

| ENR 1.6 ATS SURVEILLANCE SERVICES AND PROCEDURES

1. Use of radar in air traffic services

1.1 General

1.1.1 The Islamic Republic of Iran subscribes to the procedures for the use of radar in ATS which are given in (ICAO DOC 4444) chapter 8 with the important differences that the radar service provided outside controlled airspace will be an information service as described in 1.5.1. additionally in order to clarify the exact arrangements in use within each type of airspace in Tehran FIR, the Islamic Republic of Iran has found it necessary to amplify certain ICAO statements.

1.2 Radar stations

Within TEHRAN FIR the following MSSRs radar stations are being operated:

NO	RADAR Station	Remark
1	Esfahan	APP& En-route
2	Mashhad	APP& En-route
3	Shiraz	APP& En-route
4	Tehran (Imam Khomai)	APP& En-route
5	Tehran (Mehrabad)	APP& En-route
6	Ahwaz	En-route
7	Gorgan	En-route
8	Iran Shahr	En-route
9	Jiroft	En-route
10	Kish	En-route
11	Kushk	En-route
12	Lar	En-route
13	Mashhad (Khajeh Mohammad Mirza)	En-route
14	Tabas	En-route
15	Tabriz	En-route
16	Zanjan	En-route

1.3 Types of radar services

1.3.1 ICAO References Doc 4444, chapter 8, paragraphs 8 and 11.

1.3.2 The provision of Radar Service is dependent upon specific types of airspace as follows:

Type of Airspace	Type of Service
Relevant Class A Airspaces Relevant Class C Airspaces Relevant Class D Airspaces	Air traffic control service
Class G Airspaces	Flight information service

1.4 Use of Radar in Air Traffic Control units

1.4.1 Radar service is provided by the following units in Tehran FIR within their radar coverage:

- a) Tehran ACC Sector1 (Ref AIP Page ENR2.1-1) on
FREQ 119.300 MHz , 132.500 MHz , 316.800 MHz ,
258.400 MHz ; and
- b) Tehran ACC Sector2 (Ref AIP Page ENR2.1-1) on
FREQ 125.700 MHz , 351.900 MHz; and
- c) Tehran ACC Sector3 (Ref AIP Page ENR2.1-2) on
FREQ 126.900 MHz , 326.400 MHz; and
- d) Tehran ACC Sector4 (Ref AIP Page ENR2.1-2) on
FREQ 133.400 MHz , 291.700 MHz; and
- e) Tehran ACC Sector 5 (Ref AIP Page ENR2.1-2)
on FREQ 120.300 MHz , 309.100 MHz within the
following airways:

1-AWY A419 BTN TAVNO and DARAX.

2-AWY A453 BTN MOBAD and KHM
NDB/DME.

3-AWY W10 BTN MELMI and BND
DVOR/DME.

4-AWY R401 BTN KHM NDB/DME and
DARAX.

5-AWY N440/UN440 BTN DARAX and
BOSOS.

6-AWY W32 BTN ASMUK and BND
DVOR/DME.

7-AWY L430 BTN TAVNO and MELMI.

f) Tehran ACC Sector 7 (Ref AIP Page ENR2.1-3) on
FREQ 120.700 MHz, 302.400 MHz; and

g) Esfahan TMA/CTR on FREQ 124.600MHz,
313.800MHz; and

h) Mashhad TMA/CTR on FREQ 127.300MHz,
353.800MHz; and

i) Shiraz TMA/CTR on FREQ 119.000 MHz,
362.300MHz; and

j) Tehran TMA/CTR on FREQ 119.700MHz,
362.300MHz

1.4.2 Functions

1.4.2.1 Radar service may be used to perform the following functions:

- a) Maintain flight path monitoring of air traffic.
- b) Vectoring to aircraft to provide separation, an orderly traffic flow and to resolve conflicts.
- c) Provide navigational assistance,
- d) Assist aircraft in emergency situations,
- e) Provide traffic information to controlled flights

1.4.3 Separation

Note1: When necessary, the minimum radar separation values indicated below may be increased by Air Traffic Controllers in accordance with the traffic density and performance level of the radar equipment in use.

Note2: except for transfer of control, identified aircraft operating within controlled airspace shall not be vectored closer than a distance equivalent to one-half of the prescribed separation minimum, from the limit of the airspace for which the controller is responsible.

1.4.3.1 En-route Separation except 1.4.3.2

Horizontal Separation: The minimum horizontal radar separation shall be 10NM except:

- a) The minimum radar longitudinal separation of 20NM shall be applied between aircraft cruising at the same flight level on the same route (on trail) ;
- b) The minimum radar separation for descending or climbing aircraft on the same tracks shall be 10 NM.

1.4.3.2 Esfahan, Mashhad, Shiraz and Tehran TMA/CTR Separation.

Horizontal Separation: The minimum horizontal separation within 30 NM from TMA reference point (within "Tehran TMA/CTR" 40 NM) shall be 5 NM and beyond that up to TMA boundary shall be 10 NM.

1.5 Radar information service

1.5.1 Radar information Service is an air traffic radar service in which the controller will inform the pilot of the bearing, distance, and, if known, the level of the conflicting traffic. Avoiding action may be offered. The pilot is wholly responsible for maintaining separation from other aircraft whether or not the controller has passed traffic information , and also remains responsible for terrain clearance.

Note: provision of radar information service does not relieve the pilot-in-command of an aircraft of any responsibilities, including the final decision regarding any suggested alteration of the flight plan. The pilot must advise the controller before changing level or route.

1.5.2 When an identified IFR flight operating outside controlled airspace is observed to be on a conflicting path with another aircraft, the pilot should:

- a) be informed as to the need for collision avoidance action to be initiated, and if so requested by the pilot or if, in the opinion of the controller, the situation warrants, a course of avoiding action should be suggested; and
- b) be notified when the conflict no longer exists.

1.5.3 Radar information service to VFR flight should only be provided upon the request of the pilot and concurrence of the controller.

1.6 Establishing a service:

1.6.1 In order to establish radar service, the controller must reach an accord. If the controller is able to offer a service he will attempt to identify the aircraft. If a controller is unable to provide a service he will inform the pilot.

1.6.2 The provision of radar service to aircraft is subject to:

- i) Communication system availability and reliability
- ii) Radar equipment limitations

1.7 Limitations of services

1.7.2.1 Outside Controlled Airspace any radar service may be limited. If radar controller considers that he/she can not maintain a radar service, he/she will warn the pilot of the nature of the limitation that may affect the service being provided.

1.8 Terrain clearance

1.8.1 ICAO Reference Doc 4444, Chapter 4 paragraph 10.3.2 (Note3); Chapter 8 paragraphs 8.6.5.2 and 8.6.5.3.

1.8.2 Within Tehran, Mashhad, Esfahan and Shiraz CTRs/TMAs according to relative ATS Surveillances Minimum Altitude Chart (ASMAC) during radar vectoring.

1.9 Navigation assistance

1.9.1 If an identified aircraft observed to deviate significantly from its intended route, or not adhere to direction of designated holding pattern, shall be advised accordingly. Appropriate action shall also be taken if, in the opinion of the Radar controller, such deviation is likely to affect the service being provided.

Note: for en route flight, significant deviation is more than 5NM.

1.9.2 The pilot of an aircraft requesting navigation assistance from Radar controller shall state the reason (e.g. unreliable navigational instruments) and shall give as much information as possible.

1.9.3 Navigation assistance may be provided to VFR flight as flight information service if so requested, provided that:

- a) Pilots of VFR/SVFR flights must realize that they are responsible for remaining in VMC and meeting the obstacle clearance at all time.
- b) ATC may not see an aircraft due to equipment limitation of either the radar system or the lack of transponder on an aircraft, so radar will not provide radar separation between VFR/SVFR flights from other traffic.

1.10 Weather Deviation

1.10.1 Since all radar systems within Tehran FIR are not capable of detecting and displaying areas of adverse weather, circumnavigation of the adverse weather is the responsibility of the pilots. Pilots are required to advise air traffic controllers before any circumnavigation and returning to its cleared route.

2. SSR operating procedures

2.1 General

2.1.1 All aircraft flying within Tehran FIR are required to be equipped with SSR transponder having a combined Mode A/3, 4096 Codes capability and a Mode C automated altitude reporting capability.

2.1.2 The use of SSR transponder is mandatory for all aircraft flying:

- a) within class A airspace;
- b) within class D airspace in airways;
- c) within class C airspace in *Esfahan, Mashhad Shiraz, Bandar Abbas and Tehran TMA*;
- d) within class D airspace in *Esfahan, Mashhad, Shiraz and Tehran CTR*.

Aircraft which is not equipped with SSR transponder is not permitted to operate within the above mentioned areas.

2.2 Special Purpose Codes

2.2.1 Specific codes in certain series are reserved for special purposes as follows:

- a) Code 0000 is available as a general purpose code for domestic use and if, on verification there is a difference of more than 200 feet between the level readout and the reported level, the pilot may be instructed to switch off mode C. If independent switching of mode C is not possible the pilot may be instructed to select code 0000 to indicate a transponder malfunction.
- b) Code 2000 shall be used by flight crew in the absence of any Air Traffic Control (ATC) instructions or operating in the non-mandatory area, unless the conditions for the use of codes 7000, 7500, 7600 and 7700 apply.
- c) Code 7500 is reserved for use in the event of unlawful interference.
- d) Code 7600 is reserved for use in the event of radio communications failure.
- e) Code 7700 is reserved for use in the event of emergencies and interception.
- f) Code 7776 and Code 7777 are reserved for SSR ground transponder monitoring.
- g) Code 7601-7612 is reserved for humanitarian flights.

2.3 Standard operating procedure

2.3.1 after selection of mode/code specified by ATC, the transponder should be adjust on the "ON" or normal operating procedure as late as practicable prior to take off and to "OFF" or "STANDBY" as soon as practicable after completing the landing roll.

2.4 Transponder Failure

2.4.1 Failure before intended departure

2.4.1.1 If the transponder fails before intended departure and cannot be repaired, pilots shall:

- a) Plan to proceed to the nearest suitable aerodrome, where repair can be made, and
- b) Inform ATS unit concerned as soon as possible preferably before the submission of a flight plan. When granting clearance to such aircraft, ATC will take into account the existing and anticipated traffic situation and may have to modify the time of departure, flight level or route of the intended flight and
- c) Insert in item 10 of the ICAO flight plan under SSR the letter N for complete unserviceability of the transponder or in the case of partial failure, the letter corresponding to the remaining transponder capability as specified in ICAO Doc 4444, Appendix 2.

2.4.2 Failure after departure

2.4.2.1 If the transponder fails after departure or during en-route, ATS units will endeavor to provide for continuation of the flight in accordance with the flight plan. In certain traffic situations this may not be possible particularly when the failure is detected shortly after take off. The aircraft may then be required to return to the departure aerodrome or to land at another aerodrome acceptable to the operator and to ATC. After landing, pilots shall make every effort to have the transponder restored to normal operation. If the transponder cannot be repaired then the provision in paragraph 2.4.1.1 apply.

2.4.3 Temporary failure of SSR Mode C alone would not restrict provision of radar service to the flight.

2.5 Radar and radio communication failure procedures

2.5.1 In the event of ground radio failure, radar service automatically will terminate and the aircraft shall contact with one of the following units for relaying its position during the operational hours of service :

Sector 1 (REF AIP page ENR 2.1-1)

- FREQ 132.500MHZ.
- Tehran radar on 125.700MHZ or 120.700MHZ respectively.
- Mehrabad APP/RADAR on 119.700MHZ
- Rasht TWR on 122.700MHZ
- Tabriz APP on 122.500MHZ.
- Uromiyeh TWR on 118.250MHZ.
- Sanandaj TWR on 122.900MHZ

Sector 2 (REF AIP page ENR 2.1-1)

- Tehran radar on 120.700MHZ, 119.300MHZ.
- 126.900MHZ or 132.500MHZ respectively.
- Tehran control on 123.900MHZ.
- Mehrabad APP/Radar on 119.700MHZ.
- Esfahan APP/Radar on 124.600MHZ.
- Kermanshah TWR on 122.450MHZ.
- Sanandaj TWR on 122.900MHZ.

Sector 3 (REF AIP page ENR 2.1-2)

- Tehran radar on 133.400 MHz and 125.700 MHz respectively.
- Shiraz APP/Radar on 119.000MHZ and 125.400 MHz.
- Esfahan APP/Radar on 124.600 MHz.
- Ahwaz APP on 120.850 MHz.
- Bushehr APP on 119.700 MHz and 122.500 MHz.

Sector 4 (REF AIP page ENR 2.1-2)

- Tehran radar on 126.900 MHz and 120.300 MHz respectively.
- Tehran control on 123.900 MHz.
- Shiraz APP/Radar on 119.000MHz and 125.400MHZ.
- Bandar abbas APP on 124.200 MHz
- Kerman APP on 118.250 MHz.
- Kish TWR on 118.450 MHz.

Sector 5 (REF AIP page ENR 2.1-2)

- Tehran radar on 133.400MHZ.
- Tehran control on 123.900MHZ.
- Bandar abbas APP on 124.200 MHz.
- Kerman APP on 118.250 MHz.

Sector 6 (REF AIP page ENR 2.1-2)

- Tehran radar on 125.700MHZ, 120.700 MHz, 120.300 MHz and 133.400MHZ respectively.
- Zahedan TWR on 118.100MHz.
- Bandar abbas APP on 124.200 MHz.
- Kerman APP on 118.250 MHz.
- Yazd APP on 122.700 MHz.

Sector 7 (REF AIP page ENR 2.1-3)

- Tehran radar on 119.300MHZ.
- Tehran control on 123.900MHZ.
- Mehrabad APP/Radar on 119.700MHZ.
- Gorgan APP on 118.750 MHz

2.5.2 Action by radar controller

- If subsequent radar responses indicate that the aircraft radio receiver is working, the radar controller will assume or resume radar control, as the case may be, and continue to pass instructions as for a normal radar service.
- Controllers shall check all the pertinent frequencies.
- If subsequent radar responses indicate that the aircraft radio receiver is not working, the radar controller will take action, according to the circumstances prevailing, as detailed in paragraph below as appropriate.

d) If, prior to the communication failure, the radio failure aircraft was identified, the radar controller will ensure that all known traffic is provided with a specified radar separation minimum from the radio failure aircraft.

e) If, prior to the communication failure, the radio failure aircraft was not identified or its position is not known, the radar controller will continue the instructions detailed in DOC 4444 chapter 15 paragraph 15.5.1.1.1.

2.5.3 Action by aircraft

a) Aircraft able to receive transmissions from radar control will comply with such instructions as are issued, acknowledging as indicated by the radar controller, as detailed in paragraph a) above (2.4.2.3).

b) Aircraft not able to receive transmissions will comply with the ICAO radio communication failure procedures as prescribed in Annex 2 (3.6.5.2) and Doc 4444 chapter 15 Para 15.3 and Doc 7030.

c) It is essential that the procedures as detailed above, as appropriate, are rigidly adhered to as the action by radar controller, detailed above, are based upon aircraft compliance therewith; failure to comply may result in loss of separation.

d) Following unsuccessful attempts to establish RTF contact, aircraft equipped with satellite and/ or mobile telephone shall attempt to contact TEHRAN ACC on the following telephone numbers: +98 21 44544116, +98 21 44544060.

2.6 Radio Telephony Phraseology for the Use of radar
According to the DOC4444 part 12.4

3. Air Move Display (AMD)

3.1 In order to improve efficiency and traffic observation the AIR MOVE DISPLAY (AMD) facilities have been installed as supplementary means, in Abadan, Ahwaz, Bandar abbas, Gorgan, Kerman, kish, Lar, Rasht, Sari/Dashte-naz, Tabriz, Uromiyeh, Tehran/Mehrabad, Shiraz/Shahid Dastghaib and Zahedan ATS units (TWR/APP as appropriate).

3.2. The information shown on the displays (AMDs) is derived from some en-route or TMA MSSR systems, which have been mainly designed and installed for en-route radar service within Tehran FIR.

3.3. Since en-route MSSRs are mainly intended to be used for en-route phase, fade areas and restriction of horizontal and vertical coverage are extremely variable in different aerodromes.

3.4. AMDs are not suitable for radar service, e.g. radar vectoring, monitoring of aircraft and etc.

Note: traffic information will be passed as non-radar traffic information.

3.5. Controllers may obtain information regarding any significant deviation by aircraft from the terms of their respective ATC clearances, including their cleared routes as well as levels.

3.6. In case of observing such deviations, controllers may inform the pilot by using the following or similar phrases:

- REPORT POSITION
- REPORT LEVEL
- CONFIRM LEVEL
- CONFIRM FOLLOWING (THE NAME OF SID, STAR, INSTRUMENT APPROACH PROCEDURE
- REPORT RADIAL AND DISTANCE FROM (NAME OF VOR AND DME STATION) VOR/DME

Note : The controllers shall use non-radar phrases.

3.7. If deviation is continued, controllers may alert the pilot by using the following or similar phrases:

- IT SEEMS YOU ARE RIGHT (LEFT) OF COURSE.
- IT SEEMS YOU ARE MAKING RIGHT (LEFT) ARC.
- IT SEEMS YOU ARE BELOW (ABOVE) CLEARED LEVEL.
- IT SEEMS YOU ARE BELOW MNM SAFE LEVEL.

3.8. Normally there is no need to inform pilot that the aircraft is shown on the AMD or not.

3.9. The progress of an aircraft in emergency may be followed on the AMD as far as practicable.

3.10. The final confirmation for ascertaining the position, level, etc. of the aircraft, remains with the pilots.

3.11. Radar displays in non-radar sectors of Tehran ACC may be used as an AMD.

3.12. Radar displays in non-radar services e.g. Mehrabad APP, in periods when radar service is not provided, may be used as an AMD.

3.13. The failure of AMDs shall be recorded in the ATS watch log and NOTAM shall be issued.

4. Radar Presentation Systems

4.1 The information shown on the Radar Presentation Systems is derived from Approach PSR/ MSSR system, which have been mainly designed and installed for approach radar service within relevant Area .

4.2 The use of radar presentation system installed in control towers of Tehran/Mehrabad, Tehran/Imam Khomeini, Esfahan, Mashhad and Shiraz airport is only authorized to perform following functions:

- a. Reduce verbal coordination between tower and approach.
- b. Providing information to the tower controller about the sequencing of arriving and departing traffic.

5. Automatic Dependent Surveillance-Broadcast (ADS-B)

- NIL.