

R B Guide

Quoteable Quotes - Famous Last Words

It's a process, I just gotta figure it out. - CN

Response: Write it down! - RW

It's the least I can do. And you know how much I like to do that! - RW

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Linux - General Information

Distributions - Distros

A general term describing the most recent release (or Distribution) of a specified version of a Linux product

Colinux - Linux version which will run alongside any Windows version.

URL: colinux.org

Debian -

NOOBS -

Occidentalis -

Rubus occidentalis tweaked by Adafruit Industries is based on the Wheezy Version of Linux.

Puppy Linux -

RaspBMC -

Audio / Video

Raspbian

2015 Jessie - released

2015 Jessie Light - released

2015 Wheezy - released

20170907 Stretch - released

20170907 Stretch Light - released

Rasprazor - Desktop

Similar to Windows

SOHO - Small Office Home Office

Ubuntu -

XBMC -

Audio / Video

Linux Commands and Usage

ADD USER / DELETE USER

`sudo useradd [options] username - or adduser`

options: -m -G adm, dialout, cdrom, audio, plugdev, users, lpadmin, sambashare, vchiqq, powerdev

When prompted, enter the password for username

`sudo userdel [options] username - or deluser`

options: -d - remove all information, no parameters only removes username

Add IP Address - Add an IP address to device with an existing IP - see IP Address - Add

Append a line to a file

`echo "text-to-be-added" | sudo tee -a /path/filename.ext`

Note: crontab is located in: `/var/spool/cron/crontabs/pi`

Linux Commands and Usage - cont.

APPLICATION RETRIEVAL PROGRAMS

APT-GET -

DPKG - List of installed programs
dpkg -l

GITHUB -

TAR -

APPLICATION GET - APT - Sequence

sudo apt-get update - This command should always be used first
loads current stuff

sudo apt-cache search [device] [program]

sudo apt-get [action] [application]
action - install, install -y, purge, update, upgrade
-y - is default for answering yes at the prompt

APPLICATION GET - REINSTALL

sudo aptitude reinstall [application]
sudo aptitude -f install

APPLICATION - UPDATE OS

Note: used in anticipation of installing a new application in current os
sudo apt-get update

Linux Commands and Usage - cont.

UPGRADE RASPBIAN STRETCH TO RASPBIAN BUSTER

Note: used to upgrade OS

PREPARING RASPBIAN STRETCH FOR BUSTER

APPLICATION - UPGRADE OS TO NEW OS

Note: used to upgrade os

BE CERTAIN TO MAKE A BACKUP COPY OF THIS SD CARD FIRST!

- Next: update all currently installed packages

sudo apt update

- Next: use dist-upgrade to force upgrade to latest available version of all packages

sudo apt dist-upgrade -y

- Next: update raspberry pi's firmware

sudo rpi-update

UPDATING

- modify the "/etc/apt/sources.list" file:

sudo nano /etc/apt/sources.list

- find the following line and change "Stretch" to "Buster"

Find:

deb http://raspbian.raspberrypi.org/raspbian/ stretch main contrib non-free rpi

Replace with:

deb http://raspbian.raspberrypi.org/raspbian/ buster main contrib non-free rpi

- modify the "/etc/apt/sources.list.d/raspi.list" file:

sudo nano /etc/apt/sources.list.d/raspi.list

- find the following line and change "Stretch" to "Buster"

Find:

deb http://archive.raspberrypi.org/debian/ stretch main

Replace with:

deb http://archive.raspberrypi.org/debian/ buster main

- remove the "apt-listchanges" package

sudo apt-get remove apt-listchanges

Final steps

sudo apt update

sudo apt dist-upgrade

Remove unneeded packages:

sudo apt purge timidity lxmusic gnome-disk-utility deluge-gtk evince wicd wicd-gtk clipit
usermode gucharmap gnome-system-tools pavucontrol

sudo apt autoremove -y

sudo apt autoclean

sudo reboot

SOURCE: <https://pimylifeup.com/upgrade-raspbian-stretch-to-raspbian-buster/>

Linux Commands and Usage - cont.

ARP - Address Resolution Protocol

Associated with Network Mapper - see nmap

Usage: arp

arp -an

Linux Commands and Usage - cont.

BASH UPDATE / PATCH

sudo apt-get update

sudo apt-get install bash

sudo reboot

QUIRK - Software Defined Radio

Linux Commands and Usage - cont.

CHANGE DIRECTORY

`cd /directory`

CHGRP - Change Group

`[sudo] chgrp user location`

`[sudo] chgrp pi /var/www`

CHMOD - Set / Change Permissions

`[sudo] chmod 700 filename.ext`

CHOWN - Change Ownership

`[sudo] chown user [file] [directory]`

CLEAR - clear screen

`clear`

Linux Commands and Usage - cont.

COPY FILE

cp /path/filename.ext /path/filename.ext

COPY SD CARD

Copy image to hard drive with Ubuntu

dd if=/dev/sdb of=filename.img - to copy image to hard drive

dd if=filename.img of=/dev/sdb - to copy image to SD Card

COPY FILES

sync

sync

sync

cp [source-path]filename.ext [destination-path] [filename.ext]

sync

sync

sync

CREATE IMAGE FROM MEDIA (image file of any media)

dd if=[path] of=[path]filename.iso or filename.img

CREATE MEDIA FROM IMAGE

dd if=[path]filename.iso of=[path]

CREATE SD CARD IMAGE - files only

Copy (zip / tar) boot partition

Copy (zip / tar) ext4 partition

Partition SD Card

Copy (extract) files to boot partition

Copy (extract) files to ext4 partition

CRONTAB - create table of actions to be executed at a specific time. See also Appendix C - Crontab

Examples in table created when command is executed.

crontab -e

ex. min hr dom mon dow command

ex. 30 23 * * * sudo reboot Will cause system to reboot everyday at 11:30 pm

CURL - View output from the specified URL

curl https://wtfismyip.com/text

curl <http://ipecho.net/plain> *** NOT WORKING ***

Note: This command is quite powerful. It can access a website and copy the resulting script to another location.

Linux Commands and Usage - cont.

DATE

date - Displays Date and Time

sudo date -S "d MON YYYY HH:MM:SS" - to set date

DD - COPY DISK IMAGE - to or from device

dd - copy disk image

see also COPY SD CARD

DF - DISK FREE - determine storage capacity, amount used and amount unused

df [-a -B -h -h -total -I -T -t ext2 -x ext2]

DISK SPACE or IDENTIFY MEDIA NAME

in terminal window

df

DISPLAY CONTENTS OF FILE

cat [filename] - display contents of file (default is to screen)

DISPLAY LIST OF PREVIOUS COMMANDS

history

DISPLAY LOGIN FILE

last

DMESG - READ LAST SYSTEM MESSAGES

dmesg

dmesg | tail - (pipe tail) for multiple pages

DMIDECODE - Information about computer, memory etc.

DPKG Command

dpkg -l - Lists programs installed on computer

EXECUTE FILE

To do this you must make file executable and include

#!/usr/bin/env python as first line of program

chmod +x filename

./filename

Linux Commands and Usage - cont.

FDISK - utility for partitioning storage devices - see also gparted

See appendix P

fdisk - format disk

FIND A COMMAND in History

history | grep command

ex. history | grep mount

FIND FILE

Find / -name "ONE"

-name - file attribute

"filename.ext" - what to FIND must be enclosed in quotes

ex: find / -name "filename.ext"

FILE EDITOR

[sudo] nano [path] filename.ext instructions are on the bottom of the editor screen

[sudo] vi [/path]filename.ext :x to quit, :wq to write and quit

FORMAT MEDIA - see also Rufus

mkfs

FORMAT MEDIA

fdisk

create small fat partition

create ext4 partition

FSCK - File System Check

GPARTED - utility for partitioning storage devices

See Appendix P

GREP - search tool for plain text files

GUI Formattter - sd card formatter

guiformat.exe and guiformat-x64.exe

HALT - To shut down system properly

sudo halt

sudo shutdown -h now - to halt the system

sudo shutdown -r now - to reboot the system

HELP

add -help to any command OR

man -k [command]

Linux Commands and Usage - cont.

HISTORY - display list of previously used commands
history

HISTORY - remove history file
sudo rm .bash_history from user directory

HISTORY - display list of logins
last lists logins
last -a lists logins with IP Addresses

IDENTIFY Device [SD CARD] [USB] - in /dev
dmesg | tail

IP Address - Add - Add an IP address to device with an existing IP
ip addr add nnn.nnn.nnn.nnn/24 dev eth0
ex. ip addr add 192.168.10.20/24 dev eth0

IP Address? - see also Angry IP Scanner
hostname -I

IP Address file - to create address file
hostname -I > lip.txt
curl http://ipecho.net/plain > nip.txt
cat lip.txt nip.txt [ipe.txt] msg.txt
Note: to create a cr-lf file use sudo nano ipe.txt then press Enter key then Ctrl X, Y

IP Address Scanner - Angry IP Scanner
angryip.org

IFCONFIG - Network Configuration - To configure Networks
ifconfig

IWCONFIG - Network Configuration - To configure Wireless
iwconfig

KEY - Public & Private
ssh-keygen -t rsa [dsa]
see Appendix K

KILL A PROCESS
kill -9 pid

Linux Commands and Usage - cont.

LAST - Display login file

last lists logins

last -a lists logins with IP Addresses

LIST COMMAND - list files / folders in current or designated folder

ls [/path] [-l for file size and permissions]

ls -man

ls -al to list hidden files

ls -al - List all files with attributes

ls -l - list with attributes

LIST COMMAND LINE HISTORY - ALL PREVIOUS COMMANDS

history

LIST DEVICES

cat /proc/partitions

List Installed Packages

dpkg -get-libs | more

-L pkgname

LIST MODULES - Lists installed modules

lsmod

LOCATE -

locate "filename.ext" -q

find / -name filename.ext

LOGIN History - see history

LOOPBACK

lo [path]filename

MAKE DIRECTORY

mkdir directory_name

MAKE EXECUTABLE

chmod +x filename.ext

EXECUTE A FILE

./filename.ext

MAKE FILE SYSTEM

mkfs -

Linux Commands and Usage - cont.

MENU - in X
Alt-F2

MOUNT - Mount USB or other device for Input or output

Note: devices are listed in /proc/partitions file

mount - mount a storage device

mount -help

sudo mount -t vfat /dev/sda1 /mnt - /mnt mount point name is optional

sudo mount -t ext4 /dev/sdb2 /mnt - /mnt mount point name is optional - use anything
cd /mnt

Note. To determine fs type use sudo parted /dev/sdX -l

UNMOUNT - Unmount USB or other device from computer

[sync; sync; snyc followed by]

[sudo umount /mnt]

MOUNT - A Device on your network or another network

-

MOVE FILE - also used to rename a file or directory

mv - move

mv filename.ext /path/[new]filename.ext

mv [/path]filename [/destpath]

mv directoryname newdirectoryname

mv foldername newfoldername

NETWORK Configuration

iwconfig - Wireless

ifconfig - LAN

NMAP - NETWORK MAPPER

nmap 10.0.0.1

nmap 192.168.0.1 [192.168.1.1]

nmap -sP ###. ###.###.###/24

immediately followed by:

arp or

arp -an see Address Resolution Protocol

Linux Commands and Usage - cont.

OS UPGRADE

- sudo apt-get update
- sudo apt-get upgrade
- sudo apt-get dist_upgrade

OS VERSION

- /proc/version

Linux Commands and Usage - cont.

PASSWORD - CHANGE / RESET

`passwd [username]`

Note: remember to write down passwords to prevent being locked out.

PASSWORD - RESET - REMOVE

`sudo nano /etc/shadow`

Between first pair of colons for the specific user, remove everything, save and reboot

Note: remember to write down passwords to prevent being locked out.

PASSWORD - RESET - ROOT

`sudo passwd [username / root]`

Note: remember to write down passwords to prevent being locked out.

PASSWORD - Remove SSH Password Authentication

edit the `/etc/ssh/sshd_config` file

CHANGE `#passwordauthentication yes`

TO `passwordauthentication no`

Save file

THEN reboot RPi - or - `service ssh restart`

root login can be disabled using this same file

PARTITION - See GPARTED

`sudo parted /dev/sdb -l`

PROCESS STATUS - see all running processes - see also TOP

`ps -help [q to quit, h for help]`

`ps au`

`ps ax`

`ps -u [username]`

`ps -aux`

`ps -ef`

Linux Commands and Usage - cont.

PUTTY-0.62-INSTALLER - installs a suite of communication programs to communicate using SSH

PUTTY - Windows program to communicate with RPi using SSH

- Double Click Putty

- Enter parameters for accessing desired server

- Save

- Double Click Selection

PUTTYGEN - Program to generate Public / Private KEYS

- Click Generate

- Move mouse as instructed

- Type Key Passphrase - (record for future use)

- Confirm Key Passphrase

- Click Save Private Key - (note location and name)

- Click Save Public Key - (note location and name)

- Done

PAGENT - Windows program to provide Public / Private SSH access KEY

- Double Click Private Key

- Enter Pass Phrase

- Done

PSFTP - Windows program to Upload to / Download from RPi

- open [URL - IP ADDRESS] - connect to remote device

- help - get list of commands

- get filespec - get single file from remote

- mget filespecs - get multiple files from remote

- put filespec - send single file to remote from local

- mput filespec - send multiple files to remote from local

- dir - list files in current remote directory

- !dir - list files in current local directory

Public KEY - File sent to someone / everyone to recognize you as YOU

Private KEY - File used to access SSH connected computer

Putty - to move to another computer simply install putty then copy the Private key from original

- use the following command to move profiles from one Windows computer to another:

regedit /e "%userprofile%\Desktop\putty.reg" HKEY_CURRENT_USER\Software\SimonTatham

- Note: This command creates a file called putty.reg on the Desktop

- To replace profile on another computer: Double click the file to install on another computer

- To merge profiles with another computer: Right click to merge with another computers list

Python / Ipython - See Applications

Linux Commands and Usage - cont.

REBOOT

```
sudo reboot  
sudo shutdown -r now
```

REMOTE DESKTOP

REMOVE / STOP DEAMON FROM RUNNING

```
sudo nano /etc/default/daemon_name  
sudo nano /etc/default/tor  
Change RUN_DAEMON=öyesö to  
RUN_DAEMON=önoö
```

REMOVE DIRECTORY

```
rmdir directoryname
```

REMOVE FILE

```
rm file.ext
```

RENAME FILE - see also MOVE FILE

```
rename filename.ext newfilename.ext
```

REPEAT LAST COMMAND AS ROOT

```
sudo !!
```

Linux Commands and Usage - cont.

RESTART NETWORKING

sudo /etc/init.d/networking restart

RESTART SERVICE

ls /etc/init.d

sudo service <srvcname> restart

sudo service <srvcname> stop

sudo service <srvcname> start

sudo service <srvcname> status

sudo service tor restart

sudo service network restart or sudo /etc/init.d/networking restart

ROOT LOGIN

sudo login root

ROOT PRIVILEGES

in terminal window

sudo su

sudo su -

or any command preceded by “sudo “

RUN Control - rc.local - Also see systemd service file

See also - systemd

Include programs to run on startup in the /etc/rc.local file

Remember to include any path information so that the program can be found

Note: In the case where rc.local does not start the requested program, the program may be added to crontab in order to run as desired. This will, of course, require setting a date and time for the program to start.

Linux Commands and Usage - cont.

SAMBA - (research for later inclusion)

SCREEN - [an application which provides a process which multiple users can view using ssh]

```
screen [-x, -r]
        -x  multiple connections
        -r  single connection
```

CTRL A - L - New Window

CTRL A - N - Next Window

CTRL A - D - Detach

usage sequence:

ssh to RPi using Putty or other SSH Method

screen

sudo [language] [program_name.ext]

SD CARD (BOOT) - CREATE

EASIEST METHOD

1. Format SD Card with camera
2. Download BERRYBOOT files
3. Extract BERRYBOOT files to SD Card
4. Boot RPi with SD Card
5. Install Debian-wheezy

IN WINDOWS

Download win32diskimager

Install win32diskimager

Download desired disk image

- Extract disk image

Run win32diskimager

- Select destination drive

- Select desired image

- Select Write

SD CARD - Copy image to hard drive with Ubuntu

dd if=[path] of=filename.img path may be something like /dev/sdb

SD CARD - IDENTIFY in /dev

dmesg | tail

Linux Commands and Usage - cont.

SHUTDOWN - See also HALT or REBOOT

```
sudo shutdown -h now
sudo shutdown -r now
sudo halt
sudo reboot
```

SPLIT - split a file into several smaller files

```
split [ option ] [ input [ prefix ] ]
usage - split -l=10 infile.ext prefix
-l, --lines=NUMBER
put NUMBER lines per output file
```

SSH - change port (normally port 22)

```
sudo nano /etc/ssh/sshd_config
# What ports, IPs and protocols we listen for
Port 50683 # use available port - usually between 49152 and 65535
/etc/init.d/ssh restart # to restart SSH
change location on TTY program to look for new address
# Also need to forward corresponding port on router
```

SSH - with key

```
Create .ssh folder in /home folder ( ex. /home/pi )
Create authorized_keys file in .ssh folder
Add public key to authorized_keys file
Set file permissions to 600 - using chmod
Set folder permissions to 700 - using chmod
- edit /etc/ssh/sshd_config
- remove # from authorized keys . . .
```

SSH from one remote device to another remote device

```
Ssh [ -A ] ipaddress -A permits agent forwarding
```

SSH Login - Speed Up

```
edit /etc/ssh/sshd_config or copy from Roger RPi
```

STARTUP PROGRAMS (MODULES)

```
Add programs to be loaded at startup to the "/etc/modules" file
```


Linux Commands and Usage - cont.

STAT - display file status - create / access / modify / change
Stat [filename, foldername]

STOP DEAMON FROM RUNNING
Edit /etc/default/daemon_name
Change RUN_DAEMON=yes to
RUN_DAEMON=no

SUDOERS LIST - (see applications)
visudo or edit /etc/sudoers
add line:
username ALL=(ALL) NOPASSWD: ALL

Supervisor rights - SUPER USER
sudo su -
sudo bash -

SYMBOLIC LINKS -
ln -s /path /path/name

For Apache2 this file should be stored in /etc/apache2/sites-enabled ???

SYSTEM TIME
see DATE

TAR - (see sequences)
wget filename - Download tarball
tar xzf filename - Unzip tarball

TEE - view output of a command while concurrently writing the output to a file
echo \# text | sudo tee -a test.txt - will append # text to the end of test.txt
Note: Creates file if it does not exist

TIME
see DATE

TOP - Display top CPU processes

TOUCH - the easiest way to create new, empty files, also used to change the timestamps on existing files and directories.
touch [option] file_name(s)
touch -date=11/01/00 filename.ext

Linux Commands and Usage - cont.

UNMOUNT - Unmount USB or other device from computer
sync; sync; sync followed by
sudo umount /mnt

MOUNT (see MOUNT)

USER ADD
useradd username

USER DELETE - delete user
userdel username

USER MODIFY - modify user
usermod -a[G] [parameters] [username]

USB Information
lsusb - list USB devices

USERS - List users logged in to the system

VI - Editor
edit - [sudo] vi [/path] filename.ext
exit - :q!
quit - :q
write and quit - :wq

W or WHO - List users logged in to the system
w
who

WGET - Get a file from specified URL
wget url/filename.ext

WHICH BASH -

WHICH PERL -
#!öpath/perl - used for

.OTHER INFO

/etc -
/boot -
/home -
/usr -

Raspberry Pi Overview

Devices - see Raspberry Pi - Model and Revision

Operating System - sd and micro sd cards -

Maximum size - to date I have tested the Raspberry Pi 3 B Plus with 128 GB and while quite slow to expand the memory when booting with the latest OS, it does support the card.

Touch Screen - 7" Touchscreen Display

To invert the screen display, edit the /boot/config.txt file and add:

lcd_rotate=2

onscreen keyboard

sudo apt-get update

sudo apt-get install matchbox-keyboard

Multiple wireless profiles - In Raspberry Pi 3B Plus - Raspbian 20180418

sudo nano /etc/wpa_supplicant/wpa_supplicant.conf

It should already have the first couple of lines, but then after add a network array for each location

```
ctrl_interface=DIR=/var/run/wpa_supplicant GROUP=netdev
```

```
update_config=1
```

```
network={
```

```
    ssid="WIFI SSID"
```

```
    psk="WIFI PASSWORD"
```

```
    id_str="location1"
```

```
}
```

```
network={
```

```
    ssid="WIFI SSID"
```

```
    psk="WIFI PASSWORD"
```

```
    id_str="location2"
```

```
}
```

* I have not found an upper limit to the number of profiles

Raspberry Pi Commands

Add Users (from Raspberry Pi User Guide p36)

1. Log in to the Pi using your normal login. ie. user = pi pwd = raspberry (or the password you changed it to)
2. Type the following as a single line:

```
sudo useradd -m -G adm, dialout, cdrom, audio, plugdev, users, lpadmin, sambashare, vchiqq, powerdev  
username
```

When prompted, enter the password for username

3. To change a password type: `sudo passwd username`

When prompted, enter the password for username

See page 36 of the Raspberry Pi User Guide for additional information.

Note: remember to write down passwords to prevent being locked out.

4. To see a users group memberships type: `groups username`

CONFIGURE RASPBERRY Pi

```
sudo raspi-config
```

INFO - Information about this tool

EXPAND_ROOTFS - Expand root partition to fill SD card - if available

OVERSCAN - Change overscan - Disable

CONFIGURE_KEYBOARD - US 105 Key

Generic 105 Key (Intl) PC

ENG(US)

No Alt GR

No Compose

CHANGE_PASS - Change password for 'pi' user - MUST

Note: remember to write down passwords to prevent being locked out.

CHANGE_LOCALE - EN_us.UTF-8 UTF-8

CHANGE_TIMEZONE - US - Michigan

MEMORY_SPLIT - Change memory split - Research first

OVERCLOCK - Configure overclocking - Research first

SSH - Disable unless needed -

BOOT_BEHAVIOR - Start desktop on boot? - NO

UPDATE - Try to upgrade raspi-config - YES, Try

CAMERA - Enable if attached to RPi

CLOSE_X_GRAPHICAL_USER_INTERFACE - <Ctrl> <Alt> <Backspace>

Raspberry Pi Commands - cont.

Bluetooth on RPi 3 - Disable - see Disable Bluetooth and Wireless

CAD - Control and Display - Pi Digital

```
sudo raspi-config  
option 8  
SPI  
Finish  
python /usr/share/doc/python  
pifacecad/examples/sysinfo.py
```

COPYNO - Copy Number

/etc/copyno - contains information about the programs on a specific SD card including but not limited to the number of the current copy (ie. ONE)

CPU Information

```
cat /proc/cpuinfo
```

Disable Bluetooth and Wireless on RPi 3

in the /boot/config.txt file add one or both of these lines
dtoverlay=pi3-disable-bt
dtoverlay=pi3-disable-wifi

DISPLAY ADJUSTMENTS FOR RPi - see also Configure Raspberry Pi

```
sudo su  
cd /boot  
nano config.txt
```

[select appropriate solution to display problem]

For startx using HDMI / VGA Converter

```
uncomment hdmi_group=1  
uncomment hdmi_mode=1  
frame_buffer_width=1024  
frame_buffer_width-768  
  
for TV set sdtv_aspect=2
```

Raspberry Pi Commands - cont.

GPIO DRIVER - DOWNLOAD

```
wget http://pypi.python.org/packages/source/R/RPi.GPIO/RPi.GPIO-0.5.4.tar.gz or 0.1.0
wget http://pypi.python.org/packages/source/R/RPi.GPIO/RPi.GPIO-0.5.7.tar.gz or 0.1.0
wget http://pypi.python.org/packages/source/R/RPi.GPIO/RPi.GPIO-0.5.10.tar.gz for RPi2
or go to pypi.python.org/packages/source/R/RPi.GPIO/ for a list of current files
```

GPIO DRIVER -UNZIP

```
tar xzf RPi.GPIO-0.1.0.tar.gz or
tar xzf RPi.GPIO-0.5.4.tar.gz
```

GPIO DRIVER - INSTALLATION

```
cd RPi.GPIO-0.1.0
sudo python setup.py install
```

GPIO Setup

In Python program:

```
GPIO.setmode(GPIO.BCM)  # GPIO SETUP (Uses GPIO Port Numbers)
GPIO.setmode(GPIO.BOARD) # GPIO SETUP (Uses GPIO pin Numbers)
```

Note: With the introduction of Raspian Buster, and possibly earlier, the GPIO access can be enabled through raspi-config step 5 - P7- One Wire and P8 - Remote GPIO.

Raspberry Pi Commands - cont.

ID - Identify Chips

/etc/NAME - In file: type same name as file name along with any details needed.
ie. Programs added, special instructions for use of the chip etc.

Naming your RPi

sudo bash ?
sudo raspi-config
Select naming your Raspberry Pi, enter name

IPCONFIG - Determine ip address of Rpi

ipconfig

IWLIST - Determine wireless WIFI networks near your location - Raspberry Pi 3B+ Rpi 3B Plus

sudo iwlist wlan0 scan

IP Address - Force a specified address

There are several methods of assigning an IP address. DHCP server, many times running on the router normally sets this. In some situations the IP address can be reserved and along with the MAC address and name of the device, this is accomplished easily and without making changes to the RPi.

Python / Ipython - see attachments

Read Temperature of Raspberry Pi -

/opt/vc/bin/vcgencmd measure_temp

Router Access - A device (D) can access ANY router above itself as well as ANY routers above the router providing the IP address to that device (D).

Raspberry Pi Commands - cont.

RPi Camera - see also Appendix C

```
sudo apt-get update
sudo apt-get upgrade
sudo raspi-config
    enable camera
    finish and reboot
```

```
raspistill    -o /path/filename.jpg
               no parameter = syntax (HELP)
Note: * Failed to open vchiq instance - need group standing or [ sudo ]
        usermod -a -G video timepi
```

```
raspivid      -d - DEMO
               -o /path/filename.H264
               no parameter = syntax (HELP)
```

RPi Camera - Time Lapse (see Appendix RPi Camera)

-take:

```
raspistill -o myimage_%4d.jpg -tl 60000 -t 7200000
```

-stitch together:

```
sudo avconv -r 10 myimage_%4d.jpg -r 10 -vcodec libx264 -crf 20 -g 15 timelapse.mp4
```

RPi Camera - View H264 files

```
avconv -i fname.H264 -vcodec copy fname.ext
    ext can be any of the acceptable names
avconv --help to determine parameters
```

Note: To get avconv see FFMPEG in APPLICATIONS

RPi Timelapse

```
avconv -r 10 pict_3d.jpg -r 10 -vcodec libx264 -crf 20 -g 15 timelapse01.mp4
```

Convert MOV to mp4 (tested by Ron Gries)

```
avconv -i source.MOV -vcodec copy dest.mp4
```

TAKE VIDEO

```
Raspivid -o filename.H264 -t 10000 ( for 10 second video )
raspivid -t 30000 -b 10000000 -fps 30 -o test3030.H264 = 10MB - works
sudo avconv -i test3030.H264 -vcodec copy /var/www/html/test3030.mp4 = 35MB - works
```

Time Lapse - Create movie from jpg files

```
PhotoLapse
mencoder
```


Raspberry Pi Commands - cont.

DISABLE CAMERA LED

Edit /boot/config.txt
disable_camera_led=1

RPi Configuration File

sudo nano /boot/config.txt

RPi information

/proc/cpuinfo

SHUTDOWN -

sudo shutdown -h now - to halt system
sudo shutdown -r now - to reboot system

SSH - Enable

Enable ssh in Configure Raspberry Pi

STARTX - Begin GUI Session

Graphical User Interface - allows user to use predefined commands from drop down menus
<Ctrl> <Alt><Bsp> to exit GUI

Temperature Sensor Setup

sudo modprobe w1-gpio
sudo modprobe w1-therm

alternately you can use the following.

/etc/modules - must contain the following lines at the end of the file

w1-gpio
w1-therm

vcgencmd commands - displays a list of parameters for vcgencmd

vcgencmd measure_temp shows current cpu temperature

<https://www.raspberrypi.org/documentation/raspbian/applications/vcgencmd.md>

Raspberry Pi - Model and Revision

Model and Revision	RAM	Hardware Revision Code from cpuinfo
Model B Rev 1	256MB	0002
Model B Rev 1	ECN0001 (no fuses, D14 removed)	
	256MB	0003
Model B Rev 2	256MB	0004
		0005
		0006
Model A	256MB	0007
		0008
		0009
Model B Rev 2	512MB	000d
		000e
		000f
Model B+ ver 1.2	512MB	0010
Model B+	512MB	0013
Compute Module	512MB	0011
Compute Module	512MB	0014 (Embest, China)
Model A+	256MB	0012
Model A+	256MB	0015 (Embest, China)
Model A+	512MB	0015 (Embest, China)
Pi 2 Model B v1.1	1GB	a01041 (Sony, UK)
Pi 2 Model B v1.1	1GB	a21041 (Embest, China)
Pi 2 Model B v1.2	1GB	a22042
PiZero v1.1		
PiZero v1.2	512MB	900092
PiZero v1.3	512MB	900093
Pi Zero W v1.1	512MB	9000c1
Pi 3 Model B	1GB	a02082 (Sony, UK)
Pi 3 Model B Rev 1.2	1GB	a22082 (Embest, China)
Pi 3 Model B Plus	1GB	a020d3 (SONY, UK)
Pi 4 Model B	1GB	a03111 (SONY, UK)
Pi 4 Model B	2GB	b03111 (SONY, UK)
Pi 4 Model B	4GB	c03111 (SONY, UK)

In order to find out what hardware revision you have you can run the following commands at the command prompt or via a terminal window:

```
cat /proc/cpuinfo
```

```
cat /proc/device-tree/model
```

pinout - for the newest versions of Raspbian





















Raspberry Pi - Model A - Pinouts

Raspberry Pi - Model B - Pinouts

GPIO#	2nd func	pin#	pin#	2nd func	GPIO#
N/A	+3V3	1	2	+5V	N/A
GPIO2	SDA1 (I2C)	3	4	+5V	N/A
GPIO3	SCL1 (I2C)	5	6	GND	N/A
GPIO4	GCLK	7	8	TXD0 (UART)	GPIO14
N/A	GND	9	10	RXD0 (UART)	GPIO15
GPIO17	GEN0	11	12	GEN1	GPIO18
GPIO27	GEN2	13	14	GND	N/A
GPIO22	GEN3	15	16	GEN4	GPIO23
N/A	+3V3	17	18	GEN5	GPIO24
GPIO10	MOSI (SPI)	19	20	GND	N/A
GPIO9	MISO (SPI)	21	22	GEN6	GPIO25
GPIO11	SCLK (SPI)	23	24	CE0_N (SPI)	GPIO8
N/A	GND	25	26	CE1_N (SPI)	GPIO7
<i>(Models A and B stop here)</i>					
EEPROM	ID_SD	27	28	ID_SC	EEPROM
GPIO5	N/A	29	30	GND	N/A
GPIO6	N/A	31	32	-	GPIO12
GPIO13	N/A	33	34	GND	N/A
GPIO19	N/A	35	36	N/A	GPIO16
GPIO26	N/A	37	38	Digital IN	GPIO20
N/A	GND	39	40	Digital OUT	GPIO21

Raspberry Pi - Model B+ - Pinouts

Raspberry Pi B+ J8 Header

<i>Pin#</i>	<i>NAME</i>		<i>NAME</i>	<i>Pin#</i>
01	3.3v DC Power		DC Power 5v	02
03	GPIO02 (SDA1 , I2C)		DC Power 5v	04
05	GPIO03 (SCL1 , I2C)		Ground	06
07	GPIO04 (GPIO_GCLK)		(TXD0) GPIO14	08
09	Ground		(RXD0) GPIO15	10
11	GPIO17 (GPIO_GEN0)		(GPIO_GEN1) GPIO18	12
13	GPIO27 (GPIO_GEN2)		Ground	14
15	GPIO22 (GPIO_GEN3)		(GPIO_GEN4) GPIO23	16
17	3.3v DC Power		(GPIO_GEN5) GPIO24	18
19	GPIO10 (SPI_MOSI)		Ground	20
21	GPIO09 (SPI_MISO)		(GPIO_GEN6) GPIO25	22
23	GPIO11 (SPI_CLK)		(SPI_CE0_N) GPIO08	24
25	Ground		(SPI_CE1_N) GPIO07	26
27	ID_SD (I2C ID EEPROM)		(I2C ID EEPROM) ID_SC	28
29	GPIO05		Ground	30
31	GPIO06		GPIO12	32
33	GPIO13		Ground	34
35	GPIO19		GPIO16	36
37	GPIO26		GPIO20	38
39	Ground		GPIO21	40

Rev. 1.1
16/07/2014

<http://www.element14.com>

Raspberry Pi - Standard Pin Usage

pin07 - GPIO04 - Temperature Sensor (Input)
pin11 - GPIO17 - Pump Activation (Output)
pin12 - GPIO18 - Primary Valve (Output)
pin13 - GPIO27 - [Additional Valve (Output) *]
pin15 - GPIO22 - Secondary Valve (Output)
pin16 - GPIO23 - Tertiary Valve (Output)
pin18 - GPIO24 - Quaternary Valve (Output)
pin22 - GPIO25 - Quintary Valve (Output)
pin29 - GPIO05 - Alternate Valve (Output)
pin31 - GPIO06 - Alternate Valve (Output)
pin32 - GPIO12 - Alternate Valve (Output)
pin33 - GPIO13 - Alternate Valve (Output)
pin36 - GPIO16 - Alternate Valve (Output)
pin35 - GPIO19 - Alternate Valve (Output)
pin38 - GPIO20 - Alternate Valve (Output)
pin40 - GPIO21 - Alternate Valve (Output)
pin37 - GPIO26 - Alternate Valve (Output)

Note: With the additional GPIO Ports available on the B Plus more devices can be added.

Reading Serial Data - Using Serial to USB Adapter

CH340 serial to USB adapter

PL2303 serial to USB adapter

Basically:

```
ser_dev = "/dev/ttyUSB0"
ser = serial.Serial( ser_dev, 9600, timeout=1 )
try:
    while True:
        rec = ser.readline()
        if len(rec) > 2:
            print rec
            writeraw()
            dir = rec.split(" ")[0]
            if dir == "I" or dir == "O" or dir == "T":
                print rec
                writefile()
```

Raspberry Pi A - Standard Pin Usage

pin	use
01	3V3 -
02	5 VDC
03	
04	5 VDC
05	
06	GND - Ground
07	GPIO04 - Temp Sensor Input
08	
09	
10	
11	GPIO17 - Pump Activation
12	GPIO18 - Primary Valve (Output)
13	GPIO27 - [Additional Digital Port (I/O)*]
14	
15	GPIO22 - Secondary Valve (Output)
16	GPIO23 - Tertiary Valve (Output)
17	
18	GPIO24 - Quaternary Valve (Output)
19	GPIO10 -
20	
21	GPIO09 -
22	GPIO25 - Door Sensor (Input)
23	GPIO11 -
24	GPIO08 -
25	
26	GPIO07 -

Raspberry Pi B - Standard Pin Usage

pin	use
01	3V3 -
02	5V
03	GPIO02 -
04	
05	GPIO03 -
06	GND - Ground
07	GPIO04 - Temp Sensor Input
08	GPIO14 -
09	Ground
10	GPIO15 -
11	GPIO17 - Pump Activation
12	GPIO18 - Primary Valve (Output)
13	GPIO27 - [Additional Digital Port (I/O)*]
14	Ground
15	GPIO22 - Secondary Valve (Output)
16	GPIO23 - Tertiary Valve (Output)
17	
18	GPIO24 - Quaternary Valve (Output)
19	GPIO10 -
20	Ground
21	GPIO09 -
22	GPIO25 - Door Sensor (Input)
23	GPIO11 -
24	GPIO08 -
25	Ground
26	GPIO07 -

Raspberry Pi B+ - Standard Pin Usage

pin	use
01	3V3 -
02	
03	
04	
05	
06	GND - Ground
07	GPIO04 - Temp Sensor Input
08	
09	
10	
11	GPIO17 - Pump Activation
12	GPIO18 - Primary Valve (Output)
13	GPIO27 - [Additional Digital Port (I/O)*]
14	
15	GPIO22 - Secondary Valve (Output)
16	GPIO23 - Tertiary Valve (Output)
17	
18	GPIO24 - Quaternary Valve (Output)
19	GPIO10 -
20	
21	GPIO09 -
22	GPIO25 - Door Sensor (Input)
23	GPIO11 -
24	GPIO08 -
25	
26	GPIO07 -
27	
28	
29	GPIO05 -
30	Ground
31	GPIO06 -
32	GPIO12 -
33	GPIO13 -
34	Ground
35	GPIO19 -
36	GPIO16 -
37	GPIO26 -
38	GPIO20 -
39	Ground
40	GPIO21 -

Raspberry Pi 2 - Standard Pin Usage

pin	use
01	3V3 -
02	
03	
04	
05	
06	GND - Ground
07	GPIO04 - Temp Sensor Input
08	
09	
10	
11	GPIO17 - Pump Activation
12	GPIO18 - Primary Valve (Output)
13	GPIO27 - [Additional Digital Port (I/O)*]
14	
15	GPIO22 - Secondary Valve (Output)
16	GPIO23 - Tertiary Valve (Output)
17	
18	GPIO24 - Quaternary Valve (Output)
19	GPIO10 -
20	
21	GPIO09 -
22	GPIO25 - Door Sensor (Input)
23	GPIO11 -
24	GPIO08 -
25	
26	GPIO07 -
27	
28	
29	GPIO05 -
30	Ground
31	GPIO06 -
32	GPIO12 -
33	GPIO13 -
34	Ground
35	GPIO19 -
36	GPIO16 -
37	GPIO26 -
38	GPIO20 -
39	Ground
40	GPIO21 -

Raspberry Pi - Wiring

Digital Humidity and Temperature Sensor - DHT11

1 - VCC	-	3V3 (pin01)
2 - DAT	-	GPIO04 (pin07) or alternate GPIO port for multiples
3 - Reset	-	N/C
4 - GND	-	GND (pin06)

Note: For multiple DHT11, DHT22 or AM2302 devices a separate DAT line is required

Note: Good for 20-80% humidity readings with 5% accuracy

Good for 0-50/C temperature readings $\pm 2/C$ accuracy

No more than 1 Hz sampling rate (once every second)

Guide: To use either Sensor follow installation guide in Appendix D - DHT

Digital Humidity and Temperature Sensor - DHT22

1 - VCC	-	3V3 (pin01)
2 - DAT	-	GPIO04 (pin07) or alternate GPIO port for multiples
3 - Reset	-	N/C
4 - GND	-	GND (pin06)

Note: For multiple DHT11, DHT22 or AM2302 devices a separate DAT line is required

Note: Good for 0-100% humidity readings with 2-5% accuracy

Good for -40 to 80/C temperature readings $\pm 0.5/C$ accuracy

No more than 0.5 Hz sampling rate (once every 2 seconds)

Guide: To use either Sensor follow installation guide in Appendix D - DHT

Digital Humidity and Temperature Sensor - AM2302 - no pull up resistor is needed

1 - VCC	-	3V3 (pin01)
2 - DAT	-	GPIO04 (pin07) or alternate GPIO port for multiples
3 - Reset	-	N/C
4 - GND	-	GND (pin06)

Note: For multiple DHT11, DHT22 or AM2302 devices a separate DAT line is required

In addition, I have found that wire (24ga) length exceeding ten feet alters results

Note: Good for 0-100% humidity readings with 2-5% accuracy

Good for -40 to 80/C temperature readings $\pm 0.5/C$ accuracy

No more than 0.5 Hz sampling rate (once every 2 seconds)

Note: Operating range is -40 C to 80 F

Guide: To use either Sensor follow installation guide in Appendix D - DHT

Raspberry Pi - Wiring - cont.

Switch - Input Real Time Clock - RTC

Vcc	-	3V3 (pin01)	-----
GND	-	GND (pin06)	
			10 K ohm - 30 K ohm
CLK	-	GPIO21 (pin13)	
DAT	-	GPIO18 (pin12)	-----
RST	-	GPIO17 (pin11)	

Light Emitting Diode - LED (3 volt) - Output

LED - Anode (Long Lead)	GPIO17 (pin11)
LED - Cathode (Short Lead)	-----
	64 ohm

	GND (pin06)

Relay - Output (same as LED)

GPIO.output(11, False) # Turn Off
GPIO.output(11, True) # Turn On

Note: Need transistor circuit to activate relay coil

Raspberry Pi - Wiring - cont.

Switch - Input

```
var = GPIO.input(22) # Sense status
```

Switch - on - off

SW1	GND	pin 6
SW2	GPIO25(pin24)	pin 22(pin18) ----- 10 K ohm
	3V3	pin 1 -----

Note: See standard pin usage for alternate SW2 pin when using multiple switches

Switch - (on) - off - (on) () indicates momentary

SW1-1	GND	pin 6
SW1-2	GPIO25	pin 22 ----- 10 K ohm
	3V3	pin 1 -----
SW2-1	GND	pin 6
SW2-2	GPIO24	pin 18 ----- 10 K ohm
	3V3	pin 1 -----

Note: See standard pin usage for alternate SW2 pin when using multiple switches

Garage Door Switch - on - off

SW1	GND	pin 14
SW2	GPIO23(pin16)	pin 16

Note: See standard pin usage for alternate SW2 pin when using multiple switches

Raspberry Pi - Wiring - cont.

Temperature Humidity Sensor - DHT11 - (pins from front left - pin3 nc)

DHT11 pin1	3v3	RPi pin 1 ----- 4.7 K ohm
DHT11 pin2	GPIO4	RPi pin 7 -----
DHT11 pin4	GND	RPi pin 6

Temperature Humidity Sensor - DHT22 - (pins from front left - pin3 nc)

DHT22 pin1	3v3	RPi pin 1 ----- 4.7 K ohm
DHT22 pin2	GPIO4	RPi pin 7 -----
DHT22 pin4	GND	RPi pin 6

Temperature Humidity Sensor - AM2302 - (pins from front left - pin3 nc)

Note: No pull up resistor needed

AM2302 pin1	3v3	RPi pin 1
AM2302 pin2	GPIO4	RPi pin 7
AM2302 pin4	GND	RPi pin 6

Temperature Sensor - DS18B20 (/sys/bus/w1/devices)

RED	3v3	RPi pin 1 ----- 4.7 K ohm
YELLOW	GPIO4	RPi pin 7 -----
BLACK	GND	RPi pin 6

Tilt Sensor Module
same as switch

USB Console Cable - for all Raspberry Pi Versions including Zero - Adafruit #954

GPIO Pin 2 - Red - or pin 4 - 5 VDC - Rpi Zero ONLY

GPIO Pin 6 - Black - Ground

GPIO Pin 8 - White - TXD - GPIO14

GPIO Pin 10 - Green - RXD - GPIO15

* 115,200, Serial, Com Port from Device Manager

See Appendix C - Console Cable

Raspberry Pi - Wiring - Cont.

Raspberry Pi - Standard Pin Usage - Solar

pin07 - GPIO04 - Temperature Sensor (Input)
pin11 - GPIO17 - Pump Activation (Output)
pin12 - GPIO18 - Primary Valve (Output)
pin13 - GPIO27 - [Additional Valve (Output) *]
pin15 - GPIO22 - Secondary Valve (Output)
pin16 - GPIO23 - Tertiary Valve (Output)
pin18 - GPIO24 - Quaternary Valve (Output)
pin22 - GPIO25 - Quintary Valve (Output)

Note: Other than pin07, all listed digital ports can be used as either input or output

* Failures have been noted when using pin13 during development of this manual

Raspberry Pi B Plus - Standard Pin Usage - the same as Raspberry Pi 2 - below

Raspberry Pi - Standard Pin Usage - Digital Humidity and Temperature AM2302#, DHT11 or DHT22

pin01 - 3V3 - 3V3
pin06 - GND - Ground
pin07 - GPIO04 - Temperature Sensor (Primary)
pin11 - GPIO17 - Temperature Sensor (Secondary)
pin12 - GPIO18 - Temperature Sensor (Tertiary)
pin13 - GPIO27 - Temperature Sensor (Alternate)
pin15 - GPIO22 - Temperature Sensor (Alternate)
pin16 - GPIO23 - Temperature Sensor (Alternate)
pin18 - GPIO24 - Temperature Sensor (Alternate)
pin22 - GPIO25 - Temperature Sensor (Alternate)

* Failures have been noted when using pin13 during development of this manual

When using AM2302 - no pull up resistor is required

otherwise a 4.7k - 10k is needed between 3V3 and data pin

Raspberry Pi - Wiring - cont.

Radio Shack 276-149 - Adapter Board - Primary used for DHT Sensors

40 pin Shrouded Header - 2 x 20 Male

26 pin Shrouded Header - 2 x 13 Male

8 pos European Barrier Strip - MCM # 28-995 - from right

1 - 3V3 - pin 1

2 - GND - pin 6

3 - GPIO24 - pin 18

4 - GPIO25 - pin 22

5 - GPIO04 - pin 7

6 - GPIO17 - pin 11

7 - GPIO18 - pin 12

8 - GPIO27 - pin 13

Radio Shack 276-149 - Adapter Board - Primary used for DHT Sensors - Revised

40 pin Shrouded Header - 2 x 20 Male

26 pin Shrouded Header - 2 x 13 Male

8 pos European Barrier Strip - MCM # 28-995 - from right

1 - 3V3 - pin 1

2 - GND - pin 6

3 - GPIO04 - pin 7 *

4 - GPIO17 - pin 11

5 - GPIO18 - pin 12

6 - GPIO27 - pin 13

7 - GPIO24 - pin 18

8 - GPIO25 - pin 22

* May also be used with DS18B20 Temperature Sensor when 4.7k ohm resistor
is connected between 3V3 and GPIO04 and data line is connected to GPIO04

Raspberry Pi - Wiring - cont.

Hall Effect devices

Power Supplies - Notebook

Toshiba	Satellite	19 Vdc	3.42 a		
HP		19.5 Vdc	4.62 A	90 W	
Dell	D600				PA-10 Family
Dell		19.5 Vdc	6.7 A	130 W	PA-4E Family
Dell		19.5 Vdc	4.62 A	90 W	PA-10 Family
Dell		19.5 Vdc	3.34 A	65 W	PA-12 Family
Sony PCGA-ACX1		19.5 Vdc	2.15 A		

Power Supplies - Desktop

AT Power Supply

P8 -

P9 -

When installing AT Power Supply, Black wires are next to each other

ATX Power Supply

Computer Programming

Program Fundamentals

#!/usr/bin/env python - # used in python programs

I DOCUMENTATION

II DEFINE FUNCTIONS

III DEFINE VARIABLES

III a IMPORT EXTERNALS - GPIO SETUP

III b INITIALIZE CONSTANTS - ALL CAPS

III c INITIALIZE VARIABLES

IV PROGRAM LOGIC

A Input

B Manipulation

C Output

Program Language - C

comment

```
/* Comment */
```

Define Variables

Integers -

```
int
char
short
long
long long
```

Floating Point Numbers -

```
float
double
```

Unsigned Integers -

```
unsigned char
unsigned integer
(same as integer)
```

Assign Value

```
int a = 3;
float b = 4.5;
double c = 5.25
double sum;
```

Print

```
printf("The sum is %f.ö, sum);
```

Compile

```
cc = gcc          GNU Compile
gcc -o program.o program.c -llinkfile.h
gcc -c program program.o -llinkfile.h
```

Program Language - C - cont.

Make using Makefile

Makefile

cc = gcc

clean:

rm filename

Time

```
# include <stdio.h>
```

```
# include <time.h>
```

```
void main()
```

```
{
```

```
time_t t;
```

```
time(&t);
```

```
clrscr();
```

```
printf("Today's Date and Time : %s", ctime(&t));
```

```
getch();
```

```
}
```

Program Language - C# - C Sharp

C#, pronounced C Sharp, is basically a universal internet programming language.

Program Language - Python

Python Commands

Python / Ipython - see Applications

ASSIGNMENT

`a = 2` - assigns the value 2 to the variable a

Beginning line in a program

`#!` - also known as Shebang

`#! /usr/bin/env python` - should always be the first line of a Python Program

CLEAR SCREEN

`os.system("clear")`

Command Line - Parameter list

`import sys`

`sys.argv[0]` = initial command

`sys.argv[1]` = first parameter, etc

`len(sys.argv)` returns number of arguments. 1 = command, 2 = command and one argument etc

see - 0482-sma.py

Echo - add line feed

To add line feed to a file, use:

`os.system("echo >> filename.ext")`

END PROGRAM

`sys.exit(0)`

`break`

`raise SystemExit`

Equality

Various symbols are used to test equality - `==`, `<`, `>`, `<=`, `>=` and `!=`

`a = 27` - assigns the value 27 to the variable a

`a == 27` - Tests if the variable a is equal to 27

`a != 27` - Tests whether the variable a is NOT equal to 27

EXIT PYTHON (direct) / Ipython

`^d` - Control d

Python Commands - cont.

FILES

Try

```
try:
    [command(s)]

except [ error types ]:
    IOError:
        [command(s)]

    KeyboardInterrupt:
        [command(s)]
```

Open

```
var = open(fname)
```

Write

```
var.write("string to write to file" [ + "\t" ] [ + "other string" ] [ + "\n" ])
\t = tab; \n = newline
```

Read

```
text = tfile.read()
SENS_COLLT6 = cfgfile.readline().split(" #")[0]
dtfile = cfgfile.readline().split(" #")[0]          # folder to store data files
```

Close

```
var.close()
```

* USB Mem Stick - Try Command if present / absent

Python Commands - cont.

IF

```
if expression1:
    statements
[ elif expression2:
    statement(s) ]
[ elif expression3:
    statement(s) ]
[ else:
    statements ]

if expression1 or [ and ] expression2:
    statement(s)
```

INPUT

`raw_input` is used to get a string of information from the user. Whether the information is a number, name, integer, decimal number or just a random string of characters. The way the information is processed answers these questions.

```
a = raw_input("What is the value of a? ")
a = int(raw_input("What is the value of a? "))
a = float(raw_input("What is the value of a? "))
```

Python Commands - cont.

LOOPS

for iterating_variable in sequence:

 statements

[else:

 statements]

while expression:

 statements

[else:

 statements]

OS Commands - when used within the Python program

import os - required before os commands are executed

os.path.exists(path) or os.path.exists("pathname")

os.rename("/path/filename.ext", "/path/filename.ext")

os.system("command")

Parameter list - from command line

import sys

sys.argv[0] = initial command

sys.argv[1] = first parameter, etc

Piface CAD

sudo apt-get update

sudo apt-get upgrade

sudo apt-get install python {,3} -pifacecad

test program by running:

python3 /usr/share/doc/python3 -pifacecad/examples/sysinfo.py or sysinfomod.py

see also github

Restart Service - moved to linux commands

sudo service service_name restart

Shebang

#!/usr/bin/env python

#!/bin/sh -e

Split a string

v1 = variable.split("search_string")[n]

where variable is any string variable

where n is the portion of the string 0 = first - 1 = second etc to be assigned to v1

Python Commands - cont.

Talk to Modem or serial device

```
echo "ATDT . . . " > /dev/ttyACM0
```

or

```
sudo apt-get update
```

```
sudo apt-get install cu
```

```
cu -l ttyACM0
```

response should be "connected"

```
ATDT . . .
```

Exit cu with "~."

TIME and DATE

```
import time
```

```
time.strftime("%m/%d/%Y - %H:%M:%S") - yields 1/1/2014 - 12:01:00
```

```
int(time.time()) - yields integer
```

TEMPERATURE SENSORS

If there is an IOError on a sensor, try `time.sleep(1.5)` before reading temperature again.

Alternately, trap the error, use last good reading and continue to next sensor

```
try:
```

```
    expression
```

```
    command
```

```
    etc
```

```
except IOError:
```

```
    command
```

```
except KeyboardInterrupt
```

```
    command
```

```
    raise SystemExit
```

Special characters in Python

Degree Symbol - `chr(176)`

Copyright Symbol - `chr(169)`

Python Commands - cont.

Sample python script to identify computer and related information.

```
#!/usr/bin/env python

import os, sys, time

# os.system("command")
# usage: ./sma.py or ./sma.py 1 to display nmap and arp
# note: nmap, ssmtp and mailutils must be installed and configured

os.system("hostname -I > host")
hostip = open("host")
ip = hostip.read()
hostip.close()
nip = ip.split(" ")[0]
cmdstr = "nmap -sP " + nip + "/24 >> /home/pi/addr.txt"

os.system("cat /boot/ID > /home/pi/addr.txt")
time.sleep(1)
os.system("date >> /home/pi/addr.txt")
time.sleep(1)
os.system("hostname -I >> /home/pi/addr.txt")
time.sleep(1)
os.system("curl https://wtfismyip.com/text >> /home/pi/addr.txt")
time.sleep(3)
os.system("curl http://ipecho.net/plain >> /home/pi/addr.txt")
time.sleep(3)
os.system("cat /boot/ID >> /home/pi/addr.txt")
if len(sys.argv) > 1:
    if sys.argv[1] == "1":
#         print "Inside loop - doing nmap etc "
        os.system(cmdstr)
        time.sleep(3)
        os.system("cat /boot/ID >> /home/pi/addr.txt")
        os.system("arp -an >> /home/pi/addr.txt")
        time.sleep(3)
        os.system("cat /boot/ID >> /home/pi/addr.txt")

os.system("cat /home/pi/addr.txt | mail -s ""Address"" phone#@vtext.com")
os.system("cat /home/pi/addr.txt | mail -s ""Address"" phone#@vtext.com")
os.system("cat /home/pi/addr.txt | mail -s ""Address"" email@server.ext")
os.system("cat /home/pi/addr.txt | mail -s ""Address"" email@server.ext")
```

Python Commands - Sample Code

Digital Sensors -

```
tfile = open(spth)           # open file using sensor path
text = tfile.read()          # read sensor
tfile.close()                # close file
l1 = text.split("\n")[0]      # split data into two parts saving the first part
crc = l1.split(" ")[11]       # split first part into crc and value
if crc == "NO":               # if crc is equal to NO, read failed, redo
    tcel = failsafe
    redo = False
else:                          # otherwise convert value to temperature Celcius
    redo = False
    tcel = float(int(float(float(text.split("\n")[1].split(" ")[9][2:]) / 100))) / 10
```

Python Commands - Sample Code

Because the Raspberry Pi has only digital inputs and no analog inputs, an analog to digital sensor must be used to accomodate analog sensors necessitating additional code to convert the analog signal to a digital signal.

Analog Sensors -

Following code copied from adafruit.com

```
import time

import adafruit_dht
import board

dht = adafruit_dht.DHT22(board.D2)

while True:
    try:
        temperature = dht.temperature
        humidity = dht.humidity
        # Print what we got to the REPL
        print("Temp: {:.1f} *C \t Humidity: {} %".format(temperature, humidity))
    except RuntimeError as e:
        # Reading doesn't always work! Just print error and we'll try again
        print("Reading from DHT failure: ", e.args)

    time.sleep(1)
```

To install adafruit library,

```
pip3 install adafruit-circuitpython-dht
sudo apt-get install libgpiod2
ls
python3 greenhouse-dht.py
sudo nano greenhouse-dht.py
python3 greenhouse-dht.py
```

Python Commands - cont.

Where the wheels fall off !

I don't know. Just while things are looking right, one minor change and BOOM, the wheels fall off.

Python program:

Program runs while in development. Both ways.

`sudo python program_name` - works

`make executable - chmod +x program_name` - works

`./program_name` - works

deploy and test

first yes

second no

WHY?

Python3 - use python3 in rc.local or systemd

As first line of program use:

`#!/usr/bin/python3`

Make program executable:

`chmod +x programname.py`

Add program to rc.local:

`./programname.py`

WEB PAGE

BACK BUTTON

```
<FORM><INPUT TYPE=button VALUE=Back onClick=history.go(-1);return true;></FORM>
```

DISPLAY A PICTURE

```

```

FORWARD REFERENCE - Open link in a New Tab

```
<A href="http://nnn.nnn.nnn.nnn/" target="blank"> Name </A>
```

```
<A href="http://www.name.ext/" target= blank"> Name </A>
```

HEAD SECTION

```
<head>
```

```
<title> </title>
```

```
<meta http-equiv="REFRESH" content="300">
```

```
</head>
```

HTML Auto Refresh - goes in the "Head" section

```
<head>
```

```
<meta http-equiv="REFRESH" content="300">
```

```
</head>
```

HTML SYNTAX

```
<html>
```

```
<head>
```

```
<title> Page Name </title>
```

```
</head>
```

```
<body>
```

```
<center>
```

Click here to read chapter 4.

Example of an anchor

```
commands
```

```
</center>
```

```
<!-- comment //-->
```

```
<HR>
```

Example of Horizontal Ruler

```
<HR width="100%">
```

```
<p>
```

```
<a name="chapter4"></a>
```

Example of an anchor

```
<br>
```

```
</body>
```

```
</html>
```

Include - add a set of commands to a web page

WEB PAGE - continued

PREFORMATTED TEXT

`<pre> </pre>` - Used to identify preformatted text

PRINT BUTTON

```
<head>
  <title> Title Line </title>
  <script>
    function printpage()
    {
      window.print()
    }
  </script>
</head>

<input type="button" value=" Print this page " onclick="printpage()" />
```

REFRESH BUTTON

```
<FORM><INPUT TYPE=button VALUE=Refresh onClick=history.go()></FORM>
or
onClick=window.location.reload()
```

SCROLLING TEXT

```
<marquee behavior="scroll" direction="left" scrollamount="3" width="50%">
  <font size="+1"> scrolling text </font></marquee>
```

TITLE - goes in the “head” section - note: only one head section permitted

```
<head>
  <title> Page Name </title>
</head>
```

Apple Items

iPhone Apps

icloud.com - iCloud maintenance website

- Visit icloud.com
- Sign in using Apple ID and Password
- Follow icons for desired functions
- Logout when maintenance is complete

iCloud for Windows ver 2.1 (Windows Vista) - see also icloud.com
search for iCloud 2.1
follow instructions

iCloud for Windows (requires Windows 7 or higher) - see also icloud.com
Visit apple.com/icloud
Scroll to bottom and click on “Setup on PC”
Click on “For Windows PC”
Click “Download Now”
Install iCloud for Windows
Sign in with the Apple ID you used to create your iCloud account
Select the iCloud services you’d like to enable and click Apply

Apple Items - cont.

Putty for Apple

Pagent - putty Authentication Agent

```
Mac_user: ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/user/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in id_rsa.
Your public key has been saved in id_rsa.pub.
The key fingerprint is:
16:8e:e8:f2:1d:c9:b9:cf:43:9a:b3:3c:c1:1f:95:93 Mac_user
```

This will create a private key written to /home/user/.ssh/id_rsa and a public key written to /home/user/.ssh/id_rsa.pub.

After that you will have to upload public key in cPanel, under SSH/Shell access and load the private key in your Terminal using the ssh-add command:

1

```
ssh-add /home/user/.ssh/id_rsa
```

You will be asked for the passphrase of your key when loading it in the Terminal.

With the generated keys, you should now be able to connect via SSH.

PC Items

ARP - Address Resolution Protocol

arp -n Lists interfaces (IP) addresses available to current device

DOS Items

To test serial port:

Kermit - Communications Program

Run Kermit.exe

SET PORT 1

SET BAUD 9600

SET LOCAL-ECHO ON

CONNECT

Perform local tests with loopback plug. Keystrokes will be echoed to screen if port and loopback plug is working properly

Windows Items

7-ZIP - Zipped file Extraction Program - 7-zip.org

Open 7-zip, select file to be unzipped, click extract, select destination, click OK

Activate Windows

cmd (admin), slmgr -rearm, restart, cmd (admin), slmgr -ato, activated!

Note: Be certain the date and time are correct or close otherwise an error message appears

Activate Windows - Alternate Method

Activate manually via telephone - Call the number and enter the activation code then copy the code provided. This code can be reused if necessary.

Apple Items for Windows

See Apple Items section

AUTOEXEC.BAT - in linux it's called /etc/rc.local or systemd

Contains a list of programs to be run when the computer starts

Bluetooth - With hearing aids (from Roy Sidener)

Go to my laptop settings

Go to sound

Go to, scroll down, devices

Make my hearing aids discoverable. For mine I just open the battery door and close it again.

My computer finds them and I connect!!!!

Burn ISO to USB - see create bootable USB

Burn Image to 3.5 inch disk

RawWriteWin - Burn IBM image file to 3.5 inch disk (USB connected 3.5 inch drive)

CYGWIN - X11

Clean Debian SD / micro SD

Disk imager, select device, select image file, write

Boot in RPi, sudo Raspi-config

CLEAR USB LOGS - where device was not released prior to removal

Start, Run, regedit.exe, hkey_local_machine, system, currentcontrolset, control, usb flags,

See also Automatic Update Numbers KB310575, KB920875 and KB314634.

Clone Hard Drive

EaseUS Todo Backup Home 11.5

Macrium Reflect

Clonezilla - Clone Disks

clonezilla.org

Windows Items - cont.

Copy Files to USB Flash Drive

Insert Flash Drive into computer
Select files to be copied
Drag files to Flash Drive

Create bootable USB Stick

Rufus
under format options:
for iso to usb - select: Create a bootable disk using "ISO Image"

Create Calendar Page - pdf

In Word Perfect Office open Utilities then CorelCENTRAL Calendar to view calendar.
Select file, print, select month view, starting date, number of months, in Page Setup select Landscape. Then print.

Create SD Card - for linux

Win32diskimager - follow prompts

Create System Disks - see System Disks - Create

Create A System Image - see System Image - Create

Sound issues - [automatic updates]

Start, settings, privacy, microphone, allow access to the microphone on this device

Page Numbering in Word Perfect

Format, Page, Numbering

HP Spectre Problem (G Rich)

- with new battery
- after several weeks, battery would not charge

Solution:

- fully drained the battery
- charged the battery, went to full charge

Windows Items - cont.

Disk Boot Failure Message -

<http://ccm.net/faq/1191-disc-boot-failure-message> or Appendix W

DOS - Disk Operating System - Predecessor to Windows - see Appendix D

Device Drivers for HP - HP SoftPaq Manager

<http://www8.hp.com/us/en/ads/clientmanagement/overview.html#manageability-tools#manageability-tools>

Device Driver Installation Sequence - following Windows OS Installation

Service packs, Chipset drivers, Video drivers, Network driver, audio, modem, wireless, Touchpad, others as needed

Wireless Device Driver / Debugging - wireless not controlled by Windows

When wireless is having problems.

Right Click wireless icon

Open network connections

View available wireless networks

Click -change advanced settings

Click -wireless network tab

Select - "Use Windows to configure my wireless network settings

Downgrade from Win 8 / Win 8.1 to Win 7

Boot into BIOS setup screen, select Security tab, select Secure Boot, change to Disable

Select Advanced Tab, Select virtualization technology, change from vt-x only to disable

Select System Configuration, select Boot mode, change from UEFI-boot to CSM boot

Select Exit, Exit saving changes

Boot with Windows 7 install disk in Drive and follow prompts

Remember to enable USB 2.0 or set to automatic instead of USB 3.0 (Enable)

Drive Fills Up too fast / improperly

Check the temp folder

Start, search %temp%, Mark all (Ctrl A), Delete - to remove temp files

Drive Vaccine - Protect computer from changes - restarts after every user - drivevaccine.com

New version from same vendor is called rollback

DXDIAG - Displays information about currently loaded device drivers.

Start - dxdiag <enter>

Ease of Access - To enable users to see screen easier and other functions

When using ease of access and screen gets too large, use the gear wheel on ease of access menu bar to change the increment of change.

Windows Items - cont.

Editing Software

Photo Editing -

befunky - great photo editing software

GIMP - Photo editing software

IrfanView - great photo editing software

Picture - Paint, GIMP, Dimage Viewer

Sound / Audio

Audacity - audacityteam.org/download

Ver 2.2.1 - Works with Windows XP Pro / SP3 and above

Ver 2.3.3 - Works with all bu XP

Ver ? - Works with Raspberry Pi

Note: to speed up, Ctrl A, effect, change speed

Goldwave

Video

Pinnacle Studio - Video editing software - (see Ron)

Pitivi - also video editing software

Conversion

To convert recorded video with rf or other extension

AVI Generator converts .rf to .avi

RPi libav or avconv then converts .avi to .mp4.

Sound Editing -

Audacity

To speed up recording use “Effect - Change Speed”

To change volume up or down use “Effect - Amplify”

FairStarsCDRipper - rip CD to mp3

TextAloud3 .. converts Word files to mp3

Total Recorder - Records sound - capable of recording unattended

URL: totalrecorder.com - See Carl for explanation

tftp - Windows built in program - to activate

Start, Turn windows features on or off, select both Telnet Client and TFTP Client

Click OK

Windows Items - cont.

EXT - three letter command to identify all devices on a specified system

EXTRACT ZIP FILES - Limits - There is a 4 GB limit on the extract capability in Windows. In order to extract larger files the program 7-zip or one of the other similar programs needs to be used. Either 32 bit or 64 bit 7-zip can be downloaded from 7-zip.org .
Right click on the zipped file and select 7-zip, extract files . . .

Extract Zip Files -

Open Zipped Folder, Highlight contents, click Extract all files, Select Destination, Click Extract

Note: see also Extract Zip Files - Limits

FAX - To send a FAX

Connect Modem to USB port

Open Document to be sent, Click File, Print, select FAX then click Print

In the section named To: put the telephone number (if long distance add 1)

Fill in Subject:, place text in lower section if desired or leave blank

Click Send

FAX - To receive a FAX

Connect modem to USB port

Click Start, Devices and Printers, double click FAX, click Receive a FAX now

FAX - To print a FAX

Select the FAX to be printed

Click File, Print, select the desired printer, Click Print

File Attribute Manipulation - see Ztree, Xtree, Q-dir

File Sharing - see Networking

Windows Items - cont.

Firefox - Browser - XP uses < ver 52.0

tools, options, general, home page, about:blank for blank page

Firefox - Browser - Google search hijacked by Yahoo

Help - Restart with add-ons disabled

Remove unknown add-ons

Firefox - Password Recovery

Passwordfox recovers passwords for Firefox

Flash Drives

Use - to use a Flash USB Drive simply insert into a USB Port on your computer

Removal - to remove the Flash USB Drive click on the USB icon or small carret on the lower right and wait for a prompt then click the desired function. Remove the Flash USB Drive when prompted.

Format Device - SD, USB (or bad drive)

Insert Device

Right Click (My) Computer

Click Manage

Click Disk Management (Drive Manager)

Follow Prompts

Right Click area to be modified for drop-down menu

Group Policy Editor - gpedit.msc

Among other things,

it enables the user to determine if and when to download Automatic Updates

HIVE - a list of five system files which contain the system registry in Windows

Location for the HIVE is normally Windows/System32/config

Host Name - for Windows computers

Note: this name is used for Norton to identify a specific computer for registration purposes

Start - Right click on Computer - select properties

“Host name” is also “Computer Name”

Start - Run - cmd - <enter>

ipconfig /all

host name is listed first

Homegroup - Windows 10

Start - Control Panel - Network and Internet - Homegroup

Change advanced sharing settings

Network discovery must be on, file and printer sharing must be on

Windows Items - cont.

InSSIDer - Utility to identify Wireless Signals - metageek.com

Start inSSIDer, follow instructions

Install OS on newer Computer / BIOS

See Downgrade from Windows 8 etc.

Internet not working - try resetting windows firewall by Gerry Rich

Start, [windows firewall], restore defaults, close, shutdown, boot

Note: [] indicated item to be searched

IP Addresses

cmd

ipconfig [/all]

IP Addresses scanner

Angry IP Scanner - angryip.org

IPCHICKEN - Determine local IP address

ipchicken.com

Windows Items - cont.

Keyfinder - Magic Jelly Bean

utility to get COA install code and other information about a Windows computer system

Microsoft Office - Convert from UPPER case to lower or Proper in Access or Excel

Access - change UPPER to Proper

export to Access, insert column(s) for proper name(s)

in new column type =PROPER(A1) where A1 contains NAME to be converted to Name

close when complete

import EXCEL sheet into Access

Note: you may need to then remove unwanted columns of NAMES

MICROSOFT Word - Mail Merge

Begin by starting your document

Omit any lines which will contain address or greeting information

Save document when complete

Click Mailings from the top menu bar

Click Start Mail Merge

Click Select Recipients

Move cursor to location and click Address Block

Move cursor to location and click Greeting Line

Again SAVE document

If sending to entire list, select Auto Check for Errors

NETSTAT - Run from a command prompt on PC to determine which ports are being monitored

Windows Items - cont.

Networking

File Sharing

To Share:

Select Drive, Rt Click, Click Properties, Select Sharing Tab, Check Share this folder
Edit Share Name, Click Permissions, Check full control (if desired), Click OK

To Use Shared Files:

Open Windows Explorer, Click Network, Select Shared Device, Rt Click, Map Shared Drive

Note: User - Authenticated Users - need a username and password

User - Everyone - has open access to whatever is shared and with whatever rights are given

Windows Items - cont.

NORTON PRODUCTS

NPE - Norton Power Eraser - Find and remove viruses preventing installation of Norton Products

NRT - Norton Removal Tool - Remove a Norton product which has been corrupted

NSBU - Norton Security with Backup

norton.com, login, services, download and install

For problems: norton.com/latestnsbu, download and install, activate

Windows Items - cont.

Password Reset - Windows - most versions

chntpw - change NT password
program to change / reset windows passwords
boot cd or USB, follow instructions

ntpasswd - program to change / reset most windows passwords
boot cd or USB, follow instructions

Password Reset - Windows XP - Windows 7 - Windows 10

Passware - reset administrator password

Password Reset - All Windows O/S

Ultimate Boot CD - Boot UltimateBootCD, click on PartedMagic, Start, System Tools, PCLoginNow, Next, "Select O/S", "Select User Name", click Password Empty, click Never Expire, Next, Start, Logout, Reboot, Run CHKDSK

Windows 8.1 DVD - Boot Windows CD/DVD, select language, Next, click Repair your Computer, Troubleshoot, Advanced Options, Command Prompt, "Find O/S Drive containing Program files and Program files (x86),
cd /Windows/System32, ren Utilman.exe Utilman2.exe, ren cmd.exe Utilman.exe,
Reboot, click "Ease of access", type: net user "username" *,
at password prompt hit "Enter", Exit, Hit "Enter" at login prompt, reboot to CD/DVD,
Rename previous files to original, exit, reboot.

Windows Items - cont.

Popup Blocker - AdOn

- Ad Blocker Plus

Power Shell -

Prey - Computer tracking software - find a lost computer

preyproject.com

Print Spooler

Start - services.msc - follow prompts

REARM - reset "Not Genuine Windows" message

Start, Run, cmd <Enter>, slmgr - rearm <Enter>

Remote Assistance - see Windows Remote Assistance

Remote Access - Programs - use with Windows, Linux even Raspberry Pi

AeroAdmin

RealVNC

TeamViewer

Remote Desktop Connection

URL: windows.microsoft.com/en-us/windows/connect-using-remote-desktop . . .

REMOTE:

user name must be password protected

Forward port 3389 to local IP Address

Force remote IP to desired computer (MAC address)

LOCAL:

Start, Programs, Accessories, Remote Desktop Connection,
Computer name or IP address

Remote Desktop Software - AEROADMIN

900100.net in your browser for quick access

Download application from aeroadmin.com

either run program to access other computers using address and password (right side)

or run program to provide access to your computer (left side) follow prompts

Remove Windows 10 notification icon or other recent unwanted updates

Control Panel - Programs & Features

On the left top side you will see "view installed updates" Click that

In the search window (upper right side) paste KB3035583 or select by date

Right click KB3035583 and click uninstall

You will have to restart your computer "

Windows Items - cont.

RUFUS - program to burn ISO to USB Drive or SD drive

Follow prompts

Note: can also be used to reformat a previously used drive

Set up Wireless printer

Insert disk which came with printer, follow prompts

Slow Computer - see Appendix S - Slow Computer for more information

Use Task Manager to see which applications, processes or services are consuming memory or CPU time.

<RtClk> Task bar at bottom of screen, <Click> Start Task Manager

<Click> any Tab to display that information

<Click> CPU or Memory to see usage in order

Software - Applications

1) Facebook

a. Log in

b. Post a Picture

c. Copy a picture

d. Share

2) Email

a. Thunderbird

b. Google

c. Yahoo

3) NO ONLINE BANKING

4) NO GAMES

5) Playing Music

a. From Youtube

b. From Desktop or file on computer

c. From player program

6) Windows Versions

a. Windows XP

b. Windows 7

c. Windows 8 or 8.1

d. Windows 10

QuickBooks

New Company

Enter Company Name

For Personal Checking - Skip setup - go directly to data entry

Enter requested information, date - Check # - Name - Amount - Account and memo

Continue

- To reconcile - Actions - Reconcile

Windows Items - cont.

Safe Mode

- Press F8 to boot in Safe Mode
- Some windows versions such as XP use the F5 key for Safe Mode

SSD - Solid State Drives - Cloning drive - Macrium Reflect

- HDD to HDD - (not currently tested)
 - Macrium Reflect
 - Start program, identify source drive, identify destination drive, press enter
- HDD to SSD
 - Macrium Reflect
 - Start program, identify source drive, identify destination drive, press enter
- SSD to SSD
 - Macrium Reflect
 - Start program, identify source drive, identify destination drive, press enter
- Transfer

SSD - Solid State Drives - Cloning drive - EaseUS Todo (URL: easeus.com)

- HDD to HDD - (not currently tested)
 - EaseUS Todo
 - Start program, identify source drive, identify destination drive, press enter
- HDD to SSD
 - EaseUS Todo
 - Start program, identify source drive, identify destination drive, press enter
- SSD to SSD
 - EaseUS Todo
 - Start program, identify source drive, identify destination drive, press enter

SSD - Solid State Drives - Cloning drive - AOMEI (URL: diskpart.com)

- HDD - all functions - quite easy to use, stops before cloning won't let you proceed until you purchase

SSD - modify partition

Windows - Start, <Right Click> Computer, <Click> Manage, <Click> Disk Management
<Right Click> partition to be extended, select size, press <Enter>

SSD Problems / Recovery

Power Cycle - Crucial SS Drives (may also work for others)
Power up drive for 20 minutes, remove from circuit for 30 seconds. Repeat twice.
Reconnect drive and proceed as normal.

Freeze - Intel

Windows Items - cont.

Solid State Drives - Maintenance

Format SSD with Disk Management

Step 1: Press "Win+R" to open "Run" box, and then type "diskmgmt.msc" to open Disk Management.

Step 2: Right click the SSD partition (here is E drive) you want to format. Choose "Format".

Format E

Step 3: You can change settings in the pop-up window, such as label the partition, change file system, perform a quick format. Then click "OK".

Tips: Only the partition whose size is smaller than or equal to 32GB can be formatted from NTFS to FAT32 through Disk Management.

Step 4: A warning about data loss will appear. Click "OK" after your confirmation to execute.

Format SSD via DiskPart

Step 1: Press "Win+R" to open "Run" box, and then type "cmd" to open Command Prompt.

Notice: To format SSD from BIOS, you need to access Command Prompt from BIOS first. Windows Installation Disc, Repair Disc, or Advanced Startup will be helpful. Then, follow these commands to format the SSD.

Step 2: Input these syntax successively, and press Enter after each command.

diskpart

list volume

select volume n (where n is the partition number of your SSD drive)

format fs=ntfs quick label=test (or you can type "fs=fat32" to format SSD to FAT32)

exit

Tips: To clean an SSD drive, you can try these syntax: diskpart > list disk > select disk n (where n is the disk number of SSD) > clean > exit.

Windows Items - cont.

Format SSD with Free AOMEI Partition Assistant

AOMEI Partition Assistant is a free partition manager software which can manage your hard disk partitions easily. It even allows you to format a partition larger than 32GB from NTFS to FAT32.

Step 1: Download AOMEI Partition Assistant Standard. Install and launch it. Then, right click the SSD partition you want to format. Select "Format".

Step 2: Here you're able to name partition and change file system, and then click "OK" to continue.

Step 3: Don't forget to click "Apply" on the toolbar to commit the operation.

Note: Formatting C drive or system drive will make operating system unbootable. Think twice before you leap.

Besides, free AOMEI Partition Assistant supports write zeros to hard drive which known as a kind of low level format. Try the feature if the need ever arise.

Windows Items - cont.

Secure Boot - To change for various reasons

Disable Secure Boot, Enable Legacy Boot
Make desired changes
Disable Legacy Boot, Enable Secure Boot

Startup Programs - Add / Remove

Start - type "msconfig" - startup tab - select programs to disable / enable

SYS - Command to create system disk

SYSprep - prepare system for deployment (distribution)

SYSTEM DISKS - Create

ACER - http://acer.custhelp.com/app/answers/detail/a_id/12866/kw/recovery%20disk

Start - All Programs - Acer Folder - Acer eRecovery Management
Backup - Create Factory Default disk
See also: Acer Recovery Management - search from start menu

ACER - Reinstall System

Use Alt F10 when the ACER Logo appears to start System Reinstall

ASUS - AI Recovery program will create Recovery Partition disks

Start, All Programs, ASUS Utility, AI Recovery Burner

DELL -

TOSHIBA - Click Start, Recovery Media Creator or Toshiba Recovery Disk Creator - follow prompts
Alternately, in order to do a system recovery simply press the zero '0' key when booting.

Windows Items - cont.

SYSTEM DISKS - Install -

ACER -

ASUS - AI Restore disks will restore the Recovery Partition to the drive

Boot with DVD-1 and follow prompts

When Recovery Partition has been restored the system will reboot and continue installing the operating system. The system may reboot multiple times and may pause for user input from time to time. After installing it will restart and boot to run system for first time setup by the end user.

DELL - to access recovery partition press Ctrl + F11 while system is booting

TOSHIBA -

Windows Items - cont.

SYSTEM IMAGE - Create

Acer - In Windows 7 Before Installing

You can make a system image of your Windows 7 install and use it to restore Windows 7 to it's state when the image was made.

1. Click the Start Menu and type "Back Up" then click Back up your Files.
2. Then click Create a system image.
3. Select where to save your system image to, then click Next.
4. Then check your drives to backup, and click Next.
5. Verify the settings and click Start backup to start.
6. After the backup completes, it asks to create a system repair disc, click Yes.
7. Insert a blank CD or DVD to the disk drive and click Create disc.

Windows Items - cont.

SYSTEM RECOVER - General

In general, holding <Ctrl> + F11 keys during POST will start the System restore process.

Steps Recorder - Record Steps to reproduce an issue

- start
- steps recorder
- click Start Record
- perform needed steps
- click Stop Record

Windows Items - cont.

TGZ Files - see Extract Zip Files

TOR - torproject.org

Contains information and downloads for most operating systems

Note: error codes:

-10 - new tor version on old tor address *

-14 - device is in the boot process

-16 - device is unavailable

* To resolve, either reinstall tor or use old version of tor browser

Two Screens - Notebook

Right Click Desktop

Click Properties - or - Screen Resolution

Click Extend

USB Drives

Use - to use a USB Drive simply insert into a USB Port on your computer

Removal - to remove the USB Drive click on the USB icon or small carret on the lower right and wait for a prompt then click the desired function. Remove the USB Drive when prompted.

Virtual Box - Shared Folders

Windows 98SE -

Windows XP - Right Click - new, shortcut, browse, my network places, vbox shared folders, vboxsvr, . . . 4x6 recipes

Windows 7 - In VM main screen to prepare for sharing with XP

Select machine, shared folders, click “+” on right side of dialog box to add, select folder or file, select desired options with check boxes, click OK

Windows 8 - Reset PC

Troubleshoot, Reset PC, Reset

Windows Items - cont.

Windows 10 - Change default pdf viewer - see Appendix W

Right Click pdf document
Select Choose another app
Select your choice (recommend Adobe Reader XI)
Click “Always use this app to open .pdf files”
Click OK

Windows 10 - Create install media - see Appendix W

Windows 10 - Cortana on / off

Right Click Task Bar, Scroll to Cortana, Select Hidden / Show Cortana icon / Show Search Box

Windows 10 - Enable / Disable Administrator

CMD as administrator
net user administrator /active:yes (no to disable)

Windows 10 - Map Network Drive

Windows Key + E, Click This PC on the left side, Click Computer Tab
then select Map Network Drive

Windows 10 - Reset this PC

Start, Settings, Update and Security, Recovery, Reset this PC

Windows 10 - Remove password login requirement

See 0204 log sheet - Complete this section before forwarding

Windows 10 - Run Command - Windows key + “R”

Windows 10 - Safe Mode

Start, Settings, Update and Security, Recovery, Advanced Startup, Restart Now,
Choose Option, Troubleshoot, Advanced Startup Settings, Restart

Windows 10 - Share File or Folder

Locate file or folder, right Click Properties, Select Sharing, Configure Permissions

Windows 10 - Startup Files

Windows key + “R”, shell:startup for current user
Windows key + “R”, shell:common startup for all users

Windows 10 - Automatic Updates - Disable

If you use Wi-Fi to access the Internet, Interestingly, there is a simple option in Wi-Fi settings, which if enabled, stops your Windows 10 computer from downloading automatic updates. To do that, search for Change Wi-Fi settings in Start Menu or Cortana. Click Advanced Options, and enable the toggle below Set as metered connection.

Alternately, use gpedit to user policies, admin policies, grtoup policies, admin folder

Windows Items - cont.

Windows 10 - Change Speaker selection (may work with other Windows versions)

Right Click Speaker Icon
Select "Open Sound Settings"
Select "Manage Sound Devices"
Choose desired device
Click OK

Windows 10 - Device Census

Device Census or devicecensus.exe can be found in C:\Windows\System32, and it is a valid application from Microsoft that helps Microsoft determine what build of Windows 10 you can upgrade to without problems.

Windows 10 - Automatic updates (by number if available or date)

20220530 - Audio Sound issues
Start, settings, privacy, app permissions,
microphone - microphone access for this device is - OFF
Needs to be changed back to - ON

Windows Items - cont.

Windows - Clean Boot (see Appendix W)

Windows iso Ver 7 / 8 - Ei Removal Tool - see Appendix W

When used on an original Windows 7/8 ISO image, this utility will disable the ei.cfg file, thus converting a disc image into a "universal" disc image.

Windows Remote Assistance - request or provide assistance

Windows 10

Windows 7

Request - Start, Windows Remote Assistance, Invite, Save, Record password, Send invitation, Give password to provider, Wait for connection, Respond to prompts

Provide(7) - Double click on invitation, Enter password, Request Control

Provide(XP) - Double click on invitation, Enter password, Request Control - ???

Windows Items - cont.

Windows XP

Request(XP) - Start Windows Remote Assistance, Invite, Save, Continue, Enter a new password, Enter password again, Save, Save, Send invitation, Give password to provider, wait for connection, Respond to prompts

Provide(7) - Double click on invitation, Enter password, Request Control

WinSCP - Secure FTP Application for MS Windows Systems

download from internet or other host computer

To save WinSCP profiles in an ini file rather than to the registry change storage preferences to save as INI during setup or when needed.

Configure Editor - Options - Preferences - Editors
move preference to top - Click OK

Wireshark - Network Protocol Analyzer - wireshark.org

Open pcap file

 Select Packet

 Click Statistics

 Conversation List

 IPV4

 Click Telephony

 Voip Calls

 Flow

 Player

 Decode

 Rt Click, select Follow UDP Stream

Wiping Drives

HDD - Hard Disk Drives - DBAN is arguably the best program for this purpose

SSD - Typically the manufacturer has a program to reset the drive

 Crucial -

 Intel - Intel SSD Toolbox

WMI -

WTFISMYIP - Determine local IP address (XXX)

 wtfismyip.com

 see also IPCHICKEN

Windows Items - cont.

XP Diagnostics

- dxdiag, devmgmt.msc - Device Manager

XP Home Activation - Do this within 30 days of installing O/S

Start, Run, regedit, HKEY-Local-Machine, software, microsoft, Windows NT, Current Version, WPAEvents, OBETimer, delete contents, Type: FF D5 71 D6 8B 6A 8D 6F D5 33 93 FD, ok, close regedit, reboot computer

To set new background on Windows XP:

View desired picture, right click, click set as Desktop Background

ZIP FILES - EXTRACTING - see Extract Zip Files

ZTREE - File / File attribute manipulation software - ztree.com

Instructions to follow

Setting up Wifi with Debian

Setting up WiFi requires that your router is broadcasting the SSID. Make sure you have "Broadcast SSID" set up on your router! This will not work with "private" SSID setups.

SECURE WIFI - by turning off “Broadcast SSID”

Setting up Wifi with Occidentalis

Setting up WiFi requires that your router is broadcasting the SSID. Make sure you have "Broadcast SSID" set up on your router! This will not work with "private" SSID setups.

Setting up WiFi in Occidentalis, is also pretty straight forward. You just need to add the name of your wireless network (its SSID) and your password to a configuration file.

Step 1.

Boot the Raspberry Pi without the WiFi adapter plugged in.

Step 2.

Open a Terminal session by clicking on the LXTerminal icon, and enter the following command into it:
`sudo nano /etc/network/interfaces`

Step 3.

Make the following changes:

```
auto lo
iface lo inet loopback
iface eth0 inet dhcp
```

```
auto wlan0 *
allow-hotplug wlan0 *
iface wlan0 inet dhcp *
    wpa-ssid "network-name"
    wpa-psk "network-password"
    * Check ifconfig for correct wlan#
    * See also Wireless (p. 24)
```

Replace the italicized characters with the required information from your network keeping the quotation marks.

Step 4.

When finished press [ctrl] x and save the modified file.

Step 5.

Shut down your Pi, plug in the wifi adapter and start the Pi. Wifi should work.

Setting up Wifi with Raspbian

Setting up WiFi requires that your router is broadcasting the SSID. Make sure you have "Broadcast SSID" set up on your router! This will not work with "private" SSID setups.

Raspbian releases after 2012-10-28 include a WiFi configuration utility. You will find the shortcut for this on the Desktop. If you are using command-line tools or are logging in over Ethernet, use the following steps to edit `/etc/network/interfaces` by hand.

Step 1.

Boot the Raspberry Pi without the WiFi adapter plugged in.

Step 2.

Open a Terminal session by clicking on the LXTerminal icon, and enter the following command into it:
`sudo nano /etc/network/interfaces`

Step 3.

Make the following changes:

```
auto lo
iface lo inet loopback
iface eth0 inet dhcp
```

```
auto wlan0
allow-hotplug wlan0
iface wlan0 inet dhcp
    wpa-ssid "network-name"
    wpa-psk "network-password" or wep "Password"
```

Step 4.

When finished press [ctrl] x and save the modified file.

Step 5.

Shut down your Pi, plug in the wifi adapter and start the Pi. Wifi should work.

Miscellaneous

Command line completion

You don't have to laboriously type out long paths, filenames, and commands. Just type the first few letters and hit tab. If bash (the command interpreter, or shell) can determine what file you're referring to, it will fill in the rest for you. If not, hit tab again it will give you a list of possibilities if there are more than one.

`sudo !!` (sudo bang bang)

It can be frustrating to type out an entire command only to be told you need to be the superuser to execute it. Type "`sudo !!`" (pronounced "sudo bang bang") to execute the previous command as root.

Taking screenshots

Install scrot (by executing "`sudo apt-get install scrot`") so that you can take screenshots within the graphical desktop environment. After it's installed, execute the command `scrot` in a terminal window to save a PNG of the desktop to the working directory. Scrot is also highly configurable; execute "`scrot -h`" to see all the options available to you.

Log in remotely

If you want to access your Raspberry Pi's command line from another computer, type `sudo raspi-config` at the prompt and choose the option to enable SSH. Then type `ifconfig` to get your Raspberry Pi's IP address. On a OS X or Linux computer, type `ssh pi@[ip address]` to connect to your Pi. On Windows, use PuTTY.

Use your computer's internet connection

If you don't have a convenient ethernet connection nearby or a USB Wifi adapter handy, you can also use your computer's Wifi internet connection and share it via Ethernet to the Raspberry Pi. Here are guides to do on various operating systems:

Mac OS - <http://support.apple.com/kb/PH6589>

Windows - <http://windows.microsoft.com/en-US/windows-vista/Using-ICS-Internet-Connection-Sharing>

Linux (Ubuntu) - <https://help.ubuntu.com/community/Internet/ConnectionSharing>

Miscellaneous - cont.

raspberrypi.local

If you have trouble remembering the IP address of your Raspberry Pi when you want to access it over the network, install avahi with the command “sudo apt-get install avahi-daemon” and you’ll be able to use raspberrypi.local instead of the IP address. If you’re accessing the Raspberry Pi from a Windows machine, you may need to install Bonjour Services - <http://support.apple.com/kb/DL999> on it for this to work.

GPIO Version - identify

```
sudo python
import RPi.GPIO as GPIO
GPIO.VERSION
```

Resource Pages

DHCP Information - www.isc.org/software/dhcp

Port assignments are handled by iana.org

Where is it?

Autoexec.bat = /etc/rc.local - see RUN Control or systemd

Auto Restart = /etc/init.d

Devices are located in the /proc/partitions folder

Startup files are located in /etc/modules

OS VERSION stored in /proc/version

Passwords stored in /etc/passwd or /etc/shadow - hashed for protection

Users are saved in the /home folder

How to Do it!

To set new background on Windows XP:

View desired picture, right click, click set as Desktop Background

View onion address from web - NOT ADVISED A/C PRIVACY

onionaddress.tor2web.org

Where to find it!

American Power Conversions - Schneider Electric

Serial Number - first two digits are year of manufacture

Boot Disks

Microsoft - Microsoft.com

-Downloads, - All Windows Downloads, - Products, - [product name]

Linux -

CD Key

Microsoft Original Disks

- I386/WINNT.SIF

- AMD64/MINNT.SIF

Resource Pages - cont.

High Speed SDHC

memory.oempcworld.com

wintecind.com

- Professional Plus (60)

- Elite (95)

Problems using Putty - Port Forwarding

Port assignments can change therefore static IP address might be needed

wcnet.org - smtp server

smtp01.wcnet.org

Sequences

Note: Each sequence should have a corresponding entry in Applications

CLEAN CAMERA SETUP

create SD Card with Raspbian, latest revision

run raspi-config

2 change password

4 Internationalization

 Change Locale

 Change Time Zone

 Change Keyboard

Enable Camera

8 Advanced

 2 Hostname

 Update Menu

Create .ssh folder

Create .ssh/authorized_keys file

Edit /etc/ssh/sshd_config

 Remove # from #authorized_keys line

Chmod .ssh

Chmod authorized_keys

Sudo apt-get update

[Sudo apt-get install apache2]

[Sudo apt-get install tor]

CLEAN TEMP SENSOR SETUP

Create SD Card with Occidentalis v2.0 or latest revision

 Win32DiskImager - follow prompts - use occidentalis newest version

run raspi-config

update os

Enable ssh - see ssh sequence

Download GPIO Driver

Unzip GPIO Driver

Install GPIO Driver

Install W1 Drivers - either

 sudo modprobe w1-gpio

 sudo modprobe w1-therm

 or add two lines to the /etc/modules file

 w1-gpio

 w1-therm

Install apache2 web server

 sudo apt-get update

 sudo apt-get install apache2

 sudo chgrp pi /var/www/html

 sudo chmod 775 /var/www/html

Install tor - see tor sequence

To autorun - edit /etc/rc.local - see RUN Control or systemd

Sequences - cont.

CLEAN Barn TEMP SENSOR SETUP

Create SD Card with proper capacity and latest revision
Win32DiskImager - follow prompts - use os newest version
Create ID file in /boot with details of chip usage
Boot in Raspberry Pi
copy /boot/ID to /etc
run raspi-config
 standard stuff
 update os
 Enable ssh
create datafile folder
copy required program and configuration file
setup smtp - see SMTP sequence of application
setup ssh - see ssh sequence
add tor - see tor sequence
set ssh for key access only
edit crontab - crontab -e
edit /etc/rc.local
add and configure smtp - see smtp in sequences

CLEAN EXpi SETUP

Create SD Card with proper capacity and latest revision
Win32DiskImager - follow prompts - use os newest version
Create ID file in /boot with details of chip usage
Boot in Raspberry Pi
copy /boot/ID to /etc
run raspi-config
 select country
 standard stuff
 update os
 Enable ssh
[install required programs]
create datafile folder
copy required program and configuration file
setup smtp - see SMTP sequence of application
setup ssh - see ssh sequence
add tor - see tor sequence
set ssh for key access only
edit crontab - crontab -e
edit /etc/rc.local
add and configure smtp - see smtp in sequences

Sequences - cont.

COPY SD CARD - Manually

```
mount fat  
mount ext2
```

```
# cd /mnt  
# tar cf ~/fat.tar fat  
# tar cf ~/ext2.tar ext2
```

```
mkdosfs /dev/sd[?]1  
mkfs.ext2 /dev/sd[?]2
```

Partition new chip

mount new dos fs and ext2 fs to

```
/mnt/fat  
/mnt/ext2
```

```
# cd /mnt/fat  
# tar xf ~/fat.tar  
# cd /mnt/ext2  
# tar xf ~/ext2.tar
```

To start a process running

Start ERICSOLAR.PY - with screen support

```
screen  
sudo python [pythonprogram.py] ericsolar.py - current version is solar5a.py
```

Rev:

Place required commands in /etc/rc.local - see RUN Control or systemd

Note: Program revisions to include “path” will be required

Enable SSH Access - To Internet

Login to router

Forward port 22 to RPi - TCP

Sequences - cont.

Enable HTML Access - To Internet

Login to router

Forward port 80 to RPi - TCP

Firefox Setup -

Tools - Options - Home

about:blank or selected website(s)

While program is running

Manipulate files / Copy / Edit / Download - Secure SSH

- Secure SSH using WinSCP (from Windows)

- Activate Pageant

- login

View Logs

- ssh using Putty

- login

- Note: space in filename use leading “\”

- cat path/filename.ext OR nano path/filename.ext

- Note: to end nano use <Ctrl> X

Download Logs

- psftp or WinSCP

- open [ip address]

- login

- get path/filename.ext

- [mget path/filespec] for multiple files

- Note: to exit Type exit

Sequences - cont.

Add Web Server Capabilities

1. sudo apt-get update
2. sudo apt-get install apache2
3. sudo chgrp pi /var/www
4. sudo chmod 775 /var/www/html

Add items to cron table - take some action at a certain time

crontab -e
See: CRONTAB

AUDACITY - Sound recording / editing software

sudo apt-get update
sudo apt-get install audacity

Create SD Card for RPi Camera

Win32DiskImager
Write Rasbian Wheezy Image to SD Card
Run sudo raspi-config
 Change password
 Change Locale, Timezone and Keyboard
 Enable Camera
 Name RPi if desired
 Update raspi-config
Create .ssh folder
Create authorized_keys file in .ssh folder
Chmod 600 authorized_keys
Chmod 700 .ssh
Edit /etc/ssh/sshd_config
 Remove # from authorized_keys variable
Sudo apt-get update
Install Web Server
 Sudo apt-get install apache2
[Install tor] if desired
 Sudo apt-get install tor
 Edit /etc/tor/torrc
Add camera program

For camera to autorun, add command to /etc/rc.local file - see RUN Control or systemd

Sequences - cont.

CUPS - Common Unix Printing System - locally attached printer

```
sudo apt-get update
sudo apt-get install cups
sudo usermod -a -G lpadmin pi
Open Browser
go to http://localhost:631
Click adding printers and classes
Plug in USB cable to Rpi
Click Add Printer
Enter User Name and Password
Checkmark the selected printer
Click Continue
Verify the proper printer has been selected
Click Continue
Select Exact Printer ( or a close one )
Click Add Printer
Click Set Default Options
Print a test page
```

CUPS - Common Unix Printing System - networked printer

```
sudo apt-get update
sudo apt-get install cups-client - DO NOT INSTALL CUPS-SERVER
sudo usermod -a -G lpadmin pi
Open Browser
go to http://localhost:631
Click adding printers and classes
Plug in USB cable to Rpi
Click Add Printer
Enter User Name and Password
Checkmark the selected printer
Click Continue
Verify the proper printer has been selected
Click Continue
Select Exact Printer ( or a close one )
Click Add Printer
Click Set Default Options
Print a test page
```

Sequences - cont.

Firefox - Special - for connecting to remote network through ssh on RPi

Firefox, Tools, Settings, Network Settings, Settings

In Configure Proxy Access to the Internet,

Check the Manual Proxy Configuration button

Socks Host: 127.0.0.1 Port: 5000

Check - Socksv5, Check Remote DNS, click OK

Firefox - Standard - for returning Firefox to normal operation

Firefox, Tools, Settings, Settings

Check the "Use System Proxy Settings button

Click OK

Putty - Enable Firefox - Special Connect to remote network

Session, IP Address: nnn.nnn.nnn.nnn or Onion Address, Port: 22

Connection, Data, Auto-Login Username: pi

Proxy Socks5, Host: 127.0.0.1 port 9150

(SSH, Tunnels, Source Port 5000, Dynamic, Add) - Needed for Host

Session, Saved Session Name: any_name, Save

WinSCP - Enable Firefox - Special Connect to remote network

* Instructions to follow

Sequences - cont.

ADD A PROGRAM / SCRIPT AT STARTUP

TO FIND USB MEM STICK

```
lsusb  
cat /proc/partitions - devices are listed in this file  
mount
```

```
sync; sync; sync followed by  
sudo umount /mnt
```

MOUNT USB STICK

```
sudo mount -t vfat /dev/sda1 /mnt
```

MOVE LOG FILES FROM SD TO USB STICK

SUDO MV SOURCE DESTINATION

```
sudo mv /home/pi/ericdata/except201401*.* /mnt/201401january/
```

UNMOUNT USB STICK

```
sync  
sync  
sync followed by  
sudo umount /mnt
```

PLAY YOUTUBE IN MIDORI

Note: youtube videos play better using raspbmc os

Terminal

Login as root

```
apt-get install gnash
```

```
apt-get install browser-plugin-gnash
```

```
start midori
```

```
access youtube
```

* ADD A NEW PROGRAM / APPLICATION

```
sudo apt-get update - to update your OS
```

```
sudo apt-get install [application name]
```

Sequences - cont.

SET SSH ACCESS

- 1 - SSH Enable
- 2 - SSH - with key
- 3 - PASSWORD - Remove SSH Password Authentication (if desired)
- 4 - IFCONFIG - to determine inet address for use in next step
- 5 - ENABLE SSH ACCESS - FROM INTERNET

OPEN SSH ACCESS TO PI - do each step in order

Create .ssh folder in /home/pi folder - mkdir .ssh

Create authorized_keys file in .ssh folder

Add public key to authorized_keys file

chmod 600 authorized_keys file

chmod 700 .ssh folder

sudo nano /etc/ssh/sshd_config

remove # from #AuthorizedKeysFile line

Note: pi must own file - see chown

To ,check: ls -al

Note: to remove password authentication for ssh, see Password in Linux Commands

Change #PasswordAuthentication yes

To PasswordAuthentication no

Then save file and reboot the RPi

Sequences - cont.

PUTTY - CHANGE DISPLAY FONT

- Start Putty
- Select saved session name
- Click load
- Click window
- Click appearance
- In the font settings area click change
- Click Courier New
- Click Bold (default - Regular)
- Click 14 (default - 10)
- Click OK
- Click Session
- Click Save

SMTP - Simple Mail Transport Protocol

- sudo -s
- apt-get update
- apt-get install ssmtp
- apt-get install mailutils
- cd /etc/ssmtp
- cp ssmtp.conf ssmtp.orig.conf
- sudo nano ssmtp.conf
- follow prompts
- save
- reboot

see also Appendix S - sSMTP

To send a message or file:

- echo "Message" | mail -s "Subject" address
- cat filename.ext | mail -s "Subject" address
- address can be email_address@ip.ext or cell phone number@carrier.ext

TAR -

- wget url/programname.tar.gz
- tar xzf programname.tar.gz
- sudo command

- tar xjf filename.ext.bz2
- tar xvzf filename.ext.tgz
- Note: For Windows use 7-zip from 7-zip.org

tcpdump - Program to monitor PCAP data

- sudo apt-get update
- sudo apt-get install tcpdump
- usage: tcpdump -s0 -ni eth0 -w filename.pcap

Sequences - cont.

TOR - The Onion Router

```
sudo apt-get update
sudo apt-get install tor
sudo nano /etc/tor/torrc
    uncomment ( comment to reverse )
    - #HiddenServiceDir
    - #port 80
    - #port 22 - may need to add this line
    - Save file
    - restart service or reboot computer
        - sudo service tor restart
        - sudo shutdown -r now
    - Remove ssh password authentication
```

Note: look in /var/lib/tor/hidden_service/ for hostname (onion address)

TOR - STOP DEAMON FROM RUNNING

```
Edit /etc/default/tor
Change RUN_DAEMON="yes" to
    RUN_DAEMON="no"
```

TOR - Putty

```
Connection
- proxy: SOCKS5
- Hostname: localhost or 127.0.0.1
- Port 9150
- Session Host Name: (Onion Address)
```

Note: May need to Run CMD, netstat - on a PC to get port number being monitored

```
Host
- proxy: SOCKS5
- Hostname: localhost or 127.0.0.1
- Port 9150
- SSH, Tunnels, Source Port 5000, Dynamic, Add
- Session Host Name: (Onion Address), Save
```

Note: May need to Run CMD, netstat - on a PC to get port number being monitored

TOR - WinSCP

```
- proxy: SOCKS5
- Hostname: localhost or 127.0.0.1
- Port 9150
```

Sequences - cont.

Start Program on Boot

- sudo nano /etc/rc.local - see RUN Control
- comment all lines
- sudo python /home/pi/programname.py
- exit 0

Note: Revisions will need to include path in program

Python3 - piface CAD

- wget GPIO.0.5.4.tar.gz or current version
- pi-changes.log
- add to /etc/modules
- w1-gpio
- w1-therm
- update
- apache2
- update
- screen

WIRELESS *

1. lsusb
 2. [sudo] apt-get update
 3. [sudo] apt-cache search [device] (from 1)
 4. sudo apt-get install [firmware] (from 3)
 5. lsmod
 6. sudo nano /etc/wpa.config
- see WIRELESS-01

300 - ralink
Firmware-ralink

WIRELESS SEQUENCE

UNPLUG

- Boot Wired
- ifconfig
- inet?

UNPLUG

- connect usb wireless (while wired) plug
- ifconfig
- wlan#? (ex. wlan4)

EDIT (sudo nano /etc/network/interfaces) (Ctrl X Y Enter to save)

EDIT (sudo nano /etc/wpa.config) (Ctrl X Y Enter to save)

UNPLUG

REMOVE WIRED LAN

- Boot wireless

AMATEUR RADIO

Digital Modes

EchoLink - online radio through either HF, VHF, UHF or online.

Fldigi -

Flamp -

Flrig -

JS8Call - keyboard to keyboard via RF

FT8Call - (replaced by JS8Call)

MMSSTV - Slowscan TV

WinLink - Email for amateur radio, by internet, HF, VHF or UHF

Fonts for list - to change font for readability of mail lists ie. Inbox, Outbox etc

Fonts for text - to change fonts for readability of messages

WSJTX -

JSTDx - Offshoot of WSJTX

Settings - (similar for JSTDx)

Radio - YAESU FT-991A

Ports -

Loggers

Grid Tracker -

LOTW - Logbook of the World

QRZ -

Programming Software

CHIRP - programming tool for hand held radios

Trackers

Gpredict - Satellite mapping and progress display

AMATEUR RADIO - Digital Modes

EchoLink - online radio through either HF, VHF, UHF or online.

Setup -

AMATEUR RADIO - Digital Modes cont.

FLDIGI – Send messages, documents or other materials over RF

This program is part of a suite of programs designed to be a complete communications package

Configuration - YAESU FT-991A

Configure, config dialog, skip down to Misc

Misc

Autostart

select choices, locate, enable, test, save, close

NBEMS Interface

Enable, locate flmsg, save, close

Operator-Station

Fill out each section, Save, Close

Rig Control

flrig

check - Enable flrig xcvr control . . .

check - Shutdown flrig with fldigi

no other changes to defaults

Save, Close

CAT (rigcat) - Alternate to flrig

check Use RigCAT

Open Rig description file, select Device port

Coordinate Baud rate with Radio setting

Initialize, Save, Close

GPIO

Hamlib

Hardware PTT

C-Media PTT

Soundcard

Alerts

Devices

unchecked - OSS

check - Port Audio

Capture: Microphone (USB Audio CODEC)

Playback: Speakers (USB Audio CODEC)

No other checks

Right Channel

Settings

Signal Level

Wav file recording

Note: to go from default to fldigi change:

menu 77 from data to USB

Mode from FM to DATA-FM - OR - Click the FM drop down and select DATA-FM remember to change back to FM for phone.

AMATEUR RADIO - Digital Modes cont.

FLRIG

Config, Setup, Transceiver

Rig - FT-991A

Update - COM9 (Enhanced Port)

Baud - 4800 - Must be same as Radio (menu item 031)

FLAMP

To recover messages received:

Click File, Folders, rx, and the current date folder
then select the desired document

To send messages:

To be updated

FLARQ

To be updated

Start FLMSG

Form - RadioGram

TXT: - Enter text

To send to one person: enter Call next to ARQ Send Button

To send to all:

FLMSG

To be updated

Settings:

User Interface - Expert Mode

AMATEUR RADIO - Digital Modes cont.

FLDIGI - Macros

AMATEUR RADIO - Digital Modes cont.

FLDIGI - Macros

AMATEUR RADIO - Digital Modes cont.

JS8CALL – Make calls or send messages over multiple RF links

AMATEUR RADIO - Digital Modes cont.

SSTV – Send or receive pictures or other images over RF

MMSSTV - Slowscan TV

FT-991A Settings

Option, Setup, MMSSTV(O)

RX BPF

☐ Off

☒ Broad

☐ Sharp

☐ Very Sharp

☐ Auto Stop

☒ Auto RS

☒ Auto Rsync

☒ Auto Slant

☒ Decode FSKID

RX Buffer - ck RAM

TX -

PTT - Port: Com15 - Standard Port

ck - Exclusive lock

Radio Command

Port: COM9 - Enhanced Port

4800 Baud *

8 bits 2 stop none Parity

Flow CTS

* Must be same as Radio (menu item 031)

AMATEUR RADIO - Digital Modes cont.

WinLink - Email for amateur radio, by internet, HF, VHF or UHF

AMATEUR RADIO - Digital Modes cont.

WSJTX -

General -

MyCall: Your callsign goes here

MyGrid: Your Gridsquare goes here

Radio -

Rig: Your Radio (YAESU FT-991A)

Cat Control

Serial Port: COM9 (Enhanced Port)

Baud Rate: 4800 *

Data Bits: Eight

Stop Bits: Two

Handshake: Hardware

DTR: RTS:

PTT Method

☒ RTS

Port: COM15 (Standard Port)

Mode

☒ USB

Split Operation

☒ None

* Must be same as Radio

Audio

Soundcard:

Input: Microphone (USB CODEC)

Output: Speakers (USB CODEC)

AMATEUR RADIO

Radios: Yaesu - FT-991A - Programming

Set channel -

Tune to desired frequency, Press F M-LIST Button, Press FWD or BACK until Tone/DCS is displayed, touch Tone/DCS until ENC is displayed, Press FWD or BACK until TONE is displayed, touch TONE then use MULTI knob until the desired tone is displayed.

Save to memory:

Press and release A-M Button, use Multi knob to select Memory location

Press and hold A-M for 1 second till it beeps.

To Label the memory location:

Press and hold the F M-List Button until the menu is displayed

Touch TAG to Enter a Label for that location

Recall memory:

Press and release V/M Button to go from VFO to MEM mode

Press F M-List Button to get menu, Press FWD until MCH is displayed

Press and release MCH then use the Multi knob to select desired memory location

QMB Programming:

There are five QMB channels

APPLICATIONS - partial list

Note: Ensure that all programs have a listing in sequences to describe the installation process

APACHE2 - WEB SERVER * application - See Appendix A

```
sudo apt-get update
sudo apt-get install apache2
sudo chgrp pi /var/www/html*
sudo chmod 775 /var/www/html*
```

* After installing apache2, determine from where files are supported and use this location. Most often this will be the location. Check /etc/apache2/sites-available/000-default.conf or default-ssl.conf. If needed, make changes to these files to change default location.

ASTERISK - Telecommunications System for SIP Phones - See Appendix A

```
sudo apt-get update
sudo apt-get install asterisk
```

AUDACITY - Sound recording / editing software

```
sudo apt-get update
sudo apt-get install audacity
```

CKERMIT - Communications Program

```
sudo apt-get update
sudo apt-get install ckermit
```

CU - Call Up another System

```
sudo apt-get update
sudo apt-get install cu
```

CUPS - Print Server * application

```
sudo apt-get update
sudo apt-get install cups
```

DATA Recovery - testdisk suite

```
testdisk - recover hard disk files / partitions
photorec - recover photographs and other file types
```

DATABASE SQLite * application (see SQLite)

EVINCE - PDF reader like program

```
URL: fosshub.com
sudo apt-get update
sudo apt-get install evince
```

APPLICATIONS - partial list cont.

FFMPEG * application - for converting video files from one format to another
See -TOOLS

```
sudo apt-get update
sudo apt-get install ffmpeg
ex.    avconv -i video.H264 -vcodec copy video.mp4
       avconv -i video.MOV -vcodec copy video.mp4
```

where video.H264 is file to be converted and video.mp4 is output file
see also VLC, LIBAV Tools
formats - flu, mp4, mov, avi, wmv, mpgm mpeg

FlightAware - Flight Tracking Application (see appendix F)
IP Address - nnnn.nnnn.nnnn.nnnn:8080

FlightRadar24 - Flight Tracking Application (see appendix F)
IP Address - nnnn.nnnn.nnnn.nnnn:8754

GNURADIO - see also SDR
Sudo apt-get update
Sudo apt-get install gnuradio

GPARTED - Partition Editor
sudo apt-get update
sudo apt-get install gparted
for usage see Appendix P

Iwlist - List wireless signals in area - ??????
sudo apt-get update
sudo apt-get install iwlist
usage - sudo iwlist wlan0 scan

Kermit - Communications Program - See Ckermit

Kodi - Media Player Software
sudo apt-get update
sudo apt-get install kodi

APPLICATIONS - partial list cont.

LIBREOFFICE * complete office application -

```
sudo apt-get update
sudo apt-get install libreoffice
libreoffice - Database, Spreadsheet, Presentation, Word Processing
libreoffice-calc - spreadsheet app
```

LIBAV-TOOLS * application (see also FFMPEG)

```
sudo apt-get update
sudo apt-get -y install libav-tools
```

MPG123 - mp3 player from command line

```
sudo apt-get update
sudo apt-get install mpg123
use: mpg123 mysong.mp3
```

MENCODER - video editing / creating software / create video from jpg files - jpg to mp4

```
sudo apt-get update
sudo apt-get install mencoder
```

Note: following are examples of working commands to produce movie file from jpg files:
To produce files.txt:

```
ls - 1v | grep jpg > files.txt
```

```
mencoder -nosound -ovc lavc -lavcopts vcodec=mpeg4:vbitrate=21600000 -o driveway.avi -mf
type=jpeg:fps=25 mf://@files.txt -vf scale=3840:2160
```

```
mencoder -nosound -ovc lavc -lavcopts vcodec=mpeg4:vbitrate=21600000 -o driveway10.avi -mf
type=jpeg:fps=10 mf://@files.txt -vf scale=1920:1080
```

MONIT

```
https://monit.com/monit/sudo apt-get install monit
```

NMAP - NETWORK MAPPER

```
sudo apt-get update
sudo apt-get install nmap
```

OpenVPN - Virtual Private Network (see Appendix V)

```
sudo apt-get update
sudo apt-get install openvpn
```

APPLICATIONS - partial list cont.

PiAware * see FlightAware or Appendix F

Pinnacle Studio - Video Editing Software - (see Ron)

Davinci Resolve 16 - Video Editing Software

PRINTER * application

sudo apt-get update

sudo apt-get install system-config-printer

Public Key / Private Key -

See also Putty

PUTTY

sudo apt-get update

sudo apt-get install putty

PYTHON / IPYTHON - Programming Language

sudo apt-get update

sudo apt-get install python

sudo apt-get install ipython

Round Robin Database - RRD

sudo apt-get update

sudo apt-get install rrdtool

RUFUS - burn ISO to USB Stick

Follow prompts

SCREEN * application - for sharing with multiple users

sudo apt-get update

sudo apt-get install screen

SCROT * application - for screen shots

sudo apt-get update

sudo apt-get install scrot

SDR * see GNURADIO

SMTP - Simple Mail Transport Protocol (App V1, Chapter 4)

sudo -s

apt-get update

apt-get install ssmtp

apt-get install mailutils

APPLICATIONS - partial list cont.

SQLite * application - Database

```
sudo apt-get update  
sudo apt-get install sqlite
```

SUDO

```
sudo apt-get update  
sudo apt-get install sudo
```

TeamViewer - teamviewer.com - Server for Raspberry Pi

Note: see - How to Setup Raspberry Pi TeamViewer - Pi My Life Up

```
sudo apt-get update  
sudo apt-get upgrade  
wget https://download.teamviewer.com/download/linux/teamviewer-host_armhf.deb  
sudo dpkg -i teamviewer-host_armhf.deb  
sudo apt --fix-broken install
```

TESTDISK - * cgsecurity.org - used to check SD cards and recover files

Includes two programs:

Testdisk - used to recover storage media

Photorec - used to recover files, pictures as well as other file types

```
sudo apt-get update  
sudo apt-get install testdisk
```

TOR * application

```
sudo apt-get update  
sudo apt-get install tor
```

VLC Media Player - convert avi or other formats to mp4

VNC Server - “Common desktop sharing protocol to package up your desktop as a series of JPEG images and re-construct them in a client, complete with mouse and keyboard input”²

On remote machine use either Gnome or KDE Desktops or KRDC.

```
sudo apt-get update  
sudo apt-get install tightvncserver
```

To launch:

```
vncserver :1
```

2 Source “Master UNIX Now 2013 p 86”

WinSCP - Secure FTP Application for MS Windows Systems

download from internet

Projects

Data Logger - See Appendix D

Email on Raspberry Pi - Linux - See Applications - SMTP or

Incredible PBX - IP Phone for Raspberry Pi - Nerd Vittles - See Appendix P
<http://nerdvittles.com/?p=17094>

Serial Port - Gadget - see Appendix G

Serial Port Data Logger - See Appendix D

Solar Collector Panel Controller - See Appendix D

Temperature Logger / Display - See Appendix D

Temperature Sensor - Analog - See Appendix T

Temperature Sendor - Digital - See Appendix T

Tor - See Appendix T - TOR

USB Gadget - see Appendix G

VBOX - Virtual Box - a secondary operating system running on a single computer - See Appendix V
<http://virtualbox.com/> or <http://oracle.com/>

VPN - Virtual Private Network - See Appendix V

Downloading Software

While there are many methods of acquiring software within the Linux World, here are several along with how to use them once downloaded

git -

```
sudo apt-get update
sudo apt-get install git-core
git clone git://git.drogon.net/WiringPi
```

apt-get -

wget -

tar files -

```
tar xzf filename.tar.gz
```

Equipment

Valve - Adafruit # 996 1/2 inch Brass Valve 12 volt \$24.95

Pump - Grundfos UPF42 - pexuniverse.com

Valve - Tempering / Extender - Watts LF70A, LFL70A 1/2" or 3/4" - \$35 - \$80

DS18B20 - Digital Temperature Sensor

AM2302 - Digital Humidity and Temperature Sensor

DHT11 - Digital Humidity and Temperature Sensor

DHT22 - Digital Humidity and Temperature Sensor

USB 2.0 and Ethernet Hub \$14.95
3 USB and 1 Ethernet RJ45 - Adafruit #2909

USB to Ethernet RJ45 \$14.92
MCM #83-15105

USB Extender over CAT5 \$24.71
MCM #83-15106

Solar Programs / Defaults

Raspberry Pi Defaults - Since the Raspberry Pi is used as the basis for the solar programs it is imperative that port assignments be reliable therefore those ports are easily identified with the value of pi being 3.14159 and further since the appearance of multiple piÆs seems more and more likely if the port addressing simply starts with 14, 15, etc. this will be the default unless some overriding situation prevents this.

Alternately, port 40 will probably seldom be reached on a normal residential system, therefore, ports 40 through 49 are recommended.

For WPS ID numbers, when using a reboot / ckip.py (check IP Addresss program) etc. format:

ID file in /boot folder:

Blank Line

0000 - Device description or use
additional description

Blank Line

Blank Line

Addendum: Since IPV4 has reached the total usage of addresses and Internet Providers (IP) are now starting to use alternate methods of assigning addresses, the use of alternate methods including TOR onion addresses may be advisable since port forwarding is not needed and current IP addresses change more frequently than desired. Accessing remote computers on onion addresses should be accomplished using either PUTTY (ssh) or WINSCP (ssh) along with a public / private key combination.

Routers

Router / WAP - Setup and Commands

Router make _____

Router model _____

Router SSID _____

Administrator name _____

Administrator password _____

User name _____

User password _____

Other names _____

Other passwords _____

Send Router logs to your email

 Login to router

 Email

 Turn on notification

 Your outgoing mail server -

 Send to - email_address@internet_provider.ext

 Y / N - Requires Authentication

 User: username

 Password: password

 Daily / Weekly

 Time :

Enable SSH Access

 Login to router

 Forward port 22 to RPi - TCP

Enable HTML Access

 Login to router

 Forward port 80 to RPi - TCP

 * See also dd-wrt to Reprogram your router

 * Buffalo - router manufacturer uses dd-wrt software

Assign IP Address

 Login to router

 select desired IP address - add MAC address and device name - APPLY

WAP - Setup and Commands

WAP Make _____

WAP model _____

WAP SSID _____

Password _____

WAP SSID alt _____

Password _____

WAP SSID alt _____

Password _____

User name _____

User password _____

Other names _____

Other passwords _____

Basic instructions for Linksys WAP55AG

Connect Access Point (AP) to the computer.

In LAN Settings, setup static IP on computer 192.168.1.10

Subnet Mask 255.255.255.0

Default Gateway 192.168.1.1

Reset the AP and power cycle the AP

Open browser on computer and in the address bar type 192.168.1.246

When it asks for user name and password, type “admin” as password without any username.

Set the wireless settings e.g. SSID, Channel, Wireless security and save the settings.

Remember to remove the static IP from LAN Settings

D-Link Router - DIR655

Port Forwarding (P. 57)

Name: Pi Web Server / SSH Access

Address: 192.168._____._____ (Wired) or (Wireless)

TCP 22, 80

Allow All

Always

Set Wireless Password (P. 16)

sky2: (password)

sky5: (password)

View Connections / Status (P. 85)

LAN / Active Sessions: (P. 87)

-Status, Internet Sessions

Routing or Wireless: (P. 88)

-Status, Routing / Wireless

Logs: (P.86)

-Status, Logs

D-Link Router - DIR655 - cont

Tabs -

Setup

Internet -

Wireless Settings -

Network Settings - Use this section to configure the internal network settings of your router and also to configure the built-in DHCP Server to assign IP addresses to the computers on your network

ADD DHCP Reservation:

Enable

Computer Name

IP Address

MAC Address

Save

Advanced

Port Forwarding -

Tools

Admin -

Time -

Syslog -

eMail Settings - where to email log files

System -

Firmware -

Dynamic DNS -

System Check -

Schedules -

Status

Device Information -

Logs - View Logs, Send logs etc.

Statistics -

Internet Settings - All sessions

Wireless - Use this option to view the wireless clients that are connected to your wireless router

Wish Settings

Support

NETGEAR - Nighthawk AC1900

Model R7000

Power: 12 vdc 3.5A - C-+

ROUTER LOGIN

[http:// www . routerlogin . net](http://www.routerlogin.net)

user name: admin

password: password

SSID, MAC, Serial and key: see bottom of device

Installation

1. Download the Nighthawk app on your smartphone and follow the instructions
2. If unable to install with smartphone app, manually install through the router web interface at:
routerlogin.net

NETGEAR - WNDR3300

Attached Devices - lists devices currently attached to the router - IP, name and MAC

LAN Setup - Allows IP address to be reserved for specified devices by MAC address and device name

Port Forwarding

Name: Pi Web Server

Address: _____._____._____._____ (Wired)

TCP 80

Allow All

Always

Name: Pi SSH Access

Address: _____._____._____._____ (Wireless)

TCP 22

Allow All

Always

Set Wireless Password

sky2: (password)

sky5: (password)

View Connections / Status

LAN / Active Sessions:

-Status, Internet Sessions

Routing or Wireless:

-Status, Routing / Wireless

Logs:

-Status, Logs

NETGEAR - WNDR3300 - cont.

Attached Devices

Assign a port

Advanced, Setup, LAN Setup, Address Reservation, ADD, Select desired device

Change port number, ADD, Apply

NETGEAR - WNDR3400

Port Forwarding

Name: Pi Web Server

Address: _____._____._____._____ (Wired)

TCP 80

Allow All

Always

Name: Pi SSH Access

Address: _____._____._____._____ (Wireless)

TCP 22

Allow All

Always

Set Wireless Password

sky2: (password)

sky5: (password)

View Connections / Status

LAN / Active Sessions:

-Status, Internet Sessions

Routing or Wireless:

-Status, Routing / Wireless

Logs:

-Status, Logs

NETGEAR - R6100

Configuration - 9600, 8-N-1, No Flow Control

-Hyperterminal

File - Properties

Connect using -

COM1

Settings - Emulation VT100

Terminal Setting - Character Set

Special Graphics

OK, OK

NETGEAR - R8500

LAN Setup - force an IP address

Advanced Tab, WPS Wizard, Setup, LAN Setup, Address reservation list,
Enter desired reservations, Add, [apply?], logout

Port Forwarding - forward a port to a local IP address

Advanced Tab, Advanced, Port forwarding,
Enter desired port, address etc, TCP/UDP, +,
[apply?], logout

Netgear FSM726S - Managed Switch

Eric's Router

Port Forwarding

Name: Pi Web Server

Address: _____._____._____._____ (Wired)

TCP 80

Allow All

Always

Name: Pi SSH Access

Address: _____._____._____._____ (Wireless)

TCP 22

Allow All

Always

Set Wireless Password

sky2: (password)

sky5: (password)

View Connections / Status

LAN / Active Sessions:

-Status, Internet Sessions

Routing or Wireless:

-Status, Routing / Wireless

Logs:

-Status, Logs

Routers cont.

WAP - Wi-Fi Repeater / Range Extender

LINKSYS WAP55AG - Dual-Band Wireless A+G Access Point - see Appendix L

Maginon Wi-Fi Repeater - WLR-753 AC, WLR-755-AC or WLR-760 AC - See Appendix M

Pringles Cantenna

Just like it sounds - Pringles Chip can with a wireless wifi dongle in the side - look it up.

TP-LINK Wi-Fi Range Extender - N300 - MN: TL-WA860RE - see Appendix T

UBIQUITY - PicoStation M2 Wireless Access Point - see Appendix U

UBIQUITY - UniFi AP - Enterprise WiFi System - See Appendix U

UBIQUITY - UniFi AC MESH - Wireless Access Point - See Appendix U

Appendix A

Analog Sensors

TMP36 - Temperature Sensor

Analog to Digital Converters

There are at least two types of adc chips: ADS1x15 and MCP300x

ADS1x15 with 12 bit to 16 bit precision and 4 Channels include ADS1015 and ADS1115

MCP300x with 10 bit accuracy include MCP3004 (4 Channel) and MCP3008 (8 Channel)

Hardware implementations:

Software implementations:

APACHE2 - WEB SERVER * application

```
sudo apt-get update
sudo apt-get install apache2
sudo chgrp pi /var/www/html*
sudo chmod 775 /var/www/html*
```

* After installing apache2, determine from where files are supported and use this location. Most often this will be the location. Check /etc/Apache2/sites-available/000-default.conf or default-ssl.conf. If needed, make changes to these files to change default location.

ASTERISK - Telecommunications System for SIP Phones

```
sudo apt-get update
sudo apt-get install asterisk
```

Appendix A

Adafruit 4-Channel ADC Breakouts

<https://cdn-learn.adafruit.com/downloads/pdf/adafruit-4-channel-adc-breakouts.pdf>

Raspberry Pi Analog to Digital Converters

<https://learn.adafruit.com/raspberry-pi-analog-to-digital-converters/overview>

Appendix B

Appendix C

Camera - miscellaneous samples of instructions for taking still and video with Raspberry Pi Camera

TAKE STILL

```
raspistill -o filename.jpg
```

TAKE TIME LAPSE STILLS

take:

```
raspistill -o myimage_%4d.jpg -tl 60000 -t 7200000
```

stitch together:

```
sudo avconv -r 10 myimage_%4d.jpg -r 10 -vcodec libx264 -crf 20 -g 15 timelapse.mp4
```

Alternate Time Lapse sequence:

Using Rpi Zero, take normal sequence, create txt file of files in the sequence using:

```
ls - 1v | grep jpg > files.txt
```

use mencoder instruction to sew photos together as a .avi file:

```
mencoder -nosound -ovc lavc -lavcopts vcodec=mpeg4:vbitrate=21600000 -o driveway10.avi -mf type=jpeg:fps=10 mf://@files.txt -vf scale=1920:1080
```

use VLC to convert avi to mp4.

TAKE VIDEO

```
raspivid -o filename.H264 -t 10000 ( for 10 second video )
```

The following sequence takes a 30 second video at 30 frames per second. The next sequence shows how to convert the H264 file to an mp4 file.

```
raspivid -t 30000 -b 10000000 -fps 30 -o test3030.H264 = 10MB - works
```

```
sudo avconv -i test3030.H264 -vcodec copy /var/www/html/test3030.mp4 = 35MB - works
```

Appendix C - Carl

Tips, tricks and witticisms of my friend Carl.

It's a process, I just gotta figure it out. - CN

IP Phone Systems

Be certain you are receiving from the same place you are sending

Appendix C - Cherie

Software - Applications

1) Facebook

- a. Start Browser
 - i. Internet Explorer
 - ii. Firefox
 - 1. Double Click Firefox Icon
 - 2. Click Facebook
 - iii. Other Browser
- b. Log in
 - i. Enter eMail Address
 - ii. Enter Password
- c. View Facebook entries
 - i. Read what someone has posted.
 - ii. Use up and down arrows as needed
- d. Comment
 - i. Type your comments next to your name
 - ii. Press Enter or Click Post
- e. Post a Picture
 - i. Click “Add Photos/Video” at top of page
 - ii. Select Photo(s) or Video(s) to post
 - iii. Add comment or sticker to photo
 - iv. Click Post
- f. Copy a picture
 - i. Click Picture
 - ii. Right Click the resulting Picture
 - iii. Click “Save Image As”
 - iv. Select “File name” and note the “Location it is being stored”
 - v. Click “Save”
- g. Share

Appendix C - Cherie - Cont.

2) Email

- a. Thunderbird
- b. Google
- c. Yahoo

3) NO ONLINE BANKING

4) NO GAMES

5) Playing Music

- a. From Youtube
- b. From Desktop or file on computer
- c. From player program

6) Windows Versions

- a. Windows XP
- b. Windows 7
- c. Windows 8 or 8.1
- d. Windows 10

Appendix C - Console Cable

The following is from “Adafruit’s Raspberry Pi Lesson 5. Using a Console Cable”

Appendix C - Crontab

`crontab -e` - Set items to be processed at a predetermined time

ex. min hr dom mon dow command

ex. 30 23 * * * `sudo reboot` Will cause system to reboot everyday at 11:30 pm

00 13 * * 1 `sudo reboot` # will cause the computer to reboot at 1 pm every Monday

00 01 01 * * `sudo reboot` # will cause the computer to reboot at 1 pm on the first day of the month

00 10 * * 02 `sudo python notify.py` # Will execute the notify.py program at ten am on Tuesday

Appendix C - Clock (School)

Adjustment - Weight on the pendulum

- Slow it DOWN
- Speed it UP

Appendix Customer _____

Note: All Host sites must be key access only

Site Host ID: _____

Property: _____ Location: _____

Hostname: _____

HW: _____ Revision _____

Model _____ SN: _____

IP: _____ MAC _____ : _____ : _____ : _____ : _____

IP: _____ WMAC _____ : _____ : _____ : _____ : _____

OS: _____

URL: _____

Onion: _____

Router

Make _____ Model _____

IP: _____ MAC _____ : _____ : _____ : _____ : _____

Username _____ Password _____

Step Sequence for access:

Step 01: _____

Step 02: _____

Step 03: _____

Step 04: _____

Step 05: _____

Step 06: _____

Step 07: _____

Appendix Customer _____

Phone System Mfg: _____

Model: _____

Serial # _____

Password: _____

IP: _____ MAC _____ : _____ : _____ : _____ : _____

Misc Notes: _____

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

Appendix Customer _____ cont.

Phone System Mfg: _____

Model: _____

Serial # _____

Password: _____

MAC: _____ : _____ : _____ : _____ : _____ : _____

Network IP: _____ : _____ : _____ : _____

Misc Notes: _____

Appendix D

Remember DOS?

Attrib - change attributes of a file
usage - attrib +h filename.ext
+ or -
r - read only file
h - hidden file
s - system file

command - start new command processor
usage - command

fdisk - Prepare hard disk drive for formatting
usage - fdisk
follow prompts

format - format drive prior to writing files to drive
usage - format d: [/s]
/s - add system files

dir - list files contained in a directory or folder
usage - dir [d:] [\directory] [filespec.ext]
d: - drive
\directory - directory to examine
filespec.ext - sample filename. * for wildcard, ? For unknown letter

sys - add system files to a specified drive
usage - sys [d:]
d: - drive to add system files

Appendix D - Data Logger

Data Logger - Record data from various sources. Customized for each specific application

Serial Data Logger - Record data from various sources involving serial data output.

Solar Collector Controller / Recorder -

Temperature Logger - Record data from various temperature sensors either digital or analog.

Appendix D - DEScribe Software

Start Program

Connect and Download Settings

Open Settings from File

Edit New /settings

Select Controller Type

Sabertooth 2x32

General

Battery:

Lead Acid

Analog

Calibration

Automatic

Motor Outputs

Ramping

M1 - Custom

.501

M2 - Custom

.501

File

Open

Appendix D - DHT

Appendix E

Express VPN -

In addition to whatever this program is supposed to do, it also restricts access to various websites including amazon.com - reason given is SSL on computer doesn't website SSL protocol.

Appendix F

Appendix - Flight Tracking

ADS-B Exchange - <https://www.adsbexchange.com/>

FlightAware - <http://www.flightaware.com>

To upgrade using the same feeder_id in order to maintain your statistics,
Copy your feeder_id from /var/cache/piaware/feeder_id then
edit the /boot/piaware-config.txt and add

```
feeder-id xxxxxxxxxxxxxxxxxxxx
```

To the bottom of the file. xxxxxxxxxxxx is the feeder_id from the previous step.

Version 3.3.0 dated ~ 2017

password is flightaware

/etc/network/interfaces information is now stored in /boot/piaware-config.txt

To view use ip address n.n.n.n:8080

To reset ntp clock:

```
sudo /etc/init.d/ntp restart
```

FlightRadar24 - <https://www.flightradar24.com/>

Appendix - Flight Tracking cont.

FlightRadar24 -

```
Install Debian to SD Card
Boot in Raspberry Pi Model B+ or Model 2
sudo apt-get update
sudo apt-get install fr24feed
```

To view use n.n.n.n:8036

Installation - secure

need to add keys, remove password authentication, claim location. @88, Done

```
4.1 = 1
4.3 = ____
5.1 = yes      RAWDATA on port 30002
5.2 = yes      Base station data on 30003
6A = 2         Logfile 72 Hr, 24 Hr Rotation
6B = /var/log
               saved to /etc/fr24feed.ini
```

Appendix G

Serial Gadget - Raspberry Pi Serial Gadget -

USB Gadget -

Garage Door - Programming Remote

Appendix G - Game Emulator

RetroPie - URL: retropie.org.uk

Game emulator for Raspberry Pi

Model 0 and 1

Model 2 and 3

Model 4

Adding ROM's to installation: * Source: retropie.org.uk

—

USB

(ensure that your USB is formatted to FAT32 or NTFS)

first create a folder called retropie on your USB stick

plug it into the pi and wait for it to finish blinking

pull the USB out and plug it into a computer

add the roms to their respective folders (in the retropie/roms folder)

plug it back into the Raspberry Pi

wait for it to finish blinking

refresh emulationstation by choosing restart emulationstation from the start menu

Appendix G - Google / GMAIL

Gmail - less secure apps

Frequently you may have trouble retrieving and / or sending email through google using gmail. When this occurs you may need to log into your google account under “Security” and change settings to allow “Less Secure Apps”. Once this has been completed, close the application then restart the application to complete the request.

Appendix H cont.

Ham Radio - Digital Modes

DMR - Digital Mobile Radio

EchoLink – Make QSO's, attend nets or just make calls using as little as only your computer and a microphone.

FLDIGI – Send messages, documents or other materials over RF

This program is part of a suite of programs designed to be a complete communications package

JS8CALL – Make calls or send messages over multiple RF links

JTDX – Similar to WSJT-X

SSTV – Send or receive pictures or other images over RF

WINLINK – Send or receive email through ground or RF based stations

Sequence: Winlink, Open Session, Click Start, Click Close when complete

To close, click settings, click Exit

WSJT-X – Weak signal communications between stations over RF

Appendix H - Ham Radio - Yaesu FT-991A cont.

Ham Radio - CW

Yaesu FT-991A

Set Mode to CW-LSB or CW-USB

Set [BK-IN] on F(M-LIST) to off - for just code practice

Set KEYER to off for Straight Key - or On for Paddle

Set Pitch to 690 - To change the tone

Set MONI to 100 for volume

Tune to desired Frequency

Press F(M-LIST) button then touch [BK-IN] on the LCD to turn it ON for on the air

Menu Items:

056 - Options are [Semi] and Full

To Reset, reverse process.

Appendix H - Ham Radio - Yaesu FT-991A cont.

Ham Radio - C4FM (Digital) - Group Mode

Set your radio for a frequency of 146.58 simplex. If that frequency is in use go to 146.55.

Press Mode and select C4FM.

At 7:00 PM press the G/M button to put your radio into Group Mode. Do not press push to talk.

Everyone waits for 10 minutes while watching the display as more stations enter Group Mode.

At 7:10 I will start an informal discussion as to what we saw, what the radio did without our input and what the display shows as discussions continue.

Informal discussion will continue until the 7:30 Wires-X net begins.

Ham Radio - C4FM (Digital) - Wires-X Mode

Set your radio to the Wires-X Repeater Frequency or the preassigned memory location.

[Press Mode and select C4FM.] - optional if needed

[Press F M-List button and press FWD until the X button appears] - optional if needed

Appendix H cont.

Ham Radio - VE Testing

Amazon Fire Tablet Testing

Turn on tablet - On the top of the tablet there are three buttons, the right button is the power button. Press for about two seconds.

Swipe up from bottom to unlock. Menu should appear if connected to wireless.

To Connect to wireless if not already connected swipe from the Left. The Kiosk PIN is: w8ft

The password for the Findlay Radio Club is on the wall in the Radio Room.

[Alternate password will be available at testing location]

Touch Back “ <| “ to return to Menu.

TO TAKE AN EXAM

In “Take an exam” box touch “ JOIN EXAM SESSION “ bar

Enter Team Identifier “ W8FT “

Touch “ User PIN “ then Enter your PIN

Touch JOIN SESSION bar

TO ASSIST WITH OR MANAGE AN EXAM

In “Assist with or Manage exams“ box touch “ SIGN IN “

Enter Username (Call Sign)

Touch Password Line and enter your Examtools Password

Touch “ LOG IN “ bar

Select Session from the list

Select Applicant

Appendix H cont.

To Manage a Session - CVE or Co-Owner:

In “Assist with or Manage exams“ box touch “ SIGN IN “

Enter Username (Call Sign)

Touch Password Line and enter your Examtools Password

Touch “ LOG IN “ bar

Select Session from the Session List

If you are a Co-Owner of the session, select START SESSION in the top right

Note: JOIN if you are asked to JOIN Session

[To FINALIZE SESSION - Click FINALIZE SESSION]

Next DOWNLOAD W5YI Documents. Download a copy of this document to your computer.

Then PRINT Final forms - download a copy of this document to your computer.

Upload the two previous documents to W5YI Dropbox.

Appendix H cont.

Cheating

Methods:

Screen sharing -

Hardware:

Dual Screen - Screen splitter

Dual Mouse / Keyboard

Software:

Team Viewer

AeroAdmin

Teams

Trapping cheaters:

tasklist

Have an application link which runs prior to ET which generates a Hotlist to the CVE when the applicant knowingly clicks on the link prior to admission to session - could be included with video presentation.

ex. scan, during session - request keyboard control then run tasklist.

Appendix H cont.

Ham Radio - VE Testing

Amazon Fire Tablet -

To Reset Amazon Fire Tablet:

Settings, Device Options, Reset to Factory Defaults, RESET

New or after Factory Reset:

Set Language, >

Set WIFI,

Forgot Password

Close

Not Now

Skip

Settings

Device Options

About Fire Tablet

Serial Number, tap several times until you are a developer,

< Back

Developer Options - On

USB Debugging - On

- plug in USB from computer to Amazon Fire Tablet

[Permissions - yes] if needed, unplug and plug in USB again

- adb devices

[Device Name device]

- cd Downloads (where Fully-Kiosk-Browser-v1.48.apk was downloaded)

- adb install Fully-Kiosk_Browser-vapk

success !

Appendix H cont.

Ham Radio - Software installation - Ubuntu

In a terminal window - to download software to computer:

apt-get install adb (Android Debugging Bridge)

Download Fully-kiosk Software

<https://www.fully-kiosk.com/em/#download-box>
select and download - Fully Kiosk Browser APK . . .

Appendix H cont.

Ham Radio - Fully-Kiosk - Software installation - sd Card

Download the following two files onto a distinctively named (e.g. Fully) Micro SD Card

- The most recent version of Fully Kiosk Browser APK (for Fire OS) from the Download APK Files box on Fully Kiosk Browser & App Lockdown Help.

- fully-settings.json

Use a text editor to edit the fully-settings.json file

- Purchase a license and save the license key in the volumeLicenseKey in the fully-settings.json file. (If you skip this step, Fully Kiosk will run in demo mode.)

- Change the kioskPin in the fully-settings.json file from "1234" to whatever PIN you wish to use.

- Change the kioskWifiPin in the fully-settings.json file from "5678" to whatever Wi-Fi PIN you wish to use. Do NOT use the same value for the kioskWifiPin as you use for the kioskPin.

- Change the startURL in the fully-settings.json file from "http://aa7hw.org/tablet.html" to whatever home page (custom or standard) you wish to use.

Setup Amazon Fire HD Tablets for Exam Tools

- Power on the Tablet.

- If desired, reset your Amazon Fire to factory defaults by clicking on Settings > Device Options > Reset to Factory Defaults.

- Choose Language (English US).

- Setup WiFi.

- Tablet may automatically install firmware update (INSTALLING YOUR UPDATES... Please wait while your Fire updates).

- Setup > Device Options > System Updates, and click UPDATE button. Ensure that Your device is running Fire OS 7.3.1.5 or newer. Note that Certified Refurbished Previous Generation Fire HD 8 Tablets (8th generation) may need to update first from version 6.3.1.2 to 6.3.1.5 before they can update from version 6.3.1.5 to version 7.3.1.5.

- Registering your device requires an Amazon Account and Password, and enables you to purchase content and charge this to your credit card. Should you wish to skip the registration process:

- Click Forgot password? when asked to register your device.

- Click CANCEL when asked to Choose Country or Region.

- Click NOT NOW when asked to REGISTER YOUR FIRE.

- Click SKIP when asked whether to Skip Registration?

Appendix H cont.

Ham Radio - Fully-Kiosk - Software installation - sd Card cont.

- Insert the Micro SD card into the Tablet. May need to swipe down and select setup.
- Setup your Storage Device (Micro SD Card) by choosing Use as portable storage, then click Done.
- Open the Files app.
- Click on the three lines at the top left of the menu bar, and select your SD Card with the distinctive name (e.g. Fully).
- Click on Fully-Kiosk-Browser.
- Click CONTINUE in response to the warning ("Your tablet and personal data are more vulnerable to attack by unknown apps. By installing this app, you agree that you are responsible for any damage to your tablet or loss of data that may result from its use.")
- Click INSTALL in response to the question ("Fully Kiosk Browser: Do you want to install this application? It does not require any special access.")
- After the Fully Kiosk Browser is installed, click DONE.
- Open Settings, go to Accessibility, click Detect Home Button on Amazon Fire Tablets, and enable the slider. Click OK to the Warning.
- Open Settings, go to Apps & Notifications, then go to Special App Access. Click on Display over other apps, and enable this privilege for Fully Kiosk Browser. Back several times to main menu.
- Open Fully Kiosk Browser.
- Swipe Left, and click on Settings. Click Other Settings (the final option). Click Import Settings. Click ALLOW in response to the question ("Allow Fully Kiosk Browser to access photos, media, and files on your device?"). Then Click Import Settings again. Click Select Storage at the bottom of the screen and select External Storage. Click fully-settings.json, and click Import (1). Tap Kiosk Mode (PLUS), Enable Kiosk Mode, Set Kiosk Mode PIN, Set Wifi/Settings PIN, Back arrow <| when prompted go to apps and enable protection for Fully, Tap Yes, when prompted to Switch Kiosk Mode on?
- Click the back arrow, and select YES when asked whether to Switch Kiosk Mode on?.
- You can now remove the SD Card.

Start Fully-Kiosk, Settings, Other Settings,

Appendix H cont.

Ham Radio - Fully-Kiosk - Volume License

Manage Fully Kiosk Volume Licenses

URL: <https://license.fully-kiosk.com/license/?cmd=showVolume>

- Manage your Fully PLUS Volume License by entering the Volume License Key you used to configure your tablets.
- Check the box to indicate that you are not a robot, and click OK. This will allow you to view the number of license you have purchased, the number that you have used, and the number that are available. It will also display the Device IDs (not serial numbers) and the time (in UTC) that the device was registered for each of your licensed devices, and allow you to unregister the device if the device is lost or stolen.
- It may be helpful to label each of your devices with a sequential number (e.g. 0101) and maintain a list of devices that cross references the external label, the internal serial number (16 upper case letters and numbers) and the Device IDs (17 characters in two groups of 8 lower case hex digits, a hyphen, and 8 more lower case hex digits). The easiest way to maintain such a list is to configure your devices one at a time (they are automatically registered when you import your configuration file), and record the information prior to configuring the next device.
- You can view the Amazon Fire HD 8 Serial Number by clicking on Settings > Device Options > About Fire Tablet.
- You can view the Fully Kiosk Device ID by opening the Fully Kiosk Settings > Other Settings.

-

Appendix H cont.

Ham Radio - Tablet Maintenance

- Boot Tablet - (Hold on / off button for 2 seconds)

Swipe Up

Swipe Left

Enter Code

Exit Fully

Disable Kiosk Mode

Settings

Device Options

About Fire Tablet

- Record Device Model

- Record Serial Number

- Record Build Number

< Back

System Updates

Update

Check Now

Update

(repeat as necessary)

Record OS Version

Tap UPDATE

Fully-Kiosk Update

Return to Kiosk Mode:

- Boot Tablet - (Hold on / off button for 2 seconds)

Tap Fully

Swipe Left

Tap Settings

Tap Kiosk Mode (PLUS)

Enable Kiosk Mode

Back to Main Menu

- Switch to Kiosk Mode? YES

- Power off tablet - (Hold on / off button for 15 seconds)

DONE

Appendix H cont.

Ham Radio - Tablet Update Log

Date _____

Model _____ Serial _____

Build _____ OS ver _____ Date _____

Model _____ Serial _____

Build _____ OS ver _____ Date _____

Model _____ Serial _____

Build _____ OS ver _____ Date _____

Model _____ Serial _____

Build _____ OS ver _____ Date _____

Model _____ Serial _____

Build _____ OS ver _____ Date _____

Model _____ Serial _____

Build _____ OS ver _____ Date _____

Model _____ Serial _____

Build _____ OS ver _____ Date _____

Model _____ Serial _____

Build _____ OS ver _____ Date _____

Appendix H cont.

Ham Radio License - Remote Testing

PC Issues -

- Have applicant show the task bar.
- Each Icon with an underline or in a box is open.
- Normal open icons would be Zoom, Browser and Calculator.
- Others may or may not be an issue. Ask questions to determine if permitted.
- If necessary, have applicant display the hidden icons under the caret “ ^ “ on the right end of taskbar.

Applicant:

Screen too small - Have applicant hold the <ALT> key then press the <TAB> key

MAC Issues -

- Have applicant show the task bar.
- Each Icon with a DOT under it is open.
- Normal open icons would be Zoom, Browser, Calculator and Finder.
- Others may or may not be an issue. Ask questions to determine if permitted.

Appendix H cont.

Ham Radio - VE Testing cont.

Fully Kiosk

Connect USB cable to tablet

Tablet: Swipe down

Select File Transfer

Copy json file from Computer to Tablet Download folder

Note: Edit fully-settings.json file to include:

- volumeLicenseKey - line 167 - [*]
- startURL - line 228 - <http://www.ps1kites.com/ham/>
- kioskPinEnc Passcode - line 367 - [*]
- kioskWifiPinEnc - line 368 - w8ft

Exit Fully-Kiosk

Settings

Device Options

About Fire Tablet

Model

Serial Number - tap, tap to go to developer mode

Build Number

To Enter Wifi Settings: Swipe left toward the center, Enter the Wifi/Settings PIN and press OK

To shutdown device: Hold the power button until the screen blanks, about 15 seconds

To Exit Fully-Kiosk: Swipe left toward the center, Enter the Kiosk Mode Pin and press OK

Appendix H cont.

Ham Radio - EchoLink

EchoLink software allows licensed Amateur Radio stations to communicate with one another over the Internet, using streaming-audio technology.

URL: echolink.org

Download and install software. Usage is explained in the echolink.org website.

Appendix H cont.

Ham Radio - FLDIGI

Configuration - YAESU FT-991A

Configure, config dialog, skip down to Misc

Misc

Autostart

select choices, locate, enable, test, save, close

NBEMS Interface

Enable, locate flmsg, save, close

Operator-Station

Fill out each section, Save, Close

Rig Control

flrig

check - Enable flrig xcvr control . . .

check - Shutdown flrig with fldigi

no other changes to defaults

Save, Close

CAT (rigcat) - Alternate to flrig

check Use RigCAT

Open Rig description file, select Device port

Coordinate Baud rate with Radio setting

Initialize, Save, Close

GPIO

Hamlib

Hardware PTT

C-Media PTT

Soundcard

Alerts

Devices

unchecked - OSS

check - Port Audio

Capture: Microphone (USB Audio CODEC)

Playback: Speakers (USB Audio CODEC)

No other checks

Right Channel

Settings

Signal Level

Wav file recording

Note: to go from default to fldigi change:

menu 77 from data to USB

Mode from FM to DATA-FM - OR - Click the FM drop down and select DATA-FM

remember to change back to FM for phone

Appendix H cont.

Ham Radio - FLRIG cont.

Config, Setup, Transceiver

Rig - FT-991A

Update - COM9

Baud - 4800 - Must be same as Radio (menu item 031)

Ham Radio - FLAMP

To recover messages received:

Click File, Folders, rx, and the current date folder
then select the desired document

To send messages:

To be updated

Ham Radio - FLARQ

To be updated

Ham Radio - FLMSG

To be updated

Ham Radio - FLDIGI

Configuration - YAESU FT-991A

Configure, config dialog, skip down to Misc

Misc

Autostart

select choices, locate, enable, test, save, close

NBEMS Interface

Enable, locate flmsg, save, close

Operator-Station

Fill out each section, Save, Close

Rig Control

flrig

check - Enable flrig xcvr control . . .

check - Shutdown flrig with fldigi

- no other changes to defaults
- Save, Close
- CAT (rigcat) - Alternate to flrig
 - check Use RigCAT
 - Open Rig description file, select Device port
 - Coordinate Baud rate with Radio setting
 - Initialize, Save, Close

- GPIO
- Hamlib
- Hardware PTT
- C-Media PTT

Soundcard

- Alerts
- Devices
 - unchecked - OSS
 - check - Port Audio
 - Capture: Microphone (USB Audio CODEC)
 - Playback: Speakers (USB Audio CODEC)
 - No other checks
- Right Channel
- Settings
- Signal Level
- Wav file recording

Note: to go from default to fldigi change:

- menu 77 from data to USB
- Mode from FM to DATA-FM - OR - Click the FM drop down and select DATA-FM
- remember to change back to FM for phone

Appendix H cont.

Ham Radio - JS8CALL

Appendix H cont.

Ham Radio - JTDX

JTDX is similar to WSJT-X

Appendix H cont.

Ham Radio - SSTV - (MMSSTV)

SSTV - Slow Scan Television

FT-991A Settings

Option, Setup, MMSSTV(o)

RX

TX -

PTT - Port: Com15 - Standard Port
ck - Exclusive lock

Radio Command

Port: COM9 - Enhanced Port 4800 Baud *
8 bits 2 stop none Parity
Flow CTS

RX BFF

O Off

X Broad

O Sharp

O Very Sharp

O Auto Stop

X Auto RS

X Auto Rsync

X Auto Slant

X Decode FSKID

Appendix H cont.

Ham Radio - WINLINK

Appendix H cont.

Ham Radio - WSJT-X

Start program, start GridTracker, choose band, select CQ only (if desired),

? Where to look for log if setup to log to LOTW . . .

Local computer -

Online -

? Where to look if “Download from LOTW is clicked . . .

Appendix H - Ham Radio

Ham Radio - FCC

Name and Address Change

To change name and address with FCC:
Login with FRN Number and password
select change your name / addresss etc.
Free of charge until changed by FCC (2022-01-23)

Apply for Vanity Call

To apply for a Vanity Call with FCC:
Login with FRN Number and password
Select your current Call Sign if not already selected
Click Apply for Vanity Call from menu on the right

Ham Radio - GridTracker

Among the many things to explain the first that now comes to mind is:

Download QRZ logs

Download LOTW logs

Ham Radio - Coordinate time on your Computer / Radio

Dimension 4

Net Time

Appendix H cont.

Ham Radio - Yaesu FT-991A - Beacon Mode

Band, Enter, 29.250, Mode C4FM, GM

To exit press BACK, Mode USB

Memory

There are several memory methods.

The easiest is RCL/STO which allows the user to store and recall five entries quickly. Simply press RCL/STO for two seconds until a double beep is heard to store the current information. Press RCL/STO for one second to recall the stored information or press several times to choose the desired frequency.

The second method allows the user to store up to 99 entries. Simply press A-M button

To Store:

To Recall:

Press V/M button

Press F(M-LIST) button then touch [MCH] on the LCD

Appendix H cont.

Appendix H cont.

Ham Radio - CHIRP software

CHIRP - handheld radio programming

Appendix H - Digital

Digital - Hand Held

Ham Radio - Radioddity GD-77

GD-77 Programming - analog / digital

Contact -

- DTMF
- Digital Contact

Rx Group List -

- U TS1
- K
- LCL955

Zone -

Channel -

Scan -

VFO -

Zones contain channels

Channels contain information such as:

Frequency
Digital Contact
Rx Group

Digital Contact contains:

Contact Name: ie Eric
Contact ID: ie 3000000
Contact Type: ie Private or Group

Step 1 - Add new contact to:

Contact - Digital Contact

Step 2 - Add a channel

Channel - Add, Copy existing channel, paste to new channel, Edit new channel
change name, change contact

Step 3 - Add Channel to Zone

Burn new image to GD-77

To change people, in **General** - change **Radio Name** and **Radio ID**

Appendix H - Digital cont.

Ham Radio - MMDVM Hot Spot

- 1 - Register with Brandmeister at brandmeister.network
- 2 - Burn image to sd Card
- 3 - Review instructions in “MMDVM_Setup_Instructions”
- 4 - Boot Rpi and follow instructions

Full instructions are located at pistar.uk. Beginning there you can get complete instructions for whatever you need with regard to digital voice software.

Download Pi-Star Software

URL: pistar.uk

Download current version for Raspberry Pi

Installation guide is on that same page.

Appendix H cont.

Ham Radio Logs - eQSL

- upload from eQSL
- upload to eQSL
- upload from LOTW
- upload to LOTW
- upload from N1MM
- upload to N1MM
- upload from QRZ
- upload to QRZ

Appendix H cont.

Ham Radio Logs - LOTW - Logbook of the World

To Upload QSO log from WSJT-X:

Start TQSL

Select - Sign a log and upload it . . .

Locate wsjtx_log.adi (from C:\Users\User\AppData\Local\WSJT-X)

Follow prompts

Otherwise QSO's will be uploaded as completed in WSJT-X if so configured.

- upload from eQSL

- upload to eQSL

- upload from LOTW

- upload to LOTW

- upload from N1MM

- upload to N1MM

- upload from QRZ

- upload to QRZ

From within QRZ:

Open QRZ logbook and click settings

Click LOTW Settings

Click Import, Import from LOTW

Enter password

Appendix H cont.

Ham Radio Logs - N1MM Logger+

- Setup for normal daily logging
- Setup for new contest
- Submitting Contest Log

- upload from eQSL
- upload to eQSL
- upload from LOTW
- upload to LOTW
- upload from N1MM
- upload to N1MM
- upload from QRZ
- upload to QRZ

Appendix H cont.

Ham Radio Logs - QRZ

- upload from eQSL
- upload to eQSL
- upload from LOTW
- upload to LOTW
- upload from N1MM
- upload to N1MM
- upload from QRZ
- upload to QRZ

Appendix H cont.

Test Equipment - NanoVNA

With the NanoVNA there are 5 memory locations to save settings. SAVE 0 through SAVE 5
To Recall any of the 5, touch RECALL then select RECALL 0 through RECALL 5

To test SWR:

Turn on NanoVNA

Select Band by touching the screen with the stylus

Select STIMULUS, CALIBRATE or RECALL

To set the Frequency Range, touch STIMULUS

Touch START then enter the beginning Frequency

Touch screen, touch STOP, then enter the ending Frequency

To Calibrate Device, touch CALIBRATE then touch CALIBRATE again

with the OPEN adapter attached to CH0, touch OPEN, when complete,

with the SHORT adapter attached to CH0, touch SHORT, when complete,

with the LOAD adapter attached to CH0, touch LOAD, when complete,

touch DONE. If desired, select a SAVE location to save the settings.

To Recall a previously saved setting, touch RECALL then select RECALL location.

If the recall location is not the desired frequency, simply select a different one then touch the screen to remove the menus and begin your test.

To test SWR, attach your antenna lead to CH0 of the NanoVNA

Top left corner will display the SWR

M1: will display the Frequency

Appendix H cont.

To test Cable Length:

Attach NanoVNA to Computer using the supplied USB Cable
Start nanovna-saver software

To test Cable Loss:

Attach NanoVNA to Computer using the supplied USB Cable
Start nanovna-saver software

Software - NanoVNASaver

Appendix H

Hosts - to communicate through a host using TOR

Start a tor daemon, start *Location* Putty Host (configuration in Rpi Guide), minimize both screens.

Start Firefox Browser.

In tools, options, advanced, network, Connection settings,
use Manual proxy configuration, Socks Host: 127.0.0.1, port 5000, Socks v5,
No proxy host for: localhost, 127.0.0.1,
check Proxy DNS when using Socks v5,
then click OK.

Note - Click Use system proxy settings to undo

or Start IE Browser.

In tools, internet options, connections, Lan settings
check - Use a Proxy Server, Advanced,
Socks - 127.0.0.1 port 5000
then click OK.

Note - uncheck - Use a Proxy Server to undo

or Start Google Chrome Browser.

In Customize (three verticle dots) click Advanced, System, Open Proxy Settings
Connections, LAN Settings, Proxy Server
check - Use a Proxy Server, Advanced,
Socks - 127.0.0.1 port 5000
then click OK.

Note - uncheck - Use a Proxy Server to undo

Open a new tab and your screen is on the Host network.

Appendix I

IP Address - defaults

192.168.0.1

10.0.0.1

172.16.0.1

If attached to one of these addresses, one can look at an address above but not below.

Appendix J

Appendix K

KEY - Public and Private
ssh-keygen -t rsa [dsa]

Appendix L

Appendix L - Linksys

Linksys WAP55AG

Setup - connect Access Point(AP) to the computer, setup static IP on computer 192.168.1.10, Subnet Mask 255.255.255.0, Default Gateway 192.168.1.1, reset the AP and power cycle the AP, open browser on computer and in the address bar type 192.168.1.246. When it asks for user name and password, put “admin” as password without any username. Do the wireless settings e.g. SSID, Channel, Wireless security and save the settings. Remember to remove the static IP from the computer

Appendix M

Appendix M - Maginon

Maginon Wi-Fi Repeater - WLR-753 AC, WLR-755-AC or WLR-760 AC

Wired / Wireless Repeater - Setup

Note: the only difference is that the computer connects to the Maginon through the LAN port for wired and wirelessly for wireless.

Connect to Power with switch in Repeater position and Power Off
Switch Power On
Press reset for at least ten seconds
Connect computer to LAN Port (or wireless at WiFi Repeater)
Open browser and connect to address 192.168.10.1 *
Login using admin for both username and password
Follow prompts for Repeater Wizard
Remember to reset computer port to Dynamic when finished

Wired / Wireless Router - Setup

Note: the only difference is that the computer connects to the Maginon through the LAN port for wired and wirelessly for wireless.

Connect to Power with switch in Router position and Power Off
Switch Power On
Press reset for at least ten seconds
Connect computer to LAN Port (or wireless at WiFi Repeater)
Open browser and connect to address 192.168.10.1 *
Login using admin for both username and password
Follow prompts for Router Wizard
Change Security to WPA/WPA2 Mix
Set a new Key
Change 2.4GHz speed to 20MHz
Logout
Remember your network LAN cable must be connected to the WAN/LAN port
Remember to reset computer port to Dynamic when finished *

Appendix M - Maginon cont.

WLR-760 AC

Plug in
Connect to WiFi-Extender
Set browser to <http://Maginon.extender>
Login - password is admin

To reset - Reset button may be bent, to open case remove 2 foam screw covers near power plug, carefully open case using firm plastic card around case opening. Just below switch and one inch above on both sides. Remove rj45 cover, remove rubber boot, adjust switch, reset, reassemble, snap case closed, tighten screws and replace foam covers.

* To configure Computer LAN Port as Static address:

Start, Control Panel, Network and Internet, Network Connections, LAN Adapter, IPV4, Properties
Change from "Obtain Automatically (Dynamic)" to "Use the following address (Static)"

IP Address: 192.168.10.nn - (77 works)
Subnet mask: 255.255.255.0
Default Gateway: 192.168.10.1

WLR-753 AC

Note: This device has a three position selector switch, Router, Repeater and AP

Plug in
Connect to WiFi-Extender
Set browser to <http://Maginon.extender>
Login - password is admin

To reset, press reset button for a minimum of ten seconds or until all lights illuminate.
Follow menu prompts to setup.

* To configure Computer LAN Port as Static address:

Start, Control Panel, Network and Internet, Network Connections, LAN Adapter, IPV4, Properties
Change from "Obtain Automatically (Dynamic)" to "Use the following address (Static)"

IP Address: 192.168.10.nn - (77 works)
Subnet mask: 255.255.255.0
Default Gateway: 192.168.10.1

Appendix M - Maginon cont.

IPC-30 FHD WIFI Video Camera

Appendix M - Movies

jpg files to movies

```
ls -lv | grep JPG > files.txt
mencoder -nosound -ovc lavc -lavcopts vcodec=mpeg4:vbitrate=21600000 -o
windowsill_flowers_7.avi -mf type=jpeg:fps=24 mf://@files.txt -vf
scale=1920:1080
```

4k@90fps, no sound

```
ls -lv | grep JPG > files.txt
mencoder -nosound -ovc lavc -lavcopts vcodec=mpeg4:vbitrate=21600000 -o
windowsill_flowers_7.avi -mf type=jpeg:fps=90 mf://@files.txt -vf
scale=3840:2160
```

I had to mess around with the codec a lot before getting something that youtube would recognize, though. An sample using the 2nd block can be found here: http://www.youtube.com/watch?v=4G_aaPG2

```
ls -lv | grep JPG > files.txt
```

```
mencoder -nosound -ovc lavc -lavcopts vcodec=mpeg4:vbitrate=21600000 -o
driveway.avi -mf type=jpeg:fps=10 mf://@files.txt -vf scale=3840:2160
mencoder -nosound -ovc lavc -lavcopts vcodec=mpeg4:vbitrate=21600000 -o
driveway10.avi -mf type=jpeg:fps=10 mf://@files.txt -vf scale=1920:1080
```

Appendix N

Appendix O

Appendix P

Partitioning storage devices

FDISK - Partition Editor

GPARTED - Partition Editor

PBX Systems

Incredible PBX - <http://nerdvittles.com/?p=17094>

FreePBX Backdoor Passwords pose Asterisk Security Risk - <http://nerdvittles.com/?p=737>

Appendix Q

Quick Access Card

Raspberry Pi properties

```
cat /proc/cpuinfo
```

```
cat /proc/device-tree/model
```

Find IP of Raspberry Pi

```
hostname -I
```

Find local Wireless devices with Raspberry Pi 3B+

```
sudo iwlist wlan0 scan
```

```
sudo iwlist wlan0 scan | grep ESSID:
```

To create wlist type preceeding line into file then chmod +x wlist

ie. sudo nano wlist

Note: some systems may have wlist in which case ./wlist will display all wireless signals in area.

Login to remote system using TOR

Start TOR

Connect to remote Rpi Host

Change settings in Firefox to use Manual Proxy configuration

Connect to selected device using IP address

Network Map

```
nmap -sP IP_address/24
```

```
nmap -sP 192.168.5.143/24
```

where ip is the address of the RPi

followed by

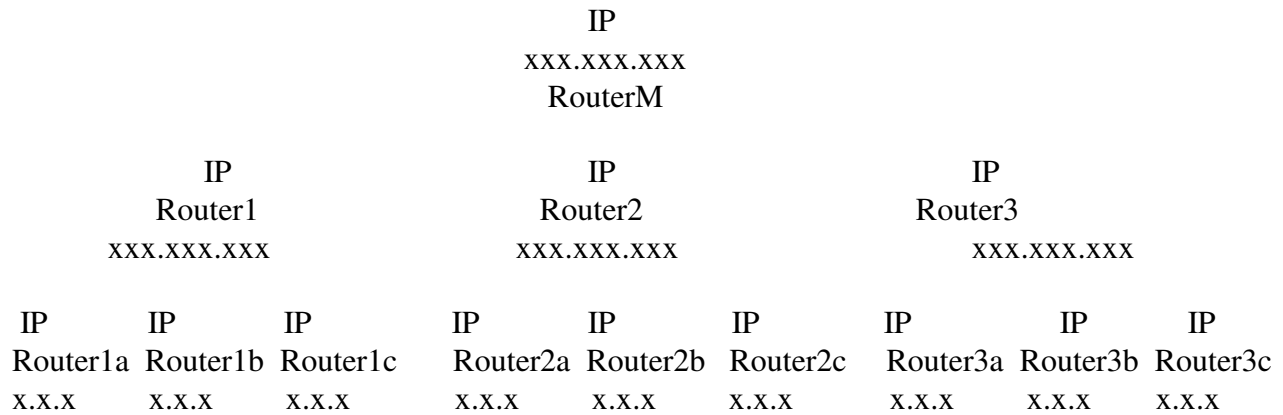
```
arp -an
```

To get corresponding MAC addresses

Appendix R

Appendix R

Router Hierarchy -



In this scenario, devices connected to Router 1a can access Router1 as well as RouterM, however, that same device will be unable to access Devices connected to Router1b or Router1c as well Router2 and Router3 or any devices connected to or below those routers.

Appendix RPi - Model A

Release Date :

USB Ports : 1

Power Port : Micro USB

Video Port : HDMI

CAT5 Port:

GPIO : 26 pins

OS : Works with Raspbian

OS Port : SD Card

Appendix RPi - Model B

Release Date :

USB Ports : 2

Power Port : Micro USB

Video Port : HDMI

CAT5 Port:

GPIO : 26 pins

OS : Works with Raspbian

OS Port : SD Card

Appendix RPi - Model A+

Release Date :

USB Ports : 2

Power Port : Micro USB

Video Port : HDMI

CAT5 Port:

GPIO : 40 pins

OS : Works with Raspbian

OS Port : Micro SD Card

Appendix RPi - Model B+

Release Date :

CPU: Broadcom BCM2835 CPU

Speed: 700 MHz

WiFi: Via USB Dongle

Onboard Bluetooth: No

RAM: 512 MB

USB Ports : 4

Ethernet: Onboard 10/100 - RJ45 Jack

Power Port : Micro USB 5V 2A

Video Port Input: CSI Camera Port

GPIO : 40 pins

OS : Works with Raspbian, plus others

OS Port : Micro SD Card

Audio Output: 3.5 mm L&R Audio, HDMI

Video Port Output : HDMI, DSI Display Port, Phono - component video

Power Consumption: 140 mA (200 mA with wifi dongle)

Appendix RPi 2 - Model B

Release Date :

CPU: ARMv7 BCM2836 Quad-Core

Speed: 900 MHz

WiFi: Via USB Dongle

Onboard Bluetooth: No

RAM: 1 GB

USB Ports : 4

Ethernet: Onboard 10/100 - RJ45 Jack

GPU: Dual Core VideoCore IV Multimedia Co-Processor

Power Port : Micro USB 5V 2A

Video Port Input: CSI Camera Port

GPIO : 40 pins

OS : Works with Raspbian, plus others

OS Port : Micro SD Card

Audio Output: Phono - Component video, 3.5 mm L&R Audio, DSI Display Port

Video Port Output : HDMI

Power Consumption: 160 mA (210 mA with wifi dongle)

Appendix RPi 3

Release Date :

CPU: ARMv8 BCM2837 64bit Quad-Core Processor

Speed: 1.2 GHz

WiFi: OnBoard

Onboard Bluetooth: Yes

RAM: 1 GB

USB Ports : 4

Ethernet: Onboard 10/100 - RJ45 Jack

GPU: Dual Core VideoCore IV Multimedia Co-Processor

Power Port : Micro USB 5V 2.4A

Video Port Output : HDMI

Video Port Input: CSI Camera Port

GPIO : 40 pins

OS : Works with Raspbian, plus others

OS Port : Micro SD Card

Audio Output: HDMI, Phone 3.5 mm - Component video and , 3.5 mm L&R Audio

Video Port Output : HDMI, DSI Display Port

Power Consumption: 200 mA

Appendix RPi Zero - Model 1.2

Release Date :

USB Ports : 4

Power Port : Micro USB

Video Port : Mini HDMI

GPIO : 40 pins Unpopulated

OS : Works with Raspbian Jessie Lite - *

OS Port : Micro SD Card

Camera Port : None

* May work with other versions

Appendix RPi Zero - Model 1.3

Release Date :

CPU: BCM2835 Single Core

Speed: 1 GHz

WiFi: No

Onboard Bluetooth: No

RAM: 512 MB

USB Ports : 1 OTG

Ethernet: No

Power Port : Micro USB 5V 2.4A

Video Port Output : HDMI

Video Port Input: CSI Camera Port

GPIO : 40 pins unpopulated

OS : Works with Raspbian Jessie Lite

OS Port : Micro SD Card

Camera Port: included

Power Consumption: 160 mA

Appendix RPi Zero - Model 1.3

Release Date : May, 2016

USB Ports : 4

Power Port : Micro USB

Video Port : HDMI

GPIO : 40 pins Unpopulated

OS : Works with Raspbian Jessie Lite - *

OS Port : Micro SD Card

Camera Port: included

* May work with other versions

Appendix RPi - Camera

Creating Timelapse Videos with the Raspberry Pi Camera

Step 1 - Taking the time-lapsed photos

This command will take a photo every 60 seconds (60000 milliseconds) for 2 hours (7200000 milliseconds) resulting in a sequence of 120 images.

```
raspistill -o myimage_%04d.jpg -tl 60000 -t 7200000
```

The “%04d” will result in a four digit number appearing in each filename.

```
myimage_0001.jpg
```

```
myimage_0002.jpg
```

```
...
```

```
myimage_0119.jpg
```

```
myimage_0120.jpg
```

Step 2 - Combine images into MP4 video

Once you’ve got your image sequence you will need a method to stitch them together. I decided to use “avconv”. You can install this useful library with the following command :

```
sudo apt-get -y install libav-tools
```

To construct the video file from your image sequence you use the command shown below. Although it appears on multiple lines for readability it should be entered as a single line on the command line :

```
avconv -r 10 -i myimage_%04d.jpg  
-r 10 -vcodec libx264 -crf 20 -g 15  
timelapse.mp4
```

The video will be the full resolution of the default image size (2592x1944).

To crop the images and create a more standard 1280x720 resolution video you can use the following command :

```
avconv -r 10 -i timelapse_%04d.jpg  
-r 10 -vcodec libx264 -crf 20 -g 15  
-vf crop=2592:1458,scale=1280:720  
timelapse.mp4
```

Appendix RPi - Camera cont.

The “vfö” option defines a video filter. In this case two filters which crop the incoming image to 259201458 and then scale them to 12800720.

The “rö” option tells avconv to create a video with a frames per second of 10. It appears twice to prevent avconv dropping frames that it thinks are similar.

The “crf” option tells avconv to aim for a quality level of “20” which is a good starting point. Lower values are better but will increase the file size.

The “-g” option sets the GOP value. The YouTube Advanced Encoding Settings page recommends that the GOP should be set to half the frame rate so this is set to 15.

The conversion process is very slow on the Pi compared to doing the same thing on a desktop PC. For long sequences with hundreds of frames I would recommend downloading an appropriate version of Libav on your desktop or laptop and build your MP4 files much faster!

Appendix Rpi - Camera cont.

Appendix Rpi - PiDrive

PiDrive - 314 GB Hard drive

Capacity - 314 GB

Interface - USB 3.0 - Cable included

Requires independent power supply - MicroUSB

Appendix Rpi - Carl

URL:

Dialer -

```
-sudo python dialer.py string_to_dial
```

Passwords - HANDWRITTEN ONLY - NOT FOR PUBLICATION

Appendix - Carl cont.

Passwords - hand written only

Router Name _____ Address _____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix - Carl cont.

Passwords - hand written only

Alt Router Name _____ Address _____

Alt Router Login _____ Pw _____

Alt Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix - Carl cont.

Note: All Host sites must be key access only
Passwords - hand written only

RPi _____ Serial _____

E MAC _____:_____:_____:_____:_____:_____ IP _____._____._____._____

W MAC _____:_____:_____:_____:_____:_____ IP _____._____._____._____

OS: _____

Onion: _____ Host: _____

Model _____ Hw Rev _____

PW _____

RPi _____ Serial _____

E MAC _____:_____:_____:_____:_____:_____ IP _____._____._____._____

W MAC _____:_____:_____:_____:_____:_____ IP _____._____._____._____

OS: _____

Onion: _____ Host: _____

Model _____ Hw Rev _____

PW _____

RPi _____ Serial _____

E MAC _____:_____:_____:_____:_____:_____ IP _____._____._____._____

W MAC _____:_____:_____:_____:_____:_____ IP _____._____._____._____

OS: _____

Onion: _____ Host: _____

Model _____ Hw Rev _____

PW _____

Appendix - Carl cont.

Note: All Host sites must be key access only
Passwords - hand written only

RPi _____ Serial _____

E MAC _____:_____:_____:_____:_____:_____ IP _____.

W MAC _____:_____:_____:_____:_____:_____ IP _____.

OS: _____

Onion: _____ Host: _____

Model _____ Hw Rev _____

PW _____

RPi _____ Serial _____

E MAC _____:_____:_____:_____:_____:_____ IP _____.

W MAC _____:_____:_____:_____:_____:_____ IP _____.

OS: _____

Onion: _____ Host: _____

Model _____ Hw Rev _____

PW _____

RPi _____ Serial _____

E MAC _____:_____:_____:_____:_____:_____ IP _____.

W MAC _____:_____:_____:_____:_____:_____ IP _____.

OS: _____

Onion: _____ Host: _____

Model _____ Hw Rev _____

PW _____

Appendix - Carl cont.

Note: All Host sites must be key access only

Site Host ID: _____

Property: _____ Location: _____

HW: _____ MAC _____ : _____ : _____ : _____ : _____ : _____

IP: _____ WMAC _____ : _____ : _____ : _____ : _____ : _____

URL: _____

Onion: _____

Step Sequence for access:

Step 01: _____

Step 02: _____

Step 03: _____

Step 04: _____

Step 05: _____

Step 06: _____

Step 07: _____

Step 08: _____

Step 09: _____

Step 10: _____

Step 11: _____

Step 12: _____

Step 13: _____

Step 14: _____

Step 15: _____

Appendix - Carl cont.

Note: All Host sites must be key access only

Site Host ID: _____

Property: _____ Location: _____

Step Sequence for access:

Step 16: _____

Step 17: _____

Step 18: _____

Step 19: _____

Step 20: _____

logout

Appendix - Carl cont.

Remote Device

Property: _____ Location: _____

Device: _____ Model _____

Site Host ID: _____

IP _____ . _____ . _____ . _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix - Carl cont.

Remote Device

Property: _____ Location: _____

Device: _____ Model _____

Site Host ID: _____

IP _____ . _____ . _____ . _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix RPi Solar - Eric

URL:

Temperature Sensors

Left Manifold	28-0000048ebe4b
Left Plate	28-000004a84bc0
Right Manifold	28-000004a82566
Right Plate	28-000004a82566
Preheat Top	28-0000048ef3a3
Preheat Bottom	28-0000048e356a
Sidearm Top	28-0000048ee906
Sidearm Bottom	28-0000048ec491

Program Name - solar10.py

URL: .>..onion

Appendix - Eric cont.

Passwords - hand written only

Router Name _____ Address _____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix - Eric cont.

Note: All Host sites must be key access only

Alt Router Name _____ Address _____

Alt Router Login _____ Pw _____

Alt Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix - Eric cont.

Note: All Host sites must be key access only

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

OS: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

OS: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

OS: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

OS: _____

Onion: _____

Appendix - Eric cont.

URL:

Appendix - EWhite

Passwords - hand written only

Router Name _____ Address _____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix - EWhite cont.

Passwords - hand written only

Alt Router Name _____ Address _____

Alt Router Login _____ Pw _____

Alt Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix - EWhite cont.

Passwords - hand written only

Router Name _____ Address _____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

TOR1 prubdnoc6maaro3y.onion _____ Pw ____non - key only_____

TOR2 rw6qjmhrao3bzxol.onion _____ Pw ____ non - key only_____

Other _____ MAC ____:____:____:____:____:____

IP _____ Pw _____

Other _____ MAC ____:____:____:____:____:____

IP _____ Pw _____

Other _____ MAC ____:____:____:____:____:____

IP _____ Pw _____

Other _____ MAC ____:____:____:____:____:____

IP _____ Pw _____

Other _____ MAC ____:____:____:____:____:____

IP _____ Pw _____

Appendix - EWhite cont.

Note: All Host sites must be key access only

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

OS: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

OS: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

OS: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

OS: _____

Onion: _____

Appendix - EWhite cont.

Appendix Jim

URL:

RPi - piaware

OS:

Network IP :

URL: . . .onion

MAC: _____:_____:_____:_____:_____:

WLAN: _____:_____:_____:_____:_____:

Dell -

OS: debian

Network IP :

URL: . . .onion

MAC: _____:_____:_____:_____:_____:

WLAN: _____:_____:_____:_____:_____:

Appendix - Jim cont.

Passwords - hand written only

Router Name _____ Address _____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix - Jim cont.

Passwords - hand written only

Alt Router Name _____ Address _____

Alt Router Login _____ Pw _____

Alt Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix - Jim cont.

Note: All Host sites must be key access only

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Appendix - Jim cont.

Appendix Loren

URL:

RPi -

OS:

Network IP :

URL: . . .onion

MAC: _____:_____:_____:_____:_____:

WLAN: _____:_____:_____:_____:_____:

Dell - WV

OS: debian

Network IP :

URL: . . .onion

MAC: _____:_____:_____:_____:_____:

WLAN: _____:_____:_____:_____:_____:

Loren Doodles:

```
while x in serport:
    out.write(x)
```

Appendix - Loren cont.

Passwords - hand written only

Router Name _____ Address _____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix - Loren cont.

Note: All Host sites must be key access only

Alt Router Name _____ Address _____

Alt Router Login _____ Pw _____

Alt Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix - Loren cont.

Note: All Host sites must be key access only

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Appendix - Loren cont.

How to send SMTP through Loren -

see yaksman

Appendix Loren - WV

URL:

RPi -

OS:

URL: . . .onion

Dell - WV

OS: debian

URL: . . .onion

Appendix - Loren - WV cont.

Passwords - hand written only

Router Name _____ Address _____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix - Loren - WV cont.

Passwords - hand written only

Alt Router Name _____ Address _____

Alt Router Login _____ Pw _____

Alt Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix - Loren - WV cont.

Note: All Host sites must be key access only

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Appendix - Loren - WV cont.

Appendix - Meggan

URL:

IP Address: _____ . _____ . _____ . _____

IPv6 Address: _____ . _____ . _____ . _____ . _____ . _____

Passwords - HANDWRITTEN ONLY - NOT FOR PUBLICATION

Appendix - Meggan cont.

Passwords - hand written only

Router Name _____ Address _____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC ____ : ____ : ____ : ____ : ____ : ____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC ____ : ____ : ____ : ____ : ____ : ____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC ____ : ____ : ____ : ____ : ____ : ____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC ____ : ____ : ____ : ____ : ____ : ____

User _____ Pw _____

Appendix - Meggan cont.

Passwords - hand written only

Alt Router Name _____ Address _____

Alt Router Login _____ Pw _____

Alt Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC ____ : ____ : ____ : ____ : ____ : ____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC ____ : ____ : ____ : ____ : ____ : ____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC ____ : ____ : ____ : ____ : ____ : ____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC ____ : ____ : ____ : ____ : ____ : ____

User _____ Pw _____

Appendix - Meggan cont.

Passwords - hand written only

AP Name _____ Address _____

AP Login _____ Pw _____

AP Wireless SSID _____ Pw _____

Instructions _____

Alt AP Name _____ Address _____

Alt AP Login _____ Pw _____

Alt AP Wireless SSID _____ Pw _____

Instructions _____

Appendix - Meggan cont.

Passwords - hand written only

RPi _____ Serial _____

E MAC ____:____:____:____:____:____ IP _____._____._____._____

W MAC ____:____:____:____:____:____ IP _____._____._____._____

Onion: _____ Host: _____

Model _____ Hw Rev _____

PW _____

RPi _____ Serial _____

E MAC ____:____:____:____:____:____ IP _____._____._____._____

W MAC ____:____:____:____:____:____ IP _____._____._____._____

Onion: _____ Host: _____

Model _____ Hw Rev _____

PW _____

RPi _____ Serial _____

E MAC ____:____:____:____:____:____ IP _____._____._____._____

W MAC ____:____:____:____:____:____ IP _____._____._____._____

Onion: _____ Host: _____

Model _____ Hw Rev _____

PW _____

Appendix - Meggan cont.

Passwords - hand written only

RPi _____ Serial _____

E MAC ____:____:____:____:____:____ IP _____._____._____._____

W MAC ____:____:____:____:____:____ IP _____._____._____._____

Onion: _____ Host: _____

Model _____ Hw Rev _____

PW _____

RPi _____ Serial _____

E MAC ____:____:____:____:____:____ IP _____._____._____._____

W MAC ____:____:____:____:____:____ IP _____._____._____._____

Onion: _____ Host: _____

Model _____ Hw Rev _____

PW _____

RPi _____ Serial _____

E MAC ____:____:____:____:____:____ IP _____._____._____._____

W MAC ____:____:____:____:____:____ IP _____._____._____._____

Onion: _____ Host: _____

Model _____ Hw Rev _____

PW _____

Appendix - Meggan cont.

Note: All Host sites must be key access only

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Appendix - Meggan cont.

Note: All Host sites must be key access only

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Appendix - Meggan cont.

Appendix Rance

URL:

RPi -

OS:

Network IP :

URL: . . .onion

MAC: ____:____:____:____:____:____

WLAN: ____:____:____:____:____:____

Dell -

OS:

Network IP :

URL: . . .onion

MAC: ____:____:____:____:____:____

WLAN: ____:____:____:____:____:____

Appendix - Rance cont.

Passwords - hand written only

Router Name _____ Address _____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix - Rance cont.

Passwords - hand written only

Alt Router Name _____ Address _____

Alt Router Login _____ Pw _____

Alt Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix - Rance cont.

Note: All Host sites must be key access only

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Site Host ID: _____

HW: _____ MAC: _____

URL: _____

Onion: _____

Appendix - Rance cont.

Appendix Roger

URL: varies, use tor for reliable access (if enabled)

Temperature Sensors

Left Manifold	28-00000xxxxxxx
Left Plate	28-00000xxxxxxx
Middle Manifold	28-00000xxxxxxx
Middle Plate	28-00000xxxxxxx
Right Manifold	28-00000xxxxxxx
Right Plate	28-00000xxxxxxx
Collector Basement	28-00000xxxxxxx
Preheat Top	28-00000xxxxxxx
Preheat Bottom	28-00000xxxxxxx
Water	28-00000xxxxxxx

Program Name - solar14.py

URL: .>..onion

SD Memory Cards

Label	Contents
-----	-----
SD84	Occidentalis v0.2 w temp sensor ready

Addresses

Flight Aware - RPi
Flight Radar 24 - RPi
Solar Collector - RPi
TV RPi Picture Viewer - RPi
10.0.0.31
10.0.0.32
10.0.0.40
10.0.0.50

Appendix - Roger cont.

Roger Doodles:

Need a program (SW on Rpi's to tell what software has been added by RAW to a Rpi.

Program name: SW usage ./SW

cat /etc/ID

Save

chmod +x SW

Appendix - Roger

Temperature Sensors

Left Manifold	28-00000xxxxxxx
Left Plate	28-00000xxxxxxx
Middle Manifold	28-00000xxxxxxx
Middle Plate	28-00000xxxxxxx
Right Manifold	28-00000xxxxxxx
Right Plate	28-00000xxxxxxx
Collector Basement	28-00000xxxxxxx
Preheat Top	28-00000xxxxxxx
Preheat Bottom	28-00000xxxxxxx
Water	28-00000xxxxxxx

Program Name – solar14.py

URL: .>..onion

ASCO Valves: Bypass is Clockwise
Normal operation is counter-clockwise

GPIO 01 – 3V3	02 –
03 -	04 –
05 -	06 – GND
07 – GPIO04 Sensors	08 -
09 -	10 -
11 – GPIO17 Pump	12 – GPIO18 Valve 1 Roof
13 -	14 -
15 – GPIO22 Valve 2 Basement	16 – GPIO23
17 -	18 – GPIO24
19 -	20 -
21 -	22 – GPIO25
23 -	24 -
25 -	26 -

Appendix - Roger cont.

Passwords - hand written only

Router Name _____ Address _____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix - Roger cont.

Passwords - hand written only

Alt Router Name _____ Address _____

Alt Router Login _____ Pw _____

Alt Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix - Roger cont.

Note: All Host sites must be key access only

Site Host ID: _____

HW _____ MAC _____:_____:_____:_____:_____:_____

URL: _____

Onion: _____

Site Host ID: _____

HW _____ MAC _____:_____:_____:_____:_____:_____

URL: _____

Onion: _____

Site Host ID: _____

HW _____ MAC _____:_____:_____:_____:_____:_____

URL: _____

Onion: _____

Site Host ID: _____

HW _____ MAC _____:_____:_____:_____:_____:_____

URL: _____

Onion: _____

Appendix - Roger cont.

Appendix Ron

URL:

Temperature Sensors

Ground Deep	28-000004A87E6B
Ground Shallow	28-0000045D8463
Ceiling	28-0000045DA247
Outside South	28-0000043DEBCC
Outside North	28-000004A89AD5
Battery Box	28-000004A7D421

Program Name - rtl6.py

SD Memory Cards

Label	Contents
-----	-----
REG164	Occidentalis v0.2 w temp sensor ready

Appendix - Ron cont.

D-Link Router - DIR655

Port Forwarding (P. 57)

Name: Pi Web Server / SSH Access

Address: 192.168._____._____ (Wired) or (Wireless)

TCP 22, 80

Allow All

Always

Set Wireless Password (P. 16)

sky2: (password)

sky5: (password)

View Connections / Status (P. 85)

LAN / Active Sessions: (P. 87)

-Status, Internet Sessions

Routing or Wireless: (P. 88)

-Status, Routing / Wireless

Logs: (P.86)

-Status, Logs

Force IP Address

Setup - Network Settings - follow prompts

Port Forwarding

Advanced - Port Forwarding - follow prompts

D-Link Router - DIR655

Tabs -

Setup

Internet -

Wireless Settings -

Network Settings - Use this section to configure the internal network settings of your router and also to configure the built-in DHCP Server to assign IP addresses to the computers on your network

ADD DHCP Reservation:

Enable

Computer Name

IP Address

MAC Address

Save

Advanced

Port Forwarding -

Tools

Admin -

Time -

Syslog -

eMail Settings - where to email log files

System -

Firmware -

Dynamic DNS -

System Check -

Schedules -

Status

Device Information -

Logs -

Statistics -

Internet Settings -

Wireless - Use this option to view the wireless clients that are connected to your wireless router

Wish Settings

Support

Appendix - Ron cont.

Passwords - hand written only

Router Name _____ Address _____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix - Ron cont.

Passwords - hand written only

Alt Router Name _____ Address _____

Alt Router Login _____ Pw _____

Alt Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix - Ron cont.

Note: All Host sites must be key access only

Site Host ID: _____

HW _____ MAC _____:_____:_____:_____:_____:_____

URL: _____

Onion: _____

Site Host ID: _____

HW _____ MAC _____:_____:_____:_____:_____:_____

URL: _____

Onion: _____

Site Host ID: _____

HW _____ MAC _____:_____:_____:_____:_____:_____

URL: _____

Onion: _____

Site Host ID: _____

HW _____ MAC _____:_____:_____:_____:_____:_____

URL: _____

Onion: _____

Appendix - Ron cont.

Appendix _____

URL: _____

Appendix _____ cont.

URL: _____

Appendix _____ Cont

Passwords - hand written only

Router Name _____ Address _____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ . _____ . _____ . _____ MAC ____ : ____ : ____ : ____ : ____ : ____

User _____ Pw _____

Other _____ Model _____

IP _____ . _____ . _____ . _____ MAC ____ : ____ : ____ : ____ : ____ : ____

User _____ Pw _____

Other _____ Model _____

IP _____ . _____ . _____ . _____ MAC ____ : ____ : ____ : ____ : ____ : ____

User _____ Pw _____

Appendix _____ Cont

Passwords - hand written only

Alt Router Name _____ Address _____

Alt Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ . _____ . _____ . _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ . _____ . _____ . _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Other _____ Model _____

IP _____ . _____ . _____ . _____ MAC _____ : _____ : _____ : _____ : _____ : _____

User _____ Pw _____

Appendix _____ Cont

Passwords - hand written only

Access Point _____ Address _____

AP Login _____ Pw _____

AP SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ . _____ . _____ . _____ MAC ____ : ____ : ____ : ____ : ____ : ____

User _____ Pw _____

Other _____ Model _____

IP _____ . _____ . _____ . _____ MAC ____ : ____ : ____ : ____ : ____ : ____

User _____ Pw _____

Other _____ Model _____

IP _____ . _____ . _____ . _____ MAC ____ : ____ : ____ : ____ : ____ : ____

User _____ Pw _____

Appendix _____ Cont

Passwords - hand written only

Alt Access Point _____ Address _____

Alt AP Login _____ Pw _____

Alt AP SSID _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Email _____ Pw _____

Other _____ Model _____

IP _____ . _____ . _____ . _____ MAC ____ : ____ : ____ : ____ : ____ : ____

User _____ Pw _____

Other _____ Model _____

IP _____ . _____ . _____ . _____ MAC ____ : ____ : ____ : ____ : ____ : ____

User _____ Pw _____

Other _____ Model _____

IP _____ . _____ . _____ . _____ MAC ____ : ____ : ____ : ____ : ____ : ____

User _____ Pw _____

Appendix _____ cont.

Passwords - hand written only

RPi _____ Serial _____

E MAC _____:_____:_____:_____:_____:_____ IP _____._____._____._____

W MAC _____:_____:_____:_____:_____:_____ IP _____._____._____._____

Onion: _____ Host: _____

Model _____ Hw Rev _____

PW _____

RPi _____ Serial _____

E MAC _____:_____:_____:_____:_____:_____ IP _____._____._____._____

W MAC _____:_____:_____:_____:_____:_____ IP _____._____._____._____

Onion: _____ Host: _____

Model _____ Hw Rev _____

PW _____

RPi _____ Serial _____

E MAC _____:_____:_____:_____:_____:_____ IP _____._____._____._____

W MAC _____:_____:_____:_____:_____:_____ IP _____._____._____._____

Onion: _____ Host: _____

Model _____ Hw Rev _____

PW _____

Appendix _____ cont.

Passwords - hand written only

RPi _____ Serial _____

E MAC _____:_____:_____:_____:_____:_____ IP _____._____._____._____

W MAC _____:_____:_____:_____:_____:_____ IP _____._____._____._____

Onion: _____ Host: _____

Model _____ Hw Rev _____

PW _____

RPi _____ Serial _____

E MAC _____:_____:_____:_____:_____:_____ IP _____._____._____._____

W MAC _____:_____:_____:_____:_____:_____ IP _____._____._____._____

Onion: _____ Host: _____

Model _____ Hw Rev _____

PW _____

RPi _____ Serial _____

E MAC _____:_____:_____:_____:_____:_____ IP _____._____._____._____

W MAC _____:_____:_____:_____:_____:_____ IP _____._____._____._____

Onion: _____ Host: _____

Model _____ Hw Rev _____

PW _____

Appendix _____ cont.

Note: All Host sites must be key access only

Site Host ID: _____

Property: _____ Location: _____

HW: _____ MAC _____ : _____ : _____ : _____ : _____ : _____

URL: _____

Onion: _____

Step Sequence for access:

Step 01: _____

Step 02: _____

Step 03: _____

Step 04: _____

Step 05: _____

Step 06: _____

Step 07: _____

Step 08: _____

Step 09: _____

Step 10: _____

Step 11: _____

Step 12: _____

Step 13: _____

Step 14: _____

Step 15: _____

Step 16: _____

Appendix _____ cont.

Note: All Host sites must be key access only

Site Host ID: _____

Step Sequence for access cont.:

Step 17: _____

Step 18: _____

Step 19: _____

Step 20: _____

Step 21: _____

Step 22: _____

Step 23: _____

Step 24: _____

Step 25: _____

Step 26: _____

Step 27: _____

Step 28: _____

Step 29: _____

Step 30: _____

Step 31: _____

Step 32: _____

Step 33: _____

Step 34: _____

Step 35: _____

Appendix _____ Router

Passwords - hand written only

Router Brand _____ Model _____

Firmware _____ MAC Address _____:_____:_____:_____:_____:_____

Router Name _____ IP Address _____._____._____._____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Wireless SSID _____ Pw _____

Special instructions _____

Router Brand _____ Model _____

Firmware _____ MAC Address _____:_____:_____:_____:_____:_____

Router Name _____ IP Address _____._____._____._____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Wireless SSID _____ Pw _____

Special instructions _____

Appendix _____ Router

Passwords - hand written only

Router Brand _____ Model _____

Firmware _____ MAC Address _____:_____:_____:_____:_____:_____

Router Name _____ IP Address _____._____._____._____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Wireless SSID _____ Pw _____

Special instructions _____

Router Brand _____ Model _____

Firmware _____ MAC Address _____:_____:_____:_____:_____:_____

Router Name _____ IP Address _____._____._____._____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Wireless SSID _____ Pw _____

Special instructions _____

Appendix _____ Alt Router / AP

Passwords - hand written only

Alt Router Brand _____ Model _____

Firmware _____ MAC Address _____:_____:_____:_____:_____:_____

Router Name _____ IP Address _____._____._____._____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Wireless SSID _____ Pw _____

Special instructions _____

Alt Router Brand _____ Model _____

Firmware _____ MAC Address _____:_____:_____:_____:_____:_____

Router Name _____ IP Address _____._____._____._____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Wireless SSID _____ Pw _____

Special instructions _____

Appendix _____ Alt Router / AP

Passwords - hand written only

Alt Router Brand _____ Model _____

Firmware _____ MAC Address _____:_____:_____:_____:_____:_____

Router Name _____ IP Address _____._____._____._____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Wireless SSID _____ Pw _____

Special instructions _____

Alt Router Brand _____ Model _____

Firmware _____ MAC Address _____:_____:_____:_____:_____:_____

Router Name _____ IP Address _____._____._____._____

Router Login _____ Pw _____

Wireless SSID _____ Pw _____

Wireless SSID _____ Pw _____

Special instructions _____

Appendix _____ cont.

Software Changes

Date _____ Time _____

Device _____ MAC _____:_____:_____:_____:_____:_____

IP _____ Pw _____

Program _____

Purpose _____

Details

Appendix _____ cont.

Software Changes

Date _____ Time _____

Device _____ MAC _____:_____:_____:_____:_____:_____

IP _____ Pw _____

Program _____

Purpose _____

Details _____

Appendix S

Software Defined Radio

CubicSDR - for Raspberry Pi

Security Systems

One -

Remote view using ISS

Two - Night Owl

View - Click Main View

Playback / Record - Click Play Back

Click View

Click Remote Playback

Select Camera

Select Start Time

Select Record

Select End Record - Click Record to stop recording

Convert .rf files to .avi using AVConvert from Night Owl

Or

Convert .rf files to .avi using AVIGenerator2.0

Convert .avi files to mp4 using Raspberry Pi avconv

Ex. avconv -i filename.avi -vcodec copy filename.mp4

Security Systems - viewer (requiring ActiveX)

In addition to requiring ActiveX, system may require software included with security system to be installed prior to use

Firefox - does not support use of ActiveX

Google Chrome - Supports separate IE extension

Start Google Chrome, open menu (triple vertical dots on right top)

select “more tools”, extensions, scroll down to IE Tab,

click IE Tab and follow instructions to continue and install extension

when ready to use an extension, click the IE tab on the right top menu

type address in the new address line

Internet Explorer - supports ActiveX

Appendix S - cont.

iPad - software

vMeye free - from App Store

Launch vMeye free, Tap Live Video

To add a device: Tap “+”, Enter Name, Address,

Port (normally 5000), User, Password, Channels then Save

To view a device: Tap Device name, Tap Channel

vMeye Super - from App Store

(compatible with iOS3.0 and above)

No current success with App

iPhone - software

vMeye - from App Store

possibly similar to vMeye free above

ISS - Desktop Software - (comes with Home Pro Series DVR)

Default username / password is admin with no password

Local configuration - user names and passwords are separate from
remote user names and passwords

When starting ISS in live mode, connected devices change from dim to lit.

To set ISS to work with home pro series 1080N:

In Device Manage:

Use device type AHD-DVR-GM

Port 34567 works*

(monitor port 5000 works with iPad) **

*Note: Port 34567 must be forwarded on Router to which the device is connected.

**Note: For iPad, Port 5000 must be forwarded on Router to which the device is connected.

Adjust time Standard / Daylight

- Remote Config, Open Device, Config Manage, System Time, Sync PC, Save, Save

ISS Portable - download from APP Store

To set time on ISS

- ISS, yes, password, Remote Config, [Remote System Name], SETTING, Sync PC, Save, Save, Live, Close, OK.

Appendix S - cont.

Security SMTP - Simple Mail Transfer Protocol - Email for Linux Computer

```
sudo -s  
apt-get update  
apt-get install ssmtp  
apt-get install mailutils
```

SSMTP - Configuration

```
set mailhub to your mailhub  
hostname  
AuthUser=(username)  
AuthPass=(password)
```

Appendix S - cont.

Solar - Hot Water - Servicing

Begin with minimum of four (4) Homer Buckets to collect fluid before putting it in original one gallon jugs from new Solar Fluid.

- Drain Solar Fluid
- Close Top Valve on Pump
- Continue Draining Solar Fluid
- Remove Pump and Replace Pump with Pipe Section with flanges
- Open Top Pump Valve
- Continue Draining Solar Fluid
- Flush - hot
- Drain
- Flush - cold
- Drain
- Charge
- Pressurize

Appendix S - cont.

Solar - PV

Epever MPPT Controller - Operating guidelines - refer to MPPT Manual for available values

Two operating keys are: Select and Enter

To change the displayed item press Select until the displayed value appears then press Enter until that value flashes. Then press Select button to change the value to the desired value.

Solar - Epever eBox-WIFI

To connect to eBox-WIFI

Connect to eBox-WIFI

Set browser to 11.11.11.254

user: admin

password: admin

Appendix S - Slow Computer

Slow Computer?

There are several "programs" which may be at fault. Most of these programs involve "automatic updates". While Updates are important, many times they consume CPU time at the most inopportune point in your day, when you need the computer!

Adobe FLASH - has an automatic update which can cause problems

Adobe READER - has an automatic update which can cause problems

JAVA - has both an automatic update as well as a quick starter both of which can cause problems

Mozilla Firefox - has an automatic update which can cause problems

Mozilla Thunderbird - has an automatic update which can cause problems

QuickTime - has an automatic update which can cause problems

The Operating System, whether it is XP, Vista, 7 or 8 - has an automatic update which can cause problems

The way to determine if there is a problem:

Right Click on the bottom bar on your screen then select "Task Manager".

Next, click twice on "CPU" at the top of the CPU Column. This will show the largest user of CPU time.

If it is not "System Idle Process", it is the "Culprit" and normally will be "svchost.exe".

If this is the case, I have attached the steps to eliminate the problems. After completing each step or after completing all of the steps you will need to SHUTDOWN your computer then turn it back on. Do this rather than using "Restart".

Along with each "FIX" there are instructions how to update manually as well as restore the "automatic update" if desired.

Note:

In addition to these programs, check Control Panel, Programs for any programs which may have been installed and used but are no longer needed. These too may be using resources unnecessarily.

Appendix S - Slow Computer - cont.

Adobe FLASH

To Disable Automatic Updates:

- Click "START"
- Click "Control Panel"
- Double Click "FLASH"
- Click "Advanced Tab"
- Click "Never Check"
- To reverse, Click a selection other than "Never Check"
- Close Flash Player Settings Manager

To Update Adobe Flash manually:

- Click "START"
- Click "Control Panel"
- Double Click "FLASH"
- Click "Advanced Tab"
- Click on the "Check Now" box.
- Close Flash Player Settings Manager

Adobe READER

To Disable Automatic Updates:

- Start "Adobe Reader"
- Click "Edit"
- Click "Preferences"
- Click "Updater"
- Click "Do not download or install"
- To reverse, Click any selection other than "Do not download or install"
- Click "OK"
- Close Reader

To update Adobe Reader manually,

- Start "Adobe Reader"
- Click "Help" on the Menu Bar
- Click "Check for Updates..."
- Close Reader

Appendix S - Slow Computer - cont.

JAVA

To turn off JAVA Updates:

- Click “START”
- Click “Control Panel”
- Double Click “JAVA”
- Click “Update” Tab
- Click to Uncheck the “Check for Updates Automatically” box
to reverse, Check the “Check for Updates Automatically” box
- Click “OK”

To manually Update JAVA:

- Click “START”
- Click “Control Panel”
- Double Click “JAVA”
- Click “Update” Tab
- Click the “Update Now” Box
- Click “OK”

JAVA Quick Starter

To disable Java Quick Starter:

- Click “START”
- Click “Control Panel”
- Double Click “JAVA”
- Click “Advanced” tab
- Click “Miscellaneous”
- Click to Uncheck the “JAVA Quick Starter” box
to enable, Check the “JAVA Quick Starter” box
- Click “OK”

Appendix S - Slow Computer - cont.

Mozilla Firefox

To turn off Firefox Updates:

- Start Firefox
- Click Tools on the Menu Bar
- Click Options on the Drop Down Menu
- Click Advanced
- Click "Never check for updates ..." in the "Firefox updates:" dialog box
 - To reverse, Click any selection other than "Never check for updates ..."
- Click "OK"

To manually update Firefox:

- Start Firefox
- Click "Help" on the Menu Bar
- Click "About Firefox" on the Drop Down Menu
- Click the "Check for Updates" box
- Wait while Firefox checks for updates . . .
- Click the "Restart to Update" box

Firefox - Fixes

To change tab font:

- In address bar: about:config
- Set layout.css.devPixelsPerPx from default of -1.0 in increments of .1 until display looks right - I used 2.4 for one user.

Alternately:

- Options/Preferences ->General -> Language and Appearance -> Zoom to compensate for changes to the above parameters

Mozilla Thunderbird

To turn off Thunderbird Updates:

- Start Thunderbird
- Click Tools on the Menu Bar
- Click Options on the Drop Down Menu
- Click Advanced
- Click "Never check for updates ..." in the "Thunderbird updates:" dialog box
 - To reverse, Click any selection other than "Never check for updates ..."
- Click "OK"

To manually update Thunderbird:

- Start Thunderbird
- Click "Help" on the Menu Bar
- Click "Check for Updates" in the drop down box
- Wait while Thunderbird checks for updates . . .
- Follow the on screen instructions

Appendix S - Slow Computer - cont.

QuickTime

To Disable Automatic Updates:

- Click "START"
- Click "Control Panel"
- Double Click "QuickTime"
- Click "Update" Tab
- Click to Uncheck the "Check for updates automatically" box
 - To reverse, Click to Check the "Check for updates automatically" box
- Click "OK"

To manually update QuickTime:

- Click "START"
- Click "Control Panel"
- Double Click "QuickTime"
- Click "Update..." Tab
- Click "OK"

Operating System – Windows XP

To Disable Automatic Updates:

- Click "START"
- Click "Control Panel"
- Double Click "Automatic Updates"
- Click "Turn off Automatic Updates"
 - To reverse, Click any selection other than "Turn off Automatic Updates"
- Click "OK"

Operating System - Windows in general - Except Windows 10

Follow XP instructions

Operation System - Windows 10

It, in general, is not possible to disable Automatic Updates in Windows 10.
There are, however, several methods to slow the Automatic Update Process.
Further research on the internet will provide these methods.

Appendix S - Solar

PV Solar - Ron Gries

Grid - Professional install

Grid - Self Install

Battery - Self Install

Appendix S - Systemd

systemd ** - the entire systemd outlind has been copied from Raspberry Pi documentation found at: <https://www.raspberrypi.org/documentation/linux/usage/systemd.md>

In order to have a command or program run when the Pi boots, you can add it as a service. Once this is done, you can start/stop enable/disable from the linux prompt.

Creating a service

On your Pi, create a .service file for your service, for example:

myscript.service

[Unit]

Description=My service

After=network.target

[Service]

ExecStart=/usr/bin/python3 -u main.py

WorkingDirectory=/home/pi/myscript

StandardOutput=inherit

StandardError=inherit

Restart=always

User=pi

[Install]

WantedBy=multi-user.target

So in this instance, the service would run Python 3 from our working directory /home/pi/myscript which contains our python program to run main.py. But you are not limited to Python programs: simply change the ExecStart line to be the command to start any program/script that you want running from booting.

Copy this file into /etc/systemd/system as root, for example:

```
sudo cp myscript.service /etc/systemd/system/myscript.service
```

Once this has been copied, you can attempt to start the service using the following command:

```
sudo systemctl start myscript.service
```

Stop it using following command:

```
sudo systemctl stop myscript.service
```

When you are happy that this starts and stops your app, you can have it start automatically on reboot by using this command:

```
sudo systemctl enable myscript.service
```

Appendix S - Systemd - cont.

The systemctl command can also be used to restart the service or disable it from boot up!

Some things to be aware of:

The order in which things are started is based on their dependencies — this particular script should start fairly late in the boot process, after a network is available (see the After section).

You can configure different dependencies and orders based on your requirements.

You can get more information from: man systemctl or here: <https://fedoramagazine.org/what-is-an-init-system/>

Working Examples

Roger - Solar Rpi - NOT working, not available in current OS

Appendix T

Appendix T - Temperature Sensor - Analog

```
# Simple example of reading the MCP3008 analog input channels and printing
# them all out.
# Author: Tony DiCola
# License: Public Domain

# Modified by Roger Weith to read multiple devices at various distances
#      20170609 1000 Testing continues with mixed results

import time
import os

# Import SPI library (for hardware SPI) and MCP3008 library.
import Adafruit_GPIO.SPI as SPI
import Adafruit_MCP3008

# Software SPI configuration:
# CLK  = 18
# MISO = 23
# MOSI = 24
# CS   = 25
# mcp = Adafruit_MCP3008.MCP3008(clk=CLK, cs=CS, miso=MISO, mosi=MOSI)

# Hardware SPI configuration: (pins 19, 21, 23, 24)
SPI_PORT  = 0
SPI_DEVICE = 0
mcp = Adafruit_MCP3008.MCP3008(spi=SPI.SpiDev(SPI_PORT, SPI_DEVICE))

print('Reading MCP3008 values, press Ctrl-C to quit...')
# Print nice channel column headers.
print('{0:>4} | {1:>4} | {2:>4} | {3:>4} | {4:>4} | {5:>4} | {6:>4} | {7:>4} |'.format(*range(8)))
print('-' * 57)
# Main program loop.
while True:

    time.sleep(.3)
    sensor1a = mcp.read_adc(1)
    time.sleep(.3)
    sensor1b = mcp.read_adc(1)
    sensor1 = float((sensor1a + sensor1b) / 2)
    mv1 = sensor1 * (3300.0 / 1024.0)
    ctemp1 = ((mv1 - 100.0) / 10.0) - 40.0
    mv1 = float(int(mv1 * 10)) / 10 # done after to keep decimal places
    ctemp1 = int(ctemp1 * 10)
    ctemp1 = float(ctemp1) / 10
    ftemp1 = (ctemp1 * 9.0 / 5.0) + 32.0
    ftemp1 = int(ftemp1 * 10)
    ftemp1 = float(ftemp1) / 10
```

```

print 'sensor1 is ', sensor1, ' mv1 is ', mv1, ' ctemp1 is ', ctemp1, 'C', ' ftemp1 is ', ftemp1, ' F'

time.sleep(.3)
sensor2a = mcp.read_adc(2)
time.sleep(.3)
sensor2b = mcp.read_adc(2)
sensor2 = float((sensor2a + sensor2b) / 2)
mv2 = sensor2 * (3300.0 / 1024.0)
ctemp2 = ((mv2 - 100.0) / 10.0) - 40.0
mv2 = float(int(mv2 * 10)) / 10
ctemp2 = int(ctemp2 * 10)
ctemp2 = float(ctemp2) / 10
ftemp2 = (ctemp2 * 9.0 / 5.0) + 32.0
ftemp2 = int(ftemp2 * 10)
ftemp2 = float(ftemp2) / 10
print 'sensor2 is ', sensor2, ' mv2 is ', mv2, ' ctemp2 is ', ctemp2, 'C', ' ftemp2 is ', ftemp2, ' F'

time.sleep(.3)
sensor3a = mcp.read_adc(3)
time.sleep(.3)
sensor3b = mcp.read_adc(3)
sensor3 = float((sensor3a + sensor3b) / 2)
mv3 = sensor3 * (3300.0 / 1024.0)
ctemp3 = ((mv3 - 100.0) / 10.0) - 40.0
mv3 = float(int(mv3 * 10)) / 10
ctemp3 = int(ctemp3 * 10)
ctemp3 = float(ctemp3) / 10
ftemp3 = (ctemp3 * 9.0 / 5.0) + 32.0
ftemp3 = int(ftemp3 * 10)
ftemp3 = float(ftemp3) / 10
print 'sensor3 is ', sensor3, ' mv3 is ', mv3, ' ctemp3 is ', ctemp3, 'C', ' ftemp3 is ', ftemp3, ' F'

time.sleep(.3)
sensor6a = mcp.read_adc(6)
time.sleep(.3)
sensor6b = mcp.read_adc(6)
sensor6 = float((sensor6a + sensor6b) / 2)
mv6 = sensor6 * (3300.0 / 1024.0)
ctemp6 = ((mv6 - 100.0) / 10.0) - 40.0
mv6 = float(int(mv6 * 10)) / 10
ctemp6 = int(ctemp6 * 10)
ctemp6 = float(ctemp6) / 10
ftemp6 = (ctemp6 * 9.0 / 5.0) + 32.0
ftemp6 = int(ftemp6 * 10)
ftemp6 = float(ftemp6) / 10
print 'sensor6 is ', sensor6, ' mv6 is ', mv6, ' ctemp6 is ', ctemp6, 'C', ' ftemp6 is ', ftemp6, ' F'

time.sleep(.3)
sensor7a = mcp.read_adc(7)

```

```
time.sleep(.3)
sensor7b = mcp.read_adc(7)
sensor7 = float((sensor7a + sensor7b) / 2)
mv7 = sensor7 * (3300.0 / 1024.0)
ctemp7 = ((mv7 - 100.0) / 10.0) - 40.0
mv7 = float(int(mv7 * 10)) / 10
ctemp7 = float(int(ctemp7 * 10)) / 10
ftemp7 = float(int(((ctemp7 * 9.0 / 5.0) + 32.0) * 10)) / 10
print 'sensor7 is ', sensor7, ' mv7 is ', mv7, ' ctemp7 is ', ctemp7, 'C', ' ftemp7 is ', ftemp7, ' F'
print
print
```


Appendix T - Temperature Sensor - Digital

Include useable and tested code in this section

Appendix T - Tent

Rogers 10' x 10' or 10' x 20'

Tent Box packed 20170621 for August usage as 10' x 20'

Includes:

Tent Box:

1 - 10' x 20' Silver Canopy

2 - 8' x 10' Silver Tapered End Walls *

4 - 7' 4" x 9' 6" Silver Side Walls

9 Frame Parts - (4) Frame Corner (A), (2) Frame Center (B) and (3) Frame Pitch (C)

6 Tensioner Parts - (4) Canopy Tensioner Ell (L) and (2) Canopy Tensioner Tees (T)

6+ - Rerod posts

6 - Orange Ratchet Straps

4 - Black / Yellow Rope retainers

6 - Dog Stakes

* One tapered end wall has a torn grommet and should not be used if possible

Bungee Bag:

50 - 8" White Bungee

60 - 8" Black Bungee

46 - 6" Black Bungee

Multiple Short and Long Ball Bungee's

150+ - Black Bungee - misc

1 - Blue Handle Screw Driver, Spare Eye Bolts, 1/4" Tap and Handle

Poles:

2 - Bundles of 3 - 10' x 1" EMT Frame Poles and 2 - 9' 9" x 1" EMT Tensioner Poles

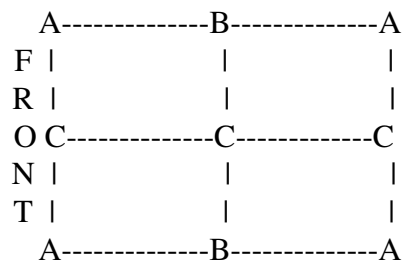
1 - Bundle of 6 - 5' x 1" EMT Roof Poles

1 - Bundle of 6 - 7' x 1" EMT Leg Poles

Assembly:

Place four corners (A) and two centers (B) and three peaks (C) in the following positions:

Place four Canopy Tensioner Ell (L) at the corners (A) and two Tensioner Tee (T) at side (B)



Between each A - B position (4), place one 10' Frame Pole and secure loosely

Between each C - C position (2), place one 10' Frame Pole and secure loosely

Between each A - C position (4), place one 5' Roof Pole and secure loosely

Between each B - C position (2), place one 5' Roof Pole and secure loosely

Appendix T - Tent

Rogers 10' x 10' or 10' x 20'

Tent Box packed 20210510 for MSW usage as 10' x 10'

Includes:

Tent Box:

- 1 - 9' x 11 ½' Silver Canopy
2 - 8' x 10' Silver Tapered End Walls *
2 - 7' 4" x 9' 6" Silver Side Walls
8 Frame Parts - (4) Frame Corner (A), (2) Display Ell(L) and (3) Frame Pitch (C)
4 Tensioner Parts - (4) Canopy Tensioner Ell (L)
8 - Rerod posts
4 - Black / Yellow Rope retainers
6 - Dog Stakes
* One tapered end wall has a torn grommet and should not be used if possible

Bungee Bag:

- 60 - 8" Black Bungee
46 - 6" Black Bungee
Multiple Short and Long Ball Bungee's
150+ - Black Bungee - misc
6 - Orange Ratchet Straps
1 - Blue Handle Screw Driver, Spare Eye Bolts, 1/4" Tap and Handle

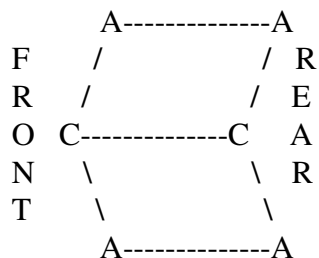
Poles:

- 1 - Bundles of 3 - 10' x 1" EMT Frame Poles and 2 - 9' 9" x 1" EMT Tensioner Poles
1 - Bundle of 4 - 5' x 1" EMT Roof Poles
1 - Bundle of 4 - 7' x 1" EMT Leg Poles

Assembly:

Place four corners (A) and two peaks (C) in the following positions:

Place four Canopy Tensioner Ell (L) at the corners (A)



Between each A - A position (2), place one 10' Frame Pole and secure loosely

Between each C - C position (1), place one 10' Frame Pole and secure loosely

Between each A - C position (4), place one 5' Roof Pole and secure loosely

Appendix T - Tent - cont.

Cover Frame with 10' x 20' or 10' x 10' Canopy

Secure open end (Front) with one short and one long Ball Bungee in each ring.

Secure closed end (Rear) with one long Ball Bungee in each ring.

Raise one side

Lift one side of the frame and insert 7' Leg Poles (3) and secure loosely

Attach tapered End Wall to rear frame (A - C - A) using WHITE Ball Bungee's

Raise remaining side

Lift remaining side of the frame and insert 7' Leg Poles (3) and secure loosely

Position rerod posts at the four corners and two side poles at approximately 10 (ten) foot spacing

Securing Sides of Canopy

Position Canopy Tensioner Ell (L) on (4) corner poles and Tensioner Tee (T) on (2) side poles

Insert the 9' 9" Tensioner Poles(2) in the Canopy Tensioners and "SLOWLY" raise to top of poles and secure loosely

Secure Canopy to Tensioner Poles using short Ball Bungee's

To tighten canopy gently loosen Tensioners on corner and side poles and gently pull down on each side

Securing Frame to ground

With tent positioned where desired, insert rerod posts in the ground long end down - "ten foot spacing"

Place each leg over the corresponding post securing the four corners with Black / Yellow Rope Retainers through Washer on top and rerod loop on the bottom

Screw Dog Stakes in to ground close to 4 Corner (A) and 2 Side (B#) Leg Poles

Secure Frame to Dog Stakes using Ratchet Straps (6)

Installing Side Walls

Attach (4) - 7' 4" Side Walls to Frame Pole from (A - B) using WHITE Ball Bungee's

Secure all side and end walls to Leg Poles using short or long Ball Bungee's as needed

Disassembly

Reverse the directions

Appendix T - Tor

torproject.org contains downloads for most operating systems

Appendix T - TP-LINK

TP-LINK Wi-Fi Range Extender - N300 - MN: TL-WA860RE

Uses - Wireless or Wired (just connect cable)

Setup

Option ONE

Power on device

Press WPS Button on Router

Press Lock Button on Range Extender next to On/Off Button

The Signal LED will change to green to indicate success

Orange - Too Close to Router

Blinking Orange - Too far from Router

In these cases, use Option TWO

Option TWO

Power on device

Disconnect your Ethernet connection

Connect to TP_LINK_Extender (Wireless)

Open Browser and Connect to tplinkrepeater.net

Use admin for both username and password

Follow prompts

Appendix T - Troubleshooting

Lenovo

- Ideapad Y480 - keyboard errors

If keyboard is typing numbers instead of letters, especially corresponding to the number on the specific key, the problem is probably the numeric lock has been toggled. Simply press and hold the function key and then press the num lock key. Release both and test to see if the proper response has returned.

Appendix U

Appendix U - Ubiquiti

Firmware Update - Manually

(<https://help.ubnt.com/hc/en-us/articles/204910064-UniFi-Changing-the-Firmware-of-a-UniFi-Device>)

Start WinSCP

- Establish a SCP connection with device to be updated

- Transfer firmware file to /tmp/ folder

- Rename firmware file to fwupdate.bin

Login to the device with putty then,

- Execute the command `syswrapper.sh upgrade2 &`

- Note: the device will be updated and reboot at the completion of the upgrade

Appendix U - Ubiquity

PicoStation M2 - Menu Tabs

Ubiquity, Main, Wireless, Network, Advanced, Services, System. Tools, Logout

Ubiquity

AirMax Settings

Enable AirMax

AirView

AirView Port

Launch AirView

AirSelect

Enable AirSelect

Main

Status

Device Name

Network Mode

Wireless Mode

SSID

Security

Version

Uptime

Date

Channel/Frequency

Channel Width

ACK/Distance

TX/RX Chains

WLAN MAC

LAN

AP MAC

Connections

Noise Floor

Transmit CCQ

AirMax

Monitor

Throughput | Stations | DHCP Client | ARP Table | Bridge Table | Routes | Log

Refresh

Appendix U - Ubiquiti

Wireless

Basic Wireless Settings

Wireless Mode

SSID Hide SSID

Country Code

IEEE 802.11 Mode

Channel Width

Channel Shifting

Frequency, MHz

Extension Channel

Frequency List, MHz Enabled

Auto Adjust to EIRP Limit

Antenna Gain dB Cable Loss dB

Output Power Dbm

Max TX Rate, Mbps Automatic

Wireless Security

Security

WPA Authentication

WPA Preshared Key Show

MAC ACC Enabled

Change

NETWORK

Network Mode

Appendix U - Ubiquity

UBIQUITY PicoStation M2 - Wireless Access Point

These devices normally require a wired connection to the router.

Discovery Software or Firmware Upgrade: ubnt.com/support/downloads

Setup - Computer

Start, Control Panel, Network and Sharing, Change Adapter settings,
LAN, Properties,
IPV4, Properties,
Static IP 192.168.1.xx, (I used 77)
Subnet 255.255.255.0,
Default Gateway 192.168.1.1, OK

Setup - PicoStation

Power up PicoStation M2 and press the reset button for fifteen seconds

With browser go to 192.168.1.20 and login using ubnt for both user and password

Wireless Tab

Mode: Access Point
SSID: Name the AP
Country US
Channel Width 20 MHz
Security: WPA2-AES
Set PreShared Key
Change

Ubiquity Tab

Enable AirMAX - NO
Change

Advanced Tab

Distance: 0 - 32 Miles - Adjust to increase power / range

Network Tab

Primary DNS same as Router IP - 192.168 1.1
Alternately use DHCP if unknown
Change

Apply and logout
You may need to reboot the AP

Remember to change the Computers IP address back to Dynamic (Automatic)

Appendix U - Ubiquity

UBIQUITY PowerBeam M2-400 - PBE-M2-400 - Wireless Bridge

Appendix U - Ubiquity

UBIQUITY UniFi AP - Enterprise WiFi System - Wireless Access Point

Discover - use Unifi Discover program to locate device. Record MAC and IP addresses

Setup - use Unifi Controller version 5.2.9 or most recent version.

Program located at: <https://www.ubnt.com/download/unifi/>

Install Cat5 Cable to Unify AP and install other end to POE Connection on POE Adapter
Connect power cable to POE Adapter then to power source.

Reset AP to factory default by pressing reset button located next to CAT 5 connector on AP for about fifteen seconds.

Install Cat5 Cable from LAN to LAN Port on POE Adapter

Launch UBIQUITY Controller Software then click Launch Browser

Record device MAC Address and IP Address

Select and record SSID and Password

Set and record Administrator Name, Password etc.

Login

Under Current Site select Default and follow prompts.

“Upgrade”, “Provision”, “Connected”

When “Connected”, system is ready. At this point you can logout and begin using the system

Misc notes:

Start UNIFI Controller

login

Click Current Site

Default

Devices

. . . :13:49 Ver 1.2.1.328

“Pending Adoption”

[ADOPT]

“Connected Needs Upgrade”

[UPGRADE], “UPGRADING”

“PROVISIONING”

“CONNECTED”

Appendix U - Ubiquiti Software

Unify Controller Software - v 5.2.9

URL: downloads.ubnt.com/unifi - UniFi n.n.n Controller for Windows

Launch program -

Initial Menu -

Launch a Browser to Manage Network

Browser Menu -

Username -

Password -

Left Column Menu

Dashboard -

Statistics -

Map -

Devices -

Clients -

Insights -

Events -

Alerts -

Settings -

Delete Site

Live Chat Support -

Appendix U - Ubiquiti Software

Unify Controller Software - v 5.6.29

URL: downloads.ubnt.com/unifi - UniFi n.n.n Controller for Windows

Launch program -

Initial Menu -

Launch a Browser to Manage Network

Browser Menu -

Username -

Password -

Left Column Menu

Dashboard -

Statistics -

Map -

Devices -

Clients -

Insights -

Events -

Alerts -

Settings -

Delete Site

Live Chat Support -

Appendix U - Ubiquiti Software - Sequence

To Configure Device - from factory default *

With Device plugged in and displaying steady white

Install Unifi version 5.6.29

Click to Launch Browser to Manage Network

Next

Select Device

Next

Enter SSID and Security Key

Enter Administrator Name, email address and Password

Record Device authentication and Password

Skip Cloud

Sign in

follow prompts.

To Change SSID

With Device working - and *Controller running on the wired network with the Access Point

Start Unifi Controller ver 5.6.29

Click - Launch a Browser to Manage the Network

*Note: A connection not secure message may appear. If it does, select Advanced,
Add Exception, Uncheck Permanently store exception, Click Confirm*

Login

Click Green WLAN Circle

Click (left side) Settings

Click (left side) Wireless Networks

Select Desired SSID

Click Edit

Make the desired changes

Click Save

(Provisioning) wait for these two messages if necessary

(Connected)

Click User (right top) drop down

Click Logout

To Change Username -

Click Username

Click Edit Account

follow prompts

Make desired changes

Click Submit

Click User (right top) drop down

Click Logout

Appendix U - Ubiquity

UBIQUITY UniFi AC MESH - Wireless Access Point

Setup - use Unifi Controller version 5.6.29 or most recent version.

Program located at: <https://www.ubnt.com/download/unifi/>

Install Cat5 Cable to Unifi AP and install other end to POE Connection on POE Adapter
Connect power cable to POE Adapter then to power source.

Reset AP to factory default by pressing reset button located next to CAT 5 connector on AP for about fifteen seconds.

Install Cat5 Cable from LAN to LAN Port on POE Adapter

Launch UBIQUITY Controller Software then click Launch Browser

Record device MAC Address and IP Address

Select and record SSID and Password

Set and record Administrator Name, Password etc.

Login

Under Current Site select Default and follow prompts.

“Upgrade”, “Provision”, “Connected”

When “Connected”, system is ready. At this point you can logout and begin using the system

Appendix V

Appendix Virtual Box

Virtual Box - <http://oracle.com/>

VBox - Create shortcut on Virtual Machine Desktop

Right Click on desktop, New, Shortcut, Browse, My Network Places,
VBox Shared Folders, VBoxsvr, . . . then choose desired folder and follow instructions

Appendix - VPN

Virtual Private Network -

Build a Smart Raspberry Pi VPN Server - <http://bitman.org/irafinch/rpivpn/>

Appendix V - VNC

VNC - Real VNC Server

VNC - Real VNC Viewer

Raspberry Pi - Registration

Individual:

- Register a new account with realvnc.com
- with password

Device:

see:

<https://www.raspberrypi.org/documentation/remote-access/vnc/>

On Raspberry Pi to be accessed: Under Licensing, sign in using your RealVNC credentials

Select OK

Done

On computer to be used to access the Pi:

Run VNC Viewer

Sign in

Double Click Device to connect to

Follow instructions - if any

Appendix V - VNC - Carl

VNC: Note: With the VNC Free account there is a limit of 5 devices which can be associated with the account.

VNC to Home Raspberry Pi

Determine device and password from details stored on Home Raspberry Pi

This could be stored in the home/pi folder or in the Apache default folder

With TOR daemon running

Connect using putty to remote host

ssh

Configure browser settings to manual proxy

Select device to access from browser

Appendix V - Virus

Win.32 virus - Use Norton Power Eraser to find and eradicate viruses prior to installing Norton 360 or any other version of Norton Security.

Appendix W

Windows All

Source: This document, titled "Disc Boot Failure Message," is available under the Creative Commons license. Any copy, reuse, or modification of the content should be sufficiently credited to CCM (ccm.net).

When starting your computer system, a '**disk boot failure - insert system disk**' error can occur for several reasons, including either hardware or software changes. It may also occur if there is a CD or a diskette in the drive while starting the computer. An incorrect boot sequence, a newly installed hard drive, an unplugged hard drive or a damaged disk may result in the **the disk boot failure insert system disk error**. It is possible to **fix the disk boot failure error** by **restoring the boot sector** in the case of corrupt system files. If the disk is damaged, partitioning the disk and reinstalling the operating system will solve the problem.

Insert System Disc Error Message

If you see the error message "**DISK BOOT FAILURE INSERT SYSTEM DISK AND PRESS ENTER**", "**No system disk**", it means the computer could not find the operating system and therefore could not boot. Below are some possible causes and solutions.

Disc Stuck in the Drive

Check to see if this is the case - if so, remove the disc(s) and try again

Incorrect Boot Sequence

Enter the BIOS setup of your computer and edit the boot sequence so that the computer starts primarily on drive C.

New Hard Drive Installed

If a new hard drive has been installed, this message is quite normal. Insert the installation CD for the operating system you wish to use and then restart the machine, having made sure the CD-ROM is defined in the BIOS setup as first in the boot sequence.

Hard Drive Unplugged

Open the system unit and check the power cable of the hard drive is properly connected.

Corrupt System Files

It may be that some system files needed to boot the computer have been deleted or damaged or that the boot sector of the disc is damaged. To find out if this is the case, start the computer with a system disk or CDROM installation of your operating system (via the Recovery Console), and type "Dir C:" to check if the contents of the C drive are accessible. If they are accessible, the problem comes from missing or damaged files and you need to run the command:

```
fdisk /mbr  
sys c:
```

Note: Before restoring the boot sector with the command `fdisk / mbr`, it is recommended to use an antivirus running under DOS, such as f-prot. <http://support.microsoft.com/kb/166454/en-us>
<http://support.microsoft.com/kb/69013/en-us>

Appendix W- cont.

Windows All - cont

Damaged Disc

If the hard disk or a partition is damaged:

If it is detected in the BIOS setup, there is a chance that it can be recovered by Taboola

If so, try reinstalling the system through the installation CD, in order to reformat or recover the partition using a utility

This document, titled "Disc Boot Failure Message," is available under the Creative Commons license. Any copy, reuse, or modification of the content should be sufficiently credited to CCM (ccm.net).

Windows 10

Windows 10 - Download - microsoft.com/en-us/software-download/windows10

Windows 10 - Media Creation Tool -

Follow prompts

Windows 10 problems - Default printer keeps changing

Navigate to Windows Start menu.

Click "Settings"

Click "Devices" in the Settings dialog.

Make sure you are in the section "Printers & scanners"

Disable the setting "Let Windows manage my default printer" by setting it to "Off".

Click the Print & Share printer 'Print+Share' and select "Set as default".

Windows 10 - How to enter BIOS

In 'Settings,' select 'Update & security.'

Select 'Recovery.'

Choose 'Restart now.'

After your computer restarts, select 'Troubleshoot' from the menu that appears.

Click 'Advanced options,' then choose 'UEFI Firmware Settings.'

Windows 10 - Bing appears to hijack browser search

If you accept a suggestion while typing your search, it may be from another search engine and inadvertently take you to a BING or Other sarch.

To resolve this problem, turn off suggestions or type your complete search

Various versions of Windows - Restore system using F5 key while booting

If system fails to boot using normal sequences, the F5 key can be pressed during the POST to start a HIVE rebuild.

Toshiba - reinstall operating system - Windows 7

While booting the computer hold down the 0 - zero key, follow prompts

Acer - Boot Sequence

Hold F12 key during POST to select device from which to boot

Appendix W- cont.

Windows 10 - Remove Updates - Remove Automatic Updates

[To be done from within Windows 10 ->

Open Settings.

Navigate to Update & Security > Recovery.

<- To be done from within Windows 10]

Click on Advanced Startup.

On Advanced Startup screen, click on Troubleshoot .

Click on Advanced Options .

Click on Uninstall Updates.

On the Uninstall Updates screen, you will see two options - Uninstall latest quality update or Uninstall latest feature...

How to Uninstall Windows 10 Updates Manually

I would like to inform that, in addition to replacing updated drivers via the Device Manager or uninstalling recent updates via the Control Panel, Microsoft has also released a troubleshooter that allows you to hide updates and thus prevent Windows from reinstalling them until a revised version becomes available.

Download the troubleshooter wushowhide.diagcab from Microsoft; it's a standalone application, no installation required.

From the initial screen, click Next.

The troubleshooter will now detect problems and look for updates. On the following screen, you can either choose to:

Hide updates or Show hidden updates.

Click Hide updates, select the offending update/s, and click Next to resolve the issue.

To restore an update, select Show hidden updates from the respective screen, select the hidden update, and click Next.

The troubleshooter will do its magic and you should finally see a confirmation that problems were resolved.

Appendix W- cont.

Internet access / wireless - Long Range

Sending wireless signals outdoors seems to be difficult at best. Whether simply using inside router or a special outdoor mounted Wireless Access Point there is usually something which prevents the signal from reaching the desired point.

Outdoor pole mounted wireless access point -

Underground / above ground cabling -

TP-Link - several models are available

Ubiquity - several models are available

UeeVii - Wireless Bridge,

Appendix W- cont.

Wiring

Network Wiring -

Standard wiring of CAT5 Jacks - use T568B where possible

Note: IF NOT USED AS POE: pins 4-5 (Blue) and pins 7-8 (Brown) are unused

Also, in order to add a camera to an existing security system, the blue pair and the brown pair can be used as the two conductors for the camera line. BOTH of the Blue conductors need to be used to replace one conductor of the coaxial cable and BOTH of the Brown conductors need to be used to replace the other conductor.

Wireshark

Log data of desired port - eth0 etc.

```
ifconfig eth0 > filename.log
```

```
tcpdump -s0 -ni eth0 -w filename.pcap
```

Note: if tcpdump is not found, install it. - see tcpdump in Rpi Guide

Appendix X

Appendix Y

Appendix Z

Glossary

Run Away - Process where collector temperature increases faster than the heat exchanger can absorb the heat being generated.

BTU - amount of heat required to raise one pint (one pound) of water one degree fahrenheit.

50gal = 400 pint

80gal = 640 pint

640 BTU per degree

10 degrees = 6400 BTU

Header - 26 pin(RPi) - 40 pin (RPi2 up) Shrouded Header

used on circuit board as connector for ribbon cable from computer

IDC - Insulation Displacement Connectors

MSC programs

devmgmt.msc - Device Manager Program

services.msc - Microsoft Management Console

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