# Monthly Newsletter

# Of The

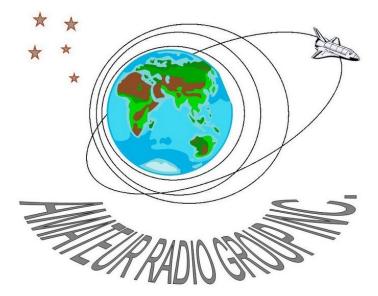
# Ballarat Amateur Radio Group Inc. #6953T

Box 1261, Mail Centre, Ballarat, Victoria, 3356, Australia.

# **Next Meeting:**

Friday, 30th of May, 2014, 7.30 pm





# Contents

Vol.27, No.4; April 2014

www.siliconchip.com.au

## Features

### 14 Autonomous Ground Vehicle Competition

University students from all over Australia pit their designing, building and programming skills to "drive" a driverless vehicle around an obstacle course. No human intervention allowed! – by Dr David Maddison

#### 22 So You Think You Can Solder?

It's a critical skill for electronics professionals and hobbyists but most of us have had no formal training in soldering. An IPC soldering training and certification course taught us far more than we ever expected – by Nicholas Vinen

27 Review: Thermaltronics TMT-2000S-K Soldering Station Professional soldering station has Curie-point regulated induction heating for fast thermal recovery and accurate temperature regulation. It also features automatic shutdown when the iron is in the workstand – by Nicholas Vinen

# Projects To Build

#### 30 40V Switchmode Bench Power Supply, Pt.1

New design combines switchmode and linear regulators for high efficiency and low output noise, with up to 5A output. It has voltage and current meters, adjustable current limit with display, 12-24V DC input and a front panel load switch – by Nicholas Vinen

- **56 USB-To-RS232C Serial Interface** Want to connect an older test instrument or PC peripheral fitted with a 'legacy' serial RS-232C interface to your late-model PC or laptop? Here's the solution: build this USB-To-RS-232C serial interface – by Jim Rowe
- 66 A Rubidium Frequency Standard For A Song Want to make laboratory-standard frequency measurements? It's now possible for a very low price; just buy a used rubidium-vapour frequency standard on-line and build our simple power supply and buffer circuit – by Jim Rowe

## Special Columns

- 38 Serviceman's Log Musical instruments: a whole new ballgame – by Dave Thompson
- 53 Salvage It! Harvesting old printers for parts – by Bruce Pierson
- 62 Circuit Notebook (1) PICAXE-Based Music Box or Doorbell; (2) 2-Cell Lithium-Polymer Charger Has Balancing Feature; (3) Three-Decade Timebase Period Divider
- 82 Vintage Radio Made in New Zealand: the 1957-60 Pacemaker radio – by Dr Hugo Holden

## Departments

2 Publisher's Letter

80 Product Showcase

4 Mailbag

- 88 Online Shop 90 Ask Silicon Chip
- 75 Subscriptions 95 M
  - 95 Market Centre
  - 96 Notes & Errata



Autonomous Ground Vehicle Competition – Page 14.

40V Switchmode Bench Power Supply – Page 30.

USB-To-RS232C Serial Interface – Page 56.

A Rubidium Frequency Standard For A Song – Page 66.

APRIL 2014 1



#### **REVIEW WITH CRAIG, VK3KG**

REVIEW of the APRIL Edition of QST for 2014.

QST 4 APRIL 2014.

- P9 Editorial Our Gateway to Wireless Communications.
- P24 Letters:
- P30 D-Terminal: Arduino meets D-STAR.
- P33 A Tiny Python Panadapter. For a KX3 or other devices.
- P39 A Series Resistance Meter uses Operational Amplifiers. Check the ESR of your capacitors.
- P42 Crystal Phasing. Understand why its used on older radios.
- P44 Build this 10 Meter MOXON 2 element Antenna.
- P46 Windows XP. Goodbye, Old friend. Hello to Win 7 &8.
- P48 The Omnidirectional Hentenna. All copper construction.
- P51 Review: Wouxun KG-UV920P-A Dual Band Transceiver. Popular Chinese base/mobile set has some differing program steps but runs up to 50W on VHF and 30W on UHF. <u>www.wouxaun</u>
- P55 160-80-40 M Apex Loop Array antenna.
- P58 The Doctor: Tune an amp on Hi or Low power.? Tilting an HF beam for better takeoff? Using AM on an older SSB High power Linear.
- P61 The MFJ 902 Antenna Tuner.
- P62 Microwavelengths. Diffraction, Scattering and Reflections.
- P64 Eclectic: Chat and the H4FSK Vitual TNC
- P65 Hands on Radio. Experiment 135 Crimp Connectors
- P67 Hints & Kinks. Primitive Paddle, a Buzz for CW, and a Sonic Antenna Tuner.
- P72 Extending the Limits. Historic look at theyears from WW1 when Amateur radio was growing.
- P75 Logless Logging.
- P76 WARC-2015 The FCC considers comments on Draft recommendations.
- P80 Public Service: High Speed Networking: Time to Net its Benefits.
- P89 How's DX? Banaba Island, Kiribati. T31A Contacts and dental service made.
- P91 World above 50Mhz. Working Grids EL08 and EL18 on 2&6. Also some Moonbounce
- P95 Amateur Radio: The next 25 years by Tim VE6SH/G4HUA President IARU.
- P96 VintageRadio: Heathkit DX-60 Transmitter.
- P100 75, 50 & 25 years Index.
- P156 QST Index of Advertisers. And that's all for this months reading.

73 Craig, VK3KG

### George Fowler Auction 2014

This was held on Sunday May 25, 2014 at the BARG Clubrooms.

About 40 + Ladies attended the auction. Soup and rolls were again supplied by BARG.

Bob, VK3BNC was again the auctioneer...









## **B.A.R.G** Items for Loan.

Antenna Analyser MFJ269 HF-VHF-UHF Antenna Analyser MFJ249 HF/VHF UHF Antenna Analsyer Antenna Analyser VHF. Autek. Receiver Drake SSR-1. Receiver FRG-7. Transceiver TS-530. Oscilloscope BWD 509. Grid Dip Oscillator. Safety Belt. Antenna Gin Pole.

