



VHF Group
Wireless Hill Museum
Proposal for Amateur Radio Shack
Draft

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1. Introduction

The VHF Group is in the process of considering projects which will allow more members to become actively involved in club activities. As a consequence the committee has recently considered renewing interest in a proposed amateur radio shack located within the Melville Wireless Hill Museum.

This document presents a list of proposals to members, for projects, from which comment is invited. None of the items currently mentioned are “set in stone.” They form a basis for discussion, upon which final implementation will depend on the views of members within the VHF Group.

2. Objectives

The project does not have a final objective “per se.” The proposal is for an ongoing project where new ideas and technology are constantly being implemented as money and resources allow.

The objectives are as follows

- 1) To encourage members, both existing and new, to become involved in the various facets of amateur radio, without having to feel the need to outlay large amounts of money directly.
- 2) Have a central repository where members can access test equipment for developing their own designs.
- 3) Create a repository of knowledge gleaned from building the shack.
- 4) Prompt the amateur radio hobby to the general public.

As circumstance would have it, several by-products of the project have also been identified. These include the following.

- 1) Community benefits in the form of enhancing displays within the Wireless Hill Museum.
- 2) An educational facility which demonstrates the ability of differing technologies to merge and complement each other.

3. Implementation

Due to the wide variety of technology available, the scope for this project can be potentially huge. Care needs to be taken to formulate long term planning with short, easily managed objectives. As a consequence, the following sections will describe the strategy under consideration.

Other considerations, of course, include the owners of the Wireless Hill Museum, namely the City of Melville. The build has significant heritage value and any equipment installed will require consultation with, and the permission of the curator. Preliminary discussions have been promising with both parties showing enthusiasm. Issues have already been raised concerning use of the site (see section 4). Further discussions should highlight requirements that need to be met by the group.

3.1 Long Term

In the long term it is hoped that the radio shack will become a showcase of amateur radio technology. The sections that follow show the projects under consideration.

3.1.1 Beacons

The current investment by the group in beacons is to be maintained. Enhancement of beacons located at Wireless Hill with remote monitoring and possibly improved accuracy can act as test bed for future deployments.

Beacon activity is to remain a principle activity for the group.

3.1.2 Central Console

The central console is a work space designed for, up to, two operators to control and operate all the equipment installed in the shack.

The console will include the following features

- 1) Multiple PC computers for operating the digital aspects of the shack.
- 2) Two monitors, one for each operator.
- 3) Two headset and microphone access points, one for each operator.
- 4) Two speakers for monitoring purposes. One for each operator.
- 5) Two remote audio lines that allow monitoring of amateur activity within the museum.
- 6) Two remote video lines that allow monitoring of amateur activity within the museum.
- 7) Two access points for allowing operators to bring in their own radios and utilise them in the shack.
- 8) A 19inch rack to allow the installation of 19inch sub-racks. The sub-racks will have the following capability.
 - a) Radios are to be mounted on plug in cards with standard interfaces.
 - b) An audio switch matrix which allows the audio and microphone paths to be switched between operators and the various radios.

- c) A RF switch matrix which allows the radios to be switched between various transverters and/or antennas.
 - d) A digital switch matrix which allows control of those radios with remote control facilities.
- 9) A clock with time derived from a GPS signal.

3.1.3 Antenna Arrays

External antenna configurations will vary from simple quarter wave vertical's to multi-element Yagi's. Configurations are yet to be determined, but the initial bands to be covered involve the following.

- 1) 6m.
- 2) 2m.
- 3) 70cm.
- 4) 23cms
- 5) 2.4GHz.
- 6) NOAA satellites.

A particularly interesting sight for the general public would be a rotating of dish, or helical antenna, tracking satellites during an overhead pass. There are several practical issues involved in implementing such a scheme. These include mounting arrangements, cable runs and public safety. It is felt this would entice visitors to the Wireless Hill picnic area, to visit the museum.

3.1.4 Antenna Switching Cabinet

All external antennas are to terminate at an antenna switching cabinet. If deemed interesting enough the cabinet could have a perspex door to allow visitors an internal view.

3.1.5 Transverters

It is envisaged that the first transverters will occupy the following bands.

- 1) 23cm.
- 2) 2.4GHz.

3.1.6 Internet

The internet has become a far reaching, research and study tool. As the group already has a site, it would be considered advantageous to expand on its use. For this reason it would be good if visitors to the web site were able to directly access certain aspects of the operation. Access would be limited to information and control that does not require license pre-conditions. Such access could involve the downloading of pre-recorded files, or, monitoring the audio of a satellite pass in real time.

Where permitted as part of license conditions, club members may operate ham equipment remotely. This may involve the use of a receiver to monitor the quality of the audio emanating from their QTH transceiver.

3.1.7 Test Equipment

Members would benefit immensely if donations of test equipment could be made for the site. This would allow members with limited resources to improve their designs and facilitate the development of the shack.

3.1.8 Tools

Members may find it inconvenient to cart tools to and from their home QTH. The construction of a shadow board with two sets of basic tools such as wire cutters, pliers and soldering iron. The person responsible for a work session has to ensure all tools are returned before leaving.

3.2 Stage 1

To show commitment by the group towards the radio shack, it is proposed the following activities need to be accomplished for stage 1 of the proposal.

- 1) Design an overall electrical layout of the shack.
- 2) Design an overall electrical layout of the console.
- 3) Mechanical design and construction of the console.
- 4) Construction and fitting of the tool shadow board.
- 5) Integration of two radios manually controlled within the console.
- 6) Integration of two PC computers and associated keyboards, monitors, etc, within the console.
- 7) The construction and fitting of the following antennas.
 - a) 2m vertical.
 - b) 139MHz antenna capable of receiving the NOAA signal.
 - c) 2.4GHz omni-directional.
- 8) Two video feeds to remote monitors.
- 9) Two audio feeds to remote speakers.

Further stages will be planned as Stage 1 builds momentum.

4. Museum Considerations

As mentioned previously, it is hoped that the group will form a closer working relationship with the Wireless Hill Museum. It is felt the museum will benefit from showing the implementation of current radio related technology with the historical equipment already on site.

The group has expressed regrets that it cannot supply an operator on a regular basis to guide members of the general public through the shack. However, it has indicated that whilst members are working in the shack during museum open hours, we would be happy to answer questions from any member of the public related to our activities in the museum. As for other times, it is hoped the video and audio content left active, will be of sufficient interest to the public.

The group would like the museum and consequently the City of Melville to make some contributions to its continuing operation in the shack.

Assistance can be given in the following forms.

- 1) Free access to the museum, out of hours, by members of the group.
- 2) Security changes to allow the alarm to be turned off at those areas of the museum where members of the group are performing work.
- 3) Wiring of an electricity sub panel in the shack, to allow isolation of electrical equipment when desired.
- 4) A high speed 1.5Mbit/sec ADSL link.
- 5) Power to maintain the operation of the systems.

Some issues have arisen, to which further information is being sought.

- 1) Occupational Health and Safety.
- 2) Insurance.
- 3) Placement of antennas around the building.
- 4) Use of the Wireless Hill callsign to promote the museum.
- 5) The placement of a viewing window so that members of the general public can see work being undertaken.
- 6) Designating committee members to act as overseer, whilst members of the group perform activities at the site.

End of document
