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ATC Phraseology Guide – Ground Control

Introduction

One of the aims of FSOpen is to provide our members with a high level of realism whilst remaining flexible enough to cater for all levels of experience. With this in mind, we have decided to incorporate a training program based on current UK procedures for members who wish to develop their understanding of Air Traffic Control within the FSX multiplayer environment.

Air traffic control relies on good two way communication between pilots and controllers and, in order to provide the best examples of this, the FSOpen ATC Phraseology Handbook provides examples derived from the CAA CAP413 and other current UK ATC source documents. Use of standard phraseology ensures messages are passed in a clear, concise and consistent format and, when mastered, adds greatly to the FSX experience for controllers and pilots alike. Progression through the ATC “ranks” is largely reliant on student controllers being familiar with these phrases and applying them correctly.

In this edition, the focus is on Ground Control (GRD) with phraseology examples and templates for a number of topics that a Ground Controller in FSOpen will encounter from time to time. However, it is recognised that, just as in the non-virtual environment, this guide cannot provide examples for all circumstances and, where this is the case, controllers should use clear language and their own judgement in order to resolve conflicts.

Control Position Responsibilities

Aerodrome Control

Aerodrome Control is responsible for issuing information and instructions to aircraft under its control to achieve a **safe, orderly and expeditious flow of air traffic and to assist pilots in preventing collisions** between:

- (a) aircraft flying in, and in the vicinity of, the Air Traffic Zone (ATZ);
- (b) aircraft taking-off and landing;
- (c) aircraft moving on the apron;
- (d) aircraft and vehicles, obstructions and other aircraft on the manoeuvring area.

In order to execute these duties, the *Aerodrome Controller (ADC)* has authority over all aircraft and vehicles on the **manoeuvring area** and aircraft moving on the **apron**.

However, it is not uncommon at busy airports for Aerodrome Control to be divided into **Air Control** (TWR) and **Ground Movement Control** (GMC or GRD).

Air Control provides services for (a) and (b) above and has absolute authority over all movements on active runways and their access points.

Ground Movement Control provides services for (c) and (d) **except** on active runways and their access points.

In FSOpen, GRD controllers will be able to:

- study available FSOpen website material for Ground Control;
- be familiar with the FSOpen ATC Flightstrip system;
- record relevant ATIS information;
- issue Start, Pushback and Taxi instructions using standard phraseology;
- issue Standard and Non Standard IFR departure clearances using standard phraseology;
- issue appropriate pre-flight information and/or departure instructions to departing VFR ac;
- demonstrate correct management of IFR/VFR traffic on the ground.

We hope you find the information contained in this guide useful.

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1. ATIS (Automatic Terminal Information Service)

1.1 FSOpen's Flightstrip software now has a great facility to enable you to record your own ATIS information. An ATIS message is intended to provide a pilot with a range of information to enable him to make a definite decision about his approach and landing or take-off. In the non-virtual world, the ATIS message is transmitted on a published VHF broadcast frequency therefore reducing RTF loading. The CAP493 (the UK Civil ATC "Bible") states that "messages should, whenever practicable, not exceed 30 seconds"; However, it also lists 20 elements that could/should be contained within an ATIS broadcast and it takes longer than 30s to read this list let alone record it! However, in an endeavour to standardise our FSOpen ATIS broadcast the following example order format is suggested:

- Name of **Aerodrome**; ATIS Information **Code** (A to Z in consecutive order);
- **Time** of Met Observation
- **Runway(s)** in use;
- Surface Wind **direction and speed** (including significant variations)
- **Visibility** (passed in metres up to 5000m then kilometres, eg 6000 Met Vis = 6km, 9999 Met Vis = Greater than 10km)
- Present **Weather**
- **Cloud** Base (up to 3 cloud layers below 5000ft or min safe altitude, whichever is greater; state cumulonimbus (CB) if present)
- **Outside air** and **dew point** temperature
- **QNH/QFE** (millibars and inches)
- Any **other information**

1.2 For all transmissions, the word '**millibar**' should be appended to figures when transmitting a pressure setting **below** 1000 mb, or in cases where confusion or ambiguity may result.

1.3 The following words **may** be omitted from transmissions provided that no confusion or ambiguity may result:

- a) '**Surface**' and '**knots**' in relation to surface wind direction and speed.
- b) '**Degrees**' in relation to surface wind direction.

1.4 A typical example would be as follows:

*"This is **Newtown** Information **Delta**, timed at **1-3-5-0** zulu;*

*Runway **1-2** in use;*

*(Surface) Wind **0-5-0** (degrees), **1-0** (knots)*

*Visibility, **Greater than 10km***

*Weather **Nil***

*Cloud, **FEW 1,800 - SCATTERED 2,500 - BROKEN 5,000***

*Outside air **Plus 2**; Dew point **Minus 1***

*QNH **1-0-0-6** , **2-9** decimal **7-1** inches*

*QFE **9-9-3** millibars, **2-9** decimal **3-3** inches*

***Newtown** Ground and Tower operating on frequency **1-1-8** decimal **4-2-5**;*

End of Newtown Information Delta"

1.5 **ATIS** Example Template

The template below can be used to create a standard FSOpen ATIS broadcast:

"This is _____ Information _____, timed at _____ zulu;

Runway _____ in use;

(Surface) Wind _____ (degrees), _____ (knots);

Visibility, _____;

Weather, _____;

Cloud (1) _____;

(2) _____;

(3) _____;

Outside air (+/-) _____; Dew point (+/-) _____;

QNH _____ (millibars), _____ inches;

QFE _____ (millibars), _____ inches;

(Additional info if required): _____

_____;

End of _____ Information _____".

2. R/T Test Transmission Check

2.1 A typical r/t check format example would be as follows:

Pilot: “[Airport] Ground, [Callsign], radio check”

ATC: “[Callsign], [Airport] Ground. Readability [x]” *

Eg.

Pilot:	<i>“[Newtown] Ground. [Jersey 3-9-Kilo], radio check”</i>
ATC:	<i>“[Jersey 3-9-Kilo], [Newtown] Ground. Readability [5]”</i>

2.2 Notes:

- A Controller should identify himself fully (eg “*Birmingham Ground*”, “*Manchester Ground*”, “*Shoreham Tower*”, etc) **following the first call** from the aircraft. This is true of all positions following initial contact from an aircraft. (In FSOpen, subsequent calls may be abbreviated to “*Ground*” or “*Tower*”, “*Radar*” etc, as appropriate).
- “*Readability 5*” - The strength and clarity of r/t calls is measured on a scale from 1 to 5 as detailed below:
 - 1 = Unreadable;
 - 2 = Readable now and then;
 - 3 = Readable but with difficulty;
 - 4 = Readable;
 - 5 = Perfectly readable).
- Any reply requiring Readability 3 or lower should include the reason (eg distortion, background interference etc)

3. ATC Clearance

3.1 An ATC clearance is an instruction used to authorise an aircraft to proceed under conditions specified by an Air Traffic Control Unit. In this context it can apply to any aircraft from engine start to shutdown although it is more commonly associated with IFR departures following the Air Traffic Service route structure. However, the format of all ATC clearances remains the same and will invariably contain the following:

- **Aircraft identification** - Eg “*Jersey 3-9-Kilo*”
- **Clearance Limit** (taxiway holding point; controlled or advisory airspace boundary; navigational reporting point/beacon; destination aerodrome)
Eg. “....*Taxi holding point ECHO-1...*”; “....*Cleared to leave the Control Zone via GRAVE*”; “....*Cleared to EDINBURGH...*” etc.
- **Route** (taxiway; departure profile; reporting point; direction; approved geographical feature)
Eg. “...*via [taxiway] Whiskey and Echo...*”; “...*TRENT 3-Delta departure...*”; “...*on track STAFA...*”; “...*cleared to leave the Control Zone to the WEST...*”; “...*via Marshy Lake...*”.

3.2 In addition, ATC clearances may contain one or more of the following:

- Level of flight (or changes of level);
- Time restrictions and/or Air Traffic Flow Management (ATFM) slot – unlikely in FSOpen;
- Communication and/or transponder code setting;
- Any other special instructions (eg local departure restrictions etc).

3.3 **FSOpen ATC Clearance** (IFR flight plan filed in Pilot Assistant)

The following example is suggested as the ideal format for ATC clearance requests in FSOpen. It assumes the pilot has filed his plan using Pilot Assistant and knows on which stand/gate his aircraft is parked (note; this will not always be the case!).

Pilot:	“[Airport] Ground. [Callsign], Stand [a], [A/c Type] with ATIS [b] (if copied), QNH [c], request clearance”
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ATC:	“[Callsign], Ground. Cleared to [destination airport]; [SID/Route]; Squawk [x]”
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Or, if some time is required to study the details of the request:

ATC:	“[Callsign], Ground. Clearance on request”
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followed, when ready, by:

ATC:	“[Callsign], Ground. I have your clearance when ready”
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3.4 Eg.

Pilot:	<i>“[Newtown] Ground. [Jersey 3-9-Kilo], Stand [37], [Dash 8] with ATIS [November], QNH [9-9-7millibars], request clearance”</i>
ATC:	<i>“[Jersey 3-9-Kilo], Ground. Cleared to [Edinburgh]; [TRENT 3-Delta departure]; Squawk [5-3-4-2]”</i>
Or	
ATC:	<i>“[Jersey 3-9-Kilo], Ground. Clearance on request”</i>

3.5 Aerodrome within Controlled Airspace

Below are more examples of ATC Clearance, the format of which can be used on FSOpen. It should be noted that these examples are based on an aerodrome established with a Control Zone eg large international airports (EGLL, EGKK, EGBB, EGCC, EGPF, EGPH etc) and some busy regional airports (EGHH, EGHI, EGNX, EGNM, EGNT, EGPD, EGPK etc):

a) Airways Clearance -

“Speedbird 2-3-9, cleared to Las Palmas, CALUM 2-Tango departure, squawk 3-2-0-6. When advised, contact Scottish Control 1-2-8 decimal 0-5-0”

b) IFR Zone Departure -

“G-A-X-B-G, after departure cleared to leave the Control Zone on track TYNE at altitude 3000ft, QNH 1-0-0-3. Squawk 4-6-5-2”.

c) VFR Zone Departure -

“G-A-V-H-E, after departure leave the Control Zone via Redmill Motorway Services VRP, not above altitude 2000ft, QNH 1-0-0-3. Squawk 4-6-4-7”

3.6 Aerodrome outside Controlled Airspace

For airports that lie outside Controlled Airspace (ie those aerodromes that are not established with a Control Zone – eg EGNH, EGSC, EGBJ, EGNR, EGNJ, EGPE, EGKA to name but a small few), the ATC Clearances above might be adapted as follows:

a) Airways Clearance

“Speedbird 2-3-9, cleared to Las Palmas. After departure route direct to CALUM, climb Flight Level 9-0, squawk 3-2-0-6. When advised, contact Scottish Control 1-2-8 decimal 0-5-0”

b) IFR Departure

“G-A-X-B-G, after departure turn right on track TYNE, climb to altitude 3000ft, QNH 1-0-0-3. Squawk 4-6-5-2”.

c) VFR Departure

“G-A-V-H-E, after departure leave the A-T-Z via Redmill Motorway Services VRP, not above altitude 2000ft, QNH 1-0-0-3. Squawk 7000”.

3.7 Notes

- The phrase “Cleared flight plan route” is incorrect and should not be used in an ATC clearance.
- In FSOpen it is good practice to use full callsigns when passing an ATC clearance although abbreviated callsigns are acceptable when there is no possibility of confusion.
- Pilots are required to “read back” all clearances in full and in the same sequence as given.

3.8 ATC Clearance Example Templates

3.9 (Pilot Clearance Request)

Pilot: “ _____ [airport] **Ground.** _____ [callsign],
Stand (or Gate No) _____; _____ [type]
with ATIS Code _____, **QNH** _____,
Request clearance”

3.10 Airways Clearance 1 (Pilot Requires/Requests SID)

ATC: “[callsign] _____, **Ground.**
Cleared to _____ [destination aerodrome];
[SID] _____ **departure;**
Squawk _____”

3.11 Airways Clearance 2 (No associated SID or pilot not familiar with procedure)

ATC: “[callsign] _____, **Ground.**
Cleared to _____ [destination aerodrome];
After departure, route direct to _____ [reporting point] ;
Climb Flight Level _____ (as required)
Squawk _____”

3.12 **IFR Departure** (Non Airways - flight plan routing via waypoints which require flight outside Controlled Airspace)

ATC: “[callsign] _____, **Ground.**
After departure, cleared to leave the Control Zone/ATZ* (as appropriate)
on track _____ [destination aerodrome or reporting point as required];
At / climbing to* _____ [altitude/FL]. **QNH*** (not required for FL) _____
Squawk _____”

3.13 **IFR Remaining** (Pilot requests IFR training circuits/ILS etc)

ATC: “[callsign] _____, **Ground.**
After departure, cleared to enter the Radar Training Circuit
Maintain Runway Heading _____ **degrees;**
Climb to [altitude/FL*] _____. **QNH*** (not required for FL) _____
Squawk _____
When advised contact _____ **Radar** [frequency] _____”

3.14 **VFR Departure** (flight leaving the vicinity of the aerodrome (guide>5nm))

ATC: “[callsign] _____, **Ground.**
After departure, cleared to leave the Control Zone/ATZ*(as appropriate)
V-F-R, via _____ [VRP, known geographical point or feature];
not above altitude _____ ft, **QNH** _____ [mb]
Squawk _____ (7,000)”

3.15 **VFR Remaining** (flight joining the VFR circuit immediately after departure)

Note: Clearance to join the VFR circuit normally passed by TWR when aircraft positioned at RW Holding point immediately prior to departure clearance.

ATC: “[callsign] _____, **Ground**(/Tower)*.
Hold Position/Hold at* _____ [Holding Point],
After departure, left/right* hand circuit, _____ [altitude/height]
QNH/QFE* _____ [mb]
Maintain V-F-R
Squawk _____ (7-0-1-0)”

* (as appropriate/required)

4. Engine Start Up and Push Back

- 4.1 At many aerodromes at which large aircraft operate, the aircraft are parked nose-in to the terminal in order to save parking space. Aircraft have to be pushed backwards by tugs before they can taxi for departure. Some aircraft also have the capability to reverse from a nose-in position to the terminal under their own power. This procedure is known as powerback.
- 4.2 In FSOpen, aircraft are required to obtain clearance for before a pushback or powerback manoeuvre is made.
- 4.3 Requests to start engines are normally made to aid ATC planning and to avoid excessive fuel wastage by aircraft delayed on the ground. At certain aerodromes, along with the request, the pilot will state the location of the aircraft and acknowledge receipt of the departure ATIS broadcast identifying letter together with the QNH unless this information has already been exchanged in a previous transmission (eg IFR clearance request).
- 4.4 However, in FSOpen it is often the case that pilots will not necessarily know what stand numbers they have spawned/parked on. Controllers may use their discretion and adapt the following phraseology examples to suit the experience of the pilot
- 4.5 Requests for Pushback and Engine Start may be made separately or in combination

Pilot: “[Airport] Ground. [Callsign], Stand [a] with ATIS [b], QNH [c], request pushback (and/or) start”

ATC: “[Callsign], Ground. Pushback (and/or) Start up approved”

Eg

Pilot: *“Newtown Ground. Jersey 3-9-Kilo, Stand 37, with ATIS November, QNH 9-9-7millibars, request **Pushback**”*

or
Pilot: *“Newtown Ground. Jersey 3-9-Kilo, Stand 37, with ATIS November, QNH 9-9-7millibars, request **Engine Start**”*

or
Pilot: *“Newtown Ground. Jersey 3-9-Kilo, Stand 37, with ATIS November, QNH 9-9-7millibars, request **Pushback and Start**”*

ATC: *“Jersey 3-9-Kilo, Ground. **Pushback** approved”*

or
ATC: *“Jersey 3-9-Kilo, Ground. **Start Up** approved”*

or
ATC: *“Jersey 3-9-Kilo, Ground. **Pushback and Start Up** approved”*

4.6 Conditional Pushback Clearance

ATC: *“Jersey 3-9-Kilo, Ground. **After the [EasyJet 737] passing behind, Pushback approved**”*

4.7 Engine Start and Push Back Example Templates

Pilot: “ _____ [airport] **Ground.** _____ [callsign],
Stand (or Gate No) _____; **with ATIS** _____ [code], **QNH** _____,
Request Start Up* / Pushback* / Pushback and Start**”

ATC: “callsign] _____, **Ground. Pushback* (and/or) Start Up* approved**”

Or, if confliction exists;

ATC: “callsign] _____, **Ground.**
After the _____ [company/colour* and type]
Passing behind, Pushback* (and/or) Start Up* approved”

* As required

5 Taxi Instructions

- 5.1 Taxi instructions issued by a controller should always contain a clearance limit, which is the point at which the aircraft must stop, unless further permission to proceed is given. For departing aircraft, the clearance limit will normally be the holding point of the runway in use, but it may be any other position on the aerodrome depending on the prevailing traffic. Taxi clearances should be noted down and read back by pilots.
- 5.2 For FSOpen, some knowledge of the aerodrome taxiway layout is desirable but not always essential. In a virtual environment, taxiway routing instructions enable ground controllers to organise the efficient movement of aircraft proceeding to and from the active runway. On occasions where the aerodrome is unfamiliar and/or no airport layout/docking chart is available, the route to/from the clearance limit may be omitted or replaced by progressive instructions if required.
- 5.3 Requests for Taxi routinely follow the ATC clearance and push/start request sequence although there may be occasions when this call is the first contact the pilot makes with ATC. **FSOpen controllers are to use their judgment in these circumstances and, wherever possible, phrase their response in such a way as to obtain the intentions of the pilot before taxi clearance passed.** The following examples assume initial r/t contact has been made with ATC and the intentions of the pilot are known.

Pilot:	"[Airport] Ground. [Callsign], request taxi"
ATC:	"[Callsign], Ground. Runway [a], Taxi holding point [b1], via taxiway(s) [c] (and) [d], QNH [e]"

- 5.4 Eg

Pilot:	<i>"Newtown Ground. Jersey 3-9-Kilo, request taxi"</i>
Or;	<i>"Newtown Ground. Jersey 3-9-Kilo, Cargo Apron, with ATIS November, QNH 9-9-7 millibars, request taxi"</i>
ATC:	<i>"Jersey 3-9-Kilo, Ground. Runway 1-2; Taxi holding point Echo-1, via taxiways Charlie and Echo; QNH 9-9-7 millibars"</i>
Or;	<i>"Jersey 3-9-Kilo, Ground. Runway 1-2; Taxi Holding Point Echo 1; QNH 9-9-7 millibars"</i>
Or;	<i>"Jersey 3-9-Kilo, Ground. Runway 1-2; Taxi Holding Point Echo 1; [Follow the taxiway ahead*] / [At the taxiway ahead, turn left/right*]; QNH 9-9-7 millibars"</i>
* As required	

5.5 Conditional Taxi Clearance

A conditional taxi clearance allows the aircraft to taxi **only after another action has taken place**.

5.6 Eg1 – Subject aircraft has another aircraft taxiing ahead.

Pilot:	<i>"Newtown Ground. Jersey 3-9-Kilo, request taxi"</i>
ATC:	"Jersey 3-9-Kilo, Ground. (Hold Position*); After the white KingAir passing in front of you crossing right to left, Taxi holding point Echo-1, via taxiways Charlie and Echo; QNH 9-9-7 millibars"
Pilot:	<i>"(Hold Position); After the white KingAir passing in front, right to left, Taxi holding point Echo-1, via taxiways Charlie and Echo; QNH 9-9-7 millibars, Jersey 3-9-Kilo"</i>

* The phrase, "Hold Position" is optional in this instance but is suggested as good practice.

5.7 Eg 2 – Subject aircraft requires to cross a subsidiary runway with traffic crossing ahead.

Pilot:	<i>"Newtown Ground. Jersey 3-9-Kilo, request taxi"</i>
ATC:	"Jersey 3-9-Kilo, Ground. Taxi Holding Point Bravo 2, Hold short Runway 0-6 Left; QNH 9-9-7 millibars"
Pilot:	<i>"Taxi Holding Point Bravo 2, Hold short Runway 0-6 Left; QNH 9-9-7 millibars Jersey 3-9-Kilo"</i>
Pilot:	<i>"Ground, Jersey 3-9-Kilo ; Holding at Bravo 2"</i>

Conditional clearance:

ATC:	"Jersey 3-9-Kilo; After the white KingAir passing you right to left, cross Runway 0-6 Left at Bravo 2"
Pilot:	<i>"After the white KingAir passing right to left, cross RW 0-6 Left at Bravo 2; Jersey 3-9-Kilo"</i>

then,

ATC:	"Jersey 3-9-Kilo, Ground. Taxi holding point Echo-1, via taxiway(s) Bravo and Echo"
Pilot:	<i>"Taxi holding point Echo-1, via taxiway(s) Bravo and Echo; Jersey 3-9-Kilo"</i>

5.8 Taxi Clearance after Arrival

The taxi clearance for arriving aircraft follows the same format as those for departing aircraft. The pilot should contact GRD only after he has vacated the landing area and reported "Runway vacated" to TWR.

Pilot:	<i>"Newtown Ground. Jersey 3-9-Kilo, request taxi to parking"</i>
ATC:	<i>"Jersey 3-9-Kilo, Newtown Ground. Taxi Gate 3-7, via taxiways Delta and Charlie"</i>
Or, (if progressive required);	<i>"Jersey 3-9-Kilo, Newtown Ground. Taxi Gate 3-7; [At the taxiway ahead, turn left/right*] then [Follow the taxiway to the Terminal*]"</i>
Or, only if airport/parking layout unknown and no other traffic to affect;	<i>"Jersey 3-9-Kilo, Newtown Ground. Taxi back, gate of your choice"</i>
Or any combination of above as required.	

5.9 Taxi Clearance Example Templates

5.10 Taxi Clearance Template (Pilot Request)

(Full Request);

Pilot: " _____ Ground. [Callsign] _____,
Stand/Gate* _____, with ATIS _____ [code],
QNH _____ (millibars);
Request taxi"

Or, (Abbreviated Request);

Pilot: " _____ Ground. [Callsign] _____;
Request taxi"

* As required

5.11 **Taxi Clearance (Airport Layout Known)**

ATC: “[Callsign]_____, *Ground. Runway* _____;
Taxi holding point _____,
via taxiway(s) _____ (*and* _____);
QNH _____ (*millibars*)”

5.12 **Taxi Clearance (Airport Layout Unknown)**

ATC: “[Callsign]_____, *Ground. Runway* _____;
Taxi holding point _____ [designator if known],
QNH _____ (*millibars*)”

Or;

“[Callsign]_____, *Ground. Taxi to the holding point for Runway* _____,
QNH _____ (*millibars*)”

5.13 **Taxi Clearance (Progressive)**

ATC: “[Callsign]_____, *Ground. Runway* _____;
Taxi holding point _____,
QNH _____ (*millibars*)

_____ [directions as required]

_____ [directions as required]”

5.13 Taxi Clearance (Conditional)

ATC: “[Callsign]_____, *Ground. Hold Position**;
After the _____
[description of obstruction (eg *white KingAir, EasyJet 737, blue Airbus etc*)]
*Passing** _____
[position in relation to subject ac (ie; in front/behind)]
*(and/or Crossing** _____
[direction of crossing traffic (ie right to left/ left to right)],
*(Runway** _____) ; Taxi holding point _____,
via taxiway(s) _____ *(and* _____*)*;
QNH _____ *(millibars)”*

*As required

6. Transfer of Control to Aerodrome Control (ADC)

6.1 As the departing aircraft approaches the holding point for the Runway in use transfer of control (handover) to the aerodrome controller may be initiated using the following phraseology format:

ATC: “[Callsign], Ground. Contact [aerodrome] Tower, [frequency]”

6.2 Eg.

ATC: “[*Jersey 3-9-Kilo*], Ground. Contact [*Newtown*] Tower, Frequency [*1-3-0- decimal-8*]”

NOTES: