

ELECTRONICS

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ATV, Where to Start

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Amateur Television, ATV, is fun and easier than you might think to get on with all kinds of applications. Besides sending and receiving live action color video between home ham stations much in the way you are probably used to with voice on two meter FM, there is; televising live or from tape your ham radio club meetings to those who could not make it in person; showing critical locations to local emergency service groups during actual disasters, parades or races; seeing Space Shuttle video and audio if some one is repeating it from their satellite TVRO; seeing the edge of space from amateur balloons or rockets as high as 100,000 ft.; getting a pilots view from a camera in a R/C model aircraft, or real airplane, and much more.



Jeff, N8QPJ, demo's R/C ATV at a Radio Club and televises the meeting on local repeater.

To see your first picture it may be as easy as turning your cable ready TV to analog cable ch 57 thru 60 and connecting it to a good outside 70 cm antenna of the same polarity as is used in your area by ATVers. It doesn't get any cheaper or easier than that to enjoy another of the many modes in Amateur Radio. Make sure your TV tuner is switched to *cable* channels when you try it. Unlike slow scan TV - SSTV - ATV standards are the same as analog cable TV and your camcorder so your TV set is your receiver without the need of any computer or other black box interface. However, 420-450 MHz band is the first ham band that has wide enough bandwidth for ATV and therefore can best be seen between antennas with line of sight.

New digital TV's will have analog cable TV tuners for many years to come. Cable channel 57 is 421.25 MHz, the most common inband ATV repeater output, and 60 is 439.25 MHz, the highest frequency used in the band generally for repeater input and simplex DX. Analog cable TV channels are amplitude modulated (AM) video spaced in 6 MHz increments and the automatic frequency control, AFC, in the TV set can usually lock up to within +/- 2 MHz of the video channel carrier frequency. Note that cable channels are on different frequencies from channel 14 up than over the air UHF channels and should not be confused. UHF broadcast over the air channel 14 is 471.25 MHz and 57 is 729.25 MHz, well above the 70 cm ham band. So all the commonly used 70 cm ATV frequencies (421.25, 426.25, 427.25, 434.0 and 439.25 MHz) can be locked onto and seen with most cable ready TV sets.



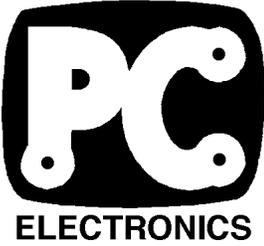
TVC-4S ATV down converter tunes 420-450 band to ch3 if you just want to try receiving but with more sensitivity than a cable TV set.



Show the family, the shack, projects, etc.

Contact a local ATVer on two meter voice (144.340 or 146.430 MHz typically) and have them send a picture your way. If you don't know of one, call or email us and we will try to put you in contact. Also check the ARRL Repeater Directory for any ATV repeaters that might be in your area. The transmitting ATV station talks on the sound subcarrier which comes over the TV speaker, and all those watching can talk back on two meters at the same time just like on a telephone. This is great for talking in beam alignment, commenting on video content, etc.

Any code free Technician class licensee can get on ATV. Since the lower the frequency, the farther the distance, given the same power and antenna gain, the 70 cm band is where 98% of ATVers operate - it is also the lowest cost and easiest to get on. The 902-928 MHz band goes half the distance and so on. ATV frequencies work best with an unobstructed line of sight path between the transmitting and receiving antennas. So the antenna and height is the most important part of the ATV station. Antennas need to be made for the 70 cm band, preferably as high of gain as possible and the same polarity as is standard in your area. Low loss coax is also a must as it takes 150 to 200 microvolts into your receiver for a snow free picture and you don't want to throw RF away unnecessarily.



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5W ATV Transmitter - See our app note for packaging the VM-70X module as above.

After you see your first picture, you will want to improve your reception for DX or get less snow with one of our downconverters and high gain beams - see our catalogue page 3. We also have 50mW or 5 watt modules for those who want to package their own systems or use them for portable, R/C, rockets or balloon ATV - see pages 2 and 5. With 5W from a Videolynx VM-70X module or TX70-5s transmitter, 14 dB of gain from DSFO ATV-25 antennas and coax loss at both ends you can send and receive snow free video over 50 miles if line-of-sight between the antennas. However, getting line of sight is the trick or waiting for temperature inversion skip. Non-line-of-sight is not predictable and just has to be tried. How well you do on 2 meter simplex is a good indication that you have an ATV path if the signal is strong.

Any camcorder or camera can simply plug its composite video and line audio into the ATV transmitter. It can be color or black and white - what ever you plug in is what you get out. Composite NTSC video is the standard A/V output in the USA for camcorders. As an alternative there are many small low cost color or black and white cameras available now that are made for security under \$200 that can be used at the home station, mobile, portable, R/C, balloon or rocket ATV. The camera shown is available from us for \$89 and is ideal for R/C, hat cams or even the shack. See our catalogue for other low cost color cameras, video ID overlay boards and more. All our products and prices are kept current on our web site.



ATV from a R/C aircraft with GPS and call letter ID overlaid



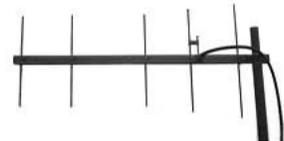
Transmit video and audio from an incident site, parade or race back to the EOC or EmComm van. Repeat weather radar during significant storms for RACES operations.



Videolynx 434 ATV Transmitter...\$99
 50mW runs on 9V, Great for demos, R/C and public service to 1/2 mile.



CG-35A Color Camera...\$89
 1.5" sq., 3 oz, 8 to 14V@90 ma. built-in mic, See page 2 of our catalog



5L-70cm beam antenna...\$90
 Popular for portable applications with its 31" boom and end mount. 8 dBd gain See page 3 of our catalog.

Videolynx Z70A ATV Transmitter.....\$149
 50mW, 4 channel with audio. 9V @ 250 mA See page 5 of our cat.



For more power, a Downeast Microwave 7025PA linear amplifier can be added.

For more info on ATV, I suggest reading the ATV section of the ARRL Radio Amateurs Handbook (W6ORG wrote it). It will give you all the basic information and background for this visual mode of ham radio. The ARRL Repeater Directory lists all the coordinated ATV repeaters in the country - see if one is in your area. Amateur Television Quarterly is also a source of continuing ATV information - www.atvquarterly.com

See all the fun uses for ATV on our Application Notes web page - www.hamtv.com/info.html - and all our products and prices.