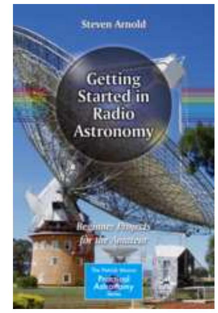

Title: ***Getting Started in Radio Astronomy***
Author: S. Arnold
Publisher: Springer
ISBN: 978-1461-481560
Date published: 2014
Length: 208 pages, 3 page index
Status: In print
Availability: Paperbound 25 to 30 USD
Reviewer: Whitham D. Reeve

My first impression of ***Getting Started in Radio Astronomy*** was that it might be a book written for a young audience. It has limited scope, so the reader is not overwhelmed by jargon and terminology associated with the many complex facets of radio astronomy. Almost the entire first half of the book is spent on history, basic electricity and magnetism, atmospheres and ionospheres of some planets including Earth and electrical components used in the construction of radio receivers. The style is conversational but often wordy. Some descriptions seem to be written for elementary school students while others appeared written for middle school students (Jupiter's moon Io is called a "flying pizza"). Much better introductory presentations on radio astronomy can be found elsewhere, particularly on NASA's and some universities' website. The book is illustrated with a few color and black-white images but the captions add little to the book.

Getting Started in Radio Astronomy is a member of **The Patrick Moore Practical Astronomy Series**, which by the beginning of 2015 contained 131 volumes. It is the only book in the series I could find on radio astronomy. The book's prerequisites are minimal. In the chapter on basic electricity and magnetism, the author refers to current flow as "electrical pressure", hinting of the old analogy of water flowing in a pipe to describe the flow of electrical current. Other analogies are used including comparing the transition of an electron from one energy state to another to Earth "jumping" from its present orbit to the orbit of Mars. These indicate the level at which this book is written.

What this book has to offer are detailed descriptions and dedicated chapters for SuperSID, Radio Jove, INSPIRE and radio detection of meteors. SuperSID is a very successful project originated by the Stanford Solar Center at Stanford University in California. SARA became involved in the project several years ago and now handles distribution and technical support. The SuperSID is a small receiver used in conjunction with a loop antenna and PC soundcard for monitoring sudden ionospheric disturbances caused by solar flares. Radio Jove is a very successful NASA outreach project originally designed to detect high frequency radio emissions at 20 MHz from Jupiter but it also detects solar radio bursts at the same frequency. A dedicated group of individuals, some SARA members, handle distribution of the Radio Jove receiver and dipole antenna kits and provide technical support. The Interactive NASA Space Physics Ionosphere Radio Experiments, or INSPIRE, dates back to 1989 and is another education outreach project. At the center of INSPIRE is the VLF-3 receiver kit, which is used to receive very low frequency natural radio. All of these projects are well documented and supported in their own right, and the associated electronics are easy to build and the software easy to use.

In the dedicated chapters on SuperSID, Radio Jove and INSPIRE, the author describes in detail his construction and application of the projects. I believe the author intended that these descriptions fill gaps in the original instructions or to serve as supplementary construction aids. However, there are so many errors and confusing statements that I think a reader would be far better off simply following the original instructions and then contacting the relevant support group if questions arise.

Flaws surface early in the book and continue throughout. The author says of the SuperSID: "*It can be used in conjunction with the Radio Jove receiver, and by looking at the data it gives a good indication that a possible aurora is on its way.*" While it is true that the SuperSID could be used to observe along with the RJ receiver, this statement inadequately describes why, what and how. The author provides no information on how to gather and actually interpret ("look at") the data. I think he would have served his readers better by breaking down the phenomena and explaining how each may be detected and how the observations may be interpreted.

Additional problems are apparent in the Glossary at the back of the book. A resistor is defined as "*a semi-conductor ....*" – a confusing misuse of the term. ARRL is called *National Association for Amateur Radio* instead of its correct name American Radio Relay League. On the other hand, ***Getting Started in Radio Astronomy*** has a few plugs for the Society of Amateur Radio Astronomers, SARA. The book does have a section in the back with a short list of references, which is very unusual in books written for the amateur market. Interestingly, I have reviewed many of the listed references in previous issues of the SARA journal, and readers may find some of these already on their bookshelves.

Flaws in ***Getting Started in Radio Astronomy*** are not limited to those described above. There are a number of technical distortions. For example, the author states the Sun has been "*throwing out*" the solar wind since nuclear fusion started in its core "*millions of years ago*". Billions of years would have been a better choice of time frame.

The chapter on meteor detection mentions "... *a powerful space radar in the United States that monitors satellites and other objects ... in Earth's orbit.*" This most likely refers to the AN/FPS-133 US Air Force (formerly US Navy) space surveillance radar or "space fence", which was shuttered in 2013 not long before ***Getting Started in Radio Astronomy*** was published. Meteor trail reflections from the radar's transmitter required a receiver operating on about 217 MHz, but the frequency is not mentioned (and does not matter now, anyway). Many observers use distant FM or TV broadcast stations as the transmitting end of meteor trail reflections, but HF beacons and time service signals also work. The author fails to mention these common transmitters.

As I read the book I placed a sticky-note wherever I noticed a problem, as I often do when reading a book for review. When I finished, the book was full of colored notes. While none of the individual problems cripple the book, they do add up to a major annoyance and call into question the book's overall usefulness – especially for newcomers who simply do not know they are reading the wrong explanation.

The author concludes the book by saying he hopes the "*book dispels the idea that huge parabolic dish antennas are needed in the garden ....*" However, like many books written for amateur radio astronomers, the front cover image of ***Getting Started in Radio Astronomy*** is, in fact, a large professional parabolic dish antenna. Why is that? I have no idea. One must ask, if a huge dish antenna is not needed, why is there a picture of one on the book's cover? By the way, even though large dish antennas are far beyond the financial and managerial means of most if not all amateur radio astronomers and their organizations, there is one notable exception as I write this review in mid-2015. The Astronomical Society of Victoria – Radio Astronomy Section is installing a repurposed 8.5 m dish antenna at their Leon Mow Radio Observatory near Melbourne in Australia. Readers can follow their progress on the ASV-RAS Yahoo group.

This is largely a negative review but the book has potential and plenty of room for improvements in a future edition. Does the book have value and is it worth 25 to 30 USD? I believe the value is the author’s focus on four specific projects. One of the most common questions I hear is, “What should I do to get started in radio astronomy?” Any one of the projects in this book will provide a good starting point to a newcomer. However, the cost of many books these days defies reason, and it is very rare to get your money’s worth in a book written for the amateur market. Unfortunately, ***Getting Started in Radio Astronomy*** is no exception.