1. Course Title

Transportable Satellite Ground Terminal (TSGT) Generation 3 (G3) Operator Level II.

2. Identification Number (ID)

052

3. Purpose of the Course

To provide military and civilian personnel with knowledge and skills to perform field preventive and corrective maintenance for the:

NATO TSGT G3 Equipment.

Repair actions are limited to the replacement of the Lowest Replaceable Unit (LRU) sub-assembly. Maintenance levels will be to level 2 without supervision and assist CSSC (CIS Sustainment and Support Centre) in level 3 operations. This will reduce the interventions required by the CSSC and extend the duration between PMI’s hence: Enhancing the overall internal capability of the end users. 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 perform preventive and corrective maintenance on the assigned TSGT G3 equipment, including but not limited to and where applicable: LRU’s replacement and basic calibrations (e.g. setting limit switches, beacon receiver adjustments, EMS (Electronic Protective Measure Modem System) and ASNMC (Advanced SATCOM Network Management & Control) system basic upgrade and fault finding, M&C operation & maintenance, Power measurements, modem firmware upgrades, ACU configuration & fault finding.

5. Qualification

NATO SATCOM TSGT G3 Operator Level II

6. Student Criteria

1. Been assigned to a NATO or National Signal Establishment with the role of technician or Operator,

2. Successfully completed the New TSGT X-Band Operator Course 043 and have 6 months practical experience using the TSGT G3 in the field.

3. Have met the Background Knowledge Prerequisites (see item 16: 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 and on the New X-Band TSGT 043 training.

4. Knowledge of the general safety procedures for working with hazardous voltages.

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 CONFIDENTIAL (minimum)

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 and
on the New X-Band TSGT 043 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

Successfully completed the New X-Band Operator Course 043 and have **6 months practical experience** using the TSGT G3 in the field.

**I. BASIC MATHEMATICS**

1. Simple algebraic equations, functions exponential & logarithms.
2. Trigonometry (sine, cosine, tangent & graphical representation).
4. Decibel Notation (dB, dBW & dBm).
5. Basic knowledge of BOOLEAN ALGEBRA.

**II. THEORETICAL KNOWLEDGE BY TECHNICAL SUBJECT**

**A. ELECTRICITY**

1. Direct Current (DC) - Ohm’s law - Kirchhoff’s laws. Units of measurements for voltage, current & resistance.
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.
5. Antenna and propagation basics.

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

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

1. Analog and Digital Multi-meter.
2. Oscilloscope.
3. Digital Data Tester & Data generator - Analyser.
5. Spectrum Analyser and Sweep generator.
6. Microwave Power Meter.
7. Earth resistance measurements.

17. Modules
N/A