but has an important secondary feature: it enables the accomplishment of 'clean' handovers between sectors. That 'cleanness' is a function not only of safety requirements but of the sense of artfulness, elegance, expedition and economy on which controller culture is heavily based.

The use of immediate information resources and of information exchanged in conjunction enables controllers to predict where an aircraft should be going and its preferred route; to direct aircraft accordingly via the radio, and to verify that aircraft

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[10] Depending on the characteristics of the flight, varying numbers of paper strips are printed out, each representing one navigational marker, or route intersection point. During the passage of an aircraft through a sector, as many as five such strips may be 'live' on the flight progress board for that aircraft.

fly as instructed. Ideally the existence of any and all aircraft within a sector will be displayed on strips, on the radar, and dealt with over the radio, and appropriate strategies for dealing with them evolve out of coordinating activities. If this does not occur, then it could be said that the aircraft in question is a problem. A problem in that, for example, in the absence of strips controllers may not know where a plane is going; in the absence of radio a controller may not be able to direct a plane to alter course as the situation demands; and without radar the controller cannot be certain where a plane is. Without trying to frighten would be air travellers the absence of one or other of these resources is something controllers have to deal with several times a day. They constitute some of the 'routine troubles' of controlling work. There are various reasons for these absences and various categories of aircraft that these relate to, and all can be said to implicate sense-making procedures on the part of the controller as fundamental to his/her tactical decision making. A situation whereby all aircraft entering a sector are represented and understood through information immediately available or communicated would constitute an ideal situation for controlling. Absence of any one source of information in one or more of these mediums causes a problem in principle, but in practice controllers do not necessarily equate such absences with the potential for conflictions with others, since planes may enter an airspace without one or other of these mediums and not be a worry to a controller. This is quite simply because these resources are mutually elaborative (Harper et al 1989). What the Flight Strip doesn't tell the controller, the radar screen does; what the radar screen doesn't, the Flight Progress Strips will. The ratio, or form, of this mutual elaboration will vary between different circumstances; the rule of thumb for controllers is that of 'making do' with what they have at hand.

The following illustration taken from transcripts of observed activities on a sector at LATCC known as Pole Hill, serves to indicate how the absence of strips in front of the controller representing an aircraft already displayed on the radar screen does

not cause a seizure in controlling activities. Rather the controller makes do with information at hand, and asks for a strip to be provided.

Transcript 2

Controller: We got strips for that Jersey off Leeds ? [an aircraft from Leeds to Jersey]
Wing Off Leeds ... no. What's the Callsign ?
Controller Jersey 1730.
8 seconds
Pilot Jersey 1730 ... at 150 ...[15,000 feet]
Controller Good morning, Jersey 1730 ... maintain ...
5 seconds
Controller Got a strip for a Shamrock 612 Dublin to Manchester ?
Wing 612 off Dublin ... no ...
Wing brings a blank strip across.
13 seconds
Strips arrive for Jersey 1730.

As far as could be ascertained, this posed no particular problems for the controller. Moreover, we noted dozens of such incidents throughout our observations. They were, if you will, natural, routine, and mundane troubles, solved as a matter of course. For the controller a problem aircraft is one which does not fit into a planned orchestration of air traffic movements, rather than one that is not represented by a flight strip, radio contact or radar datum. Controllers recognise which plane is a threat to their orchestration from those which are not by making assumptions about the intentions of pilots *as if they had all the information normally available to them.*

In the case of civilian traffic such assumptions are largely unproblematic partly because of the relative predictability of the traffic, and partly because 'finding out' can for the most part be done quickly and effectively by recourse to other controllers or to other members of the suite team. Thus, in normal circumstances it is the existence of those resources in some combination or form that enables controllers to make assumptions about the intentions of pilots and indeed of other controllers and thus the probable ways in which these intentions will be realised. In brief what is presupposed in, and underscores the work of controlling is the ability to predict where a plane will

be. Controllers have to make these predictions with whatever information is at hand, and in the nature of the work the information at hand can and does vary considerably. In the case of military rogues however, dealing with and constituting sufficient information about aircraft is far more problematic: 'finding out' takes longer for example, and the traffic, for reasons we will discuss, is less predictable. In the next section we will concentrate mainly on those 'troubles' which relate specifically to military planes that enter controlled airspace on an ad hoc basis, precisely because it is these aircraft that are most likely to cause interpretive problems, and more specifically because the separation of responsibility into military and civilian control, with concomitantly different purposes, creates both potential conflictions in the airspace and potential conflicts between the two organisational spheres. Our purpose is to specify how this particular category of air traffic movement is recognised, dealt with, and routinely 'taken account of' by controllers. The 'reasons for these events' offered by controllers to make sense of these events will be discussed and the transparency of controllers reasoning in relation to these aircraft outlined.

2.2 Military control within the civilian operations room.

Military planes can be instantly recognised by the data blocks on the radar screens. All military aircraft flying VFR will have the same Squawk code. During the day it will be quite normal for several military planes to be displayed on civilian controllers' screens at any one time. A proportion of these military planes are under military ATC and this is indicated by additional information about flight level and the radar console being used to control them being incorporated in the data blocks. For the most part we shall now confine our remarks to these aircraft.[11]

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[11] Some military traffic is under the control of civil controllers, normally when the bulk of the route is through controlled airspace. This traffic also causes some difficulties:
Irish Sea controller to Pole Hill controller: "Macship on the way ...." [A Macship is a term for a USAF Air Transport Plane]
Pole Hill controller to observer: "OK ... they can be a bastard ... they'll cause you some interesting problems ..."

Throughout our research we observed occasions when military aircraft under military control generated friction. For example, during observations on one day, a controller on Bristol/ Sector 23 concerned himself on two occasions with military aircraft that he was not controlling, but which he felt constituted potential threats to the orderliness of movements through his sector.

Transcript 3

Controller What's he up to? [Pointing to a military plane]
Controller to observer
See this plane here? See this one? .... it looks to me like he's gonna come in.[i.e. enter the airways] He's going to come in, isn't he ? And I'm climbing him [points to a plane in the airways] to 20 ... telephone time ...[he calls the military]

Transcript 4

Controller on phone to Military Ops
Got a problem. See that Speedbird? [A British Airways aircraft]
Military Controller
Give me a moment ...
Controller Just before Malby ... one of your boys is there [i.e. a military plane] at 16 and I wanna know where he's going.
Military Controller
Oh right .... no, don't worry, he's turning away.
Controller to observer
There we go again.

Transcript 5

Controller on phone to Military Ops
This one [referring to a military plane] .. looks as if he's going to do a crossover ...
Military Controller
Which one?
2 seconds silence.
Military Controller
Ah, no ... I see which one you mean ... no ... I'll check ...
1 Minute.
Military Controller to Controller
You're OK ... he's waiting, I've got a couple more for him ... from Yeovilton.

From an ethnomethodological point of view of course the exchange of information presupposes an accomplishment of meaning on the part of members. Their understanding of it is the outcome or the accomplishment of their practical reasoning and sense making procedures. Thus, the existence of what in controller parlance are called ‘rogues in the airspace’, that is planes that are potentially conflictual, will have to be treated as being isomorphic with the procedures employed to make that existence apparent for those to whom those aircraft are a problem, controllers themselves.

The examples of transcripts 3, 4,and 5 begin indicate the range of assumptions controllers might have about the possible behaviour, the motivations, and hence in ATC terms, the destinations of military aircraft. In the first, the civilian controller assumes the (civilian) aircraft he has instructed to climb will continue to do so. With the military plane however it is altogether much more difficult for him to predict its trajectory. For one thing it is not under his control, and thus he cannot "know" accordingly where it will be going; but on the face of the evidence he has at hand, i.e. its current trajectory as presented on the screen, the aircraft will enter the airways at a point that will cause a problem; i.e., a confliction with the orchestration of controlled aircraft. This is not, of course, certain, but to the extent that it is a practical possibility it is a problem the controller needs to deal with. For the controller, a ‘rogue’ aircraft exists. The ‘rogue’ is ‘there’ on the radar display, and judging by it’s apparent intentions might well cause a confliction. Consequently the controller must clarify the situation and fill in for himself the details of the military plane's intentions by contacting military operations.

What we are trying to do here is uncover how controllers recognise and understand the controlling situation; in this example, transcript 3, we are seeing once again how controllers make do with the information they have at hand so as to determine for practical purposes the trajectories of aircraft. The practical reasoning involved in dealing with military rogues is, needless to say, more complicated than reference to this example shows.

Let us consider in more detail how controllers recognise rogues. We have begun to see that, potentially at least, rogue military planes can be recognised and acted upon in much the same way as any other aircraft. If it appears that they have the intention of entering the airways and if doing so may upset the orchestration of regulated aircraft then a procedure will have to be adopted to deal with the problems they may cause. In contrast if it is *apparent* that the aircraft will not enter the airways then they can safely be ignored. As we have said, the appearance of intention is thus critical for the decision making process in that in interpreting what aircraft are likely to do, the controller will either ignore or treat them as a potentially serious problem.

The word 'apparent' here though is something of a gloss on what involves the deployment of tacit skills and knowledge about the behaviour of ‘rogues’. We need to ask how does a controller see a plane as 'apparently' intending to go this way? (as against another direction). Assumptions about what a ‘rogue’ aircraft include, are supported by and understood in reference to, a broader context of knowledge about ‘rogues’ in the past, known to be typical cases and consequences and retrospectively recognised methods for remedial action, such as contacting the military controller as soon as a candidate ‘rogue’ is recognised. Taken as whole, this knowledge enables controllers to differentiate those planes that are ‘rogues’ and need sorting out and those planes, which though not conforming to the standards of air traffic control procedures in one way or another, can be ignored.

We can illustrate some of these considerations with two generic, contrasting examples. A military plane that flies erratically beside the airways will on many occasions be ignored, even though it might wander into controlled airspace. In contrast, a military aircraft in uncontrolled airspace (or VFR) which has been flying in a constant direction towards controlled airspace boundaries will be treated as a ‘rogue’ and efforts made to ensure that it does not enter the airways or if it does, without any potential confliction with regulated traffic. This is because the former plane can be accounted as ‘probably sightseeing’ and as such is likely to fly all over the

place in an almost haphazard manner but will nonetheless not enter the airways. On the other hand the latter aircraft is ‘evidently’ or 'apparently' on a course to somewhere or other, a course which would appear to necessitate crossing the airways. Whatever the reason for the pilot not submitting a flight plan before hand, or failing to contact the civilian ATC authorities over the R/T, the controller must take into consideration the presumed or apparent intentions of this pilot when the controller coordinates his or her other aircraft. There is then a difference between aircraft which can be seen as 'apparently sightseeing' and those which are 'on the way somewhere'.

But there are further complications. When controllers see a military plane they also take into account the following factors. First, military pilots often - but not always - radically alter their flight path. So although a plane may appear, at first glance, to be sightseeing the pilot may be steering his or her plane erratically for other reasons. The alterations in trajectory may be consequent upon the weather, upon the complexity of the machinery, and the kinds of agenda military pilots are set when undergoing training. The upshot of this is that civilian controllers cannot always trust their own assessments of the intentions of military pilots. Second the relationship between military controllers and pilots is altogether different from that of pilots and controllers in the civilian airways making time for controlling directions to be obeyed longer in military than in civil. We saw in transcripts 3, 4, and 5 that the military controller did not immediately recognise the potential problem aircraft the civilian controller had drawn attention to. This was because, and here we must adumbrate, the military controller uses a smaller radar screen than civilian, sometimes making obscure the various planes represented and because military pilots are only ‘advised’ by controllers rather than controlled; the affectiveness of military control is further attenuated by the practical circumstances of military pilots mentioned above such as the fragile complexity of military flying machines and their particualr flying agenda; and because military pilots are often less than familiar with the regulations and procedural protocols of controlled airways. (See appendix 1) The upshot of these factors is the

need to make the telephone call to military as soon as a rogue is noted. In short, for the civilian controller, military planes are conspicuous by their unpredictability, and represent a possible source of tension and disruption because they are controlled by others, and the different protocols of that control are such that early liaison becomes imperative.

That these problems exist, and that controllers routinely deal with them, is not something unrecognised by the organisation for whom the controllers work. Indeed, in part to help minimise these difficulties, organisational apparatus have been set up to facilitate liaison between civil and military. We shall now turn to consideration of practical reasoning about military rogues within that context.

2.3 The London Joint Operations Unit

The London Joint Operations Unit (LJO) was as we say designed in recognition of the difficulties that can arise as a consequence of military aircraft traversing civilian sectors. The LJO unit is a squadron of military controllers who exist to assist the movement of military traffic into and out of controlled airspace. The protocol in such situations is that routes are determined by civilian sector controllers or chiefs, but by and large actual controlling or 'talking to the aeroplanes' is done by military controllers[12], right through the sector. Military 'crossovers' pose a whole series of problems for civilian control; their routes are often in confliction with predominant traffic flow, military pilots are often undergoing training and thus lack familiarity with procedure, and military aircraft are more subject to failure. Taken together, their effect on orchestration can be such that they slow traffic up, divert attention, and necessitate cumbersome and slow coordination:

[12] Although it should be noted in passing that protocol demands that civilian controllers can control directly if they so wish.

Transcript 6

Controller to observer

> You've just missed an interesting moment or two ... there was a military coming across here [points to radar] at 35 [thousand of feet] and I had the Midland 60 at 35, so I watched it to see what was going to happen ... I put it to 33 just in case ... all they [military control] did was turn it right, which didn't help at all ... all it did was move the confliction point further that way [points North] ... in the end [the chief] had to phone them to find out what they were actually doing with it ...

Indeed, sometimes these coordinative procedures are ridden with tension, as the following examples should make clear. In the first, a trajectory problem is dealt with, and in the second a climbing military is causing some problems to a civilian controller attempting to coordinate a Southbound aeroplane at 37,000 ft and a Northbound at 35,000ft that he wishes to descend.

Transcript 7

On being told by the LJO that there is a military aircraft seeking crossing clearance:

Chief on phone to military

> What's his squawk? ... Oh, it's alright ... I've found him [looking at radar] ... he's clear to cross at 250.

One minute

Chief to incoming chief

> Crosser at Upton ... there ... I've haven't told radar yet, he's too far away ... I haven't even told them there's a crosser yet.

[The chiefs are standing behind the controller who is aware of the conversation]

30 secs

Chief to military:

> If you route direct to Ottringham

Chief to controller on telephone

> Hello ... Lufthansa 1663 ... if we take him to 270, and miss the 6164? ... OK [6164 is a military squawk]

20 secs

Chief to controller

> He 's going up very quickly [referring to the military plane]... really leaping up there ... he will reach 250 too soon. We will have to put him [the Lufthansa] .. if we put him to 370 ..

Chief to military

> The Lufthansa's going up quickly indeed ... we've given him 370 ... should miss the 6164 no problem at all

Transcript 8

Controller Where's he going ? [referring to military plane]
LJO I'm giving him 2000ft on top of yours.
Controller. He's going to cross right between the two of them!
LJO. NO! 2000ft ON TOP!
Controller Jesus ... I'm staying at 35 ...
Chief He's turning left ...
Controller Now where the fuck's he going ... Jesus, do you want to do it by yourself ? I'm not moving from 35.
Controller on phone to nieghbouring sector controller
Bit of ambiguous coordination here so I'm having to keep the 8 Romeo at 35 ... can I give him to you at that ?

Such transcripts of course can only provide a hint of the events in question but sufficiently indicate the tension that can occur between the LJO and civilian operations and the kinds of (detailed) considerations that causes it. The problem civilian controllers have is not simply that military planes can upset their harmonious orchestration of flight movements, but that the military planes are a problem to understand, and consequently to deal with. As we have seen, it is difficult to be certain of their flight path, to liaise with military control, and so on. In other words, military planes that look as if they will cause conflictions are rogues both insofar as a confliction might occur and in the fact that the knowing of this and being able to deal with it is problematic.

For controllers of course, military rogues are just part of a day's work. They are the cause of problems, dealt with as a matter of course like any other. But unlike other problems these are manifestly more consequential and a failure to deal with them will not just bring into doubt the artfulness and skill that controller's pride themselves in but will threaten safety itself. It is no surprise therefore that military rogues are a topic of considerable interest to controllers, something they talk about again and again.

Transcript 9

1st ATCO	I think the one that frightened me most was the Ascot ... remember that? .. I won't mention any names,but ... there was a low climbing Jumbo going up to 28, and the Ascot was coming across at 26 ... I remember him saying 'expedite your climb' and it was absolutely the wrong thing to do ... that Jumbo lumbering up ... Jesus, that was so close ... and that wasn't reported ... when he ... do you know what the Ascot pilot said when he apologised to him? ... he said 'Oh don't worry, anything to make the day more interesting ...
2nd ATCO	You know what happened, don't you? I was sitting next to him on Irish Sea. There was a potential confliction between a military rogue and the Ascot and it had been going on for ages and we were all watching it ... and he completely forgot about the Jumbo ... just forgot about it .

3. Conclusion

The argument we are offering then is that just as examinations of 'skill' founder on classificatory schema which presuppose what those skills can be, so do conceptualisations of conflict in the workplace founder when their context specificity remains unexamined. The view from the conventional sociology of work implicates concepts such as conflict as 'structuring principles' of social life and in particular in the workplace, and assumes thereby that there is a class of phenomena that can be termed 'conflicts' in opposition to those that cannot. The problem is that under ethnomethodological examination, those classes disappear. Ethnomethodology specifically brackets such versions of structure, and treats 'conflict' as an accomplishment, or outcome, of members in the context or setting of their activity. A justification for the use of the term ethnomethodologically would have to result in the uncovering of processual differences in the way situations are accomplished which justify the subsequent division of our descriptive categories into conflictual and consensual situations.We have, therefore, attempted to show in our examination of a particular source of potential conflict in Air Traffic Control, that of internal organisational differences between military and civil controlling, and the knowledge of those differences that members take into account in interaction, what it would mean to bring an ethnomethodological perspective to the problem of 'conflict' in the workplace;

that is, to spell out the features of the situation that lead to members distinguishing between the routine, largely unproblematic, activities of the day, and those which, by dint of the different interests and procedures specified in different parts of an organisation, cause the tensions, occasional disputes, and procedural problems evident in the above examples. What it means therefore, if anything at all, to say that work involves 'conflict' depends fundamentally on the interests and procedures assumed and adopted by members, and is manifested in their orientation to the rules of the organisation. The management, resolution, or negotiating away of those 'conflicts' is equally a feature of knowledge about those differences. From within the conventional sociology of work of course, it will be argued that our view is endemic in our methodological choices- that treating 'conflict' as a phenomenon rather than as the consequence of structural strain, will inevitably lead us to these kinds of conclusions. We have no argument with that contention- it is as true of ethnomethodology as it is of more conventional sociologies. However, such arguments usually act as prefaces to 'so what?' questions, and it is precisely in the consequentiality or explanatory power of our position that we wish to argue it's purpose.

We have tried to show how the processually distinctive character of situations where conflicting interests exist, arise out of those interests, the way in which those interests shape and are shaped by spheres of responsibility, and are resolved through the recognition of those differences. Additionally, we have tried to examine the consequences of an organisational structure, the LJO, which was designed to deal with the occurrence of military and civil ‘conflicts’ and demonstrate how that in turn produces new iterations of processually distinctive conduct. We have, of course, not dealt with all, or even many, of the potential sources of ‘conflict’ that exist in the organisation known as the Civil Aviation Authority, of which NATS is one part. Indeed, we have consciously restricted our examination to one specific form of activity. Nevertheless, encounters between civilian controllers, between controllers and other team members, between controllers and technical staff, and between controllers and

management can all in principle lead to something which might be termed 'conflict' becoming manifest where interests diverge[13], but the point we are trying to make, one we believe well worth reiterating, is that ‘conflicts’ and their ‘resolutions’ can be treated as accountable features of work. The factors which may be germane to their appearance are contingent and complex, but above all are consequent upon the perspectives, interests, and routine interpretations that people bring to their work and to work related aspects of their sociality. In the context of controlling the overriding importance of safety and the powerful culture of artfulness and craftsmanship means that resolution of potential conflict in that context is of paramount importance. Thus, the frustrations and irritations that are demonstrably part of the routines of controlling, maximal when organisational difficulties as between military and civilian controlling are encountered, do not result in outcomes which would parallel conventional definitions of conflict. For the paradox is that in virtually every instance, the conflict, or confliction, whatever its specificities, is 'resolved'. Accounting for this is as much a sociology of ‘conflict ‘ as any of the studies more orthodoxly thought to be part of this domain.

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[13] Our data contains a limited number of examples of these divergencies. The following, however, is an example of a controller talking about problems of staffing and industrial conflict, and might repay analysis in the terms we have suggested:

> “Its getting worse ... I mean, you need a minimum of twelve, maybe thirteen controllers to staff the North Bank, and on this Watch you’re already down to fourteen. It only needs someone to be off and you’ve got a serious problem. I think they should close a sector down, to make the point ... I really do ...”
> “How often do they close a sector?”
> ‘Never ... its never happened as far as I know ... but it would show them ... they might realise then how bad things are.”
> “Well ... what actually would happen if a sector were to be closed? ... I mean, what do you do? Just fly round?”
> “That’s right ... everything would have to fly round ... take other routes ... the airlines would create hell ... every flight would be late and it would cost them the earth in fuel terms.”

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Appendix 1

Military flying and control

The bulk of the paper deals with military flying from the perspective of civilian controllers. "Knowing" how to deal with military rogues involves knowing a whole body of information about the practices and technologies of miltary control much of which we cannot go into to here. But the reader will better understand the grounds for the reasoning of civilian controllers with the following information.

Military controlling bears little resemblance to civilian; instead of being organised for the maintenance of safety within regular flows of traffic on certain busy routes, military control is designed for the coordination of a few aircraft over vast areas of airspace. This is because military flying is of a very different character to that conducted in the airways: the great bulk of it is done according to Visual Flight Rules at the discretion of the pilots themselves, pilots who are often more interested in how the get to a destination (i.e. the flying techniques used) than in the destination itself. When controlling is required, it is not often for the separation of aircraft but for their conjuction, so that for example, in-flight refuelling can be done, formations achieved and sorties commenced. When flying for these purposes, aircraft travel from various bases around the UK and meet at some prespecified point in the air. It is the controllers' task to get these aircraft to meet or at least to achieve visual contact. Once in sight of each other, it is the pilots' responsibility to maintain separation. In contrast it is unusual for aircraft to see much of each other on the airways since they are always well separated.

This type of controlling would not benefit from sectorisation in the manner of civilian ATC, and instead the aircraft flying within the total airspace are divided among controllers on the basis of what each group of planes wishes to do. Thus planes on an in-flight refuelling exercise will be controlled by one controller, aircraft on a different exercise by another. Each controller will work for the duration of any exercise and will find themselves controlling various types of exercise on any day.

Instead of small areas or sectors of airspace, the radar screens display either half of, or all UK airspace which is divided by a line between Anglesey and the

Wash. Since there may be many dozens of aircraft at any one time, most of which will not be under the jurisdiction of a controller, only those aircraft under control will have data blocks displayed beside the blips on the screen. All other signals will remain ‘mere’ blips. These data blocks show the squawk code of each aircraft and its height. The code specifies which radar centre has control of the plane (London or Eastern) and which radar consul is being used for the purpose. With the latter information it is possible to know where the controller responsible for any aircraft can be contacted. Military radar screens are only 16” in diameter (rather than 24” as for civilian control) because controllers often find themselves supervising aircraft at opposite ends of their airspace and thus at opposite sides of the screen, and find this eases their ability to survey all aircraft simultaneously.