The 30th Year

FAIRCHILD WESTON
Schlumberger

DATA SYSTEMS DIVISION, Sarasota, Florida

FAIRCHILD
WESTON
SYSTEMS INC.

TO ALL DATA SYSTEMS EMPLOYEES:

On the occasion of Data Systems Division's celebration of 30 years in Sarasota, it is a pleasure to extend greetings and appreciation to the many employees whose varied talents have combined to make this Division a special place in which to work.

Technical innovation, business acumen, and energetic cooperation are notable attributes which are evident among the workforce we have come to know since coming to Sarasota five years ago. Judging by the quality and loyalty of the large number of employees who have service records of 20 or more years here, those same values have been part of this operation from its earliest beginnings.

With continued dedication to sound business practices, our American tradition of hard work, judicious planning, and the required flexibility to respond to the fluctuations of the marketplace, this Division and its employees can proceed into the '90's with excellent prospects for growth and prosperity.

All the members of the management staff join in saluting you and this 30th year of progress in Sarasota.

Carl L. Schleicher
General Manager

R. J. Keller
Senior Vice President

December, 1987

FAIRCHILD WESTON
Schlumberger

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PROLOGUE

Thirty years ago, the Golden Age of the vacuum tube began its wane into history. One elementary function, one vacuum tube. Software consisted of a strong right arm and a mechanical Marchant calculator. Wollensack was a household word in audio magnetic recorders. EMR FM discriminators were boxes which glowed in the dark from the tubes.

Twenty years ago, not one but 20 to 50 transistors occupied one small chip. It was called SSI, Small Scale Integration, and it was good. Software belonged to the diligent who could speak in octal codes and punch paper tape. The recording world marveled at the Sangamo Electric magnetic recorders which could record information at hundreds of kilohertz and could actually be moved by several Charles Atlas types (also a technology of the times). EMR FM discriminators shrank to card size, and an upstart technology, Pulse Code Modulation (PCM), appeared in box form using SSI digital logic chips.

Ten years ago, 50 to 100 transistors were squeezed into tiny plastic packages. It was called MSI, Medium Scale Integration, and it was considered better than SSI. FORTRAN, although an old man of high-level languages, reasserted himself in the software world, pushing aside some of the assembly language aficionados. Magnetic tape became the software media. A toy computer hiding behind the impressive alias "microprocessor" was introduced by some ex-Fairchild employees in a strange and exotic land called Silicon Valley. PCM recording appeared in the recorder world and new terminology such as "bit error rate" had to be learned. Several FM discriminators managed to get on one card but the young upstart, PCM, had pushed aside FM so that EMR products had a peculiarly digital flavor. Boxes in racks were the order of the day.

Today, the acronym march has relentlessly continued with MSI supplanted by LSI (Large Scale Integration - 500 to 5000 transistors per chip) and on to VLSI (Very Large Scale integration - 5000 to 50,000 transistors per chip), permitting incredible advances in all of our technologies. The 8470 is revolutionizing the tired old FM technology with an innovative, all-digital approach. Many PCM functions that were formerly in boxes are now on cards. The 8715 is processing real time telemetry data at rates not thought possible several years ago. FORTRAN has become a socially acceptable language in the telemetry world; although PASCAL has slipped into some products and whispers of languages such as ADA, LISP, and PROLOG can be heard on clear days. The ominous "disk crash" haunts those who used to complain about loading new tape reels. Error detecting and correcting coding on PCM recording has reduced bit error rate discussions to arguments over how many uncorrected error bursts will fit on the head of a pin.

What of tomorrow? If I could reasonably predict the technology of tomorrow and how it will affect our business, I would quit and join the "futurist" lecture circuit. However, given a past history of underestimating the rate of technological progress (I thought the slide rule would last at least until 1980), allow me to speculate on the next thirty years.

Ten years hence, all remaining Data Systems Division box level products will have shrunk to card size, card level products to chip levels, and single racks to boxes. ADA will challenge FORTRAN as the language of choice for Telemetry Systems, and Artificial Intelligence (AI) software will provide natural language interfaces to our products and systems. Optical disk recorders will challenge instrumentation recorders in some applications. No one will be interested in bit error rates with built-in error correcting features of recorders.

Twenty years hence, current box products will be on chips; current racks on boards. To quote noted Computer Scientist Tony Hoare, "I don't know what the computer language of the 21st century will be, but its name will be FORTRAN..." A concurrent object-oriented, very high language, suited for programming multiprocessor computers, will replace ADA. AI software to write computer programs will be as efficient as current human software programmers. Solid-state, molecular technology will challenge magnetic and optical recording, eventually replacing both.

Thirty years hence, current racks will be replaced by chips. Systems will be designed by selecting functions which will be compiled onto custom silicon chips. Most software will be generated automatically from system requirements. Arguments will be held on how many ancient Cray Computers can be put on the head of a pin. All of the fun of soldering, typing, and computer programming will be gone; but, then again, what do I care? I'll probably be gone also...

Bill Waggener

Bill Waggener Sr.
Technical Director

FAIRCHILD WESTON SYSTEMS INCORPORATED – THIRTY YEARS OF PROGRESS IN SARASOTA ! ! !

On February 26, 1987 the US Space Program got back on track with the successful launch of an unmanned Delta rocket from Cape Canaveral. It's payload? A Geostationary Operational Environment Satellite (GOES), intended to fill a critical surveillance void of Earth weather (especially hurricane) activity.

On August 16, 1987, the world mourned the crash of Northwest Orient Airlines Flight 255 in Romulus, Michigan, a suburb of Detroit. The tragedy claimed 158 lives.

Looking back over the newsmaking events of 1987, these two are certainly among the standouts. But what has this to do with FWSI? We as a Company played a role in each of these and countless other events throughout modern history.

For the GOES Satellite and three other satellites, we built a Pulse Code Modulation (PCM) Subsystem. In layman's terms, this Subsystem translates the satellite microwaves into a format that a computer can understand and subsequently output as weather data, weather maps, etc. This particular project, which we shipped to the National Space Technologies Laboratory (NSTL) in Mississippi in Fourth Quarter 1986 and First Quarter 1987, includes both FWSI Telemetry Components and FWSI Instrumentation Recorders.


GOES Will Provide Full U. S. Weather Monitoring Capability

Sarasota firm made devices to record plane's flight data

FAA Orders Improved Recorders On Jetliners

Recorders could hold crash answers

Weather Satellite Is Lifted Into Orbit After Launch

Aircraft's 'black box' repaired at Fairchild-Weston in Sarasota

Flt. 255 flaps not set for takeoff

As it turned out, according to the National Transportation Safety Board, the tragedy in Michigan probably was the result of pilot error. And how did they reach this conclusion? Key evidence came from recorded data within the airplane's two "black boxes". These so-called black boxes (which are actually orange) are the

Cockpit Voice Recorder and the Digital Flight Recorder, both manufactured here in Sarasota, withstood the fiery crash and following inferno with the data intact.

These recorders have such a high success rate and are so vital in crash investigations and subsequent correction measures that the Federal Aviation Administration (FAA) has ordered that they be standard equipment on newly built commuter planes. They are already required on the big commercial carriers.

The NSTL PCM Subsystem and Flight 255's Cockpit Voice Recorder and Digital Flight Recorder are two isolated FWSI product deliveries. Yet, they are a microcosm of the big FWSI picture, one that is interfused with the trials and triumphs of FWSI's most cherished asset; we the FWSI people.

We have, over the last thirty years in Sarasota, designed, developed, built, and delivered thousands of telemetry, recorder, and systems-oriented products to a virtual Who's Who in worldwide industries and government agencies. In turn, most of these customers have paid us the ultimate compliment in subscribing to repeat business.

This booklet salutes you, the Fairchild Weston employee, both past and present. The following pages review the events prior to 1957 that led to the establishment of Electro-Mechanical Research in Sarasota, and then the events, projects and product developments of the last 30 years. The center pages contain group photographs of the FWSI Family today.

So, when you're ready for that trip down nostalgia lane, settle back, relax, and happy reading. Oh, and while you're at it, give yourself a pat on the back. As a part of the FWSI Family, you have a lot for which to be proud!

HAPPY THIRTIETH ANNIVERSARY !!!

THE PRE-SARASOTA DAYS

THE BEGINNING FOR SCHLUMBERGER

Schlumberger today is a multibillion dollar, multinational conglomerate. Yet, it started out as a family-owned enterprise in France less than 100 years ago! The company was started by brothers Conrad and Marcel Schlumberger as a mineral and oil exploration company.

Years before the company's inception, Conrad, who was a professor of Physics at the French Institution Ecole les Mines, accurately measured and recorded the electrical resistivity of various types of rocks. He realized that each type had its own unique electrical resistivity "signature."

Conrad expanded on this concept by taking his measurement device to the field. After numerous experiments, adjustments to the results, and then follow-up experiments, Conrad developed a successful technique where, by measuring the relative electrical resistivity of points below the Earth's surface from ground level, he could develop a fairly accurate picture of the geological formations beneath the Earth's surface. Thus, "electrical prospecting" was born.

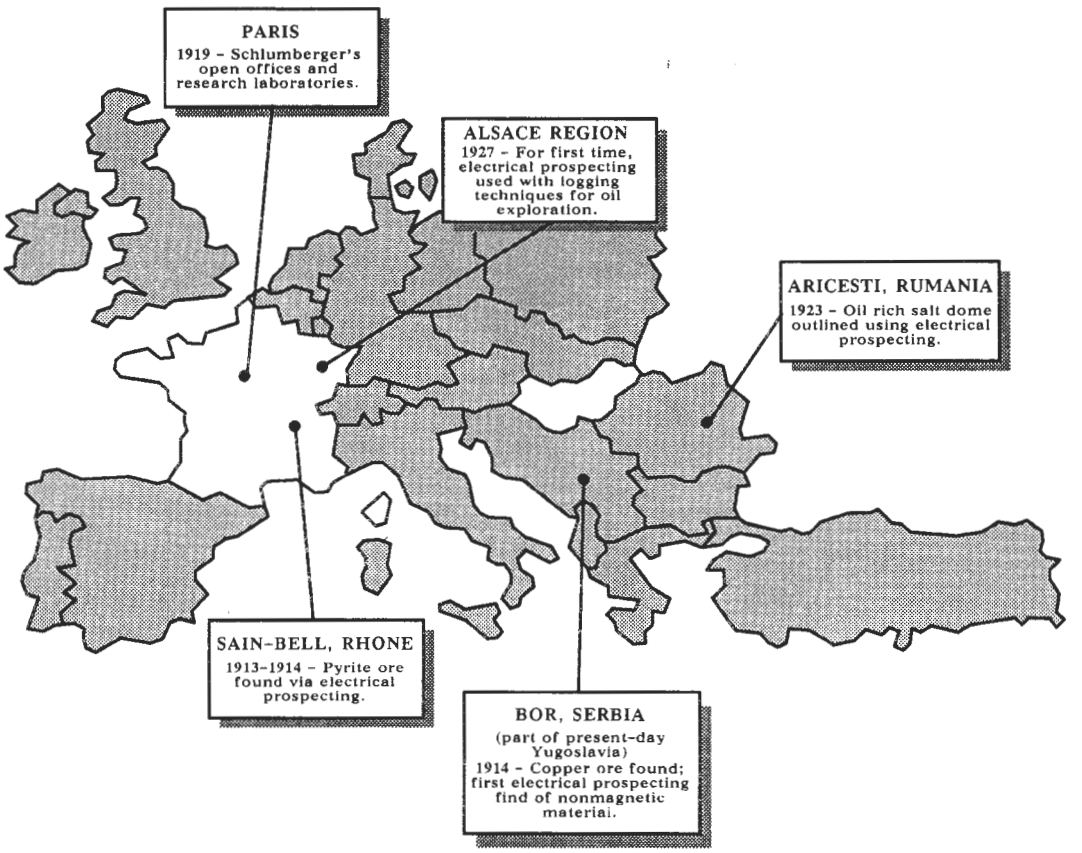
During the period 1913 - 1914, Conrad combined this technique along with another recently discovered phenomenon - instantaneous polarization - to outline a pyrite ore body at Sain-Bell, Rhone and a copper ore body at Tilva Roche near Bor, Serbia. The latter discovery marked the first time that a nonmagnetic ore body had been discovered by geophysical means. This was also Conrad Schlumberger's first commercial undertaking in this field.

This might have led to the beginning of Schlumberger as a company, but World War I interrupted the progress until 1919. Then Conrad, joined by his brother Marcel, opened a modest 5-room facility at 30 rue Fabert in Paris, and converted the space into office, laboratory, and workshop facilities. By the way, this location is next door to today's Schlumberger World Headquarters.

Research and development of the "electrical prospecting" techniques continued into 1923, a year in which two significant events occurred pertaining to the fledgling Schlumberger enterprise. First, Conrad resigned as a professor of physics to dedicate fulltime efforts to the joint venture with his brother. Second, the efforts paid off quickly as the brothers used their techniques to delineate an oil-productive salt dome in Aricesti, Rumania. Thus marked the beginning of Schlumberger oilfield activity.

In September of 1927, Schlumberger applied the electrical prospecting technique to a drill hole being bored for the Pechelbronn Oil Company in the Alsace Region of Eastern France. They did it by manually raising and lowering

the instruments in and out of the drilled hole on a point-by-point basis and then sequentially logging the measured results at each point. This is the first time that a log had been electrically taken of an oil exploration boresite.



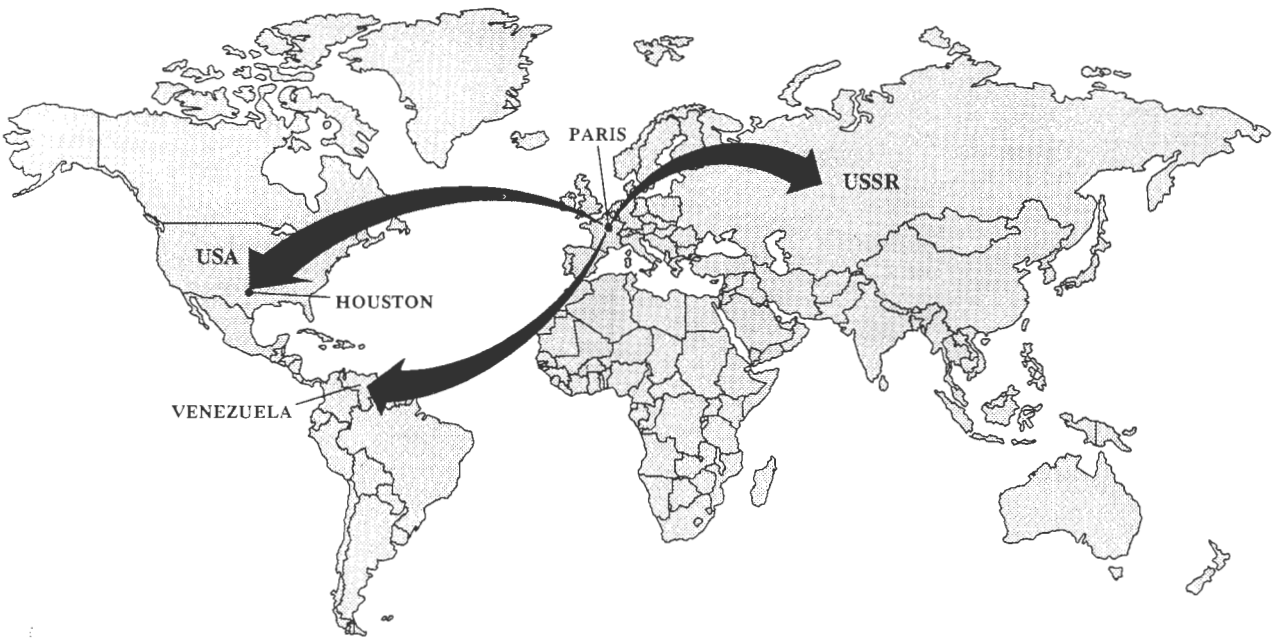
Schlumberger realized the fantastic significance of this "log." By running additional logs at strategic locations within the greater prospective drilling area and then comparing the logged data from all of the drilled sites, Schlumberger was able to derive a clear picture of the area's geological patterns. This, of course, helped oil drillers select those sites with higher probability of success. That event completely changed the course of oil drilling ... and Schlumberger!

EXPANSION, EXPANSION, EXPANSION ! ! !

By 1929, Schlumberger was exporting this oil exploration technique to countries throughout the world, including the United States. Initially, the US ventures, which included drill sites in Texas, California, Oklahoma, and Louisiana were not profitable. The Depression had begun and oil was plentiful, so Schlumberger pulled out in 1930.

However, successes were accumulated in other countries, especially Venezuela and

the Soviet Union. Through these efforts, Schlumberger developed a worldwide positive reputation for its service. In 1932, the Royal Dutch Shell Group (makers of Shell Gasoline) asked Schlumberger to resume their US logging operations. They did so, sending crews back to California that year and then to the Texas Gulf Coast in 1933.



1929 - 1937 Schlumberger's export their oil exploration techniques

By September 1934, Schlumberger had 40 employees and 11 trucks working logging operations in the USA. From this group, an American subsidiary, Schlumberger Well Surveying (SWS) Corporation, was founded in Houston, Texas. The first American headquarters was a two-room office. Within two years, increased business justified the construction of a plant until Schlumberger shops, offices, and test facilities covered two city blocks. This solid growth continued through the rest of the decade.

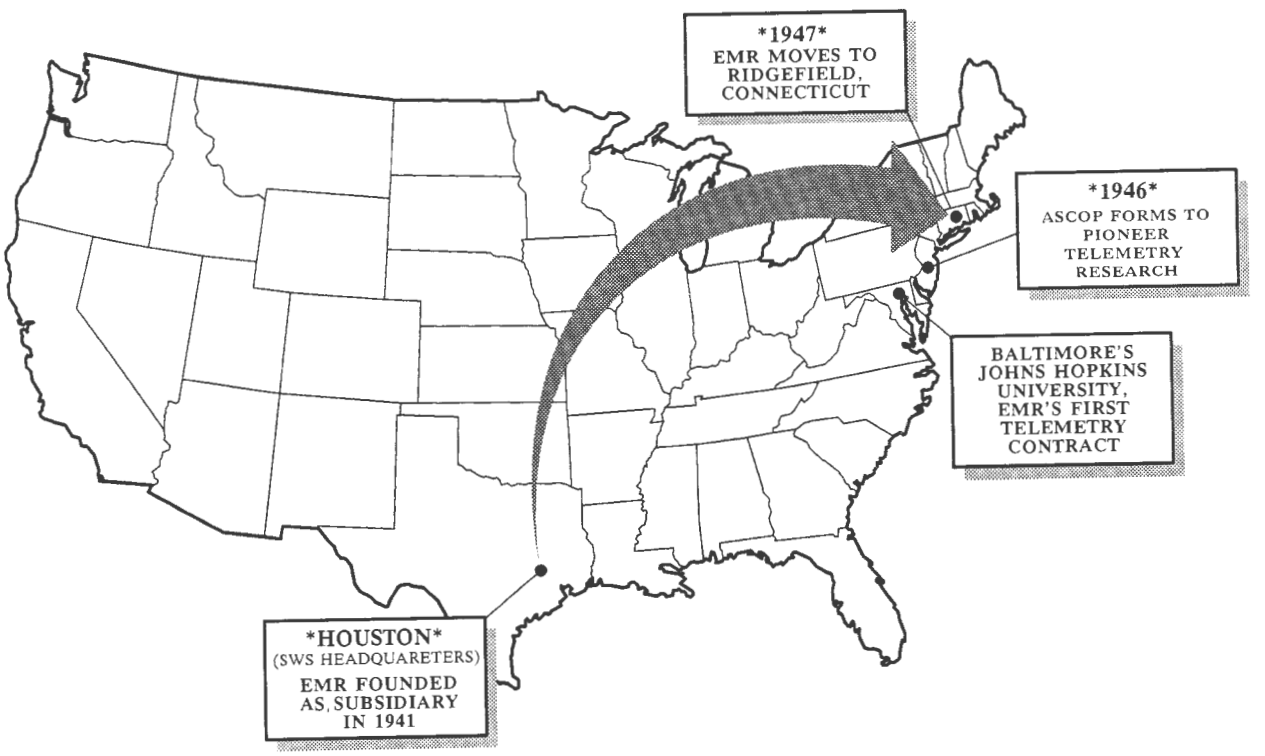
THE BIRTH OF EMR

By 1941, it was evident that the United States was not going to remain a neutral party in World War II for much longer. To contribute to the pending war effort,

SWS Houston created a spinoff nonprofit corporation, Electro-Magnetic Research, in the spring of 1941. The primary purpose of this new concern was to research and develop defense applications for SWS's technology.

One of the first EMR developments, a mine-detection system to stop jeeps and tanks upon detection of a land mine on their path, was actually begun at Schlumberger France before the onset of World War II. The fruits of project, along with many other pioneering endeavors for other types of land mine detectors, underwater mine detectors, infrared detectors, and missile guidance systems, were all provided to the Allies for the war effort.

EMR did not terminate with the close of World War II in 1945. Rather, the young subsidiary intensified research and development efforts, branching into the field of research instrumentation. Notable developments during this period include highly sensitive galvanometers, accurate and stable strain-gage amplifiers, precision signal generators, and improved degaussing equipment. EMR had become a laboratory for profit.



It followed naturally in 1947, that when SWS Houston decided to move their research and development laboratories to Ridgefield, Connecticut, that they would also move the EMR Subsidiary since its primary function was also research and

development. Now a part of the Industrial Northeast, EMR found to its avail a highly diversified, yet close customer base. The firm grew, developed and diversified.

However, the significance of other 1948 contracts pales in significance to EMR's history when compared to that of a contract signed with the Applied Physics Laboratory of Johns Hopkins University of Baltimore, Maryland. This marked the beginning of the marriage between EMR and telemetry.

A little background is appropriate here before continuing the discussion of the EMR/Johns Hopkins contract. After the war in 1946, a research group from Princeton University in Princeton, New Jersey founded the Applied Science Corporation Of Princeton (ASCOP) to continue important work in telemetry begun at the university during World War II. First, a definition of telemetry:

> *Telemetry is the science of measuring quantities such as speed, pressure, or temperature via an electrical apparatus, transmitting the measured quantities via a medium such as a radio wave, and then, at the distant station, receiving the data and then recording and/or indicating the measurements in a form that can eventually be understood by humans.*

Prior to 1948, ASCOP had collaborated with Johns Hopkins on a project to study the entire field of missile telemetry for the Navy Bureau of Ordinance. To support this joint effort, EMR was contracted to develop its first telemetry product, the Model 27 Subcarrier Discriminator. In layman's terms, this product per forms the telemetry subtask of receiving and then indicating the measurements.

ASCOP continued its studies for the Navy through 1953. A direct consequence of this is that ASCOP pioneered airborne and ground equipment to exploit the relatively untried techniques of time division multiplexing, one of the two main methods of telemetering data.

Meanwhile, EMR's Model 27 proved so reliable, that the company received many more orders for the product from a number of organizations. EMR then further expanded its position in the newly developing telemetry marketplace by introducing the Model 67 Modular Discriminator in 1954. This unit and its cousin, the Model 189, were used on test ranges and by aircraft/missile suppliers throughout the free world.

EMR had, by this time, already established itself as the leader in telemetry data equipment. In fact, by 1956, the company was employing over 350 per sons.

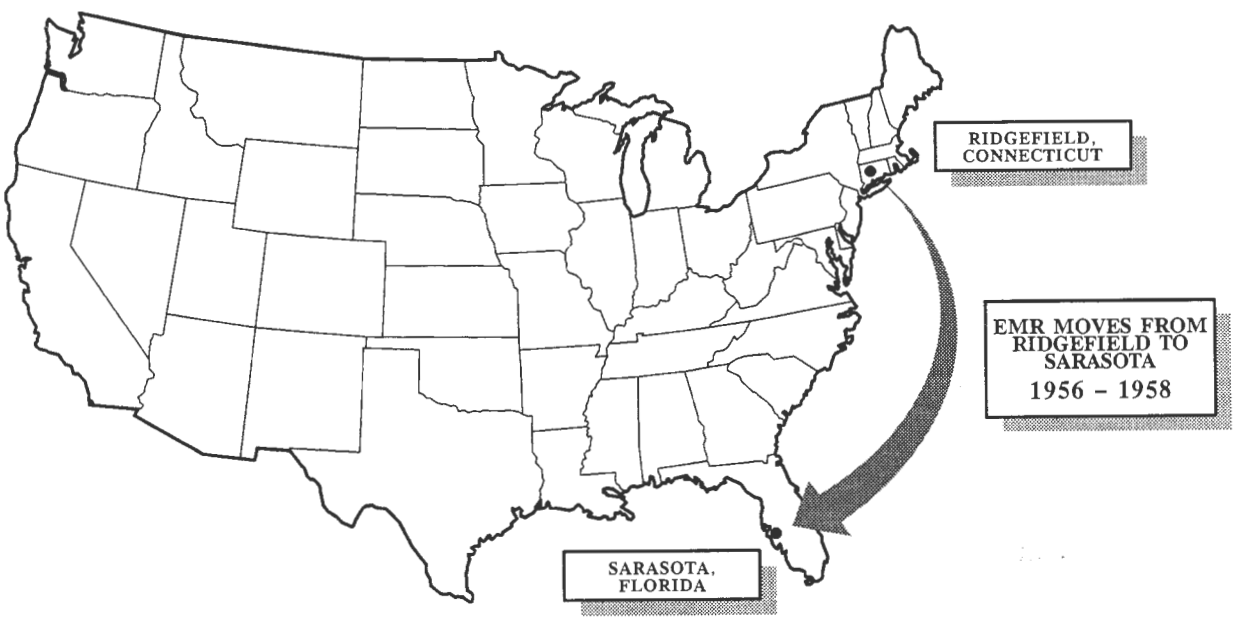
THE SARASOTA DAYS

SARASOTA, HERE WE COME!

Success has its price, and, as evidenced by a December 5, 1956 article in the **Ridgefield Press**, EMR had outgrown Ridgefield's available labor pool:

> *"Citing a lack of sufficient personnel to staff any further expansion of its production facilities in Ridgefield, Electro–Mechanical Research Inc. announced today that it plans to build an additional manufacturing plant five miles outside of Sarasota, Fla."*

At the same time, the Sarasota Industrial Council, which was instrumental in luring EMR to Sarasota, was for the first time making public the successful conclusion of negotiations that had gone on secretly for most of 1956. The announcement was made by retiring President Roger Adams at the Council's annual meeting, held at the H & H Cafeteria. (The building that was once this cafeteria is now the Florida Power & Light Facility on Main Street.)



Depending on who you talked to or what paper you read, the opening of the EMR Sarasota Plant promised to create anywhere from 300 to 500 jobs initially for

the Sarasota community. At the time, the city had a population of 30,000 and the county totaled 60,000.

In early 1957, EMR trained the first of its Sarasota employees. They were then immediately put to work in the Company's temporary headquarters on Clark Road, at the site where the Sun Haven U-Save now stands. Construction of the new permanent Sarasota Facility commenced. Some interesting facts and figures pertaining to the new site are as follows:

- The site of the new plant was a 90-acre tract of land at the corner of Sara Palm Bee Trail and Packing House Road. (This is the same site that our plant is at today, but Sara Palm Bee Trail is now Fruitville Road and Packing House Road is now Cattleman Road.)

- The land purchase price as recorded at the Sarasota County Courthouse on December 19, 1956, was $61,000.

- The architects who designed the facility are Roland Sellew and Erwin Gremli II.

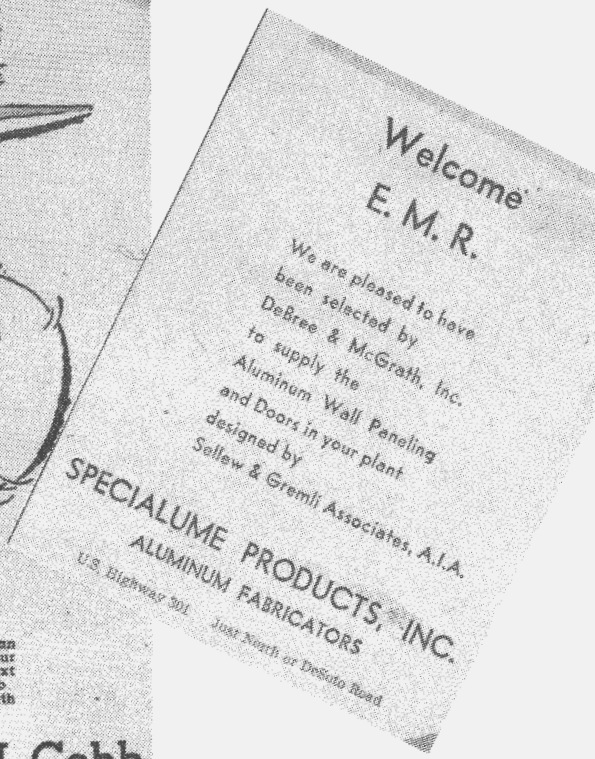
- The First Phase provided 45,000 square feet of usable space. This represents approximately three times the production space as offered by the Ridgefield Site.

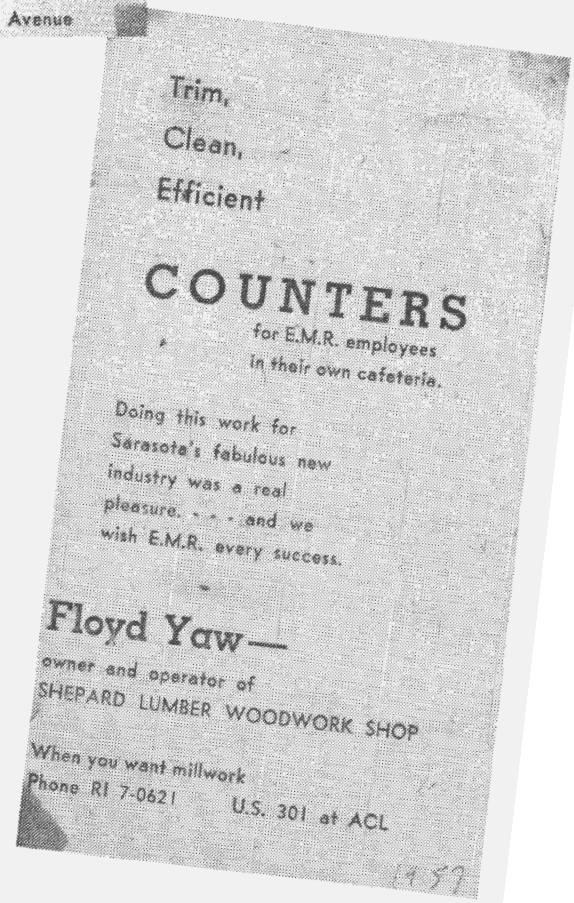
- The First Phase building contractor was DeBree and McGrath, who beat out all other bidders with the low bid of $316,668.

The transition to Florida quarters went smoothly, and soon EMR was back full-time to the business of making telemetry products. As evidenced by the number of advertisements taken out by local merchants, EMR was welcomed to the Sarasota business community with open arms. EMR responded in kind by running an ad of its own and by participating in Sarasota's Florida Products Festival on February 14 through 23, 1957.

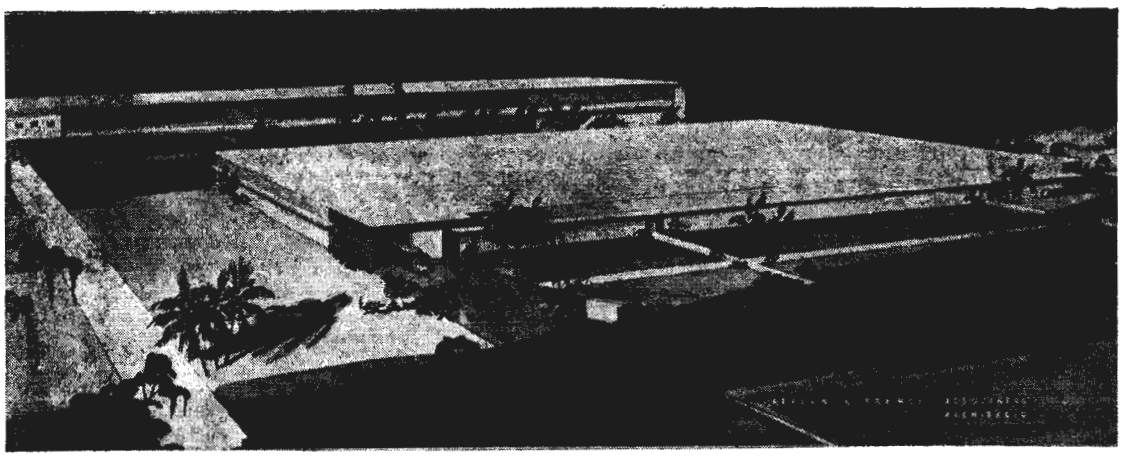
The telemetry boom continued into the summer of 1957. EMR had barely moved into its new plant (June 30, 1957) when the firm announced that it would begin efforts immediately to double the plant's size and to move its administration and engineering staffs from Ridgefield to Sarasota. Most applauded the growth as good for Sarasota. However, a minority viewpoint did not want to see Sarasota change, as evidenced by this excerpt from an editorial on Economic Cutbacks in the August 23, 1957 **Sarasota News:**

> *"The west coast of Florida is fortunate to be out of the industrial area that will feel the pinch. It should remind our industrial councils in this region that all this ballyhoo about bringing industry to Sarasota County has its drawbacks, and only the chosen few get any benefits out of it. Certainly the residents of Sarasota County will not benefit, and the sooner we forget all of this industrial talk and concentrate on making our community a specialized area for retired and artisan groups the better everybody will be."*





Sarasota welcomed EMR with open arms...



Sarasota plant of Electro-Mechanical Research, Inc., now under construction

We are proud to be a member of Sarasota's community and to contribute to the well-planned development of Sarasota and the State of Florida.

Electro-Mechanical Research Inc.

Foremost In Telemetry

The Product of Florida Products

SEE OUR EXHIBIT AT MONTGOMERY-ROBERTS

...EMR responded in kind.

EMR EXPERIENCES RAPID GROWTH; ACQUIRES ASCOP

By October 1, 1958 when the new 30,000 square foot two story addition opened, EMR's employment swelled to about 400. Our existing telemetry products continued to have a dominant share in the FM telemetry. Three events occurred over the next twelve months that enabled the company to expand into other areas of telemetry.

First, Schlumberger transferred the Pulse Code Modulation (PCM) project and the associated personnel from the Instrument Group (still located in Ridgefield, Connecticut) to the EMR Sarasota Plant.

Second, EMR's entry into the highly sophisticated transmitter market was winning broad customer acceptance.

Third, Schlumberger acquired ASCOP, the Princeton New Jersey firm with whom we participated in our first telemetry venture. Schlumberger made ASCOP a subsidiary of EMR Sarasota called EMR ASCOP. As part of this purchase, we acquired ASCOP's well developed product line in the area of Pulse Division Modulation (PDM) telemetry and Pulse Amplitude Modulation (PAM) telemetry, the M–Series.

In 1959, EMR developed a PCM/PDM/PAM processor, the Model 185, that was a pioneer for telemetry processing at that time. In fact, the Model 185 was one of the "showstealers" of that year's International Telemetry Conference in Denver, Colorado.

It was also during the 1958–1959 time frame that EMR, like most of the American high–tech industrial structure, was rapidly becoming preoccupied with the rumblings of the greatest scientific challenge yet... The quest for space.

EMR AIDS IN US SPACE CHASE

By 1959, USSR had established itself as the world leader in the quest for space. While the Soviets were chalking up success after success, the USA literally could not get off the launching pad, as described in a May 31, 1959 **Sarasota Herald–Tribune** article:

> *At Cape Canaveral a missile belches fire and smoke, rises sluggishly from its launching pad and then accelerating more rapidly disappears into the clouds with a thunderous roar.*
>
> *Inside a nearby blockhouse, scientists hover over their instruments following the flight. Suddenly they note a deviation from course. An order is given and one of the scientists pushes a bright red button labeled "Destruct."*
>
> *In the air over the Atlantic the missile explodes and fragments of a*

multi–million dollar test vehicle fall into the ocean.

* * *

At a dry lake in California a hyper–secret plane is rolled onto the runway. The control tower gives an "okay" and the plane roars into the air.

A few second later there is a deafening explosion and the plane disintegrates in midair. Bits of wreckage litter the dry lake bed.

If one were to stop reading the article at this point, one would probably conclude that the US space hopes were in a dismal array. But, as its headline indicates, the article captures the pride that Sarasota and EMR has for the roles that they are about to play in helping get the US Space Program on track:

EMR Builds Vital Telemetry, Electronic Equipment

Sarasotans Will Help Put Man In Space

The article continues:

"What went wrong to allow the missile to deviate from its charted path? What happened to that aircraft that caused it to blow apart in midair?

In either case, there were no survivors. Yet odds are better than 100 to 1 that the cause of each accident can be pin pointed – that corrective steps can be taken and t hat success will eventually be gleaned from failure.

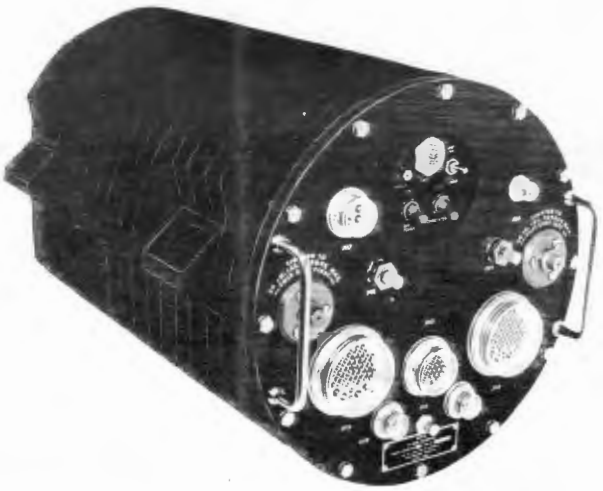
And the odds are good too that made–in–Sarasota products, by Sarasota craftsmen and engineers will provide the clue to these mythical accidents that will enable scientists to over come their failures. . .

. . . last week, Sarasotans working in a suburban plant widely known for its electronics wizardry, delivered to a national defense unit an instrument that will hasten the day in which man can penetrate space, continue to live and make his re–entry back to earth."

What the article is alluding to two special–designed Airborne Telemetry Packages; one that we designed for the National Advisory Council for Aeronautics (NACA) for the unmanned portion of their Project Mercury, and the other that we designed for the US Air Force's Titan Missile Program. EMR's involvement in these two programs marked the beginning

of the company's involvement in aerospace activities.

The FM Airborne Telemetry package that EMR provided for the Project Mercury was a two-foot by one-foot cylindrical package, weighing about 50 pounds. It transmitted back all of the environmental and physiological data for the Mercury "monkey flights," those missions that were manned by chimpanzees prior to the first US manned flights. EMR provided ground station FM discriminators for all of the Project Mercury missions, including John Glenn's famous three-orbit flight around the earth on February 20, 1962.



EMR Airborne FM Telemetry Package for Project Mercury

The Package EMR designed for the unmanned Titan Missile project was similar in structure to the one designed for Project Mercury. EMR's successes with Titan and Mercury led to numerous other "aerospace-oriented" contracts in the early 1960's. Some of the more interesting projects include the following:

- **NASA Explorer Energy Particle Satellite Series** – We fabricated and assembled the telemetry satellite systems for this series of satellites, which performed experiments to measure protons and electrons in space and to also measure their relationships with space magnetic fields. This information was critical for further development of the manned space program.

- **Project Gemini** – We built, tested, installed, and trained the operators for the World Wide Range Stations, the PCM telemetry ground stations placed strategically around the world to that receive telemetry data from the Gemini missions as they passed over the range of each station. EMR also provided all of the airborne telemetry on the Gemini spacecrafts. For this project, we developed the Model 285 Telemetry System, which was state-of-the-art in 1962.

A SALUTE . . .

CURRENT EMPLOYEES, PICTURED IN THE FOLLOWING PAGES, SALUTE OUR COLLEAGUES, RETIREES, AND FRIENDS WHO HAVE PASSED ON.

TOGETHER WE HAVE MADE IT POSSIBLE TO CELEBRATE 30 YEARS OF PROGRESS IN SARASOTA.

GENERAL MANAGER'S STAFF
Joe Keller, Carl Schleicher, Rick Greenawalt, Jerry Aldrich, Carl Aquilino, Bill Waggener, Sr., Bill Shaw, Ray McPartlin, Maurice Gritzman. MISSING FROM THIS PHOTO: Dick Dobbyn, Julie Soderquist.

GENERAL MANAGER'S STAFF (Cont'd)
Dick Dobbyn and Julie Soderquist

Lillian Conway and Sheila Briley
(Fairchild Sarasota Credit Union office).

OPERATIONS MANAGEMENT

FRONT ROW: Rob Ramey, Paul Copen, Debbie Sutor, Bud Steinhoff, Gary Petersen. SECOND ROW: Frank Bloechl, Hans Kaiser, Ray McPartlin, Eldon Andrews, Gary Mahaffey. BACK ROW: Dave Clouse, Mike Lockwood, Mike Eisenbise. MISSING FROM THIS PHOTO: Bob Wallace.

TELEMETRY ASSEMBLY

FRONT ROW: Marian Cook, Rita Keen, Patsy Carter, Faye Bragg, Mary Peterson, Eva Perez, Debbie Beyerlein. SECOND ROW: Loraine McFarlin, Pat Wetjen, Mable Altman, Shirley Chalfant, Irma Jones, Cheryl Martin, Hester Spann, Delta Wildermuth, Dianne Hammond. THIRD ROW: Pandorel Griggs, Opal Black, Polly Smith, Pat Bowers, Sharon Krueger, Nina Van Tassel, Sheri Tipton. BACK ROW: Candy Esber, Cindy Buckles, Beth Elinski, Edie Himes. MISSING FROM THIS PHOTO: Loretta Horton.

POST WAVE

FRONT ROW: Sybille Sabbides, Clara Vann, Rose Routsong, Marianna Campbell, Joanna Nguyen, Cheryl Sheets, Elizabeth Horton, Janet Kozlakowski. SECOND ROW: Josefina Nunez, Mary Pless, Mary Evans, Pat Bowers, Ann Bassett, Willine Lahman, Miriam Smith, Evelyn Christian. BACK ROW: Dot Berner, Regina Devine, Alice Wright, Shirley Huckaby.

TELEMETRY TEST

SEATED: Patty Jones, Wayne Norman, Joan Stabenow. SECOND ROW: Greg Sutton, John Burr, Jack Newcomb, Lonnie Gunter, John Brisbin, Richard Healey, Barry Dufour, Ray Thomas, George Norton. THIRD ROW: Dean Norfleet, Don White, Phil Luquette, Bill England, John Fierstos, Dane Armentrout, Burton Schmitt. BACK ROW: Ric Roehsner, Frank Black, Simon Ford, Richard Bridgman, Doyle Jones. MISSING FROM THIS PHOTO: Della Presley.

SYSTEMS ASSEMBLY, INSTRUMENTATION RECORDERS ASSEMBLY, MAGNETICS, PREWAVE & SOLDER WAVE

SEATED: Sydney Eaton, Jackie Newberry, Cheryl Mnick, Susie Carrico, Bruni Duffey. SECOND ROW: Thelma Willetts, Anne Stockton, Betty Cobb, Betty Hunt, Linda Sittler, Gail Salter, B. J. Matthews, Evelyn White, Dianne Pericciuoli, Judy Boyd. THIRD ROW: Arline Cifaldi, Jean Wilson, Welma Bohon, George Phillips, Ronnie Sumner, Hillary Norfleet, Bev Gill. BACK ROW: Pat Parrish, Joanie Odzic, Victor Powell, Bob Moore. MISSING FROM THIS PHOTO: Margaret Dill, Pat Horton, Darlene Horton.

POTTING LAB, EQUIPMENT RECORDER ASSEMBLY

FRONT ROW: Judy Tibbs, Ruth Gentzler, Rita Balleroni, Marlowe Lymer, Lillian Eger, Kim Jaskolka, Elizabeth Bell, Vivian Gilliam. SECOND ROW: Nita Rose, Alwilda Fisher, Joyce Koscielny, Alyene McCoy, Shirley Terry, Pat Martin, Vivian Godfrey. BACK ROW: Bud Lang, Teresa Smith, Vi Blair, Steve Creech. MISSING FROM THIS PHOTO: Etta Williams.

RECORDERS TEST

SEATED: Dave Dowding, Terry Vinson, Kemp Mednick, Tim Sorenson. SECOND ROW: Mark McClure, Terri Hughes, Joanne Mixon, Laura Barnhart, Cathy Wilson, Cheri Vandevander, Tom Jackson, Robert Williams. THIRD ROW: Matt Neelley, Mike Reilly, Stanley Baron, Hans Kaiser, Bob Wallace, Scotte Kavanaugh, Steven Troyan, Joe Yourkoski. BACK ROW: Terry Hurst, Bob Boyer, Barry O'Brien, Robert Carlson.

PRINTED WIRING BOARD (PWB), PAINT SHOP, TOOL & DIE

FRONT ROW: Joe Eaton, Sally Marlowe, Ann Stinton, J. J. Jeannette, Irmgard McWhorter, Dave Cobb. SECOND ROW: Art Smith, Gene Waldroop, Eldon Andrews, Gene Flagg, Bernie Dorobkowski. BACK ROW: Richard Veigel, Richard Peck, Mike Venneman, Rick Ramos. MISSING FROM THIS PHOTO: Joe Barnett, Ed Bassett, Ed Caron, Emma Green, Ray Honor, Nancy Lemacks, Dorothy Richey, Wes Woodruff.

SHEET METAL & MACHINE SHOP

SEATED: Becky White, Kathy Ling, Helen Duthe, Ollie Stone, Paul Shetler, Mark Stone, Phil Stockton. SECOND ROW: Fred Krase, Ralph Krueger, John Dezzi, Fred Hittel, Jesse Sotomayor, T. Keovilay, Hutch Ferrugia, David Kolchakian, Bill Whaley, Steve Jelemensky. THIRD ROW: Greg Williams, Billy Fincher, Eldon Andrews, Don Stover, Wayne Reid, Howard Graham, Mark Lawson. BACK ROW: Brad Jones, Robert Grados, Norris Henderson, Bob Lahmers, Ed Morrow. MISSING FROM THIS PHOTO: Stanley Krosnicki, Jeff Morrow, Julian Sunderman.

PLANT ENGINEERING & MAINTENANCE

FRONT ROW: Harry Yates, Kay Cole, Mike Matthews. SECOND ROW: Mike Mace, Rob Crawley, Rick Laufer, Mike Eisenbise, Edward Christian, Bob Thomson. BACK ROW: Dave Richards, Joe Smith, Dan Konieczka.

MACHINE REPAIR
FRONT ROW: Vic Letterman, Rick Laufer, Larry Stewart. BACK ROW: Don McCrea, Nevel Christie, Bill Wheeler.

STOCKROOM/SHIPPING/RECEIVING
FRONT ROW: Kathy Baron, Harriett Fincher, Zoraida Muriedas, Mellonee Houston, Becky Walser, Shirley Strom, John Elliott. SECOND ROW: Gary Mills, Al Dyer, Al Balleroni, Bernie Cori, Kevin Robinson, Ed Sleeman. BACK ROW: Marc Kolchakian, Joe Yeager, Mike Rosenthal, Mike Heaton. MISSING FROM THIS PHOTO: Barbara Bailey, Sandy Halverson and Henry Lamb.

MACHINE REPAIR

FRONT ROW: Vic Letterman, Rick Laufer, Larry Stewart. BACK ROW: Don McCrea, Nevel Christie, Bill Wheeler.

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MANUFACTURING ENGINEERING

SEATED: Tony Reali, Harry Wendt, Mike Moninger. SECOND ROW: Andrea Perryman, Naomi Sundstrom, Art Acosta, Woody Griggs, Charlie Morina, Kathleen Costello, Chris Lester, Bob Kellett. THIRD ROW: Van Stone, Rick Karow, Gary Mahaffey, Rob Ramey, Bud Steinhoff, Tom Toler, Jeff Moler. BACK ROW: Bob Heaton, Sr., Gary Phillips, Rick Farina, Fred Meyer. MISSING FROM THIS PHOTO: Frank Bloechl, Barbara Boucher, Mauri Calvert, Dick Dungan, Al Marion, Art Sokol, Hank Zarnoski.

PRODUCTION CONTROL

FRONT ROW: Shirley Smith, Marie Valence, Tracey Hardy, Rita McCrea, Janet Ellis, Cora Di Virgilio. SECOND ROW: Valerie Fordham, Judy Mewes, Marci Mewes, Gary Petersen, Carolyn Smith, Jeanne Ruth, Carol Waters. BACK ROW: Ken Triplett, Tony Peet, Phil Ingram.

PROCUREMENT
FRONT ROW: Patty Woolums, Paula Baker, Joyce Jarzynski, Chris Hopkins. BACK ROW: Don Parker, Ed Mongillo, Mike Lockwood, John Urban, Dan Toler.

SECURITY & GRAPHIC ARTS
FRONT ROW: Donna Roth, Iris Thompson, Karen Lewis, Millie Baublitz, Bobbie Houtsch, Betty Austill, Cheryl Foster, Verna Lee Frye, Bruce Biggs. SECOND ROW: Jon Wolf, Neil Plume, Jim Horvath, Dennis Potoka, Bill Shaw, Joe Koscielny, Myron Klineschmidt. BACK ROW: Tom Crawford, Mike Rosenthal, Steve Frayer. MISSING FROM THIS PHOTO: Pat Lahmers, Barbara Martin, Louise Ream, Ron Snavely.

QUALITY ASSURANCE

FRONT ROW: Greg Brooks, Tim Palm, Tom Hackett, Sandie Woods, Bill Miller, Baba Marrero, Dave Walker, Bob Van Doninck, Bill Mandakis, George Zimmerman. SECOND ROW: Keith Marsh, John Whitmire, Burt Boss, Maurice Gritzman, Chuck Warren, Art Weinzierl, Terry Honeycutt. BACK ROW: Ray Sola, Robin Speidel, Rob McLendon, Jon Thompson. MISSING FROM THIS PHOTO: Don Cupicha, Alan Davis, Bonnie Lou Iler, Jay Lawton, Luis Sandoval.

QUALITY ASSURANCE

FRONT ROW: Sue Obenauer, Sandra Bacon, Monica Laskowsky, Francis Wilson, Ernestine Ray, Cora DiBello, Doris Roberts, Vivian Owen, Carmen Ireson, Frank Levanti, Camille Gutermuth. SECOND ROW: Pearl Jennings, Kathy Lowe, Sharon Gooch, Wayne Brinton, Larry Foster, Stan Stortz, Jerry Lavelle. BACK ROW: Sam Virts, Larry Dunham, Claude Howard, Jack Routsong. MISSING FROM THIS PHOTO: Linda Altice, Larry Bickford, Kathy Dilks, Shannon Lavelle, Sally Sarnie, Rick Wilson, John Young.

SALES AND CUSTOMER SUPPOR

RT PERSONNEL IN THE FIELD

RECORDERS ENGINEERING

FRONT ROW: Philip Decker, Pat Zieschang, Patricia Holmes, Bev Kitaoka, Preston Cox, Greg Purdom. SECOND ROW: Dave Hart, Ernie Sandoval, Hans Napfel, Ron Connolly, Tom Bray, Bill Davis. BACK ROW: Andy Berecz, Jim Azukas, Paul Coyas, Jack Boehner. MISSING FROM THIS PHOTO: Mart Dismukes, Jim Fulmele, Chuck Jones.

RECORDERS ENGINEERING

FRONT ROW: Ron McDeed, Francis Wozniak, Tom Meloche, Herb Jones. SECOND ROW: Mike Russell, Pete Richardson, Tom McCarthy, Ellis Speicher, Roy Kitaoka. BACK ROW: Scott Zeiner, Dave Harmas, John Traxler, Keith Smith. MISSING FROM THIS PHOTO: Leon Head, Bob Hughen, Bill Miles.

RECORDERS PRODUCT LINE MANAGEMENT & IR MARKETING
FRONT ROW: Ron Johnson, Carlo Mammelli, Debby Wilcox, Chris Govaars, Ruth Erlandson, Carl Aquilino, Dave Clark. SECOND ROW: Jack Long, Royal Bechtold, George Prozzo, Bill Hardman, Don Taylor, Ken Norbrothen. BACK ROW: Bill Zoerner, John Talbot, Larry Wells, Gary Simms. MISSING FROM THIS PHOTO: Steve Hoff, Bill Kessler.

AVIATION RECORDERS MARKETING, PRODUCT MANAGEMENT
& CONFIGURATION MANAGEMENT
FRONT ROW: Carl Palkovich, Janet Cave, Barb Rich, Lori Yoder, Terri Workman, John Kerwin. SECOND ROW: Mike Nastanski, John Dolan, Peggy Huestis, Charlie Grouse, Fran Hinkle, Phillip Wright. BACK ROW: Barry Hawkins, Todd White, Sandy Markman. MISSING FROM THIS PHOTO: Dave Schmidtman, Fred Wheeler.

TELEMETRY RESEARCH & ENGINEERING

FRONT ROW: Carlos Mileham, Guy Ellis, Greg Lambert, Rosa Brown, John Belt, Ty Rigdon. SECOND ROW: Chip Voss, Phil Schram, Robin Johnson, James Hornberger, Mike O'Brien, Robert Williams, Steve Crabtree, Mark Fogelson. THIRD ROW: Phil Van Atta, Jim Robinson, Jim Schadl, Pavlo Bobrek, Hal Roberts, Wayne Sarnie, Pervis Sanders, Dan Cunningham. BACK ROW: Michael Hackathorn, Alex Hamilton, Russ Phillips, Bill Waggener, Jr.. MISSING FROM THIS PHOTO: Jim Fillion, David Payne, Phil Potts, Gene Schroeder, Mike Smith.

TELEMETRY SOFTWARE ENGINEERING

FRONT ROW: Mike Havrilla, Ken Coonce, Laura Deninger, Beth Putnam, Lee Wade, Kathy Bossert, Sue Sutherland, Rhonda Payton, Jon Mather. SECOND ROW: Karl Hahn, Marvin Edgeworth, Paul Weller, Larry Creel, Adam Leonard, Roger Mort, Paul Taylor. BACK ROW: Rick Mitchell, Mike Hutchinson, Jim Massing, Art Hallett. MISSING FROM THIS PHOTO: Mona Lewis, Bobby Feather, Mark Gilmore, Margarida Karahalios, Jeff Kelley, Kevin Lewis.

TELEMETRY CONTRACTS, APPLICATIONS ENGINEERING, PROGRAM MANAGEMENT, EXPORT MARKETING, BUSINESS MANAGEMENT

FRONT ROW: Ron Cheshire, Rosemary Williams, Kathy Thompson, Beth Corbin, Dorothy Watson, Terry Cori, Martha Eaton, Becky Morrison, Earl Studenwalt, Joel Weber. SECOND ROW: Barry Barton, Jerry Belveal, Jerry Aldrich, Jon Brown, Wiley Dunn, Jud Strock. BACK ROW: Arthur Kelley, Thomas Greinke, Tom Pittet, Ken Slezak. MISSING FROM THIS PHOTO: Harry Durrett, Tim Gatton, Jim Graham, Ed Rodgers, Gary Schumacher, Ray Shuford, Bud Thurmond, Jean Tomkinson, Dick Vorce.

TELEMETRY ENGINEERING MANAGER, TELEMETRY HARDWARE

SEATED: Bill Anderson, Don Riker, Fuad Muhammed Ali, Gene Harbert, Len Zeiler, Dick Haase. SECOND ROW: Bill Cox, Art Tackman, Jack Cain, Bharat Parkhani, Chris Lawson, Cindy Cole, Tom Smeed, Mike Meesit, Dale Roedger. THIRD ROW: Dave Lyon, Donald Worthington, Chris Freeberg, Jack Snider, Erwin Lawson, Mike Weed, Gary Snyder, John Keal. BACK ROW: Walt Knopik, Milt Litwiller, Roy Paxton, Dave Johnson. MISSING FROM THIS PHOTO: Bob Buell, Mike Erdahl.

TELEMETRY TECHNICAL PUBLICATIONS
FRONT ROW: Scott Havens, Ann Murray, Carolyn Peet, Susan Taylor, Sue Nurczyk. SECOND ROW: Mark Hanigan, George Emigh, Don Lignore. BACK ROW: Mike Andreotta, John Wood. MISSING FROM THIS PHOTO: Bill MacNeill.

COMPUTATIONAL SERVICES & TELEMETRY MANUFACTURING SUPPORT
FRONT ROW: Carol Byrne, Teresa Fannin, Judy Lamp, Donna Watkins, Michelle Crawford, Karen Critchlow. SECOND ROW: Eric Hogberg, Jan Ammen, Karen Bailey, Fred Paine, Sheri Wilkinson, Ed Domrzalski. BACK ROW: Bill Gibson, Troy Schleicher.

EDC, DRAFTING & DESIGN

FRONT ROW: Ron Zoerner, Darrell Powell, Dorothy Bennett, Patty Lehman, Joan Brothers, Carol Scheele, Ray Wilson, Ken Clair. SECOND ROW: Bill Burchette, Ray Nervina, Ben Robinson, Ron Basham, Jerry Sahagian, Gary Fuller, Paul Waldmann. BACK ROW: Fred Paine, Jay Boardman, Chuck Arterton, Rick Englund. MISSING FROM THIS PHOTO: Elizabeth Byrd, Carroll Cissel, Jerry Kallenbach, Beverly Still.

SIGNAL PROCESSING SYSTEMS ENGINEERING MANAGEMENT & SERVICES

SEATED: Gary Wilson, Mark Hemmerlein, Jim Hess, Bruce Templeton, Kerry Smith, Rich Putt. FIRST ROW: De Wayne Yates, Craig Bolger, Della Brown, Linda Lotz, Nancy Du Plantier, Julie Robinson, Robert Vander Vliet, Mike Witchey. SECOND ROW: Bill Liebe, Truman Prevatt, Pat Goux, Bob Blazek, Nick Ostrye, Graham Hildebrand, Lonn Benson. BACK ROW: Dean Becker, Charlie Hall, Thad McCulloch, Joe Lehmann. MISSING FROM THIS PHOTO: Jacque Critchfield.

SIGNAL PROCESSING SYSTEMS PROGRAMMING, SYSTEMS & ANALYSIS
FRONT ROW: Vic Boucher, Bill Schmitz, Mary Gayle Wright, Yvonne Gurzell, Cheryl Bennett, Chuck Berster, Ray Brown. MIDDLE ROW: Patrick Teagarden, Herb Larrabee, Dick Van Deusen, Gene Farnsworth, Bob Blazek, Mike Wagner, Ralph Portuondo. BACK ROW: Mike Wright, Jim Wachob, Scott Rowe, Rick Mowrey. MISSING FROM THIS PHOTO: Jack Bauder, Frank Doran, Rich Hubbard, Carl Kochmit, Ed Kreyling, Fred Lowery, John Schilling, Stan Smith, Joe West, Steve Wethington.

SIGNAL PROCESSING SYSTEMS U. S. G. SYSTEMS
FRONT ROW: Fritz Rummery, Lee Cain, Gail Jongebloed, Mary Lou Carter, Kathy Mills, Scott Pinsker, Ron Vander Vliet. SECOND ROW: Dick Crete, Ken Knicely, Charles Enoch, Bruce Squires, Gregg Parks, Fred Phillips. BACK ROW: John Jester, Harold Leslie.

SIGNAL PROCESSING SYSTEMS PROGRAM MANAGEMENT & ADMINISTRATION
FRONT ROW: Judy Brewer, Peggy Creadon, Judy Studenwalt, Liz Peters, Corinna Decker, Naomi Fiacable. SECOND ROW: Stuart Ulfers, Tom Fultz, Frank Bost, Dale Munson, John Jorgensen, Skip Brawn. BACK ROW: Richard Rice, Pat Redmond, Tim Taylor, Ellis Burns. MISSING FROM THIS PHOTO: Jon Altenbernd.

CUSTOMER SUPPORT
FRONT ROW: Janice Maus, JoAnn Navitsky, Florence Johnson, Jean Mazza. SECOND ROW: Rick Phillips, Jim Matthews, Don Roberts, Jerry Stubbs, Al Pisacane. MISSING FROM THIS PHOTO: Jim Apperson, Linda Fledderman, Will Long, Bob Petrey, Jim Ratcliffe, Vince Supple.

FINANCE

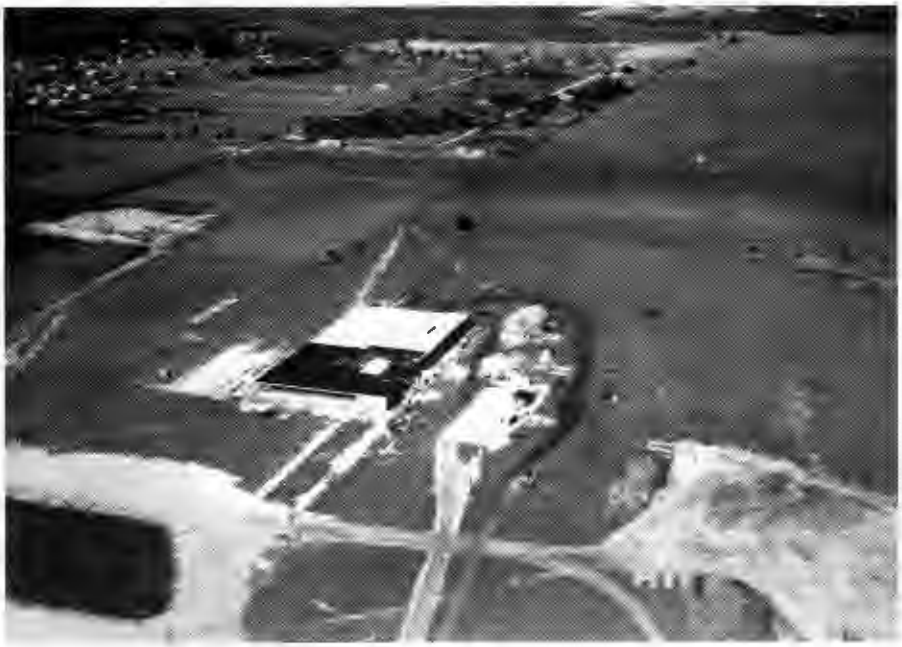
SEATED: Pat Carney, Arlene Klinebriel. FRONT ROW: Cinda Whaley, Ernestine Anderson, Ann Mongillo, Deborah Stilley, Catherine Houle, Deanna Turpin, Kathy Medred, Carolyn Kleist, Teresa Towne. SECOND ROW: Wanda Bass, Mike Harris, Beth Jenkins, Dave Taylor, Karen Peterson, David Owens, Nita Pineas. BACK ROW: Jay Langan, Tom Papst, Ed Annaratone. MISSING FROM THIS PHOTO: Sharon Key.

MANAGEMENT INFORMATION SERVICES

FRONT ROW: Tina Buss, Sandy Basham, Betty Crabtree, Dianne McBroom, Isabel Wetz, Linda Chadwick, Peggy Long, Kathy Boley. MIDDLE ROW: Dick Kissell, Bill Kirby, Dale Dennis, Sandy Hatcher, Shirley Buerge. BACK ROW: Dick Frye, Bob Heaton, Jr., Michael Rhodes, Dale Woodland.

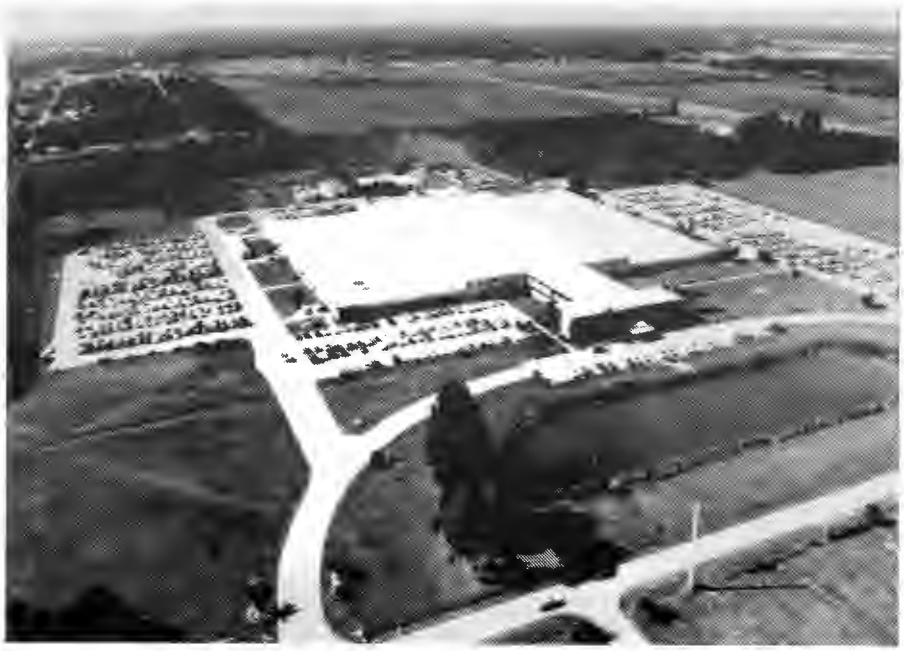
PERSONNEL

FRONT ROW: Cindy Mathews, Alma Sanger, Debbie Graham, Berenice Henderson, Elaine Ellis, Margaret Herbst. SECOND ROW: Thomas Salmon, Rick Greenawalt, Dexter C. Nash. MISSING FROM THIS PHOTO: Freddie Masse.

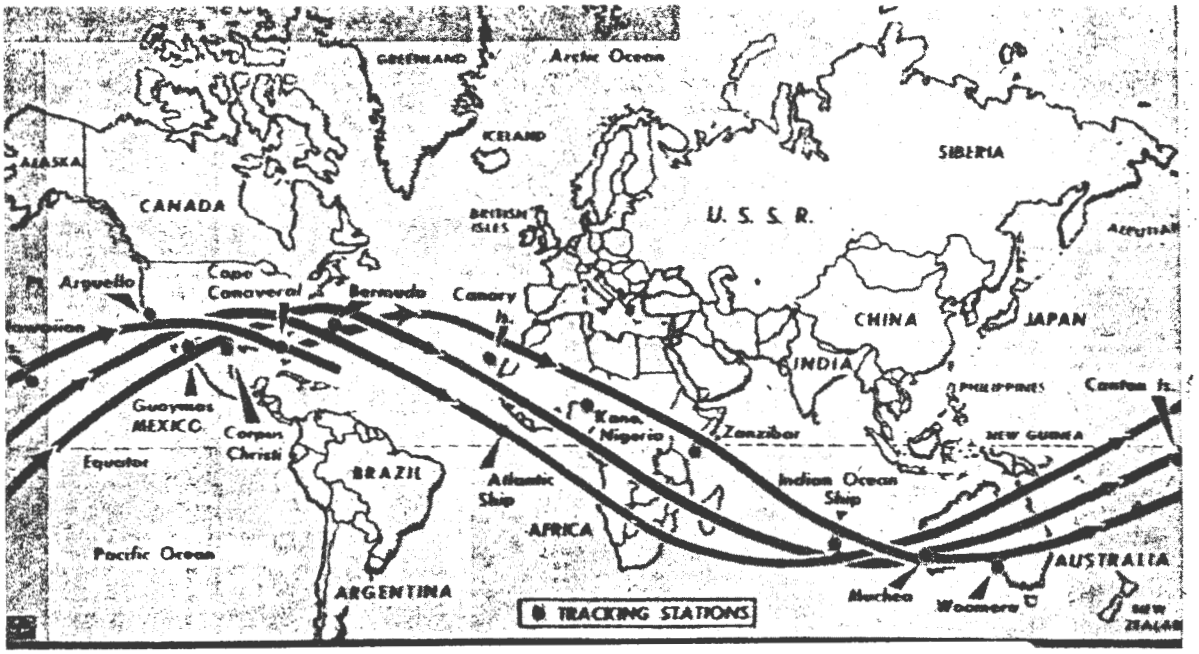


1957

30 Years
Later



30 YEARS OF PROGRESS IN SARASOTA.



AP Wirephoto Map

ORBITAL FLIGHT PLAN — Black lines illustrate the orbital flight paths of the capsule carrying astronaut John H. Glenn Jr. on his flight three times around the globe Tuesday. Small circles locate the tracking stations which maintained contact with the space ship. A Sarasota-made EMR telemetry unit in the space craft relayed information about Glenn and the ship to the ground. There EMR "discriminators" identified the information by the frequency assigned to it.

This Picture Story Highlighted EMR's Contribution to Mercury 6

- **Project Celoscope** – EMR provided more than telemetry oriented efforts for this project, contracted by the Smithsonian Astrophysical Observatory. The Celoscope, housed in the National Aeronautics and Space Administration's (NASA's) Orbiting Astronomical Observatory, provided a wealth of information pertaining to the different star types and astronomical mapping information that was not available from the ground because of interference from the Earth's atmosphere.

- **Dyna-Soar** – This was the most ambitious space venture to date. It started as a joint NASA/US Air Force project to launch a vehicle into space that could return to earth on its own power at a selected site. In principle it was the same as the Space Shuttle of the 1980's. This project, awarded to EMR in 1961, was valued a $7 million, the largest contract awarded to EMR to date.

In addition, EMR also won the Titan Missile Program transmitter business, as Martin contracted us to build the Model 121 quartz line P-band transmitter for use on that program. We then expanded our line to include L-band and S-band transmitters for a customer base that included McDonnell Douglas, Philco Ford, Sandia National Laboratories, and others.

EMR's fortunes seemed to be well on the upswing. The Company had become almost exclusively an aerospace telemetry company with NASA and the US Military family as our primary customers. And aerospace was booming!

DYNA-SOAR BECOMES A DINOSAUR - EXTINCT

The EMR boom because of Dyna-Soar and other aerospace contracts was tremendous. Between 1961 and 1963, building additions doubled the facility to 195,000 square feet. The company also was hiring at a rate so that, by the Summer of 1963, we had over 1600 employees.

But 1963 gave birth to a new axiom: "Those who live by the aerospace contract die by the aerospace contract." In December of 1963, US Secretary of Defense Robert McNamera canceled the Dyna-Soar project with little previous warning. EMR, like all of the other contractors, was suddenly caught with a surplus of employees and no work. Unfortunately, layoffs were the only alternative.

Between the layoffs, transfers to other divisions, and not replacing those employees who retired or quit, EMR's number of employees dropped to approximately 800 by 1966, where it stabilized. Meanwhile, our marketing philosophy was changed dramatically as a result of the Dyna-Soar disaster. The company learned that it needed to diversify its customer base.

EMR DIVERSIFIES BY ADDING AND CHANGING DIVISIONS

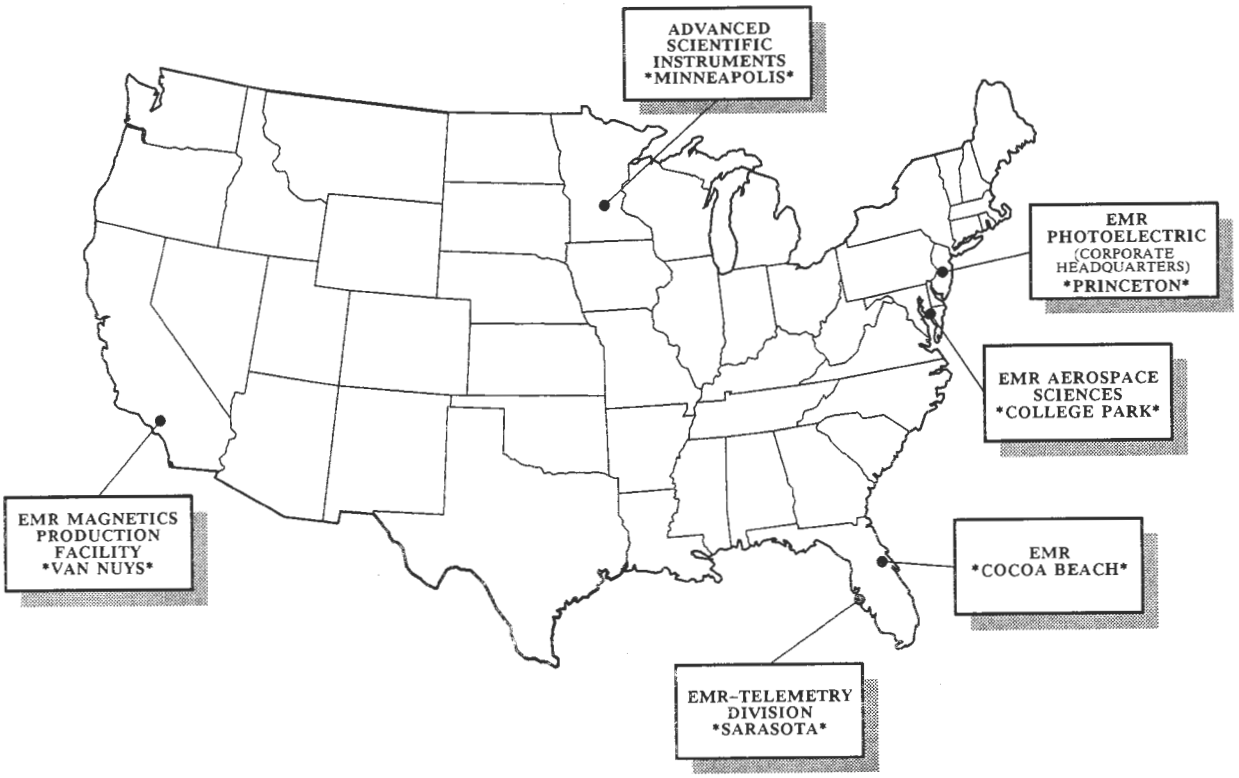
Electro-Mechanical Research diversified more than its customer base in the mid-1960's. Through acquisitions, reorganizations, the opening of new offices, and name changes, the overall corporate picture of the EMR Division changed dramatically:

- **Advanced Scientific Instruments, (ASI) Inc.** of Minneapolis, Minnesota was purchased in 1963. ASI produced the Model 210 Digital Computer and related peripherals. This was a high-speed processor at the time. This evolved to become the "EMR Computer."

- **EMR Photoelectric** evolved when all Sarasota photoelectric activities were moved to the Princeton facility (the old ASCOP) in May 1965. From this point through the 1980's Sarasota and Princeton became almost completely divested of each other's activities.

- **EMR Aerospace Sciences** opened to provide satellite integration support services to our aerospace contracts with NASA's Goddard Space Flight Center in College Park, Maryland. This facility was administratively combined with the EMR Photoelectric Division in the late 1960's and the Maryland office was closed.

- **EMR Cocoa Beach** was a service extension of EMR Sarasota for providing local service to our NASA contracts at the Kennedy Space Center at Cape Canaveral. It was closed down in the late 1960's.



- **EMR Magnetics Production Facility** of Van Nuys California became the supplier for magnetics components for our 200 Series Telemetry products manufactured in Sarasota. The group was originally a small firm, West Coast Products, which was purchased as a wholly owned subsidiary by Schlumberger and placed under EMR in the corporate structure. In the late 1960's, this groups' production operations were moved to Sarasota, and the Van Nuys operations was closed down.

All along, Electro-Mechanical Research had become known as EMR. In fact, EMR was displayed prominently on all of the company's products as the corporate logo. In March 1966, EMR became the official name as well as the logo. Further, the Sarasota facility was renamed the EMR - Telemetry Division. Also in 1966, EMR's corporate headquarters were moved from Sarasota to Princeton, NJ.

By the end of 1966, EMR Sarasota had made great inroads towards diversifying its customer base. We had made ventures into commercial aviation (British Trident and Boeing 707), and also into the nuclear power industry with telemetry systems for monitoring nuclear devices. Nevertheless, a substantial portion of our customer base remained with the military family and with NASA.

FIRST PULSE PUBLISHED

On June 24, 1966, EMR published the first issue of **Pulse**, the company's in-house newsletter. This publication provides information pertaining to the latest in ongoing projects and negotiations, and interesting items of information on our employees, both at work and at play. The early **Pulse** issues were biweekly. Later, the issue evolved to expanded contents, but on a monthly basis. Pictured on the next page is the front cover of the first **Pulse** issue.

PULSE

EMR

The EMR Telemetry Division News

Sarasota, Florida

Vol. 1, No. 1 May 13, 1966

WHAT IS PULSE?

"Pulse" is a new, bi-weekly company newspaper for EMR's Telemetry Division employees, including those of you in the Division's ten field sales offices.

How will it affect you? What are its objectives?

Its purpose is to help keep you informed about matters affecting you and your job. In "Pulse," managers will communicate their philosophies, ideas, opinions -- their points of view.

In "Pulse" will be information about the company -- its plans and progress -- and its problems, and the individuals who make up our Division.

"Pulse" will be published every two weeks. On every other Friday beginning May 13, as you go home, you may obtain your copy at the door. "Pulse" will be sent through regular mail to the field sales offices.

We invite your comments. Letters to the editor are welcome, and every effort will be made to incorporate your views and suggestions into our news coverage.

EBERLY CONDUCTS QUARTERLY BUSINESS REVIEW

At a meeting of all Telemetry Division Professional and Managerial employees last week, David A. Eberly reviewed past performance and presented plans for the year immediately ahead.

Mr. Eberly's comments came in the first quarterly meeting scheduled for review of Division business operations.

Mr. Eberly described the three types of business in which the Division is princi-

Front Page of First Pulse, Published June 1966

CULMINATION OF SUCCESSFUL AEROSPACE PROJECTS

Not all aerospace projects ended as did the Dyna-Soar. EMR contributed to many successful space-oriented projects that were tremendous successes. Two of the most important NASA successes of the mid-1960's were the Surveyor Spacecraft soft landing on the moon and the successful launch and subsequent data collection from Project Celoscope.

The Surveyor Spacecraft, which landed on the moon on June 2, 1966, provided lunar information that was essential to the planned Apollo Man on the Moon program. The information was sent back to earth via EMR equipment.

For the Surveyor Spacecraft program, EMR provided both Model 167 Discriminators and Model 185 PCM Decommutators. The Model 167's went to the moon with the spacecraft. During the mission, they sent back PCM data pertaining to the mission's progress. The Model 185's, situated at tracking stations throughout the world, received and decommutated the data from the craft.

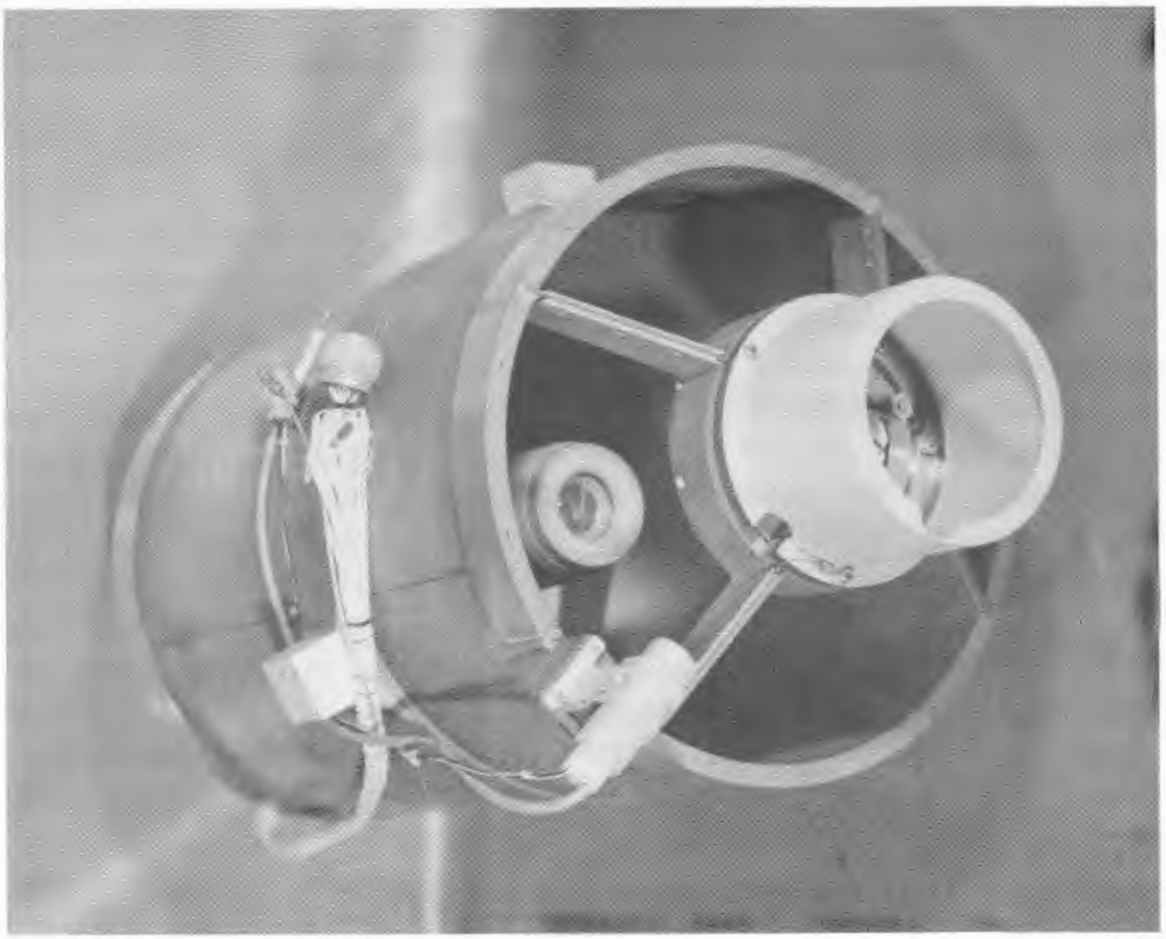
For Project Celoscope, EMR not only provided the ground station and airborne telemetry, but also provided for acquisition and integration of the four camera-telescope devices that were to be used for collection of the astronomy data. These devices had such strict tolerance requirements that it took the manufacturer over 100 attempts to come up with four telescope lenses that met the requirements! On the next page, you can see one of those four devices mounted within its casing.

By the time the Orbiting Solar Observatory (which Project Celoscope was a part) was launched in 1968, the Smithsonian Astrophysical Observatory has dropped the operational requirements of Project Celoscope to two weeks after launch to consider the mission a success. In other words, if Celoscope could remain operational for collecting data for two weeks, the Observatory group would have been satisfied.

Two years later, Project Celoscope was still faithfully churning out data from three of the four cameras. They collected so much astronomical data from this project that it could not be processed quickly enough. They finally had to turn the project off!

Also during this period, the transmitter business continued to grow. Martin contracted EMR for a special adaptation of the Model 3620 S-band 20W Transmitter to function under extreme temperature, vibration, and shock. These components were constructed in support of the Titan II Program.

We also built the Model 3675 L-band 50W Transmitter and the Model 3670 L-band 20W Transmitter during this time frame. These were used primarily in flight test procedures.



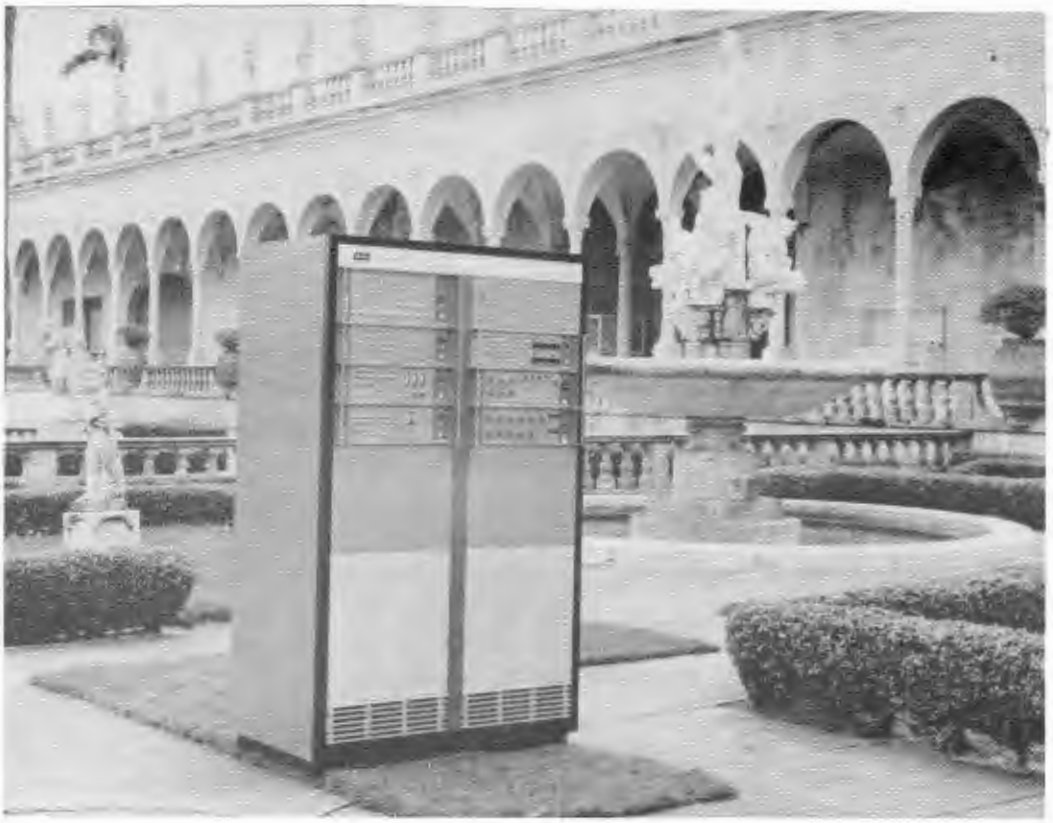
Project Celoscope Telescope/Camera in Casing

EMR BRANCHES INTO COMPUTER/TELEMETRY SYSTEMS - C5A

In December of 1966, EMR was awarded a contract to develop and implement the Automatic Reduction Station for providing flight testing of Lockheed Georgia's C5A Galaxy Cargo Transport - the largest airplane in the world. EMR's System was required to process data for such parameters as pressure, temperature, vibration, strain, and others from more than 1000 sources within the C5A.

To perform these tasks, EMR developed a system-approach that encompassed the EMR 2700 Series Telemetry equipment, an EMR 6040 High-Speed Digital Computer (made at our Minneapolis Division) and TELEVENT-11 telemetry programming software.

This 1967-1968 project resulted in our first system that provided what we now refer to as the Telemetry Front End (TFE) and a Computer Subsystem. This is also the first Telemetry System ever to provide for processing and displaying telemetry data while the mission (C5A flight) was in process. In our industry, this was a breakthrough of gigantic proportions!



Our 2700 Series Telemetry Equipment, Photographed at the Ringling Museum Grounds – Part of the C5A System

ANOTHER NAME CHANGE FOR EMR

In the 1960's, Schlumberger continued to diversify its position in the electronics field through expansion and acquisition of other companies. One of the Schlumberger acquisitions was Weston Instruments, which had its headquarters in Newark, New Jersey and a division (Boonshaft and Fuchs) in Hatboro, Pennsylvania. Weston Instruments was the dominant supplier at the time of laboratory-grade and commercial-grade meters.

In May of 1968, Schlumberger reorganized its subsidiaries such that EMR became one of three divisions of the Weston Instruments Division of Schlumberger. Further, Weston's Hatboro division became a division of EMR Sarasota. Confusing, isn't it?

Functionally, this reorganization had no effect on Sarasota operations. By the way, during this time period, two of the EMR employee "niceties" were introduced: 1. The company began providing automatic deposit of employee checks to their selected banks, and, 2. The on-site EMR Credit Union opened.

SOME KEY 1970's PROJECTS

During the first half of the 1970's, EMR quietly continued to develop and produce telemetry products and systems for a wide variety of applications. In turn, this continued to widen the company's customer base. Some of the key projects completed during this period include the following:

- **TIROS-M** - This was one of our first ventures into telemetry systems designed to process weather data. We completed this project in 1969 for the Environmental Science Services Administration (ESSA) of the US Department of Commerce. The System included two digital data handling systems which combined EMR-Sarasota TFE equipment with EMR-Minneapolis computer equipment.

- **Apollo** - Although we were not the dominant telemetry supplier for NASA's Apollo program, we did supply ground telemetry systems and airborne telemetry transmitters on the Apollo booster rockets. Apollo is, of course, the space program that culminated with the USA sending a man to the moon and back safely to Earth.

- **L-1011** - Lockheed California contracted with EMR to pro vide them a sophisticated telemetry system, similar to the one delivered in 1968 for the C5A, that would be used to test Lockheed's newest commercial airplane, the L-1011 TriStar. In addition to the Ground Station Processing System, Lockheed also contracted for EMR to develop a "quick-look" van-mounted mobile telemetry station and a "quick-look" FM substation that could be easily set up at a Lockheed-selected site. Quick-look stations are designed to give "on-the-spot" real time information on an experiment as it is happening.

- **AIDAS** - This system, whose full name is Advanced Instrumentation and Data Analysis System, collected and processed test data from US Army helicopter flights. The system was a full-complement EMR telemetry system, including airborne and ground station telemetry and EMR computer processing. This contract was awarded in 1969. The System was installed in September 1970.

- **Cardiac Telemetry System** - This system was developed in conjunction with General Electric in 1970 for Sarasota Memorial Hospital and the South Trail Fire Department of Sarasota. The system provides information on a cardiac patient to the physician at Sarasota Memorial Hospital while the patient is enroute to the hospital in the ambulance. This speeds up emergency response to a cardiac condition.

- **Orbiting Solar Observatory** - EMR built the highly complex White Light Coronagraph, which made observations of the sun's corona from the Orbiting Solar Observatory, launched in September 1971. Under contract with the Naval Research Laboratory, EMR designed, built, and tested sophisticated television and electronic equipment which helped make digi tal television observations of the sun. EMR also provided the NRL with both the ground based support equipment and the PCM telemetry equipment used on board the satellite.

- **Upstage Transmitter** - This miniature S-band 2W solid state unit marked EMR's final entry in the transmitter market. The unit, built for McDonnell Douglas, was a technical success, but not a financial one.

Rutherford's Indianapolis 500 Race Car

- **Skylab** – First in 1968 for Saturn V/Apollo and then as a follow-up in 1970, EMR was awarded contracts to develop PCM Systems for monitoring and encoding measurements of internal and external spacecraft environments and on-board experiments for transmission back to earth. The second system was part of the NASA Skylab, a manned orbiting workshop that was launched by NASA in 1973.

- **Vehicle Test System** – This system was designed by EMR and introduced in 1970 – 1971 to the automotive industry. These systems provided assistance to the automobile industry in complying with government safety regulations. The systems provide information on items such as crash and impact testing of air bags, seat belts and other safety devices, and evaluation of tire, wheel and brake performance. For heavy machinery, the equipment supplies load and vibration data.

- **Water Quality Monitoring System** – This system provides for rapid, around-the-clock monitoring of a body of water for pollution. These sensors at various remote sites (bodies of water) can then be monitored from a central analysis station. One of these systems was installed by Sarasota County.

- **SWS** – In 1973, Schlumberger Well Services (SWS), who was our original parent company, became one of our customers. EMR began developing and producing telemetry monitoring equipment for well digging operations. If you'll remember, this was the beginning of the "energy crisis," and oil and gas exploration were ongoing at a furious pace! Our plant continues to build equipment and systems for SWS on an as-needed basis to this day.

- **Johnny Rutherford** – Does that name sound familiar sports fans? He was the winner of the 1974 Indianapolis 500. EMR designed and built an on-board telemetry package for Rutherford's Indy car called the Laboratory on Wheels. The system monitors various on-vehicle data items, including temperature, pressure, gas level, etc. and provides readouts at the pit stop. Thus Johnny could concentrate on more important things, like driving!

- **Military Aircraft** – Our telemetry systems contributed to the successes of the F-14 (1971), the F-15 (1972), and the F-16 and B-1 Bomber (1974).

SCHLUMBERGER ACQUIRES SANGAMO . . . ANOTHER NAME CHANGE!

In 1975, Schlumberger acquired the Sangamo Electric Company of Springfield, Illinois. A year later, Schlumberger administratively combined Sangamo with the Weston Instruments Divisions. Thus, Sangamo Weston was born, and the Sarasota Facility became the EMR Division of Sangamo Weston. The Illinois Facility became the Data Recorders Division of Sangamo Weston.

But that's just the beginning of our story. In 1978, Schlumberger closed the doors of the Illinois Facility and moved the Data Recorders Division to Sarasota. So now we had two divisions under one roof! Now is an appropriate time to fill you in on the Sangamo story:

In the beginning, around the turn of the 20th Century, Springfield's Illinois Watch Company was in the business of manufacturing watches. And as time passed, the Illinois Watch Company became the Sangamo Electric Company.

Sangamo's product line evolved and expanded to include other pro duct lines, primarily watt hour meters. When the US became involved in World War II, the production of watt hour meters diminished to zero in favor of more necessary

defense-oriented products. Sangamo became the US's major developer and producer of surface ship sonar and sonar training devices. This leadership position in sonar lasted well over 20 years.

It was Sangamo's sonar work and a requirement to store and reproduce realistic replicas of the waterborne acoustic noise and target energy emanating from the sea that led to the company's entry into the instrumentation tape recorder business. In the mid 1950's, Sangamo developed Sonar Memory Equipment (SME) which required the use of a magnetic tape storage "ping to ping" correlator to improve sonar performance.

The only recorder company willing to produce the 56-channel recorder/ reproducer required for this project was a small company in New Cannen Connecticut called the DGC Hare Company. The logo on all DGC Hare recorders was a "Bugs Bunny" like image of a hare with a very mischievous look.

As the SME and other recorder developments progressed, the ties between DGC Hare and Sangamo Electric grew closer. Eventually, Sangamo acquired the assets of DGC Hare. Included in this acquisition were many significant patents and hardware designs in the instrument tape recorder area. Thus Sangamo's Data Recorders Division was born!

THE SANGAMO PRODUCT LINE

While the SME itself was not a huge commercial success, it did lead to the development of Performance Monitoring Equipment (PME). Like SME, it captured the sonar stave and other signals and background noises emanating from the sea. However, unlike PME, SME could be used for post-operation analysis, training, and research and development.

Magnetic tapes of signatures/echoes of friendly as well as unfriendly submarines and ships in a variety of sea conditions could be selectively used in the laboratories to improve detection, classification, and tracking techniques. Over 120 recorders were produced and installed on US Navy destroyers, laboratories, and Naval training facilities.

In addition to the sonar application oriented work on recorders, a commercial recorder group was formed that was destined to produce some of the most advanced recorders of the era. Of the many recorders developed and manufactured during the early period, one type deserves particular mention; the portable coaxial reel recorder/reproducer. In those early days, Sangamo took the lead in marketing to become the world leader in coaxial reel portable machines.

In the late 1950's, the Recorder Group worked with the US Naval Research Laboratory to develop a special recorder for data acquisition and reduction - the AN/FSH-7. This device was quite

impressive, as described by one of people who worked on it:

> *"It was a sight to behold, imposingly standing higher that the tallest person, in its Navy gray steel enclosure with silvered mesh gaskets and cable shields, RFI glass and all the expensive looking hardware used with military equipment of the day. Dual capstans driven by low mass servo systems and a humungas tape storage basket provided record, reproduce and correlation capability. It's performance exceeded all expectations (except those of the people who conceived, designed and manufactured it) and over 150 recorders were shipped in the next few years. To this day, it is still the largest order of recorders, in terms of quantity, ever obtained by the recorder group."*

In the 1960's, Sangamo developed and marketed the SABRE Series of instrumentation recorders. SABRE stood for Sangamo All Band Recorder. Models marked range from the SABRE II through the SABRE XII. Later, when the division went through (still another) name change, the SABRE logo was dropped in favor for simply "Model", and the Roman numerals were replaced by their Arabic equivalents. Thus, the SABRE III became the Model 3.

THE THIRD DECADE BEGINS

Business for the EMR Division and the Data Recorders Division of Sangamo Weston continued to pick up and diversify as Sarasota's Facility entered its third decade. In 1977, the EMR Division ventured into the data acquisition market with the design and construction of a data acquisition and computer analysis system for General Motors. The system was an invaluable research instrument for GM's research into ways of preventing damage to automobiles from excessive shock and vibration during railroad shipment.

In 1977, the Telemetry Group bid and won a contract to place a sophisticated Capital Control System in Florida's new State Capital Building. This single system provided single-point control of electricity, water, fire protection, and security instruments.

Another contract that was a significant indicator of EMR's diversification was one with the US Energy Research and Development Administration (ERDA), the predecessor to today's US Department of Energy (DOE). EMR built a mobile van equipped with telemetry equipment for testing various types of experimental windmills for use as power sources.

As the company celebrated its 20th Anniversary in Sarasota, it could look back over a solid, diversified history. As a company, EMR had risen up from the dark days of Dyna-Soar. It had developed a diversified customer base, and now with the addition of the Sangamo Tape

Recorders, and the research and development ventures into commercial telemetry applications, a diversified pro duct line.

Still other contracts with the Federal Aviation Administration and General Electric led EMR to develop a windshear detection system for the nation's airports, and a monitoring system for the testing of GE steam turbine generators. EMR was also branching into the weather business, a market with a sunny potential in the late 1970's!

WEATHER DATA SYSTEMS DIVISION

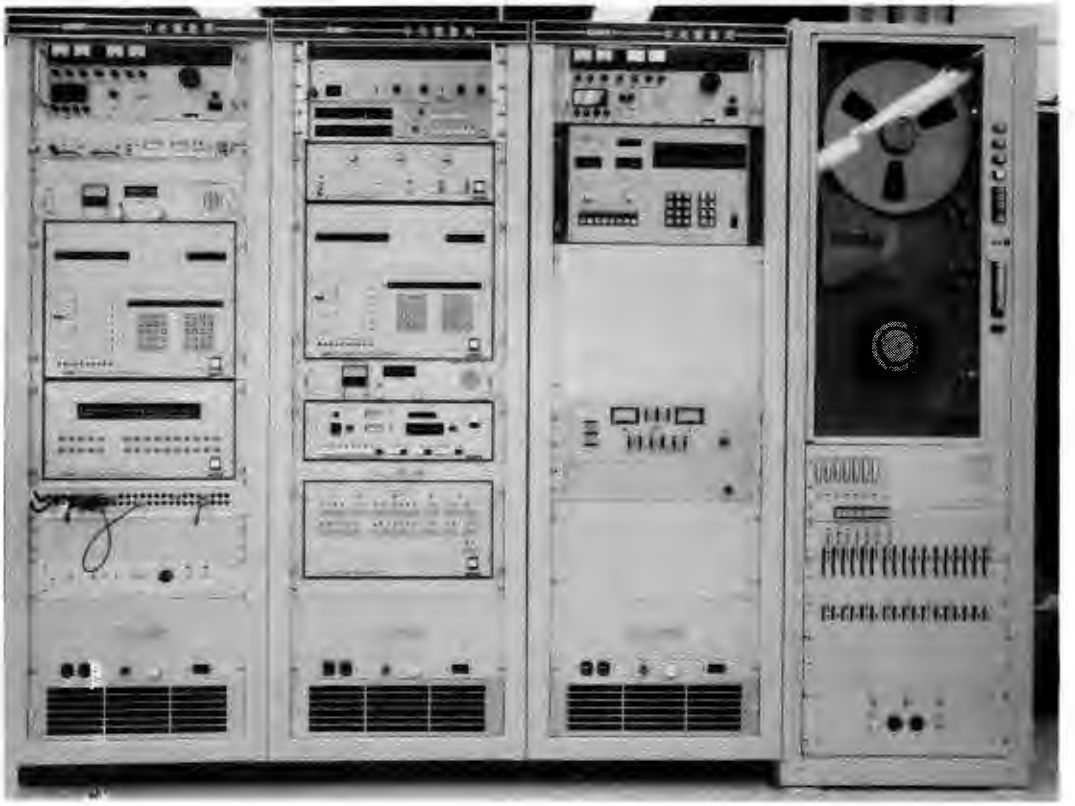
Because of the expected volume of business in weather satellite telemetry, a separate division was formed to handle and develop both the weather telemetry business and data acquisition business. For a while, going into the 1980's, it appeared that the business would take hold to be self supporting. We shipped telemetry weather systems to locations all over the world, including the one shown on the next page along with a weather photograph attained from the system.

The weather/data acquisition business went stagnant, and in 1979, a corporate decision was made to end the division. Unfortunately, this led to some employee layoffs.

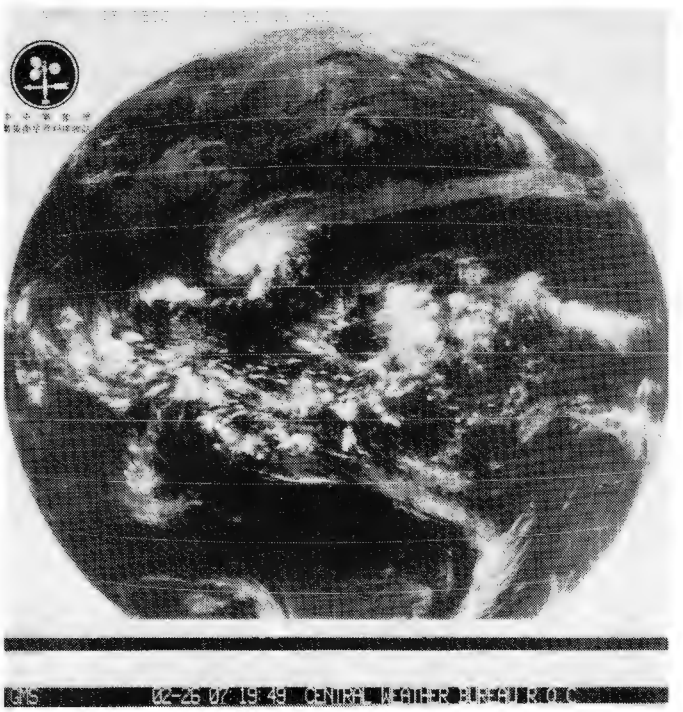
ENTER THE NAME FAIRCHILD

As you might have guessed, it was getting to be time for another name change at the Sarasota Facility. However, this one has a new twist. First off, in 1979, Schlumberger acquired the Fairchild Camera and Instruments Company. This acquisition included the giant Fairchild Semiconductor Division in northern California as well as several other divisions.

Schlumberger combined the Weston Divisions and the Fairchild Divisions that catered to certain types of defense government contracts to form a new Fairchild Weston Division. At this time, Sangamo Weston's EMR Division and Instrumentation Recorders Group were not effected.



This Weather Telemetry System Was Installed in Taiwan. . . . .



One of the Weather Photos; Note the Typhoon in Taiwan's Vicinity

However, the Sarasota Plant management, trying to respond positively to the loss of the weather systems business, opened a small Division at the Sarasota Plant, but under Fairchild Weston management. This group was the beginnings of the Signal Processing Systems Division.

Also during the 1979–1980 timeframe, the Instrumentation Recorders Group went after a new segment of the instrumentation recorders business when they introduced a line of airborne, on–board recorders. These recorders can withstand extreme environments such as temperature extremes, vibration and shock.

EMR DROPPED FROM COMPANY NAME

Effective June 1, 1980, another reorganization took place that merged the EMR Division and the Instrumentation Recorders division into the Data Systems Division of Sangamo Weston. The fledgling Fairchild Weston Systems Group continued to reside at the Sarasota Plant as an autonomous unit.

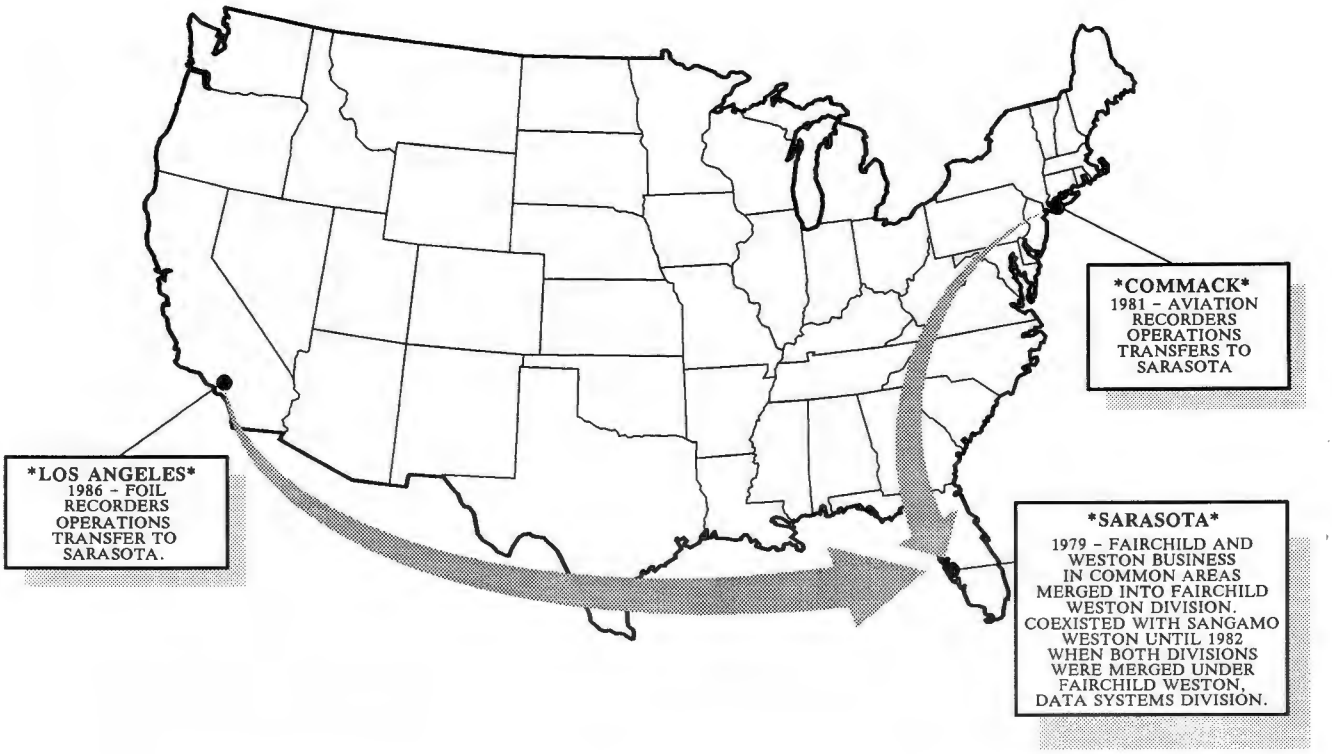
For the first time, EMR was no longer a part of the Sarasota Plant name. However, to this day, we still manufacture and sell our telemetry products and systems under the EMR logo. Just the name EMR still commands the respect of quality in the telemetry marketplace!

AVIATION RECORDERS ADDED TO PRODUCT LINE

In 1981, Schlumberger transferred the Fairchild Industrial Products' Aviation Recorders product line to Sarasota from the Commack, New York Facility. These so–called "black boxes" are actually bright orange. They have been instrumental in aviation disaster investigations.

Both the digital flight recorders, and the cockpit voice recorders (manufactured at the time by Fairchild's Los Angeles Facility) are designed to survive a plane disaster, such as a crash, intact. During a flight, the voice recorder records continuously transmissions to/from the pilot. The digital flight recorders record such information as airplane instrument readings.

In 1986, the Los Angeles cockpit recorder operations were also moved to the Sarasota Facility. Today, we have a lion's share of the world market in these two product lines.



Aviation Recorders; These "Black Boxes" Are Actually Orange

WOULD YOU BELIEVE A NEW NAME?

On August 1, 1982, the Data Systems Division of Sangamo Weston and the Signal Processing Systems (SPS) Group of Fairchild Weston Systems were consolidated as the Data Systems Division of Fairchild Weston Systems, Inc. (FWSI). Like EMR before him, Sangamo was no longer part of the Sarasota Plant's name. Our division now reported to the Fairchild Weston Systems Inc head quarters in Syosset, New York.

This organizational change provided for the Sarasota Plant to be part of an American-based subsidiary. In turn, this opened up new business opportunities for the company.

So what sort of business have we been pursuing over the last five years? The Instrumentation Recorders Group continues to expand its market with versatile and reliable products as the Model 80 and the Model 85. More and more Telemetry Systems include FWSI Instrumentation Recorders for both digital and analog applications.

As mentioned in the introduction, the FAA is expanding requirements for both digital flight recorders and cockpit voice recorders. Our business in this area continues to expand dramatically.

The Telemetry Group continues to provide systems for a wide range of applications for a customer base that expands the globe. We developed a telemetry system for testing of the Space Shuttle Program. Our business relationship with the Military family, NASA, and the FAA is ongoing as evidenced by contracts such as McClellan, AERO, Hill, and White Sands Missile Range.

We are developing exciting new product lines such as the 8000 Series, the 8470, the 8715, and the RTTADDS Family of software. Our SPS Group continues to grow and expand at a dramatic rate.

The Team Involvement Circles employee involvement program was started up. In just a few short years, employee suggested and implemented programs have resulted in significant improvements in the way we do things in all areas from manufacturing to engineering to technical publications. In short, these are exciting days at Fairchild Weston Systems, Inc.

A ROSE IS A ROSE. . .

Effective January of 1987, Schlumberger reorganized its Fairchild house. Guess what??? We have a new name. The Data Systems Division of Sarasota has been merged with the Syosset Division to form the new Communications Systems Group of Fairchild Weston Systems, Inc. To paraphrase that song, "the title may change, but our song of employee pride in quality products goes on and on. . .

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