LEON LYSHER
Late 1950s - 1986

Introduction	MUSIC Welcome to the Dahlgren Centennial Celebration – A Century of Innovation. We hope that this and our many other products, events and offerings will showcase what Dahlgren has accomplished during its last 100 years. Throughout our history, we've interviewed some of the most prominent minds, leaders and innovators that have been here, and we're opening up the vault to share them with you this year. Today we are honored to listen to the story of Leon Lysher, whose work spanned from the late 1950s to 1986. During his tenure at Dahlgren his most significant contribution focused on electronic warfare. Let's listen to Mr. Lysher…
Ken Baile	Maybe the best place to start is sort of the transition from HERO [Hazards of Electromagnetic Radiation to Ordnance] into EW. You were there for that. How much did HERO play a role in having the skill set that gave us the ability to…?
Lysher	I think HERO pretty much ceded the electromagnetic compatibility problem. Just the whole original electromagnetic compatibility was old HERO-ites, like us. They brought in a couple new faces. Mills came. I guess Colby was home-grown when they—he didn't come from HERO.
Baile	I think he was in W Department.
Lysher	W somewhere.
Ron Pollard	I think they hired him in to run the division over there. And then Mills showed up shortly thereafter, and Clayberg… They did that FR69, remember that? The big fleet exercise?
Lysher	Yeah that was strictly a compatibility thing.
Pollard	You're right.
Lysher	And that then, they learned how to collect stuff out of the air. As with that, FR69 then grew into other things. And I couldn't remember where the P-3 came from.

Pollard	We had the P-2 first.
Lysher	Was it the P-2 first?
Pollard	Yeah, black P-2. I don't really know. Mills was, I think, involved in getting that program in. It may have come out of FR69 because they were having—
Lysher	Well see FR69 they did the airplane flying stuff, collecting data.
Baile	That was with the C130, wasn't it? No? They did it with a P-2?
Pollard	And then they went to a P-3. But the branch we were in, you were sort of the Branch Head. Clayberg may have been the Branch Head, and you were—
Lysher	No, I think I was the Branch Head.
Pollard	Who was the Division Head?
Lysher	Colby
Lysher	I used to go down and get my marching orders from Colby
Baile	This is when you were in [Building] 218 and then moved to the hangars?
Lysher	Yeah, that was in 218 when Colby was the Division Head
Pollard	When I was over there, we had the balloon. Remember it had the corner reflector in it.
Pollard	Got from Goodyear. Remember? They built it for us? We built that—brass corner reflector array and then made cross section measurements of the shipping container? Fred Brown was over there. And then he took that design and got the RCA [Radio Corporation of America] — Goodyear guys to go make the balloon.
Lysher	And then somewhere along there, Mills came up with the circular phased array.
Pollard	That was the system that had all the white wires in it.
Baile	What could that do?
Lysher	Nothing. What happened was it was a good idea. You could finally phase stuff, and it was a receiver, and then they had—how did it go? It started out with, I

	think, dipole antennas all the way around, and then they just sampled all the way around. And you could get direction, and the signal, and collect a gazillion signals a minute. I don't know. I don't remember the name of it. But then, technically something went wrong. I guess they were getting interference between the dipoles all the way around, and it didn't work. So then they decided to use horns. And then somehow the horns, they lost a lot of their gain. And then I remember whoever the contractor was, we had a big flap over it because they were talking about how much gain it had. And they'd measure pattern, take the peak over the average. I forget all that technical stuff. But instead of—they weren't measuring the gain, they were touting gain but they were really measuring directivity, because they had all kinds of losses or something. I remember that vividly because one day the president of whoever the company was making it called me up with all his panties in a twist because I was going around telling people that it really didn't have 20 db of gain. It only had 2DB or something. Then I started explaining I could do it, then I started explaining how you measure directivity, and how you measure gain, but anyway, he finally gave up on me and hung up. I remember that part. That was one of Mills' pet projects.
Pollard	I was looking at your bio, and it says you worked in a lot of EW programs. Your job in F20 was to work on special EW programs. This must have been one of those special programs.
Lysher	That was probably one of the special programs. And then when I was in F20, I sent John McQuiddy—I don't think he's ever forgiven me on this wild goose chase thing. Somebody was going to shoot the STYX [SSN-2], and Chuck Bernard's buddy—what was his name? Shriner. Shriner was convinced that you could measure the signal from it. So he set up this whole elaborate—I don't know where he worked—a big program to go out and measure that. And so then we needed to send an observer along, and I sent John McQuiddy. I think it ended up a pretty big fiasco when they didn't measure anything.
Pollard	You and I went to Hawaii one time. I can't remember what that was all about. I remember they were going to send me, and they didn't trust me because I was a GS-123 or something like that, so they sent you to keep an eye on me.
Lysher	Yeah, what was that about?
Pollard	I can't remember.
Lysher	We were selling something.

Pollard	I remember we got out there and nothing happened because we were talking about something else.
Lysher	Well the most exciting thing that happened there, we went to this big meeting, and all kinds of stars there, and Admiral Lake was our keeper, he was probably about a two star then. The meeting starts up, there was a three star in there, and the three stars says, "Oh Julian, I have some things to do. You take notes, and let me know what happens." And he got up and left. And I'm sitting there thinking no matter how big a wheel you are, you still got to take notes for some bigger wheel.
Pollard	We were briefing CINCPACFLT [Commander-in-Chief, U.S. Pacific Fleet] is what he was briefing about.
Lysher	It was some kind of deal—it'll come back in a second. I think it had something to do with looking at a lot of stuff at one time, rather than just individual systems.
Pollard	What I remember was he came down to the hangar, we were all briefing him, and I was one guy of a hundred guys with a few slides to talk to him.
Lysher	Julian Lake?
Pollard	Julian Lake. And then when I finished, he says, "You're going to Hawaii with me to explain this," or something like that. For the life of me I can't remember what we were going to Hawaii for.
Lysher	Yeah, it was some kind of scheme we were peddling to make measurements on a ship. All the signals coming off a ship, measuring them all—it was some kind of—put the arms around something big. I'm not quite sure what.
Lysher	As you talk about these things, they kind of start to filter back in a little bit.
Pollard	Do you remember much about what Bill Lewis was doing with the huts, OICS [Operational Intelligence Collection System] vans, and all those sorts of things?
Lysher	Well they were intercept receivers in there, and they take them and set them on a ship, and intercept signals. And I guess—did we do the Pueblo one?
Pollard	They did three ships. The following one—the DERs, the destroyer escort ships.
Lysher	With the shacks on them.
Pollard	I think those following ones they were building them inside the ship.

Lysher	Yeah, but when the Pueblos got captured by the North Koreans, was that our hut?
Pollard	I don't think so?
Lysher	I remember we got kind of wrapped around that axle a little bit, but I don't think it was our hut.
Pollard	Yeah, I think the – our huts went on FRAM [Fleet Rehabilitation and Modernization] destroyers. It had the hangar on the back, you know , on the hangar deck there, it just sat down on the ship. Pueblo was like an AGI [Auxiliary General Intelligence (NATO) Intelligence Collectors], it was unarmed. Intelligence collection ship.
Lysher	I guess those huts though…They just had—what was the receivers, broadband receivers?
Pollard	Hewlett-Packard spectrum analyzers. We loved those.
Lysher	I think it's just commercial gear put on a hut. And then there was the ice cream truck.
Baile	Radome sides on it?
Pollard	That one was an idea to… There was a Russian ship that was coming into port in Canada, and Mills had the idea we'd put together an ice cream truck with radome on the side, all the listening devices, and park it on the pier, sell a few ice cream bars, and get intelligence from the Soviet ship as it came in and out of the water. I don't think it ever went anywhere, did it?
Lysher	I don't remember.
Pollard	I don't know whether it ever got deployed or not.
Lysher	I don't remember it ever going to Canada.
Pollard	Well that was where we were going to use it.
Lysher	But I know it went somewhere, I think.
Pollard	Could be. I don't know.
Baile	I know it got – I don't know whether it was a Russian ship there or not or if it

	was just for a test. I was on the test that took them to Norfolk.
Pollard	Maybe it came into Norfolk right after Canada. I'm really not sure.
Baile	Parked right outside the ship in the parking lot. Mike Owens I think went over on that. Mike Owens. What else do you remember Leon?
Lysher	The things I don't remember. I don't remember how we got into the SLQ-32? Somehow we eased into that.
Pollard	We put that proposal in to actually build the thing, if I remember correctly.
Baile	Oh yes, we did. That's when Paul Malcolm was division head
Pollard	PM20, or whatever the program office up there, rejected our proposal and said if we would do it with a contractor they would put it in the pot for review. And then of course we refused that. And after that we got—I'm not sure—if I remember they had the SLQ-32 and SLQ-31, Raytheon and Hughes built a buy-two and fly them off the other end.
Lysher	Well we must've been doing something like that before. We didn't just slip into the SLQs.
Pollard	Well I remember the proposal we put out was more of a surveillance than an anti-ship missile thing. Close-in self-defense gadget, more of a surveillance kind of a system, like we put on the huts, long range surveillance, rather than self-defense. I think that's what our proposal was mostly about.
Lysher	Well the Hawaii thing—that had to do with our own signals, didn't it?
Pollard	I don't know. [I] remember Ken and I were doing measurements on ships, remember that RINT [Radiation Intelligence] stuff? The RINT unintended emissions, Black Crow, and I don't know if it had anything to do with that or not.
Lysher	Yeah I think it was for our emissions rather than somebody else's I think. And then we used to go to the ATOG [Advanced Technical Operations Group] meetings.
Pollard	Yeah you were the ATOG EW guy.

Lysher	I was trying to remember what we talked about then.
Pollard	Do you remember at one time—Mills and all those guys took a C130, and Shrike [anti-radiation missile, ARM] was having a problem back then with the SA-2 missile. The missile was coming in. It was an ARM missile homing in on the radar and it would get some kind of interference signal and go off into the jungle. And they took a C130 and bolted, on the flap that comes down, bolted a shrike seeker on the bottom, took it over and flew it around the Gulf of Tonkin, made EMI [electromagnetic interference] measurements, if you will, see what the interference was. Remember that?
Lysher	But then they went over with the P-3, didn't they?
Pollard	Could be?
Lysher	They made a lot of measurements with that.
Pollard	Could be it was about the same time. Mills used to have a picture in his office. It was a photograph of the back of a Hewlett-Packard. Spectrum analyzer had two signals over-laced. It was a signal from the SA-2 radar. He would always point to that, I remember, and say, "There's the problem. We found it!" When they'd figured out what the problem was, they'd ask China Lake, and they fixed the missile after that.
Lysher	Well, I forgot that time who went on the P-3 to Vietnam. I know Lee Clayberg went.
Baile	Let's see, who was the guy that because—in the hangar the offices were on the one side of the aisle and some of the labs on the other side…
Lysher	Which hangar? Hangar 1 or 2?
Baile	Hangar 1 in the upper deck, a bunch of labs. What was the purpose of that big acoustic array that somebody had there. Do you remember that? Was that Bill Masi? Because it was in the early days when I just reported onboard. That was a weird looking thing, and I wondered, "What in the world are they doing with that?"
Lysher	Was that Charlie Hankle and company over there then? Didn't Charlie go over there with the compatibility group?
Baile	I don't know

Lysher	Charlie was over there. Johnn Creech was over there, wasn't he?
Pollard	Bob Moran.
Lysher	Bob Moran, yeah.
Pollard	How about in that timeframe, the Semi work? Remember, Bob [Hudson] was always sort of working both sides, protecting your stuff but also trying to turn around on the Soviets.
Baile	That was Bob Hudson's work
Pollard	I remember he and Frank Rose were going around. They sold the SEW [Special Effects Warhead] program, a special effect warhead. Bob had the slides with skies falling, and Frank had the suitcase with the electromagnetic bomb in it.
Lysher	Yeah, that's another area that we got caught up in. The thing got classified beyond all belief. Then we got caught up in that rescue mission. I guess all that stuff probably is still classified.
Baile	I don't think so. I think parts of it is, but there's been a book written about that, some of that stuff that went on.
Pollard	What was the rescue?
Baile	Rescuing the hostages.
Lysher	Hostages in Iran.
Pollard	Oh okay, the ill-fated rescue?
Lysher	Yeah.
Pollard	Carter?
Lysher	Yeah. Well that was when I was over in HERO that we were doing that work, Bob Hudson was, that crowd. Because that was the time that we didn't have any money. Every day we got new tasks and no money. And this went on—finally we were big time in the tank, with no money, no authorization, and it came down with some other thing to do. And I told Bob Hudson, "You go back up and tell them that unless I get a direct order from the commanding officer at Dahlgren here to do this without money, it ain't getting done." Next morning, about 6:30 in the morning, my phone rang. It was the Captain, "Do it." I think among my memorabilia I still got a letter.

Pollard	Did that program have a name or anything?
Lysher	"Doing work without money" or something [laughs]. I don't remember. And they were running tests there at Dahlgren, and they had that C130, and they were making sharp turns, and they came out over Jimmy Nash's farm and busted the fuel tank and sprayed jet fuel all over Jimmy Nash's farm.
Pollard	I remember the guys flying that plane were crazy
Baile	Well they were going to land that thing in a football field; I think that was the plan. They were going to pull the hostages out.
Pollard	Well I remember somebody was sort of chastised for—"You're going to get hurt landing like the way you're landing." He says, "You think that's bad, you ought to try landing at night in China on a quarter mile strip!"
Lysher	Well it was something like we had one of the helicopters come in for HERO, and the guy flew it into the hangar, and somebody over at the hangar pitched a fit. That guy said, "You know where I just came from? That was a piece of cake!" Yeah all that crap was forty-something years ago already.
Pollard	I know it's hard to think about it.
Lysher	Could think about who else was around at that time too. John Smith's gone, Chuck Ranck's gone.
Pollard	What about Gene Gallaher, was he in that?
Lysher	I don't think so.
Pollard	[Ray] Polcha and [Reggie] Grey and Bob [Hudson] were over there with you.
Lysher	Yeah Gene got into this too when Bob's things was starting to get bigger, but Pete Hogue… Ron Sapone, he's gone.
Baile	McQuiddy's still around.
Lysher	Yeah, McQuiddy's probably, since he's been in the business all this time, he'd probably have a little more recollection. But there aren't that many anymore.

Baile	Dave Lemon. We were going to try and see if anybody knew about Dave. Do you remember Dave Lemon?
Lysher	Yeah
Baile	He did a lot of effort.
Lysher	Yeah
Baile	Last time anybody knows about him, he was in Hawaii.
Lysher	Yeah, that's what I was going to say. Hawaii vaguely rings a bell.
Pollard	They had the measurement program when we went up to SWL [Special Warfare Laboratory] and they had all the data, big reams of data and needed somebody to analyze it. And we did the data, analyzed the data, Ken and—who was the guy that did all the digitization?
Baile	Gary Goss.
Pollard	Gary Goss did all the processing, analyzed all the data, put everything together. Big thick secret report on it.
Lysher	They did the collecting.
Pollard	General Dynamics had the vans, had the radar range down in Dallas-Fort Worth area. They also had a portable range to do the measurements. And anyway, from the report we'd written, we'd got some more money from ARPA [Advanced Research Projects Agency]. And they wanted to sort of build a demo of it, passive active, finding targets, you know. Mike Owens built a processor, and Dave Lemon built the receiver for the thing, and they put it in a balloon, put the a balloon down in Florida, and looked at a missile site over across the way, and the only problem was they could only get about 15 minutes of time on it. We got a signal from it, and we were pointed right at the target, but we could never quite get everything lined up in time to work, so right at the end of the contract for the balloon, and then it was also getting to be about '73 and the war's winding down, and they weren't that much interested in finding—not much going on in the air war, so it sort of petered out with that. In fact, the guy we just ate lunch with…
Baile	You mean [Dave] Lindberg?
Pollard	Lindberg. Lindberg and Ken and the guys built the system for data collection for

	the guys up at the fort to collect intelligence on the next generation radar system. Helicopters…
Lysher	This balloon thing, Mike Oberschmidt was involved in that, wasn't he?
Pollard	He was the program manager. Fred Brown was a JPD [Junior Professional Development] over there. Fred and I were working on it, trying to—trying to work the numbers and everything. But we did those measurements in the—cross-section measurements in the room there as we scaled it up to like fifty-something gigahertz, figure out what the data was. We made the balloon, made the measurements out at Ohio, and it came on up the pattern and the level came out almost identical to what we calculated. I'd like to have that big brass thing. You remember that big brass thing?
Lysher	Yeah
Pollard	Corner array? The made-for-model of the balloon? They turned out exactly alike.
Lysher	One thing I remember about this—it's kind of coming back—is Oberschmidt and I went up to some meeting up there, peddling it, and this guy, the Systems Command wanted to know how much it's going to cost to make them. We hedged and hawed and said we'd have to you know… He said, "You guys come up with a number right now, or I'm going to just come up with one." So Mike and I, we pulled a number out of the air, and that was what we were going to manufacture them for. But it never came to that anyway, I guess.
Pollard	Not sure what happened there. It was a good idea, I thought. And we knew it worked, cheap. It was like in a soup can; the whole thing was packed in real small and all you had to do was throw it overboard. When it got in the water, it popped open, and it just sat in the water and looked like a ship. It'd bounce around and do everything a ship did. It would blow away kind of fast if there was a wind, but—
Lysher	Well it made it look like the ship was going.
Pollard	Or you could tether it to the ship. I don't know. I guess it was competing with SLQ-32 and CIWS [Close-In Weapon System], and a bunch of other things, and nobody sort of liked simple things.
Lysher	Whatever it is, we had a sponsor up there that was going to fall on the spear for it.
Pollard	But it was cheap. I can't remember what you guys did, but the number was, like

	$10 grand or something.
Lysher	Yeah, it was cheap.
Pollard	And as far as decoys go, you can't get much cheaper than that. The division you're talking about, Colby, that was an electromagnetic compatibility division that Colby handled, right?
Lysher	Mhm, right.
Pollard	And then branches out of that, at least the branch you had, went to [F]20. And then I guess Bill Lewis's branch—Bill came over from K Lab or someplace like that, didn't he?
Lysher	Did he?
Pollard	He was in K Lab originally. I don't know how he was sort of moved around. He must've come from there to the compatibility thing. I don't know. It must've spun out of that. He was working on FEWSG too, according to his bio, Fleet Electronic Warfare Support Group or something like that, a simulator—fleet simulator. EW simulator.
Conclusion	Thank you for listening to this week's Dahlgren Centennial Podcast, and hopefully you have learned another interesting aspect of what our people accomplish for the Navy and for our nation. We will continue sharing how Dahlgren is a one-of-a-kind location where innovation is heralded as the hallmark of each individual. <u>PAUSE</u> Tune in next week to hear from Dr. Ralph A. Sawyer whose significant work at Dahlgren spanned from 1941 to 1945. His podcast will focus on his contribution to the Armor & Projectile Laboratory. Thank you for celebrating this century of innovation with us at Dahlgren. <u>MUSIC</u>