RCA AMATEUR RADIO CLUB

Legacy Amateur Radio Club

AFFILIATED CLUB

INDIANAPOLIS, INDIANA

MARCH, 2017 MONTHLY NEWSLETTER

THE NEXT MEETING OF THE RCA AMATEUR RADIO CLUB WILL BE
TUESDAY, MARCH 14th, 6:30 PM AT G.T. SOUTH'S,
5711 E. 71st STREET, INDIANAPOLIS, IN

RCA ARC NEWS

SUMMARY OF THE FEBRUARY MEETING – At the Feb. 14 meeting, the repeater continuing problems were discussed at some length. Jim, K9RU, is preparing a second final amplifier to be used as we think the problem may be related to an intermittent parasitic oscillation in the final amp. Field Day (June 24-25) will again be a joint effort with Indy Radio Club, W9JP, at Camp Belzer. The recent RTTY Contest was discussed as was the upcoming ARRL DX (CW and phone). The Indy Radio Club will again sponsor a bus to the Dayton Hamvention on Saturday, May 20. Jim Keeth AF9A talked about JT65 and his experiences operating the mode.

SEVERE WEATHER WEEK AND STATE WIDE TORNADO DRILL – Indiana sees an average of 22 tornadoes a year. Indiana has already witnessed a couple at the beginning of March!

The Indiana Department of Homeland Security is asking Hoosiers to plan ahead for tornado season and participate in the Statewide Tornado Drill on Tuesday, March 21.

A test of the Emergency Alert System will sound both in the morning and evening on commercial radio, television networks and all-hazards radios.

As part of the drill, Marion County Amateur Radio Skywarn will run a Skywarn net on the 146.760MHz repeater during both drills.

The drills will be at 10:15 a.m. and 7:35 p.m. Tuesday, March 21.

March, April and May are Indiana's most severe tornado months, although tornadoes have occurred at all times of the year.

If you have questions free to send us an email at mcinares@gmail.com

NEXT RCA / IRC AMATEUR RADIO LICENSE TEST SESSION

Time: Saturday, March 11th. Exams start at 12:00 noon. Walk ins allowed.
Location: Salvation Army EDS Training Facility,
4020 Georgetown Rd,
Indianapolis, IN 46254
Contact: Jim Rinehart k9ru@arrl.net 317 721-1458

THE INDIANAPOLIS RADIO CLUB HAS CHARTERED A BUS TO THE DAYTON HAMVENTION – The day trip will be on Saturday, May 20, with tickets for the bus running $30 per person (same as last year). The bus has two pickup and drop off points in Indianapolis, Southern Plaza and Peddlers Mall. Stop for breakfast at McDonald's in Richmond and dinner on the way at MCL at Richmond. Contact Rhonda Curtis, WS9H, for more details and to purchase

bus tickets: ws9h@comcast.net. You can buy ticket at an IRC meeting or mail a check made out to the Indianapolis Radio Club to Rhonda Curtis, 5936 Riva Ridge Dr. Indianapolis IN 46237.

Note that the bus ticket does not include admission to the show. Hamvention tickets are on sale now via their web site at http://hamvention.org/purchase-tickets/

THE LAST DAYS OF RCA BUILDING 1, Mar. 8, 2017 – K9RU reports building 2 has been torn down as has the one across the street which was a warehouse.

INDY MINI-MARATHON, MAY 6, AMATEUR RADIO VOLUNTEERS – It is not too early to start thinking about volunteering to help out with the amateur radio communications for the Mini-Marathon. This is a lot of fun and there are the 500 Festival "perks", such as the free t-shirt, volunteer day passes at the IMS track, etc.
For more information contact:

Michael R. Palmer, N9FEB
Marion County IN Events Coordinator for Ham Radio
7461 Hague Rd., Indianapolis, IN 46256
(317) 849-3602 home, (317) 753-8691 cell, www.IndyHams.org

HAMFESTS, OPERATING EVENTS, VOLUNTEER OPPORTUNITIES

Mar 11	Skywarn Spotter Training at Salvation Army EDS
Mar 13	Marion County Skywarn Spotter training https://www.weather.gov/ind/spotter#train
Mar19 - 25	Severe Weather Awareness Week
Mar 21	Tornado Siren Test and Skywarn Test Net
Mar 25	Sam Costa Run, Hamilton County
Apr 1	Columbus Hamfest http://www.carcnet.net/
Apr 5	ARRL Frequency Measuring Test (Wed. evening, in the US)
May 6	500 Festival Minimarathon
May 19-21	Dayton Hamvention http://hamvention.org/
May 27	500 Festival Parade
June 24-25	ARRL Field Day
July 7-8	Indianapolis Hamfest http://www.indyhamfest.com/

Opportunities for public service: http://indyhams.org/events

ARISS INTERNATIONAL CHAIR FRANK BAUER, KA3HDO, IS HAMVENTION'S AMATEUR OF THE YEAR

Dayton Hamvention® has announced its 2017 award winners for Amateur of the Year, Club of the Year, and Special Achievement. Each year, Hamvention honors radio amateurs who have made major contributions to the art and science of Amateur Radio.

Amateur of the Year – Amateur Radio on the International Space Station International Chair Frank Bauer, KA3HDO, of Silver Spring, Maryland, is Hamvention's 2017 Amateur of the Year. Bauer has been a driving force behind the program since its inception. He also serves as AMSAT-NA Vice President for Human Spaceflight.

In the mid-1990s, Bauer proposed an experiment to have the high-Earth orbit (HEO) AMSAT Phase 3D satellite (AO-40) measure the signal strength of the GPS satellite constellation. The AO-40 experiment subsequently has been cited often in aerospace literature, as it remained the most comprehensive above-the-constellation data source for nearly a decade and led to changes in the system's specifications and applications. The results of the AO-40 experiment jump started a game-changing transformation in navigation at HEO/GEO altitudes, enabling new and exciting missions in these orbits.

A radio amateur since 1974, Bauer holds bachelor's and master's degrees in aeronautics and astronautics from Purdue University. His career in aerospace spans 4 decades at NASA and within private industry.

In 1983, in preparation for the space mission of Owen Garriott, W5LFL, Bauer was responsible for setting up and operating the worldwide retransmission of space shuttle air-to-ground communications via Goddard Amateur Radio Club station WA3NAN. This initiative provided a critical conduit of information to hams attempting to contact ham-astronauts in the pre-internet era.

Club of the Year --The Clark County Amateur Radio Club (CCARC) of Vancouver, Washington, is the Hamvention Club of the Year for 2017. Established in 1930, the club serves southwest Washington and northwest Oregon. CCARC has been an ARRL-affiliated club since 1932, and is an ARRL Special Service Club.

Special Achievement Award --S. Ram Mohan, VU2MYH, of Hyderabad, India, will receive Hamvention's 2017 Special Achievement Award. Mohan is the Executive Vice Chairman and Director of the National Institute of Amateur Radio (NIAR) in Hyderabad, India. Licensed since 1988, he has conducted a number of experiments on HF and VHF communication equipment and carried out propagation tests, organized training programs, DXpeditions, workshops, and general Amateur Radio activities, including public service communication.

Technical Achievement Award – Rob Brownstein, K6RB, is the recipient of the Hamvention 2017 Technical Achievement Award. Licensed in 1958 at age 11, Brownstein could hardly wait to upgrade to General and get on SSB, but he soon discovered that he enjoyed operating CW much more.

So, he put his microphone aside and never looked back. In January 2010, Brownstein was among about a dozen hams on several continents who founded the CW Operators Club (CWops).

In 2012, he was elected president of CWops and served two consecutive terms. During his tenure as president, Brownstein encouraged and participated in all aspects of the club, from ragchewing and contesting to mentoring, through CW Academy, begun in earnest in 2012. Since then, the Academy has mentored more than 800 radio amateurs through its beginner, intermediate, and advanced CW courses.

Official award presentations will take place at Hamvention, May 19-21, at the Greene County Fairgrounds and Expo Center in Xenia, Ohio. --ARRL Letter

FCC INVITES COMMENTS ON ARRL PETITION TO ALLOCATE NEW 5 MHZ BAND

The FCC has invited comments on the ARRL's January 12 Petition for Rule Making to allocate a new, secondary contiguous band at 5 MHz to the Amateur Service. The League also asked the Commission to keep four of the current five 60-meter channels -- one would be within the new band -- as well as the current operating rules, including the 100 W PEP effective radiated power (ERP) limit. The federal government is the primary user of the 5 MHz spectrum. The FCC has designated the League's *Petition* as RM-11785 and put it on public notice. Comments are due Monday, March 20. ARRL plans to file comments in support of its petition.

The proposed ARRL action would implement a portion of the *Final Acts* of World Radiocommunication Conference 2015 (WRC-15) that provided for a secondary international allocation of 5,351.5 to 5,366.5 kHz to the Amateur Service; that band includes 5,358.5 KHz, one of the existing 5 MHz channels in the US. The FCC has not yet acted to implement other portions of the WRC-15 *Final Acts*.

"Such implementation will allow radio amateurs engaged in emergency and disaster relief communications, and especially those between the United States and the Caribbean basin, to more reliably, more flexibly and more capably conduct those communications [and preparedness exercises], before the next hurricane season in the summer of 2017," ARRL said in its petition.

The League said that 14 years of Amateur Radio experience using the five discrete 5-MHz channels have shown that hams can get along well with primary users at 5 MHz, while complying with the regulations established for their use. "Neither ARRL, nor, apparently, NTIA is aware of a single reported instance of interference to a federal user by a radio amateur operating at 5 MHz to date," ARRL said in its petition. NTIA -- the National Telecommunications and Information Administration, which regulates federal spectrum -- initially proposed the five channels for Amateur Radio use. In recent years, Amateur Radio has cooperated with federal users such as FEMA in conducting communication interoperability exercises.

The League said in its petition that while the Amateur Radio community is grateful to the FCC and NTIA for providing *some* access to the 5-MHz band, "the five channels are, simply stated, completely inadequate to accommodate the emergency preparedness needs of the Amateur Service in this HF frequency range," ARRL said. Access even to the tiny 15-kHz wide band adopted at WRC-15 would "radically improve the current, very limited capacity of the Amateur Service in the United States to address emergencies and disaster relief," ARRL said.

The WRC-15 *Final Acts* stipulated a power limit of 15 W effective isotropic radiated power (EIRP), which the League said "completely defeats the entire premise for the allocation in the first place." ARRL said the FCC should permit a power level of 100 W PEP ERP, assuming use of a 0 dBd gain antenna, in the contiguous 60-meter band. "To impose the power limit adopted at WRC-15 for the contiguous band would render the band unsuitable for emergency and public service communications," the League said.

MORE COUNTRIES AUTHORIZE 5 MHZ BANDS

Uruguay and Hong Kong are among the latest countries to establish new bands in the vicinity of 5 MHz. The Final Acts of World Radiocommunication Conference 2015 (WRC-15) provided for a secondary international allocation of 5,351.5 to 5,366.5 kHz to the Amateur Service.

In Uruguay, new Amateur Radio regulations that came into force on February 24 provide for a 5,351.5-5,366.5 kHz 60-meter band as well as for allocations on 472-479 kHz, 47-47.2 GHz, and 77.5-78 GHz. In addition, radio amateurs in Uruguay now have extended allocations on 80 meters, 3,500-4,000 kHz, and on 160 meters, 1,800-2,000 kHz. The new bands and sub-bands were adopted according to the recently updated International Amateur Radio Union Region 2 (IARU-R2) band plan.

Holders of the General license in Uruguay may operate with 15 W EIRP, while Superior licensees may operate with 25 W EIRP.

Uruguay also has established a Beginner (Inicial) class license and a training program for new radio amateurs with mandatory operating practice on 80, 40, 10, and 2 meters. Uruguay has established procedures for non-citizens to apply for and renew Amateur Radio licenses, and reciprocal permits for non-residents will be available.

In Hong Kong, the local telecommunication authority OFCA has allocated 5,351.5-5,366.5 kHz to the Amateur Radio Service on a secondary basis. The maximum power permitted is 15 W EIRP. All 60 meter allocations are on a secondary basis.The ITU *Radio Regulations* permit assignments at variance with the *International Table of Allocations*, provided a non-interference condition is attached. --ARRL Letter

"MYSTERIOUS FOGHORN" IS CHINESE OVER-THE-HORIZON BURST RADAR

The International Amateur Radio Union Region 1 (IARU-R1) Monitoring System newsletter reports a mysterious "foghorn" -- a Chinese over-the-horizon (OTH) burst radar -- is operating in Amateur Radio bands.

"We observed the mysterious foghorn on 7, 10, and 14 MHz," the newsletter recounted. "This is a Chinese OTH radar, which is often jumping, and sounding like a foghorn." The signal is frequency modulation on pulse (FMOP) with 66.66 sweeps-per-second bursts.

Other intruders include a Russian frequency shift keying (FSK) signal from Kaliningrad on 7,193 kHz and a Russian FSK signal on 7,193 kHz (50 baud, 200 Hz shift). German telecommunications authorities have filed another complaint.

The latest IARUMS newsletter also reports strong splatter from Radio France International (RFI) on 7,205 kHz down to 7,186 kHz. The French REF has informed RFI and French telecommunications authorities.

Intruders still reported, and the subjects of complaints from German authorities include Radio Hargeysa in Somaliland on 7,120.0 kHz; Radio Eritrea with Ethiopian interference on 7,175.0

kHz; Radio Taiwan and a Chinese jammer on 7,200.0 kHz, and a Radio Tajik harmonic (from 4765 kHz) on 14,295.0 kHz.

NATIONAL MUSEUM TO MARK 75TH ANNIVERSARY OF VOICE OF AMERICA

The National Voice of America (VOA) Museum at the VOA-Bethany site in West Chester, Ohio, will join in celebrating the 75th anniversary of the VOA. The Voice of America marked its diamond jubilee on February 1. In 1942, not 2 months after the US officially entered World War II, a live, 15-minute shortwave broadcast was transmitted into Germany from a small studio in New York City. Introduced by "The Battle Hymn of the Republic," the voice of announcer William Harlan Hale declared, "We bring you Voices from America. Today, and daily from now on, we shall speak to you about America and the war. The news may be good for us. The news may be bad. But we shall tell you the truth."

"We're planning a series of events and exhibits this year to celebrate the VOA's commitment across America and the world to embrace best practices in telling the truth in order to let the world decide," said Jack Dominic, the museum's executive director. The West Chester Amateur Radio Club is a museum partner and operates WC8VOA from the museum.

At the dedication of VOA-Bethany, FCC Commissioner Clifford Durr referred to the forest of towers on the site as "siege guns of radio...that can hurl explosive facts against the enemy's weapons of lies and confusion... They are also potential guns of peace." Helped by an array of rhombic antennas, VOA-Bethany station transmitted news to Europe during World War II and to South America during the Cold War. The federal government decommissioned the Bethany station in 1994.

"The men and women who made up the VOA broadcasting system were our journalistic beacons of light during the 20th century," said Ken Rieser, president of the VOA Museum board. "Elmer Davis, John Houseman, Edward R. Murrow, and Robert Bauer all had positions of leadership within the VOA."

Today the VOA is the world's largest international broadcaster, transmitting news and information in 47 languages to 236 million people each week, according to the VOA website. The National VOA Museum of Broadcasting, located in the art deco Bethany station building, houses three collections -- the Gray History of Wireless radios, VOA-Bethany station's Voice of America control room, and the Media Heritage Cincinnati Museum of Broadcast History.

The National VOA Museum of Broadcasting is open on the third Saturday of each month -- from 1 to 4 PM Eastern Time. For more information, visit the VOA Museum website. --ARRL Letter

MARS REFOCUSES ITS MISSION, ENCRYPTS DATA NETS

Today's Military Auxiliary Radio System (MARS) program has changed markedly from what it was just a few years ago. So says US Army MARS Program Manager Paul English, WD8DBY, who contends that MARS must adapt in order to remain relevant and useful to its sponsor, the US Department of Defense (DOD).

"Probably the most significant changes were the Navy's decision to 'sunset' the Navy Marine Corps MARS program and our move to refocus Army and Air Force MARS on providing contingency HF Radio communications support to the DOD and the services," English said. "In order to focus our support on the Department of Defense, MARS leadership had to rethink, essentially from the ground up, what it means to be a MARS member." MARS relies on volunteers from within the Amateur Radio ranks. Among other things, recruits receive specialized training in military messaging formats and digital messaging protocols.

While the priority MARS mission is to provide contingency HF communication to support the DOD and the military, MARS also supports communication for combat commands providing humanitarian assistance and disaster relief, provides contingency communication for Defense Support to Civil Authorities (DSCA), and provides "morale and welfare communications" in

support of the DOD.

MARS still provides support for civil authorities, but it must follow DOD procedures for how that support is provided, English explained. "MARS leadership used to actively encourage our members to support civil authorities," he said, "and that put us in direct competition with the Amateur Radio community as well as with other federal agencies."

English said that in today's MARS program, the primary digital protocol is software that emulates Military Standard (MilStd) 188-110A (M110A) serial phase-shift keying, which is compatible with what is used by the military. MARS members may still use Amateur Radio digital modes on working channels, but M110A is the principal mode. There are no plans to transition to digital voice modes.

This year, MARS introduced an online encryption program that allows all digital radio traffic to be encrypted as it is being transmitted. MARS has also expanded its use of automatic link establishment (ALE), although members are not required to use it.

"Our bread and butter remains single-channel HF communication," English said. "The majority of our members who do use ALE are using the *MARS ALE* software program. Some of our members who support our national nets are moving to hardware ALE radios."

The MARS program supports quarterly contingency communication exercises supporting the DOD. These are based on "very bad day" scenarios, where traditional forms of communication are no longer available. "Through these exercises, the DOD -- via the MARS community -- reaches out to the Amateur Radio community to provide situational awareness information at the county/local level," English said.

That makes sense to MARS member Bill Sexton, N1IN, who was Army MARS public affairs officer from 2001 until 2014. "At least in theory, the blanketing omnipresence of hams across all 50 states offers a backup for blacked-out regions in the event of a catastrophic attack or natural disaster," Sexton allowed. "The challenge is mobilizing back-up operations in the total absence of internet, telephone, cell phone, or texting resources." --ARRL Letter

RST-SUFFIX SPECIAL EVENT IS BACK

Members of the North Country DX Association (NCDXA) are on the air for the entire month of March from locations in Alaska, Yukon Territory, Northwest Territories, Nunavut, and Greenland using RST-suffix fixed-station call signs. Expected to be active are KL7RST, VY1RST, VE8RST, VY0RST, and OX7RST. The goal is to promote Amateur Radio in *northern* North America.

The 2017 event, the second annual RST operation, features the addition of OX7RST, as well as more rovers and fixed stations, new QSL cards, and certificates. Plans call for operation from a Canadian research station near the North Pole on Ellesmere Island, a diamond mine in Northwest Territories, an Alaskan bush school, and many other locations. Activity will be on all modes, 160 through 6 meters, including 30, 17, and 12 meters. SWLs may participate too.

The object is to work or log as many NCDXA RST stations as possible from their various locations. NCDXA RST stations will send a signal report and location. Receiving stations should send signal report and state, province, or DXCC entity.

Logs will be uploaded to Logbook of The World (LoTW). More information is available on K7ICE's QRZ.com profile page. NCDXA is also on Facebook. --ARRL Letter

ARISS TO SWAP OUT HANDHELD VHF TRANSCEIVERS ON SPACE STATION

The 10th SpaceX International Space Station cargo resupply mission delivered investigations to study human health, Earth science, and weather patterns last Thursday. It also carried a new Ericsson 2-meter handheld radio to replace one that failed a few months ago, disrupting the Amateur Radio on the International Space Station (ARISS) program. The VHF radio in the *Columbus* module was used for school group contacts and for Amateur Radio packet,

temporarily relocated to UHF after the VHF radio failure. ARISS International Chair Frank Bauer, KA3HDO, said the new Ericsson radio will, at some point, be installed in *Columbus*, replacing the Ericsson UHF radio now supporting APRS packet and some school contacts. Bauer made it clear that the new Ericsson transceiver is an interim measure for ARISS.

"ARISS is making great progress on the development of the new interoperable radio system that we hope to use to replace our aging radio infrastructure in the *Columbus* module and the *Service*module," he said. "The hard -- and expensive -- part of this effort is just beginning, with testing and human [spaceflight] certification on the horizon." ARISS was able to shift school contacts from NA1SS to the Kenwood TM-D710 transceiver in the Russian *Service Module*. Cosmonauts use that radio to carry out their ARISS school contacts from RS0ISS.

Bauer thanked all of ARISS's partners, which include ARRL and AMSAT, as well as individuals and entities that have donated to the program. In December, ARISS announced a "notable contribution" from the Quarter Century Wireless Association (QCWA) to help support development and certification of new ISS radio hardware.

The Ericsson MP-A VHF handheld transceiver that ISS crew members had used to speak via Amateur Radio with students and educational groups around the world for more than 16 years began displaying an error message last fall, rendering it unusable. ARISS has said ARISS's new JVC Kenwood TM-D710GA-based radio system, once on station and installed, will improve communication capability for students scheduled to participate in educational contacts and related activities. The new system also will allow greater interoperability between the *Columbus* module and the Russian *Service Module*.

In 2015, ARISS kicked off its first fundraising program, after relying on support from NASA, ARRL, AMSAT, and individual donors and volunteers to cover the costs of day-to-day operations and spaceflight equipment certification. NASA budget cutbacks made it less certain that ARISS would be able to cover its operational expenses going forward. ARISS leadership initiated the fundraising effort with the goal of securing greater financial stability. The ARISS website has more information on how to support the program. -- *Thanks to AMSAT News Service, ARISS*

TECHNICAL

Interested in Iridium satellites? – The Iridium satellite constellation was conceived in the early 1990s, as a way to reach high Earth latitudes with reliable satellite communication services. Very little public information on the details of how the system works is available.

Fairly recently, a number of “consumer” products which use the Iridium system, have appeared on the market. Using some of these products, a couple determined guys were able to reverse engineer the Iridium system and presented their achievements at The Eleventh HOPE (**H**ackers **O**n **P**lanet **E**arth) last summer. Fascinating presentation! Read the historical information below then watch the Youtube video...

https://www.youtube.com/watch?v=cvKaC4pNvck&list=PLavdGnjBLuiX97DAKk32NJ1bCF1a0cv01&index=16

Historical infromation has been reprinted from Wikipedia:

Early "calculations showed that 77 satellites would be needed, hence the name *Iridium* – after the metal with atomic number 77. It turned out that just 66 were required" to complete the blanket coverage of the planet with communication services.

The constellation was launched to orbit in the late 1990s and the first telephone call was made over the network in 1998. However, although the system met its technical requirements, it was not a success in the market. Insufficient market demand existed for the product at the price points on offer from Iridium as set by its parent company Motorola. The company failed to earn revenue sufficient to service the debt associated with building out the constellation and Iridium went bankrupt, the largest bankruptcy in US history at the time.

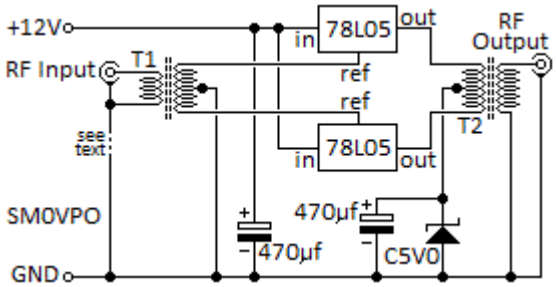
The constellation continued following the bankruptcy of the original Iridium corporation. A new

entity emerged to operate the satellites and developed a different product placement and pricing strategy, offering communication services to niche market of customers who required reliable services of this type in areas of the planet not covered by traditional geosynchronous orbit communication satellite services.

Next-generation constellation – Iridium is currently developing, and is expected to launch during 2017 and 2018, **Iridium NEXT**, a second-generation worldwide network of telecommunications satellites, consisting of 66 satellites, with six in-orbit spares and nine on-ground spares. These satellites will incorporate features such as data transmission which were not emphasized in the original design.[11] The original plan was to begin launching new satellites in 2014. Satellites will incorporate additional payload for Aireon, Inc. which is receiving ADS-B data for use by air traffic control and via FlightAware for use by airlines.

Wikipedia: https://en.wikipedia.org/wiki/Iridium_satellite_constellation

Push-Pull Voltage Regulator Amplifier – Now this is a circuit that is interesting. It is a push-pull power amplifier miss-using voltage regulators as active devices. The circuit can be used for audio or radio frequencies. This unit will deliver over 250mW before the 78L05's begin to restrict the current to 100mA (peak). If you use 1-Ampere bypass transistors then you can get a nice comfortable 2.5-Watts out.



Circuit Description **–** This is simply a pair of 78L05, +5V, low-power voltage regulator chips, each of which will amplify one half of the input waveform. Transformer T1 isolates the input to the amplifier and gives two anti-phase signals to drive each of the voltage regulator inputs (reference inputs).

The 5V regulators each deliver +5V, which is fed though the output transformer T2, with the centre-tap connected to a 5V Zener Diode. The Zener will not conduct (much) until the voltage rises above +5V DC. The two +5V out pins of the regulators are modulated with the input waveform, so either side of the transformer is driven in antiphase.

5.0V is not a prefered value, but I had a few in my junk box from one of these "mixed bulk packs" you get at radio rallies. 1N5222 is a 400mW 2.5v Zener diode, and you could use two of these in series. You could alternatively use A 5.1V Zener and use a germanium diode to raise the T1 centre-tap by 130mV.

The amplifier itself has a fantastic power-rail ripple rejection, due to the action of the 78L05 regulators. They are simply voltage followers with a +5V bias. More information: http://213.114.137.49/audio/push-pull-reg_0.htm --SM0VPO

SHORTS

Nayif-1 Amateur Radio Satellite Transmits Message from Dubai's Ruler: The *Nayif-1* Amateur Radio satellite is beaming a message from Sheikh Mohammed bin Rashid, Vice President and Ruler of Dubai -- the first to be transmitted by the new satellite. AMSAT-NA has designated *Nayif-1* as Emirates OSCAR 88 (EO-88). The message, in Arabic, says, "The renaissance of peoples, nations, and civilizations starts with education; and the future of nations starts at their schools." Launched on February 15, the *Nayif-1* satellite carries a U/V linear

Amateur Radio transponder for SSB and CW and a telemetry transmitter. *Nayif-1* was a joint project of the Mohammed bin Rashid Space Centre (MBRSC) and American University of Sharjah (AUS). It is the United Arab Emirates' first nanosatellite. Telemetry is on 145.940 MHz, 1.2 kb BPSK (FUNcube standard). The SSB/CW transponder uplink passband is 435.045-435.015 MHz, and the downlink passband is 145.960-145.990 MHz.

AMSAT-NA Heading to Reno this Fall for 2017 Space Symposium and Annual Meeting – AMSAT-NA will hold its 2017 Space Symposium October 27-29 at the Silver Legacy Resort in Reno, Nevada. The hotel offers free parking and airport shuttle, complimentary WiFi, and eight restaurants and retail shops. The 2017 AMSAT Space Symposium will feature numerous presentations on Amateur Radio satellites, operating techniques, news and plans from the Amateur Radio satellite world.

The Board of Directors meeting is open to AMSAT members. There is also the AMSAT-NA annual membership meeting. There will be a banquet with a keynote speaker and door prizes. Several members of the Sierra Nevada Amateur Radio Society (SNARS) and other local radio amateurs will be helping with this event.

More information about the 2017 AMSAT Symposium will be posted on the AMSAT website as it becomes available. — *Thanks to AMSAT News Service*

Speaker Announced for SouthWest Ohio DX Association DX Dinner at Dayton – The SouthWest Ohio DX Association (SWODXA) has announced that Ruth Willet, KM4LAO, will keynote its 32nd annual DX Dinner®, held in conjunction with the 2017 Dayton Hamvention®. Her topic will be “Experiencing the Hobby of a Lifetime.”

A student at Kettering University majoring in mechanical engineering and engineering physics, she was a member of the 2016 Dave Kalter Memorial Youth DX Adventure (YDXA), which operated from the island of Saba in August 2016.

The DX Dinner will be held on Friday, May 19, at the Dayton Marriott, 1414 S. Patterson Boulevard, starting with a social hour at 5:30 PM.

Eastern VHF/UHF/Microwave Conference Set for April 21-23 --The 43rd annual Eastern VHF/UHF/Microwave Conference will take place Friday through Sunday, April 21-23, at Baymont Inn and Suites, 20 Taylor Street, Manchester, Connecticut — just a few miles northeast of Hartford. Take Exit 63 off I-84.

Registration before April 1 is $20 ($30 after that date). Admission includes a pizza and sub lunch on Saturday and a hospitality room Thursday and Friday evenings, plus a CD copy of the *Conference Proceedings*. The Saturday buffet banquet is an additional $30 per person, and banquet tickets must be ordered before April 10.

More information is on the conference website.

THANKS FOR READING!

THE RCA ARC MONTHLY NEWSLETTER IS COMPILED AND EDITED BY JIM RINEHART, K9RU AND JIM KEETH, AF9A. ALL MATERIAL CONTAINED HEREIN IS OBTAINED FROM THE SOURCES CREDITED AND EDITED FOR THIS NEWSLETTER. EMAIL TO mailto:WebMaster@w9rca.org.
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