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INTRODUCTION

This Manual was developed by the City of Chicago, Department of Aviation, Airport Airfield Operations Section (AAO). Its purpose is to implement training requirements mandated by FAR Part 139.329, and to review important safety information relating to personnel who operate vehicles, equipment, and taxi aircraft in the movement area (runways, taxiways, and surrounding surfaces). This will enable you to understand the hazards and the controls created for your protection and for the safety of others at O’Hare International Airport. It is the responsibility of each person who works in or around the movement area to study and understand this information.

O’HARE INTERNATIONAL AIRPORT
DEPARTMENT OF AVIATION
AIRFIELD OPERATIONS
CITY ATRIUM
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FACILITIES FAMILIARIZATION

Concentrations of buildings on the airport consist of the core or Domestic Terminal Complex, International Terminal Complex, the Hangar Alley to the north, the cargo area to the Southwest and Southeast, the Airport Maintenance Complex (AMC) to the southeast, and the old military base to the northeast.

The airport is also divided into landside operations and airside operations. The landside portion includes all terminal areas, access roads and the Kennedy (I-190) Expressway to Mannheim Road. The security checkpoints referred to as "Guard posts" provide access to the airside portion, where all air traffic movements take place.

GATES

In this section the trainee will be exposed to the various ramp areas on the airfield, including all gates at various concourses, and their number system as an identification method to locate a certain gate. There are a total of 162 gate positions at O'Hare which include all four (4) terminals.
TERMINAL 1

Lufthansa

United

United Express
TERMINAL 2
Air Canada     Delta
Air Canada Jazz JetBlue
America West   US Airways
Continental    US Airways Express
Continental Express
CARGO FACILITIES

O'Hare Airport has three areas on the airfield where cargo facilities are located.

East Cargo: Located east of Terminal 5 and north of the "D" (Delta) Taxiway. This includes the Lynx Cargo Building.


Southeast Cargo: The newest facility is located directly south of the AMC Building at the corner of Mannheim and Irving Park Road. The buildings to date include: Aer Lingus, Burlington Air Freight, Air Canada, Japan Airlines, British Airways, Cathay Pacific, Alliance, Korean Air, Challenge, Varig, Fin Air, Virgin Atlantic, Turkish Airlines, Lot Polish, Iberia, Eva, Midwest Express and DHL.

The above complexes serve all cargo air carriers in addition to passenger air carriers which carry cargo.

There is also the new U.S. Post Office (U.S. Military).
AIRFIELD MARKINGS

RUNWAY MARKINGS

MARKING COLOR
All runway markings are white except for runway intersection hold short markings, taxiways lead in lines that extend onto the runway and runway shoulder markings (chevrons); if present.

RUNWAY DESIGNATOR
Runway numbers and letters are determined from the approach direction. The runway numbers are rounded to nearest ten degree of the magnetic azimuth of the centerline of the runway, measured clockwise from magnetic north.

RUNWAY CENTERLINE MARKING
The runway centerline identifies the center of the runway and provides alignment guidance during takeoff and landings. The centerline consists of a line of uniformly spaced stripes and gaps.

RUNWAY AIMING POINT MARKING
The aiming point marking serves as a visual aiming point for a landing aircraft. These two rectangular markings consist of a broad white stripe located on each side of the runway centerline and approximately 1,000 feet from the landing threshold.

RUNWAY TOUCHDOWN ZONE MARKERS
The Touchdown Zone markings identify the TDZ for landing operations. TDZ markings are coded to provide distance information in 500 feet increments. These markings consist of groups of one, two, and three rectangular bars symmetrically arranged in pairs about the runway centerline.

RUNWAY SIDE STRIPE MARKING
Runway side stripes delineate the edges of the runway. They provide a visual contrast between runway and abutting terrain or shoulders. Side stripes consist of continuous white stripes located on each side of the runway.

RUNWAY SHOULDER MARKINGS
Runway shoulder stripes may be used to supplement runway side stripes in identifying pavement areas contiguous to the runway sides that are not intended for use by aircraft. Runway shoulder markings are yellow.

RUNWAY THRESHOLD MARKINGS
Runway threshold markings come in two configurations. They either consist of eight longitudinal stripes of uniform dimensions disposed symmetrically about the runway centerline, or the number of stripes is related to the runway width.
RELOCATED THRESHOLD
Sometimes construction, maintenance, or other activities require the threshold to be relocated toward the departure end of the runway. (In these cases, where the relocation is temporary, a NOTAM should be issued by the airport operator identifying the portion of the runway that is closed, i.e., First 2,000 feet of RWY 27L closed.)

DISPLACED THRESHOLD
A threshold that is located at a point on the runway other than the beginning. This area may be available for takeoffs in either direction and landings from the opposite direction.

DEMARICATION BAR
A demarcation bar delineates a runway with a displaced threshold from a blast pad, stopway or taxiway that precedes the runway. A demarcation bar is 3 feet wide and yellow, since it is not located on the runway.

CHEVRONS
These markings are used to show pavement areas aligned with the runway that is unstable for landing, takeoff, and taxiing. Chevrons are yellow.
RUNWAY MARKING PRECEDENCE
Where runways intersect, the markings on the runway of higher precedence continue through the intersection, while the markings of the runway of the lower precedence are interrupted except that the runway threshold marking, designation marking, aiming point marking and touchdown zone markings are relocated along the lower precedence runway to avoid the intersection area. Where aiming point markings are relocated, the threshold will also have to be relocated to retain the required distance from the threshold to the aiming point marking. For intersection of runways of the same precedence order, the preferred runway (lowest approach minimums or most often used) is considered to be of a higher precedence order. For marking purposes, the order of precedence, in descending order, is as follows: Precision Instrument Runway-Category III, Precision Instrument Runway-Category II, Precision Instrument Runway- Category I, Non-precision Instrument Runway and Visual Runway.
**PRECISION INSTRUMENT RUNWAYS**

A runway having an existing instrument approach procedure utilizing air navigation facilities with both horizontal and vertical guidance for which a precision approach procedure has been approved. There are thirteen precision instrument runways and one non-precision instrument runway at O'Hare airport.
TAXIWAY MARKINGS

GENERAL
All taxiways should have centerline markings, and runway holding position markings whenever they intersect a runway. Taxiway edge markings are present whenever there is a need to separate the taxiway from a pavement that is not intended for aircraft use or to delineate the edge of the taxiway. Taxiways may also have shoulder markings and holding position markings for Instrument Landing System critical areas, and taxiway/taxiway intersection markings.

TAXIWAY CENTERLINE MARKING
The taxiway centerline is a single continuous yellow line that provides a visual cue to permit taxiing along a designated path. 150 feet prior to a runway, the Anew enhanced centerline marking starts, which consists of a dashed line on both sides of the taxiway centerline.

TAXIWAY EDGE MARKINGS
Taxiway edge markings are used to define the edge of the taxiway. They are primarily used when the taxiway edge does not correspond with the edge of the pavement.

a. Continuous Markings These consist of a continuous double yellow line that are used to define the taxiway edge from the shoulder or some other abutting paved surface not intended for use by aircraft.

b. Dashed Markings These markings are used when there is an operational need to define the edge of a taxiway or taxilane on a paved surface where the adjoining pavement to the taxiway edge is intended for use by aircraft, e.g., a hold pad or an apron. Note: Wing tips and engines can overhang edge markings.

TAXIWAY SHOULDER MARKINGS
Taxiways, holding pads, and aprons are sometimes provided with paved shoulders to prevent jet blast and water erosion. Although shoulders may have the appearance of full strength pavement, they are not intended for use by aircraft. Usually taxiway edge markings will define the area not intended for use by aircraft. Where conditions exist such as islands or taxiway curves that may cause confusion as to which side of the edge stripe is for use by aircraft, taxiway shoulder markings may be used to indicate that the pavement is unusable. Taxiway shoulder markings are yellow.
SURFACE PAINTED TAXIWAY DIRECTION SIGNS
Surface painted taxiway direction signs have a yellow background with a black inscription, and are provided when it is not possible to provide taxiway direction signs at intersections, or when it is necessary to supplement such signs. These markings are located adjacent to the centerline with signs indicating turns to the left being on the left side of the taxiway centerline and signs indicating turns to the right being on the right side of the centerline.

SURFACE PAINTED LOCATION SIGNS
Surface painted location signs have a black background with a yellow inscription. When necessary, these markings are used to supplement location signs located along the side of the taxiway and assist the pilot in confirming the designation of the taxiway which the aircraft is located. These markings are located on the right side of the centerline.

RUNWAY HOLDING POSITION MARKING
For runways these markings indicate where an aircraft or vehicle is supposed to stop. They consist of four yellow lines two solid and two dashed, spaced 12 inches apart and extending across the width of the taxiway or runway. The solid lines are always on the side where the aircraft is to hold. There are three (3) locations where runway holding position markings are encountered.

1. Runway holding position markings on taxiways that intersect runways.
2. Runway holding position markings on runways that intersect other runways when used for Simultaneous Operations on Intersecting Runways (SOIR) or Land and Hold Short Operations (LASHO).
3. Taxiways located in runway approach areas.
These hold position markings extend onto the shoulder to within 5 feet of pavement edge or 25 feet which ever is longer.

SURFACE PAINTED HOLDING POSITION MARKINGS
Surface painted holding position marking supplement the signs located at the holding position markings. This could be used where the width of the holding position on the taxiway is greater than 200 feet.

ILS CRITICAL AREA HOLDING POSITION PAVEMENT MARKINGS
An area on a taxiway where, during instrument conditions, an aircraft may interfere with the signals for the Instrument Landing System (ILS) if the aircraft penetrates the designated critical ILS area. Aircraft are required, during instrument conditions, to remain behind the ILS critical area.
HOLDING POSITION MARKINGS FOR RUNWAY APPROACH AREAS
These markings are used at some airports where it is necessary to hold an aircraft on a taxiway located in the approach or departure area of a runway so that the aircraft does not interfere with the operations on that runway. This marking is co-located with the runway approach area holding position sign.
ROADWAYS
Vehicle roadway markings may contain either a solid white line or zipper style markings to delineate each edge of the roadway, and a dashed yellow line to separate lanes within the edge of the roadway. Vehicle operators must obey all signs and traffic signals. Taxiways can only be crossed at service roads. Remember taxiing aircraft always have the right of way.
AIRFIELD SIGNAGE

A properly designed and standardized taxiway guidance sign system is an essential component of a surface movement guidance control system. This is necessary for the safe and efficient operation of an airport.

The sign should include the following:
* Provide the ability to easily determine the designation or name of any taxiway on which the aircraft is located.
* Readily identify routes toward a desired destination.
* Indicate mandatory holding positions.
* Identify boundaries for approach areas, ILS critical areas, and (runway safety areas/obstacle free zones (OFZ).)

There are six (6) types of signs installed on airfields: mandatory instruction signs, location signs, direction signs, destination signs, information signs and runway distance remaining signs. This section is a review of AC 150/5340-18C (Standards for Airport Sign Systems). This Advisory Circular contains the FAA standards for the location and installation of signs on airport runways and taxiways.

MANDATORY INSTRUCTION SIGNS
Mandatory instruction signs have a red background with a white inscription. They are used to denote:
1. An entrance to a runway or critical area and;
2. Areas where an aircraft is prohibited from entering.
3. Runway approach area hold position sign.

RUNWAY HOLDING POSITION SIGNS
This sign is located at the holding position on taxiways that intersect a runway, or on runways that intersect other runways. The inscription on the sign contains the designation of the intersecting runway. The runway numbers on the sign are arranged to correspond to the respective runway threshold. For example, the sign below "14R-32L" indicates that the threshold for Runway 14R is to the left and the threshold for Runway 32L is to the right.

14R-32L  22L
RUNWAY APPROACH AREA HOLDING POSITION SIGN
At some airports, it is necessary to hold an aircraft on a taxiway located in the approach or departure area of a runway so that the aircraft does not interfere with the operations on that runway. In these situations, a sign with the designation of the approach end of the runway followed by a dash and letters "APCH" should be located adjacent to the hold bar on the taxiway pavement at that runway approach area.

![14R-APCH](image)

ILS CRITICAL AREA HOLDING POSITION SIGN
When an Instrument Landing System is being used, it is necessary to hold an aircraft on a taxiway at a location other than the normal holding position location for the runway. In these situations the holding position sign for these operations will have the inscription "ILS" and be located adjacent to the holding position marking on the taxiway.

![ILS](image)

NO ENTRY SIGN
This sign is located in areas where an aircraft may mistake a roadway or other non-movement area as a taxiway.

![No Entry](image)
LOCATION SIGNS

Location signs are used to identify either a taxiway or runway on which the aircraft is located. Other location signs provide a visual cue to pilots to assist them in determining when they have exited an area.

TAXIWAY LOCATION SIGN
This sign has a black background with a yellow inscription and yellow border. The inscription is the designation of the taxiway on which the aircraft is located. These signs are installed along taxiways, either by themselves or in conjunction with direction signs.

RUNWAY LOCATION SIGNS
This sign has a black background with a yellow inscription and yellow border. The inscription is the designation of the runway on which the aircraft is located. These signs are intended to complement the information available to pilots through their magnetic compass. Typically, they are installed where the proximity of two or more runways to one another could cause pilots to be confused as to which runway they are on.

RUNWAY BOUNDARY SIGN
This sign has a yellow background with a black inscription with a graphic depicting the pavement holding position marking. This sign faces the runway and is visible to the pilot exiting the runway. This is intended to provide pilots with a visual cue, which they can use as a guide in determining when they are "clear of the runway".

ILS CRITICAL AREA BOUNDARY SIGN
This sign has a yellow background with a black inscription with a graphic depicting the ILS pavement holding position marking. This sign is located adjacent to the ILS holding position marking on the pavement and can be seen by pilots leaving the critical area. This sign is another visual cue for determining when pilots are "clear of the ILS critical area".

RUNWAY DISTANCE REMAINING SIGN
These signs have a black background with a white numerical inscription and may be installed along one or both side(s) of the runway. The number indicates the distance (in thousands of feet) of landing surface remaining. The last sign will be located at least 950 feet from the runway end.
DIRECTIONAL SIGNS
Directional signs have a yellow background with a black inscription. The inscription identifies the designation of the intersecting taxiway(s) leading out of an intersection that a pilot would normally be expected to turn onto or hold short of. Each designation is accompanied by an arrow indicating the direction of the turn.

DESTINATION SIGNS
Destination signs also have a yellow background with a black inscription indicating a destination on the airport. These signs always have an arrow showing the direction of the taxiing route to that destination. These signs should be located prior to the intersection if a turn is involved. Destination signs contain information for: runways, taxiways, aprons, terminals, military areas, cargo areas, general aviation, etc.

INFORMATION SIGNS
These signs have a yellow background with a black inscription. They are used to provide the pilot with information on such things as areas that cannot be seen from the control tower, applicable radio frequencies, noise abatement procedures and various advisory information.
AIRFIELD LIGHTING

RUNWAY LIGHTS / RUNWAY EDGE LIGHTS
Lights having a prescribed angle of emission used to define the lateral limits of a runway. Runway lights are uniformly spaced at intervals of approximately 200 feet, and the intensity may be controlled or preset. The last 2,000 feet of lights are amber. HIRLS (High Intensity Runway Lighting System) runways have a 5 step lights intensity system, controlled by ATCT & electrical vaults.

TOUCHDOWN ZONE LIGHTING
Two rows of transverse flush-mounted light bars located symmetrically about the runway centerline, normally at 100 feet intervals. The basic system extends 3,000 feet from the runway's approach.

RUNWAY CENTERLINE LIGHTING
Flush centerline lights spaced at 50 foot intervals beginning 75 feet from the landing threshold and extending to within 75 feet of the opposite end of the runway. The centerline lighting system is designed flush to facilitate landings, roll-outs, and takeoffs under adverse day and night visibility conditions. The last 3,000 feet of the system, as viewed from the landing or takeoff position, should be color coded in order to provide distance remaining information to the pilot. The first 2,000 feet of this last 3,000 foot segment should be alternating red/white with the last 1,000 feet solid red. This system should be installed on all precision approach runways used by air carrier aircraft. It should also be installed on all other runways intended to support low visibility

TAXIWAY CENTERLINE LIGHTING
Taxiway centerline lights are used to facilitate ground traffic under low visibility conditions. They are located along the taxiway centerline in a straight line on straight portions, on the centerline of curved portions, and along designated taxiing paths in portions of runways, ramp and apron areas. Taxiway centerline lights are steady burning and emit green light.

* All runways HIRL (High Intensity Runway Lighting).
TAXIWAY EDGE LIGHTS
Taxiway edge lights are used to outline the edges of taxiways during periods of darkness or restricted visibility conditions. These fixtures emit blue light. Amber lights indicate the intersection of a vehicle roadway. Taxiways have a 3 step light intensity system, controlled by ATCT & electrical vaults.

TAXIWAY LEAD-OFF LIGHTS/HIGH SPEED CENTERLINE LIGHTS
Taxiway lead-off lights extend from the runway centerline to a point on an exit taxiway to expedite movement of aircraft from the runway. These lights alternate green and yellow from the runway centerline to the runway holding position or the ILS/MLS critical area, as appropriate.

OBSTRUCTION LIGHT
A light or a group of lights, usually red or white, frequently mounted on a surface structure or natural terrain to warn pilots of the presence of an obstruction.

LIGHTED WIND SOCK
Lighted and frangible mounted wind socks must be installed near the approach end of each runway, preferably opposite the 1,000 foot mark and 250 feet off the left side of the runway for aircraft design group V airports or at least outside the runway safety area. The new standard is to site the windsocks outside of the object free area, OFA.

THRESHOLD LIGHTS
Fixed green lights arranged symmetrically left and right of the runway centerline, identifying the runway threshold. A minimum of four (4) threshold lights on either side of the centerline for an instrument runway. Lights should be green from the approach side and red on the opposite side.

FAA THRESHOLD LIGHTS
Fixed green FAA threshold lights identifying the approach end of the runway upon landing.

RUNWAY GUARD LIGHTS
In surface or elevated flashing amber lights which alert vehicles & aircraft to the entrance of a runway.
IN-SURFACE RUNWAY LIGHTING PROFILE

10' spacing defined edge line to center of edge light

75' +/- 2'

5' spacing between lights

36'

Centerline Light

Runway

Runway Touchdown Zone Lights (TDZ)

Defined runway edgeline
NAVIGATION AIDS (NAVAIDS)

Automation and instrument landing techniques have become the primary means of enhancing the safety and efficiency of air transportation. The FAA has the statutory authority to establish, operate, and maintain navigational facilities and to prescribe standards for the operation of any of these aids which are used for instrument flight in federally controlled airspace. The Technical Operations, of the FAA, (Tech Ops), maintains all of the NAVAIDS at O'Hare. These Navaids include both visual aids like the Approach Lighting Systems and Visual Glideslope Indicator Systems as well as aids utilizing radio signals.

When driving near radio navigational aids, stay out of the protected areas around them to avoid interfering with their signals. If a road or taxiway is close enough to an ILS to affect it, there should be an ILS holding position sign like the one mentioned earlier.

VISUAL AIDS TO NAVIGATION:

- **APPROACH LIGHT SYSTEM**

Approach Light Systems (ALS) provide the basic means to transition from instrument flight to visual flight for landing. Operational requirements dictate the sophistication and configuration of the approach light system for a particular runway.

**ALSF-2** Approach lights system with sequenced flashing lights in ILS Cat-II/III configurations. Runways 10, 14R/14L/28/27L/9L/27R are ALSF-2.

**MALSR** Medium-intensity Approach Lighting System that provides a visual lighting path for landing aircraft. The MALSR system usually is a 2,400-foot-long array of lights but can be longer or shorter depending on local terrain and includes Runways 4R, 9R, 32R, and 22L.
Precision Approach Path Indicators (PAPI's)
The Precision Approach Path Indicator (PAPI) is a light system positioned along side the runway that consists of either two or four light arrays that provide a visual indication of an airplane’s position on the glide-path for the associated runway. At ORD, the four light fixture setup is used. See image below for light code definition. At ORD, the FAA owns and maintains these visual aids.

The Precision Approach Path Indicator (PAPI) is a system of lights so arranged to provide visual descent guidance information during the approach to a runway. These lights are visible from 3-5 miles during the day and up to 20 miles or more at night. The row of light units is normally installed on the left side of the runway.
ELECTRONIC RADIO SIGNAL AIDS TO NAVIGATION:

INSTRUMENT LANDING SYSTEM (ILS)
It is designed to provide an approach path for exact alignment and descent of aircraft on final approach to a runway. The system is divided functionally into three parts:

**Guidance Information**
1. Localizer for Azimuth guidance
2. Glideslope for vertical guidance
3. Range info from Rwy threshold

**Range Information**
- can be provided via Marker beacons and Distance Measuring Equipment, DME.

LOCALIZER
The localizer provides horizontal guidance to the runway. The localizer antenna is located in a fixed position at the opposite end of the runway approach.

GLIDESLOPE
The glideslope provides vertical guidance to the runway. The glideslope antenna is located approximately 1,000 feet from the approach end of the runway to either side of the runway.

DVOR/DME equipments are each part of the rho-theta air navigation system. The rho (distance from the facility) is supplied by the DME and the theta (azimuth bearing from magnetic north) is supplied by the VOR/DVOR – At ORD this equipment is used to provide approach guidance to the ends of runways.
RUNWAY USE INFORMATION

Runways are identified by their magnetic compass headings. For example Runway 9L-27R is positioned directly East and West. East is 090 degrees and West is 270 degrees, thus the runway is identified 9L-27R. The third digit is dropped from the magnetic heading.

All references to runways should be made in the direction the aircraft are heading. For example, if an aircraft is landing on Runway 14R-32L from the northwest to the southeast, the runway would be identified as Runway 14R. The letters R and L simply refer to right and left, indicating there is a parallel runway on the airport with the same compass heading.

The runways are marked with the compass heading numbers on the opposite end of the runway. For example, on Runway 9L-27R, the physical West end of the runway would be marked with the West compass heading of 270. An aircraft landing from the East to the West would be moving in the 360-degree direction, landing on the East end of the runway.

The figure below is a depiction of a compass rose with Runway 14R-32L superimposed on the diagram below.
AVIATION ALPHABET
Because some letters sound similar, the following words are used to reduce confusion. For example, taxiway B would be referred to as taxiway Bravo.

ICAO Phonetics

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<td>ZOOLOO</td>
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TERMS USED IN AIR TRAFFIC CONTROL RADIO PHRASEOLOGY

When communicating with the Air Traffic Control Tower (ATCT) via tower radio, all personnel will use the following correct phraseology:

**Abeam** - An aircraft is "abeam" a fix, point, or object when that fix, point or object is approximately 90 degrees to the right or left of the aircraft track. Abeam indicates a general position rather than a precise point.

**Abort** - To terminate a preplanned aircraft maneuver, e.g., an aborted takeoff.

**Acknowledge** - Let me know you have received and understand this message.

**Advise Intentions** - State your plans. Tell me what you plan to do.

**Affirmative** - Yes.

**Correction** - I made a mistake. An error has been made in the transmission and the correct version follows.

**Emergency** - A distress or an urgency condition.

**Expedite** - Used by ATC when prompt compliance is required to avoid the development of an imminent situation. Expedite climb/descent normally indicates to a pilot that the approximate best rate of climb/descent should be used without requiring an exceptional change in aircraft handling characteristics.

**Final** - Commonly used to mean that an aircraft is on the final approach course or is aligned with a landing area.

**Go ahead** - Proceed with your message. Not to be used for any other purpose. (Never means proceed).

**Go around** - Instructions for a pilot to abandon his/her approach to landing.

**Hold** - Position - Stop where you are.

**Hold short of** - Proceed to, but do not go beyond the point specified.

**Immediately** - Used by ATC or pilots when such action compliance is required to avoid an imminent situation.

**Negative** – “No,” or “permission not granted,” or “that is not correct.”

**Out** - The conversation is ended and no response is expected.

**Over** - My transmission is ended; I expect a response.

**Proceed** - You are authorized to begin or continue moving.

**Read back** - Repeat my message back to me.

**Roger** - I have received all of your last transmission. It should not be used to answer a question requiring a yes or a no answer. (See AFFIRMATIVE.) (See NEGATIVE.)

**Say again** - Used to request a repeat of the last transmission.

**Standby** - The controller or pilot must pause for a few seconds, usually to attend to other duties of
a higher priority. The caller should reestablish contact if a delay is lengthy.

**Unable** - Indicates inability to comply with a specific instruction, request, or clearance.

**Verify** - Request confirmation of information.

**Wilco** - I have received your message, understand it, and will comply with it.
ATCT RADIO COMMUNICATION PROCEDURES
CONFIRMATION OF AIR TRAFFIC CONTROL TOWER
(ATCT)/GROUND VEHICLE RADIO PROCEDURES

1. Use the correct radio frequency, depending on location and situation.
   - North Local    126.90
   - South Local    120.75
   - North Tower Local  128.15
   - Inbound Ground  121.9
   - Outbound Ground  121.75
   - Emergency Tower  119.25
   - ATIS            135.4
   - North Tower Ground  124.125
   - 3rd Local       132.70

The Quality Assurance Office at the ORD Tower has developed guidance to help individuals that operate vehicles in the movement area; (trucks, snow equipment, TLTVs – super-tugs, or taxi aircraft), apply effective communication skills to coordinate movement with Air Traffic Control.

IMPORTANT!

When contacting the air traffic controller in the tower for access to drive on a runway or when crossing a runway:
   1). First listen for a break in radio traffic
   2). Then Identify who you are calling, (Tower or Ground), state your vehicle identification, Your location, and intentions / request (Where you want to go or what you want to do)

   DO THIS ALL ON INITIAL CONTACT WITH THE TOWER.

It is the controllers’ intentions to get a request and deal with that request in the very next transmission if possible.

Be prepared, the response might be to hold short of the runway, in which case you must answer with your vehicle call sign, your location, and acknowledgement of what you are to hold short of.

This concept will be addressed below in detail with the reasoning behind it identified.

The information presented below has been taken from excerpts of presentations made by the Quality Assurance Office to explain the use of effective communication skills through preferred phraseology.

Please remember:

The single most important part in communication is Understanding what was meant.
EFFECTIVE COMMUNICATION

Effective communication requires:

• **Good operating techniques**
  - Prepare first:
    - Make sure you are on the proper frequency.
    - Your transmission should be well thought out.
    - Before keying the transmitter, know what you want to say.
  - Acknowledgement
    - If the instructions do not sound right, ask for clarification.
    - Always "read back" Crossing / Hold Short instructions with vehicle number, the runway and the position. **Always.**
  - Do not be intimidated by ATC or the volume of traffic on the frequency.
    - If you need help ask.
    - If you are lost advise immediately,
      (This could happen in a snowstorm whiteout condition, at night or in fog.)
  - Use of standard phraseology
    - Use standard phraseology in order to facilitate clear and concise communication.
    - The key is communication, once established, continues to be understood.
  • **Proper transmission sequence**
    - Elements of the initial transmission to the control tower.
      - Who are you calling? *(you need to get their attention)*
        (If at ORD, “Tower” or “Ground” will suffice.)
      - Who are you? *(Who is the tower going to talk to? “City” is not an answer)*
        (What is you vehicle number?)
      - Where are you? *(some runways are longer than 2 nautical miles with may intersections, be specific)* (Approach end, departure end, or intersection.)
      - What do you want to do?
        (Cross, drive, go back and forth or inspect.)
    - The control tower will come back to you with their instructions, **BE PREPARED**.
      You may get a HOLD SHORT instruction
      And will be required to acknowledge the hold short properly.
  - Elements of an interim transmission
    - Who are you?
      (What is you vehicle number?)
    - What do you want to do?
      (Cross, drive, go back and forth or inspect.)
    - Where are you?
      (Approach end, departure end, or intersection.)
Important points you need to remember.
During an emergency or snow removal, multiple airport vehicles may be crossing a specific runway at multiple different points along that runway. It is important that you don’t use a clearance from the tower intended for someone else, or acknowledge someone else’s clearance. For that reason, always read back. Your call sign, do not just say “city”, indicate what you are about to do or what you just did, followed by where you are going to do it or where it was done.

Communication (Transmissions) associated with a good Runway Crossing Operation.

Initial

Driver Transmission -- “Tower, Broom 9 at Uniform, to cross runway 32R”

ATC Transmission -- “Broom 9, tower, cross runway 32R at Uniform”

Interim (If crossing a Rwy say the word “runway”)

Driver Transmission -- “Broom 9 crossing runway 32R at Uniform”

Final

Driver Transmission -- “Tower, Broom 9, clear of runway 32R at Uniform”

ATC Transmission -- “Broom 9, thank you”

Communication (Transmissions) associated with a good Hold Short Operation.

Initial

Driver Transmission -- “Tower, city 87 on runway 9R to cross Runway 14L”

ATC Transmission -- “City 87 hold short of runway 14L on runway 9R”

Interim

Driver Transmission -- “City 87 holding short of runway 14L, on runway 9R”

(If crossing a Rwy or you are driving on a Rwy, ↑ say the word “runway”)

Next transmission still Interim

ATC Transmission -- “City 87 cross runway 14L on runway 9R”

Driver Transmission -- “City 87 crossing runway 14L on runway 9R”

Final

Driver Transmission -- “Tower, City 87 clear of runway 14L on runway 9R”

ATC Transmission -- “City 87 roger”
Summary

- Listen to the appropriate frequency.
- Listen and be ready for instructions.
- Use standard phraseology with all communication.
- Be brief.
- Be ready for instructions OTHER THAN WHAT YOUR EXPECTING.
- Ask ATC for clarification.
- Ask to cross a runway at the appropriate time.
- Read back all “holds short” or “crossings” with the vehicle number, runway/taxiway and position.
- Look left and right before entering a runway.
- Be especially vigilant for potential conflicts involving the runway you are planning to use.
- Proceed with caution after receiving clearance and only when safe to do so.

2. Any time you are around aircraft and driving a vehicle or towing/taxing an aircraft:
   - Avoid complacency; concentrate on the tasks at hand.
   - Maintain situational awareness at all times, know your location on the airport surface.
   - Maintain and practice professionalism by utilizing standard radio phraseology and frequency discipline.

3. There two locations on the airport where the runways do not physically intersect another runway but are so close in proximity that the Runway Safety Area, RSA, of the one runway intersects / overlays the other runway. The physical runway surfaces as well as the RSA are protected for landing and departing aircraft and driving through these two areas must be coordinated with air traffic control. The two locations at ORD are: assuming an aircraft is taking off from Rwy 10 East bound, the 1000 foot Rwy 10 RSA would pass through Rwy 22L and the other location is a Rwy 32R takeoff that would run full length, the Rwy 32R RSA would pass through Rwy 9L-27R. The graphically depictions are shown below in green.

   When driving on the airfield and accessing runways, the following procedures should be followed under normal circumstances. Additional radio contact/permission with the ATCT may be needed since each situation is different.

   **IMPORTANT**

   Special phraseology is used with the air traffic controller to cross or drive through these safety areas.

   It is important to follow this phraseology so you do not confuse the controller or use a phrase that might confuse a pilot on short final making him think that you are crossing the runway he has been cleared to land or depart on right in front of him.
**Rwy 22L**
Phraseology
Initial Call -- ORD Tower, CITY 14 to drive RWY 22L and proceed through the R-S-A
Or if you are on the runway already and want to reconfirm you are permitted to drive through the RSA.
Reconfirm -- ORD Tower, CITY 14 on RWY 22L to drive through the R-S-A
Be prepared to hold short of the area if ATC directs you to. In this case, Hold short of the area-------HOLD SHORT OF RWY 22L

**Rwy 4R**
Phraseology----------CITY 14 to drive RWY 4R and proceed through the R-S-A
Reconfirm----------CITY 14 on RWY 4R to drive through the R-S-A
Hold short area------SHORT OF TAXIWAY “S-5”

**Rwy 27R**
Phraseology--------CITY 14 to drive RWY 27R and proceed through the R-S-A
Reconfirm--------CITY 14 on RWY 27R to drive through the R-S-A
Hold short area-----SHORT OF 3000’ DISTANCE REMAINING SIGN

**Rwy 9L**
Phraseology--------CITY 14 to drive RWY 9L and proceed through the R-S-A
Reconfirm--------CITY 14 on RWY 9L to drive through the R-S-A
Hold short area-----SHORT OF 5000’ DISTANCE REMAINING SIGN

There has been a request to the FAA in Washington D.C. to develop a sign that can be placed alongside the runway to identify where a vehicle should hold short of the RSA. The FAA is trying to make a sign that will provide this hold short position without confusing a pilot as he rolls past it on a takeoff or landing.
4. When calling to cross or drive a runway, determine the direction of air traffic use and that should be stated in the initial transmission. This lets the ATCT know you are aware of the direction of the air traffic using that runway.

With aircraft landing or departing on Runway 10, the call to tower to cross or inspect the runway should use the phrase cross or drive “Runway 10”.

With aircraft landing or departing on Runway 28, the call to the tower should use “Runway 28”.

5. When the ATCT gives you clearance to drive on or across the active runway, be sure to repeat the message that Air Traffic Control has given you. This read back should include any hold short instructions of intersecting runways or taxiways.

6. When you receive ATC clearance and are driving on a runway that crosses an intersecting runway, your ATCT clearance is only good to cross that intersecting runway once. After you initially cross the intersecting runway, you are required to call ATC for any additional crossing of that intersection.

7. When exiting the runway or runways, call ATC that you are clear of all runways.

USE SERVICE ROADS WHENEVER POSSIBLE TO AVOID MOVEMENT AREA ENCROACHMENT.

WHEN DRIVING ON THE AIRFIELD, ALL VEHICLES MUST FOLLOW THE TRAFFIC PAVEMENT MARKINGS, SPEED LIMITS, AND OTHER TRAFFIC REGULATIONS. WHENEVER POSSIBLE, USE OF THE SERVICE ROAD IS PREFERRED, EVEN IF THIS WILL REQUIRE MORE TIME AND DISTANCE.

WHENEVER YOU ARE DRIVING IN THE MOVEMENT AREA YOU MUST:

- USE YOU MARS LIGHT
- HAVE A WORKING ATCT RADIO
- HAVE A WORKING CITY/COMPANY RADIO
- NOT EXCEED 30 MPH DUE TO TRIGGERING AN AIRPORT MOVEMENT AREA SAFETY SYSTEM (AMASS) ALARM IN THE ATCT. (NOTE: IF REQUESTED BY ATC OR TO AVOID AIRCRAFT CONFLICT IT MAY ON RARE OCCASION BE NECESSARY TO EXCEED THE 30 MPH NORMAL LIMIT)
OPERATION OF GROUND VEHICLES WITHIN THE MOVEMENT AREA

Each ground vehicle authorized to operate on the M.A. at the Airport shall be under direct control as follows:

**ALWAYS CHECK THE ATIS TO VERIFY THE STATUS OF THE AIRFIELD.**

**Runways**
No person shall drive a Ground Vehicle on or across any runway at any time, except authorized City of Chicago employees (who are in contact with the ATCT via two-way radio and receive clearance) or person(s) who are escorted by City employees (who are in contact with the ATCT via two-way radio and receive clearance), FAA, or other DOA-AAO authorized drivers within other organizations.

**Movement Area**

(1) Vehicle operators on the M.A. shall maintain two-way radio communications between each vehicle and the ATCT; or

(2) An escort vehicle with two-way radio shall maintain communications with the ATCT to accompany any vehicle without a radio; or

(3) When it is not operationally practical to maintain two-way radio communications between the vehicle and the ATCT or to provide an escort vehicle, vehicles not equipped with two-way radios shall follow the procedures below:

- Vehicle Operators shall yield the right-of-way to all aircraft at all times;
- Vehicle Operators shall drive on defined service roads only;
- Vehicle Operators shall come to a complete stop where posted, prior to crossing any and all taxiways on the service roads. However, vehicles should avoid stopping in the islands between the A-(Alpha), B-(Bravo) and D-(Delta) taxi lanes. The crossing of these taxiways should not be initiated until the operator ensures that both taxiways can be crossed in one continuous movement. (Only Exception: limited stopping is permitted in the island adjacent to the “K” Concourse between the A-(Alpha) and B-(Bravo) Taxiways, between the stop bars.);
- Vehicle operators shall obey all posted signage including “STOP”, “NO TURNS ACTIVE TAXIWAY”, “AVOID STOPPING BETWEEN TAXIWAYS” and heed warnings including CAUTION JET BLAST”;
- Vehicle operators shall follow all regulations published in the City Ground Vehicle Operating Regulations; and Vehicle Operators shall obey the roadway signage, signals, and flag personnel.

(4) During IFR conditions, remain clear of the movement area, unless access to the movement area is absolutely necessary. Then you will be required to call the ATCT for clearance at ILS critical areas, POFZ and CAT II/III hold position markings.
Operations Near Aircraft
No person, other than the operator of an aircraft-servicing vehicle for a designated aircraft, operating a ground vehicle on the AOA shall pass within twenty (20) feet of a parked Aircraft or, in the case of an aircraft being loaded, unloaded or serviced at ground level, between said aircraft and terminal concourses while passengers are enplaning or deplaning.

Requirements For Repositioning Aircraft Within The Airport Movement Area.
This information is addressed under separate cover in a document entitled:

CHICAGO O’HARE INTERNATIONAL AIRPORT
RULES, REGULATIONS, POLICIES AND PROCEDURES FOR
AIRCRAFT REPOSITIONING WITHIN THE MOVEMENT AREA VIA:
TOWBARLESS TOW VEHICLE, TLTV, (AKA, SUPER-TUGS), MECHANIC TAXI
OPERATION, OR CONVENTIONAL TOW.

It is a living document that is amended as needed to address issues associated with repositioning aircraft within the movement area.
It as located on the O'Hare “OPS Docs” website at:

http://opsdocs.ohare.com/

User I.D: ops
Password: ops

The previous section of this manual corresponding to effective communication and standard phraseology is directly applicable to all vehicles, broadly construed, (which would include TLTVs and mechanics taxiing aircraft), that operate in the movement area.

Noise Abatement Runway Closure Advisory
Due to noise abatement runway closures, closed taxiways and runways should be treated with extreme caution. Maintenance traffic and A/C taxiing to and from locations still use these routes, unless barricaded. Always use service roads first, unless required to drive within the movement area for airfield inspections or job duties. Night time and extreme weather conditions make it harder to see approaching aircraft. Exercise extreme caution during adverse weather conditions.
LESSONS LEARNED

Lessons learned examples...

Always use extreme caution when driving on the AOA, taking the most direct route can lead to disaster.

On a clear night a motor truck driver was driving westbound on H Taxiway to the north airfield for an assignment, at the same time, a regional jet aircraft was taxiing from the hangars to the terminals on E taxiway. The vehicle was struck by the aircraft and dragged an excess of 150 feet before the aircraft was able to stop. The vehicle operator was extricated and both he and the taxi-mechanics operating the aircraft received minor injuries. The possibility for loss of life and the cost from lost revenue from the damaged aircraft could have been avoided by driving on service roads and only accessing the movement area when absolutely necessary.

On a sunny day two electricians parked their vehicle on the shoulder of a taxiway to work in a grass island without coordinating a closure of the area, or remaining clear of the taxiway's safety area. A taxiing B747 approached the vehicle parked on the shoulder of its taxiway, the electricians reacted and tried to signal the aircraft to stop, but were too late and an engine caught the cab of the vehicle ripping it off the vehicle. Always coordinate access to a work site with FAA ATCT if the area is open to aircraft or coordinate a closure of the area through DOA-AAO.

A dog escaped from its kennel at a terminal ramp, several airline personnel chased the dog in vehicles crossing several active taxiways and two active runways until they were stopped by DOA personnel. If you do not have access to the movement area-never leave the service roads or ramps, call Airport Airfield Operations at 773-686-2255 to report any issues involving the movement area (taxiways and runways).
THINGS CHANGE, LEARN IT, REMEMBER IT, AND PRACTICE IT!


IMPORTANT! WITHOUT FAIL, NO EXCEPTIONS, YOU MUST HAVE AN OPERATIONAL TRANSPONDER ON, TO DRIVE ON Twy “C”, “C1”, and Rwy 9L-27R when they are OPEN! When in doubt, Call Airport Airfield Operations over the radio, or 773-686-2255, Before you drive onto Twy “C”, from “P” Twy. Signs have been installed on “C”, northwest of “P1”.

REMEMBER OPERATIONAL TRANSPONDER or

NO ACCESS TO Twy C AND Rwy 9L-27R when OPEN.

- ILS Critical Areas: Look at Graphics 3 and 4. Listen to ATIS on 135.4 Mhz or by calling 773-601-8921, or the ASOS at 773-462-0118, BEFORE you drive onto the airfield. If visibility is less than 3 miles and/or the Ceiling is reported to be below 1,000 feet, All contractors and City vehicles MUST remain clear of, NOT drive through, any of the ILS Critical Areas. (See Graphics 3 & 4, Localizer Critical Areas in Red, Glide Slope Critical Areas in Blue). Operations in these areas, if at all, will only be authorized By Airport Airfield Operations, over the Radio, dependent on the runway configuration in use. If in Doubt, remain clear and confirm through Airport Airfield Operations at 773-686-2255.

- Look at Graphic 5. Runways that pass through other Runway Safety Areas, RSA’s. Three Runways at ORD Pass through another Runway’s Safety Area and MUST be protected under certain circumstances. If the runway you are on is open and controlled by the air traffic control tower, ATCT, then the tower will advise you where to hold short of, if necessary. HOWEVER:

If you are driving on Rwy 9L-27R and the runway is closed but Rwy 14L-32R is open, call the tower to coordinate the crossing.

If you are driving on Rwy 32R-14L and the runway is closed but Rwy 9L-27R is open, call the tower to exit at Twy P1, and REMAIN CLEAR OF Rwy 9L-27R.

If you are driving on Rwy 4R-22L and the runway is closed but the tower is using RWY 10-28, call the tower to coordinate the crossing.

Simply treat the situations mentioned above as if the runways intersected.

The Driver is responsible to coordinate passing through the shadowed RSA’s on Graphic 5 if the runway the driver is located on is closed but the intersecting RSA runway is open.

- Setting the Proper Radio Frequencies for the North Tower Runway/Local Control and Taxiway/Ground Control. Shaded areas on Graphic 1.
• “ICOM” Radios: Pull out small knob on the tuning selector to enter quarter channel spacing mode, i.e., 128.15 or 124.125 Mhz. to return to half channel spacing, normally used for other Airport frequencies, push the same knob back in.

• “Air Science” Radios: (4X4 inch square log) has a little “slide switch” in the upper right corner of the radio. Half channel spacing, (most airport frequencies), slide the switch to the right; quarter channel spacing, slide the switch to the left (North tower frequencies).

It is NOT difficult to select the North Tower Frequencies once you are familiar with it, try it!

Learn it! Then Practice it! And Then REMEMBER IT!
Learn it! Then Practice it! And Then REMEMBER IT!
NEW TAXIWAY OPERATING PROCEDURES IN EFFECT NORTH AIRFIELD.

- Procedures and tower frequencies in effect for Runway 9L-27R, and Taxiways: Charlie (C), Charlie One (C1), Charlie 2 (C2), and Whiskey Tango (WT).

- All vehicles MUST have an OPERATING TRANSPONDER to drive on Rwy 9L-27R and Twys C and C1, if that runway and those taxiways are open, NO exceptions.

- The ONLY way around this is if Rwy 9L-27R and Twys C, and C1 are CLOSED.

- If there is a Need to go onto Runway 9L-27R and/or Taxiways C, C1.

YOU MUST CALL OPERATIONS TO FORMALY CLOSE THIS PAVEMENT

The shaded areas above constitute the limits of the North Tower Airfield Local Control and Ground Control Frequencies.

When not on the runways, monitor the appropriate ground control frequencies.
ORDN 124.125 in the shaded areas above, or 121.9 for other locations.
If on taxiways next to runway exits, monitor the appropriate runway frequency.
When areas are open, a vehicle transponder is required. Vehicles with operational transponders only beyond this point if C Twy is open. If RWY 9L-27R is open, all vehicles must have an operational transponder. If a vehicle does not have a transponder, this area must be closed to gain access.
NORTH AIRFIELD ILS CRITICAL AREAS

REMAIN CLEAR OF ALL TWYS THAT PASS THROUGH RED & BLUE SHAD ED AREAS WHEN VISIBILITY IS LESS THAN 3 MILES AND/OR CEILINGS BELOW 1000 FEET

CHECK ATIS 135.4 Mhz
ASOS 773 462-0118
ATIS 773 601-8821
AIRPORT OPERATIONS 773 686-2255
REMAIN CLEAR OF ALL TWYS THAT PASS THROUGH RED & BLUE SHADED AREAS WHEN VISIBILITY IS LESS THAN 3 MILES AND/OR CEILINGS BELOW 1000 FEET

CHECK ATIS 135.4 MHz
ASOS 773 462-0118
ATIS 773 601-8821
AIRPORT OPERATIONS
773 686-2255
 Treat this RSA as if runways intersected when Rwy 9L-27R is Open and 32R-14L is Closed. If you are on 32R-14L, call the tower and coordinate access to runways 9L-27R.

Extended RSA’s (behind the RWY thresholds) are typically 500ft wide and 1000ft long.

Treat this RSA as if runways intersected when Rwy 14L-32R is Open and 9L-27R is Closed. If you are on 9L-27R, call the tower and coordinate the crossing.

Treat this RSA as if runways intersected when Rwy 10-28 is Open and 4R-22L is Closed. If you are on 4R-22L, call the tower and coordinate the crossing.
O'HARE INTERNATIONAL AIRPORT
CHICAGO, IL

Navaids Critical Areas

Legend
- Runway Protection Zone
- Glide Slope
- Localizer Critical Area
- Runway Safety Area
- Object Free Area
GLIDE SLOPE
Typical
WIDTH AND LENGTH VARIES
O'Hare International Airport
CHICAGO, IL
Localizer

LOCALIZER
Typical
WIDTH : 400 Ft.
LENGTH: Varies
O'HARE INTERNATIONAL AIRPORT
CHICAGO, IL
Runway Safety Area

RUNWAY SAFETY AREA
Typical
WIDTH : 500 Ft. (250 ft from Runway Centerline)
LENGTH: Length of Runway and Continues
1,000 Ft. Beyond Runway Threshold

O'Hare International Airport
OBJECT FREE AREA

Typical

WIDTH: 800 Ft. (400 ft from Runway Centerline)
LENGTH: Length of Runway and Continues 1,000 Ft. Beyond Runway Threshold