Interviewee: Lynn Couret
Interviewer: Robina Mapstone
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MAPSTONE:

The date is June 14, 1973, this is Bobbi Mapstone, I'm talking to Mr. Lynn Couret, and this is an interview for the Smithsonian Institution Computer History Project. Let's start by going back and talking about what you know about how the idea for Telecomputing Corporation came about, how it got set up, and maybe discuss some of the main principals of which I believe there were seven, right?

COURET:

Right.

MAPSTONE:

And talk about the people, and just a general overview of what it was like in those days.

COURET:

Okay. It started back in 1947. The company was put together by Bill Bell, Ward Beeman, Jack Weaver, Wishe Colwell, Don Fritz, Jerry Bednarik, and I was the seventh person.

MAPSTONE:

Can you tell me the background of these people before they formed Telecomputing? i.e., university, military-radar, previous companies?

COURET:

The company was formed because there was a crying need at the time for engineering data reduction. This was before the advent of computers, and we only had punched card equipment.

Lockheed, who was our angel to begin with, rented us a small building on the front of their parking lot on Hollywood Way in Burbank, and Telecomputing was formed with the people to do various stress analyses for Lockheed only at the beginning.

The type of work we were doing for Lockheed was determinant reductions, stress analyses, and doing it on punched cards. Some of these systems were rather unique in

that we had what were called mirrored cards. If you looked at them in the front on one side, and you turned the card over, it'd look the same on the back side, and when you flipped the card over it became a master card for the next batch. You follow what I mean?

MAPSTONE:

I follow you. If must have been a very complicated method.

COURET:

Well, yes, and if you got your hands crossed you had to start over again, which we did in the beginning. Finally, it was second nature. We worked on determinants which had as high as 500 variables, which is quite a calculation. Then we'd finally get down to maybe fifty cards, the fifty solutions, or the 500 solutions, whichever it was, because the cards were packed, and we'd list off umpteen copies on vellum using a Bruning machine. In those days, Xerox wasn't around, either.

Along about December 1947 or January of 1948, Telecomputing, as it was known, was in the process of developing a reader for measuring the pressures of manometer tubes, oscillograph tapes, and various data of that type, which could be photographed either on 35 mm film, or 70 mm film, or on rolls of paper. The reader had cross hairs, X and Y axis, with an azimuth correction thrown in, and in the process produced a punched card. Every time the hairs crossed on the spot, they hit a button which cut the card.

The prototype of this machine was manufactured on the desk in the office, because we had a very small office at the time. We had two johns and a 20' x 30' office, and with seven of us there it was pretty much wall-to-wall machines and people. These cards were produced from the Telecorder, which I think was the name of the machine when it was finally manufactured. The original prototype was a real Rube Goldberg. (laughter)

About this time a fellow by the name of Bill Carthuser, an engineering graduate from UCLA, came on board, to work with Weaver and Bell and Beeman and Colwell in the development of the Telecorder. Bill got stuck with being the only guy to operate the machine, because he knew all of its idiosyncrasies, and he could tinker with it when it wasn’t working and make it operate just the way he wanted it to.

Then, in about June [1958?], we got a contract on the Pioneer Project, which was a government contract and it was the forerunner of retrieval systems which we know now as recovery systems for rockets. It was very hush-hush and we were all cleared for top secret and all this stuff, for what it meant.(laughter) We had some interesting experiences in that, and although I didn't directly participate, it was in and around, above and below me, as I tried to do the data processing work.

We'd have one fellow, maybe Beeman, lying on the floor with a stopwatch in his hand, and maybe Wishe Colwell standing on top of the filing cabinet with another stop-watch, and Jack Weaver standing right next to him with a rubber eraser that had been weighed so accurately right down to a gnat's eyelash. And they would drop the eraser, and everybody click their watches, and when it hit the floor they'd click again, timing it. This sort of crazy thing.

Then they made a catapult for launching this because they wanted to take it out in the desert. They built this catapult in our office which was half below the surface of the ground, it was semi-basement. There was a ramp over in one corner so you could wheel stuff in and out. They built this catapult over in that corner and the projectile in a shop that they'd borrowed from Lockheed, or a little corner in one of Lockheed's shops, or something. They had an elastic nylon cord hooked to a drum, and they would stretch this thing out and hook it into the carrier for the projectile. Then they had a big double door that rolled back into the ceiling, and this was pointed out over the parking lot. Sunday morning when everybody was there, they would fire this projectile through the door out in the lot. It was supposed to deploy a propeller-type thing that was supposed to open up as it came down. Well, the trajectory of the thing wasn't high enough, so it didn't work properly. It was too flat a track. Needless to say, they busted a few projectiles, landing on the asphalt out in the parking lot.

They decided to go out to the Mojave Desert to where they could really do something. They had such a strong spring put into the drum where this nylon cord was hooked on, that nobody could turn. It took about four weekends, Saturday and Sunday, of cementing the launcher to the ground, and then they hooked an automobile to the cord and backed the automobile out so they could hook it to the bottom of the projectile, or the carrier for the projectile. The stand was situated on a hill to give them more elevation. Needless to say, it worked better than it had over in the office, but they still weren't able to get enough height.

Finally, they decided they would build a longer ramp with a steeper angle. They didn’t think that the spring in this drum which retracted the cord which shot the projectile off the carrier like a catapult was good enough, so they devised some gimmick with a whole lot of electric motors and they loaded a whole flock of batteries into the back of a pick-up truck and went out to the desert. Now you have to keep in mind they had to take everything down except the stand itself every time they got ready to come back, so three quarters of the day was spent re-erecting everything, testing everything to be sure it would work, and then maybe getting one shot a day before it'd be dark and they'd have to come back in. Finally, they got the thing set up to the way they wanted it, they got enough height, it did work properly, and they made their calculations. It was a huge engineering project which eventually wound up being data that w e had to reduce and produce various reports and all kinds of analyses of one kind or another on.

MAPSTONE:

Who was the customer for this project?

COURET:

Uncle Sam. Who else has got money to throw away?

MAPSTONE:

That's right. The Air Force?

COURET:

It was a joint venture between the Air Force and MIT. They had the original deal. Then they dug up the launcher, brought it back and stashed it on the ramp in the office, which was great. Then they started playing around with a balloon.

This was a weather balloon, and it was quite large when it was inflated, and the only thing you could inflate it with to make it rise was helium. Helium is really expensive. (laughter) To make a long story short, they fiddled around with hot air and with compressed air and it'd fill the bag, and nothing would happen. It'd just sort of lie there, you know, like a big blob. So, they decided to use the helium, but they were only going to partially fill it. W+11, there was about a 10-foot clearance right outside the door, and a 6-foot chain link fence that went around the building. Why, I don't know. It was there when we moved in, and it was there when we moved out. Anyhow they started filling the thing up with helium. [phone rings, pause]

MAPSTONE:

Okay, we're talking about the balloon.

COURET:

By "they," I'm referring to Bell, Weaver, Colwell, Carthuser, and Phil Kirkley had come on board by then. We had gotten a shop and he was the shop foreman. Anyhow, they started filling the balloon with helium, and they had intended only to fill it up enough so that they could carry the whole thing outside where they had erected an anchor out in the parking lot. It was a four-foot pipe which had been sunk in the ground some 8 or 10 feet and it was perforated. Just like in testing oil wells, they shot off charges and then they filled in with cement so that the cement would go into the holes and would be rigid. I might add it worked so well that at a later date Lockheed had to dynamite it out of the ground. (laughter)

But to get back to the balloon. They had it partially filled, and since helium is very light, the balloon went to the roof of the building and flattened out and elongated itself along the ceiling. Well, they were in a quandary. Because of the cost of helium, they didn't want to release any of it, and yet they wanted to get the balloon out of the building, and they couldn't. I wish you'd have seen that. Only started (laughter) about seven o'clock in the morning, and about eleven o'clock the next night, or that night, they finally gave up and said, "Well, I guess we're going to have to let the helium out."

About this time, from all their gyrations, the balloon must have hit a nail or something in the ceiling, and it fell right down on top of the whole bunch of us. Wow, like that! Can you imagine?

Well, we worked the craziest hours in the world. I mean, we didn't work an eight-to-five job, which was what made it so interesting.

They had to take the balloon back to the manufacturer because he was the only one that could patch it, and then, I don't know, it took three or four weeks before they finally decided to take the balloon outside, anchor it and then fill it up.

What they were trying to do with this balloon is still a mystery to me.

MAPSTONE:

Oh, I was going to ask you that!

COURET:

I think what they had in mind was building into this projectile a balloon similar to a weather balloon filled with a certain amount of helium, which would be accurate had it reached its peak and started to descend. Then it would eject this balloon and fill it up with helium so that the descent would be slow. Now remember, we were pioneering, and we didn't know what we know today about space shots or anything like that. The general gist of why this helium balloon had to be tested was so they could come up with some figures for the calculations they wanted to make, which in turn would wind up on punched cards, and then would run the cards through the punched card equipment to do multiplications and divisions.

MAPSTONE:

This still has to do with recovery system.

COURET:

Yes, it's all the same project. At least everything was charged to that project, because it was the only project. Of course, all this time we were still doing work for Lockheed, thank God (laughter), because the government in those days didn't pay as fast, well, not any faster than it does now, I guess. It was a cost-plus type of thing, no fixed fee attached, which meant we had carte blanche. Those were some of the funnier things that happened. There was a lot of serious work done besides that. Oh, another thing they did: they hung ping-pong balls to the ceiling at various heights and spaces, and they would throw projectiles made out of balsa wood and try to make them go in between the ping pong balls. They would turn a fan on, which would cause them to flop around. As I was

saying, we were all trying to work under these conditions, with things falling on your head and ducking!

MAPSTONE:

(laughter) Oh, that's marvelous!

COURET:

They finally finished all these experiments, and they came out with stacks and stacks of papers that we had to have keypunched, which we did. Pat Hopney, she married Don Fits, who as I mentioned is deceased--keypunched all this data and then we started the data reduction. Bill Bell had written all the procedures and given us the formulas broken down so we could fit them to the antiquated equipment which we had--we call antiquated now, but it was the most sophisticated equipment that you could buy in those days, such as a 602.

We started with 601s, which would multiply, add and subtract. Division was a horrendous experience. It would sit there and divide into infinity, I mean, just hang up, and go on and on and on. If you didn't get the card out it just sat there forever. So, they weren't very sophisticated. Then we went to the 602 and to the 602A, and then they brought in a piece of gear called a 603, which was a forerunner of the tube unit for the 604, the Card Programmed Calculator.

The 603 stood on two stands, like those "Watch for Pedestrians," signs which have a big iron base and then the pole goes up and then the sign is hooked to that. There were two of those stands, one on each side, and the tube unit was built around it. We called it the Telecomputing Monster. Whenever they wanted to impress somebody, they'd bring them in at night, and one of the guys would sneak in and turn on the computer and all the tubes would light up. They had put color plastic in back of some of the breather holes to give it color, because all the lights were the same color originally. They'd turn it on and the tubes would blink off and all kinds of things would happen Of course, it was a set-up deal, but it always produced the same results regardless, unless the machine got temperamental, which it did quite frequently, then it would just go ape.

I think Dr. Hurd from IBM was the main dignitary they were showing this to one night. I wasn't there personally, but I heard about it from Bill Bell the following day. The IBM machine exploded. He was the head of their research lab back in New York, and the next day we had four C. E. out there trying to find out what had caused it. It seems one of these colored pieces of plastic had fallen off of the frame, dropped across a couple of tubes, melted, shorted things out and blew the thing sky-high. This was just another one of the things that happened around there. We weren't really using it for anything because no one knew anything about the machine really, except Bill Bell.

By the way, he was called the Grandfather of the 604; he had a lot to do with its development. Bell was on a retainer fee from IBM, from Remington Rand, and from Beckman Instruments in regard to the manufacture of computer hardware. He was a genius, believe me. The guy was brilliant.

MAPSTONE:

That's interesting. I've never heard his name mentioned in relationship to IBM as a consultant.

COURET:

William D. Bell. Well, he was on a retainer fee and they paid him regularly, so he contributed something evidently.

He also wrote a book or two.

MAPSTONE:

Did he? Can you give me references?

COURET:

I've got the book at home. I can look up the title and call you. ["What Management Should Know About Computers," by W. Bell, McGraw Hill, 1956.]

MAPSTONE:

Yes, please.

COURET:

I bought the one that was published. About this time, we got out first Card Programmed Calculator, better known as the CPC. It was a 604-tube unit and a card-reader punch and a tabulator that was hooked to it. At that particular time, they didn't have what we referred to as ice-boxes, the storage units; they came out a little later. Then we hooked on with a cable and plugged into the tabulator and the tabulator was hooked to the 604 by another cable. We moved to Santa Anita Street in Burbank to a much larger building, because the military--the Navy, the Air Force, the Army--were all interested in the Telerecorder, which was the machine that read the oscillograph tapes, manometer tubes and everything, that could record either on paper or film of one size or another. The company began to grow, and they were manufacturing and, of course, improving the readers as they went along. I think the last one they put out was about the tenth model. This was in the late forties and fifties when the war was still going on, so a lot of this

stuff was bought by the military because they had a need for it at the time, I guess.

MAPSTONE:

The Korean War is what you mean, isn't it?

COURET:

Yes, well, they followed so closely anyway.

MAPSTONE

Right.

COURET:

We moved over to Santa Anitas Street and manufacturing began to get larger. They started to develop the Teleplotter, which again ran from data that had been reduced on the CPCs, and a summary card produced which was in turn fed into a card reader which drove the plotter. We had a demonstration deck which was a nude; it was Marilyn Monroe plotted in detail. The very last little X that it printed--if you will excuse me--was the crown of the nipple of one of her breasts. Every time it got to that point; the plotter went completely ape. The reading would go all over the table! I often swore that the guys had rigged it this way, but they said no. "The machine reacted to Marilyn," is what we always said. (laughter)

All of these experimental pieces of gear were out in the data processing room, because we had 220 outlets. They could have had them in the shop, too, but they always brought them over for testing because we produced the input for the machines.

About the same time that we moved to Santa Anitas Street, we signed a contract with JPL, and what's the other one up there, the other technical school, the MIT of the west in Pasadena? It'll come to me. Anyway, we had direct links from their wind tunnel directly into Santa Anita Street.

MAPSTONE:

Cal Tech?

COURET:

Cal Tech. It came in the form of a teletype punched paper tape. They were hooked to the gauges and then transmitted over the telephone line to the teletype, which produced hard copy as well as a punched paper tape. We, in turn, took the tape after they quit

transmitting, converted the tape to cards, and fed the cards to the CPC to test. They were testing models of airplanes, missiles; you name it in these wind tunnels.

MAPSTONE:

This was the cooperative wind tunnel?

COURET:

Yes, up at Cal Tech. JPL had a small wind tunnel of their own, and we reduced their data. A little later we were tied to Point Mugu's wind tunnel, so really locally, in the Los Angeles area; we were doing all the wind tunnel data reduction at the time for these companies. After we reduced the data and produced hard copy, we punched out a summary of the answers and then converted them to paper tape and transmitted them back to Cal Tech. It came out over there as a punched paper tape, and they either had a tape reader or they converted it back to cards and listed it off. But they got hard copy from us which was delivered by courier later in the day.

This brought on some thinking at Telecomputing, and they soon came up with the Grand daddy of all transmitted data in actual, usable form as far as computer input is concerned without directly connecting it to the computer itself. They rigged up a keypunch type of machine to the telephone line, they had a black box hooked onto it, and the output was punched cards, eliminating the punched paper tape. After some practice our processing crews could then receive, reduce, and transmit back to whoever the customer was. I think the record was 4 1/2 seconds per data point, received, reduced, and re-transmitted back to the customer. Again, a courier took the hard copy either that day or the next.

For some reason or other most of this transmission was done starting in the afternoon, and extended into the late hours of the night. We worked twenty-four hours a day, seven days a week and we had shifted, of course. Very little data--I don't know why--was transmitted in the morning. Maybe it was for tunnel maintenance, they might have used that time for checking safety or whatever.

Oh, that's something else. Over at Cal Tech they had built up the wind to the desired velocity in the tunnel, and it ruptured. Luckily, the spot where it ruptured had so much reinforcing steel around it that it didn't blow. Had it ruptured in, say, the center of a section of the tunnel it would have just blown, and the whole thing would have gone because of the pressure built up in it. It takes a while to reduce the pressure and the velocity of the wind in this thing. It doesn't happen like that (snap of the fingers). They don’t just turn off the switch. They have to pump the air out, and it's quite a complicated process in its own right which I'm not that familiar with.

The tunnel was down and they had to inspect the thing minutely. What had happened was during the manufacture of the steel that made up the tunnel itself a little bubble on

the inside had not been seen in the final inspection. Although you couldn't see it from the outside, the pressure was enough that it broke through. When it came through the first half there was the bubble and it jumped and it just came right out and blew a hole in the roof. It was a pin-hole really, you could hardly see it. Anyway, that was one thing that happened over at Cal Tech. In the years that we did this work--I don't remember whether it was the beginning or the end--they had these huge four-bladed propellers which created the wind. I guess the blades must have been ten or twelve feet each, to give you an idea of the size of the tunnel. It was a big one. The blades had louvered guards in front of them to control them so they could move and direct the wind, and it went tearing down one end. The thing was built sort of in a rectangle and it had to go around the corners. The propeller started off and where the propellers were housed was an extension of one end of the tunnel. It wasn't actually a part of the tunnel itself, it was connected to it; it was an extension.

MAPSTONE:

Like a hallway, coming in.

COURET:

Yes, well, it was just a big round rube, so to speak. There were four sets of propellers, one behind the other. One of the blades went shearing off and tearing down one end of the tunnel. Luckily the propeller that sheered was on the first set, nearest the opening. Had it been a back one, they say it would have blown the place apart. They were made out of, I don't know, some titanium, only one place in the whole country could make them, they were very vital, they didn't have any spares, and so on. That shut them down for quite awhile.

Back to Telecomputing to give you some idea of the type of work that we really did. We did no commercial data processing at all. It was all engineering mathematical equations and problems of all kinds, such as radio isotope studies for the forerunner of medical use of the radioisotppe.

We started with the Weather Bureau, because they used it for trying to forecast the weather and we used to reduce that data for them. We did engine parameter studies for Pratt Whitney and a few others for the development of the jet engines as we see them today. They didn't look anything like that in the days we were working with them. We were working with--was it JPL?--JPL, because I think they were the ones that made the first missile, What was it called? I've forgotten now. It was a very small missile in physical size, but it was one of the very first that the government sponsored, was successfully fired, flew, and was recovered, and the whole ball of wax. [phone rings; interruption in interview.]

MAPSTONE:

Okay, we were talking about—

COURET:

the missile by JPL. This was the first time they ever did any telemetering. Of course, being the only engineering service bureau, we had to reduce the data. It was quite a chore. We had the equivalent of Watts lines, which were non-existent in those days or they were just coming into being, direct to Cape Canaveral, which is now Cape Kennedy, if they haven't changed it back to Canaveral. They're always yakking about it.

We were also working with MIT on the prototype of automated manufacturing equipment, like drill presses, lathes, stampers and so on, where they could put in a whole sequence of events onto tape and feed the tape into the machine, press a button and it would go through the whole operation which it might take ten men to do. It could do operations on a right behind the other, or do them four or five simultaneously. It was strictly an MIT project and was a forerunner of the automated machinery business. We reduced the data they sent us and then produced these tapes which were used for operating. Originally they were punched paper tape.

MAPSTONE:

Do you know which were some of the early machines that this was used on?

COURET:

No, I don't remember. I wasn't interested really at the time, so there wasn't any reason. I never saw the machines. I was told what they were, and I know what they look like because we had them out in our shop.

These are the types of things that Telecomputing was originally set up to do. As a by-product, we turned into a manufacturing company, and that, plus a number of other things, progress, we call it, caused our business to disappear. Eventually we went out of business. The manufacturing remained, but computing was nil. Originally computing supported the whole show.

Along with all of this work we were doing for the infant missile industry, the government, the automated machinery operation for MIT, and engine parameter studies for the jet engines which are prevalent now in aircraft, we started to develop the original* point of sale recorder. At this point Telecomputing had grown from seven people up to something like 3,500 people. We were no longer a little bitty outfit.

MAPSTONE: Let's just get some time factor here. When did you start work on the Point of Sale Recorder? Approximately?

COURET:

I would say very early 1950s.

MAPSTONE:

In seven, in six years then, you grew from seven to 3,000. **COURET:**

That was the peak. Also, at the same time, we had taken over all of the data reductions for all of the tests run at Holloman Air Force Base. I was there the day that Major Stapp rode the sled driven by Jayto jet engines. His picture was on the front of *Life Magazine* and they took it with an Azimuth camera which they used to shoot missiles because no other camera was fast enough. Do you remember that on the front of *Time*?

MAPSTONE:

Yes.

COURET:

Well, I was there that day, and we reduced the data on that. We had White Sands and the Alamogordo Base, which was a government contract to supply personnel to do the data reduction for the Air Force mainly; some Navy, but mostly Air Force. We were also doing some trajectory studies for the Army Ballistics out of Fort Bliss. All of this type of stuff. It was fantastic.

I would say that at that period Telecomputing had under one roof more brains than ever had been gathered in one company at any given time since, or before. I exclude myself because I had to go to school just to keep my job. (laughter) Seven years of night school for mathematics as a condition of employment set on me by Mr. Bell, my buddy! Somewhere in the early 1950s the company had a choice to make of whether they wanted to go into commercial data processing as a service organization.

About this time UNIVAC had come out with UNIVAC I, which was a big, hairy, water-cooled computer, and Lock-heed had gotten a 701, the first big computer put out by IBM. They started doing all their own data reduction, so we lost the contract to Lockheed, except for a rush job every now and then. Boeing got computers, North American got computers, and since they were our customers, that phase of Telecomputing's work began to fall off because they did all their own work internally. From their standpoint that may or may not have been a smart move. This put Telecomputing in a position of deciding whether they would stay in the service business and go commercial. The type of personnel we had weren't suited for commercial data processing because they were engineers and physicists and mathematicians. They'd kind

of blue-sky it, and you can't do that in commercial data processing.

They decided to put all their eggs in one basket, so to speak, and started to push the Point-of-Sale. The Point-of-Sale was a device which attached to a cash register and recorded whatever was sold. Say it was a dress. It would record the color, the size, the style, the price, the taxes, and the total bill. And this was recorded on a tape. Now the ultimate dream for the Point-of-Sale was to have a huge computer-type memory bank, and then periodically it would pick up these tapes from the various cash register stations and run data for a myriad type of information, such as inventory control, what items are moving, what colors are selling, what sizes.

To merchandisers, such as a department store, this is very critical information because they buy so far in advance. If they have an item that is really moving and they don't it right away, by the time they realize it, it's too late to reorder because the manufacturer has started to manufacture the next season's clothes already and has closed down that line. And in those days, of course, most of the clothing manufacturers were on the East Coast.

MAPSTONE:

Oh, that's right. Let's just turn over the tape before we run out.

[End of Side 1]

COURET:

The idea was to give the merchandising department instant information so that they could make decisions today rather than waiting until the end of the week or whatever.

MAPSTONE:

What aspect of it was Telecomputing manufacturing?

COURET:

The actual recording device.

MAPSTONE:

In other words, you would use a standard cash register.

COURET:

Yes, and there would be a black box attached to it.

MAPSTONE:

And it was the black box with all the circuitry and everything that was your machine?

COURET:

Which was attached, yes. It was called the Point-of-Sale Recorder.

MAPSTONE:

And the output? **COURET:**

Originally it started with punched paper tape, and then they switched to mag tape because it had come out in the interim with the advent of the big computers. The idea was that they could check the status every hour or every half-hour, however frequently they wanted to, depending on the volume of people that were buying. Purchases aren't being made in every department simultaneously, although it may happen occasionally, but every department isn't selling something every minute of the day. some departments are busy all day, and others are not, so this information was very valuable to the buyers, or merchandisers if you will. It also enabled them to keep their finger on an updated inventory hour by hour, or every three hours, or whatever period of time they wanted. The development of the Point-of-sale Recorder was going along fine, and they started to develop the memory banks which went through various phases.

Also, at the same time, they were trying to develop a punched card sorter, because the fastest sorters in those days were 450 cards a minute. Today you can get them at speeds over two thousand cards per minute. They played around with mechanical and electrical devices, and they finally got to pneumatic. This was another one of those Rube Goldberg's which we had out in data processing. The prototype was a huge circular thing run by an electrical motor, which in turn operated from a photoelectric cell which turned the valves on and off to suck the cards into the proper pockets. It was a huge timing operation. Needless to say, on various occasions it was snowing cards. It would just blow them all over the place. (laughter) You didn't know whether they were your cards or test cards or what, so you had to be very careful. It was always that way. They were always doing something.

Along about that same time, we started to develop a combination machine tool, which was a cutter for cutting lengths of various types of bar steel or aluminum or whatever, and moving over to the next station; it was a three-station thing. They had the cutter on one and, I think it was a milling machine or a lathe in the middle, and on the opposite and was a drill press or something else. Of course, these were all prototypes, and didn't look anything like the gear they were called, but they did these functions. Here again, all these operations were controlled from punched cards or punched paper tape. Each machine did a specific one or two operations, and it was a forerunner of automating a

manufacturing operation.

There was always lots of activity, day and night. Everybody was in it. We had engineers coming out of our ears, under foot and everywhere else. Most of them were pretty nice guys. We had a couple of funkys, but you get that everwhere, you know. Some of them had some weird, wild ideas and today we accept them. They were just way ahead of their time, which was what really happened to the Point-of-Sale, to get back to that. [phone interruption.]

MAPSTONE:

Anyway, you were just going to get back to the Point-of-Sale. **COURET:**

About this time, they had the recording device and the method for attaching it to the latest type of cash registers available, whether they were a single-drawer or sixteen-drawer cash register, it didn't matter. They hired a guy by the name of Ayers who had been with Ford, as vice president of sales. He went back to New York, and supposedly sold umpteen Point-of-Sale Recorders to the W. R. Grace Department Store. W. R..Grace had many things, airlines, ship lines, but this was a department store they happened to own in New York. How big it was or whether it's still there, I don't know. Anyway, they took six of these recorders to N.Y.

At the time we in data processing were told this was going to happen, any number of us, myself included, said, "We haven't checked them out long enough; we haven't given them really enough testing." We had just finished the production models, some of them were in the testing stage and were running into problems Anyway they took 6 of them back there and set them up. It seems as though in punching the tape, each machine had its own idiosyncrasy Some elongated the holes horizontally, some elongated them vertically, some on an angle, and they had all types of problems with the tension which caused the elongation of the holes. There were read failures and punch failures. The girls would make a mistake on the cash register and wouldn't hit the error key so that it would record on the tape and wipe out the bad data that was already punched, because it punched instantaneously, so they couldn't get the data converted to cards and they couldn't do anything with it.

By this time the computing department had been moved from Santa Anita Street over to Verdugo Avenue, still in Burbank, and we were in a building all by ourselves, quite a large building. By then we had, oh, I don't know, six or seven CPUs and all kinds of equipment all over the place. Here came these huge boxes of punched paper tape for us to convert to cards for W. R. Grace. We all wound up with pointed eyes from reading the hole. That's the truth. We actually read the holes in the tape and transcribed the data onto a prepared format chart. As fast as we'd fill a page, we'd give it to the keypunch section, and they would keypunch the cards. Needless to say, after two weeks of looking through holes, our eyeballs fit the holes.

Besides the machine-making errors, the human element got involved and everybody was crawling the walls. We finally got it all read and converted to cards. They decided they'd better put it on mag tape. We went from the cards through a computer and put it on mag tape and shipped the tape back to New York. About two days after they got it, all the phones in the joint started to ring at once, "What's the format on the ape?" Some twenty-five copies of the tape layout format had been shipped and it was a cinch somebody unpacked them and threw them away with the packing material. Stan Mannis, who is now with Air Research here in the city, had made the tape layout and done the whole job of converting it from cards to mag tape. Stan didn't have any copies, from memory he had to make a tape format. Well, it turned out to be a fiasco and they threw the whole thing out.

About that time Bell decided he didn't want any part of the way it was going, because he and Beeman had been fighting for years. They had contests to see who could buy the most Telecomputing stock to gain control of the company. Beeman was an older man and had been working a lot longer than Bell and he had more money available so he eventually got more stock than Bell. Bell left Telecomputing Corporation in 1954 I think it was, or was it the end 1953? Right in there somewhere. Computing was relegated to the back seat after Bell had left, and we were just doing our own work.

In February 1954, a guy whom I had hired, by the name of Tom Duke, a graduate of MIT, walked in one day and said, “You've got a choice. You can either quit or we'll transfer you to Holloman, at $2.50 an hour." Hell, I was making almost a thousand dollars a month salary as it was, +o I said, "Well, just write up my severance check, I'm leaving." And that was when I left Telecomputing, February 1954. I guess I spent about 6 ½ to 7 years with the company, so it was a blow. We went through some rough periods prior to my leaving where we were reducing personnel because of the New York fiasco with the Point-of-Sale Recorder because they hadn't had enough sense. Ayers didn't have any signed purchase agreements, so he sold the company a bill of goods. They had tooled up and loaded up with material and personnel and were renting buildings all over.

MAPSTONE:

The company took the whole loss.

COURET:

Oh, yes, it damn near broke them, because they weren't a company big enough to stand that kind of thing. Ayers left shortly after I did and went to Friden, Inc.

Then Telecomputing interested Remington Rand in the Point-of-Sale. In fact, when I was in Caracas, Venezuela, with Price Waterhouse and their management advisory services, I walked into a department store--we were going to do a survey--and, lo and

behold, there was a Point-of-Sale Recorder sitting there. On the outside it said, "Remington Rand." I lifted it up and it said, "Telecomputing Corporation, Burbank, California, Point-of-Sale Recorder Number So-and-so." (laughter) Anyway the powers at that time were Beeman, Weaver and Holly Dickinson, who is now president--or chairman of the board--at Canoga Electronics. The last I heard, were running the company.

Then Whittaker got into the picture and bought them out for a tax loss. Telecomputing was a separate division for a long time, and where it really wound up was that it became Computing Software, which was then spun off as an independent Whittaker subsidiary and Telecomputing's name disappeared. That was the end of Telecomputing's name at that point.

MAPSTONE:

When would that have been?

COURET:

In the early 1960s.

MAPSTONE:

What's the full name of Whittaker? I'm not familiar with it.

COURET:

Whittaker Corporation

MAPSTONE:

Okay. Is it electronics?

COURET:

Yes, a black box manufacturer originally, but they diversified. Now they're going the other way, they're coming back. Whittaker sold a block of stock to Sears & Roebuck, and I think that is the part of C & S that Sears sells their tax service on. You know, they've been banging that for the last 2 or 3 years, I think. I read in Business Week maybe six months ago, that Friedman, who is the president or chairman of C & S, is going to phase out all data processing and go into publishing home work manuals. They're thinking of changing the name from Computing and Software to some-thing else. Now you're right up to today as far as the old Telecomputing is concerned.

MAPSTONE:

Point-of-Sale Recorder; that was bought up by Remington Rand? Is that right?

COURET:

Well, I don't know. I think they had a working agreement, because Whittaker took it over about six or eight months, or a year, after Remington Rand got it. Maybe they had taken over a contract for sales purposes, because when Ayers blew up in their face, their whole sales force was disbanded and let go. Like I say, we had some real tough times. every Friday was called a Black Friday because we had a big lay-off. For the guys that had been there from the beginning it was like losing part of the family, because we were all very close, we knew everybody, and there were no strangers. We went through that for quite a while, and they finally got rid of all of us. Chick, who was supposed to be in on this interview, had been sent down to the desert. When I say desert, he was originally sent to Alamogordo and then he was transferred to White Sands, then after Whittaker bought Telecomputing out in 1959, I think it was, he was transferred up to Vanderburg Air Force base in Santa Maria, in charge of that. Then, when the Air Force decided they were going to furnish their own personnel, they cancelled out on it, or they didn't renew the contract. That was when Chick Fiala went to SDC. Then he got caught in that 3,500 people lay-off, or however many were laid off, over at SDC when they decided to be a profitable organization instead of a non-profit organization. They decided that they had to cut the fat out.

He was there a little over ten years, I guess. Chick started the Southwestern Information System and he was in business about a year when I joined. We are going into our third year now. That's the story!

MAPSTONE: Okay.

Did Remington Rand do anything with the Point-of-Sale REcorder? I mean, did it become a key thing for them?

COURET:

No, they didn't perfect it any more, and it still had bugs in it, but they did sell them because, like I said, I ran into that one in this department store in Caracas, Venezuela. This was in 1956 or 1957.

MAPSTONE:

Basically, it was really ahead of it's time because . . .

COURET:

It was way far ahead! There are all kinds of systems, you know.

MAPSTONE:

Right. Right, but it was probably a good 10 years ahead.

COURET:

Ahead of time, yes. If they'd have held it 6 months more and perfected it, Telecomputing would still be in business today. They had started building the prototype mockup for the storage. They had all the plans and the format and the whole thing was laid out. They did a tremendous amount of research. They were encouraged by Robinson's here in Los Angeles. In fact, they put in a partial system and Don Fitz went down and managed it for Telecomputing and was eventually transferred to Robinson's payroll when Telecomputing went out. He wound up with J. C. Penney when they went from some manual and some punched card operation to computer operations. Don was in charge of that whole thing. **MAPSTONE:**

So, he really became an expert in the field?

COURET:

Yes, through his experience at Robinson's and working with the Point-of-Sale. From that tape we used to produce daily sales by drawer, by station. They could pinpoint girls that were making errors in change; they knew what their deposit should be because we took this data, reduced it, and ran it through the printer. After a little manipulation it came out and you had a report for Station #1, or Cash Register #1, maybe it was a six-drawer, Drawer A, Drawer B, and so on. They got how much change they started with, recorded sales, refunds, how many charge cards had been used, the whole works.

In turn, they had all the detail for inventory control. Robinson's, at that time, ran a report during the night and at eight o'clock the next morning. This wasn't really the original idea. The idea was to give it to them as fast as possible, with the eventual idea of connecting e very cash register to the computer directly so that management could query the computer and get a print-out or hard copy of anything he wanted to know, instantaneously updated. That really is the terminal idea that is so prevalent today.

Point-of-Sale was the forerunner of a lot of things, and I imagine that and those connections we had with wind tunnels gave a lot of other engineer’s ideas, because they were always parading through the joint. There were visitors all the time, especially from some of the big colleges, like MIT, Cal Tech. We briefly did a good deal of work for the Atomic Energy Committee at Telecomputing, doing data reductions and the calculations for the reactors that they were building back at Oak Ridge. This is all recorded history somewhere, but don't ask me where, or who would have it. I don't know. It was a lot of

fun.

MAPSTONE:

How about patents? Were any patents taken out on the Point-of-Sale?

COURET:

I don't recall. I'm sure they must have been.

MAPSTONE:

Who do you think would be the key names to check in a patent search?

COURET:

Well, there would probably be Ward Beeman, Jack Weaver, Weiss Caldwell. Those were some of the officers of the company in the last stage.

MAPSTONE:

And therefore, also the engineers?

COURET:

Well, Caldwell and Weaver and Beeman. Ward Beeman was originally the head aeronautical engineer for Lockheed. He had a big job, and Weaver was one of his subordinates. I don't know what the connection was between Beeman and Caldwell. I think Caldwell was a friend of Bell's, but how they met and so on I don 't know. They were all basically engineers except Bell. Bell didn't have a degree to his name, but he had enough credits to get 10 degrees. He wouldn't take the required subjects, he went to UCLA and to SC and took the subjects that he was interested in and that he thought he needed.

In the early stages at Telecomputing, he insisted that all the data processing personnel be able to read the blueprints on the 604 and the CPC as a condition of employment. We didn't have to call the service engineers and IBM didn't like this.

MAPSTONE:

No. (laughter)

COURET:

When he converted the determinate reduction from a simple punched card operation and put it actually on the 604, we needed an impulse, a half-time impulse, before IBM's machine would emit its first impulse. In other words, the cards used to read top edge first, and would read what we call a 12-punch, which was the highest punch on the card. We needed one punch between the edge of the card and the 12-punch about halfway, to cause the thing to read. IBM said it couldn't be done. With Bill Bell I spent I don't know how many nights over a period of 3 or 4 weeks going over the blueprints and following the circuits. Finally, he says, "Oh, hell, that's simple!" He plugged a wire in, ran it down through the machine, put it another thing, and said, "Try it, it'll work." And it did, (snap) just like that! Of course, the first CE that came over said, "What the hell is this?" Bill Bell says, "Get your hands off of it." Then we had a battery of experts came down from IBM from Poughkeepsie about five or six months later. We had seven or eight 604s around and every one of them had that wire on it. That was the type of guy Bell was. Fantastic! What a brain!

MAPSTONE:

Do you know how Bell and Beeman got together originally?

COURET:

Yes. I'll tell you. Just before the war I went to work for Vega Aircraft Company, which was over on San Fernando Road and Alameda Street in Burbank. Bill Bell was working at Lockheed Aircraft on the corner of Empire and San Fernando Road, which was about two miles down San Fernando Road. They were owned by the Gross brothers; Courtland and I forget the other guy' s name. Then Vega built Burbank Airport, originally, and they moved their factory down there because they had gotten a contract to make trainers for the Air Force. They also made the Vega airplane that Jimmy Doolittle flew around in all the time. He was a big booster, and I think originally he was one of the stockholders in Vega Aircraft.

When they transferred Vega to the airport, they pulled Bill out of Lockheed and they put us in Vega factory tabulating at that time, which had to do with everything the factory did and nothing to do with any of the accounting. That was in a separate group. Oh, eventually they merged them together. That's where I met Bill Bell originally. And we hit it off like that (snap) for some reason or other. Naturally when he was looking for what he thought were good, reliable people, he called on the people he knew. Don Fitz also had worked there for Lockheed, and had Pat Hopney, who later became Mrs. Fitz. She's the one you talked to out at Electron.

MAPSTONE:

Right. She's the one who put me onto you. _ _ _ _ _ No, I think Jack Ott did.

MAPSTONE:

Oh, Jack Ott, that's right.

COURET:

He used to work for me. He was in charge of the reader room, which is what we called it, where they were reading various tapes and films and God knows what. Stan Mannis, was the first one to develop a system for reducing data on one computer, automatically feeding the results into a larger computer to do much faster and higher-grade calculations, and then taking the output and feeding it back into the first computer for print-out. He's been around. He was at STL for a long time.

MAPSTONE:

What's STL?

COURET:

STL? It's part of Bunker-Ramo now. I used to know the names, but I've forgotten.

MAPSTONE:

Okay.

COURET:

Until just recently Jack was vice president of sales for Data Products. The guys have all done well for themselves. These were some of the earlier people. Of course, a lot of them are deceased, too. Bill Carthuser committed suicide, Don Fitz died, Bill Bell has died, Ed Perry is dead. These were all the original group I'm sure there are a lot of the others that have worked at Telecomputing.

MAPSTONE:

So, Bell and Beeman met through Lockheed, right?

COURET:

Yes, at Lockheed Beeman, being in charge of the aeronautical engineering department, got involved with stress analysis and all this stuff, and Bill Bell was doing it on punched card equipment for Lockheed. He was a forerunner of their engineering data processing group. They now have four or five big computers and they do the whole shot now in there. But that's how they met.

MAPSTONE:

In the beginning you said that Lockheed had been the angel of Telecomputing. Did that mean that they approved of this formation, and was it a spin-off or was it an individual company?

COURET:

No, it was a completely separate organization. Lockheed had no connection. The part they played, for which I called them an angel, was they gave us a contract for X years at X dollars based on X volume of work. If it exceeded that they paid us more money. Well, it always exceeded it, naturally, so they paid us more money. They put Telecomputing in business, actually. In turn, for that investment on their part, they got all their data reduction done, unless it exceeded the contract. They paid the whole clean lump sum, you know, for five years, I think, or three years. Something like that.

MAPSTONE:

Oh, I see. So, it really did give you some funds.

COURET:

Well, it gave us the capital to start. That was the part that Lockheed played in it. Of course, it was engineered by Beeman because Beeman was the chief aeronautical engineer for Lockheed. Like I say, Weaver was one of the middle management in engineering and he reported to Ward Beeman.

MAPSTONE:

Were you ever an officer yourself?

COURET:

Of Telecomputing?

MAPSTONE:

Yes.

COURET:

Yes, I was the data processing manager; then I was staff assistant to Bill Bell; and then I was gone. (laughter)

MAPSTONE:

Okay, there's a couple of things. The Telecorder. I'd like to pursue the patents on this, and again who would be the names? Firstly, was it patented?

COURET:

Well, I think it was.

MAPSTONE:

Because it was produced.

COURET:

It was sold, you know, and the government bought an awful lot of them. Here again, Weaver, Beeman, and Colwell, probably would be the originators.

MAPSTONE:

Colwell is spelt how?

COURET:

C-o-1-w-e-1-1, is I believe how it's spelled.

MAPSTONE:

And his first name?

COURET:

Wishe, that's the only name I can remember. Wishe Colwell.

MAPSTONE:

Okay.

And it's Ward Beeman.

COURET:

And Jack Weaver.

MAPSTONE:

Is he any relative to an Al. Weaver who is up in Palo Alto, Weaver Associates?

COURET:

I don't know.

MAPSTONE:

Okay. Again, on the Teleplotter, that, too, probably was patented.

COURET:

Would be the same.

MAPSTONE:

And that also was manufactured and sold?

COURET:

Yes. Here again the military were the biggest buyers.

MAPSTONE:

So your basic manufacturing lines were the Telecorder, the Teleplotter, and . . .

COURET:

Point-of-Sale.

MAPSTONE:

a Point-of-Sale.

COURET:

Those are the ones that actually got out the door. They had many, many other projects going, but they never got into production.

MAPSTONE:

So until the 701 really, the computing, the data reduction aspect of your engineering computing service, was your major

COURET:

bread and butter? In effect the 701 was the start of the downfall.

COURET:

Oh, yes, they started tolling the bell about that time, because these huge aircraft companies who were all our customers, like Pratt Whitney who was manufacturing aircraft motors both for military and civilian use, didn't have their own computers at that time. When you go out and you spend $40,000-50,000 a month rental for a big computer, you had to be subsidized by the government, which all the aircraft were, and eventually Pratt Whitney was, too. Then they could afford a computer. So, they got their own; North American, Lockheed, and Boeing, and I forget who was down in San Diego--they are still there--but they all got their own computers.

MAPSTONE:

Convair?

COURET:

Convair, and there's another one.

MAPSTONE:

Chance-Vought.

COURET:

Yes. When they all had their own computers, there was no reason for them to send the work out anymore. We had a dying market in the aircraft industry and the missile industry was so tiny at that time. There was Cal Tech, JPL and MIT, maybe one or two others, that were even doing anything. had that been well established, not as well as it is now, but even one third of what it is now, we could have shifted from the aircraft manufacturers and motor manufacturers to the missile.

MAPSTONE:

Of course, the other companies who were into missile development were Northrop, and…

COURET:

We did work for Northrop.

MAPSTONE:

and North American.

COURET:

In fact, we did all the data reduction for Radio Plane, which was the original Northrop. Northrop bought out Radio Plane. Northrop had a lot of money, but they were a very small company. Radio Plane were testing a win9ed missile at Holloman. They were one of the pioneers of the missile industry. When they were bought out, of course, Radio Plane disappeared as a name.

MAPSTONE:

Okay, what I was talking about was the fact that these other companies, who were in on the ground floor of missiles also had their own computing machinery.

COURET:

You see, it was centralized under NASA, and NASA could let as many contracts as they wanted at one time. I understand they're more controlled now than they used to be, because Congress cut off the money. Regardless of what the various missile manufacturers were doing for their own R and D, when it came on the test range it came under NASA, and they used to say, "We'll handle this."

MAPSTONE:

And that's where you would have come in.

COURET:

Right!

MAPSTONE:

Okay, I see.

COURET:

By this time, we had connections in Washington. You know, this is the only way you're

going to get big. But the missile business was in its infancy at about the time we were going downhill at Telecomputing. I attribute our demise strictly to very poor management. Here again, when you get into the commercial end, engineers don't know a damn thing about the commercial field. They don't think like commercial people do.

MAPSTONE:

Oh, right.

COURET:

If they want something, they go out and buy it. Well, you know you can't do that. Or if they want to do a research project, they go ahead and spend the money. Well, where's that money coming from? How are you going to justify it? Well, they never worried about justifying the expenditures, and for a small company, this can be the death knel1.

MAPSTONE:

That's right. This is interesting that you mention the bad management, because in my talks with other people a lot of the problems seem to have come from bad management. But the bad management has been of the type where the complaints were that the management wasn't computer oriented. They might be engineering oriented, but they were, for instance, aircraft engineers who hadn't got into the new way of thinking.

COURET:

Yes, that's right.

MAPSTONE:

Yet in Telecomputing's case, not only was your management engineering oriented, it was also computer oriented.

COURET:

Well, it was really supported

MAPSTONE:

Yes. So, it's interesting that it's . . .

COURET:

Beeman was an engineer, and he thought like an engineer; Colwell was an engineer, and

he thought like an engineer; Weaver was an engineer, Holly Dickinson wasn't an aeronautical engineer, he was an electronics engineer; and Bell was sort of in-between.

MAPSTONE:

He was the eclectic of the group.

COURET:

Yes. Of course, Beeman having control of the company there-by forced his will on the other officers. Bell was the only one who would say no, and he was outvoted all the time. They were all on the board of directors also. Actually, Beeman ran the company as if it was his own, and Beeman was a poor manager. Then they hired Ayers and he hated computing. He didn't know anything about computers, and he hated them. He was afraid of them, really, yet he was going to go out and sell a product that was a computer, which, in my estimation, is bad planning and poor management.

MAPSTONE:

It seems like the first rule of salesmanship is to kind of like your product.

COURET:

Well, at least know it.

MAPSTONE:

Right. Did you get into machines other than IBM? I noticed we've mostly talked IBM machines as the ones you used.

COURET:

We had contact with ElectroData, which is now Burroughs Corporation--they bought them out--and Remington Rand, so we had a varied experience. We had some other equipment, which is no longer around.

MAPSTONE:

Did you have a Datatron?

COURET:

No, we didn't have a Datatron. We had a--oh, what the hell is the name of it? Three letters, not NCR, but something similar.

MAPSTONE:

CRC?

COURET:

No. Not DDC either.

MAPSTONE:

Hmm. Can't think.

COURET:

Oh, this is way, way back.

MAPSTONE:

Okay, so you did have other machines.

COURET:

We had other equipment, yes.

MAPSTONE:

Did you get into the Computer Research Corporation's GP machines?

COURET:

No, no.

MAPSTONE:

IBM was really your main source of machines.

COURET:

Well, let's fact it, they had more people available who knew how to operate and program

and everything else on IBM, because IBM has always had at least 80% of the market, and, at one time, they had 95%. (phone interruption.)

Many of the things that are actualities today were first tested or started by Telecomputing, in that data transmission, data communication, we now have computer to computer which is the outgrowth of that very simple beginning. We have remote terminal; the Point-of-Sale was the original remote terminal. It wasn't going across country or fifty miles, but it was going maybe four or five floors away. The Point-of-Sale recording itself was an original, basic idea that was developed by Telecomputing originally. The plotter was another one, an automated plotter. CalComp has a beautiful plotter now, but in those days there were none, and there was a crying need for it, especially in the aircraft business and the early missiles for plotting all the testing. We had five plotters down at Holloman, and we ran off the graphs, for trajectory, xenith, azimuth, the whole thing. It was beautiful but looking back from what I see today and looking back it looks like a rowboat next to a beautiful, sleek yacht. You know that's where it all began. I'm not saying that every idea that's been put forth was started at Telecomputing, but we were frontrunners in those particular areas of data transmission and capture of data at its source where the action happened kind of thing.

MAPSTONE:

Data transmission seems pretty interesting.

COURET:

We started off using a common teletype which punched out a paper tape. Then we got to direct telephone lines where the data came in and punched out the card. We reduced the data, produced another card, and transmitted the data back over the me machine and the same telephone line. Like I say, they got to the point where they could receive, reduce and re-transmit in four-and-a-half seconds, which is pretty fast when you figure one machine as over here and the other one was over there, and you had to get a card out of this one and get it back over there. You know, four-and-a-half seconds is not very long.

MAPSTONE:

That certainly isn't.

COURET:

That was really the forerunner of transmitting data over lines. I'm sure the telephone company and maybe Ma Bell had tried it, but . . .

MAPSTONE:

Work had been done as early as 1940.

COURET:

Yes.

MAPSTONE:

George Stibitz had done a demo using a teletype to transmit data to his computer.

COURET:

Well, Teletype was the original.

MAPSTONE:

Right. The concept had been around, but this is an interesting application of it.

COURET:

This was a commercial application, which was the first in its particular field, yes. There were a lot of things, but I've probably forgotten a lot of them, too.

MAPSTONE:

Okay, that's the end of the tape. Thank you very much.

[END OF INTERVIEW]