August 2018

Spartans Summer Newsletter 2018

As the summer of 2018 passes all too quickly, I realize that the latest newsletter labeled Winter 2018 should properly be called the Winter of 2017/18 and was issued nine months ago. The Spring luncheon is the inspiration for the summer newsletter and the source of most of the membership news it contains. For more timely information I recommend our web site https://clubspartans.weebly.com maintained by our webmaster **Margaret Gross**, but the newsletter allows me to reminisce and comment in a way that could be done by web blog but without any greater assurance that the members will read and comment on the content.

Our founding member and long term secretary extraordinaire **Al Lawson** has asked to be relieved of his duties and is now located in a retirement home near Ottawa and close to family members. We can only wish him many years of contentment while he observes and comments on the activities of the revised planning committee that now includes **Susan Sztyk** and **Wanda Daniels**. We have already had our first committee meeting and hopefully have done an adequate job of reassigning Al's former duties.

For the third time we were fortunate to have the Felix retirement home as luncheon venue thanks to the hosting of resident and Spartan committee member **George Larder**. Once again we thank the luncheon organizers **Gil Kerr** and **Ed Sorochan,** as well as the Larder family, including daughter **Barbara,** friend **Mark Smolka** donor of the bourbon door prize, and grandson **Nick Lefrancois** for his services. The lively response from almost fifty attendees was close to the limits of the room and required some last minute accommodations by the staff for kitchen and seating arrangements.

We were pleased to welcome first time visitor **Michael Payette**, and the return of long time member **Mary Buchanan.**

Although facilities were provided for a planned slide show, gremlins crept in and the show had to be cancelled in spite of the best efforts of our volunteers. At the Fall luncheon we expect to succeed on our second attempt to reminisce over **George Larder's** fishing expeditions, and to see some of the installation challenges on the Grand Prairie to Alaska system recorded by **Dan Mercik**. New member **Michael Payette** also provided a lovely addition to a small collection of the Spar revue pictures that I had previously obtained from **Muriel Munro**

The three door prize winners were:

1) Manfred Altman, a bottle of Jack Daniel's bourbon mounted in a decorated metal box with a whiskey glass enclosed.

2) Dan Mercik, a bottle of Crown Royal whiskey.
3) Ted Phillips, a small mantel clock made and donated by the late Curt Ingerville

Thanks to all committee members for their valuable contributions to the maintenance of our group.

Nicole Bourdeau	Photographer and chief recruiter
George Larder	Treasurer, jam maker and Felix host
Gil Kerr	Luncheon organizer
Margaret Gross	Webmaster
Ed Sorochan	Member at large and acting organizer
Gus Gross	Member at large

Correspondence with members

The replies to the spring luncheon invitation usually provides most of the news that finds its way into the newsletter, but this time there was little member response, or perhaps it is another example of missing the diligent contributions of Al Lawson, who faithfully forwarded newsworthy messages to me for inclusion.

There is no shortage of correspondence with members, but almost completely restricted to the small but energetic group I call the Spartan writers. The theme of the correspondence understandably emphasizes the history of microwave radio relay and space developments, but still contains enough of the human element to be interesting to the broader membership. I can only emphasize that we all should write down accounts of interesting events that made life at work interesting and worth sharing.

From **Jill Krzyzanowski**:

Hi Mr. Keyes - I am writing to you on behalf of my father **Al Lawson**, we spoke by phone a few weeks ago. I would like to let you know that my father is now in rehab for his broken hip. He is doing well and progressing every day. Please note that he has now officially resigned from his administrative duties with the Spartan's but is happy to continue to participate in luncheons and other activities as a paid member. I trust you will be able to find someone else to take over all my father's previous duties surrounding membership secretary and photographs.

I replied: Thank you so much Jill for stepping in to pick up some of your father's volunteer duties. Members of the organizing committee are keenly

aware of his volunteer contributions, particularly when they stop and we have to scramble to make up the loss. We fully appreciate that your dad can no longer carry on his volunteer activities and we sincerely wish him a complete and speedy recovery. Until such time as we have a reassignment of his duties, we will leave him on our committee distribution list, hoping the news may be a source of distraction from his bodily ills.

Thanks again on behalf of the organizing committee

Lorne

And **George Larder** commented:

Thank you Lorne for passing this message from Al's daughter Jill. I was shocked to hear her news as I had no idea his fall resulting in a broken hip was that serious. This is the end of an era for me as Al and I have worked together for so many years on behalf of the Spartans, and for so many years at Spar as well. I will reply to Jill asking her to pass on my sympathy to Al for what he going through. His resigning from all his activities on our committee leaves a very big hole to fill.

From **George Rout**:

Hello Lorne. I must owe some dues, as I have not received any news for a while. Perhaps somebody can bring me up to date.

I just had a call from **Eila Tallon** formerly of RCA with sad news that Martha Szick died this morning, Jan 18, 2018, in BC where she has been living for a number of years. She was 84. Martha had heart problems and a recent fall and recovery caused a heart attack. She was the prime expediter of materials for the ISIS 2 project.

From **Dan Mercik**:

Lorne--if ever the history of the GPA System is written I would like to make the following story its final chapter.

As section engineer for Watson Lake--Whitehorse portion of GPA System, I was located in Whitehorse where, the day before the system opening ceremonies were to take place, I was instructed to phone the Whitehouse to make sure that the line was operational: it was to be used the following day for prime minister J. Diefenbaker to talk to president J. Kennedy. I did, and it worked. The only reason I mention it is not that I talked to some technician in the Whitehouse but because I had to get out of bed in the middle of the night, drive to the station for a two minute call. The line was OK. On the day of the Opening (July 22, 1961) Whitehorse was bursting at the seams: dozens of politicos from Ottawa, reporters, camera crews, almost equally large representation from the States, a surprisingly large group from

Rockefeller Plaza and from Montreal our President John Houlding, Chief Engineer **Bruce MacKimmie** and two others whose names I do not remember. There was not a car to be had in Whitehorse so I ended being our group's chauffer. Mr. Houlding thanked me by giving me the autographed copy of the Opening Ceremonies Official Program. The ceremonies dragged on with boring speeches, strained phone conversation between Diefenbaker and Kennedy (they hated each other). When it was all over, there followed a never ending series of receptions, cocktail parties, and formal banquets.

Late in the afternoon Bruce, visibly upset, came to the hotel where I and few other RCA Victor technicians were staying to apologise: it suddenly hit him that NOT ONE RCA VICTOR EMPLOYEE WHO ACTUALLY WORKED ON THE SYSTEM WAS INVITED TO ANY FESTIVITY.

Adam

PS: It is all silence on the microwave radio relay history front. Have we reached "the end of history" ?....AJM

Thanks Dan for the “final chapter” of the GPA system, and I hope it is not the end of history. I believe as we age we develop hibernating habits that may not include writing memoirs. **Mike Morris** has contacted **Saul Koblin** and I hope and expect that this will result in useful recollections from him.

Keep up the memory flashes.

Lorne

And again from Dan: Dear Lorne

The attached may not merit being preserved in the archives of RCA Victor but deserves to be remembered and made known to those who were not involved in this project and which, in my opinion “made” the Communication Division.

To clarify: Ken Gordon, a very bright young engineer, was my “second in command”, Kaj Jensen, mechanical engineer, responsible for those strange contraptions we were attaching to the towers to move the test antenna. Full of humor and a prankster, he “staked a claim” on Mt. Mactavish so real that he had CNR legal brains in a spin. (during the Gold Rush Mactavish made some miners rich).

The Epistle was the joint effort of my crew, fortified by a bottle or two of Canadian Rye and given to me at the end of testing.

With Regards, Daniel of Mercik.

Dan:

You attached an interesting copy of your birth certificate but not the “epistle” that you referred to in the body of your message. Perhaps you got into

a bottle of Canadian Rye. (Ironically Dan was the winner of a bottle of Crown Royal Rye whiskey as a luncheon door prize). The name of Ken Gordon is familiar, but I did not know him. I knew Kaj Jenson as a very competent mechanical engineer working on the Relay satellite repeater in the 1960 to 62 period. Your closing salutation shows me that you are adding to your list of aliases.

Regards, Lorne

Dear Lorne—it was not the bottle—I was rushing to finish the email as the dinner quests were at the door and clicked on the wrong line. But please DO read the Epistle as you will find it unique, to say the least. Daniel.

From faithful monitor Milt Lillo:

Hi Dan,

Over the past year or so I've seen several versions of your Epistle. The PDF file of the image you have just sent appears to be perhaps your original version. Since that image is not very clean I've taken the liberty to copy and format it into an RTF document. I suggest that you edit it to match exactly what you intended to write and then export it into PDF format. I don't know if this tome has been published in the member's stories section of the Spartans website but it would be a great addition. (The subject "Epistle" will be posted)

Disturbing news from Barbara Larder:

My dad is currently in the Valleyfield Hospital due to water on his lungs. He will not be able to attend the organizing committee meeting planned for his room at the Felix. Kind regards. This news item has a happy ending as George recovered quickly and our committee meeting took place as planned.,

From diligent researcher **Mike Morris:**

Hi Lorne, Just a brief update.

I met with Saul on Thursday in Toronto and we had a good chat (and lunch) at his Condo. I took a lot of notes but the meeting was only the first of several that will be needed.

Interestingly (to me) Saul's memory seems to work like mine. Many "incidents", names and personalities are crystal clear: deep technical details less so, and as we talked more details emerged.

He also supplied a number of RCA "Organization Notices". I recognize all the names except a Mr. "M.C. Kiryelejza" who was appointed Supervisor, Microwave Communications, by Vic Isaac on September 19th 1960.

He gave me a copy of the Montreal Gazette front page and page 4 from July 24 1961 dealing with the GPA inauguration. Curiously the front page says Kennedy called Diefenbaker from Hyannisport….while page 4 says Diefenbaker called Kennedy in Washington. No doubt there's a sane explanation for this anomaly. There's also the good news that the new system would reduce the time it took to get a warning of incoming missiles by 2 1/2 minutes. July 24 1961 also happens to have been my 21st birthday (I was still in London having graduated in June).

Saul has many hundreds of slides which he promised to look at to see what he could find although he didn't have anything handy to view them with but mentioned a relative who may be able to help. Some of the slides are getting brittle he says.

More later after our next meeting. Regards, Mike

To which I replied:

Your meeting with Saul is a great start. It is encouraging to find that his overall memory is good and may improve on details as you move along. Try to find out about other systems that used either MM600 or CW20 equipment. I am moderately familiar with the VHF and UHF equipment, which was sold in Canada and abroad in the mid to late 50s. I cut my teeth on system engineering when I was directed to design a hot standby system for a VHF system for Columbia that developed eventually into a more sophisticated design using baseband continuity (and regulation) rather than simple carrier presence. The system had been designed by RCA International and I had to dig into the full details to establish baseband noise levels, and began to be familiar with CCIR recommendations.

I worked for Marc Kiryelejza who reported to Vic around this time and later went to the US and was replaced by Doug Russell as I recall. By the 58 era we were well into the MM600 design including special measuring equipment that I became very familiar with but did not design. It was probably logical that Greg directed me to design a baseband switcher for the MM600 that eventually became a baseband combiner by the time we built the Montreal to Vancouver CN/CP system.

Don’t forget that I have a good quality scanner for slides and have lots of experience having scanned over ten thousand images from my collection, not all Oscars I can assure you.

Great stuff

Lorne

From **Linda Baxter**:

Not sure if you knew Victor Sadlowski now living at my Aunt's senior residence, Chateau Dollard and he is in a wheelchair. I was shocked to see him in this condition, and he needed a few minutes to recognize me and that is certainly not like him.

Again from **Mike Morris**

Gentlemen: Do you think these Mill Village 1/2 videos are worth adding to the SPARtans website? https://www.youtube.com/watch?v=O_Luk0mFNzo They're already on another website but of course they can disappear any time.

RCA gets a mention at the end of one of the larger video when a published paper by **Doug Jung** and **Peter Foldes** is highlighted. Also the MV-1 feed and receiver assembly is shown ("RCA Victor") when it was transported to Expo 67 and then a museum in Ottawa (Canada museum of S&T?)...I didn't know that.

I can recognize some of the equipment here and there and the control desks. None of the names shown mean anything to me except I recognize one gentleman, a technician that I worked with on site, in the lineup at the end of the larger video.

I wrote to fellow writers as follows:

I have just burned up more than one hour watching the 2002 IEEE milestone ceremony 40th Anniv of Telstar recognizing the first transatlantic television transmission from Andover to Plumeur Boudeau via Telstar 1. You will have to track through a few TV milestones before coming to the video.

I was interested to see if an embarrassing incident involving the British Post Office (BPO) earth station at Goonhilly Downs was mentioned, but it was not. Goonhilly was the intended receiver for the first transmission, but it failed to receive the signal because the station used the wrong sense of circular polarization. The problem was recognized quickly and the solution was to remove a short section of waveguide and rotate it 90 degrees to change the sense of polarization, but it was too late, and the backup station at Plumeur, a carbon copy of the Andover station, claimed the first. I was a little surprised and disappointed that they did not include this evidence of human frailty, to balance the chest beating.

The error was remarkably similar to failures in communications during WW2 when British drawings were misinterpreted by North American manufacturers, a flaw pointed out to us in a humble engineering drawing class in our first year of engineering, (first angle versus third angle drawing convention). When I asked some of the satellite people directly involved how this could happen, they replied that this important interface had been

discussed and agreed between ATT and BPO engineers, but unfortunately one assumed looking up the antenna and the other looking down.

Some of you may recall that the early satellite designs including Telstar and Relay, of necessity used circular polarization (I can explain that later).

Lorne

This prompted a lively response from diligent correspondent **Dave Barnby** and the following response from me:

Dave:

You are a gem with your ready references and in depth research. I rely on my memory with occasional references to the web, which I apparently did not do with the spelling of Plumeur Bodou. Count on the French to be mischievous as usual trying to embarrass or one up the Brits. The Brits are still to be congratulated for their riskier approach of developing their station from scratch while the French simply copied the proven Andover station that had demonstrated its functionality with the prior Echo balloon experiments.

The French on the other hand must be congratulated for turning their site into a museum while the rest of the big antennas of the era are probably dismantled or bull dozed. It helps no doubt that the French site is relatively close to millions of potential visitors while the others are generally remote.

In some recent correspondence, probably in connection with the newsletters, I mentioned that I had the privilege of working at the Andover station in January 1963 after the launch of NASA's Relay experimental satellite in December 1962. As anyone who has seen up close or worked with these giant installations, they are awesome. Try to visualize a Hogg horn (sugar scoop) with a 20 meter aperture lying on its side atop a circular railroad platform for adjusting the azimuth of the whole assembly, while the elevation was adjusted by rotating the horn about its horizontal axis. This arrangement is called properly I believe, an elevation over azimuth configuration. The test area that I was using was a room about 25 feet square at the apex of the huge tapered horn and of course swung around as the antenna rotated in azimuth.

Those of you familiar with tracking earth stations realize that the AZ/EL configuration means that a direct overhead pass produces an abrupt change in the azimuth by 180 degrees. For the tests I was supporting (first transatlantic colour TV) there was in fact a pass almost directly overhead used to equalize the group delay before the real pass that was not surprisingly mid Atlantic about an hour later. As I was going about my business equalizing the group delay, sitting on a lab stool, I felt slightly dizzy and found myself falling over. I realized that I was not ill but merely being centrifuged as the whole assembly slewed remarkably fast in azimuth. It is only a guess but I was probably about

20 feet from the vertical axis of azimuth rotation. The real pass about an hour later was very sedate, and the test transmission went on normally.

Now for a brief explanation of the choice of circular polarization: These early experimental satellites were invariably spin stabilized with donut radiation patterns symmetrical around the spacecraft spin axis. Although I am not an antenna expert, I believe it would have been possible to produce linear polarized radiation, but this would this would have complicated the earth station feed design as it would have to track the polarization angle, as well as the azimuth and elevation, as the geometry of the path changed during a pass. In later satellite designs using reflectors for higher gain, the antenna assembly was "despun" but now there was a problem of the rotating connection between the repeater and the reflector, which favoured circular polarization solutions. It was not until the dominance of the geostationary orbit that linear polarization became standard for point to point satellite communications, as the relative geometry of the satellite to earth station did not change with time. For broadcast satellites, circular polarization is still used, as only azimuth and elevation adjustments are needed for the simple receiving antennas.

Sometime Spartan member and earth station antenna expert, **Roland Schwerdtfeger** commented and I replied:

Your insights and experience are always valued Roland, and Mike, what prompted you to find that obscure CW20 reference on the web? I too have never heard of the CW60 and CW62 (See reference later in the newsletter). Even as a non expert, I have some appreciation for the complexity of the dual band dual CP earth station feed mentioned by Roland.

During the development of the satellite repeater for NASA's Relay program in the 1960 to 62 period, we were asked to quote on satellite simulators to be provided for the earth station bore sight locations. I do not recall being directly involved in the process, but some wise person, probably Emeric Podraczky, proposed that we simply replicate the design we already had in hand for the flight program and build them with regular MIL spec components, instead of the outrageously expensive space devices, then mount them in weatherproof boxes. I do not recall what was used as radiating and receiving elements, but it seems logical that they used the same polarizations as the real thing, possibly coaxial fed flat spirals. It may not have been intentional but it eliminated any uncertainty of polarization and potential embarrassment similar to the Telstar incident discussed earlier. I recall that we built and installed six non redundant sets world-wide and never heard a single complaint. Although we built the all solid state redundant repeater, the TWTA's were provided directly from RCA Somerville to save integration and testing

time, but at least it gave us some hands on experience with them. Indulge me if you will with a somewhat strange tale that now comes to mind.

Fast forward a decade or so and I found myself in a meeting at Fairchild near Baltimore who were looking for repeater expertise for a small satellite program (that went nowhere). A tall lean fellow and I exchanged some glances of recognition, and at coffee break quickly concluded that we had met at Goddard Space Flight Centre (GSFC) the contracting agency for NASA's Relay program. He was anxious to share a story with me and said that I was probably the only living person who would appreciate the unusual tale he was about to recount.

As well as now being a consultant he was an avid hobbyist and regularly patrolled the surplus electronic stores in the Baltimore area. On a recent visit he peered into a wooden barrel full of random electronic components that were for sale by the pound and saw the unmistakable shape of a TWTA from the Relay program. He knew as I did that the focusing ring magnets were of platinum cobalt, the material with the highest coercive force at the time, and very expensive. He purchased one item then destroyed it to salvage one of possibly twenty or so used in each TWTA. When an assay confirmed the composition, and a market price was established, he quickly returned to the surplus store and negotiated a very modest price for the whole lot, presumably without raising the suspicion of the store personnel. Apparently, as was common practice at Goddard, all deliverables from their programs were returned at the conclusion of the program for possible use in the labs. When no longer needed they were disposed of and wound up in the barrel. I did not press him for the financial success of his exercise, but he did concede that he was driving a better car than he had ever done before. A little mental arithmetic later told me that for probably a few tens of dollars he pocketed around $50,000.

Lorne

A long term correspondence with former RCA employee and good friend **Ken Crook** included this exchange about a shared experience when I took him on a sightseeing flight around Montreal:

Thanks for the picture just received and for the reminder of my flying days that terminated voluntarily about the time that Riggie began to be very anxious when I went flying. I had to check in at almost hourly intervals that made flight planning difficult. I believe I could still pass my medical but I have

not seriously considered flying again, but I must concede that the ultralights look interesting.

While doing some digital housecleaning of my mail yesterday, I reread your most interesting account of your career at the Stanford Linear Accelerator (SLAC). I have not done anything similar but I use my retiree's newsletters as an opportunity to recall some vignettes and make comments. I was also reminded of the link you sent about the Canadian transcontinental microwave system that enabled Canadians to watch the Grey Cup live from coast to coast. I cannot claim any part of that development, as it was based on the same Bell labs TD2 microwave system that in 1953 completed the US transcontinental system from Chicago to LA, coaxial cable had linked much of the eastern US by then. The wheel has made a complete revolution, as almost certainly most transcontinental traffic now is digital by fiber optic cable. The Canadian system installed by Bell Canada was essentially a carbon copy of the US system but much longer. I cannot find the link you sent, but from memory the Canadian system was turned up around 1957. It was not until around 1960 that the RCA Montreal designed MM600 microwave equipment was used in a system for CN/ CP telecommunications from Montreal to Vancouver. I played a part in that equipment design and the associated test equipment.

I was in my final year of engineering in 1953 when the US system was commissioned and I followed the development closely. The whole affair was well documented in the Bell System Technical Journal (BSTJ) and had quite a profound effect on my approach to engineering. It showed how even the largest problems can be analyzed and subdivided into manageable pieces, a process now called system engineering. I was reminded of another major technical achievement just recently by a documentary on the technology contributions to WW2 by the radar group at MIT (The Rad Lab) although the key to microwave radar was the invention of the magnetron at Manchester U. An interesting footnote is that Dr. Rene Whitehead, later head of RCA Montreal research labs, was a member of the wartime "Tizzard group" that brought the first example of the magnetron to the USA and Canada. This fact was barely mentioned in the documentary. Only recently I watched a program on Silicon Valley and the key role played by Stanford University. It claimed that hardly a cent of WW2 defense R&D funds went to Stanford while MIT was flooded by millions. This oversight began to be corrected in the cold war era and by this time Stanford used the wise tactic of encouraging entrepreneurship by its research staff and graduates benefiting from the defense dollars pouring in.

Another great technical advance that influenced me was the first Trans Atlantic Telephone cable (TAT1) linking London, New York and Montreal, 1956 I recall. I had obtained and digested the full set of papers on the system and even took a half day off, without pay, to attend the opening ceremonies at the

Canadian Overseas Telecommunications Corporation (COTC) building on Beaver Hall Hill. I even had a chat with a technician in the cable landing in Oban Scotland complete with broad accent.

Two things stick in my memory, the first was that the vacuum tubes used were designed and built in the late 30s but wartime had disrupted the plan to build the cable. From then, the actual batches of tubes had been on continuous test so that those used in 1956 had batch history from the late 30s. In later years I learned how difficult it was to predict the lifetime of thermionic cathodes, so that even in 1970s when we were using TWTAs in long life communications satellites, there was no reliable and verifiable model for cathode life. The second was my astonishment when I started to read the paper on the actual cable laying and found that the first technical reference was to a paper written in the 1870s by Lord Rayleigh for the first trans Atlantic telegraph cable. How's that for staying power

Lorne

This and other recollections from my early career prompted this interesting response from Mike Morris:

Your reference to the TAT-1 undersea cable and vacuum tubes reminded me of my job interview at Cable and Wireless in 1961: fresh out of Imperial College with my Physics degree in my hand. In those days of course most graduates in Physics (well me for sure) had near zero idea of what to do after graduation and the college was no help. After writing a few letters to companies I'd heard of I got an interview at Cable & Wireless having very little idea of what they actually did…presumably something to do with cable and possibly wireless. Anyway I was shown around a lab that must have been built around the time of the Lord Rayleigh you mention by a bearded gentleman in a white lab coat. Long stretches of polished wood and brass "troughs" holding cables immersed in salt water. The function of a repeater was explained and also how those (uncouth?) transistors, which I may have heard about, were not now nor would they ever be used in serious applications, such as undersea cable repeaters. I was also told that "money is not important" since being in this laboratory was a vocation and a privilege. Fortunately I was not offered a job.

Switching the subject back to Microwave systems I found the attached from 1964 which is of interest even if it is from the RCA USA perspective. RCA Montreal is mentioned in connection with the MM600 and MM1200. The "MM60" also gets a mention and I wonder if this was the name originally given to the 3102 in Montreal? It also answers the question about the CW60 if not the CW62. Interestingly the author, Haddon Wilson, appears to be Canadian

(Kingston graduate). Similarly I've found a paper on the CW60 by a Mr.E.J.Forbes who graduated in Winnipeg and also first followed Mr. Wilson through Canadian G.E., both joining RCA in 1953.

I replied:

An interesting tale of your first encounter with the real world of telecommunications. I read your RCA Engineer attachment with interest and of course recognized many names. Greg often mentioned Haddon Wilson and he was indeed a Queen's grad four years before me and much respected by Greg. We may have overlapped at RCA Victor, but remember that I worked for perhaps two years in defense electronics under Russ Good and Joe Baron before joining Greg. By that time, I believe Haddon had decamped for Camden NJ.

Two names brought traces of recognition. The first was Dr. F.(Fred) Sterzer, in connection with MM600 that started as a joint development with Camden but gradually became a solo Montreal venture. I am sure RCA tolerated and even encouraged creative conflict within the corporation to demonstrate who was the most capable, before earning a corporate mandate. The second name was R.F. (Roy) Privett a lean quiet Brit, as I thought, until our paths crossed about a decade later. After a few moments for mutual recognition he figuratively pounced on me with a tale of underhanded betrayal by RCA Victor on the MM600 development project. Even after a decade he was still seething over this perceived sleight. I personally did not believe there was any subterfuge in the process but simply a fine design besting a poorer one and said so. It did little to smooth ruffled feathers. The key issue as I recall was Emeric Podraczky's proposal to use varactor multipliers and up converters to eliminate the unreliable and low performance driver TWTA configuration proposed by Camden. Emeric's concept was incorporated successfully in our repeater for NASAs experimental communications satellite Relay starting in 1960 and became the standard for terrestrial microwave relay systems.

I really hope we can develop a time line for microwave relay systems as the paper by Elvidge, Lopianowski and Martin only raised confusion in my mind about where the Rimouski Mt. Carleton system fell on the time line. With the name freshly in mind I googled Lopianowski and Vancouver and got a credible address in West Van that turned to complete frustration when I tried to "Leave a Message" to establish contact, and got an Air Canada pop up that obscured the message panel and would not go away.

Lorne

Roland:

So good to see you in active correspondence with Spartan members again. I did not see Dave's query that triggered your response, but you are not using the conventional definition of Faraday rotation, "a rotation of the plane of polarization which is linearly proportional to the component of the magnetic field in the direction of propagation", no mention of raindrops. You clearly explained the genuine raindrop effect on depolarization.

Almost always a story comes to mind when some almost forgotten name or topic comes up. In the mid sixties I had the privilege of working with Kishore Chitre who had earned his PhD on circulators and isolators that rely on the Faraday rotation principle. He did his best to give me some insight into these devices that appeared so marvelous but mystifying when they first appeared in the late 50s. The next serious consideration of the Faraday effect came during the development of the RCA Satcom in the early 70s. During the FCC licensing process NASA was asked to provide technical support to the FCC, and someone in the organization, or one of their consultants, questioned the viability of orthogonal linear polarization for frequency reuse. Their concern was that misalignment of the wave and the fixed antenna would produce unacceptable degradation in isolation. I had been asked a relevant question earlier by the RCA technical team developing specifications for the spacecraft attitude and station keeping subsystem. Analyses showed that the cross polar effect was simply the sin of the misalignment angle (20 log sin delta in dB), so I had at least a maximum angle that could be tolerated. The more difficult task of analyzing the propagation path and its statistical significance was left to Tony Raab who did a masterful job of showing that the Faraday Effect was measurable but statistically insignificant, and we got on with the job.

An unrelated foot note to that memorable meeting at Goddard Space Flight Center (GSFC) arose during a coffee break at this well attended meeting. A relatively young engineer came up and introduced himself and said he had something he wanted to show me. Almost immediately I recognized him as an assistant to the responsible engineer on a contract for several wide band modulator and demodulators that we had delivered to GSFC in the early 60s. I was the project engineer for that project, ably assisted by Fred Grosswindhager and Peter Oldfield, two of the best engineering assistants in the business. After descending several floors we entered a basement lab and he showed me a rack of equipment containing one of the modulator/demodulator sets mentioned. He said with both pride and satisfaction, that for the past decade this modem had become the lab standard for performance and stability and had rarely been turned off. I believe that I passed on this overdue recognition to Fred and Peter. There was another incident in connection with this project that was a powerful

contributor to my professional development but I will leave that account for a future exchange.

Lorne

Interview Alert

To the credit of MDA, their public relations or communications group has been carrying on an earnest attempt to record the history of MDA and predecessor companies, Berliner Gramophone, RCA Limited, Spar, and EMS. Recent achievements in space have been well recorded and displayed by a mural and time line in the Ste Anne de Bellevue plant. The Ondes Berliner Museum and various published material has covered the early days of the complete time line from around the turn of the last century to the early 1930s, but the WW2 period is missing completely and the post WW2 period is very sparse. This is an area where those of us living and with reasonable memories can contribute.

In the past few years several of our members have done a good job of establishing the satellite earth station time line falling in the gap mentioned, illustrated by both pictures and poignant stories. Microwave radio relay developments, critical to the development of prime contractor capability for major space related work, is poorly recorded. Some of us are working on this area hoping to develop a credible time line of development and radio relay installations and space developments in the transition period. These newsletters contain some vignettes of developments in early radio relay and the beginning of space activities, but no definitive time line has yet been prepared.

The subject of employee interviews to contribute to the recognition of 110 years of Canadian industrial developments by MDA and predecessor companies has been raised to me by Krista Lane several times and I apologize to everyone for not acting promptly on her request. I believe Krista is a permanent MDA employee located in Vancouver. She is executing a plan to commemorate 50 years of achievement by MDA and 110 years of achievement by predecessor companies. Specifically she is looking for volunteer interviewees to record past highlights. I have told her of Spartan effort along these lines and that in general the Spartans want to help in this project. The logistics would likely involve a session at Montreal with an interviewer.

If you are willing to participate let me know and send along a brief description of what you would like to talk about. I have already alerted the group I call Spartan writers who have contributed to the history preservation activity and are good interview candidates. I started the ball rolling by volunteering to talk about pioneering space activities at RCA and Spar with emphasis on communications and scientific satellite work. I have received a

positive reply from Doug Jung whose areas of experience overlap mine in some areas but from a different perspective.

Please consider taking advantage of this unique opportunity to contribute your memories.

Deaths

Roger Louie passed away last year but his death was not noted until Ed Sorochan called about attendance at the spring luncheon and found to his discomfort that he passed away in 2017.

I replied to Ed's notification:

I can understand your embarrassment and I too am surprised that no one in our Spartan group seemed to know about Roger's death, although he rarely attended the luncheons. He was a quiet and intelligent person and along with me and Jimmy Huang formed a car pool of NDG residents for possibly twenty years. Although we all had different work and travel demands, the car pool cut our individual driving time and distance in half.

Lorne

Sending regrets

Doug Gilligan	Tanis Warens	Jane Robinson	Claude Richard
Ian Grier	William McMath	John Runeckles	
Walter Hrycyna	Tony Reynolds	Sim Shek	
Richard Lubesky	Me-won Hong	George Videc	
Fred Markhauser	Gaetan Robert	Bronwen Williams	

Your editor

Lorne