Training and Certification Program

Presented by:
Claudiu Mateescu
International Committee of the Red Cross
Who we are

• The association of the global satellite communications industry
• Not-for-profit
• 200+ member organizations
• All major satellite operators, manufacturers, & service providers

• Experienced satellite systems engineers
• Instructional designers & Flash developers
• Partnered with GVF
• Training content creation and program administration
• Created content for, and manages, the highly-successful GVF training program (10,000+ trainees, VSAT, marine, mobile)
Who we are

The International Committee of the Red Cross (ICRC) is an impartial, neutral and independent organization whose exclusively humanitarian mission is to protect the lives and dignity of victims of armed conflict and other situations of violence and to provide them with assistance.

The ICRC also endeavours to prevent suffering by promoting and strengthening humanitarian law and universal humanitarian principles.

- More than 11,000 staff in 250 offices around 80 countries.
- Around 200 engineers and technicians
  - 160 registered to GVF modules
  - 1 Examiner + 5 Advanced Satcom Professionals
- Around 130 VSAT terminals
Why GVF online simulator-based training?

- Global, scalable, low cost
  - Over 10,000 enrolled
- Simulators teach and assess technical skills
- Courses are self-paced, available 24 hrs
- Automatic course and prerequisite linking for certification management
- Registration self service or by order.
- Dedicated student support staff
- Requires only a moderate-speed Internet connection and browser with Flash player
- Simulator skills assessments connect to LMS student scores
- Multi-language instant-switch capability
- Readily customized for each organization

Student learning system user interface, showing customization
Who is using GVF training?

... and many, many more.
Endorsed by WBU-IMCG

- The International Media Connectivity Group (IMCG, previously ISOG), founded in 1985, is a committee of the World Broadcasting Unions (WBU).

- IMCG provides a global forum for members of the WBU to exchange information, outline requirements and resolve common operational problems. WBU-IMCG's mission includes identifying solutions for all operational matters associated with satellite transmission of broadcast-related data, and to work with all international broadcast groups to achieve these solutions.

- **In 2014, WBU-IMCG formally endorsed the GVF training and certification program, including the ITU-R S.2049-compliant criteria for certifying operators of broadcast, mobile, and SNG uplink terminals.**
Our mission:

Reach *all* VSAT installers!

12,000+

worldwide have engaged in GVF training...

...but there may still be 10,000-40,000 untrained field technicians still out there.
How to fight interference

**REACTION**

- CARRIER ID
- GEOLOCATION
- COLLABORATION

**PREVENTION**

- EQUIPMENT QUALITY
- TRAINING
Role of training in interference prevention

- CARRIER ID
- GEOLOCATION
- COLLABORATION
- INTERFERENCE
- ASI
- CROSS-POL
- EQUIPMENT QUALITY
- POWER/FREQ/BW
- RE-RADIATION
- TRAINING

GVF Training and Certification Program
Interference impacts all satcom users

Interference source: Adjacent Satellite (ASI)
Training objective: Beam-balance antenna pointing technique
Interference impacts all satcom users

How cross-pol interference affects other users
Let’s rotate the feed left and right, and watch how the cross-pol interference gets stronger and weaker.

Interference source: Cross-pol interference
Training objective: Feed alignment and cross-pol test skills
Interference impacts all satcom users

Correct carrier levels

Interference source: Excess carrier power intermodulation
Training objective: Transmit power lineup skills
Why is interference increasing?

The perfect storm:
Small dishes (wide beams) x Cheaper labor x High volumes

As volumes grow, hardware costs are now well below $1000 terminal, labor costs are also lower, and high volumes result in more interference incidents.

Over 100,000 Ku-band VSATs are installed every year. Any one can cause serious interference.

1990 Today

13 GVF Training and Certification Program
Satcom Professional program

For installers and field technicians/engineers of fixed VSAT terminals.
Satcom Professional Certifications

Interference-prevention emphasis:
- Beam balance pointing (prevent ASI)
- Cross-pol alignment
- Connector attachment (prevent re-radiation)
**Satellites in orbit**

VSAT's almost always use satellites in "GEO" orbit. There are other kinds of orbits used for satellites, too. Click NEXT to learn more.
Exercise: find and peak

You must **find** the satellite and perform the **initial peak in azimuth and elevation**. You may assume the following:

**Your location is 165 deg W, 37 deg N. The satellite is at 175 deg W. The VSAT will use H downlink polarization. Pointing angles from your look angle calculator: True azimuth = 196, Elevation = 46, Polarization = 13.**

Remember your steps:

1. Preset the polarization. Use the Quick Reference Sheet to help make sure you are turning the right way.
2. Preset your elevation.
3. Scan coarse az to find the satellite. Step elevation up and down and scan az again if needed
4. Peak it with the el and fine az adjusters.
5. **Lock the coarse azimuth clamps.**

When you have finished, or you need a hint, click the SHOW MY RESULTS button.
Marine program

For operators (seafarers) and field engineers (installers and maintainers) of marine stabilized-antenna terminals.
Marine Certifications

 Operators On Board Vessels

GVF Specialist Marine VSAT Operator Certifications

561: Fundamentals for Marine VSAT Operators

562E: Operating the Sea Tel Model '09 series Marine VSAT

562E-IMA: Operating the Sea Tel Model 'IMA series Marine VSAT

562T: Operating the HCC SpaceTrack 4000 Marine VSAT

520: Satcom Fundamentals

503E: Sea Tel Model 09 series Installation and Maintenance

503E-S1: Sea Tel Model 09 series Installation and Maintenance

HOST-E Sea Tel hands on skills test (appr. by Sea Tel)

HOST-T ST4000 hands on skills test (appr. by HCC)

GVF Specialist Marine VSAT Operator Certifications

GVF Marine Installation & Maintenance Certifications

Interference-prevention emphasis:

- Blockage
- Workmanship
- Cross-pol

* HCC cert. also requires GVF 510 & 521
Balancing exercise
This antenna is unbalanced. In this exercise, you must balance it by attaching weights and then test for balance using the procedure you have learned.

When you have finished, or you need a hint, click the SHOW MY RESULTS button.

Passed horizontal balance test? No.
Passed vertical balance test? No.
Mobile/SNG/Broadcast program

For operators of:

- Auto-deploy/auto-point terminals
- Uplinkers operating traditional SNG vehicles
- Any terminal with manually-controlled modem/RF/antenna equipment and spectrum analyzer for pointing
Mobile/SNG Certifications

Autopoint terminal operators

Operators of SNG or other manually-controlled uplinks

GVF Training and Certification Program

GVF 530 Core skills for Mobile Satellite Terminal Operators

GVF 531 Access Procedure Skills

GVF 532 Core Uplinking Skills

GVF 909A Satcom Theory for Broadcast Uplinkers

Interference-prevention emphasis:

- Line of sight
- Verify pointing accuracy (beam balance)
- Verify cross-pol
- Identify correct satellite before uplinking
- Follow General Access Procedure
- Control uplink power and avoid IMD
- General theory
Line of sight skills 3-D simulator

Line of Sight (LOS) practice exercise

Which (if any) antenna positions give clear line of sight to your satellite?

Magnetic azimuth = 184°, Elevation = 48°.

Remember to allow 10° clearance on all sides, and read the HELP carefully before you start!

<table>
<thead>
<tr>
<th>Position</th>
<th>Line of sight?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>
Manual acquisition skills practice
Your autopoint terminal is trying to point to the wrong satellite. You must put the controller into manual mode, and use the az and el jog controls to find the correct satellite.

When you have finished, or you need a hint, click the SHOW MY RESULTS button.
Cross-pol skills simulator (Autopoint)

Adjust cross-pol with SAC

In this exercise, you must follow the SAC (Satellite Access Center) tech's directions to run a cross-pol check. IMPORTANT: Click TASK for complete details about your assignment, how to pass, and tips. When you have finished, or you need a hint, click the SHOW MY RESULTS button.

SAC: Thank you for calling XYZSat. I would be pleased to help you do an uplink crosspol alignment. Please initiate a CW test carrier at 14174.700 MHz.

This panel shows your telephone dialog with the SAC technician.

This panel represents the controls for transmitting a test signal from your modem. This example is based on IDirect, but every modem will have a similar function via a web page or on its front panel.

This panel represents the controls for the antenna controller in your auto-point terminal.
What does a 70 MHz upconverter do?

In a "70 MHz" uplink system, the modulator outputs a signal in the neighborhood of 70 MHz. Normally the modulator has a range of only about +/- 18 MHz. Therefore, the upconverter must also have a frequency adjustment, so you can choose where in the RF band you want the signal to be placed.

Click NEXT to learn more.
Full-arc spectrum simulator

Find the satellite & point
You must find your assigned satellite and accurately point the antenna. Click TASK for full details of your task assignment and tips. When you are finished click SHOW MY RESULTS.

Antenna position controller
- AZ: 94.8
- EL: 31.4
- POL: 38.2
- JOG SPEED: SLOW

Full-arc spectrum simulator
Access procedure skills test
In this exercise, you must preset your pol, then follow the SAC (Satellite Access Center) tech’s directions to run a cross-pol check and bring up your uplink. Assume you have already pointed the antenna in az and el. Click TASK for complete details about your assignment, how to pass, and tips. IMPORTANT: THIS IS A TEST OF YOUR ABILITY TO PRECISELY FOLLOW WRITTEN AND VERBAL INSTRUCTIONS!

When you have finished, or you need a hint, click the SHOW MY RESULTS button.

SAC: Thank you for calling XYZSat. I would be pleased to help you activate your uplink. We will do a CW uplink crosspol check and alignment, and then bring up your modulated carrier on your assigned frequency to the correct level. First, please PRESET YOUR POLARIZATION angle and assume Vertical downlink and Horizontal uplink. Then when you are ready, go ahead and initiate a low-level CW test carrier at 14204.100 MHz.

Unlimited tries are allowed.
What’s new?

New online courses:

• GVF 811: Carrier ID Principles and Operation

• GVF 514: Installing VSATs with Integrasys Satmotion

• O3b 731: Introduction to O3b Networks

All are available at no additional charge for GVF Knowledge Center subscribers.
# Contacts

<table>
<thead>
<tr>
<th>Global VSAT Forum</th>
<th>SatProf, Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://www.gvf.org">www.gvf.org</a></td>
<td><a href="http://www.satprof.com">www.satprof.com</a></td>
</tr>
<tr>
<td>David Hartshorn</td>
<td>Greg Selzer</td>
</tr>
<tr>
<td><a href="mailto:david.hartshorn@gvf.org">david.hartshorn@gvf.org</a></td>
<td><a href="mailto:greg@satprof.com">greg@satprof.com</a></td>
</tr>
<tr>
<td>+1-202-390-1885</td>
<td>+1-214-507-7059</td>
</tr>
</tbody>
</table>

Thank you!