

# CAESAR CREEK SOARING CLUB

# FREQUENT FLYER

# APRIL 13, 2024

#### **UPCOMING EVENTS:**

April 20 – Spring cleaning day.

April 20 - Oct: Pot luck dinners resume (Every 3rd Sat) Maury Drummey PIC

April 27 – May 5: Ridge Trip CANCELLED

May 4 - CCSC Board Meeting, 10 AM to 11:45 AM, CCSC clubhouse

May 13 and 14 – Practice Days for Sports and Standard Class Nationals

May 15 – 24 – Sports class Contest: Linda Murray Contest Manager; John Lubon Contest Director.

July 7-12 – Youth Camp, Steve Hoffman & Henry Hayter PIC's.

August 5-9- Adult Camp, Steve Statkus PIC.

## SSD BOARD HIGH LIGHTS:

YTD SUMMARY: 81 flights in March 2024 vs. 77 last year. YTD 144 flights vs 212 in 2023. No change in gas price, still \$ 0.43 per 100 feet.

2024 Glider Contest: It's sports class only. Pilots must register on the SSA website. Thirty-one pilots are expected to begin arriving starting 5/11. Four tow planes will be available to launch all gliders in one hour. As usual, the club is looking for volunteers. Tow pilots should contact Larry Kirkbride.

Volunteers for ground crew launch, spotting, retrieval and weighing gliders are needed so if you're inclined contact Dick Holzwarth. Linda Murray will need some help in the kitchen 5/14 and 5/24.

2024 Ridge Soaring has been cancelled after considering the potential of risk exceeding reward. But if you're interested in experiencing the thrill of ridge soaring contact Sarah Arnold at: info@chilhowee.com. Sarah owns and operates Chilhowee Gliderport, a wonderful operation in a beautiful valley an easy days drive from Cincinnati.

TOW PLANES: Annual conditional inspections complete. All serviceable.

SAFETY: The board agreed to finish upgrading our fleet by the purchase of three additional transponders for the Schweizers. Kevin Price volunteered to contact Columbus approach and share our most likely outer turn points, timing and potential altitudes for the upcoming glider meet. This to forestall cargo heavies heading for Wilmington and passing through a gaggle of gliders awaiting the starting gate to open, while four eyes in the cockpit read the pre-landing checklist. And the board agreed that training flights that conclude with a final glide over the pine trees at the pond, landing to the East on 09 South are a bad idea and are not authorized going forward. This was communicated at the recent instructors meeting.

**GLIDER MAINTENANCE:** The ASK's have completed their annuals. The Grobs are moving along and should be complete by month end at which time the Schweizers will begin cycling through Cubby's, with the 1-26 being the final glider for 2024. Wing repair is complete awaiting paint. Fuse is at Bob Miller's hanger getting a panel radio and transponder installed.

# **FACILITY UPDATES:**

**BG GOOD DEAL** is still a good deal. This year, as in the past several years club members can reserve the Baby Grob for 2-hour flights all flight season for a payment of \$100.00. Tow charges will apply but not glider rental. If no one wants the glider after 2 hours, stay up until sundown. Here's a tip to maximize your hang time in that cute bird: fly the paint off during the adult camp, I'm pretty sure there will be no waiting list. But down-wind dashes are off the table.

**CAMPER TRAILER MAINTENANCE**: If your trailer is under a dead tree, think about moving it to a safe spot until the tree is removed. The spring clean-up happens April 20. It would be a good time to enjoy some fellow ship at the club. The probability of drafting some help with the job will not be any higher. The club has 250 feet of hose, a pressure washer and extension cords. Why not be a GOOD CAMPER and spruce up your hideout? Also, Rob Cluxton (past club member) will be attending the Glider Meet 5/13 – 5/24 and is looking to (rent?) a members' trailer while here. If you're interested, call Rob at 513-702-3925.

#### **CREW REPORTS:**

## 1st Sat:

No flight ops due to standing water on the field. Crew moved cut tree debris from around the tow plane hangar.

Steve F.

## 1st Sun:

Flew 28 flights most of which were students. No equipment issues Last flight landed at 630 pm.. We were using single runway operations due to field conditions and we washed the tow planes and k-21 after using them.

Mike K.

#### 2<sup>nd</sup> Sat:

No operations today due to inclement weather and very wet/soft field. Crew disassembled the big Grob and put it in the shop for annual inspection.

Dick Holzwarth

#### 2<sup>nd</sup> Sun:

We operated on Runway 27, using 33Z and one 2-33. Despite the grim forecast, the winds were not as strong as predicted, and we found enough dry runway to operate safely. We launched 9 flights. A rope break occurred on tow at about 2000' AGL. The adaptor broke at the large ring, which remained attached to the glider. A second adaptor was found to be badly frayed. 48L was brought back from Cubby's. 33Z was washed at the end of the day. The hose at the well needs to be replaced. The oil was changed on the Kubota. The oil drain pan is now full of waste oil. 33Z tach time: 864.2 Lucy Anne Mckosky

# 3rd Sat:

5 flights starting about 10:30 AM operating off 27. Several instructors are now current. We shut down operations at about noon due to the wet field. No equipment problems. Jack Dickerson replaced two steps on the crow's nest.

Maury

# 3rd Sun:

A Very windy and textured day. No 2-33 instructions today due to the wind, but there was 1 flight in CC. Michael Keltos programmed both K-21s with the surrounding airport frequencies.

A cheat sheet for both aircraft is in the works. (See elsewhere for the freqs.) Golf cart 2. had a tire come off the rim. Big thanks to Matt Gunther for fixing it. Rolf fixed the trim on S.D. yesterday and is ready to go. Best regards,

Dan Miner.

## 4th Sat:

Low ceiling, excessive cross wind and soft field. No flights. Crew worked to disassemble the big Grobe for it's annual inspection.

Chuck Lohre

#### 4th Sun:

15 Flights in windy conditions but right down the runway. Operated from the West end. Keith Kilpatrick

#### 5th Sat:

No operations today due to rain showers in morning, no Customers and a forecast for high gusting winds in the afternoon. Notification sent out at 12:20 am via Remind app.

Christian Maurer retuned 909 from Cubby's and was secured in the hangar. Thanks to Chuck Lohre who filled as our instructor.

Jim Marks, ACC

#### 5th Sun:

The field was in good condition, but we got off to a slow start due to low ceilings and lack of tow pilots. We started flying around noon when the weather improved, and we launched a total of 13 flights using both 2-33's, 33Z, and 909. Many thanks to Christian Maurer for helping out with towing. No major equipment issues, but the tow hook tongue on 135 tended to stick in the slot and was difficult to return to the hookup position.

Tach times: 909: 916.9 33Z: 7870.46

Lucy Anne

#### 126 Sat:

No flight ops due to wet field.

Golf cart 2 left rear tire came off the rim while checking the field. A spare tire was put on in the field with the use of a board, the jack in the barn, some 2X4s, a lug wrench provided by Steve Statkus, and a screw driver for removing the hub cap. The other golf cart tires were checked. Several were low and inflated.

The Remind app asked me for parent contact info-full name and email or phone number before being able to use it. I need that information to use the app. NE wind sock is missing. SW wind sock is torn and hanging by 2 ties. In the pond, the ~10 inch diameter "T" is off the drain pipe, perhaps allowing the drain pipe to become clogged.

Stephen Speck, a prospective new member from Chicago, has the following ratings: commercial, multi, single, CFI, CFII, and MEI. I gave him a brief tour and a membership application. I gave Kevin Price his email for follow up.

Steve F

#### **CCSC SPRING CLEANUP:**

It's that time of year when we spend some effort to spruce up our facility and the SSD Board has chosen 4/20/24 as the day. Here's a yearly general list that needs to be attended to. It is provided to all crew chiefs and is posted in the clubhouse.

# **Skill Levels required:**

Easy - Elbow grease any member can do Moderate – May require some lifting Harder - "requires special tools"

- 1. Pick up sticks in campground and around the premises for burning *Easy*
- 2. Clean out Kitchen fridge and freezers *Easy*
- 3. Clean out and organize glider trailer *Easy*
- 4. Wash windows in clubhouse Easy
- 5. Power wash green algae on barn *Easy*
- 6. Clean out bottled water coolers and large igloo water dispensers **Easy**
- 7. Clean out gutters above office glider hanger *Easy*
- 8. Rake out flower beds *Easy*
- 9. Add mulch to flower beds *Easy*
- 10. Blow out barn floor of leaves around golf carts including around piper cub in side hanger *Easy*
- 11. Blow out or sweep tow plane & glider hangers *Easy*
- 12. Straighten up and clean around wood pile and wood storage area **Easy**
- 13. Cut down decorative grasses in campground *Easy*
- 14. Power wash patio floor, chairs and tables *Moderate*
- 15. Cut up any dead trees and move logs to wood pile for splitting *Hard*
- 16. Replace any florescence bulbs throughout facilities & Hangers *Easy*
- 17. Stack and burn piles of cut brush *Easy*
- 18. Power wash golf carts in conjunction with #19. *Easy*
- 19. Change oil and filters in golf carts (Team of three required.) Easy but messy
- 20. Change the fuel storage tank filter (completed this year.)

Note: Some tools found in the tractor barn, or workshop.

#### **CCSC MEMBER UPDATE**

I've had this idea (member interviews) floating in my head for some time, but last month's FF convinced me it's much better to interview the living, then staring at one who isn't, and wondering what tales they took with them. With that thought in mind, I chose my good friend, racing partner and published author Chuck Lohre who has many good tales plus a just completed whopper (details to follow.)

In the Lohre DNA lies an active artistic gene passed down from father (shark trailer) to the twin boys, Tom and Chuck - the love of painting. This affair resulted in twice painting the Mike Fink paddle wheeler moored up river from the Roebling Bridge. Determined not to be a one trick pony Chuck bought, restored and lived in the Frank Lloyd Wright house in Clifton while running his father's advertising business, and becoming an expert on rock crushing machines on the side. He is passionate about sustainability, green building and steers the Green Cincinnati Education Advocacy group. (Check out Green-Cincinnati.com).

Chuck joined the soaring club in 1981 after flying RC gliders for a number of years. He bought a 1-26, partnered in a 1-36, Pic -20B and ASW-15 which he currently owns. He's the club treasurer, 4<sup>th</sup> Saturday crew chief and our newest CFIG instructor, trained under the watchful eye of Instructor Emeritus Larry Kirkbride.

It may have been the Fink paint jobs that got Ohio River water flowing in the brother's veins, but Chuck worked for some time cutting barges on river boats up and down the Ohio. Sailing became important to them and "the rest of the story" has them telling their story of crossing the Atlantic in the summer of 2023.

"Three Men in a Tub: Spam, the Pee Bottle, and Other Tales of Derring-Do on the High Seas from Lake Erie to Finland". The Craft: Clio of Cincinnati, a 32' Bayfield, Sailed from Port Clinton, Ohio, to the Russian border near Kotka, Finland. Last summer and fall 3 "Cliftonites" crossed the Atlantic in a small sailboat. Join them at the Clifton Recreational Center on Friday, April 19 at 6:30 PM to enjoy some ship's fare and hear their story. Free Dramamine to be served!



"Dream, Pretend, Imagine: a Sailing Adventurer and a Journey of the Mind" by Chuck Lohre. Available on Amazon.

#### HERE AND THERE:

## SSA, FFA & WeGlide WEBINAR:

Three organizations, with good intentions and an idea that combines these intentions with a goal of increasing cross country glider flying using today's software technology that is currently being used by contest fliers in both Europe and the U.S. But, in this application it is used as a training tool to analyze soaring flights and share the traces with your soaring community as well as worldwide. It also provides a system to develop local soaring tasks suitable to your skill level and capability of your glider. These tasks are available to other glider pilots locally and worldwide. It provides a log of your flights and the ability to view your trace with a seasoned X-country pilot to assist your analysis of the flight. With appropriate tracking hardware your flight and others attempting the task can be monitored real time.

These features can be found in other software. That's true, but WeGlide pulls the features into one package, at zero cost for the basic program, as mentioned above. It's OLC in the 21<sup>st</sup> century but with fender skirts, air lift shocks and nitrox for added horsepower. If this has your attention, Google WeGlide and be amazed.

SSA is on board for obvious reasons, but in parallel has rolled out X-country classes at clubs across the country that look a lot like our X-country camp without the two place gliders and a John Lubon clone in the back seat. They plan to use WeGlide as explained above.

The FAA is on board because they have an educational component associated with their purpose of existence. It remains to be seen if this is a good thing for the gliding community or not. (I'm making sure my glider is filled with the proper documentation, and a current sectional for the possible ramp check, including the Ohio document.)

WeGlide is the corner stone of the effort. During the Webinar they seemed open to accommodating some on the issues we have in the U.S. They stressed the ability to adjust tasks that accommodate low performance and high-performance gliders at the same time. It seemed the accommodation was to increase the diameter of turn points, but there may be more behind the scenes that escaped my attention.

Check out WeGlide. If you're an OLC flier it will be familiar to you, and you'll be able to fly the Alps in the comfort of Cincinnati in April. For myself, I'd rather be in the Alps enjoying the cow bells.

# **Unraveling Thermal Formation:**

Thermals, those invisible pillars of rising air that we as glider pilots rely on for sustenance in the sky, they are a fascinating meteorological phenomenon for us all. Understanding how thermals develop is essential, for a good flight and how long one might stay in the sport! Let's delve into the intricacies of thermal formation and explore the processes that give rise to these vital elements of flight.

Thermals owe their existence to the sun's radiant energy, which warms the Earth's surface unevenly throughout the day. As sunlight strikes the ground, different surfaces absorb and retain heat at varying rates. Dark surfaces such as asphalt or plowed fields absorb more solar radiation and heat up quickly, creating localised areas of warm air near the surface. Conversely, lighter surfaces like sand or grass reflect more sunlight and retain less heat.

As the warm air near the surface expands, it becomes less dense than the surrounding cooler air. This buoyant air begins to rise, forming a thermal updraft. The process is akin to boiling a pot of water on a stove, where warmer water at the bottom rises while cooler water sinks to replace it. In the atmosphere, this vertical movement of air sets the stage for the development of thermals.

Topography also plays a crucial role in the formation of thermals. Mountainous terrain, for example, can enhance thermal development by acting as a natural barrier to airflow. As sunlight heats the slopes of mountains, pockets of warm air are generated, creating strong updrafts along the mountainsides. We as glider pilots often seek out these ridge thermals, to gain altitude, extend our flights & overall cross-country speed.

Additionally, wind patterns influence the behavior and distribution of thermals. Light winds can allow thermals to form and persist over a given area, while stronger winds may disperse or distort a thermals structure. Convergence zones, where air masses of different temperatures and moisture content meet, can also trigger the formation of thermals as warm air is forced to rise along the boundary between the converging air masses.

The timing of thermal development is closely tied to diurnal cycles, with thermals typically becoming stronger and more abundant during the middle of the day, as solar heating reaches its peak. However, thermals can also form during the nighttime under certain conditions, such as when warm air trapped near the surface by an inversion layer begins to rise as the air above cools!

Once thermals break away from terra-firma, thermals can grow in size and strength as they ascend through the atmosphere. The rising air cools adiabatically with increasing altitude, causing moisture to condense and form clouds under the right conditions. Cumulus clouds, characterised by their fluffy appearance and cauliflower-like shape, often mark the presence of thermals in the sky, providing visual cues for us to locate and exploit.

The development of thermals is a dynamic interplay of solar heating, surface properties, topography, and atmospheric conditions. These rising columns of warm air not only sustain our flights but also contribute to the complex dynamics of weather systems. By understanding the processes behind thermal formation, we can gain insight into the intricate workings of the Earth's atmosphere and the marvels of flight that it enables us to enjoy!

By Adam Woolley via Wings and Wheels

**2024 TOTAL FLIGHTS LOTTERY:** Will not happen due to a lack of interest in the idea.

**2024 PHOTO CONTEST:** Send your photos to me, stevestatkus@gmail.com.

# **BEHIND THE SCENES:**

#### YEW (July 7-12) UPDATE:

Attention, all CCSC youth members. If you want to supercharge your "Yellow Book" and make serious improvements to your glider flying skills you need to be part of the Youth Camp this summer. It's an opportunity you'll not have during your crew day. Students have logged over ten flights with the same instructor during the youth camp. That intensive training yields improvements that would take five times as many flights with different instructors. But, you need to get in the front of the line. To do that, contact Steve Hoffman by email at stevehoffman440@gmail.com.

Between now and July, you have the opportunity to log four free glider flights in your log book, one a month. Get at it, and I'll see you at youth camp; your Crew Chiefs Steve Statkus and Chuck Lohre.

# CCSC ASK-21 Radios by Channel:

A big thanks to Michael Keltos for his efforts to provide the following table which will be affixed to the cockpit of each of our gliders. Sometimes, simplification takes a lot of effort.

1	123.3	2OH9 - CCSC CTAF – Gliders, Tow Planes, Ground Ops
2	122.9	40I – Red Stewart Airfield (Waynesville)
3	123.075	I68 – Warren County Airport/John Lane Field (Lebanon)
4	122.8	MGY – Dayton/Wright Brothers (Springboro)
5	118.85	Columbus Approach
6	123.0	MWO – Middletown Regional/Hook Field
7	122.725	KGDK - Greene County.
8	122.725	I66 - Clinton Field
9	122.7	I73 - Moraine
10	121.5	Guard – emergency only

Note: CC's radio (FSG 71 M) holds 10 channels. SD's (Dittel FSG 2T) holds 20.

## Lawn Care:



Jayce Becker is offering campsite mowing and cleanup.

# **Services:**

Mowing - \$10.00 (per campsite)
Additional Services (Stick Pickup/Exterior Camper
Clean up/Leaf Removal/Etc.) - \$10.00 an hour

**Call/Text:** 513-532-8438 (Autumn's Cell)

Email: jayce.astewart@gmail.com

#### PARACHUTE PACKING:



Jonny Stewart is Skydive Sports! He is providing a drop off service right here at CCSC. If you need your parachute repacked, just leave it in the CCSC office and fill out one of the service cards and attach it to your rig.

Phone: 937-267-1733

Email: skydivesports@gmail.com

https://www.facebook.com/skydivesports/



https://www.instagram.com/skydivesports/

# HP-18 FOR SALE N77BF











Schreder HP-18: 40:1 L/D with winglets. Ailerons extended for improved roll response. Removable tip plates for temporary tiedown, one man rig, wing stand, tow out wing wheel, canopy cover, new instrument panel with Ilec SC-7 vario, Dynon D6 includes attitude indicator, remote compass, air speed, rate of change of air speed, altimeter, very sensitive rate of climb, rate of turn, inclinometer and stall warning, two 12V 7A/h battery power supply . There is a very obnoxious gear up warning horn, geared flap control with index wheel, radio with xtmr amplifier, boom mic, and parachute. Enclosed trailer has sway control, solar powered vent, hard wired running lights w/4 wire light connection, spare tire, 12 volt electric winch for glider loading with trailer aft end control switch. Trailer pulls nicely at highway speed with a 4 cylinder Ford Escape. New annual.

Contact: Dick Eckels 513-974-8184 or 937-672-3407 email: rchrdeckels@gmail.com

LAND'S END EMBROIDERED CLOTHING AND PROMOTIONAL ITEMS AVAILABLE ONLINE. PATCHES ARE IN THE DISPLAY CASE. – Chuck Lohre

Embroidered patches are available in the display case at \$5 each. The design is slightly different from the Land's End version.

The Land's End embroidered CCSC patch is approved for use on their clothing line website. Go to http://business.landsend.com/store/ccsc and select your garment or promotional product and then select the "APPLY LOGO(S)" box. The CCSC Patch was created for general club use. For my own personal use, I created the embroidery of my call sign "6V" and the ASW 15 planeform for the sleeves. If you would like your call sign or planeform created, send me a photo of your tail, the one-time cost is \$29 each to create the embroidery programming.

Most of our plane forms are on the back of our silk-screened t-shirts in the clubhouse. The sizes run large, I got my usual XL shirt and it's too large for me.

Only some of the promotional items are available one at a time for embroidery. My shirt, shown, cost \$35.95, plus \$8.95 for the patch and \$6.95 each for the sleeves. They will also charge you tax and my shipping was \$9.90.



**P2**, the ASW 27B in the picture, is now for sale. The glider and trailer are in excellent condition. It has flown a total of 895 hr., including 643 hr. at CCSC. Anybody seriously interested in such a valued glider is welcomed to contact me, Poul D Pedersen, on 513-769-1263



# **CCSC GROUND CREWS:**

# 1<sup>ST</sup> SATURDAY

CC: Steve Fenstermaker (cell: 937-581-7713) ACC: Dick Huskey. Tow Pilots: John Armor, Instructors: Tom McDonald. Crew: Gerry Daugherty, Yuri & Thomas Gavarret, Mark Hanlon, Joe Jaap, Kevin Price.

# 1ST SUNDAY – Training Crew

CC: Mike Karraker (cell: 937-830-0627) ACC: Mark Miller. Tow Pilots: Christian Maurer, Norb Maurer, Andy Swanson. Instructors: Manfred Maurer, Bob Miller. Crew: Don Burns, Steve Hoffman, Lucas Hoffman, Eran & Rachel Moscona, Dieter Schmidt, Andrew Stryker, Jordan Stryker, Joe Zeis.

# 2<sup>ND</sup> SATURDAY

CC: Dick Holzwarth (cell: 937-542-9612) ACC: Jim Marks. Tow Pilots: Brian Mork, Haskell Simpkins. Instructors: Bob Anderson, Bill Gabbard. Crew: Jim Fox, Bill Hall, Aniyah James, Jim Suda, Lizz Suda.

# 2<sup>ND</sup> SUNDAY

CC: Lucy Anne McKosky (cell: 937-216-5754)
ACC: Kate Menchen Kreiner. Tow Pilots: Lorrie Penner, Gordon Penner, Instructors: Jim Goebel, Greg McDowell, Tom Rudolf. Crew: Kevin Cochran, Jack Derrickson, Fred Hawk, Bob Kramer, Mike McKosky, Lauren Simpson,, David Wrinkle.

# 3<sup>RD</sup> SATURDAY

CC: Maury Drummey (cell: 513-871-1998) ACC: Rolf Hegele. Tow Pilots: Don Green, Henry Hayter, Chris Keegan. Instructors: Sami Rintala. Crew: Jim Dudley, John Dudley, Charlie DeBerry, Evan Estes, Michael Hayter, Charlie Maxwell, Poul Pedersen, Charlie Richardson, Isaac Stacy, Brogan Williams.

# 3<sup>RD</sup> SUNDAY

CC: Dan Miner (cell: 614-395-3953) ACC: Andrew Stringfellow **Tow Pilots**: Tony Bonser, Tim Christman, Karl Ludolph. **Instructors:** Dick Eckels, John Kondratowicz, Maia McDaniel. Crew: Val Boehm, Mike & Nathan Keltos, Josiah Guentter, Brian Stoops.

# **4<sup>TH</sup> SATURDAY:**

CC: Chuck Lohre (cell: 513-260-9025) ACC: Ethan Saladin. Tow Pilots: Guy Byars, Andrew Dignan, Larry Kirkbride. Instructors: John Atkins, Joe Jackson. Crew: Cole Delabar, David McMaster, John Murray, Curt Pollock, Tony Rein.

#### 4<sup>TH</sup> SUNDAY

CC: Chris Summers (cell: 513-807-0077) ACC: Steve Statkus. Tow Pilots: Ron Blume, Tim Morris, Al Quinn Instructors: John Lubon. Crew: Richard Cedar, Rick Ghai, Keith Kilpatrick, Tim & Ian Lynch, Bill Noe, Lincoln Noe, Dan Reagan, Pete Schradin, Christian Summers.

#### 2024 5th WEEKEND CREW DAYS:

Mar 30 - 2<sup>nd</sup> Sat

 $Mar\ 31-2^{nd}\ Sun$ 

 $Jun\ 29-3^{rd}\ Sat$ 

 $Jun \ 30 - 3^{rd} \ Sun$ 

Aug  $31 - 4^{th}$  Sat Sep  $29 - 4^{th}$  Sun

DCp 27 + Dui

Nov 30- 1st Sat

Dec 29 - 1<sup>st</sup> Sun

#### **POINTS OF CONTACT:**

PRESIDENT: Andrew Dignan

**VP:** John Lubon

**MEMBERSHIP:** Andrew Stringfellow **SAFETY OFFICER:** Kevin Price

**DIR OF OPS:** Brian Stoops (937-750-3788)

TREASURER: Chuck Lohre DIR OF FACILITIES: Ad Hoc TOWPLANES: Tim Christman

GLIDER MAINTENANCE: Bob Miller BUSINESS MANAGER: Jon Stewart,

BM@soarccsc.com

FREQUENT FLYER EDITOR: Steve Statkus

Note: See Membership Roster on soarcesc.com for phone numbers and email addresses for all members.

Revised 2023/11/20 rdh