

# ARTS<sup>1</sup> II Display Emails

*A topical compilation by Lowell A. Benson*

## INTRODUCTION

Each time one of our Club or Board members asks a question or poses an issue, a search for opinions and data ensues! December 4<sup>th</sup> at 12:12 PM, Steve Koltes send a message to Keith Myhre asking a simple question, “Would the museum be interested in an ARTS II Display?” They exchanged several emails addressing the subject.

I, Lowell Benson, was copied on one of their mid-January exchanges. After reading the discussion, I reached out to an ARTS III retirees’ group that has been having monthly lunch meetings. My thought was that they might have some ideas for a display poster, etc.

I was right; we learned about experiences of several people as well as a few more tidbits of Air Traffic Control (ATC) procurement history. Copied hereunder are the emails that I saved on the topic – chronological order.



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<sup>1</sup> Automated Radar Terminal Control System

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*Edited with Microsoft Word, 23 April 2020*

December 4, 2019 at 12:40 PM, Keith Myhre<sup>3</sup> to Steve Koltes

Steve, I think it would be great at Lawshe. I talked with Matt Carter yesterday. He told me DCHS (Dakota County Historical Society) is planning on submitting a grant request for an interactive display using TPT video footage. If implemented, that would probably require rearranging the ERA/UNIVAC/LM exhibit area. Perhaps with room for the ARTS II console.

I'll talk with Matt the next time we're at DCHS on the 17<sup>th</sup> and see if he is OK with finding room for the display.

Would you or someone else be willing to put together a poster board explaining the history/significance of ARTS II and describing what the visitor is looking at? We've got lots of photos/slides of ATC displays. Perhaps we could incorporate some. And blow up a photo of a display screen and affix it to the glass so that the viewer would be able to see what controllers see.

What's with the Burroughs keypads?? See you tomorrow. Keith

{Editor's note: The tomorrow was the Old timers' gathering at the Lost Spur.}

December 4, 2019 1:18 PM, Steve Koltes to Keith Myhre.

**Subject:** Re: ARTS II display for DCHS

I can look into getting data. The ARTSII system was the precursor to common ARTS. Burroughs was the original manufacture and was brought into Lockheed combining with the Air traffic group here in Eagan.

<sup>3</sup> Email addresses of communicating people are not copied herein to minimize phishing.

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December 19, 2019 12:11 PM, Keith Myhre to Steve Koltes

Steve, Matt is enthusiastic about adding the ARTS II display console to the Lawshe Museum display of UNIVAC/Unisys/LM equipment. Several questions:

1. How will the display console be transported to the Museum?
2. Weight
3. Dimensions
4. Is the display still operational so that you can take a photo of MSP aircraft tracks? Matt would like to blow up the photo & tape it on the screen.
5. If not, do you already have a photo?
6. Alternatively, a good photo of MSP tracks from another round CRT.
7. Photo of the MSP ATC room that could be displayed with the console to show the operational usage
8. Photo of the IOP as installed at the FAA test center to be blown up & used with the IOP at the Museum.

**The IOP is to the right of the Univac laboratory jacket. We can relocate the two kiosks of the drum memory & antenna coupler.** That should provide enough room for the ARTS II console to be placed in front of the IOP.



Equipment references: <http://vipclubmn.org/CP30bit.html#IOP>,  
<http://vipclubmn.org/Memory.html#Drums>, and <http://vipclubmn.org/couplers.html#Program>.  
{Side note: The glass bottle like part on the right side of the Antenna Coupler is a corona shield, this keeps the high voltage antenna connection from arcing to nearby metal aircraft parts.}

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January 2, 2020 at 11:43 AM, Keith Myhre to Steve Koltes

Steve – I'm resending my e-mail, in case you missed it earlier. Keith

January 2, 2020 9:55 PM, Steve Koltes to Keith Myhre

I did not see these questions. I will check on this and get some answers.

1/2/20 11:24 PM (GMT-06:00), Keith Myhre To: 'STEVE KOLTES'

Subject: RE: FW: ARTS II display for DCHS

Thanks, Steve.

Saturday, January 18, 2020 11:15 AM, Steve to Keith

A few answers.

1. I think when we want to transport it I will rent a truck from Menards or something like that. It would be best to use the loading dock since it is fairly heavy.
2. Around 200 lbs.
3. About 30 inch by 30 inch and around 4 ft high.
- 4 - 8. There is a presentation that shows the history of the system as well as how it fits into the overall ATC system. I ask the folks there to go through it and remove any proprietary data and we should be able to use it.  
They have no problem storing it for us until we would like to take it so we can control the timeline.

Sat 1/18/2020 11:46 AM - ARTS II display for DCHS, Keith to Steve Koltes

Cc: Matt Carter; Rebecca Snyder; Les Nelson; Bob Pagac; Greg Oxley; Keith Myhre; Harvey Taipale; Lowell Benson

Steve,

Let's wait until April, when Bob, Les and I are all back from warmer climes, to help transport/unload/move the display. No snow to deal with then either.

Does the presentation run on the ARTS II display? Or on a PC? Power Point?

Thank you for checking on things. Keith

Mon 1/20/2020 11:52 AM, Harvey Taipale to Keith Myhre

My recollection is that ARTS II was not our system. In any event our earlier programs subcontracted displays to T I. Don't think there's any Minnesota history here.

Mon 1/20/2020 12:27 PM, Keith Myhre to Harvey Taipale

Harvey: It is true that ARTS II wasn't developed or manufactured in Minnesota. But the UNIVAC/Unisys/Lockheed/Leidos ATC group has developed/supported ARTS III and other successor & complementary air traffic control systems for over 50 years in Eagan. Most of that has been software and support vs. designing/manufacturing hardware. Better to have an ARTS II console to help tell the story of Minnesota ATC than no console at all.

Keith

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Tue 1/21/2020 7:34 AM, Lowell Benson to ARTS III group

**Subject:** Displays at the Lawshe Memorial Museum, ARTS

To Brent Jordahl; Hank Donaldson; Roger Stern

Brent, Hank, and Roger: Good Morning, as you three well know, our heritage companies were very, very involved in FAA systems! File Computer for flight strips, ARTS I, ARTS III, Common ARTS, ..... <http://vipclubmn.org/EngDoclmg/10.%20ATC.pdf> is a very high-level museum poster board.

**Steve Koltas** now has opportunity to bring an ARTS II system display to the Lawshe Memorial Museum in S St Paul; the Legacy Committee would like to put together a poster showing the relationship of this ARTS II system to our ATC lineage. Especially since Common ARTS superseded the 120+ small airport ARTS II installations as well as the 60+ large airport ARTS III ATC systems. (reference: A 1990 **History** of Terminal Automation by the ATC staff.)

At one time **Brent** told me that a bunch of former Air Traffic Control engineers and managers had a monthly gathering for lunch. Would/Could you discuss this topic at your next lunch, then provide the Committee with any recollections that would aid in developing such a poster?

Do you know of anyone else that could contribute to this topic?

Thanks in advance for anything that you could contribute! Keep Warm.

*Lowell A. Benson, U of MN BEE '66.*

Retired Eng. Mgr. UNIVAC 1960 => UNISYS 1994 & U of MN 1994 => 2001

*Life is the time, space continuum of human interactions!*

Ps: See <http://vipclubmn.org/aircontrol.html> if your memory needs refreshing about ATC systems.

Tom Montgomery did an excellent job of gathering info for the web chapter - someday this chapter could use the evolution to Leidos data.

Thu 1/23/2020 3:56 PM, Henry Donaldson to Lowell Benson

Dear Lowell,

I believe the original ARTS II was generated as a part of the Phase I Enhancement program and consisted was a prototype system installed in Knoxville with, I believe, a 1206 and some sort of a BDAS. It later went out for a bid and three or four companies submitted proposals. The submitted bids were unacceptable and the program was rebid as a two-step IFB. The winner (with a VERY unreasonably low bid) was Burroughs and was awarded the contract after given the opportunity to revise their bid. They lost their xxxx on the project, but I believe installed the systems in the various locations. Therefore, I don't understand what the ARTS II systems as installed would be related to or included in the ATC lineage of UNIVAC. Therefore, I am not sure what relevance the ARTS II display would have for our museum show.

I will check with my buddies at the next lunch to confirm this data and gather more if possible.

As a second issue, I have checked the charts given in the "History" reference (below) and find at least one error. ARTS I in Atlanta was a beacon AND Radar tracking system, not a 'beacon level tracking system'. ARTS III was a 'beacon level tracking system' and therefore a retrograde from ARTS I in Atlanta and the Common IFR Room in New York.

Regards, Hank Donaldson

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Fri 1/24/2020 7:56 AM, Lowell to Hank,

Hank: Thanks for your ATC feedback. Please let us know what others at the lunch know - recall about ARTS II. There are two acronyms that you reference that aren't in my waning memory, BDAS and IFB.

My personal knowledge is limited, just had 1.5 yrs working on the Advanced Automation Systems' definitions that were supposed to replace the 120 ARTS II systems, the 64 ARTS III systems, and the 21 En-Route systems with advanced technologies. Karen Maddock was the on-site Rockville MD Program Manager for the AAS (Advanced Automation Systems) group reporting to Bill Marberg, <http://vipclubmn.org/USsites.html#Rockville>. Probably a good thing that the FAA ended up cancelling the AAS project **because our Common ARTS** then became the 'unifying' system for all the FAA sites.

Others may recall that Fred Jenny was leading the Burroughs 'defense' groups that included Systems Development Corporation (SDC) responsible for maintaining the ARTS II systems.

I looked at slide 19 of the FAA 'History', to find the *Beacon Tracking Level* bullet that you note as being erroneous. Since that is not our Legacy Committee's slide set - I can't easily 'fix' errors in items provided to the Legacy committee. There are several other documents linked from <http://vipclubmn.org/aircontrol.html#Perusing> that were provide by Tom Montgomery, et al' as the ATC systems part of our Legacy Anthology was developed.

Relative to an ARTS II item at the Lawshe Memorial Museum, I agree with Keith Myhre's note to Harvey Taipale: " Harvey: It is true that ARTS II wasn't developed or manufactured in Minnesota. But the UNIVAC/Unisys/Lockheed/Leidos ATC group has developed/supported ARTS III and other successor & complementary air traffic control systems for over 50 years in Eagan.

Most of that has been software and support vs. designing/manufacturing hardware. Better to have an ARTS II console to help tell the story of Minnesota ATC than no console at all! Keith".

Again, thanks for your feedback - Cheers!

Lowell Benson, BEE, U of MN 1966 - *Predict the future; then plan and work to make it happen!*

Wed, Jan 22, 2020 at 10:14 AM, Brent Jordahl to Al Thomas

Hi Al, cold enough for u down there? I'll be down there in different places mid-February. Any thoughts on the message below? Brent - Sent from my iPad

Begin forwarded message: **From:** Lowell **Date:** January 21, 2020 at 7:34:00 AM CST

**To:** "Brent Jordahl, Hank Donaldson, Roger Stern

**Cc:** "Steve Koltes", "Keith Myhre ", "Harvey Taipale", "Matt Carter", "John H Westergren" >

**Subject:** Displays at the Lawshe Memorial Museum, ARTS {Editor's note: Message is above.}

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January 23, 2020 at 9:47:59 AM CST, Al Thomas to Brent Jordahl

Subject: Re: Displays at the Lawshe Memorial Museum, ARTS

Had two days of cold (got down to 35° yesterday morning, according to my personal weather station) but temps are heading back to normal (75°).

Having an ARTS II RADS would make for a good display especially if someone could find a lonely ACD in the FAA warehouse. Let me know if your FL plans next month bring you close to the Fort Myers area. AL

Fri 1/24/2020 10:08 AM, Brent Jordahl to Lowell

Lowell: I didn't have much input to ARTS II other than I took over the Contract Administration of "left overs" of the contract when Valley Forge facility was closing the facility. I asked Al Thomas for any input he may have, and his response is ~~below~~ just above. I also administered the subcontracts that Unisys had with IBM on AAS and worked with Karen Maddock. Sent from my iPad

Sat 1/25/2020 11:51 AM, Steve Koltes to Harvey

(In response to Keith's response to Harvey.)

ARTS II became our {ATC group in St. Paul} system with our merger with Burroughs in 1986.

I guess we should define what we consider legacy.

Sent from my Verizon, Samsung Galaxy smartphone

1/28/2020 6:26 PM, Hank Donaldson to Lowell

Lowell,

**BDAS** stands for Beacon Data Acquisition System and is the digitizing unit for secondary radar as used in the ARTS III system. In ARTS I (Atlanta) it was called the BVD for Beacon Video Digitizer and was provided by AIL. Atlanta also had an RVD which was a Radar Video Digitizer which was provided by Burroughs.

**IFB** stands for Invitation For Bid which is a two-step procurement process. The first step is for submission of technical proposals in response to the requirements of the Request for Proposal. One must meet the requirements of the RFP and the trick is to just barely meet them because once you have qualified, you must price your exact technical proposal. You then submit one bottom line number as total contract price and the low bidder wins. If you propose a Cadillac technical solution to meet the spec, you must price that solution in the price submission. There is technical negotiation/discussion to establish that your proposed solution meets the specification. It was rarely used by FAA for ATC systems and then generally when the requirements are very well known and easily understood. As I stated, ARTS II had undergone a first round of proposals and everybody understood the requirement. Burroughs 'bought into the project' like they did almost every FAA contract they won. In my opinion, it was generally a combination of very badly wanting the business and not understanding what was needed. As an example, we bid on the RVD for Atlanta. Our cost estimates came in about \$1.2M and we cut it in half and bid \$650K, CPFF (Cost Plus Fixed fee.) Burroughs bid \$350,000, Fixed Price and won the contract. They lost their xxx on the project, just like several others they won.

I will talk to my troops at lunch about your ARTS II display question, but I am having a difficult time seeing where the ARTS II display would fit in the scheme of things at the museum. I would really be lost as to how to develop a poster giving the relationship of that display to the ARTS III system and therefore to our group in Eagan.

I don't recall a Karen Maddock on the Rockville site but I do remember a Karen Hughes who worked for Marberg and managed some people in Rockville.

Regards, Hank

1/29/2020, 7:48 AM. Lowell to Steve Koltes, et al'

From Lowell to Steve, Keith, John W. Hank D, Brent Jordahl and Roger Stern.

Steve: As you and others put together another exhibit piece of our heritage companies; there is information in <http://vipclubmn.org/Articles/JamesBacon.pdf> that is usable, especially page 8 of this paper. That 1991 organization chart (a snapshot in time) shows ~235 people and their assignments. For example, the primary focus of this article, James Bacon, is listed under the far-left box under ARTS/DBRITE H/W. I recognize the names of many people on the right side of this chart, listed below my signature. The only person on the left side that I recognize is R.P. Sunderman, Richard who retired from Lockheed Martin and was a member of the VIP Club until 2011.

There were people in the Finance department and marketing department who were part of the ATC heritage that are not listed in Mr. Marberg's organization. I knew/know most of the people that are listed below from other projects or Club activities.

Hope that this helps in putting together yet another part of our Legacy (s) story.

*Lowell A. Benson*, U of MN BEE '66.

Retired Eng. Mgr. UNIVAC 1960 => UNISYS 1994 & U of MN 1994 => 2001

*Life is the time, space continuum of human interactions!*

From the top of the chart:

W. P. Marberg was Bill - William

D. Rayman is De Ett who with husband Dan is a VIP Club member

M. Fabro is Mary Lynn who with husband Quent is a VIP Club member

S. Turner is Sandra who is a former VIP Club member

B. Wheat is Bruce, who is a VIP Club member

H. Donaldson is Hank, a VIP Club member

K. Larson, Ken - my recollection is that he is deceased.

R. Calvesio, Ray - a VIP Club member

B. Clark, Bruce - a former VIP Club member

G. Jolly, Gary -

P. Pierce, Pat -

M. Cole, Merle - a former VIP Club member, was at the December Old Timers'

M. Huck, Mike - a VIP Club member

D. Jones, David - a VIP Club member

R. Lachenmayer, Dick -

W. Lofsness, Wayne - a VIP Club member

A. Thomas, Al - a VIP Club member

P. Encarnacion, Paul - he transferred from Air Defense to AAS after this chart was printed

G. Westman, Gary -

L. Day, Larry - a former VIP Club member, ?deceased?

J. Overocker, Jim - a VIP Club member

K. Maddock, Karen - my boss in 1991/2

L. Benson, Lowell - a VIP Club member, etc.

L. DuBois, Lee -

R. Winegardner, Robert -

A. Beck, Tony - a former VIP Club member and my boss who gave me lay-off papers in 1994.

J. Sater, Jack - a former VIP Club member, deceased.

J. Halverson, Jim -

J. Balli, Juan - saw him at the Roseville Good Old Days two years ago.

T. Montgomery, Tom - a former VIP Club member and principal author of

<http://vipclubmn.org/aircontrol.html>

M. Alexander, Merlyn -

D. Folkerts, Dennis -

E. Lantto, Ernie - a VIP Club member and my boss in 1971/2.

M. Swanson, Mark - a VIP Club member

K. Van Duren, Ken - deceased

A. Westerhaus, Andy - Chatted with him at the Old Timers' gathering in December.

{End of Lowell's 'met' list.}

1/29/2020, 8:24 AM, John Westergren to Lowell, Steve, Keith, Hank, Brent, and Roger

Steve, Pat Pierce is now working at DRS in Burnsville and he could probably give you a lot of info.

The Sub-Contracts org isn't shown on the Marberg organization chart, but my wife Pat was working there then and in prior years.

Regards, John

2/28/2020 @ 2:57 PM, Roger Stern to Lowell –

Lowell, I'm finally getting a couple of boxes, with lots of items for the group to review, ready to ship. Think you told me once, but have misplaced, please provide the name and address again.

Thanks, and have a great weekend, Roger - Sent from my iPhone

3/2/2020 @ 2:07 PM Lowell to Roger, et al' –

Roger: Thanks, Please ship the boxes to:

Lawshe Memorial Museum

Attn: VIP Club Team

130 3rd Avenue North

South St. Paul, MN 55075

Our volunteers there will review the materials, then either catalogue and keep or list and transfer to the Charles Babbage Institute. If any of your papers and documents are duplicates of what we already have, those will be recycled.

Thanks in advance for your contributions to the Legacy Initiative.

Lowell Benson, BEE, U of MN 1966

*Predict the future; then plan and work to make it happen!*

3/2/2020 at 9 PM, Roger to Lowell, et al'

Lowell - thanks, shipped two boxes to the museum % Pagac. I contacted him before your email. I probably have three or four more, will try to get them out of the house in a week or so.

Best to all, Roger - Sent from my iPhone

Established in 1980

April 15, 2020 4:20 PM, LABenson to Steve, Keith, John, & Harvey

**Subject:** Displays at the Lawshe Museum

Gentlemen: Here is a draft of another article for 'Our Stories.' Feedback is always welcome.

I realize that each of you is trying to minimize socializing to avoid possible infectious situations. When the state and country does get close to being clear of Covid-19, we can return to normal activities. One of those for several will be volunteerism at the Lawshe.

Keep Safe! *Lowell A. Benson*, U of MN BEE '66.

April 15, 2020 11:12 PM, Keith to Lowell, et al'

Bob Pagac started going through the first boxes Roger Stern shipped to the Lawshe Museum while I was in Hawaii but didn't get very far before the museum was closed. He'll pick up on that project once we are able to get back into the museum. At that point, I will coordinate with Steve and Matt Carter to transport the ARTS II display to the museum.

## EPILOGUE

There have been so many, many people involved with Air Traffic Control over almost seven decades! Not one of us knows everything that occurred, however the stories related and linked above cover most of our Heritage companies' ATC history.

For those reading this paper who might be curious about the Lawshe Memorial Museum – take a look at <http://vipclubmn.org/Exhibits.html#Lawshe>. That paper has links to previous display poster boards about our Legacy. <http://vipclubmn.org/Articles/DreamRealization.pdf> has photos of many of the artifacts already on display at the Museum.

Thanks to all who have contributed to this piece of Our Story. Have you, the reader, noticed that the times of the various messages range from 7:34 AM to 11:12 PM. Some are night owls, others early birds, and the majority do email around noon time.

Other stories about your computer industry experiences and careers are welcome – send them and we'll find a place within our IT Legacy anthology.

Regards,

