1. Course Title

**NATO Dual-band Auto-pointing Rapid deployable Terminal (DART) for Operator**

2. Identification Number (ID)

051

3. Purpose of the Course

To provide military and civilian personnel with knowledge and skills to

a. install and operate a DART SATCOM terminal;

b. perform limited preventive maintenance on the DART terminals. Repair actions are limited to the replacement of the Lowest Replaceable Unit (LRU) sub-assembly.

4. Learning Objectives

Upon completion of the course, the qualified student will be able to:

- Deploy, teardown and operate the DRAT terminal designated for operations and exercises.
- Perform basic activity to check the performances of the DART system.
- Maintain operational the DRAT system to ensure Satellite communications.

5. Qualification

**NATO SATCOM DART Operator**

6. Student Criteria

1. Been assigned to a NATO or National Signal Establishment with the role of technician or operator,
2. Have met the Background Knowledge Prerequisites,
3. Have successfully completed a national military or civilian course on basic electronics,
4. Have completed the pre-course study material (see item 16: Student has to complete the SATCOM basics (ID 601) course (pre-course study material) at [https://jadl.act.nato.int/](https://jadl.act.nato.int/). There will be an Exam on arrival questions are taken from the above on-line training)

7. Rank

- Officers
- NCO’s
- Civilian technicians and engineers
8. Language Proficiency

Language Proficiency according to STANAG 6001: English SLP 3232 and a detailed knowledge of
the applicable English electronic terminology.

9. Security Clearance

NATO Restricted

10. Course Length

5 working days

11. Special Instructions

12. Class Size
- Maximum
- Recommended
- Minimum

6/6/3

13. Nomination Procedures

See joining instructions and nomination procedure on www.nciss.nato.int

14. Pre-course Study Material

Student has to complete the SATCOM basics (ID 601) course at https://jadl.act.nato.int/
There will be an Exam on arrival questions are taken from the above on-line training.

15. Location

The course is conducted at the NATO Communications and Information Systems School (NCISS),
Latina Italy.

16. Background Knowledge Prerequisites

Completion of the ADL Course ID 601- SATCOM Basics Ver 3.0 is mandatory

I. BASIC MATHEMATICS

1. Simple algebraic equations, functions exponential & logarithms.
2. Decibel Notation (dB, dBW & dBm).

II. THEORETICAL KNOWLEDGE BY TECHNICAL SUBJECT

A. ELECTRICITY
1. Direct Current (DC) - Ohm's law.
2. Alternate Current (AC) - Wave shapes, Peak Values, rms Values.
3. DC/AC power – Impedance.

B. ELECTRONICS
1. Passive components (resistors, capacitors, inductors) fixed and variable.
2. Operational and Solid State Power Amplifiers (SSPA).
3. UPS.

C. TELECOMMUNICATIONS - PRINCIPLES AND TECHNIQUES.
1. RF basics.
2. Multiplexing basics (TDM, FDM).
3. Modulation – BPSK, QPSK and 8PSK.
4. Error detection / correction techniques

D. READING AND INTERPRETING ELECTRONIC / ELECTRICAL CIRCUITS AND INTERCONNECTION DIAGRAMS.

E. PRACTICAL EXPERIENCE BY FIELD OF ACTIVITIES - USE OF TEST EQUIPMENT.
1. Digital Multi-meter.
2. Oscilloscope.
3. Digital Data Tester & Data generator - Analyser.
5. Spectrum Analyser.
6. Earth resistance measurements.

F. PRACTICAL EXPERIENCE BY FIELD OF ACTIVITIES - USE OF TEST EQUIPMENT.

III. Basic Communication Systems (e.g. SATCOM, VHF-UHF, HF, LOS)

17. Modules