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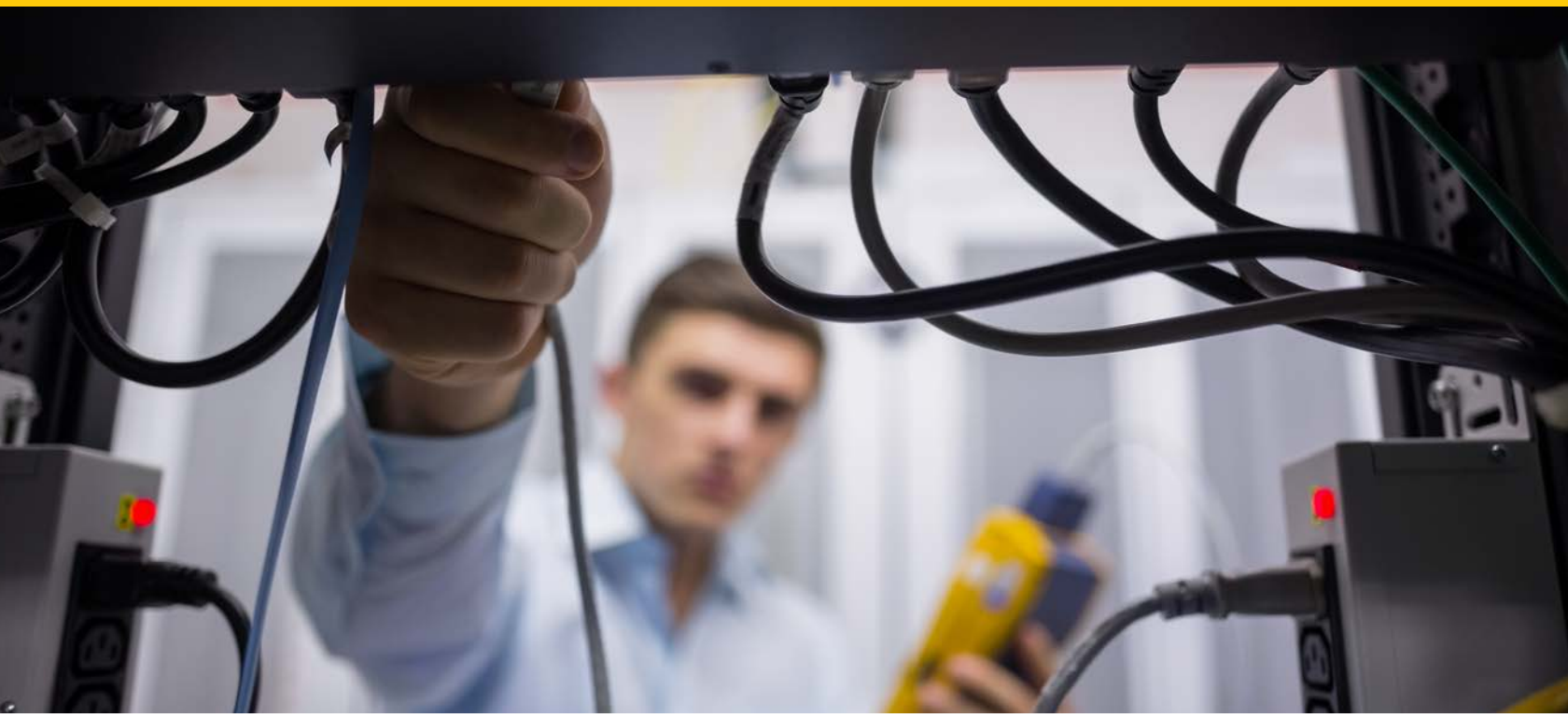
Manual on Air Traffic Safety Electronics Personnel Competency-based Training and Assessment

First Edition, 2017



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INTERNATIONAL CIVIL AVIATION ORGANIZATION

SUBJECT 8: DATA PROCESSING/AUTOMATION

TOPIC 1: DATA PROCESSING/AUTOMATION

SUB-TOPIC 1.1: Introduction to data processing

1.1.1	Describe the functions and generic architecture of the systems.	2	Generic FDP and SDP overall functional block diagrams.
1.1.2	Describe how the systems interface with other systems.	2	Surveillance sensors, displays, flight plan distribution systems, recording, international ATM networks. e.g. Safety nets, military interfaces.
1.1.3	Define basic software functions/applications.	1	FDP (route processing, code/call sign correlation, code allocation, strip distribution, track labelling) SDP (coordinate conversion, plot and track processing, MRP, safety nets, track labelling).
1.1.4	State the legal aspects for data processing in ATM.	1	Traceability and recording of data and actions, configuration control.
1.1.5	State the additional data used by ATM system.	1	e.g. MET, airlines
1.1.6	State current developments and future possibilities.	1	e.g. Coflight, iTEC, SESAR, NextGen, multisensor tracking.

SUB-TOPIC 1.2: System software and hardware principles

1.2.1	Describe the current hardware configurations used in ATM.	2	Redundancy and backup e.g. Driver, interfaces, hardware platforms, fault tolerant systems.
1.2.2	Describe the current software platforms, used in ATM.	2	Operating systems.

SUB-TOPIC 1.6: Miscellaneous information

1.6.1	State the additional data used by ATM system.	1	e.g. MET, airlines.

SUB-TOPIC 1.3: Surveillance data processing (SDP)

1.3.1	State ATC requirements.	1	QoS, mandatory data recording, dependability.
1.3.2	Explain the principles of SDP.	2	e.g. Single, multi, plot, track.
1.3.3	Describe the functions of SDP.	2	Plot processing, tracking, single sensor and multisensor tracker (e.g. radar, ADS, MLAT), estimating limits and accuracy of multisensor tracker, recording e.g. ARTAS tracker.
1.3.4	Describe radar data inputs/outputs.	2	Tracks, plots, messages, code/call sign, time, control and monitoring, conflict alerts, FDP interface, maps, adaptation.
1.3.5	Describe the surveillance data-based monitoring functions.	2	Safety nets, ATC tools e.g. Safety nets: STCA, MSAW, APW, runway incursion alerts ATC Tools: MTCD, AMAN, DMAN, A-SMGCS.

SUB-TOPIC 1.4: Flight data processing (FDP)

1.4.1	State ATC requirements.	1	QoS, unambiguous, accurate, error free, timely.
1.4.2	Explain the functions of FDP.	2	Flight strip production, flight plan data updates, code/call sign correlation, flight progress monitoring, coordination and transfer e.g. CIV/MIL coordination.
1.4.3	Define inputs and outputs.	1	Flow control flight strips/data displays, MRT, environmental data, static data, airspace adaptation.
1.4.4	Describe the basic software functions/applications.	2	FDP (route processing, code/call sign correlation, code allocation, strip distribution, track labelling).
1.4.5	Describe the FPL data update process.	2	Automatic and manual update.

SUB-TOPIC 1.5: Human machine interface systems

1.5.1	Describe the different display technologies.	2	Raster scan, common graphic display interface, LCD, plasma, TFT, Touch Input Device.
1.5.2	Recognize what information is normally displayed on the ATCO and ATSEP HMI.	1	—

SUB-TOPIC 1.6: Miscellaneous information

1.6.1	State the additional data used by ATM system.	1	e.g. MET, airlines.

EASA
European Aviation Safety Agency

ATM/ANS (IR + AMC/GM)

eRules

Appendix 2a – ATSEP Basic training – Streams

ATSEP UOID *(Unique Objective IDentifier)*	**CORPUS**	**Tax**	**CONTENT**
ATSEP.BAS.DPR	**DATA PROCESSING**		
ATSEP.BAS.DPR_1	**DATA PROCESSING**		
ATSEP.BAS.DPR_1.1	**Introduction to Data Processing**		
ATSEP.BAS.DPR_1.1.1	Describe the functions and generic architecture of the systems	2	Generic FDP and SDP overall functional block diagrams
ATSEP.BAS.DPR_1.1.2	Describe how the systems interface with other systems	2	Surveillance sensors, displays, NMOC, recording, international ATM networks e.g. safety nets, military interfaces
ATSEP.BAS.DPR_1.1.3	Define basic software functions/applications	1	FDP (IFPS, route processing, code/call sign correlation, code allocation, strip distribution, track labelling) SDP (coordinate conversion, plot and track processing, MRP, safety nets, track labelling)
ATSEP.BAS.DPR_1.1.4	State the legal aspects for data processing in ATM	1	Traceability and recording of data and actions, configuration control
ATSEP.BAS.DPR_1.1.5	State current developments and future possibilities	1	e.g. Coflight, iTEC, SESAR, multisensor tracking, SWIM, flight object
ATSEP.BAS.DPR_1.2	**System Software and Hardware Principles**		
ATSEP.BAS.DPR_1.2.1	Describe the current hardware configurations used in ATM	2	Redundancy and backup e.g. driver, interfaces, hardware platforms, fault tolerant systems
ATSEP.BAS.DPR_1.2.2	Describe the current software platforms, used in ATM	2	Operating systems
ATSEP.BAS.DPR_1.2.3	Describe concepts of virtualisation in ATM	2	Virtual Centre (Remote CWP - SESAR) e.g. display virtualisation (RDU: Remote Display Unit), server virtualisation (server consolidation)
ATSEP.BAS.DPR_1.3	**Surveillance Data Processing (SDP)**		
ATSEP.BAS.DPR_1.3.1	State ATC requirements	1	QoS, mandatory data recording, dependability
ATSEP.BAS.DPR_1.3.2	Explain the principles of SDP	2	e.g. single, multi, plot, track
ATSEP.BAS.DPR_1.3.3	Describe the functions of SDP	2	Plot processing, tracking, single sensor and multisensor tracker (e.g. radar, ADS, MLAT), estimating limits and accuracy of multisensor tracker, recording e.g. ARTAS tracker
ATSEP.BAS.DPR_1.3.4	Describe radar data inputs/outputs	2	Tracks, plots, messages, code/call sign, time, control and monitoring, conflict alerts, FDP interface, maps, adaptation

Appendix 2a – ATSEP Basic training – Streams

ATSEP UOID *(Unique Objective IDentifier)*	**CORPUS**	**Tax**	**CONTENT**
ATSEP.BAS.DPR_1.3.5	Describe the surveillance data-based monitoring functions	2	Safety nets, ATC tools e.g. safety nets: STCA, MSAW, APW, runway incursion alerts ATC Tools: MTCD, AMAN, DMAN, A-SMGCS
ATSEP.BAS.DPR_1.4	**Flight Data Processing (FDP)**		
ATSEP.BAS.DPR_1.4.1	State ATC requirements	1	QoS, unambiguous, accurate, error free, timely
ATSEP.BAS.DPR_1.4.2	Explain the functions of FDP	2	Flight strip production, flight plan data updates, code/call sign correlation, flight progress monitoring, coordination and transfer e.g. CIV/MIL coordination
ATSEP.BAS.DPR_1.4.3	Define inputs and outputs	1	Flow control (NMOC/IFPS/FMP, ETFMS), flight strips/data displays, MRT, environmental data, static data, airspace adaptation
ATSEP.BAS.DPR_1.4.4	Describe the basic software functions/applications	2	FDP (IFPS, route processing, code/call sign correlation, code allocation, strip distribution, track labelling)
ATSEP.BAS.DPR_1.4.5	Describe the FPL data update process	2	Automatic and manual update
ATSEP.BAS.DPR_1.5	**Human Machine Interface (HMI)**		
ATSEP.BAS.DPR_1.5.1	Describe the different display technologies and interfaces	2	Common graphic display interface, LCD, TFT, Touch Input Device, video interfaces, extenders e.g. DVI, HDMI, DisplayPort, Thunderbolt, video and USB signal extenders, video splitters and video frame rate encoders
ATSEP.BAS.DPR_1.5.2	Recognise what information is normally displayed on the ATCO and ATSEP HMI	1	-
ATSEP.BAS.DPR_1.6	**Miscellaneous Information**		
ATSEP.BAS.DPR_1.6.1	State the additional data used by ATM system	1	e.g. MET, AIM (NOTAMs), CDM, aircraft data