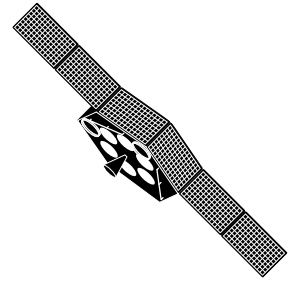# THE AMATEUR SATELLITE RESOURCE GUIDE

Are you a new Amateur Satellite operator, or are you considering becoming one? If so, you probably have a thousand questions you want answered. Some people like to just dive into a hobby and learn by trial and error while others like to take their time and gather as much information as they can before taking the plunge. It is for the latter group that this list was created. Fortunately, there are many good sources of information available, from books and periodicals to FAQS and server files, many of which are gathered here. This list is by no means complete, but will serve as a starting point as you begin to learn more about this exciting aspect of Amateur Radio.

Books

The AMSAT-NA Digital Satellite Guide, G. Gould Smith, WA4SXM, et al

>Available from AMSAT HQ. An introduction to operating through the packet satellites, including the use of the DOS programs PB and PG, which are included on diskette.

The AMSAT-UK Guide to OSCAR Operating, R.W.L. Limebear, G3RWL

>Available from AMSAT-UK. Compiled by the author from his original work and information derived from other satellite operators world-wide. Includes sections on tracking, setting up a station, history of the Amateur Satellite program, Doppler shift, band plans, and much more. Includes a four page insert with material updated January, 1997.

The ARRL Handbook for Radio Amateurs, Paul Danzer, N1II, editor, satellite section edited by Robert Diersing, N5AHD

>Available from the ARRL and other sources. Although not totally devoted to satellite operations, the Handbook covers practically everything that an Amateur needs to know. Filled with theory, applications, and construction articles. The 1997 edition contains 39 pages on satellite communications, including updated information on digital satellites. A "must have" book. The new Handbook on CD contains actual sound files from several Amateur satellites.

The ARRL Satellite Anthology, Rich Roznoy, KA1OF, et al

>Available from the ARRL, AMSAT HQ and other sources. A compilation of articles on satellite operation previously published in QST Magazine, the AMSAT Journal, and the World Wide Web.

How to Use the Amateur Radio Satellites, Keith Baker, KB1SF

>Available from AMSAT HQ. Describes each of the currently available satellites, Mir and SAREX. Includes several pages on the requirements for working the satellites, plus some "do's and don'ts" to make your operating more enjoyable.

The RS Satellites Operating Guide, G. Gould Smith, WA4SXM

>Available from AMSAT HQ. An overview of working RS-10, RS-12, RS-15, and Mir. A very good introduction to satellite work.

The Satellite Experimenter's Handbook, Martin Davidoff, K2UBC

> Available from the ARRL, Amsat HQ and other sources. Considered by many to be "the book" on operating the Amateur satellites. Contains the history of the program, theory, and construction articles.

Periodicals

The AMSAT Journal

> Published by AMSAT-NA. Bimonthly magazine sent to AMSAT members.
> AMSAT
> 850 Sligo Avenue #600
> Silver Spring, MD 20910
> (301) 589-6062

CQ (monthly magazine - has a satellite column)
CQ VHF-Ham Radio Above 50 MHz (monthly magazine - satellite column by G. Gould Smith, WA4SXM)

> CQ Communications, Inc.
> 76 North Broadway
> Hicksville, NY 11801
> (516) 681-2922

OSCAR Satellite Report (bi-weekly newsletter)

> R.Myers Communications, L.L.C.
> P.O. Box 17108
> Fountain Hills, AZ 85269
> (602) 837-7108

QST (magazine - has a monthly satellite column)

> American Radio Relay League
> 225 Main St.
> Newington, CT 06111-1494
> (860) 594-0200

Satellite Times (bi-monthly magazine covering all types of satellites, has an Amateur Satellite column)

> Grove Enterprises, Inc.
> P.O. Box 98, 7540 Highway 64 West
> Brasstown, NC 28902-0098
> (704) 837-9200

Worldradio (magazine - has a monthly satellite column)

> Worldradio, Inc.
> 1901 Royal Oaks Dr., #190
> Sacramento, CA 95815
> (800) 366-9192

73 Amateur Radio (magazine)

> Wayne Green, Inc.
> 70 Route 202 North
> Peterborough, NH 03458
> (603) 924-0058

E-Mail Resources

AMSAT mailing lists

> There are several of these, each with a specific purpose:
>
> **ANS** - official AMSAT News Service bulletins
> **AMSAT-BB** - the AMSAT "bulletin board" list
> **AMSAT-DC** - Items of interest to AMSAT people in the District of Columbia area and anyone interested in their projects.
> **KEPS** - Keplerian element distribution
> **SAREX** - Information on the SAREX project
>
> Send E-Mail to listserv@amsat.org with a message telling which lists you wish to subscribe to, your call sign, and your E-Mail address. These lists are manually maintained so allow a few days for your requests to be processed.

ARRL Mail Server

> Send an E-Mail message to info@arrl.org. In the message body, put "send index" (new line) "quit" (both without quotes). You will receive the most recent index of all files available on the Server. Be warned that the index is large and will be sent in two parts. There are several good text files here on working the satellites, as well as information on many other topics.

Ham-Space Digest

> A digest of the newsgroup rec.radio.amateur.space. Subscription requests should be sent to: Ham-Space-Request@ucsd.edu.

FTP Resources

> A good way to access an ftp site is to use a Web browser and use a URL in the form of "ftp://sitename/".

archive.afit.af.mil (129.92.1.66)

> An anonymous ftp site with Keplerian element sets that are updated daily. Also has some documentation and software. Look in the /pub/space directory.

ftp.amsat.org

> An anonymous ftp site with lots of text, GIF, and program files of interest to the satellite operator. An index of available software may be found on the AMSAT Web site at URL http://www.amsat.org/amsat/ftpsoft.html.

ftp.funet.fi

The anonymous site of the Finnish University and Research Network with extensive files for practically every computer platform. Download the file 00index.all from the directory /pub/ham for a complete listing. Of particular interest are the selections under /pub/ham/satellite and /pub/ham/vhf-work.

ftp.tapr.org

An anonymous site maintained by the Tucson Amateur Packet Radio Corporation. Although not a satellite oriented organization, TAPR has played a big part in the Amateur digital communications world, much of which is applicable to the packet satellites. Available at the site are several software packages of benefit to the satellite operator.

oak.oakland.edu

A huge selection of Ham radio files, including satellite related information and programs.

Telnet Resources

callsign.ualr.edu:2000

Operated by the University of Arkansas, Little Rock Amateur Radio Club. Allows the user to look up addresses of licensed Amateurs in the United States. Updated daily from the FCC data base. If your system won't allow this address, try deleting the colon (:) and replacing it with a space (callsign.ualr.edu 2000).

oig1.gsfc.nasa.gov

The NASA Goddard Space Flight Center's RAID BBS has Keplerian elements that are updated within two hours of being released. To access, use username: oig and password: goddard1.

World Wide Web Resources

http://www.amsat.bm

Home page of AMSAT-BDA, sponsored by the Amateur Radio Satellite Group of Bermuda.

http://www.system-one.com/sdfx/

Lots of information on DX available to the satellite operator, including upcoming DXpeditions, known active DX countries and a satellite DX standings list can be found in the Satellite DX Foundation's page.

http://acsprod1.acs.ncsu.edu/scripts/HamRadio/sattrack

A great site with information on getting licensed (including sample tests), a satellite pass prediction program, links to call sign servers and many other locations. Operated by the NC State University Amateur Radio Club.

http://www.amsat.org/

The World Wide Web AMSAT-NA connection. Has information on AMSAT, articles, photos, and a link to the AMSAT ftp site for downloading software. This is the best place to start when looking for Amateur Satellite information and links to other sites.

http://www.aras-sara.ca/arasbook.htm

Web site for Canadian QSL address information.

http://www.arrl.org/

Home page of the American Radio Relay League. Contains lots of information on becoming a Radio Amateur, plus links to sites for practically any Amateur related activity. Also has links to ftp servers for downloading software.

http://gndstn.sp.nps.navy.mil/

Sponsored by the Naval Postgraduate School's Space Systems Academic Group, this site is a remote ground station, using the WiSP program, for accessing the downloaded directories, files, and images from UO-22, KO-23, and KO-25.

http://www.grove.net/~tkelso/

Has NORAD two line element sets updated daily. Documentation and software are also available.

http://www-dx.deis.unibo.it/htdx/sats/satmain.html

Sponsored by the 425 DX News Bulletin from Italy, contains summaries of frequencies, orbits and other data of the current satellites, as well as FAQs in English, Italian, and Spanish.

http://www.dxer.com

A very extensive collection of links to various sites supporting all aspects of Ham Radio.

http://www.seva.net/vascarg

Sponsored by the VASC Amateur Radio Group at the Virginia Air and Space Center, the official visitor center of the NASA Langley Research Center.

http://www.tapr.org/

The Web site for TAPR. See the discussion of ftp.tapr.org above.

http://www.ualr.edu/~hamradio/

Web site for US QSL address information, updated daily from the official FCC Web site. Maintained by the University of Arkansas, Little Rock radio club.

http://www.wwnet.com/~jsmyth/index.html

The page of the Southeast Michigan Area AMSAT group. Has information about SAREX, pacsats, and analog satellites.

Other WWW sites - All of the above have links to other sites, some containing much more than information on satellites. With the content of the World Wide Web growing so quickly, there are many more sites of which I am unaware. The great thing about the World Wide Web is that you can point your browser to any Ham site and just see where it leads you!

Newsgroups

If you have a newsgroup reader, rec.radio.amateur.space is where you will find messages on Amateur satellites, Mir, SAREX/Shuttle, weather satellites, etc.

On-Line Sources

Almost all of the large on-line services have sections devoted to Amateur Radio and most of these have a Satellite sub-section. These are good places to find many of the shareware and freeware programs available. Some also offer "forums", "chat rooms", or "bulletin boards" for the exchange of messages.

HF & VHF Voice Nets

International Nets

AMSAT South Pacific	Saturday	2200 UTC	14.282 MHz
AMSAT International	Sunday	1900 UTC	14.282 MHz

USA Regional Nets

AMSAT-NA East Coast	Tuesday	2100 Local	3.840 MHz
AMSAT-NA Mid-America	Tuesday	2100 Local	3.840 MHz
AMSAT-NA West Coast	Tuesday	2000 Local	3.840 MHz

Local Nets

There are many local nets, primarily on 2M repeaters. One of particular note due to its multiple methods of distribution is:

Houston Area AMSAT Net	Sunday	2200 Local	1.860 MHz

and is also available via Real Audio at http://www.phoenix.net/~paigecom/ and on SBS6, T13B, 12.031GHz at 74 degrees. (That's 2200 Local to Houston, TX, by the way.) A complete listing of on-the-air nets is available at http://www.amsat.org/amsat/activity.html or by calling/writing AMSAT HQ.

Other Resources

Practically everywhere. Don't forget your local BBS, PBBS, club, SIGs, Hamfests and various Conventions. Some of the bulletins available of interest to the satellite operator are:

ANS

The official news bulletins distributed by AMSAT, these may be received by subscribing to the ANS list (see above) and may also be found on packet and land-line bbs's, and is uploaded weekly to KO-23. Current and archived editions are available on the AMSAT Web site. (http://www.amsat.org/amsat/news.html)

Spacenews

Published and distributed by John Magliacane (KD2BD), this weekly bulletin covers Amateur satellites and has occassional articles about the space program and interesting astronomical phenomena. Spacenews is available by subscribing to the ANS mailing list, and from the same sources as ANS, including the AMSAT Web site (same URL as ANS).

SATGEN

Written by John Branagan (GM4IHJ), SATGEN is not a traditional "news bulletin", but instead each issue (sometimes a series of issues) covers a technical topic related to the Amateur satellites (in particular) and non-Amateur satellites (in general). SATGEN is distributed via packet and is also available from the AMSAT ftp and Web sites. There are two indexes to the SATGEN bulletins on the AMSAT Web site, one chronological by issue number and the other by subject keyword. URL http://www.amsat.org/amsat/articles/satgen/sategn.html has links to both indexes as well as the current issue.

A Word About Equipment and Software

I have purposely not suggested equipment. I can not and will not give recommendations on what you should buy as this should be a personal choice based upon your needs, financial situation and intended modes of operation. There is a lot of good equipment, new and used, available from a variety of sources, and don't forget that building at least part of your station can be a rewarding and educational experience.

Consider doing one or more of the following: collect catalogs and fliers at Hamfests, call the manufacturers for specification sheets and talk with your friends. Read the magazines listed above; they are full of advertisements, and don't forget the For Sale section in the back. Pay attention to the postings on AMSAT-BB, Ham-Space Digest, and rec.radio.amateur.space; there is almost always a string of "Which radio should I buy?" messages in progress. A list of some of the manufacturers that sell new hardware of interest to the Amateur Satellite operator can be found at http://www.amsat.org/amsat/suppliers.html.

There are so many available software titles, it would be impractical to list them all, but any program needed, from tracking and terminal emulation to telemetry decoding and APT, can be found for a variety of computer platforms: DOS, Windows, OS/2, Macintosh and Unix/Linux. As a starting point, though, here are a few programs available from AMSAT you may wish to consider. (see URL http://www.amsat.org/amsat/ftpsoft.html)

InstantTrack

DOS based, 8088 and up, graphics require EGA or greater, coprocessor not required but recommended. Very tight code runs on even older PC's. Shows satellite position over color world map or in sky. Updates Keplerian elements easily with NASA or AMSAT format elements. Background mode allows tracking satellites and controlling antenna rotors while other programs are running. Generates lists of passes for several satellites for one day or one satellite for several days.

NOVA for DOS and NOVA for Windows

386 or better with floating point, Pentium recommended, 256 or higher color graphics, approximately 10MB hard disk space, DOS, Windows 3.1™ or Windows 95 / Windows NT™. Realtime tracking of an unlimited number of satellites. Over 100 maps of the Earth, individual continents,

the sky, and a "radar display". AutoTracking support of many available rotor controllers without need for TSRs or DLLs (NOVA for DOS only at this time). A commercial product by Northern Lights Software Associates with the proceeds AMSAT receives through its distribution going to benefit the Amateur Satellite program. More information about the NOVA family of software may be found at the Northern Lights Software home page (URL http://www.nlsa.com).

Quiktrak

DOS 3.0 or later, 512K memory for CGA graphics, 640K for EGA/VGA graphics. Track single satellite with footprint, ground track, and all pertinent data. Real time tabular data for several satellites at one QTH or one satellite visibility for several locations. Uses Kansas City Tracker interface standard.

STSOrbit Plus

For DOS systems. Display emulates the NASA "Big Board" used to track the Shuttle during typical missions. Predicts ground track of primary satellite and shows location of others at same time. Color EGA/VGA display, CGA/HGA display is monochrome. Uses NASA/NORAD element sets. Available from AMSAT and other locations. Shareware.

WiSP

A Windows™ based set of programs for the digital satellite operator that replaces the DOS programs PB and PG. Available in 16 bit (Windows 3.1) and 32 bit (Windows NT / Windows 95) versions. Controls the TNC/modem, processes mail, tracks satellites, and passes information to controllers for automatically turning the antenna rotor. Minimum system is 386DX/25, a coprocessor and 4MB of RAM. Available from AMSAT and other sources. Distributed in the shareware format. Registration is with AMSAT.

Winsat

A Windows™ based program that displays calculated orbital data and other information in a text window. Can track several satellites at once with each satellite in its own map window. Minimum requirements are the same as for WiSP. Can control antennas using the driver written by KC6WYG.

Satellite Pro

For Macintosh (up to 7.1). Data base will hold orbital elements for up to 30 satellites. Modules allow quick Locate of a satellite, the ability to Track a satellite in minute detail, generate a Schedule of upcoming passes, or show a Window of common visibility with another station. Five graphic display options show Rectangular, Great-Circle, Perspective, View From Space, and Polar views of the satellite's path. Requires at least 1MB memory and a double-sided (800K) disk drive.

AMSAT also has software available to run on the Commodore C-64, C-128, and Amiga computers, the Apple II, the Tandy Color Computer 3 and TRS-80 Model 4, and the Atari 8-bit and Atari ST. Call AMSAT headquarters for more information.

Use your judgment when you pick something out. Many packages may be down-loaded from BBS's, the World Wide Web, and FTP sites. If you have Internet access, two obvious places to start looking are ftp.amsat.org and http://www.amsat.org, the AMSAT sites. You won't find all of the above titles there, but you'll definitely find some of them. Remember, most of the programs that can be downloaded are shareware;

if you use them, please register them. If they are not shareware, please do not copy them to pass along to your friends. Proceeds derived from software ordered from AMSAT HQ or picked up from an AMSAT booth at a Hamfest are funneled back into the program.

One More Thing...

It is hoped this list will be of some benefit in your quest for information about operating the Amateur Satellites. It would be impossible to list all of the publications in print or electronic resources that are available, but I have presented a good selection to get you started. A word of caution, though: Read all you can, but don't delay putting what you have learned into practice. There is a wonderful world out there just waiting for you to contact, so when your tracking program tells you there is a satellite coming over, put down your book or close down your Web browser, pick up your microphone, and call "CQ Satellite". You can always go back to your reading when the pass is over.

Due to the changing nature of the "on-line" world, some WWW URL's and the addresses of ftp/telnet sites may change. If you find any to be in error, or discover one that you feel should be included in future editions of this handout, I would like to hear from you. Please send the site address information, including sponsoring organization and a brief synopsis of its contents, to me at the e-mail address below. If an address changes, please send me the updated information.

Thank You to the following for providing encouragement and input: Barry Baines WD4ASW, Keith Baker KB1SF, Cliff Buttschardt K7RR, Joe Holman AD7D, Jim Jefferson KB0THN, and Omri Serlin AA6TA.

A special Thank You to Paul Williamson KB5MU, Web Master of www.amsat.org, for providing many valuable suggestions on using the Web and ftp resources and serving as proofreader for this edition of the listing.

Not only are you granted permission to copy and redistribute this handout, you are highly encouraged to do so, but please pass along only unmodified copies. Any comments and suggestions for future updates should be sent to me at the addresses below.

Hope to see you on the birds soon!

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