

the

Monitor

April

The MRCS Officers

2011

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Ken Myers
(see above)

The Next Meeting:

Date: Wednesday, April 6, **Time:** 7:30 p.m.
Place: EAA building, Mettetal Airport, Plymouth, MI

What's In This Issue:

The March Meeting Notes – March Show and Tell
Barry Jones Nieuport 17 - 2.4GHz Presentation Highlights
Upcoming Events

The March Meeting

The video before the meeting was about Charles Lindberg's flight. The video was streamed from the Internet. The videos are found at <http://www.airportappraisals.com/>

Arthur Deane then presented a slide show presentation showing what a great flying season 2010 was at the field.

The guest speaker was **Arthur Deane**. He presented information on the 2.4GHz radio systems we use today. (see 2.4GHz Highlights)

Several members renewed their memberships for 2011 near the beginning of the meeting.

Alan Minsterman was a visitor to our meeting and also became a member. Welcome aboard Al.

After the presentation, **Arthur** started the business portion of the meeting by calling on **Lynn Morgan** to tell us about our 2011 membership drive. We now have 69 current members. About 60 are dues paying and we are at about 87% of our peak for last year.

Ken Myers noted that the dates for Mid-Am are July 9 & 10 for this year. Arthur brought up the FAA possible

flight restrictions. Go to AMA site for petition signing to send a letter to your congressman to get the current Senate bill passed by House.

March Show and Tell



Ken Myers shared information on his latest design. It is a 1/9-scale An-2 biplane. He showed photos of the full-scale, to familiarize the members with the aircraft, and showed mock-ups of some of the troublesome design areas of the model.

Helicopter Frequencies

21,27,29,39, 41

Sailplane Frequencies

11, 12

**The Nieuport 17
Barry Jones' Winter Project**



Hi Ken,

I have attached pictures of my winter project. It is a 1/4 scale Balsa USA Nieuport 17. Everything is complete except the paint for the wheels and the rudder. I need warm weather for that.

The airplane was slung and the plane balanced perfectly. The sling balance is shown in one of the photo.

It has a Zenoah 26 engine. It is controlled with 1 rudder, 2 elevator, 1 throttle, 1 engine kill, and 2 aileron servos. It weighs 14 lbs.

I would bring it to the meeting but it takes a little while to set up and my van is not set for airplanes right now.

Barry Jones



2.4GHz Presentation Highlights

1. Manufacturers are very secretive about their technology. They do not discuss current practice and future developments. Probably related to licensing agreements and potential copying.
2. Model aircraft demands require a continuous and accurate response.
3. For RC use, accuracy and reliability matter more than transmission speed.
4. A radio control equipment manufacturer saw an opportunity to use modern electronic technology to overcome the single user per channel restriction and gain a competitive edge over their competition.
5. Spread-spectrum signals are coded and transmitted over a range of frequencies. The receiver is mated to the transmitter, which decodes these signals. Other transmitted signals on same frequency appear as noise and are ignored.
6. The spread spectrum bandwidth is 2.4 GHz to 2.4835 GHz with 80 channels of approximately 1MHz width. 75 to 79 channels are actually used. Individual manufacturers may limit their systems to certain sets of channels determined in advance or selected as least occupied.
7. Each individual FCC approved Spread Spectrum Tx has a unique Global User Identifier (GUID) built into it. The user's Rx must be tied (bound) to the code. There are 4.2 billion GUID codes available. Each control signal from the TX contains the GUID, which allows the RX to identify true signals and filter out in correct signals as noise. Electrical interference from motors, ignitions and ESCs is generally less than 300 MHz and does not effect 2.4GHz systems
8. Two types of control system are currently mandated:
 - Direct Sequence Spread Spectrum (DSSS)** where the transmitter and receiver stay within a predetermined channel or channels of the 2.4GHz spectrum.
 - Frequency Hopping Spread Spectrum (FHSS)** where the transmitter and receiver constantly change their operating frequency within the allowed limits of the 2.4GHz band.

Hybrid systems may combine features of both systems. Futaba, Airtronics and Hitec Systems are based on a FHSS strategy. Other RC systems use DSSS.

To improve reliability, most RC systems have hybrid features have built into them.

9. **Adaptive Frequency Hopping** improves resistance to interference by avoiding crowded frequencies.

10. Multiple users capability on each channel now allows manufacturers to offer built in telemetry from plane to TX.

11. **Binding** - Each manufacturers' system has a specific binding procedure. The transceiver in the plane must be linked (Bound) to its specific hand-held transceiver containing the specific GUID Code.

12. **Fail Safe** - Manufacturers recommend setting up a Fail Safe Plan to establish a flight path if the signal is temporarily lost. A receiver may go into fail-safe mode on start up, therefore the landing gear failsafe position should be down.

13. The manufacturers' recommendations for antenna placement **MUST** be carefully followed to avoid loss of signal.

14. Range checking of 2.4GHz systems is **critical** to prove out the correct antenna placement. The receiver antenna/antennas' must be more than 12' off the ground to obtain accurate test results. Generally, to reduce signal strength for range testing, a button on the transmitter is pushed and held.

15. The major suppliers in the US market are, JR /Spektrum, Futaba, Hitec, Airtronics and Multiplex. The big three hobby supply companies, Tower Hobbies, Horizon Hobby and Hobby Lobby, also have special 2.4GHz systems from the orient combined with certain RFT planes.

16. Spektrum brand is updating to an AFHSS type system that they call DSMX.

17. Hitec 6-ch and 7ch transceivers uses a single antenna lead with a BODA (Boosted Omni Directional Antenna) antenna. While the Optima 9-ch uses dual BODA antennas.

18. There are alternatives to the popular brands, although they remain less proven.

XPS was originally a module based system single channel non-hopping DSSS system. It has developed into a hopping system.

Assan Another DSSS non-hopping system from China.

iMax Another Chinese system

These are low cost systems. Before becoming an early adopter potential buyers should review the comments in Internet discussion groups.

19. Each manufacturer has a different transmission and coding plan. As a result, the components from different manufacturers cannot be mixed.

20. Low cost alternative receivers from Asia are coming on the market. There is an alternative design from Hobby King for the Futaba receiver. It is not a pirated copy. The initial response has been positive.

The Hobby King clones for the Spektrum receivers have raised questions regarding range and dubious distribution channels.

Before becoming an early adopter potential buyers should review the comments in Internet discussion groups.

21. The fact is that all systems whether DSSS or FHSS have demonstrated reliable and interference free operation capable of handling multiple users.

22. Which is the best 2.4 GHz system?

It is like buying a car. Some people have a long-term commitment to a particular brand. Some buyers spend a lot of time researching the best technologies. Others simply admire the lines and kick the tires.

23. For further information on Spread Spectrum systems

<http://www.sss.mag.com/ss.html#tutorial>

http://www.hpl.hp.com/personal/Jean_Tourrilhes/Linux/Linux.Wireless.modem.html

24. Ken Myers recommends that you visit the RC Model Reviews Web site at

<http://www.rcmodelreviews.com/> and check out the information provided by its author and reviewer on 2.4GHz systems

To change your email address contact Ken Myers at kmyersefo@mac.com

The 2011 membership application is available at the club Web site, <http://www.midwestrcsociety.org>, for downloading with the link on the homepage.

IMPORTANT: Channels 36 & 56 May NOT be used at the 7 Mile Rd. Field

Upcoming Events:

March 30, 2011 (Wed.), An Evening with Horizon Hobby, presented by Skymasters, Ultimate Soccer Arenas, 7 p.m.
Info: <http://www.skymasters.org/events/flyers/meeting11-03-30.gif>

April 1-3, Weak Signals Toledo Show, Seagate Centre, Toledo, OH <http://www.toledoshow.com>

April 6, Wednesday Midwest monthly meeting
Aviation Video starts at 7:00, meeting at 7:30. Bring your projects to share.

April 27, 2011 (Wed.) Castle Creations, Patrick del Castillo joins the Skymasters for the evening. 7 p.m. Larson Middle School, Troy, MI
<http://www.skymasters.org/events/flyers/meeting11-04-27.gif>

Full-size Antonov An-2 Colt



Shows relative size of the Aircraft

Ken Myers shared some information on this Russian behemoth biplane at the March meeting.

For more information on the full-scale and the design of his 1/9-scale model, see the February and March EFO *Ampeer* newsletters.

<http://homepage.mac.com/kmyersefo/ampfeb11/ampfeb11.htm>

<http://homepage.mac.com/kmyersefo/ampmar11/ampmar11.htm>



The Midwest Monitor/Ken Myers
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