

AOP 07 –
Aerodrome
Ground Lighting,
Signs, Markings
& Nav aids

Document Control

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1.0	01/08/2020	J Donkin

1 SECTION 1 - Aerodrome Ground Lighting (AGL)

1.1 General

ADR.OPS.B.040 Night operations states the aerodrome operator shall ensure that means and procedures are established and implemented for providing safe conditions for aerodrome operation during night operations.

Aerodrome ground lighting provides pilots with location, orientation and alignment information in adverse visibility conditions and at night.

Leeds Bradford Airport is certificated to operate twenty-four hours.

The SAGLE is responsible for the provision of all AGL requirements.

All AGL circuits are controlled and monitored by the AGL\CMS which alerts the Duty ATCO to any faults by means of audible alarm with an associated alarm message. The monitoring and alarm system is duplicated and located in the AGL Engineer’s watch room. Any faults shall be reported immediately to the Duty Electrical Engineer.

Runway 14 is a precision approach runway with a CAT 1 Instrument Landing System (ILS).

Runway 32 is a precision approach runway with a CAT 3 Instrument Landing System (ILS).

ATC will display the lighting provided in accordance with the time of day and the prevailing weather conditions this is carried out automatically by the AGL\CMS on selection of the Runway heading and a weather setting.

Standby generators are located at 14, 32, Southside and Workshop Lighting Control Centre’s and are permanently available in the event of a mains power failure and are used as primary power for essential services during LVP’s.

1.2 Approach, Runway & Taxiway Lighting

The provision of approach and runway lighting system is illustrated in the table overleaf.

1.2.1 Runway & Approach Lighting Table

R/W r/w	Approach Lighting	Threshold Lighting	PAPI	Runway Lighting	Runway End
14	<u>High Intensity Centre line with 5 Crossbars</u>	Inset High Intensity Green Twin Module Fittings. With Elevated High Intensity Green Wing bars	3.5° RHS	Runway Edge Elevated High Intensity Bi-directional with LI Omni-directional component. Runway Centerline High Intensity Bi-directional Colour Coded Inset Fitting	High Intensity Red Inset Fittings
32	High Intensity Centre line with 5 Crossbars. Supplementary Approach	Inset High Intensity Green Twin Module Fittings. With Elevated High Intensity Green Wing bars	3° LHS	Runway Edge Elevated High Intensity Bi-directional with LI Omni-directional component. Runway Centerline High Intensity Bi-directional Colour Coded Inset Fitting Touchdown Zone High Intensity 15 Barrette 4 Fittings either side of Centerline	High Intensity Red Inset Fittings

1.3 Approach Lighting

1.3.1 Runway 14 CAT 1

High Intensity Approach Lighting that extends to 872m from the Threshold with five crossbars. Threshold lighting is provided by High Intensity Inset Fittings plus elevated wing bars.

1.3.2 Runway 32 CAT 3

High Intensity Approach Lighting that extends to 815m from the Threshold with five crossbars. Supplementary High Intensity Inset Approach Lighting that extends from Threshold to 262m. Threshold lighting is provided by High Intensity Inset Fittings plus elevated wing bars.

1.4 Precision Approach Path Indicators

Precision Approach Path Indicators are located as follows

- Threshold to 14 PAPI's = 334m
- Threshold to 32 PAPI's = 316m

PAPI Maintenance procedures are located within Leeds Bradford Airport Airfield Ground Lighting Maintenance procedures Job Sheet No 2.

1.5 Runway Lighting

Runway 14/32 has Bi Directional High Intensity Elevated Edge Light with a Low Intensity Omni directional component. With additional High Intensity Inset Bi Directional fittings located at Taxiway intersections.

Runway 14/32 has Bi Directional High Intensity colour coded Runway Centerline.

Runway 32 has 15 Barrettes of 4 Touchdown fittings either side of the Runway Centerline.

1.6 Taxiway Centerline and Stop Bar Lighting

1.6.1 November Taxiway

Centerline lighting interlocked with Stop Bars at November 1, 2 & 3 with additional interlocked Stop Bars at Bravo, Charlie also connecting to Delta Taxiway Centerline. This centerline also provides a colour coded Lead on \ off at its intersection with Runway 14/32.

1.6.2 Delta Taxiway

Centerline lighting interlocked with Stop Bars at Delta 1, 2 & 3 also providing connection to November Taxiway. This centerline also provides a colour coded Lead on \ off at its intersection with Runway 14/32.

1.6.3 Echo Taxiway

Centerline lighting interlocked with associated stop bars at Echo 1 & 2 Stop Bars.

1.6.4 Lima Taxiway

Yellow /green centre line routing lights interlocked with associated stop bars.

1.6.5 Stop bars

Stop Bars are located at Alpha 1, Bravo, Charlie, Delta 1, 2, 3, Echo 1, 2, Foxtrot 1, Lima 1, November 1, 2, 3

1.7 Apron Edge Lighting / Taxiway Edge Lighting

Taxiway Blue Edge is provided at Echo Taxiway, Lima, Southern Edge of Alpha Taxiway and around the junctions with Alpha 1, Bravo, Charlie, Delta 3, Runway 32/November/Mike Intersection and Foxtrot Taxiway to Mike Taxiway, Stands 18 and 1 and stands 19 to 21C.

1.8 Runway Guard Lights

Guard Lights are located at Alpha 1, Bravo, November 1, Delta 1, Juliet, Lima 1, Foxtrot 1 and Echo 1 & 2.

1.9 Runway / Taxiway Road Access

VH1, 32/14 Emergency Access Road (EAR), 14 Glide are all supplied with solar powered guard lights.

1.10 Airfield Illuminated Signs

Airfield Illuminated signs are provided at all CAT 3 Holding points and other areas to provide required airfield information. See drawing TFHLN C/2/111 Rev 0 held in engineering office.

1.11 Traffic Light

A traffic light is in position at 32 Lighting Control Centre. This provides runway protection and is controlled via the AGLCMS

1.12 Illuminated Windsocks

Illuminated Windsocks are provide for both Runway 14 & 32

1.13 Obstruction Lighting

Obstacle lighting is installed on any permitted structure which penetrates the runway and taxiway planes. The following have obstruction lights fitted:

- 14 Glide path
- 32 Localiser
- 32 Glidepath
- Far Field Monitors (Width Monitor Only)
- Watchman Radar
- 14 Anemometer Pole
- 32 Anemometer Pole
- Receiver Site Masts
- EVCR
- HRDF
- DME
- Apron Floodlight Poles 6,7,8,9,10,11,12,13,14,15,16,17,18
- Air Traffic Control
- Multi Flight Hangers
- 14 Localiser
- 14 Glide Path Monitor
- NDB
- Security Cabin
- Chevin Beacon

There is also an obstacle beacon installed on the high ground at the Chevin.

1.14 Apron Flood Lighting

Main Apron Stands 1 to 18 are illuminated by 13 Floodlight Columns supplemented by mobile floodlight towers.

Eastern Apron Stands 19 to 21C are illuminated by 4 Floodlight Columns

Multi Flight East Apron is illuminated by Floodlights fitted at High Level above the Hanger Doors

All floodlighting is controlled via PE Cell Controllers and records of lighting levels are recorded and held by AGL Department in Apron Lighting Survey files.

1.15 Airfield Ground Lighting Intensity / Brilliancy Settings

The intensity / brilliancy settings for Airfield Ground Lighting are automatically set by the AGL Control and Monitoring System once a controller has selected a runway heading and a weather setting the lights will be selected.

In the event of control system failure airfield ground lighting will be operated locally at each Lighting Control Centre by the duty Electrical Engineer. Details of local switching instructions and intensity \ brilliancy settings can be found in ATC\AGL\SYSTEM USER MANUAL 3 \ AGL Part, ATS/TEC/SUM/AGL/Annex A and Leeds Bradford Airport Airfield Ground Lighting Maintenance procedures Job Sheet No 5 (hard copies retained).

Please refer also to LBA AGL Control System Operations and Maintenance Manual.

1.16 Secondary Standby Power Supplies

In the event of a mains power supply failure Airfield Ground Lighting services will automatically be supplied by standby generators located each Lighting Control Centre within 10 seconds.

If no alternate power supply is available the aerodrome authority should notify the effect by NOTAM. There is no need to withdraw a system from service or to downgrade it arbitrarily unless the failed power source is not recovered within 2 Hours.

Mains power supply failures exceeding 2 Hours approaches should be restricted to non-precision status and departures precluded when the RVR is 400m or less.

During LVP'S the standby generators will be brought on line via the AGL\CMS to power the Airfield Ground Lighting in the event of Generator failure the system will fail to mains in less than 1 second.

All Electrical Mains Supplies and Generators are monitored by the AGL\CMS.

Full load tests of the standby generators are carried out on a monthly basis with all details of tests carried out in Leeds Bradford Airport Airfield Ground Lighting Maintenance procedures Job Sheet No 3.

1.17 Lighting Inspections

Airfield Ground Lighting Inspections are carried out twice daily by the Duty AGL Engineer before first movement and dusk, as operations permit.

Details of lighting inspections can be found in Leeds Bradford Airport Airfield Ground Lighting Maintenance procedures Job Sheet No 1.

1.18 AGL Flight Inspections

Airfield Ground lighting is subject to a 6 Monthly Flight inspection and is carried out in conjunction with ILS Navigational Equipment flight calibration checks.

It is the responsibility of the Senior Air Traffic Engineer to arrange flight inspections and to analyse the inspection reports in consultation with the flight inspectors and Duty AGL Engineer.

2 SECTION 2 - Aerodrome Signs and Markings

2.1 General

Aerodrome signals, signs and markings provide visual guidance to pilots approaching the airfield and manoeuvring on runway, taxiway and apron surfaces.

2.2 Light Signals

Air Traffic Control has signal lamps capable of producing red, white and green lights to make all signals specified in the Rules of the Air as appropriate.

2.3 Temporary Obstruction Markings

The AOU is responsible for locating and marking temporary obstructions and bad ground on the movement area.

- Obstructions and bad ground will be marked with:
- Red and White reflective Bad Ground Markers.
- Black and White Threshold Bars

2.4 Taxi Guidance Signs

Access to runway 14/32 from all taxiway routes are identified by a series of ground mounted signs. Signs are located at points adjacent to taxiways and beyond which an aircraft or vehicle should not proceed, unless they have been authorised to do so by ATC. Taxiway/runway Hold markings are also located at these points.

2.5 Runway Markings

Markings on Runway 14/32 are as follows:

- Runway centerline (Marking only)
- Runway edge
- Permanent displaced Thresholds
- Numerals
- Aiming Point and touchdown zone

2.6 Taxiway Markings

Taxiway markings are identified by green centerline lights where available.

2.7 Apron Stand Markings

- All apron stands have yellow taxiway centerlines with appropriate aircraft stop distances.
- Apron stand signs are illuminated

2.8 Road Signs and Markings

- Wherever possible and appropriate, road signs and markings on aerodrome movement areas comply with Traffic Sign Regulations.
- The airport has installed uncontrolled crossings on the apron to ensure safe crossing of passengers. All vehicles shall remain clear of the crossings when passengers are crossing and keep to apron speed limitations.

3 SECTION 3 - Communication and Nav aids

3.1 Radio Communication Facilities

Aerodrome, Approach and radar facilities are provided at Leeds Bradford Airport. VHF frequencies in use are:

- Leeds Bradford Delivery 121.805 MHz
- Leeds Bradford Tower 120.305 MHz
- Leeds Bradford Director 125.380 MHz
- Leeds Bradford Radar 134.580 MHz
- International Distress Freq Tx & Rx 121.500 MHz

Radio frequency and hours of operation are set out in the UK AIP. A discrete emergency frequency (Non ATS) is available on 121.600 MHz when RFFS vehicle attending aircraft on the ground in an emergency.

In addition, UHF frequencies are used on the following channels:

- Channel 1: ATC airfield
- Channel 2: Terminal
- Channel 3: ATC/Snow clearing
- Channel 4: Fire Operations
- Channel 5: Fire Operations
- Channel 6: Not in use
- Channel 7: Not in use
- Channel 8: Engineering
- Channel 9: Not in use

Automatic Terminal Information Service (ATIS) is provided on:

- Leeds Bradford Information 118.030 MHz

All communication facilities within the ATS unit are recorded in accordance with the ANO.

3.2 Radio Navigation and Landing Aids

3.2.1 Instrument Landing Systems (ILS)

RWY 14

- Ident I-LBF
- Frequency 110.90.
- Frequency paired DME Channel 46X

RWY 32

- Ident I-LF
- Frequency 110.90
- Frequency paired DME Channel 46X

3.2.2 NDB

- Frequency – 402.5KHz
- Ident – LBA

3.3 Maintenance and Inspection

The SATE is responsible for ensuring that the maintenance and inspection of aids to navigation is conducted in accordance with the LBA ATE Maintenance Exposition.

3.4 Airside Call Signs

Specific call signs are used which have been designed to minimise the risk of call sign confusion.

The system avoids the repetitive use of numbers and allocates departments which have more than one vehicle with a specific series of numbers. No numbers will be allocated more than once.

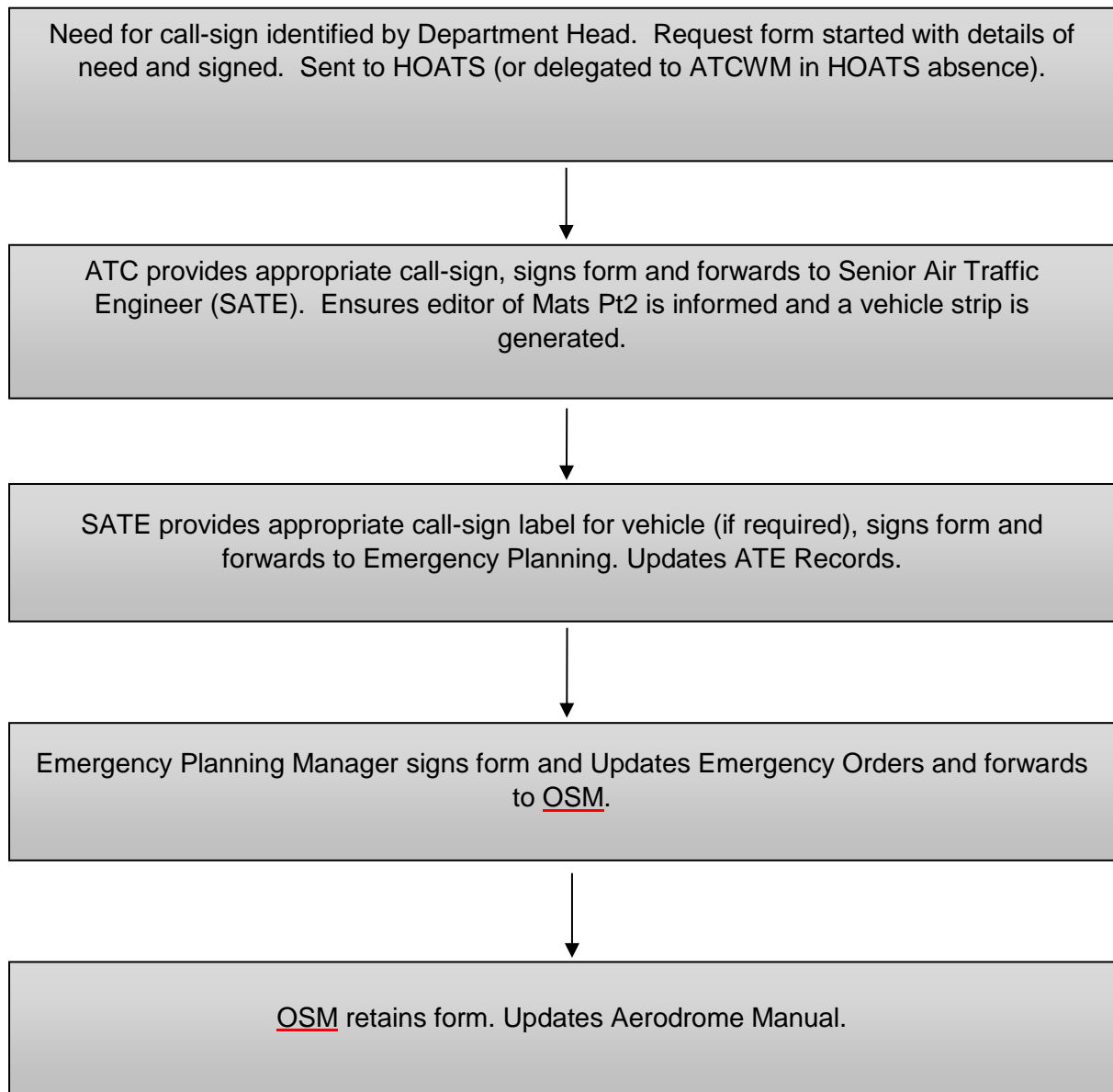
Where a department uses a series of similar (or identical) vehicles, the vehicle call sign number should be displayed prominently on the vehicle to aid ATC recognition.

Where a department has only one vehicle or a unique call sign then no number designator will be required.

The Ops 5 to Ops 9 call signs will be used by the designated individuals at all times (regardless of whether they are on foot or within a vehicle).

Any call using the above Ops Call signs will indicate that the inspection is of an urgent nature and that priority will be given to runway access over training flights or non-commercial VFR private flights.

Generation of New Call Signs



For LBA staff, the call-sign request form can be found on SharePoint at Forms>Airside Operations Unit and for business partners an electronic copy can be requested from LBA Operations Support Manager.

Call-signs 70 – 79 reserved for future growth

Call-signs 14 & 32 not available to avoid possible confusion with runway designation

Call-signs 51 – 54 not available to avoid possible confusion with Fire 1 – Fire 4

Call-signs 98 & 99 not available to avoid possible confusion with HLE 98 & HLE 99

3.4.1 List of Active Call Signs

CALLSIGN	CALLSIGN	CALLSIGN
CHECKER	FIRE CHIEF	SNOWMAN
ROVER	FIRE 1	RAMP HOG 33
SWEEPER	FIRE 2	RAMP HOG 34
OPS 5 (AOM)	FIRE 3	
OPS 6	FIRE 4	SPRAYER 36
OPS 7 (AOUS)	FIRE 5	SPRAYER 37
OPS 8 (AOUS)	COACH 40	SNOW BLOW 38
OPS 9 (ATSM)	COACH 41	SNOW BLOW 39
	COACH 42	BRUSH 21
SPARKY 10	COACH 43	BRUSH 22
SPARKY 11	COACH 44	BRUSH 23
SPARKY 12	COACH 45	BRUSH 24
	COACH 46	BRUSH 25
TELS 13	COACH 47	BRUSH 26
TELS 15	SECURITY	BRUSH 27
	MULTIFLIGHT TRACTOR	BRUSH 28
WORKS 16	MULTIFLIGHT BOWSER	BRUSH / TRACTOR 29
WORKS 20	MULTIFLIGHT MOBILE	BRUSH / TRACTOR 30
TRACTOR 18		BRUSH / TRACTOR 31
TRACTOR 19	RIG 96 (Jet 2 De-icing Rig)	BRUSH / TRACTOR 35
BOWSER 60	RIG 97 (Jet 2 De-icing Rig)	TUG 70 (JET 2)
BOWSER 61	RIG 98 (Jet 2 De-icing Rig)	TUG 71 (JET 2)
BOWSER 62	TUG 90 (Jet 2)	TUG 72 (JET 2)
BOWSER 63	TUG 91 (Jet 2)	TUG 73 (JET 2)
BOWSER 64	TUG 92 (Jet 2)	TUG 80 (Swissport)
BOWSER 65	TUG 93 (Jet 2)	TUG 81 (Swissport)
BOWSER 80	TUG 94 (Jet 2)	TUG 82 (Swissport)
BOWSER 83	TUG 95 (Jet 2)	TUG 83 (Swissport)

