1. Course Title

NATO Transportable Satellite Ground Terminal (TSGT) Technician.

2. Identification Number (ID)

035

3. Purpose of the Course

To provide military and civilian personnel with knowledge and skills to operate and perform preventive and corrective maintenance on the TSGT equipment. 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:

a. Operate the NATO Transportable Ground Terminal Equipment.
b. Perform preventive on the NATO Transportable Ground Terminal
c. Perform fault-finding and repair actions down to Lowest Replaceable Unit (LRU).

5. Qualification

NATO Transportable Satellite Ground Terminal (TSGT) Field Maintenance Technician

6. Student Criteria

1. Been assigned to a NATO Transportable SGT as Chief Electronic Maintenance Technician or Electronic Maintenance Technician,
2. Have successfully completed a national military or civilian course on basic electronics,
3. Have met the Background Knowledge Prerequisites (see item 16 and: 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).
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

15 working days (3 weeks, 5 days/week)

11. Special Instructions

Homework and self-study will be requested to the students. Internet access will be granted since SATCOM Basic and other study material are online.

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. 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. Solid State (diode, transistors PNP-NPN, FET, LEDs).
4. Integrated Circuits (SSI, LSI).
5. Devices - Analog (rectifiers, power supplies).
6. Devices - Analog (amplifiers "all types", oscillators, tuned circuits).
7. Devices - Digital (Gates: AND, OR, XOR, Inverters)
8. Devices - Digital (Gates: FF's counters, registers, multiplexers, converters)
10. TWT Amplifiers (microwaves)
11. Microprocessors (CPU)
12. Memories (ROM, RAM, EPROM, EEPROM).
14. Input / Output Units

C. TELECOMMUNICATIONS - PRINCIPLES AND TECHNIQUES.

2. Signal Codes (BCD, ASCII).
3. Telephony - Telegraph codes, speed and distortion - Teletype operation concept.
4. Data Modem - peripherals (printers, VDUs).
5. Telephony - Voice coding (PCM - Delta modulation).
6. Multiplexing - TDM - (applied to telephony).
7. Multiplexing - FDM - (applied to telephony).
8. Modulation - PSK and QPSK.
9. Error detection / correction techniques
10. Antenna and propagation.

D. STANDARDS AND PROTOCOLS
1. ISO - 3309 – 1976
2. EIA - RS 232C, EIA - RS 422, RS 423, RS 449

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

IV. PRACTICAL EXPERIENCE BY FIELD OF ACTIVITIES.

A. USE OF TEST EQUIPMENT.
1. Analog / Digital Multimeter.
2. Multi Trace Oscilloscope.
3. Frequency Counter.
5. Spectrum Analyzer / Sweep generator.
6. Microwave Power Meter.
7. PCM Test Set.

B. HANDLING OF PRECISION EQUIPMENT.

C. REPAIR / MAINTENANCE AND MEASUREMENTS ANALOG OR DIGITAL (min 6 months experience).
1. Digital Equipment Troubleshooting Maintenance technique (solid state).
2. Analog Equipment Troubleshooting Maintenance technique (PCB level) (solid state).
3. Battery Charge, reserve battery dc supplies.

17. Modules
N/A