

ANS 1.7.028	 CAAI	CNS Inspector Handbook
Voice/Data Recording Equipment approval		Revision 0
		June 1, 2017

1. Objective

- 1.1. This directive is part of the CNS inspector handbook.
- 1.2. This directive provides guidance for evaluating and approving Voice/Data Recording Equipment.

2. General

- 2.1. Under article 26 to the Israeli Air Navigation Law, 2011 the operation of an air traffic management unit is required to be licensed by the CAAI
- 2.2. Under articles 27(a) & 29 to the Israeli Air Navigation Law 2011 the air traffic management unit has to be equipped with suitable equipment to perform the job required as prescribed in the Air Navigation Regulations.
- 2.3. According to regulation 3 of the Air Navigation Regulations (Safety at Airport of the Airport Authority), 1992 an air traffic management unit shall be equipped with adequate equipment to enable the unit to provide its services safely for the security of the users.
- 2.4. Voice/Data Recording Equipment is required (by ICAO annex 11 paragraphs 6.1.1.3, 6.1.1.4, 6.2.2.3.3, 6.2.2.3.7, 6.2.2.3.8, 6.2.3.1.7, 6.2.3.5, 6.2.3.6, 6.3.1.2, 6.3.1.3, 6.4.1) to be capable of recording and replaying the terms or content of any messages or signals transmitted, received, or conveyed through the equipment at ATC Unit or Aeronautical Radio Station.
- 2.5. The recording apparatus is required to be in operation at all times when an ATC service is being provided.
- 2.6. This directive sets out the requirements for the reviewing and inspecting of Voice/Data Recording Equipment (including engineering, maintenance and training of related technical personnel requirements), intended for use within air traffic management units, as part of the process of issuing or amending air traffic management unit license.
- 2.7. Abbreviations

ANL	-	Air Navigation Law, 2011
ANR	-	Air Navigation Regulations
ATC	-	Air Traffic Control
ATM	-	Air Traffic Management
ANS	-	Air Navigation Service
ATS	-	Air Traffic Service

3. Reference Material ,Form& Job-Aids

3.1. Law & Regulation

- 3.1.1. ANL 2011 articles 35(a) & 27(a) & 29
- 3.1.2. ANR (Safety at Airport of the Airports Authority), 1992 - Reg 3.

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3.2. CAAI AP & Directives

- 3.2.1. AP 1.7.005 / 2.7.005 - ATS equipment installation, maintenance, operation & approval

3.3. ICAO annexes & documents

- 3.3.1. ICAO Annex 10 Volume III, Part I — Digital Data Communication System & Part II — Voice communication Systems
- 3.3.2. ICAO Annex 11 Air Traffic Services.
- 3.3.3. ICAO Doc 7192 - Training Manual Part E-2 Air Traffic Safety Electronics Personnel (ATSEP)

Note: This document incorporates the relevant SARPs from ICAO Annex 10 and Annex 11 together.

3.4. Forms & Job-Aids – none

4. Process

4.1. Technical Requirements

This document sets out the engineering requirements for voice/data recording equipment at ATM Units providing an ATC service.

- . **Note:** The term 'voice/data recording equipment' may be abbreviated where appropriate to 'recording equipment' in the remainder of this document. Similarly the term 'communications' applies to both voice and data link communications unless voice or data link are specified.

The requirements apply, but are not limited to, analogue tape recording/replay equipment using reel to reel, cassette or cartridge magnetic tape archival media and to digital computer based equipment using tape cartridge or other magnetic, electronic or optical devices to provide secure and reliable long-term storage/ archive of the recorded data.

4.1.1. Safety objective

The recording equipment shall provide a complete, identified, intelligible and accurate record of the communications to be recorded which may be used, in the event of an incident or accident.

4.1.2. General Requirements

4.1.2.1 Minimum Performance Specification

- 4.1.2.1.1. Recordings shall be retained for a minimum period of 30 days from the date of the last recorded message.
- 4.1.2.1.2. When the recordings are pertinent to accident and incident investigations, they shall be retained as long as the investigator requires their retention.
- 4.1.2.1.3. Archive media shall be controlled and stored in a suitably

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secure location

4.1.2.2 **Time-Recording Devices**

4.1.2.2.1. Voice/Data Recording equipment shall include time-recording devices or techniques to ensure the 'time-stamping' of ATS communications.

4.1.2.2.2. Time-recording devices or techniques shall use Co-ordinated Universal Time (UTC) and shall express each time-stamp in hours, minutes and seconds of the 24 hour day beginning at midnight.

4.1.2.2.3. The time-recording device or technique shall be checked as necessary to ensure that the time-stamps are maintained within ± 5 seconds of UTC by regular reference to Global Positioning System (GPS).

Note: ATS units may already be deriving their master time sources from this signal, but it is important to ensure that the output from these receivers is UTC.

4.1.2.2.4. Wherever Data Link Communications are in operation, time recording devices shall be accurate to within ± 1 second of UTC.

Note: In this case, the time accuracy is ± 1 second and the resolution is 1 second.

4.1.2.3 **Communications to be recorded** (those functions may be recorded by different recording equipment's. In this case there should be an option to synchronize the data recorded in the different equipment)

4.1.2.3.1. **Air-Ground Communications (Aeronautical Mobile Service)**

- Direct pilot-controller communications between aircraft stations and aeronautical stations shall be recorded.
- The voice communications to be recorded shall be derived from a receiver in the aeronautical station providing 'off-air' signals of the pilot and controller transmissions.
- Where the voice communications to be recorded are routed via a Voice Communications Control System (VCCS) or other air traffic service equipment to the recording equipment, the continuity of recording shall be ensured in the event of a failure of either the VCCS or air traffic service equipment.

4.1.2.3.2. **Air-ground digital data exchanges;**

- Direct pilot-controller digital data exchanges communications between aircraft stations and aeronautical stations shall be recorded

4.1.2.3.3. **Ground-Ground Communications (Aeronautical Fixed Service)**

- Direct communications between ATS Units and between ATS Units, and appropriate Military units shall be recorded

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4.1.2.3.4. **Surface Movement Control Service**

- Surface Movement Control Service Communications, used for the control of vehicles and personnel on the maneuvering area, shall be recorded.

4.1.2.3.5. **Surveillance data from primary and secondary**

- Radar equipment or other systems (e.g. ADS-B, ADS-C), used as an aid to air traffic services, shall be automatically recorded.

4.1.2.3.6. **Automatic transfer of data to and/or from air traffic services computers**

- In all cases where automatic transfer of data to and/or from air traffic services computers is required, suitable facilities for automatic recording shall be provided.

4.1.2.3.7. **Flight progress strips**

4.1.2.4 **Installation**

4.1.2.4.1. The recording equipment shall be installed in accordance with the manufacturer's, supplier's or agent's instructions so as to ensure correct and reliable operation.

4.1.2.4.2. Long-term archive/storage facilities shall be constructed, maintained and operated in accordance with the manufacturer's, supplier's or agent's instructions so as to ensure the reliable retention of data for the ICAO minimum requirement of 30 days.

4.1.2.5 **Equipment and Power Supply Configuration**

4.1.2.5.1. The equipment and power supply configuration shall be such as to ensure the availability of recording, without interruption, when an ATS is being provided.

4.1.2.5.2. It is likely that the provision of main and standby equipment or systems, which contain multiple hard disc drives (HDD) or solid state drives (SSD) configured as a Redundant Array of Independent Drives (RAID), will be necessary to achieve the required availability.

4.1.2.5.3. The provision of a backup power supply from either a central battery system or individual UPS units shall ensure the availability of power to the recording equipment and other essential equipment in the event of a mains interruption.

4.1.2.5.4. The equipment configuration should take into account such factors as the hours of operation of the ATS unit, provision for maintenance/repair, ability to replay recorded archival media whilst continuing to record, exchange of media.

4.1.2.5.5. The incorporation of suitable mains conditioning devices as part of the mains/backup power supply arrangements may be useful in preventing equipment malfunction due to surges, spikes and noise on the power supply.

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4.2. Maintenance of voice/data recording equipment

4.2.1. General Requirements

- 4.2.1.1 Maintenance arrangements shall be established to ensure the continued availability and reliability of all voice/data recording equipment, associated with the provision of an ATC service.
- 4.2.1.2 All the technicians will be properly trained on the voice/data recording equipment.
- 4.2.1.3 A record of any functional test and particulars of any maintenance, repair, overhaul, replacement or modification shall be kept in respect of the equipment to a minimum period of two years.
- 4.2.1.4 Provision is made in the certificates for a record of an individual's proficiency. This may be used to record how often an individual performs maintenance duties on specific equipment and/or lapses in competency on specific equipment.

4.2.2. Training

- 4.2.2.1 A training program ensuring that the employees shall execute their positions and the activities laid upon them in an appropriate professional level according to the service provider procedures;
- 4.2.2.2 The training will be according to ICAO Doc 7192
- 4.2.2.3 The training program is accepted by the CAAI
- 4.2.2.4 The training program shall include separate parts according to these details:
 - 4.2.2.4.1. Initial training;
 - 4.2.2.4.2. Periodic training;
 - 4.2.2.4.3. Special training;
 - 4.2.2.4.4. Human factor training;
 - 4.2.2.4.5. Work safety;

4.2.3. Maintenance program

- 4.2.3.1 A maintenance program is the source of scheduled inspections, relevant controls and supporting data. The Maintenance Program should always be active (subject to review and amendment) and utilized such as to enable effective maintenance to be carried out in a logical, concise, clear and controllable manner.
- 4.2.3.2 The CAAI approval of the Maintenance Program provides a mechanism to record minimum standards that the service provider must comply with.
- 4.2.3.3 The maintenance program may be applicable to more than one Recording Equipment of the same type.
- 4.2.3.4 The inspector will review the maintenance program according to applicable supporting information provided by the service provider.
- 4.2.3.5 The maintenance program will be designed to meet Human

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Factors principles.

4.2.3.6 Consideration should be given to routinely monitoring equipment at adverse weather conditions (i.e. salt laden atmosphere, high humidity, extreme heat etc.). These considerations should include increasing maintenance inputs for cleaning, lubrication and inspection of protective finishes as an example.

4.2.3.7 The maintenance program should include:

4.2.3.7.1. Preface that include the following:

- The type/model of the equipment and, where applicable, power systems.
- A list of the manuals (reference, revision numbers) that were used to prepare the maintenance manual (supporting information).
- A statement signed by the service provider accountable manager that:
 - The specified equipment will be maintained according to the maintenance program; and
 - The program will be reviewed and updated as required; and
 - Practices and procedures to satisfy the maintenance program will be to the standards specified in the manufacture Maintenance Instructions. In the case of approved practices and procedures that differ, the statement should refer to them.

4.2.3.7.2. List of scheduled inspections that include for each task the following information:

- Task description
- Interval
- Reference to manufacturer manual or other supporting information.
- Skill of technician – if required.
- Applicability – if the maintenance program is used for more than one facility.
- List of items with life limitation (including the life limitation for each item).
- Required test equipment (including manufacturer, model, S/N and next calibration date)

4.2.3.7.3. Forms

- All the forms/log books that are going to be used will be part of the maintenance program.

4.2.3.7.4. Additional procedures if required

4.2.3.7.5. Permitted variations to maintenance periods

4.3. Additional information

The inspector will review all the other documents required by CAAI AP 1.7.005

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4.4. **Demonstration and Inspection Phase**

- 4.4.1. CAAI requires service providers to demonstrate their ability to comply with regulations and safe operating practices before issuing or amending ATM Unit license.
- 4.4.2. These demonstrations include actual performance of activities and/or operations while being observed by the inspector.
- 4.4.3. The demonstration will include:
 - 4.4.3.1 Factory Acceptance Test (FAT)
 - 4.4.3.2 Customer Acceptance Test (CAT)
 - 4.4.3.3 Site Acceptance Test (SAT)
- 4.4.4. The demonstration will include on-site evaluations of equipment maintenance and support facilities.
- 4.4.5. During these demonstrations and inspections, the inspector will evaluate the effectiveness of the policies, methods, procedures, and instructions as described in the Service provider manuals and other documents.
- 4.4.6. Deficiencies will be brought to the attention of the service provider and corrective action must be taken before an approval is issued.

5. **Task Outcomes**

- 5.1. After the document compliance and the demonstration and inspection phases have been completed satisfactorily, the inspector will notify the inspector in charge of the licensing project that the voice recording equipment (equipment model, frequencies, identification, location, limitations etc.) and supporting documentation is adequate.
- 5.2. The process above should be documented in the Sharedocs/Saar system.