

Be Prepared to Deploy Critical Communications

Equip Your Response Team with Solid Skills

VSAT stations can provide instant, high-bandwidth voice and data communications anywhere, but installations require a high level of technical training. In an emergency, field crews need to know how to quickly and accurately deploy satellite terminals for reliable communications links without creating destructive interference to other services. That's why satellite operators and manufacturers worldwide strongly recommend or require that all VSAT installation personnel become Certified through the Global VSAT Forum (GVF).

The Global VSAT Forum is the industry's non-profit association, through which the **VSAT Installation & Maintenance Training Course** has been established to serve as the international standard of excellence... regardless of the equipment involved.

The Global VSAT Forum Certified Installer Database

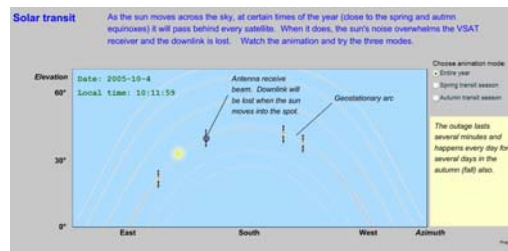
GVF provides immediate public access to its Certified VSAT Installers by including them in the GVF Certified Installer Database at www.gvf.org, the number-one Web resource for satellite communications support. Emergency managers who need to make contact with an international pool of highly qualified satellite communications installation technicians rely upon this complimentary resource before, during and after emergencies occur – anywhere throughout the world.

IAEM and GVF bring on-site training to the EMEX expo, Orlando, November 2006

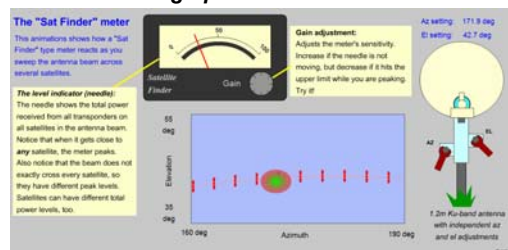
The GVF VSAT Installation & Maintenance Training Course consists of three levels. The first two levels can be taken online at www.gvf.org, where live animations clarify complex concepts. Hands-on skills can be practiced with realistic interactive simulations in more than 250 learning pages. All that is needed is Internet access and a computer with the free Flash player installed. Trainees can take advantage of:

- Numerically accurate, interactive simulators
- Access any time, 24/7
- Learning at their own pace
- Review of the materials at any time
- Ability to check their knowledge with quizzes
- On-line tests for Level 1 and Level 2 Training
- Printing of Certificate upon Course completion
- Access to the reference materials library

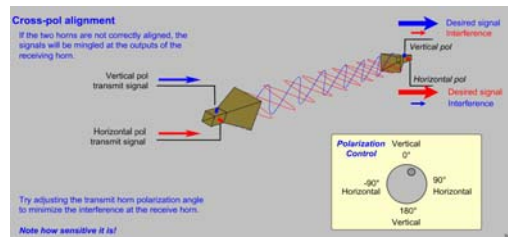
Register today at the GVF Training Portal (gvf.coursehost.com), complete the on-line Level 1 and Level 2 Courses, and join the IAEM-endorsed Level 3 class in Orlando. For further details, visit the GVF Training Portal.



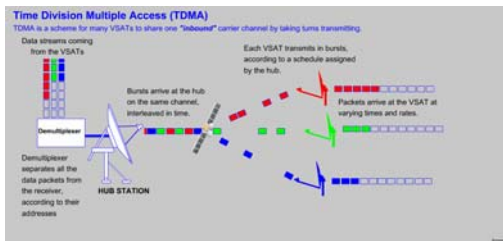
Visualize the process of solar transit with this graphic animation



Practice your dish pointing skills with the hands-on simulator.



Understand cross-polarized signal separation by experimenting with antenna alignment



Learn how TDMA, DAMA, and other access methods work with animated illustrations

On-line course outlines

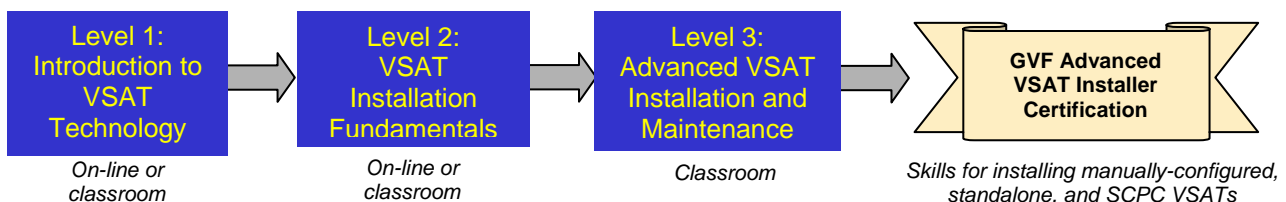
Level 1: Introduction to VSAT Technology

1. **About the Global VSAT Forum:** Activities, regulatory, industry advocacy, training programs and certifications.
2. **Communications technologies:** Demographics and technologies; microwave, fiber, wireless, satellite; economics of fiber vs. satellite; global demographics and satellite applications.
3. **Satellite communications and spacecraft:** How satellites work; myths and truths; strengths and weaknesses; payloads; bent-pipe and on-board processing transponders; launch methods; launch and spacecraft costs; lifetimes.
4. **Orbits:** Gravity and momentum; orbit period and altitude; GEO, MEO, and LEO; properties of geostationary orbits; global coverage; orbit slots; co-location; stationkeeping.
5. **Dish pointing concepts:** Latitude, longitude; azimuth and elevation; the GEO arc; az-el beam movement across the arc.
6. **Footprints:** Downlink signal strength; downlink EIRP; uplink and downlink footprints; contours; examples.
7. **Electromagnetic waves and frequencies:** Fundamentals of waves; amplitude and frequency; the spectrum; bands; C, Ku, and Ka band allocations for satcom; latency (delay) effects.
8. **Access methods:** SCPC and fixed point-to-point links; bandwidth sharing; TDM and TDMA, FDMA, SCPC, DVB-RCS, DAMA; comparisons and applications; interoperability and standards.
9. **Earth stations and VSAT terminals:** Components in VSAT and SCPC terminals; BUCs, LNBs, antenna and feed systems; modems; large earth station equipment; typical block diagrams; examples.
10. **VSAT networks:** Satellite vs. terrestrial tradeoffs; deployment options; capital and recurring cost tradeoff issues; operator specifications and type approvals; international, national, and local regulatory factors; the importance of high quality installations.

Level 2: VSAT Installation Fundamentals

1. **GVF VSAT Training:** Certifications; sequence of courses.
2. **Signals and Noise:** Amplitude and frequency review; units you should know; Watts, decibels, and gain; signal power and bandwidth; noise power and bandwidth; C/N and C/No, and Eb/No.
3. **Antennas:** Types and operating principles; gain; patterns; beamwidth and diameter; sidelobes and effects.
4. **Propagation:** Blockage; free space loss; water loss; rain zones; elevation effects; solar transit outages.
5. **Modulation:** Analog and digital modulation; BPSK, QPSK, 8PSK, 16QAM; symbol rate and bit rate; forward error correction; bit error rate and packet loss rate; BER and TCP/IP.
6. **Satellite Links:** Link budget concepts; anatomy of a link budget; fade levels; link margins; availability; fade countermeasures.
7. **Polarization:** Launching linearly polarized waves; matching transmit and receive antenna orientations; cross-polarized signals and XPD; pol frequency re-use and cross-pol transponders; cross-pol interference; circular polarization; pros and cons of LP and CP.
8. **VSAT equipment:** Downconversion and upconversion; LNB, BUC, IFL cables, IDU/modem, feed systems; block diagrams.
9. **Site survey and planning:** Site survey; etiquette; line of sight; how to find required azimuth and elevation; using a compass and inclinometer; mount types and their applications; checklist.
10. **Installing the equipment:** Installing the mount; plumbing the mast vertical; pre-setting the antenna.
11. **Grounding:** Lightning strikes; grounding options and rules.
12. **Antenna az-el pointing:** Maximizing link quality and preventing interference; meter types; finding the right satellite; simple peaking; beam balance peaking; simulator exercises.
13. **Cross-pol alignment:** Preventing cross-pol interference; methods for setting pol angle; manual and automatic cross-pol checks; simulator exercises.
14. **Carrier lineup and link test:** Operator authorizations; carrier lineup and test signals.
15. **Data interface concepts:** Ethernet; Internet Protocol (IP); configuring gateways, subnets, and net masks; proxies.
16. **Review of the installation process:** The key installation steps: site survey, mounting the outdoor equipment, IFL and grounding, dish pointing and cross-pol, indoor eqpt, bringing up the carrier and testing the link.
17. **Troubleshooting and maintenance:** Common field mistakes; troubleshooting link, network, and interference problems; preventive maintenance.

Certification course structure



Global VSAT Forum
The association of the global VSAT industry.
www.gvf.org



SatProf, Inc.
Animated, interactive, technically-accurate on-line training for satellite professionals.
www.satprof.com