## Feedline / Coaxial cable

Unless you are going for a very minimalist portable unit, you will need a cable to take the signal to your antenna. In radio talk this is the feedline and is made from coaxial cable. You need enough cable to reach your antenna from your transmitter. Don't use more than you need as the longer the cable, the more power is lost through resistance before it even gets to the antenna.

You must use 50 ohm coaxial cable, this is different to the type used for televisions and costs about 65 pence per meter.

You can use the coaxial cables (RG-58) that were used for Ethernet computer networks before CAT5 twisted pair took over. This stuff can be found for free quite easily and would be perfect for portable systems.

The thicker RG-8 is best if you need a long cable run or are planning what you hope will be a permanent installation.
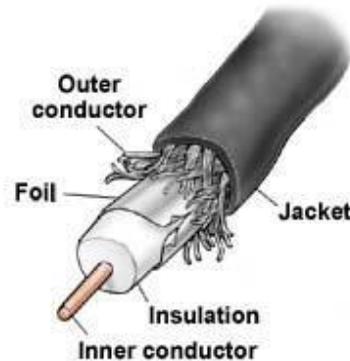
Usually your coax will to be terminated in PL259 plugs to fit the SO239 sockets normally found on transmitters and antennas. Sometimes BNC connectors are used which is handy if you are recycling computer network coax. Maplin (www.maplin.co.uk) is a good place to get coax and connectors.

Power supplies

The operating voltage of most of these things is 12 to 16 volts DC which you can supply from a regulated DC transformer or a suitable 12 volt battery.

The power supplies used for CB radios are perfect but you could also use a PSU taken from an old junk computer (not an ATX supply as they don't have proper on/off switches). Some laptop power supplies are also suitable.

For mobile use car batteries are fine, but lighter, safer and more portable are the lead-gel 'dry fit' batteries used in house alarms etc. These batteries can often be acquired free from mobility centres.

As well as being regulated, your supply must be able to provide sufficient current accounting for inefficiency. Here is a rough guide:

1 to 5 watt exciter	= 1 to 2 amps
10 watt amplifier	= 4 amps
20 watt amplifier	= 6 amps
40 watt amplifier	= 8 amps

You should never use the so called "wall - wart" transformers like you get for phone chargers etc. Not only are they unlikely to supply sufficient current, as they are unregulated they will probably also add a nasty (50hz mains) buzz to your audio.

SWR Meters

Measure your VSWR and keep it low. SWR is an abbreviation for standing wave ratio which is the ratio between power going into the antenna and the power being reflected back by the antenna. A properly tuned antenna is going to reflect very little power back. A high SWR can destroy the final output of your transmitter. You measure VSWR with an SWR meter. Make sure you get a model designed to work in the 88-108MHz range! Some cheap CB SWR meters do work in this range but many do not so check the specs before you buy. You can pick SWR meters for under £5 from car boot sales or ebay (watch the postage).

Your VSWR should be as close to 1:1 as possible. Don't worry if you can't get better than 1.5:1, that will do.

Choosing a frequency

Choosing a frequency to transmit on is not as simple as picking a nice sounding number. You need to find a clear spot that isn't used by anyone else. That's not easy, the airways are pretty crowded and you are not the only pirate looking for a gap.

When you have found a possible gap, double check that it is clear at the far limits of your range. That means getting out on a bus with a portable radio. Don't just check during the day, but also evening and at the weekend as you may find your attractive empty spot on the dial hosts the midnight session for some jungle spinning weekend pirate.

- Frequency Finder UK, by Town/City
  http://mysite.wanadoo-members.co.uk/freq_find/town_city.html
- London Pirate Radio Listings – updated each month
  http://homepage.ntlworld.com/pir8radio/

Mono or Stereo

Having stereo can greatly increase the cost of your equipment. Transmitting stereo requires something called a stereo encoder, which is fitted inline between your audio source (or mixer) and the audio input of the exciter. Some exciters have the encoder built in, but most do not. Stereo encoders start at about £35 but it is also possible to do stereo encoding in software (for example a winamp plugin or www.heinecke.nl/) which could be useful if you intend to use a computer as your audio source.

Mono is not only cheaper but will also provide a greater effective range compared to a stereo transmitter of the same power. Stereo uses a greater bandwidth than mono and having spread the power wider, the apparent signal will be weaker. Weak stereo signals have a lot more hiss than a mono signal.

So, if it's cheaper and more effective to use mono, why would you ever choose stereo? The answer lies in the little stereo light you see on radio receivers. Within a stereo transmission there is a 19khz signal, which tells the receiver that it is looking at a stereo transmission that needs decoding. It also tells radios with digital tuning that they have achieved accurate tuning so these radios may not bother stopping on a mono station!

So, if you want people in their cars to find your station when they press scan for a quick sweep through the channels, you will need stereo. If on the other hand you are advertising a specific frequency, then you can probably rely on people managing to manually tune their radios and you can safely stick to mono. Likewise, if you are planning on doing break-in transmissions, you already know people are tuned in, so mono is fine and you need all the power you can get.

Broadcasting Sites

The highest locations are best. In cities, tower blocks are an ideal but obvious answer and are especially favoured by commercial pirates. A further advantage is that there are usually electric sockets in the lift or heating rooms on the roof, so it's easy to get power.

To get onto the roof of a tower block you need a crowbar, or better, a key. The 'Fireman's keys' have to be standard for all blocks, so once you have one you can get onto most roofs easily. Try asking other pirates, or possibly a friendly caretaker or fireman. Or you can break the door, remove the mortise lock, get keys made up for it, then replace it.

When on the roof BE CAREFUL (sudden gusts of wind can blow you over the edge at this height!) and always wear soft shoes and keep quiet. Lots of people have been busted simply because the tenants below heard them and called the police (be aware how easy it is to get trapped). Its useful to dress like a repair person, and claim to be a lift mechanic if challenged.

Any building higher than most others will do, and you can increase your height for instance by mounting your aerial on top of high, well secured scaffold pole. If your town or city has hills this could provide a good option.

You can use a piece of derelict or common land, or at night you can use parks, cemeteries or even allotments. A better option is if there are hills outside the built up area, then use a field or wood away from houses. If you use the directional aerial you can cover the city just as well. This was done by Andromeda Radio, to good effect, they used to cover most of Manchester from a high hill outside, using a mere 4 watt transmitter with directional gain aerial.

Audio Sources

It's beyond the scope of this booklet to go into detail about studio equipment, mixers, turntables, cassette decks, and so on. Further more, there is little point in factoring in the costs for these things either - you could easily spend many hundreds or even thousands on this stuff. However, because this stuff has become ubiquitous consumer electronics, you will probably already have something suitable or will find somebody who does.

Generally, something like an MP3 player, portable CD or even an ancient cassette walkman, would be fine for the kind of activities you are likely to get up to.

Depending on your plan, you will probably find that battery life is an important factor and long play, shuffle, repeat or auto-reverse would also be very useful.

For a portable set up, a minidisk recorder (or two) is perfect - especially one with long play and a microphone socket. The batteries last ages and just one minidisk can store five hours of content. Plug in a microphone and you can record and do live announcements!

For a studio, a computer fitted with a sound card and a microphone will do everything you need. You'll be able to record, capture, edit and mix audio. You'll also be able to download music and other audio from the net. With winamp and various plugins, you'll be able to add effects like echo and simulate a limiter compressor (although you will need a reasonably fast computer to do this kind of real-time processing). You'll also be able to produce CDs or MP3s and stream audio for internet radio.

The major problems hindering STL usage has been price and the availability of equipment. This does not mean that STLs aren't widely used by pirates: in London, for example, just about every station (and there are dozens, if not hundreds of pirates in London alone) uses an STL.

Affordable off-the-shelf possibilities do exist. You could try using AV audio/video senders which operate on either 1.2ghz or 2.4ghz and are easy to buy (about £35). The ones you get from high street shops like Dixons are not very powerful (upto 100 meters) but you can import much more powerful units (1w / 1000 meters) from overseas vendors advertising on ebay. You could theoretically gain additional performance by building high-gain directional (Pringles style) 'can-tennas' as used for WiFi.

Another possible cheap solution would be to use walkie-talkies as a link. PMR handsets can be purchased in Dixons for around £25 a pair. They can achieve a range of a mile or so in ideal conditions but don't expect great sound quality for music. Probably only useful for very short term low budget application. Such a system was used for GM-FM at the Pink Castle to provide remote voice announcements and was surprisingly effective.

Netcasting and WIFI

Some have said internet radio and TV (netcasting) will replace broadcasting because of its unlimited potential for access. However, it's still cheaper and more convenient to listen to a real radio than it is to get online and that is likely to remain true.

However, netcasting has become a very effective way of separating the studio from the transmitter. For the last few years this has been done mostly with dialup, ISDN or ADSL but WIFI has opened the door to much more exciting possibilities.

What is needed?

At a bare minimum you need an audio source (such as a walkman), power source, transmitter and antenna. Usually, the antenna would be separate from the transmitter and connected by a coaxial cable (known as a feedline).

A slightly more elaborate system might consist of multiple audio sources with an audio mixer and microphone(s) which would allow mixing between recorded audio and the inclusion of live audio such as somebody speaking.

Other common additions include an amplifier to increase the output power and an audio compressor / limiter which has the effect of making the transmitted audio sound louder.

A block diagram of a typical radio station would look something like this:
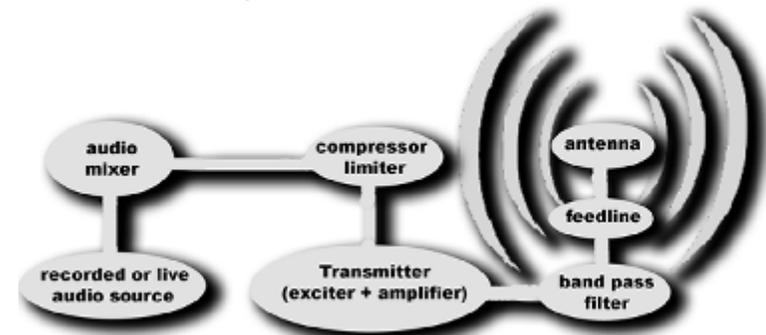
Internet radio

Having introduced the idea of using netcasting as a means of providing an almost untraceable link from a studio to the transmitter we may as well go into more detail about streaming audio online. There are thousands of internet stations – some people joke that there are more stations than listeners and that's not that much of an exaggeration. Anyway, it's cheap and easy to setup. You don't have to use loads of expensive gear like mixers and decks, just a microphone and a reasonable computer (something like a Pentium II 500mhz with plenty of memory).

Software required under Window$ would be winamp with the oddcast plugin. Additional useful plugins might include a compressor limiter and a radio scheduler plugin to enable automatic 24/7 playlist control. Alternatively you could use a commercial package such as SAM Broadcaster (spacialaudio.com) which does everything you could possible want.

If you prefer to use open source software you won't have a problem finding streaming software but open source radio scheduling and automation software is another mater.

You need access to a streaming server. Since you will be doing political subversive radical DIY media you should have no problem persuading Indymedia to give an streaming account. However, while free, streams from Indymedia do not get listed in the station guides accessible from WinAmp, iTunes or MediaPlayer etc. so don't expect many listeners. Use of a commercial streaming server will cost money (unless you have a friend in the business). However, they really aren't expensive unless your station becomes really popular (which is very unlikely). Check out live365.com or do a google search for shoutcast servers.

that the stronger signal tends to 'win', blotting out the weaker one completely. With a small transmitter you'll only win for a short distance, but even a few hundred yards could cover a whole high density estate. Strength of signal is the main factor, a big powerful transmitter (100-200 watts) can break in your message on the most popular channel on prime time. For break-ins all precautions should be doubled, also be sure to clear right away from the area as soon as you've finished, and don't use the same time or broadcasting site again. Break-ins are more common in countries where pirates have been repressed, e.g. in Germany or the Eastern Block, and are ideal for announcing demonstrations etc. or replacing the news headlines with uncensored news, or commercials with audio subverts. Break-ins could be done from a vehicle while driving long distance along a motorway. There would be very little chance of getting caught.

Squats are another obvious and seemingly much underused site for the guerrilla pirate, especially during big meetings or gigs, which could be broadcast live from the roof. This has been done successfully for instance in Amsterdam and Berlin.

Industrial areas during strikes and disputes may provide an excellent opportunity for the more political pirate group, and could provide vital communication for raising awareness, gaining support and mobilising.

Occupations, especially those involving tall cranes, industrial chimneys or cooling stacks. Getting caught in these situations is is pretty likely so therefore a low-cost disposable transmitter would be ideal and abandon or hide the equipment before you come down and avoid leaving anybody's finger prints on or inside the cases etc.

Suppliers of transmitter kits

NRG Kits www.nrgkits.com

They have a really wide range of kits, both PLL and VFO. If you need a little more power for the job, they have some pretty juicy VFO transmitters. Their prices are good and they are no doubt very popular with the club promoting pirates around town. Their website has a workshop section with loads of useful info (much of which has been plagiarised for this booklet).

Broadcast warehouse www.broadcast-warehouse.com

Certainly not the cheapest, they have a range of professional equipment and high quality kits, which includes a full line of very high quality amplifiers, exciters, limiters and other gear you need to get started. They also appear to offer good support and replied promptly to emailed inquires. Their 1w PLL circuit is tiny and great for making concealed portable devices.

Veronica www.veronica.co.uk

Veronica have been around for a while and supply not only PLL exciters, but also power amps, antennas, stereo encoders and compressor/limters etc. There prices are good (and include VAT and postage) but support seems poor and they are really bad at answering emails (even from customers).

PCS Electronics www.pcs-electronics.com

This company is not based in the UK (they are in Latvia I think) but are worth mentioning because they supply some unique kit, including a PLL exciter with 7 watts variable output and also an exciter that is built onto a PCI computer card which is fully software controllable. I've heard good things about their support too.

I won't bother listing US suppliers but I will mention Free Radio Berkeley (www.freeradio.org), which is spear-heading a movement to challenge the regulations in the US and is trying to foster a low power broadcasting movement. As with other US suppliers, I think you have to assemble their stuff yourself. They sell various transmitters plus output filters, dummy loads, RF amplifiers, and antennas.

Why use pirate radio?

"Whoever would overthrow the liberty of a nation must begin by subduing the freeness of speech."
Ben Franklin

The late John Peel demonstrates why there has to be more to radio than superstar DJs.

Radio broadcast in the UK is heavily regulated. Any transmission in the FM broadcast band (87.5 – 108 mhz) is subject to licensing under section 1 of the Wireless Telegraphy Act 1949. Getting a licence is generally very difficult and expensive although there is some limited provision for community stations and restricted service licences (RSL) for temporary stations for events. Any unlicensed use is illegal.

We all know how essential the free exchange of information is when it comes to effective organising. Radio can be a very effective means of communication.

Some activists try to get information to people through the mainstream newspapers or TV and radio news, but obviously this means working through the filters of the corporate media. Activists also routinely use a variety of DIY communication mediums such as leaflets, flyposters, mailing lists, websites etc. All these have their pros and cons depended on the intended recipients etc. Pirate radio is another possibility in the activist media toolkit - with it's own advantages and disadvantages.
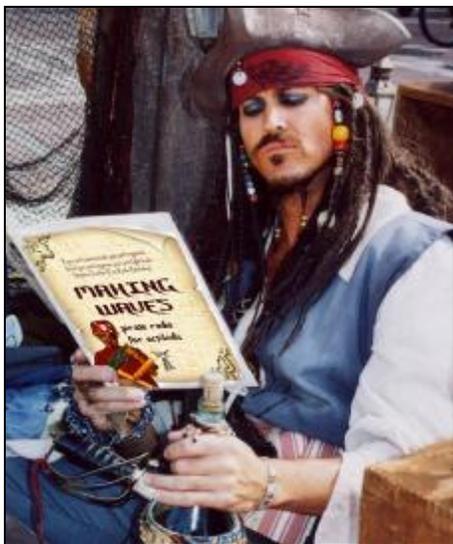
pros	cons
No filters or censorship	Not national (unless you use MW or LW)
Easy access for your audience	Requires some technical competence
Can reach lots of people	Illegal – fines and/or prison
Different audience than online media	Can be very time consuming
Can be targeted at specific communities	More expensive than internet

Further help and useful links

Other radio how-to guides
www.freeradio.org
www.irational.org/sic/radio
home.att.net/~optcamel/fmradio.htm
www.prometheusradio.org/piratestart.html
www.radio4all.org/how-to.html
www.pcs-electronics.com/ (see 'our guides')
www.barkingduck.net/ehayes/essays/pirbook.htm

The alt.radio.pirate usenet newsgroup, can be also be good source of information but remember that it is publicly archived and searchable by google etc.

BRIEF LEGAL BRIEF

Police can stop and speak to you at any time, they can also stop and search your vehicle if they have reasonable grounds. Police must give a written record of the incident to anyone they stop - not just those they search.

You don't have to answer any of their questions and are not required to give your details.

You cannot be lawfully detained against your will unless you have been arrested.

If arrested, you should be informed why and cautioned: *"You do not have to say anything but it may harm your defence if you do not mention now, anything you later rely on in court. Anything you do say will be given in evidence."*

You still have the right to remain silent and are strongly advised NOT to say anything until you have received legal advice.

Most people are convicted on evidence given voluntarily by themselves or their friends. You have nothing to gain by talking to the cops – but that doesn't mean you should be rude as that won't help either.

Remember - NO COMMENT !

You will have to give a verifiable name and address or you may not get bail. Remember they might search that address.

Misc links.
www.radio4a.org.uk
www.underthepavement.org
www.tranquileye.com/free/
www.mediageek.org
www.aspisys.com
hacklab.org.uk
kevinboone.com/stopsearch.html
kevinboone.com/arrest_detention.html
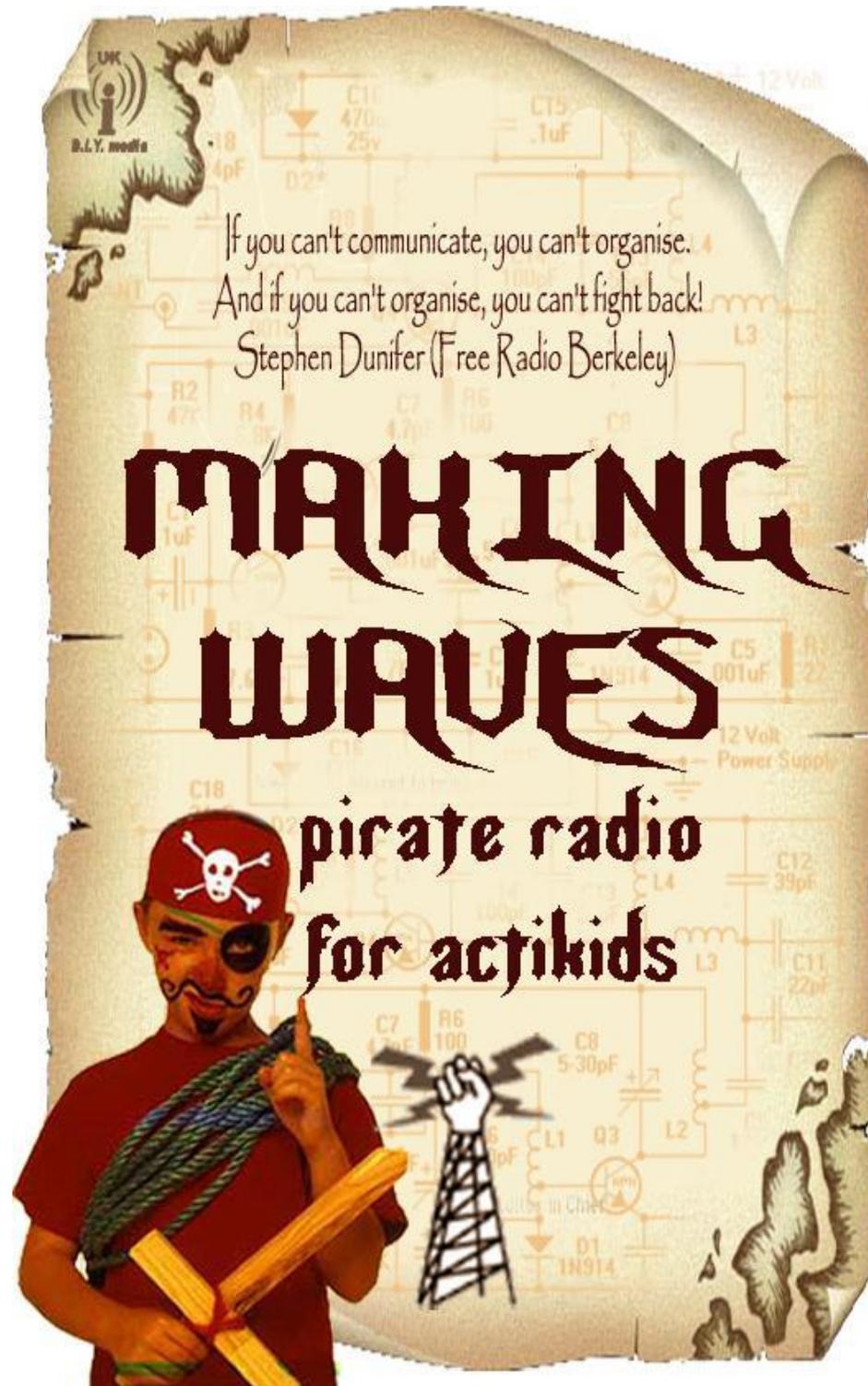
A Pirate Hamster Production

piratehamster@hushmail.com

Dedicated to Zipper (RIP)

Downloadable PDF versions of this booklet can be found on the internet..

version 0.9c
Nov 2004

If you can't communicate, you can't organise. And if you can't organise, you can't fight back!
Stephen Dunifer (Free Radio Berkeley)

MAKING WAVES
pirate radio for actikids

Making a box for it

Unless you are buying second hand or have a big enough budget to waste on boxed equipment, you will probably be faced with loose circuit boards that need cases. The cases will need to protect the circuits from physical damage, provide adequate airflow for cooling and also screen other electrical equipment from direct electro-magnetic interference. Basically that means you need a metal box with some ventilation and possibly a fan.

Unless you are planning on running your equipment from a battery, it might be useful to have a case that contains a 12 volt regulated power supply. We've already seen how old computers contain such supplies so one possibility is to make use of an old AT computer case (386,486 or early Pentium).

However, computer cases tend to be quite large so perhaps a better choice would be to gut a redundant external SCSI CDROMs etc. Ask around - some geek will have something you could use.

Other readily available cases include thrown out VHS video players, although they are not likely to contain a suitable 12 volt power supply.

For a quick bodge you could get away with a plastic or cardboard box covered in tinfoil and gaffer tape – not ideal, but for a portable unit that's going to sit in your backpack, it might do.

Amplifiers

Amplifiers take the low level output of your exciter (typically 1 watt or less) and boost it to a higher level (perhaps 10 or 20 watts or much more). More watts cost more money but this extra power will deliver better reception to your listening audience. It's not just about greater range, but also greater penetration into and around buildings.

Some amplifiers may also have filtering stages built into the design. You should ensure that you have band pass filter fitted if you intend to transmit an amplified signal from a static location for any length of time as you are likely to cause interference and piss people off and then get the authorities on your case.

Band pass filters

These devices are used to decrease harmonics, the unwanted emission of frequencies outside of the 88 mhz to 108 mhz band. Harmonics cause interference to TV's etc. They are likely to piss somebody off and bring the heat down on you pretty quick.

Band pass filters seem to be quite expensive and difficult to come by. You can find designs to build your own on the Internet and they look relatively simple but without expensive test equipment you would have no way of knowing if it was working.

You probably won't need to worry anyway. Modern exciter designs are apparently pretty clean and if you are not using an amplifier, or are using a portable or one-off temporary station then you may choose not to bother with filtering.

The Exciter

The exciter is the centre of your transmitter and creates the radio waves that carry your audio. It contains an oscillator, an audio input section, a FM modulation section, a RF pre-amplification stage and an RF amplified output stage and sometimes an RF filter stage.- but you don't need to know that. You will hear of two types, VFO and PLL...

The cheapest are the VFO (Variable Frequency Oscillator) units, because there are fewer components. However, the downside is that they can drift slightly off frequency in response to temperature or voltage changes. If you had set your transmitter to 100 MHz, you may find that it drifts down to 99.95 MHz. Most noticeable on a digital radio receiver, it will probably just mean the stereo light goes out but in the worst case scenario the sound may cut out and the listeners will have to retune.

More modern, complicated and expensive, the PLL (Phase Locked Loop) will not drift. Once your transmitter is set to 100MHz (for example) it will stay exactly on that frequency. You can also reset the frequency at any time and it will remain exactly on any frequency you select. A PLL transmitter is the best, but most expensive choice.

Whatever type of exciter you get, you need to get one that is powerful enough to cover your intended range or be used in conjunction with an additional amplifier.

- A list of suppliers can be found towards the end of this guide.
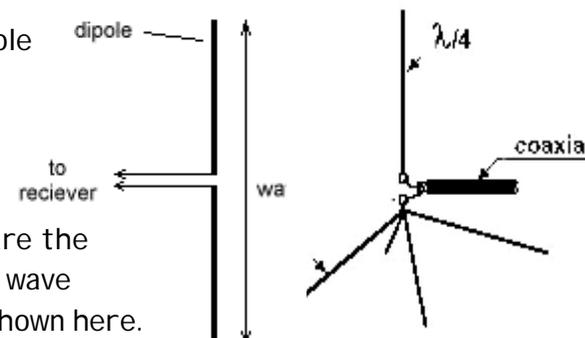
DIY Antennas

Commercially built antennas for transmitting at these frequencies are quite expensive but fortunately it is really easy and cheap to make your own. There really is no point in buying one, just make one from scraps of copper wire, pipe, or aluminum.

A good antenna is vital and if poorly set up it will not only give poor performance, but may also result in local interference and damage to the transmitter. You can check if your aerial is matched to your transmitter correctly by using an S.W.R meter.

Never turn on a transmitter unless it is connected to an antenna or dummy load !
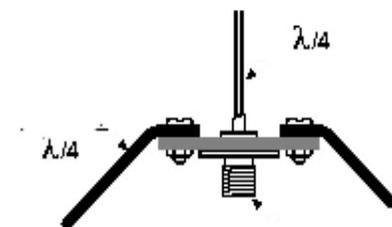
Common easy to build antennas

- Simple half wave dipole
- Ground plane
- J Pole
- Slim Jim

The simplest to build are the dipole and the quarter wave ground plane antenna shown here.
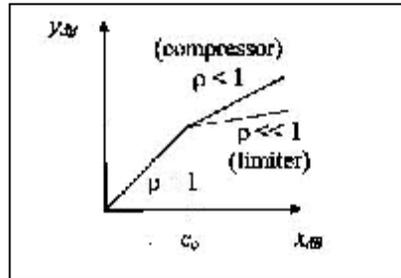
The formula you can use to determine element size (1/4 wave) is: 1/4 Wavelength in Inches = (234/Freq.in MHz) X 12

Check out construction guides online. J Poles or Slim Jims are the probably the best.
http://www.pcs-electronics.com/en/guide.php?sub=antennas
http://www.irational.org/sic/radio/omni-aerial.html
http://users.marktwain.net/aschmitz/antennas/jpolecalc.html

Limiter compressors

A limiter compressor is usually considered essential for any serious broadcasting, as they prevent over modulation from causing 'splatter' which may cause interference to other radio transmissions. They can also make a huge difference to the apparent strength of received signals by increasing the average modulation and masking the background hiss found in weaker signals. The limiter compressor acts as an automatic volume control and will make sure the transmitted sound is as loud as it can be, but not over modulated.

If you are broadcasting just pre-recorded music, and provided that it is all roughly at the same loudness level to start with, you should be able to adjust the volume (modulation) level on the transmitter and everything may be fine. However, if you try broadcasting live speech without a limiter compressor you will find major problems with both over and under modulation. This is because live speech can vary by up to 20 times in amplitude.

While you avoid over modulation and the associated problems by using a limiter compressor, as well as significantly improving reception, there are drawbacks. One is loss of dynamic range due to compression but that won't really effect you unless you were planning on playing classical. More of an issue is the cost as a limiter compressor is likely to cost more than the transmitter.

If you are pre-recording all your content or planning on having a studio, you can use a software limiter and compressor, which are usually DSP plugins for winamp etc.

How far will my signal go?

Many factors dictate your range; power output (measured in watts), the type of antenna, the height and the terrain. Your signal should go as you can see because signal propagation at these frequencies is virtually line-of-sight. However buildings, hills, trees, background noise and other transmissions, all conspire to reduce your effective range. Obviously, getting your antenna as high as possible is very important.

A well-placed antenna could give you an effective range of a mile or two using just one watt! Increasing your power to five watts would more than double that range. Under good conditions you could expect the following effective ranges..

Watts ERP	approx. range
1 watt	1-2 miles (1.5-3km)
5 watts	3-4 miles (4-6km)
15 watts	6 miles (10km)
30 watts	9 miles (15km)
100 watts	15 miles (24km)
300 watts	30 miles (45km)

The figures shown are for a reasonable signal on a car stereo and are only a rough guide.
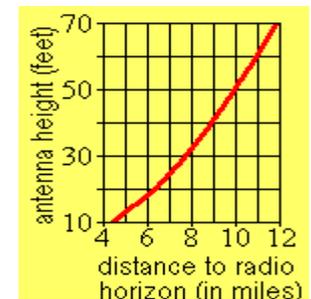
More power delivers better quality reception for further and gives better penetration into buildings but don't assume that 100 watts will go ten times as far as 10, it doesn't work like that. Raising your antenna height and improving the gain of your antenna system is generally a better way to increase your range than using a more powerful transmitter. If the antenna is only a few meters above the ground then its range will always be limited to a few miles and the signal will always be plagued by multipath interference, even if you pump hundreds of watts into it.

- More about range from http://free.freespeech.org/lowpower/range.html

What will it cost?

Obviously it is perfectly possible to spend tens of thousands of pounds setting up a radio studio and transmitter with masts and relays etc. However, a few hundred pounds would get you a fully functional system capable of sounding just as good. Further more, you can build a wicked little portable 12 volt system for under £100.

Example 1: £300
hi-power city-scale stereo rig

1 watt PLL exciter ~£70
stereo encoder ~£30
20 watt amplifier £100
Stereo compressor / limiter £105

Using mono instead of stereo
would save about £80 in this case.

Example 2: £125
portable live-broadcast mono

5 watt mono VFO excite £70
compressor limiter (mono) £55

If you use only pre-recorded and pre-processed audio you could leave out the compressor limiter to cut the cost.

The examples above are for brand new equipment in the form of pre-assembled kits. If you are confident with soldering, you can save around £25 - £30 on each item by buying the kits unassembled. Either way, the kits do not include cases or power supplies. Additionally, the example does not include the cost of antennas or audio source but they can be made or obtained at little or no cost.

The cost of getting a station set up is comparable with doing large print runs of posters, leaflets or stickers. However the radio station can be used again and again and doesn't have a use-by-date like much of the printed material we produce. In other words, while nowhere near as cheap as the internet, pirate radio can be a very cost effective medium for activists.

Remote link up systems

To try and prevent (or at least partially blunt) the eventual enforcement action, pirates have experimented with unique ways of "protecting" their studios - transmitters are replaceable; dedicated people are not. The easiest way to protect a studio is to separate it physically from the transmitter. Radio authorities find pirates by the signals they produce, and the place where those signals are coming from is the first place they'll visit. If that place is not the studio, it forces enforcement agents to at least take one extra step to catch a pirate.

Separating the transmitter from the studio may also provide a bit of early warning to the people behind the station that a visit or raid is imminent, especially if an overzealous agent unplugs the transmitter before the studio location can be discovered.

The easiest way to protect the studio is to prerecord all content onto some kind of long play medium and leave it playing at the transmitter site. However the ability to 'go live' is very useful and using solely pre-recorded content may not be an option for your particular application.

Live links are usually done with wireless studio-to-transmitter (STL) which usually consists of another radio signal beamed to a special receiver which then feeds the broadcast transmitter. They generally operate using a narrow direction beam pointing directly at the receiving antenna which means it doesn't take much power to cover a great distance and makes detection and tracking much more difficult. However, using an STL doesn't guarantee that a studio will escape a raid as the authorities may trace pirate STL signals before shutting down the main transmitter.

Real life examples

2001 - During the seven week occupation of a proposed GM field by a Pink Castle, a 4 watts transmitter was used to provide a link to the local community in nearby Littlemoor and Weymouth. The idea was that come an eviction, a call out on the radio would alert supporters and bring help. The antenna was placed on a hill up a tree (disguised as a branch) and the transmitter was hidden in a hedge beneath. It was powered by car batteries, which were recharged from solar panels each day. The audio source was a walkman with auto-reverse and would need somebody to climb the hill to change the tape or batteries. A remote link up from the camp was achieved using walkie-talkies and allowed 'emergency' voiceovers to be broadcast over the recorded content.

2002 – On the first day of the COP8 Climate Talks in New Delhi, activists converged on the British International Motor Show accompanied by a solar powered sound system. Throughout the day "Drive Time NEC", a spoof radio show, was broadcast on FM so that people arriving in their cars could tune in while they hunted for somewhere convenient to park.

The legal question it raises is intriguing. Technically, the people in the studio aren't violating any laws because they're only netcasting. If someone is rebroadcasting their internet feed, they could conceivably claim ignorance of that operation.

The computer used can be fairly low spec, the kind of stuff you can get for free such as a Pentium II 266 mhz. All it needs to do is connect to any available open WIFI access point and start playing the specified audio stream in winamp or a similar player.

Since you are now effectively using a computer as your audio source you can avoid the expense of a hardware limiter compressor or a stereo encoder because it can all be done by software (assuming your computer is fast enough).

All the required software can be obtained for free but you will need to buy a WiFi card which cost about £20. You may need to use an external directional antenna to get a good connection to the nearest WiFi node. The cheapest option is to use a USB WiFi and an extension USB cable.

Check out www.usbwifi.orcon.net.nz for genius low cost directional hi-gain WiFi systems.

Practical uses of pirate radio

These days, most pirate radio involves setting up a studio in someone's spare room, linking it to a remote transmitter on a nearby tower block then going live (often just at night or maybe only at weekends) until the transmitter gets found then switching to another tower block. However, there are more imaginative and perhaps more appropriate ways in which activists might use radio.

Portable. With a small transmitter powered from a battery and your antenna disguised as a placard, umbrella or flagpole you can transmit from within the crowd at a demo. Would provide a perfect medium for discussion, information and warnings of police movements, as well as for entertainment and music - but only if you advertise in advance the need to bring radios (or seed the crowd with your own people with radios). Could be especially useful at actions like big blockades with groups covering different areas.

Hit and run. For a decent range and a 'real' audience you will need a better location than can be found during most demos. This could be sitting on the roof of a tower block for a night or sitting in a car park on a hill overlooking the city. Spend the night pumping out loads of power and radical content all over the city and then bugger off before anyone bothers looking for you. Don't get into habits in terms of locations or times and you should be pretty safe - but probably a good idea to use look-outs and have an escape route.

Break-ins. The idea is to grab your audience by broadcasting on top of a legal station. The sentences are much higher but there's little chance of getting caught if your break-ins are short, say for five minutes, on top of the news or advertising of a major station. You're taking advantage of a quality of FM broadcasting

Radical Content

It's easy to find plenty of music to play, just use a peer2peer file share program like limewire or edonkey to find and download what you need. However, there is no point going to all the effort of setting up a pirate station if all you are going to play is music that people can already tune into elsewhere. You wouldn't be reading this if you didn't have your own ideas about what you want to broadcast, be it grassroots news reports from your community, subverts, political rants, local comedians and poets, interviews or unsigned musicians etc. Whatever original content you are planning on producing, check out some of the radical content already available, you might find it useful for your station or simply get some ideas. Upload to the internet any good content that you produce so that other people may rebroadcast it.

Indymedia newswires can be a good source of audio from news reports and interviews to music and soundscapes. Also check out the global radio page (radio.indymedia.org) for downloadable content and links but it is mostly stuff from the USA.

An hour-long weekly news show is produced by the London Indymedia radio people. It is streamed and broadcast on Resonance FM (resonacefm.com) and eventually gets archived online. You can also pickup UK news and loads of other original UK relevant content from rampART radio (www.rampartradio.co.nr).

A-Infos Radio Project (www.radio4all.net) was formed in 1996 by grassroots broadcasters, free radio journalists and cyber-activists to provide the means to share radio programs via the Internet for re-broadcast. It's great, new stuff almost every day!

Other places to look...

www.democracynow.org   www.blackopradio.com/
www.microradio.net   www.flashpoints.net/
radio.oneworld.net   www.diversity-radio.net
www.interworldradio.org   resistanceisfertile.com/radio

pirate radio

Contents

Preface

This booklet contains everything you need to know in order to set up and operate a pirate radio station as a tool for activism.

While there are loads of pirate stations banging out dance music and promoting clubs, it seems rare for activists in the UK to make use of radio. It's really not that difficult or expensive and activists usually have a healthy disregard for the law so perhaps the low level of activity is due to a lack of accessible information. If that is the case then hopefully this little book will inspire activists to make more waves...

This whole guide is heavily plagiarised from various bits and pieces trawled from the web. You can find links to some of the sources at the back of the book.

Ofcom and the law..

Information from www.ofcom.org.uk...

The economic value of the UK radio industry is worth £20 billion at 2000 prices. Ofcom is responsible for ensuring that this vital national asset is not threatened by misuse of the radio spectrum. Pirate radio is a criminal and anti-social activity and station operations are a menace to legal broadcasters and the public alike. Anyone involved with pirate broadcasting, even if they allow their premises to be used, or if they advertise on a station commits an offence. The **maximum penalties, at Crown Court, are unlimited fine and two years in prison**.

On conviction, a court may order all or any of the apparatus of the station, including record collections, portable telephones, etc. to be forfeited to Ofcom.

Ofcom is addressing the pirate problem proactively, listening to the broadcasts of pirate stations from its monitoring station to gain information about pirates, such as the telephone numbers used in station operation. Service providers may cut them off if they are being used for illegal activity. Other information gained from this monitoring, such as about advertisers, is used to support enforcement action. The complaints of licensed broadcasters and members of the public about interference are recorded and passed to the Agency's local staff for action.

A Justice of the Peace, or in Scotland a Sheriff may grant a search warrant under Section 15 of the WT Act 1949, valid for one month, allowing those authorised by Ofcom to enter premises etc with or without constables and to examine and test any apparatus found on such premises. Under Section 79(2) of the T Act 1984, the warrant may authorise the persons authorised by Ofcom to seize and detain for the purposes of any proceedings in relation to offences or forfeiture proceedings any apparatus or thing found which appears to those authorised by Ofcom to have been used in connection with or to be evidence of the commission of any offence. Power is given in Section 79(3) of T Act 1984 for constables or those authorised by Ofcom, to seize and detain without warrant any apparatus or thing found where they have reasonable grounds to suspect that certain offences have been or are being committed. Under Section 15(4) of the WT Act 1949 any person who intentionally obstructs an authorised enforcement officer exercising powers under the WT Act 1949 or the T Act 1984 or who fails or refuses without reasonable excuse to give any assistance which those Acts require may be guilty of an offence.