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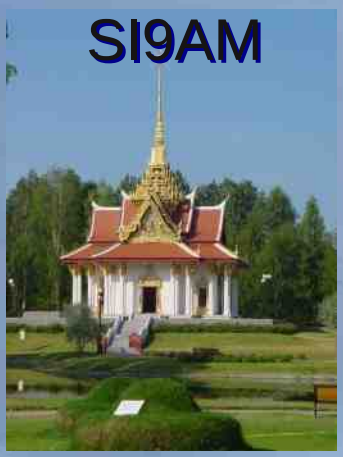
HAM-MAG

The first free & monthly E-magazine for amateur-radio, SWL...

Getting started in HAM contest



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Send us articles, informations.

We have received few articles for this issue
and we have almost nothing for the next one !

A neat MIC Switch with Sound Card Interface
By WB8YWA, Jim

First I had a problem that most Ham's face, couple of rigs, wanted to use same MIC, wanted both rigs to have the ability to operate PSK31 & MMSSTV. I did a lot of cable swapping while I look for an 8 Pole 2 Position switch. I found all the parts easy that I needed accept these 8P2T switches. Then one day while cleaning out my junk boxes I found some old left over computer data A/B switch boxes. I open it up and found an excellent 25 Pole 2 Position switch with just the correct length of wire color coded for my project. Note: these A/B switch boxes are found at flea markets all the time and come in all configurations, but all have at least 9 poles. Some have more than 2 Positions if you want to switch more MIC's or Radio's.

I wired two of these switches using the common of each switch and the other 2 Poles to the four 8 Pin Female MIC Jacks, two for two rigs and two for two different MIC's (Desk & Headset). Then I switch pin 1 and 8 (ICOM Audio in and out) of the common wires with a 2P2T Toggle switch, one pole to 1:1 audio transformer and 10K pot for the Sound Card and the other back to the common wiring for MIC use.

Inside wiring and part placement look at picture;

st I also installed a push button (push on – push off) switch that is also wired to pin 5 and 6 (ICOM push to talk pins). This allows keying while using headset or if keying is not done through the computer on the data mode.

Back side showing MIC and audio connectors look at picture;

Picture of Switch Completed showing front panel;

This switch can be custom made for any type of radio; the enclosure can be any style but feel you should use solid metal for RF Shielding.

Wiring for the 1:1 and 10k Linear Taper is:
For Radio MIC to Computer Speaker - Wire one side of 1:1 transformer to arm of 10K and other lead to end of 10K. Wire computer jack to this same terminating point. Other end of 10K is wired to ground. Second winding of 1:1 Transformer is wire to ground with one lead while the other lead is terminated to the 2P2T switch that would be Pin 1 (MIC Audio ICOM).

For the Computer MIC to Radio Audio - Wire one side of 1:1 transformer to arm of 10K and other lead to end of 10K. Wire computer jack to this same terminating point. Other end of 10K is wired to ground. Second winding of 1:1 Transformer is wire to ground with one lead while the other lead is terminated to the 2P2T switch that would be Pin 8 (Speaker Out Audio ICOM).

Best 73's ! Jim WB8YWA

Want to creat pile-ups? Try SI9AM !
By SM3CVM

Calling CQ, CQ. This is SI9AM calling.

King Chulalongkorn's Road follows a undulating landscape down to a little valley. Something white can be seen occasionally between the trees; suddenly it turns out to be a most unusual kind of building in this part of the world. A fascinating building stands there, exotic and beautiful, in the middle of the Nordic scenery. We have arrived at the King Chulalongkorn Memorial Building in Utanede, Jämtland, the only building of its kind outside Thailand.

History takes us back more than a hundred years. In 1897, King Chulalongkorn travelled from Siam (since 1939 known as Thailand) to Stockholm in the Kingdom of Sweden. He also went further north to acquaint himself with the Swedish forest industry. On the way back he passed through Utanede to the Indal river valley and on the river to the sea coast. The visit of a royal guest from far away raised a great deal of interest among the local population.

In memory of the event, the little gravel road through the forest that the king had been travelling was later named King Chulalongkorn Road. The rumours about the road was spread in Thailand and Thai monks began to come to Utanede to walk on the beloved king's road. Little by little, contacts were created between Ragunda municipality and Thailand, and these eventually led to a decision to build the King Chulalongkorn Memorial Building. Construction was started in 1997.

How does amateur radio fit in this? Enthusiastic radio amateurs from the SM3 region saw here a possibility to set up a facility for visitors who would use a well-equipped radiostation at a very special location. Exotic because of the beautiful Thai memorial building. But special also because of the fantastic scenery with forests, hills and water inviting to outdoor life, walks and fishing in the pristine wilds.

- This is an excellent location for holiday combined with amateur radio and tourism. The Indal river valley has a wonderful scenery and here is an exotic touch of Thailand, plus a well-equipped amateur radio station with a unique call sign good for DX as well as for rag chews. But be prepared for pile-ups, says Lars Aronsson, president for SI9AM.

The station is in a building next to King Chulalongkorn Road, a couple of hundred meters from the Thai buildings. At the station there is a bunk bed for two, a toilet, a refrigerator with freezer compartment and the possibility to warm one's food. There is a restaurant in the building and a number of rooms which are open in the summer months. Hotels, restaurants and other services are available the year around at a distance of 10 to 20 kilometers from Utanede. The nearest cities are Sundsvall and Östersund, 90 and 130 kilometers away. The station is available for visiting operators around the year for a small fee.

The station equipment consists of an FT 1000 MP with an ACOM 1000 amplifier. A 24-meter mast holds a tribander beam for 10/15/20 meters and a two-element for 40 meters. For other bands there are various wire antennas. A number of different software like TR, DX4WIN, HAM-Log, WIN-TEST and others is used for logging.

Facts about the visiting amateur radio station SI9AM: County Z302, Locator JP82iw.

QSL via SM3CVM, bureau or CBA. E-mail request for QSL via bureau is preferred.
Reservations and questions to info@si9am.se Information and photos at http://www.si9am.se

73's de SV3CVM

Getting started in casual contesting
By Dick Thompson - W0RAA

Having been licensed for many years (45 years in all), I have had an opportunity to partake in many of the various facets of amateur radio. I've been a net control station for the Ohio SSB Net when I was living in Ohio. I have participated in many disaster situations including the 1964 Palm Sunday Tornado that struck Indianapolis, IN and the surrounding communities. (I may be one year off on the year, but at my age, senility makes for a good excuse). I have handled phone patch traffic for troops stationed in far off places like Korea, Viet Nam, Europe, etc. I've demonstrated amateur radio in Special Events and participated in many Field Day operations. All have been very rewarding and in most cases, fun activities. But that's not the purpose of this article. Amateur radio offers something for everyone, and many, if not all, can be fun activities. In the past few years I have found my niche in ham radio: contesting. I am not a writer, so please be kind.

For many years I dabbled in contesting in one form or another. I rarely submitted a log in any of them and my participation consisted of mainly passing out contacts to the serious contenders. Then, after I retired I decided to get back on the air (after having been off the HF bands for almost 10 years). I live in a retirement community and management kind of frowned on antennas. So, one day I approached the then current manager, and told him I had been a ham for almost 40 years, and I wanted to get back on the air and had intentions of putting up a vertical antenna. (I was mainly on 2 meters and 440 during that 10-year period, so I was never completely off the air). His response was "No problem, as long as the neighbors don't complain about television interference, etc." So, I was on my way.

I decided to get back into doing some contesting and looked at my options for various modes. Of course SSB can be done by anyone, CW has always been a fun mode for me, but I had never experimented with digital modes like RTTY and PSK31, etc. I bought an Icom 757 and put up a Hustler 4-BTV vertical. It was great being back on HF again. I made many contacts that summer, and had only one complaint from a neighbor. I was getting into her computer speakers. A couple toroids solved that problem. No problems since. My antenna situation now consists of a Butternut HF-9V, a Hy-Gain TH5DX on a 40’ crankup tower and a short 80 meter dipole. My HF Transceiver is a Yaesu FT-950 and I also have a Ameritron AL-811 amplifier.

I decided to get into a CW contest, so I entered one of the SS (Sweep Stakes) contest. I can't recall which one but I had a ball. My score wasn't very high, but I had fun and that was my goal. So when the fall contest season started I decided to participate much more than I had in the past. I purchased WriteLog as a contest software package and it worked quite well as it supported many big and small contests. WriteLog is $35 and renewals are $30 (or in that area) if you decide that any updates that have been added since your last purchase will be necessary for your needs. All upgrades are free for one year with WL. So, any additional upgrades in that 12-month period are at no charge. The web site for WriteLog is www.writelog.com.

Also, another very capable program (and it is free) is N1MM Logger (www.n1mm.com). It is regularly updated and bugs that may happen as "bumps in the road" are usually fixed in a reasonable period of time once they are reported to the N1MM programming team. N1MM also supports a wide range of contests.
There are other software packages available, but I am not familiar with any of them, so I won't elaborate on them at this time. A Google search for "Contest software" will produce enough sites to keep you busy and off the streets for weeks, if not longer.

Of course, if you don't want to use a computer to log contacts that you make in a contest, there is always the pencil and paper method. Just be sure you can read your writing after the contest is over. Since most log submissions are made over the Internet, and the contest software packages have the ability to create Cabrillo files for submission, I would suggest that you use a computer. Another advantage is that most contests do not allow duplicate contacts on the same band, and the contest software programs will let you know if you have worked a station before. Keep in mind that contesting is not allowed, by gentleman's agreement on any of the WARC bands. The WARC Bands are 12 meters, 17 meters and 30 meters. There are CW, RTTY & Data frequencies on all the WARC Bands as well as Voice frequencies. The WARC Bands were named after the World Administrative Radio Conference (WARC) held in 1979. The new Channelized 60 meter band is never used in a contest. For those who are not interested in contesting and abhor the QRM created by contests, you can take refuge in the WARC bands and operate with no contesters to bother you.

The use of a computer in a contest simplifies the process and enhances the fun. My favorite form of contesting is using RTTY mode. I participate in most major RTTY contests, including the ARRL RTTY Roundup (I have taken First Place in the Rocky Mountain Division in 2007) as Multi/Single LP (Multi-Op/Single Transmitter, Low Power). Shel (KF0UR) and Jim (N0TUI) were co-operators in that contest. I operated in the Colorado QSO Party last July and took First Place in In-State CW Low Power and First Place in In-State Digital Mode Low Power. Both Single Operator.

CQ Magazine is a huge sponsor of contests. They have the CQWW CW, CQWW RTTY, CQWW SSB, CQWW SSB WPX, CQWW CW WPX, CQWW RTTY WPX, and the list goes on and on. The ARRL sponsors many contest on HF and VHF. The ARRL DX Contest is a big one. The RTTY Roundup is one of the most popular contests also. North American QSO Party contests are very popular and a good way to get your feet wet. A good site to check out, for what contests are happening at any given time, is http://www.hornucopia.com/contestcal/. Another is SM3CER's site, which is located at http://www.sk3bg.se/contest/index.htm. You may also want to take a look at the National Contest Journal web site located at http://www.ncjweb.com/index.php. And there are many more. All are very helpful. Also, there are many contesting forums on www.Yahoo.Groups.com. Do a search for Amateur Radio or Ham Radio. The National Journal magazine produced by the ARRL is a first class publication with a lot of great contesting information as well as hints and kinks type of articles. Don't forget to look at Amateur Radio Contesting FAQ's at http://www.qsl.net/zs1an/contesting_faq.html#warc.

You might ask questions like "What does SOAB mean?" What about "SOLP?" SOHP?" etc.

These are all abbreviations for contest entry categories:
o SOLP - Single Operator Low Power
o SOHP - Single Operator High Power
o SOAB - Single Operator all band
o SOSB - Single Operator Single Band, often includes the band, e.g. "SOSB/80" for a single band entry on 80m
o M/S - Multi/Single - Many operators but only a single transmitter
o M/2 - Multi/Two - Many operators with two transmitters
o M/M - Multi/Multi - Many operators with many transmitters

You don't need to have a "Super Station" setup to have fun in a contest. The simplest of rigs and antennas will allow you to participate. Nobody is going to refuse to contact you because your signal isn't 20 over S9. Every contact the big pistols and the small pistols make count for points, and who knows, you may be a "multiplier" contact for someone that may put them in First Place. So every contact counts, and many contesters listen for both the loud and the weak stations.

With the software that is available today and with the soundcards in the computers, getting into a RTTY or CW contest or any contest is a piece of cake. The Fn keys on your computer can be programmed to send your reports, in RTTY, CW as well as voice. I have actually been in contests and never touched the keyboard of my computer. All I had to do was point and click with the mouse. OK, OK, call it lazy, but it's still fun. Isn't technology great, as the old saying goes? You can set the software to key your transmitter, make the exchange and then log the contact, making you ready for the next one. And believe me, they can come fast and furious at times.

If you have never participated in a contest and would like to get started, I suggest that you start by entering a small contest like a state QSO party. There are also short Sprint Contests that usually last about 4 hours on a weekend afternoon or evening. The NAQP (North American QSO Party - CW, SSB & RTTY) are all great contests to enter. Another short contest, held on the first Monday of each month is the Spartan Sprint. Information is on the following web site: http://arsqrp.pbworks.com/Spartan-Sprints. Join the fun of a QRP contest.

I could go on and on and bring up a lot of other thoughts and ideas on contesting, but you really need to get into a contest to learn what it's all about and find out about all the fun you may be missing or could be having, whichever the case may be.

73,

Dick

The author can be reached at w0raa@arrl.net
or the address listed on http://www.qrz.com.

Discovering :
The W3FF Portable Dipole Antenna

This is the antenna I designed for my 'walking portable' station. It is a dipole constructed out of the plastic plumbing pipe CPVC. There are telescoping whips at the ends of each side of the dipole, and these whips are adjusted to bring the antenna into resonance on each of five HF Bands.....10, 12, 15, 17, and 20 Meters. The longest elements are on 12 and 10 Meters, where the dipole is actually a full half wave. On the lower three bands, coils are used to shorten the antenna. It takes just about a minute to make band changes. Operation on Six and Two Meters has been tried successfully too. It costs about $30 to build this multi-band, portable dipole.
Note that the coils are not tapped. They are taken out of the circuit entirely on 10 and 12 Meters. I use one coil for 15 and 17 Meters, and a separate coil for 20 Meters. Details on the 2 and 6 Meter operation may be found later in this text.

Parts List
Here are the parts to make the dipole:
CPVC pipe is a cream-colored plastic pipe. Buy a 10' section of it. Get the 1/2 inch ID size. It will be about 5/8 inch OUTSIDE DIAMETER. CPVC pipe is found at Ace Hardware stores and many other home improvement outlets in the USA.
You will need 6 CPVC couplers. These are cream-colored also, and are straight. Be sure to get the size that fits the above pipe.
One PVC T in the half inch size. This is a slip-slip-thread. The thread is on the bottom of the T. NOTE: This is the only piece of PVC used in this project.
While at the hardware store, buy some electrician's tape. You will need a roll of black and a roll of red tape. The red tape is just for marking one set of coils to differentiate them for tuning purposes, so you will need just a small roll.
Also, you will need some hardware to affix the wire to the whip. Here is what I use:
Two 8-32 by 1/4 inch stainless steel machine screws, two matching washers and two matching nuts.
The following parts are available at most Radio Shackstores:
Two Radio Shack replacement whips. The whips extend to 72 inches, and collapse to 13 inches.
RS Part # 270-1408B
Two packages of Radio Shack electrical connectors. I use the blue ones, and I take the wire, strip it, and fold it over before inserting in into the connector. That makes a better connection.
RS Part # 640-3313
One package of tiny ring connectors to use to connect the wire to the whip. These fit the 8-32 hardware. I don't have the RS Part # in front of me as I write this, but you will find them where you find the electrical connectors.
One spool of #20 Radio Shack insulated speaker wire. It comes in 75' spools, and that is more than enough to make several antennas.
RS Part # 278-1388

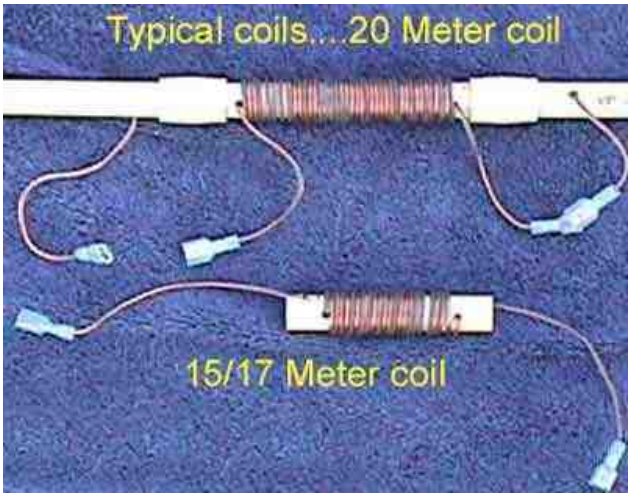
The only other part you might need is an rf bead to keep the rf off the outside of the coax on some bands. You can try making a loop of say a half dozen turns of coax right below the feed point of the dipole and see if that is OK for your installation. If that doesn't get the SWR low enough to satisfy your transceiver, you can order rf beads from a company like Palomar. I use only one or two beads on my own dipoles.
Buy ferrite beads. Use Mix 43. Buy a core size that fits the coax you prefer. Since we are dealing with a portable antenna here, I use RG-8X coax, and the Palomar # FB-56 fits the bill nicely.
Go to: www.Palomar-Engineers.com Their phone number is: (760) 747-3343.

Note that the beads are low in cost, just $1.65 each. However, there is a shipping charge on each order of $6, so you might want to order some additional beads to use for other projects, experimenting, or sharing with your friends.

Tools Needed

You will need a hacksaw, a small hammer, a screwdriver, a pair of needle-nosed pliers, a drill with a 1/8" bit, (perhaps, also, a 3/16" bit, if you want a little extra room when drilling the holes in the PVC), a crimping tool, and a tool for removing insulation from wire. You will need a measuring tape. Keep a pad and pencil handy to record measurements. A Marks-alot felt pen will be needed in the final tuning phase. You should buy or borrow an antenna analyzer if you don't own one.
Here's how to build the antenna:
Cut two pieces of CPVC, each 22" long.
Drill a 1/8" hole about 3/4 of an inch in from each end of the CPVC pieces. Don't
drill the whole way through. Angle the drill slightly toward the long end, so that you can slide a wire into the piece of pipe. Drill the holes on the same side of the pipe.
If you leave the speaker wire in its pair form before you cut it, you will be sure to use the same amount of wire on each coil. Cut 28" of wire from the spool, and split it into two28" pieces. Put one end of one of the wires into the hole you just drilled in the CPVC. Gently push the wire until you see it come out the other side of the pipe. Take a pair of needle-nosed pliers and work the protruding end into the hole at the end of the CPVC. You will have about 3" of wire on each side of the pipe when you are finished.
Do the same for the second 22" CPVC pipe piece.
Crimp one of the end electrical connectors, a female connector, on one side of each piece of the section you just finished. Put a male electrical connector on the other side on each section. You are finished with the 'arms' of the dipole.
Now let's construct the 15 and 17 Meter coils. You get two bands with one set of two coils. Cut a 3 1/4" section of CPVC with the hacksaw. This is the form for the coil. Drill a 1/8" hole all the way through the section, about 3/4 of an inch in from each end. Cut a piece of wire 64" long and poke about three inches through one of the holes you just drilled. Start wrapping the wire around and around the CPVC section until you have approximately 22 turns on the coil. Push the tag end through the hole you drilled earlier, and tape the whole coil tightly with plastic tape. Cut the tag end so that you have about 3"of wire coming out of the hole in the pipe. Put a female electrical connector on the one wire, and a male electrical connector on the other protruding wire.

The 20 Meter coil is prepared exactly the same way, but you start with a coil form of CPVC of about 5 1/4", and you use 8'4" of wire. Wrap 41 turns on this coil. For appearance sake, wrap the coils with black plastic tape. Then, on one 15/17 Mtr coil, put on a single wrap of RED plastic tape (to differentiate it from the other15/17 Meter coil). Do the same thing on one of the 20 Meter coils. This completes the construction of the coils. (SEE PHOTO)



The telescoping whips are held by CPVC also. Cut two 9" pieces of pipe. Drill a 1/8" hole about an inch in from either end of each piece. (Not the whole way through the pipe.) Take a 15" piece of wire, and feed it into the hole you just drilled and out the other end of the pipe. Leave about 3" of wire sticking out of the hole you just put the wire through. Do this for each piece of pipe. Set the assembly aside.

Each Radio Shack telescoping whip has a tiny hole at the end of it. Enlarge that hole to accept a short machine screw (6/32 by 3/8" long) by drilling each whip with an appropriate bit, a bit about 1/8" in diameter. Before going further, take some black plastic tape, and wrap 17 inches of it around the whip at a point just about an inch up from the previous enlarged hole in the whip. This is simply to make the whip fit snugly into the piece of CPVC that you have prepared to hold the whip. Add more tape or take some away to make the fit snug. Cut another 17 inch piece of tape, and wrap it at a point 7 1/2" from the hole in the whip. This gives you the support to keep the whip centered in the CPVC. (SEE PHOTO)

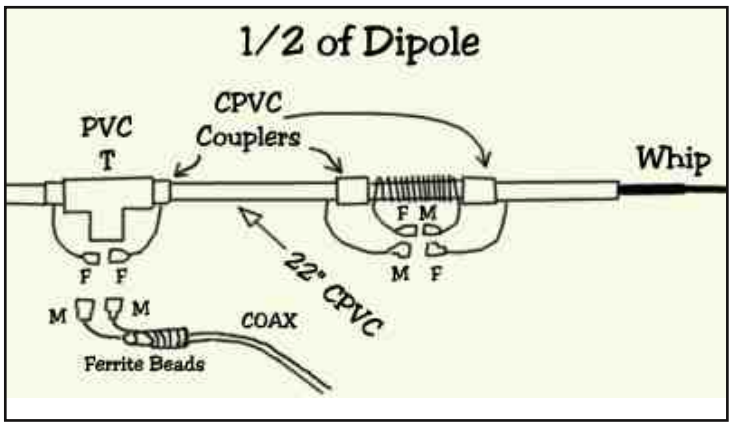
Take the previously made up assembly with the 15" of wire in the CPVC, and strip the insulation from the wire for about a half inch. The only reason this wire is not shorter than it is, is because it is much easier to put the wire through the pipe first, rather than by threading it in later. Connect the wire to the 6-32 machine screw you have put through one of the whips. Use a tiny lock washer and secure the wire. Now, pull on the 3" tag end of the wire you have coming out of the hole in the CPVC, and lead the whip into the piece of pipe until you see that the hole in the metal whip is adjacent to the hole in the CPVC. Cut off the wire so that you have just 3" protruding. Strip that wire end and put a female electrical connector on the end. The whip should be snug in the CPVC. At the telescoping end of the whip, where it comes out of the plastic pipe, tape the end of the pipe to the whip. This will keep it from slipping out of the pipe.

The PVC T has slip/slip ends on it. The CPVC arms attach to this T. The sizes of the pipes are different, so an adaptor is made as follows: Cut a piece of CPVC 2 1/4 inches long. Place a CPVC adaptor onto that piece of pipe, and tap it in firmly with a small hammer. Insert the pipe end of that assembly into the PVC T. Take a second CPVC coupler and place it onto the pipe. Carefully tap that coupler into the PVC T, so that you have a final assembly that looks like this: (SEE PHOTO)

My thanks to Justin, K5JBB, who came up with this idea when he was making one of the antennas early in 2001.

Note that there are 5 electrical connectors on each side of the dipole. The electrical connectors are placed on the wires in a specific order. There is a female connector on one side of the dipole arm and a male electrical connector on the other side. The dipole arm with the female electrical connector is going to be placed next to the PVC T when the antenna is assembled. The other end of the dipole will have the male electrical connector on it.

Place a CPVC coupler onto the 22" arm of the dipole. Put one of the two 15/17 Meter coils into that coupler, noting that the electrical connector you want to use on the 'arm' side is a male electrical connector.



Place a CPVC coupler onto the other side of the coil.Place the piece of CPVC that holds the telescoping whip into the CPVC coupler to the coil. Note that there is a male electrical connector on the coil. This attaches to the female electrical connector on the whip assembly. This completes the antenna assembly. (SEE PHOTO ... drawing)

Make up a piece of RG8Mini or RG58 or similar light-weight coax as follows: On the end that attaches to the dipole, make a pigtail by stripping back the covering to expose the shield of the coax. Pick out the strands of braid so that when the braid is twisting to a point, it will be small enough to fit into one of the blue male electrical connectors. Bare the inside white or clear wire of the coax. You might want to use some shrink-wrap tubing to strengthen and protect the pigtails. Put one male electrical connector on each of the coax pigtails.

To get the radiation off of the outside of the coax (providing a better match and a lot less RF on the outside shield), you can do either of two things: Coil the coax in a 4" diameter with about 7 turns and secure the turns with black plastic tape. OR... You can also use ferrite beads by fitting them over your coax and taping them on with black plastic tape. Your choice, but the beads are the best way to go. Pick a mix for the HF frequencies. Most of the antennas I have built have worked much better with the beads. This antenna was designed for use with my walking station, so I use 10'of RG-174 coax. It is tiny, and the ferrite bead information is as follows: Palomar Model #FB63-43. I use a half dozen beads on the coax, very near to the pigtails at the dipole feed point. If you use RG8Mini, the Palomar Model # is: FB-56-43. I use one or two of these (longer) beads. (SEE PHOTO)

Fit a PL-259 on the other end of the coax(with appropriate reducers, depending on the size of the coax you are using). This completes the construction phase of the project.

You will need a mast to support the antenna. I have been using the aluminum paint masts that one would use to roller-paint ceilings with. They come in varying sizes, and the one I use most is the model that collapses to 6' and extends to 12'. There is a male, threaded, plastic top on most of these tiny masts. Take a piece of black plastic tape, and wind it around the plastic top just one and a half times. Cut the tape off, and press it to the plastic top. You will find that when you prepare the mast in that manner, it will thread nicely directly onto the PVC T of the dipole, even though it is a 'cross-thread'. You are now ready to tune the antenna.

Tuning the Dipole

This procedure is easy if you have an antenna analyzer to help you do the work. It can be done with a transceiver in the CW position by checking the power output at a known level, but using an analyzer such as the MFJ model, is better.

Set up a testing range by using a tripod or similar method of holding up the mast and the antenna while you are making the adjustments.

Each band is tuned separately. Start with Ten Meters. BYPASS the coil entirely by simply leaving the coil out of the circuit. Pull out all of the sections on each side of the dipole's telescoping whips. Check the resonance of the antenna with the SWR analyzer. Push the ends of each side of the antenna in slightly until you see that the antenna is in resonance, that is, that you have an SWR in the neighborhood of 1.7 or less.

Note the number of sections it takes you to do this. Write this information down on a pad, and move onto the next band.
On 12 Meters, simply pull the whip ends out slightly, and check to see if the antenna is in resonance by doing so. No coils are used on 10 or 12 Meters.
If you find that your antenna is just not long enough to resonate on 12 Meters, simply take a 9" piece of #20 wire, install a female electrical connector on one end and a male electrical connector on the other end. Insert this jumper on the HOT or RED side of the dipole where the coil is bypassed. This lengthens the antenna just enough to make a perfect match on 12 Meters.
To load the antenna on 17 Meters, plug in the 15/17 Meter coil, and pull out the whips until they are in full extension. Check the resonance. You might be right on the 17 Meter band with very little adjustment. If the frequency shown on the antenna analyzer is too low, say in the 16 or 17 MHZ range, simply shorten the RED (hot) side by one section. Set the analyzer for 18.140 MHZ and watch as the SWR be longer than the other (it has to do with the groundside and the 'hot' side of the dipole as the coax is connected) to get a very low match. Note on your pad the number of sections out on the ground side and the number of sections out on the hot side. In the "Tuning Tips" section, see the list of how many sections it takes to resonate on various bands.
When you are satisfied that 17 Meters looks good, go to the 15 Meter position on the analyzer and start shortening the whip elements to go up in frequency to about 21.300 MHZ. When you get a dip, experiment as you did with the other bands. Just changing the whips slightly will change the resonance as you will see.
On 20 Meters, remove the 15/17 Meter coil, and insert the 20 Meter coil. Use the same tune-up procedure to get a big dip in the middle of the band, say about 14.200 MHZ.
Now, if you are satisfied that the measurements you made are in the ballpark on each band, check it out with your transceiver in the CW position. Just pick a frequency and check for power output. By lengthening and shortening the elements slightly, you will find settings where the power will maximize on each band. Mark those measurements ON the arms of the dipole, so that you will be able to change bands in just a few minutes. Use Marx-alot or a similar product to mark the CPVC arms.

Some Tuning Tips

Tune the antenna away from metallic objects, like cars, other antennas, towers, etc.
Use these APPROXIMATE settings for your antenna. If you have the proper # of turns on the coils, and if you used the correct Radio Shack speaker wire (#20), here are the settings I typically get: 10 Meters. RED or HOT side out 4.5 sections out, and BLACK..4 sections out. 12 Meters...both sides out all the way, with the 9" jumper inserted on the RED SIDE only. (no coils inserted on 10 and 12 Meters) On 15 Meters, pull out 2 sections plus 2 inches on the RED side, and 3 full sections out on the BLACK side. On 17 Meters, it's 3.5 sections out on the RED side, and 5 sections out on the BLACK side. (You should have the 15/17 Meter coils inserted for those bands) And, on 20 Meters, put the 20 Meter coils in, and pull out 3 sections plus 4" on the RED side, and 5 sections out on the BLACK side. These will vary with your antenna, but the settings are an excellent starting point.

BONUS ! Six Meters works well on all these I have tried. No coils. Push all sections in, and check the resonance. Pull the RED side out an inch or two at a time until you get the frequency you want.

BONUS ! Two Meters can be used, just by taking the 9" CPVC whip assemblies and putting them into the PVC T. Adjust the whips carefully to resonate on 146 Mhz. Remember to hold the antenna in a vertical position when working stations on FM. Thanks to Larry, K7COP, for investigating this aspect of dipole operation.
The antenna is not efficient on 40 or 80Meters. Email me if you want to try 40 Meters, and I will send you the info by return email.

FINALLY....
If this seems too complicated or confusing, simply email me and I will help you with the construction or the tuning. It takes me about an hour to construct a complete antenna. Several builders say it takes them 2 to 3 hours to complete the project. It takes me 20 minutes to tune one, and it should take you less than an hour.

Have fun with it, and let me know your suggestions for improving it!

73's ! Budd W3FF
Websites :
http://www.qsl.net/w3ff/index.htm
http://www.buddipole.com/

THE DX NEWS

From the Web (tnx opdx, 425 dx news, arrl...)

 5B, CYPRUS

Terence, G4MKP, will be active as 5B/G4MKP from Tsada village near Pafos between August 14-25th. Activity will be mainly CW on 80-10 meters. QSL via M0URX.

 7P, LESOTHO

Just a reminder that a group of operators is active until August 13th. They plan to have two stations active at all times with a third station to possibly be on for PSK and RTTY. Activity will be on all bands, but with a special effort on 160/80 meters. Operators are: Pista/HA5AO (7P8AO), Frosty/K5LBU (7P8CF), Laurent/ W0MM (7P8MM), John/9M6XRO (7P8OK) and Ben/DJ0YI (7P8YI). QSL 7P8OK via M0URX, others via their home callsigns. For more details, please visit the Texas DX Society's Web site at: http://www.tdxs.net

 8Q, MALDIVES

Andrew, G7COD, will once again be active as 8Q7AK from Embudu Village, Embudu Island (AS-013, WLOTA L-3911), between October 12-25th. Activity will be on 80-12 meters including 30/17/12m using CW and SSB. Operating schedule (everyday) is as follows: 0730-0830z, 0900- 1030z, 1300-1500z and 1730-1800z. Suggested frequencies are:
CW - 3503, 7003, 10103, 14003, 18073, 21003 and 24893 kHz
SSB - 3795, 7063, 14147, 18133, 21253 and 24953 kHz
QSL via his home callsign, direct or by the bureau. Look for complete details at QRZ.com under 8Q7AK.

 C3, ANDORRA

Last week we reported that Vini, IK2CIO, would be active as C31/IK2CIO between August 6-12th. We have been informed by several sources that "the Andorran Radioamateurs Union (URA) reminds that the local administration has not implemented the CEPT Recommendation T/R 61-01; therefore, any C3/homecall activity should be regarded as illegal." An up-to-date list of licensed amateurs can be found at: http://www.ura.ad

 DP3, GERMANY (Special Event)

Members of the Waldkirchen Radio Club will activate special event station DP3SSKW on CW and SSB through December 31st. Activity is to celebrate the 3rd Shito-ryu Shukokai Karate 2009 Worldcup being held in Waldkirchen. QSL via the Bureau; direct QSLs only via DK7FK. Skeds for 40 and 80 meters are possible via E-mail to DK7FK:
b.barth@pension-monika.de

 9G, GHANA (Update/Change)

Silvano/I2YSB informs that there has been an update to their activity in Ghana between November 13-27th. Their activity will also include an IOTA trip to Abokwa Island (AF-084). They will use two different callsigns for their activities. Operations on the mainland will use the callsign 9G5TT, while operations on AF-084 will use 9G5XX. Activity will be on all HF bands (160-10 meters) and modes. Silvano states that they do not have a licence for 60 meters and 6 meters. On AF-84 there will be one station on 20 meters only. The time of the operation on the island will be on a day to day basis and will depend on the sea condition and weather forecast. QSL via I2YSB, direct only. More information can be found at: http://www.i2ysb.com

DX-CALENDAR
By SM3CVM

The calendar is available at http://www.sk3bg.se/

- 1/8 PHILIPPINES; DU9/PA3GZU OC-130 from Mindanao Island (WLOTA 2803) by PA3GZU. Activity will be holiday style on the HF bands with low power. QSL via his home callsign, the Bureau is preferred.

- 1/8 UNITED STATES of AMERICA; N2OB NA-111
from Long Beach Island by members of the Old Barney ARC. Expect main activity on 20 and 40 metres SSB with two stations. QSL via N2OB.

- 3/8 CANADA; K9AJ/VYØ and KD6WW/VYØ NA-185
from Thomson Island from the local evening on 31 July. They will have two stations and will operate CW and SSB around the usual IOTA frequencies. QSL via home calls. The NA-185 IOTA group is offshore Rankin Inlet, Nunavut, on the western shore of Hudson Bay and was activated only once by NU2L/VE8 back in 1993.

- 7/8 ASCENSION I.; ZD8Z AF-003
by N6TJ. Activity will be on all bands CW/SSB. QSL via his new manager AI4U, direct or by the Bureau.

- 10/8 CAYMAN IS.; ZF2GC NA-016
from the Grand Cayman Island by W9CGI. Activity will be mainly on 17 and 12 meters using PSK31 and SSB. He will use a vertical antenna with under 50 watts. QSL via his home callsign, eQSL preferred; direct w/SASE or by the Bureau.

- 11/8 SWAZILAND; 3DAØ
by 3DAØDJ (GI4FUM/EI4DJ), 3DAØTB (G4LDL), 3DAØMH (GM3TAL), 3DAØVA (M0VAA), 3DAØMM (NC4MM) and 3DAØEL (UT5EL). They plan to put up a scout station at the international Scout Camp near Manzini which will be active as 3DAØSS in the future. They will use the antennas (for 160m-10m) which are already at the Hawane Resort operating two stations around the clock. QSL cards should be sent to the operator's homecall. The DXpedition homepage can be found at: http://www.gi4fum.co.uk/

- 12/8 BELIZE; V31NP NA-073
from Ambergris Cay by LA5OPA. Activity will be mostly on 20 meters SSB and PSK31. He will also operate on the other bands, if
propagation is open to Europe. Per will be using 100 watts with a
Buddipole antenna system. QSL via LA5OPA, by the Bureau or direct.

- 13/8 LESOTHO; 7P8AO, 7P8CF, 7P8MM, 7P8OK and 7P8YI
by HA5AO (7P8AO), K5LBU (7P8CF), WØMM (7P8MM), 9M6XRO (7P8OK) and DJØYI (7P8YI). They will have two stations QRV all the time, and a third station might be on for PSK and RTTY. Activity will be on all bands, with a serious effort on 160 and 80 metres. QSL 7P8OK via MØURX, others via home calls. The web page for the expedition can be found on the Texas DX Society's site http://www.tdxs.net/

- 31/8 HONG KONG; VR2/F4BKV AS-006
mainly on PSK31 with some SSB during good propagation openings. His web site is at http://www.f4bkv.net/

- ca 2/10 CHILE; CE73RG
The Radio Club Rancagua (CE4RG) was founded on July 22, 1936, and the 73rd anniversary will be celebrated with the special event station. Operation will take place in CW, SSB and PSK on 80/40/20/17/15/12/10m. QSL via CE4WJK.

- 30/9 CROZET I.; FT5WO AF-008
by F4DYW says he will be working at Alfred Faure Base on Ile de la Possesson. He plans to operate on 20, 15 and 40 metres SSB during his spare time, using 100 watts and dipoles. QSL via home call, direct or bureau. Look for updates on http://f4dyw.free.fr/index.php?langue=fr&contenu=ft5wo.html

- 31/10 JAPAN; 8J6SL AS-077
from the Kumamoto Museum to celebrate the 100th anniversary of Hisatsu (Railroad) Line (Steam Locomotive) on the Island of Honshu (JIIA AS-077-001). Activity will be on all bands and modes. Possibly 5 stations will be on the air. QSL via the JARL Bureau.

- 1/11 ANTARCTICA; VKØBP AN-016
is currently working at Antarctic Davis Base Station, Gridsquare MC81xk. His activity is limited due to his workload, but he is expected to be on all HF bands. He seems to like 20 meters between 1500-1800z. Operations have been on SSB and PSK31, but he plans to operate on other modes later on during his stay at the Davis Station. QSL via VK2CA. PLEASE NOTE: There is also a possibility of activating other field huts in the area, and he will sign as VK0BP/P. Look for more details on his Web page at http://www.vk0bp.org/

- ca 16/11 LEBANON; OD/W5YFN
has received approval from the local authorities while in Lebanon, for one year starting on 16 November.

- 31/12 HONG KONG; VR2009EAG
special event to promote the Hong Kong 2009 East Asia Games. Operations will be primarily on the HF bands from 40-10 meters
and VHF on 6 meters. The modes used will be primarily SSB, RTTY, PSK31 and SSTV. QSL Manager VR2XMT: Charlie Ho, PO Box 900, Fanling Post Office, Hong Kong.

- 2009 WEST MALAYSIA; 9M2TI
by EA4ATI to work in Kuala Lumpur for the whole year 2009. He will work with 400 watts and a vertical in CW and SSB on 40m/20m/15m/10m. He also plans to take part in all major contests (if possible from stations better equipped). QSL via EA4ATI.

- 31/10 2010 CANADA; VA7PX NA-075
from Mayne Island. QSL via VE7AXU via bureau or direct.

- 2010 MARSHALL IS.; V73NS OC-028
from the Kwajalein atoll by WD8CRT, who will have to work here for two years starting on Jan 5, 2009. He will work mostly in CW on 160-6m. QSL via bureau or direct to Neil Schwanitz, PO Box 8341, APO, AP 96557, USA. His website is http://www.qsl.net/v73ns/

1/8 - 9/8 EGYPT; SU8LH
from Ras El-Bar Island and the first Egyptian Lighthouse Dxpedition. Activity will be on the HF bands, as well as 6 meters, CW and SSB modes. QSL via SU1SK. Look for updates to be posted at http://www.qsl.net/su1sk/Links.html

3/8 - 3/10 TIMOR-LESTE; 4W
by CT1GPQ. Activity will be on 40/30/20/17 meters SSB, RTTY and preferably CW. His station setup will be an Icom IC-706 MK2g, a dipole for 40 and 30 meters and square loops for 20 and 17 meters. QSL Manager is CT1GFK. Activity logs will be online (possibly daily) on: http://algarvedx.com/
This is "NOT A DXpedition"! CT1GPQ will be in Timor-Leste with a Medical Team and radio operations will take place only during his spare time.

8/8 - 12/8 JAPAN; JA6VDB/6 and JE6AQP/6 AS-040
from the islands of Nozaki and Ojika, in the Goto Islands group.
They plan to operate CW and SSB on 40-15 metres. QSL via home calls, direct or bureau.

9/8 - 14/8 OGASAWARA; JD1BLY and JD1BNF AS-031
from Chichijima Island by JI5RPT (JD1BLY) and JO1LVZ (JD1BNF). Activity will be on 160-6 meters using the satellites, CW, SSB, Digi modes and 2m WSJT EME. QSL via their home callsigns. Log searches will be available on the following Web sites:
JD1BLY: http://www.ji5rpt.com/jd1/
JD1BNF: http://www.hattsan.com/

11/8 - 30/8 AGALEGA & ST. BRANDON IS.; 3B7FQ AF-015
from St. Brandon Island by 3B8FQ. This may be his last visit to 3B7 for the next five years. It will be a working trip, with time shared for maintenance on the island's meteorological equipment. Operation will be CW and SSB on 40-10 metres. QSL via K5XK.

13/8 UNITED STATES of AMERICA; N3AQC
by WY3H, W3IRS and K3WWP will operate a special event station from the USS Requin (Submarine) which is dry docked in the Alleghney River in Pittsburgh, PA. Their operating times will be roughly between 10 a.m. to 2 p.m. (+/- a few minutes) EST (1400-1800z). A special QSL card will be sent to all contacts. Operation will be on 20 and 40 meters only in the CW portion of the bands.

14/8 - 23/8 PUERTO RICO; W4L NA-099
from the Arecibo Lighthouse (ARLHS PUR-001, TWLHD WLH KP4-001), Puerto Rico (NA-099, USI PR-006S, WLOTA 2802). This activity will include the International Lighthouse/Lightship Weekend (ILLW, August 15-16th). Look for them on the following frequencies: SSB - 7150, 14225, 18122 and 28350 kHz - SSTV - 14230 kHz
QSL direct to: CARG, PO Box 140031, Arecibo, PR 00614-0031.

14/8 - 25/8 CYPRUS; 5B/G4MKP
from Tsada village near Pafos. Activity will be mainly CW on 80- 10 meters. QSL via M0URX.

15/8 - 16/8 UNITED STATES of AMERICA; W2T
from the Tucker's Island lighthouse (USA-911) by The Old Barney ARC from 13 UTC through 21 UTC each day. Operation will be primarily on 40 and 20 metres SSB with two stations. QSL via N2OO.

17/8 - 23/8 NAURU; C21TI
by EA4ATI/9M2TI and other operators which was to take place between June 16-26th, was postponed, but is already booked/rescheduled.
Look for activity on all HF bands from 160-10 meters + 6 meters. Station will have power and a 7 element yagi. The suggested - Frequencies are:
CW - 1825.2, 3505, 7005, 10110, 14025, 18075, 21025, 24895 and 28025.
SSB - 1825.2, 3799, 7065, 14195, 18145, 21295, 24945 and 28495 kHz
6m - 50.115 MHz - QSL via EA4ATI. Look for possible updates on the Web page at http://c21ti.madrono.net/index.html

22/8 - 25/8 CANADA; VC1W NA-154
from Welsh Island by VE1VOX and VE1AOE. They plan to have two stations on the air and possibly more operators to join their operation as the date approaches. This is a remote island and weather may affect the actual dates. QSL Manager is VE3EXY.

24/8 - 29/8 MARSHALL IS.; V73NF and V7XX (or V73J) OC-029
from Majuro by JA2DSQ (V73NF) and JH2BNL (V7XX or V73J) will
be active from Majuro. QSL via their home callsigns.

30/8 - July 2011 FRENCH POLYNESIA; FO
by F5PHW. Since he is there for work, his on air activities will be limited, but he will try to operate as much as possible. If he lives in a house, Phil intends to be active on all HF bands from 80-10 meters mainly on CW and RTTY (possibly some PSK31) with very little SSB using only 100 watts. His antennas from the house QTH will be: 80-40m - Inverted V + HF6VX (GP), 30m - HF6VX, 20-10m - HF6VX + Spiderbeam (not sure). However, if he lives in an apartment the antenna may only be the HF6VX. QSL via F8BPN, by the Bureau or direct.

4/9 - 16/9 AUSTRAL I.; FO/G3BJ OC-050 and OC-152
from Rurutu and Tubuai by G3BJ and G4JKS on vacation. Operations will be mostly CW on 80-10 meters (no 17/12m). They will use a K3 transceiver and a Butternut HF6.

6/9 - 7/9 FIJI; 3D2 OC-016
Requested call is 3D2G. This pacific dxpedition/tour by PG5M will be an ultra light solo DXpedition and CW only. He will use an Elecraft K3, and a 2x20m doublet plus vertical antennas. QSL via PG5M, by the Bureau or direct. For direct requests, please enclose a minimum of 2 USDs for return postage. More details and updates will be available on http://www.dx.to/

8/9 - 14/9 W. KIRIBATI; T3ØG OC-017
from Tarawa Island by PG5M on Pacific dxpedition/tour. This will be an ultra light solo DXpedition and CW only. He will use an Elecraft K3, and a 2x20m doublet plus vertical antennas. QSL via PG5M, by the Bureau or direct. For direct requests, please enclose a minimum of 2 USDs for return postage. More details and updates will be available on http://www.dx.to/

8/9 - 17/9 ARUBA; P41USA
by W3BTX (P49T) and W3TEF (P4/W3TEF) will once again activate P41USA this year over the anniversary date of the USA attacks on September 11th, 2001. Look for them to be active on all bands. Activity will include the September VHF Contest. All QSLs go to W3TEF.

15/9 - 16/9 FIJI; 3D2
Requested call is 3D2G. This pacific dxpedition/tour by PG5M will be an ultra light solo DXpedition and CW only. He will use an Elecraft K3, and a 2x20m doublet plus vertical antennas. QSL via PG5M, by the Bureau or direct. For direct requests, please enclose a minimum of 2 USDs for return postage. More details and updates will be available on http://www.dx.to/

17/9 - 23/9 TUVALU; T2G OC-015
Pacific dxpedition/tour by PG5M. This will be an ultra light solo DXpedition and CW only. He will use an Elecraft K3, and a 2x20m doublet plus vertical antennas. QSL via PG5M, by the Bureau or direct. For direct requests, please enclose a minimum of 2 USDs for return postage. More details and updates will be available on http://www.dx.to/

18/9 - 25/9 NIUE; ZK2BJ OC-040
by G3BJ and G4JKS on vacation. Operations will be mostly CW on 80-10 meters (no 17/12m). They will use a K3 transceiver and a Butternut HF6.

18/9 - 30/9 CHATHAM Is.; ZL7/N7OU
by N7OU making a lightweight, solo Dxpedition. Activity will be on 80-10 meters, CW only, using 100w into a vertical. QSL via N7OU.

19/9 - 20/9 Scandinavian Activity Contest CW 1200 - 1200 UTC

22/9 - 21/10 MAYOTTE; TO7RJ AF-027
by DJ7RJ. He will be leaving the island on 25 October, so he will be active as FH/DJ7RJ during the last days. Expect CW and SSB on 160-10 metres and perhaps 6 metres. QSL via home call.

24/9 - 27/9 FIJI; 3D2
Requested call is 3D2G. This pacific dxpedition/tour by PG5M will be an ultra light solo DXpedition and CW only. This will be an ultra light solo DXpedition and CW only. He will use an Elecraft K3, and a 2x20m doublet plus vertical antennas. QSL via PG5M, by the Bureau or direct. For direct requests, please enclose a minimum of 2 USDs for return postage. More details and updates will be available on http://www.dx.to/

24/9 - 27/9 St. PIERRE & MIQUELON; FP/homecall NA-032
from Miquelon by MØTDG and G3ZAY. They will operate CW and SSB; low band operation will depend on equipment availability (and airline baggage limits). QSL via home calls. G3ZAY will also try to activate McNutt's Island (NA-126) on 29 September.

24/9 - 7/10 BONAIRE, CURACAO; PJ2/PA1FJ SA-006
from the Island of Curacao. QSL via his home callsign, direct, by the Bureau or eQSL.

26/9 - 27/9 Scandinavian Activity Contest SSB 1200 - 1200 UTC

27/9 - 15/10 DOMINICA; J79ZG
by DL7AFS and DJ7ZG. Activity will be on 80-6 meters on the usual DX frequencies, mainly on CW, SSB, RTTY and PSK, as well as 6 meters. They will look especially for JA stations. QSL via DL7AFS. Their Web page for this operation is http://www.qsl.net/dl7afs/Index_J7.html

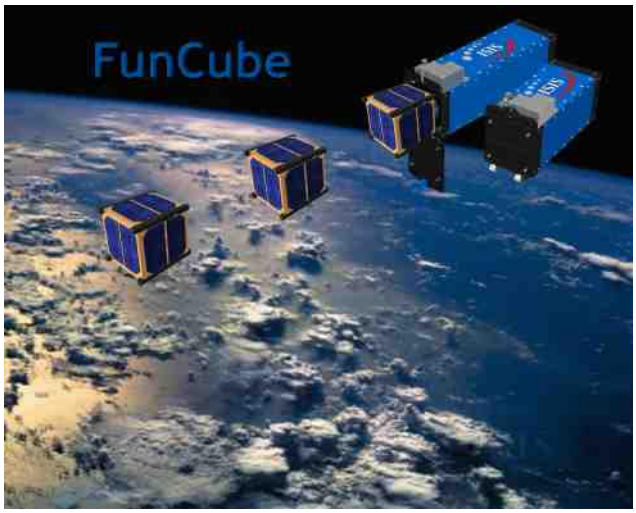
AMSAT-UK
FUNcube Press Notice
By Trevor M5AKA

AMSAT-UK has announced a new amateur satellite project - FUNcube. The project has received major initial funding from the Radio Communications Foundation (RCF) and is expected be developed in collaboration with ISIS-Innovative Solutions in Space BV.

FUNcube is an educational single cubesat project with the goal of enthusing and educating young people about radio, space, physics and electronics. It will support the educational Science, Technology, Engineering, Maths (STEM) initiatives and provide an additional resource for the GB4FUN Mobile Communications Centre.

The target audience consists of primary and secondary school pupils and FUNcube will feature a 145 MHz telemetry beacon that will provide a strong signal for the pupils to receive. It is planned to develop a simple receiver board that can be connected to the USB port of a laptop to display telemetry in an interesting way. The satellite will contain a materials science experiment, from which the school students can receive telemetry data which they can compare to the results they obtained from similar reference experiments in the classroom.

FUNcube is the first cubesat designed to benefit this group and is expected to be the first UK cubesat to reach space.



It is anticipated FUNcube will be launched into a Sun Synchronous Low Earth Orbit about 600-700km above the earth using one of the many launch opportunities that exist for Cubesat missions. In such an orbit the satellite passes over Europe approximately 3 times in the morning, and 3 in the evening, every day, perhaps allowing the morning passes to be used for educational purposes and the evening passes for Amateur Radio communications.

FUNcube will carry a UHF to VHF linear transponder that will have up to 1 watt and which can be used by Radio Amateurs worldwide for SSB and CW communications. Measuring just 10 * 10 * 10 cm, and with a mass of less than 1kg, it will be the smallest ever satellite to carry a linear transponder and the choice of frequencies will enable Radio Amateurs to use their existing VO-52 or DO-64 station.

A key feature of the satellite is the absence of an On-Board Computer. For reliability and maximum power efficiency, the design has been kept as straight-forward as possible with satellite control being achieved using simple commands.

AMSAT-UK has more than 350 individual members and is one of more than 20 such groups worldwide. AMSAT-UK teams have provided hardware for more than 10 satellites over the past 35+ years including SSETI Express in 2005.They are presently involved with the development of hardware and software for a number of satellite projects including the European Student Earth Orbiter (ESEO), P3E, SUITSAT2, the Columbus module on the ISS and also the GENSO Ground station network.

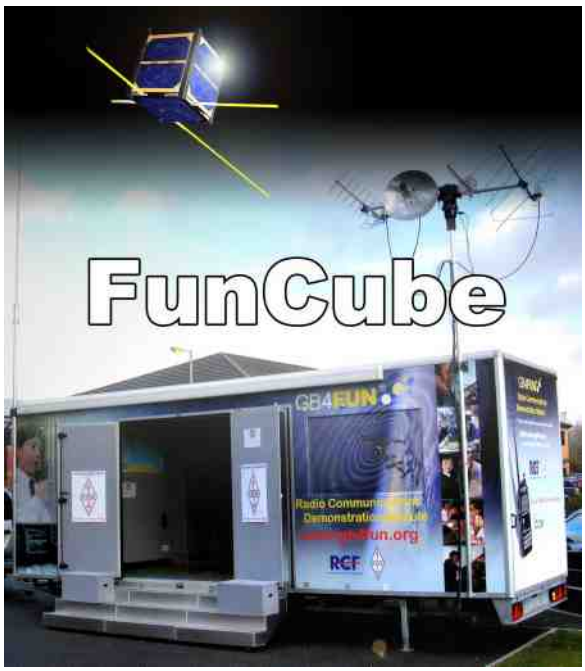
The Radio Communications Foundation is a Registered Charity (Number 1100694) set up in 2003 to fund efforts to bring the wonders of radio into the classrooms, universities and any other public place where hands on demonstration can influence understanding. The RCF funding for FUNcube is made possible through the generous bequest from a “silent key” who wanted the hobby that he loved brought to the attention of others. Any one wanting to make a bequest in their Will so that their name can live on in the hobby, or anyone simply wanting to make a donation, should click on the link below.

AMSAT-UK: http://www.uk.amsat.org/

Radio Communications Foundation: http://www.commsfoundation.org/

GB4FUN: http://www.gb4fun.org.uk/

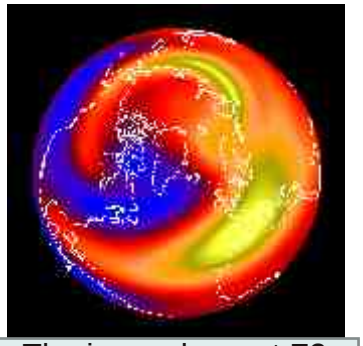
FUNcube contact: Graham Shirville G3VZV Tel: +44 (0)7713 665725



Ionospheric Perturbations
By ON4SKY

A disturbing star (I)

Since the pioneer works of Grote Reber, W9GFZ, in 1937, the ones of first broadcasters and from the Royal Air Force on first radars at the end of World War II, we all know that the main source of radioelectric perturbations is our sun. Its surface activity, especially chromospheric eruptions, Coronal Mass Ejections (CME) as well as its electromagnetic and particle radiations can potentially modify the ionosphere constitution and affect the geomagnetic field, disturbing their properties.



The ionosphere at F2 level (300 km aloft) during a severe geomagnetic storm

These intense radiations, heavy particles and other fast moving bubbles of gas move away from the sun at a few hundreds km/s prisonned in the solar electromagnetic field. After ten minutes or so for the fastest or a couple of days these radiations collide with the geomagnetosphere and induce indirectly an increasing of the level of ionization of the ionosphere. Sometimes the hit is very beneficial, sometimes much less. How work these mechanisms and how do they affect the ionospheric propagation ?

Sky wave propagation

Radio waves reaching the ionosphere layers are called sky waves. Only these ones allow long distance propagation (DX). To understand how they can be affected by the sun activity, we must first of all define characteristics of the ionosphere and its properties. Then we will focus on solar radiations, geomagnetic and ionospheric disturbances to close in dealing with solar an geomagnetic indices and their effects on critical frequencies like MUF, LUF and other FOT.
The ionosphere is constituted of several layers of ionized gas acting like as many reflecting surfaces more or less open or transparent to shortwaves depending on their density and the incident angle of the signal. From up to down, physicists defined three main "reflecting surfaces"
- F-layer, divided in F1 and F2 at daytime, it allows long distance propagation
- E-layer, accessible between 80 and 2m bands, it vanishes at night
- D-layer, its absorbs radio waves at daytime in the 160-40 m bands, degrades the MUF but does not intervene in DX.

Several additional effects increase also reflectivity or waves :
- Plasma clouds (sporadic-E)
- Gray line (along the line of the terminator)
- Azimuth (tilts, horizontal gradients, plasma irregularities, etc).

In addition, properties of the signal will influence its propagation:
- Distances involved between the transmitter and the receiver
- Ground properties (dielectric constant, conductivity, resistivity, etc)
- The antenna takeoff angle
- The working frequency vs. the critical frequency
- The ouput power
- The modulation mode (CW, SSB, etc)

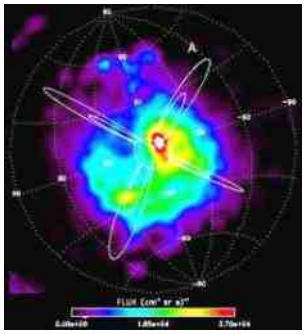
If we want to work remote stations, sky waves must be reflected one or more times to the ground by the ionospheric layers. Some have to be highly ionized to reflect sky waves while other must be transparent in order that sky waves could travel across to reach higher layers. But several factors that will be developed below and in the next pages affect their ionization level and their response to sky waves propagation :

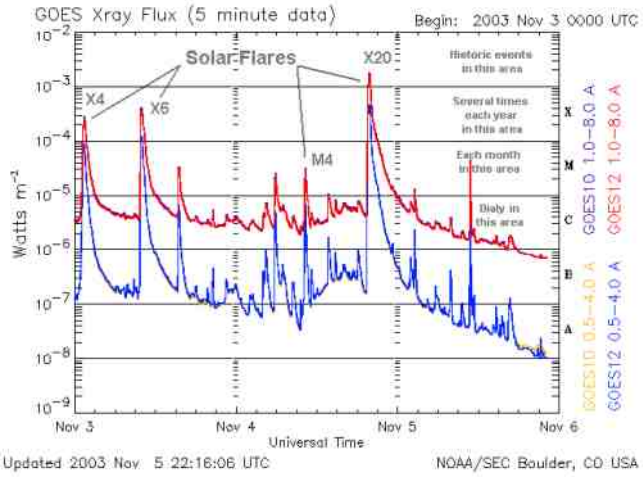
- The amount of electromagnetic radiation and particle emissions (X-flare, EUV, UV, CME, solar wind, etc) emitted by the sun and their variation according the time of day and time of year

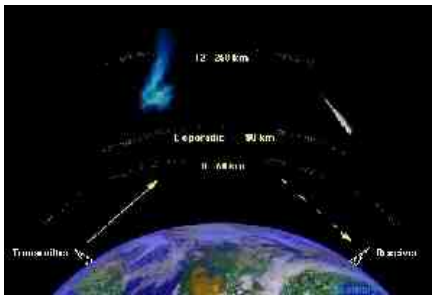
- The status of the geomagnetic field (Ap and Kp indices)

The relation between all these variables where hard to correlate, and until recently we even didn't know that CME had a so strong impact on the Earth ionosphere.

To well understand how develop ionospheric perturbations, we have to divide this study in two parts : first, determine what solar radiations are able to disturb either the ionosphere or the geomagnetosphere, then what components of the geomagnetosphere affects the radio propagation and in which way. At last from these data we could create a model of the ionosphere to establish forecasts.







At left, the Earth ionosphere seen from the Sun. At center of the image (red) neutral atoms emitted by the sun strike head on the earth near the equator and warm locally the ionosphere. At center, a historic X-ray burst of Class X28 classified as a "mega flare" recorded by a GOES satellite on November 4, 2003. Immediately after the Kp-index jumped to 7. A right these breaks in the ionosphere layers due to the presence of an aurora cause blackouts; if this event is fine for Aurora traffic it interrupts all HF communications during several hours. Documents NASA/MSFC, SEC/NOAA and T.Lombry.

Variations of the ionosphere

We have seen in the chapter dealing with the radio propagation that the ionosphere shows several layers, ranging from the D-layer at 90 km of altitude, and the F-layer located between 200 and 300 km of altitude. Its structure at any location is complex and depends mainly on the frequency, the amount of EUV light coming from the sun and the electron density (the rate of photoionization or recombination).

The fact that the ionosphere is created by the solar activity suggests that its variation will be similar to the one of the air temperature. And indeed, we observe that globally the electron density of the ionosphere is the greatest in summer, at noon and over the equator. But this picture is uncomplete. Due to the EUV radiation, that follows the 11-year solar cycle, the ionosphere varies much more than this.

We can define five main variations of the ionosphere :

Diurnal variation

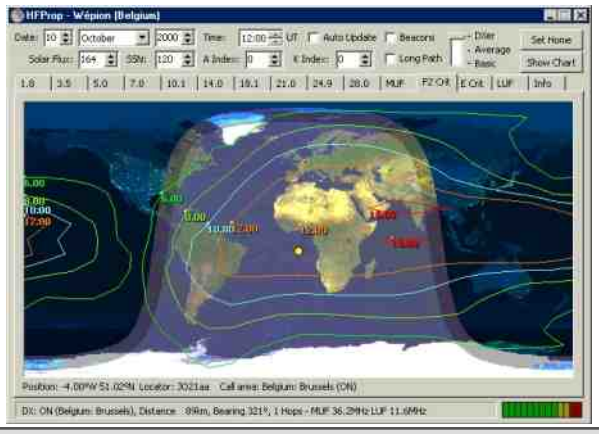
As its name suggests, these variations occur only throughout the day, following the apparent movement of the sun. They affect the D, E and F1 layers depending on the solar activity, and the solar zenith angle over the location.

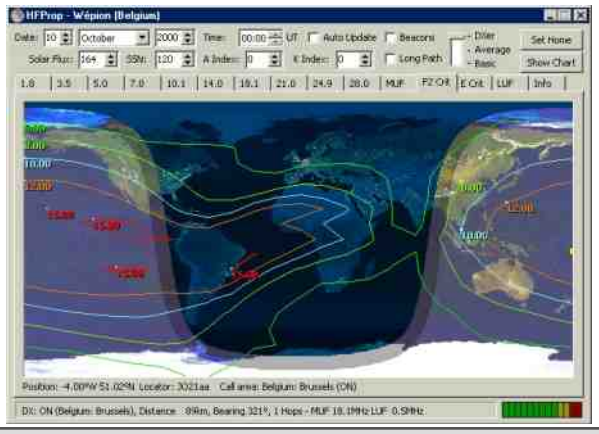
The E-layer does not completely vanish at night and stays around a critical frequency foE = 0.6 MHz, but one often considers that its drops to zero and vanish at night as it as little consequence on radio propagation.

The F1-layer becomes a separate layer only at daytime and mainly during 3 to 4 hours before and after local noon. It disappears after sunset leaving the place to the F-layer located higher in altitude.

The F2-layer variation is more complex. Its critical frequency foF2 reaches is the lowest level (about 2-4 MHz), just before dawn, after the recombination process eliminated all electrons. The foF2 rises rapidly after sunrise due to the photoionization, amplifies during the day (to reach about 15 MHz near the equator), then decreasing at sunset but it never vanishes. Surviving the night, the F2-layer is the most important layer for HF communications.

Software review : SWIM, PropLab Pro, STD Aurora monitor





Iso-contour maps of the foF2 critical frequency at noon and midnight a day of October 2000 during the maximum of the solar cycle. Even if they stay very high due to the intense solar flux, globally foF2 drops up to 30% and MUF up to 50% at night; in the field, that means that the Frequency of Optimal Transmission, FOT, drops of several bands. For a circuit between Belgium and Congo at 100 W output, the S/N ratio at receive and FOT forecasts drops from 24.6 MHz at 1500 UTC to 13.4 MHz at 0300 UTC. Signals in Congo will the strongest from 1900 UTC and during the night on 20m with a S/N close to 20 dB (S2). Note that at that time the foF2 is also forecasted the highest, at 15 MHz over the equatorial zone. Maps created with HFProp.

Seasonal variations

The ionosphere varies also with seasons. In winter for example, the sun is always lower over the horizon than in summer (zenit angle higher in winter than in summer). This affects the critical frequencies of the D, E and F1-layers that is greater in summer than in winter. But this is the opposite for the foF2 at mid-latitudes that shows is greatest variation in winter. This difference is known as the "mid-latitude seasonal anomaly" and finds its root in seasonal changes in the relative concentrations of atoms and molecules.

Latitudinal variations

As with seasonal variations, the solar zenith angle affects also the ionosphere with latitude. Critical frequencies of each layer are not superposable and show considerable difference at low, mid and high-latitudes.

Variations from day to day

As the air temperature varies following the 24-hour cycle and from day to day, so do the critical frequencies of the ionosphere in reponse to the change of EUV radiation from the sun. Changes occuring sometimes at a very fast rate in the low atmosphere (within 5 minutes), usually one ignore most of these details and one works in terms of average behaviour of the ionosphere for the month, at each of the 24-hours of the day. These values are divised in three groupes : median (valid 50% of the month), lower decile (valid 10% of the month) and upper decile (valid 90% of the month). If the true critical frequency measured with a digisonde is much lower or higher than on the remaining days (respectively the 15, 27 or 3 other days on the month) we speak of "disturbed days". They are all associated to a deep change of the solar activity.

Variation with the solar activity

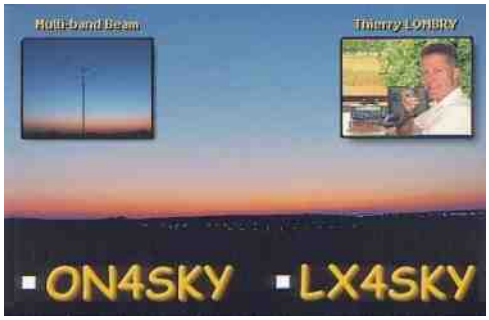
Considering only the day-to-day variations of the ionosphere, we cannot describe its behaviour with accuracy as many other indicators affect propagation conditions. Among them, name the solar flux characterized through its electromagnetic and particle emissions which is the main factor affecting the ionosphere. Its impact is obvious if we use a calibration graph showing the monthly median value of foF2 as a function of SSN. The foF2 double of frequency in winter when SSN jumps for example from 50 to 100.

Recall in this context that instead of using the SSN to estimate the status of the ionosphere, we can use the ionospheric index T which is a measure of the ionosphere itself. It is performed by a a group of stations in order to cancel out local variations and leaving only those common to all stations.

Plasma blasts in the ionosphere

Highlight a last phenomenon recently discovered in the ionosphere. We don't know what could be its effects yet, but it looks visually spectacular !

Beside gamma rays lightnings detected in the ionosphere, in 1994 the Geophysical Institute discovered an absolutely amazing phenomenon. Between 75 and 95 km of altitude, bright bluish plasma jets like the one displayed at left shoot up from thundery supercells top (lines of cumulo-nimbus). This event last only two or three milliseconds. Researchers think that these ionization blasts are linked to the ionospheric activity, but the mystery remains.



In all cases, we are at some orders of magnitude above the harmless HAARP experiments about which some people complain in regards with their potential effects in the atmosphere !...

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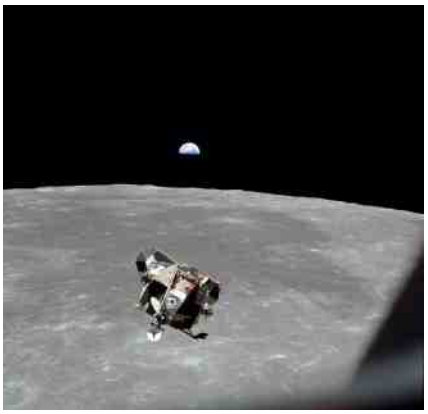
40 Years ago... The first Men on the Moon !

The First Lunar Explorers

At 9:32 a.m. Eastern daylight time on July 16, 1969, Apollo 11 left Launch Complex 39A at Kennedy Space Center, bound for the moon. Four days later, at 4:18 p.m. EDT on July 20, Neil Armstrong skilfully set the lunar module Eagle down in the Sea of Tranquility and reported, "Houston, Tranquility Base here. The Eagle has landed."

For the next 10 minutes Armstrong and Aldrin were occupied with several post-landing procedures, reconfiguring switches and systems. Armstrong found time to report to Mission Control what he had been too busy to tell them during the landing: that he had manually flown the lunar module over the rockstrewn crater where the automatic landing system was taking it. Then he made his first quick-look science report:

We'll get to the details of what's around here, but it looks like a collection of just about every variety of shape, angularity, granularity, about every variety of rock you could find. . . . There doesn't appear to be too much of a general color at all. However, it looks as though some of the rocks and boulders, of which there are quite a few in the near area, it looks as though they're going to have some interesting colors to them. . .
After giving Houston as many clues as he could to the location of their module, he added some more description:



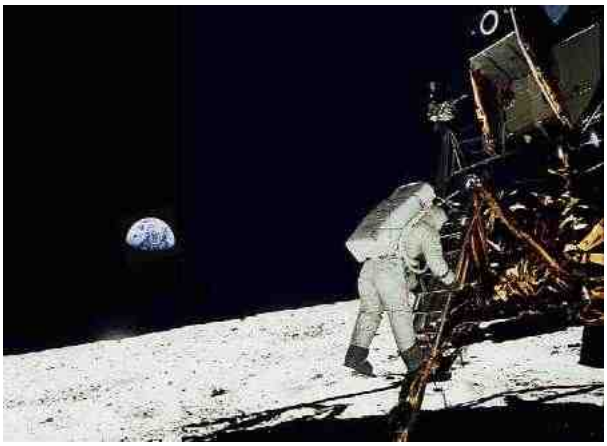
The area out the left-hand window is a relatively level plain cratered with a fairly large number of craters of the 5- to 50-foot variety, and some ridges - small, 20, 30 feet high, I would guess, and literally thousands of little 1- and 2-foot craters around the area. We see some angular blocks out several hundred feet in front of us that are probably 2 feet in size and have angular edges. There is a hill in view, just about on the ground track ahead of us. Difficult to estimate, but might be half a mile or a mile.

Armstrong and Aldrin then started preparing their spacecraft for takeoff, setting up critical systems to be ready in case something happened and they had to leave the lunar surface quickly. A short break in this activity gave Armstrong a chance to pass along more information about the landing site:

*The local surface is very comparable to that we observed from orbit at this sun angle, about 10 degrees sun angle, or that nature. It's pretty much without color. It's . . . a very white, chalky gray, as you look into the zero-phase line [directly toward the sun]; and it's considerably darker gray, more like . . . ashen gray as you look out 90 degrees to the sun. Some of the surface rocks in close here that have been fractured or disturbed by the rocket engine plume are coated with this light gray on the outside; but where they've been broken, they display a dark, very dark gray interior; and it looks like it could be country basal*t.

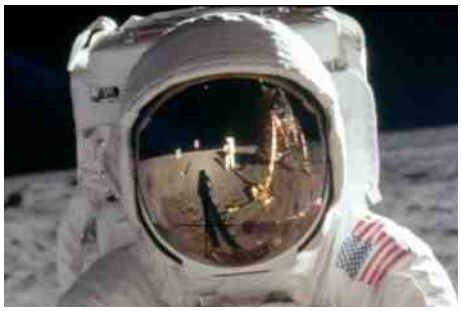
Setting up the spacecraft systems took another hour and a half to complete; then they were ready to get out and explore. The flight plan called for them to eat and then rest for four hours, but Aldrin called Mission Control to recommend starting their surface exploration in about three hours' time. Houston concurred. Although they had been awake almost 11 hours and had gone through some stressful moments during the landing, it seemed too much to expect the first men on the moon to take a nap before they made history.
While Armstrong and Aldrin tended to their postlanding chores, Mike Collins, orbiting 60 nautical miles (112 kilometers) overhead in the command module Columbia, had little to do. Houston enlisted his aid in an attempt to locate Eagle, giving him the best map coordinates they could derive from the sketchy information available. With his navigational sextant Collins scanned several spots, without success; Columbia passed over the landing site too rapidly to allow him to search the area thoroughly and he never found the lunar module. Determination of its exact location had to wait for postmission analysis of Armstrong's descriptions of the area and examination of the spacecraft's landing trajectory.

Getting ready to leave the lunar module took longer than the crew had anticipated. It was after 9:30 p.m. in Houston, an hour and a half later than they had hoped, when they opened the hatch. Armstrong carefully worked his way out onto the "porch," then climbed down the ladder, pausing on the lowest rung to comment on the texture of the surface and the depth to which the footpads had penetrated. At 9:56 p.m. he stepped onto the moon's surface, proclaiming, "That's one small step for man, one giant leap for mankind" - inadvertently omitting an "a" before "man" and slightly changing the meaning he intended to convey.

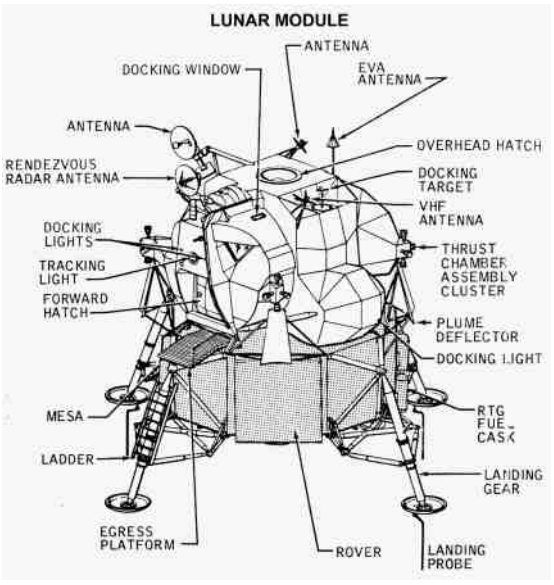


Armstrong made a cursory inspection of the lunar module and reported his reactions to the new environment. Aldrin then lowered a camera on the lunar equipment carrier - a clothesline and pulley arrangement that seemed out of place in the high-technology environment of Apollo - which Armstrong immediately began using. Mission Control reminded him to scoop up the contingency sample, which he did. "I'll try to get a rock in here. Just a couple." He noted that the collecting tool met resistance after penetrating a short distance into the surface material. He then stowed the sample in a bag that he tucked into a pocket of his suit. To the scientists on earth he remarked, "Be advised that a lot of the rock samples out here, the hard rock samples, have what appear to be vesicles in the surface. Also, I am looking at one now that appears to have some sort of phenocryst."

Aldrin then joined Armstrong on the surface, and they spent the next several minutes inspecting the landing craft and reporting on its condition, adjusting to the low lunar gravity and trying various ways of getting around on the surface. After a brief commemorative ceremony (reading the plaque attached to the lunar module) and a short conversation with President Richard Nixon, they began unloading and emplacing the scientific instruments and collecting samples. They supplemented earth's limited television view of their activities with descriptions of what they were seeing and doing. On a couple of occasions they acted like field geologists. Aldrin reported that he saw a rock that sparkled "like some kind of biotite," but he "would leave that to further analysis." After closely examining some rounded boulders near the spacecraft, Armstrong said they looked "like basalt, and they have probably two percent white minerals in them. . . . And the thing that I reported as vesicular before, I don't believe that any more. . . . they look like little impact craters where BB shot has hit the surface."



The geologists in Houston watching this surface activity on television were quite pleased with the astronauts' performance. At one point Armstrong disappeared from the field of view of the TV camera, causing some momentary anxiety at his apparent departure from the plan. It turned out that some unusual rocks had attracted his attention and he had gone off a few meters to collect them. That was exactly the kind of thing the geologists had hoped people on the moon would do. By the time the crew had taken two core samples, again experiencing difficulty in driving a sampling tool into the surface, and filled their sample return containers, Houston notified them that it was time to wind up their activity. Just before midnight CapCom Bruce McCandless told Aldrin to "head on up the ladder," and at 12:11 a.m. Houston time both men and their samples were back in the lunar module and the hatch was sealed. Humanity's first excursion on the surface of another celestial body had lasted 2 hours, 31 minutes, and 40 seconds.



Back inside the lunar module, Armstrong and Aldrin removed their lunar surface suits and portable life-support systems and used up their remaining film. Houston passed up some more instructions in preparation for liftoff and tentatively signed off for the night, but before long CapCom Owen Garriott, who had relieved McCandless, came on the line with some questions from the scientists about the nature of the surface and the problems in driving sampling tools into the surface. Three hours after they returned to the lunar module, the lunar explorers finally were able to turn in for a few hours of fitful sleep.

Next morning Armstrong, Aldrin, and Collins spent most of their time setting up Eagle and Columbia for liftoff and rendezvous. Before the lunar module left the moon, however, Armstrong gave Mission Control a detailed description of the landing approach path and landing area, in the hope of helping scientists locate their exact landing spot, and summarized the characteristics of the soil and rocks around the area.

Liftoff and rendezvous went smoothly. When the two spacecraft were locked together Collins cracked Columbia's oxygen supply valve and Aldrin opened the lunar module's vent valve, to create a gas flow into the LM when the hatches were opened - part of the procedure to minimize back-contamination-while Aldrin and Armstrong vacuumed the lunar dust from their suits as best they could. Their vacuum cleaner, a brush attached to the exhaust hose of the LM suit system, was not very powerful and the tenacious dust came off only with difficulty. There was not nearly as much loose dust in the lunar module as they had expected when they returned from the surface; evidently it stuck tightly to whatever it touched. They passed the rock boxes and other items over to Collins and then clambered into the command module, where they removed their suits and stowed them in the bags provided. After jettisoning the lunar module and straightening up the command module, the three astronauts settled in for an uneventful trip back to earth.
In the early morning hours of July 24, 8 days, 3 hours, 18 minutes, and 18 seconds after leaving Kennedy Space Center, Columbia plopped down into the Pacific Ocean about 200 nautical miles (370 kilometers) south of Johnston Island. Recovery crews from the U.S.S. Hornet arrived quickly and tossed the biological isolation garments into the spacecraft. After the cocooned astronauts emerged from the spacecraft the swimmers swabbed the hatch down with Betadine (an organic iodine solution); then astronauts and recovery personnel decontaminated each other's protective garments with sodium hypochlorite solution. The biological isolation garments were not uncomfortable in the recovery raft, but aboard the helicopter they began accumulating heat. Both Collins and Armstrong felt that they were approaching the limit of their tolerance by the time they reached the ship. An hour after splashdown they were inside the mobile quarantine facility. As soon as they had changed into clean flight suits, the astronauts went to the large window at the rear end of the mobile quarantine facility to accept the nation's congratulations from President Nixon, who had flown out to the Hornet to meet them.

Meanwhile, recovery crews brought Columbia on board and connected it to the astronauts' temporary home by means of a plastic tunnel. Through this, the film magazines and sample return containers were taken into the quarantine trailer, then passed out through a decontamination lock. Sample return container no. 2, holding the documented sample, was packed in a shipping container along with film magazines and tape recorders and flown to Johnston Island, where it was immediately loaded aboard a C-141 aircraft and dispatched to Ellington Air Force Base near MSC. Six and a half hours later the other sample return container was flown to Hickam Air Force Base, Hawaii, and thence to Houston.

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COMIC'S HAM

Have some fun

THE QSL OF THE MONTH

NEWS CONCERNING YOU E-MAGAZINE HAM-MAG

Dear YL, Dear OM.

At the beginning of july I've moved to a new QRA.
With my new Internet access, I can send only between 400 and 500 emails by day.
So to send the magazine to all the subscribers (5,500 english and 4,500 french) will take about 20 days !
I have decided to change the way of sending your issue.
I have created an "Yahoo Group" for ham-mag.
Now, to receive your magazine, you have just to subscibe to this group, yes, like before you'll receive your issue every month, but only via the "Yahoo-group".

To subscibe clik on the link below and send an empty mail to this address :

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Link :

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Thanks a lot and best 73's

Vincent F5SLD
HAM-MAG