IOWA STATE TODAY
FRIDAY, May 1, 1942 - 2:05 to 2:15 p.m.
Narrator, Ione McNay

(Opening - Fight Song - from station call - up full 20 secs., fade background for opening announcement)

ANNOUNCER: It's time for Friday's edition of Iowa State Today. Campus news and interviews, brought to you each Monday and Friday at this time. And here's your narrator, Ione McNay.

MCNAY: Thanks, _____, and good afternoon, everyone. It isn't often we get to meet an inventor on Iowa State Today, but we have one this afternoon. He is Dr. John Atanasoff, professor of physics and mathematics at Iowa State College. He has brought along his assistant, Clifford Berry of Ames, a graduate student in physics. The invention is an electrical calculator that can solve linear algebraic equations, computing simultaneously in 450 digits. Now, if any of you happen to labor over the solving of mathematical problems the way I do, I know that the mere thought of such a machine must fill you with awe. This machine is about the size of an office desk, and to my untrained eye, really doesn't look much like a calculator. It's made up of odd-looking cylinders, hundreds of vacuum tubes and thousands of wires. But since the two men who constructed it are right here, I'll let <u>them</u> tell you about it. Why did you ever start working on such a machine, Dr. Atanasoff?

ATANASOFF: About twelve years ago I was working on a complicated problem in Quantum Mechanics. Part of this work required some thought, but part of it required an inordinate amount of calculation. Now, Miss McNay, someone has said that mathematicians are naturally lazy people. If this were the sole requirement I would certainly qualify. At any rate, the result was that my needs in this problem and my observations in regard to the solution of many other problems showed how badly such a device is needed. Of course, for the time being I could do nothing, but the idea stayed in my mind. I did not spend my working hours on it, but some times when I had a few moments when awake during the night I would think about it. Later I had graduate students

solving complicated problems and what they accomplished was greatly restricted by the necessity for laborious calculations. This more immediate need gave the idea a further impetus. At last general plans for such a machine commenced to take form. I combed the whole realm of physical devices for such a structure that would be suitable. About four years ago I obtained assistance and went to work on the machine.

MCNAY: What's a calculator like this one to be used for?

ATANASOFF: In man's efforts to obtain control of nature there are many relatively simple problems, but some much more complicated ones. Some of these problems are so involved that even engineers do not customarily try to solve them. If they are important enough, research experts work on them and put their solution in practical form for the use of engineers. There are other problems which are not directly concerned with an engineer but are related to questions in pure science. This machine is designed for such research purposes.

MCNAY: Then it won't do finger-counting mathematicians like me much good. How much would it cost to have a calculator like yours made?

ATANASOFF: Ten or fifteen thousand dollars.

MCNAY: Has anybody else ever tried to work out a device like yours?

ATANASOFF: Yes. Several attempts have been made in this direction, but they have yielded machines of much less accuracy and much less capacity.

MCNAY: The term "high speed" in connection with the calculator interests me. Just how efficient is it in that respect?

ATANASOFF: When this machine is in actual operation we expect that it will do the work of 100 expert computers with ordinary calculating machines.

MCNAY: Did you do the actual assembling of the machine?

ATANASOFF: No. I got the original idea and have since done some of the design work. Mr. Berry, here, did the rest of the design work and some of the actual construction. Other men have done the rest of the construction.

MCNAY: Where are you from, Clifford?

BERRY: I have lived in Ames for the last seven years, and before that in Marengo, Iowa.

MCNAY: You've been working on your doctor's degree, I believe. Was your master's degree taken here, too?

BERRY: I received my master's degree in Physics in 1941 and my bachelor's degree in Electrical Engineering in 1939.

MCNAY: By the way, Dr. Atanasoff, have you ever been a student at Iowa State College?

ATANASOFF: I received the master's degree from Iowa State College.

MCNAY: That really makes this an Iowa State product, then. Clifford, nobody'd believe me if I tried to describe that machine, so will you tell us about how much electrical wiring, for instance, has gone into it?

BERRY: More than a mile in addition to the wiring in 35 transformers. I might say that the machine also uses about 350 vacuum tubes. Data is put into the machine by means of punched cards rather than a keyboard and this requires some rather complicated mechanisms which we have constructed.

MCNAY: Just a minute there, are vacuum tubes anything like the tubes in an ordinary radio set?

BERRY: Yes, they are exactly the same thing. As a matter of fact, most of the tubes which we are using are of an inexpensive type, commonly used in radios.

MCNAY: Back to the wiring of the calculator, how do you know which wires go where?

BERRY: Well, of course we have a complete ~~d~~ wiring diagram of the machine, which we follow. When we have a large group of wires in one cable we put identifying tags on each wire.

MCNAY: How much ~~l~~ electricity does the machine use?

BERRY: It uses about as much as an electric range.

MCNAY: That sounds like a lot of current to me. How will you keep the machine cool?

BERRY: We have installed a large fan in the machine to blow air through it.

MCNAY: Can you tell us why so many radio tubes are used in this machine?

BERRY: They are used for various things. However, the largest portion of them - 210 to be exact - are arranged in thirty groups of seven each. These units do the actual computing - in fact we call them "electric brains" since their action is somewhat like that of the human brain in computing. We also have an electrical device for storing numbers - a kind of electrical memory. A good many tubes are used in connection with this memory device.

MCNAY: How much longer will it take to complete the machine?

BERRY: We expect to have it completed some time this summer. We should have had it done last fall except for our concentration on defense work during the past year.

MCNAY: I have a question I'd like to ask Dr. Atanasoff - How do you know your calculator will work when you do get it finished?

ATANASOFF:

MCNAY: What will you do with this particular machine?

ATANASOFF:

MCNAY: That's all we have time for today. Thank you both - Dr. Atanasoff and Clifford Berry. If I ever have any tough mathematical problems I want solved, I'll know exactly where to go for the solution.

(Music - Fight Song - up full. Fade background for closing announcement.)