Before setup in the field:

Setup the linux box:
- Configuration of etc/network/interfaces.
  #Wireless interface
  auto ath0
  iface ath0 inet static
  address 192.168.1.A
  netmask 255.255.255.0
  wireless_mode Ad-Hoc
  wireless_essid CS496
  ap [2nd MAC ADDR HERE] “mac addresses of the other 2 stations”
  ap [3rd MAC ADDR HERE]
  channel 6 “specify the channel”
  rate 54M

  #Ethernet interface
  auto eth0
  iface eth0 inet static
  address 192.168.1.B
  netmask 255.255.255.0

- apt-get update (update the list of packages)
- apt-get install iperf
- apt-get install wavemon
- apt-get install tcpdump

Antenna construction: for all parabolic dishes and yagi’s, be sure to follow the directions so that the polarity each dish is uniformly either horizontal or vertical. If the polarities are opposite then they will not be able to communicate effectively.

To setup in the field:
Power:
- If running off of ac:
  use the normal ac power supply in the case.
- If running off a car battery or other 12 volt power supply;
  try and use the mosfet dc power supply directly. There is no reason to go from dc to ac, then back to dc to the board.

Connect antenna to pcmcia card via pigtail.

Boot up the cpu.
- If using wireless to login, connect to 192.168.1.A via SSH. Make sure that the laptop you are using is configured for ad-hoc with the ESSID set properly
- Otherwise use a crossover cable to connect to eth0
Login, then make sure that everything is configured correctly

```bash
iwconfig ath0:
```
look for ESSID as the name in the config file (Cs496)
check that mode = ad-hoc
make sure ip-address is set.

**Check AP Association:**

Wavemon, run wavemon and check the access point list:
- If remote: go to options (F7) and set the main screen to AP List
  then (F10) to quit and startup wavemon again. You will see a
  list of all the AP’s in range
- If via crossover cable: just hit (F3) for the AP list.

```bash
iwlist ath0 ap
```
Will list access points by MAC address only and signal noise
level/quality. (can be done in ad-hoc mode)

Since all machines should be pre-configured, you should at this level be able to ping
each-other. If you know the ip address, try to ping it, Otherwise ping broadcast and then
check arp to see what nodes responded.

**Check Signal strength:**

The Access Points screen in wavemon as well as iwspy*
*iwspy works better that iwconfig when in ad-hoc mode. Iwspy monitors AP’s
within the current CELL.

```bash
iwspy ipaddr
```
“gives the link info for the ip address specified via arp cache. If this fails,
ping the address and then run the command again.

```bash
iwspy [Mac address]
```
“does not use arp cache”

A good idea is to use iwspy and the mac address of the AP you are communicating with
in a loop and grep for the mac address. This should continually show the signal strength
so that then you can orient the antenna and watch the effects.

Iwspy with give accurate Link Quality, Signal Level, and Noise Level.

**Test Application Layer throuput:**

- Use iperf to test the throuput of the link:
  ```bash
  iperf -c [server addr] “TCP link test”
  iperf -c [server addr] -u -b 56623104 “UDP Test at 54M”
  ```
- Use tcpdump to record traffic for later analysis.
- May be particularly interesting to see the results of iperf test.
WHAT TO DO ADDITIONALLY:

Topograpical maps and GPS coordinates for orienting the antenna’s.

If we had the **gps** coordinates at each location we could then use that in correlation with topographical maps of the area in order to calculate the direction and angle needed. It is important to have the **elevation** at each location.

Also, we could use a protractor and a sharpie to mark the degrees on the adjustable section of the clamps. Then if we had a level to make sure the top was flat we could accurately align the dish.