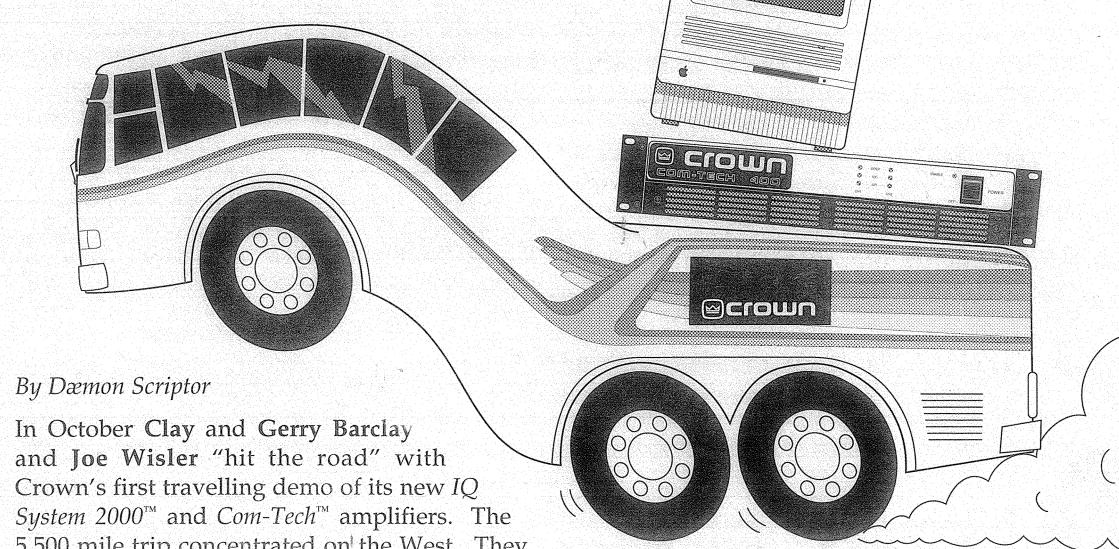


## IQ/Com-Tech TOUR

INNOVATION AND QUALITY "HIT THE ROAD"



In January  
we focus on  
Quality at  
Crown  
International



By Daemon Scriptor

In October Clay and Gerry Barclay and Joe Wisler "hit the road" with Crown's first travelling demo of its new *IQ System 2000™* and *Com-Tech™* amplifiers. The 5,500 mile trip concentrated on the West. They stopped in Denver, Salt Lake City, Reno, San Francisco, Los Angeles, San Diego, and Las Vegas. A total of 15 stops were made in just nine days.

In San Diego, they were able to give five demos to various groups of engineers and technicians of the U.S. Navy. The Navy is in the process of upgrading its aging audio technology and is very excited by the quality and cost-efficiency of Crown amplifiers.

Three of our western reps assisted with the tour: Terry Richardson of Pro Tech Marketing (Colorado and Utah), Greg Hockman of Seabridge Audio (California), and John Frigaard of JND (San Francisco). Both the reps and the dealers

who participated welcomed the demos and were impressed with the time and effort given to them.

An Apple Macintosh computer and eight CT-200 amplifiers were used to demo the *IQ System 2000*. Both amplifier "null tests" and listening tests were conducted to demonstrate the superior fidelity of *Com-Tech* amplifiers in direct comparison with the amplifiers of several competitors. In addition, technical assistance was given to the dealers of two custom *Com-Tech* installations.

The trip was a tremendous success and will help our western reps and dealers better represent our products.



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## A Man of Quality

By Beryl Moore

Clarence Moore, co-founder of Crown International, Inc., believed there was only one way to do something—and that was better than it had ever been done before. As a school teacher he encouraged his students to do only their very best. As a pastor he was determined that the

church would be all God had made it to be.

When building his first transmitter, he meticulously worked all the detail out on paper first, making sure his design would work. In building his first tape recorder, he had a *Zero Defects* approach. His goal was to get rid of the "wow" sound. And he did. He approached quality by asking himself, "What does God want me to do?" Once he knew the answer, he would fulfill those requirements. Clarence believed God expected only his best, and quality was the result.





# How Mics are Quality Tested

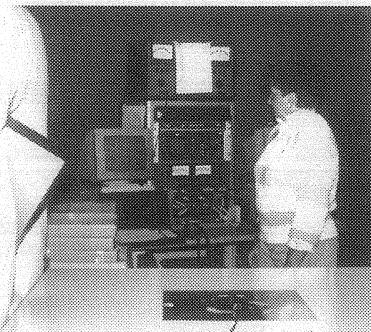
By Bruce Bartlett

Before it goes out the door, every single Crown microphone is tested to meet demanding quality standards. This testing occurs in three stages: in the Quality Assurance Department, in the Production sound room, and in Audit checks of packaged microphones.

Technicians in Quality Assurance test all incoming mic capsules to insure that their performance is up to standard. These people include Supervisor Jim Downs, Mable Healey, Fran Payne, Donna Baker, and Julie Nelson. Using MikeTest software written by Craig Schroeder of Engineering, the testers measure the frequency response and sensitivity of each capsule and compare it to a lab-standard capsule. Those capsules not meeting the performance envelope are rejected.

In addition, fabricated parts for microphones are inspected for cosmetic appearance, paint finish, and dimensions. The circuit boards that go into microphones are tested for correct electrical performance.

After the pre-tested capsules and electronics are installed in microphones, each finished micro-



Ann Schrock tests a mic.

## The Last Crown Babies Born in 1989!



Geoffrey Scott Moore  
Son of Kathy and Richard.

Born December 14, 1989  
8 lbs, 12 oz.  
22 in. long

Geoffrey has the distinction of being:

The first son of  
the first son of  
the first son of  
the first son of  
the first son.

(That's five generations!!)



Iris Anne Bock  
Daughter of Sue and Tim.

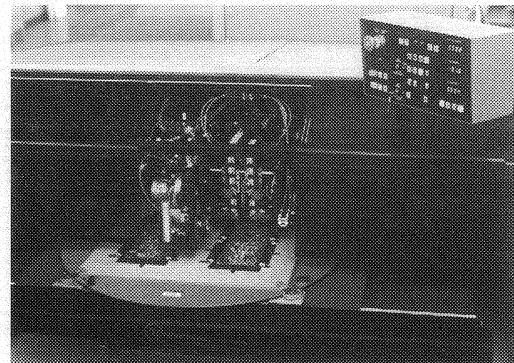
Born December 22, 1989  
9 lbs, 4 oz.  
22 1/2 in. long

# A New Axial Lead Component Inserter is Delivered

By Richard Putz

There is a new arrival at Crown in the Module Assembly Department. It was born 11-3-89 and weighed in at 2 tons. The manufacturer is Universal Instruments Corporation.

It replaces the ailing Amistar inserter and should give a three-fold increase in our ability to insert



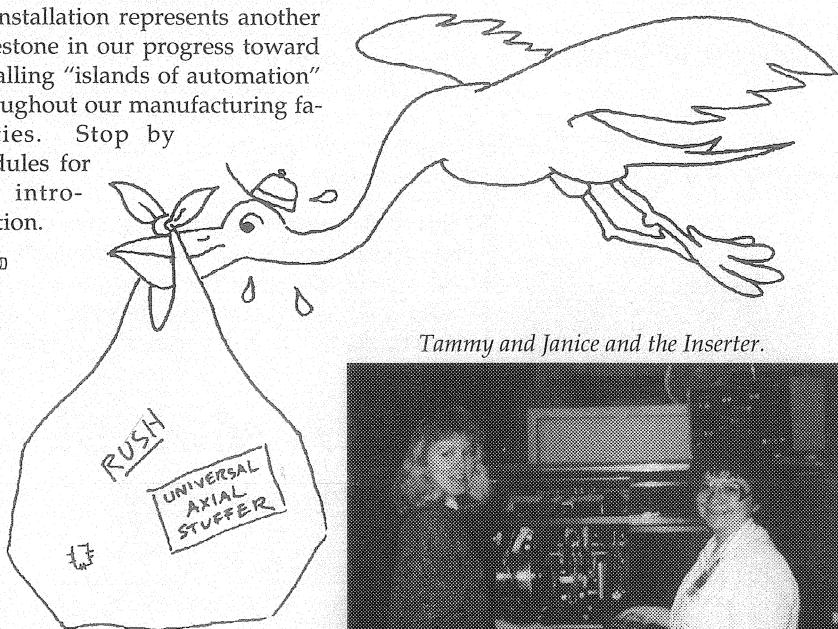
phone is tested in the Production sound room. Again, the MikeTest software is used to verify correct frequency response, sensitivity, and off-axis attenuation (in directional microphones). For some mic models, the MikeTest program suggests modifications to the microphone to bring it within specifications. This highly skilled job is performed by Linda Koppernagel, Diana Long, Cheryl Crow, Ann Schrock, and Sue Ramsby, supervised by Helen Cosby.

Finally, the completely tested mics are packaged for the customer. Every microphone then goes through Audit, where it is removed from its packaging, talk-tested and visually inspected. Audit is a large group of people headed by Jim Downs.

Because of this quality control, our customers can be confident that every Crown microphone looks and sounds as good as advertised.

axial-leaded components. Tammy Grosse and Janice Pletcher were learning to program a board at the time the picture (opposite) was taken. Notice their happy smiles. They have been anticipating this inserter for about two years.

Its installation represents another milestone in our progress toward installing "islands of automation" throughout our manufacturing facilities. Stop by Modules for an introduction.

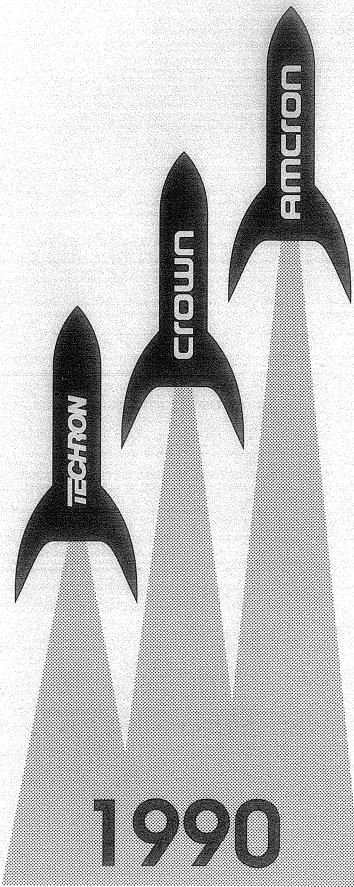


Tammy and Janice and the Inserter.



# Market Outlook 1990

By Dave McLaughlin



Whatever else it produces, 1990 will almost certainly produce a few surprising twists in Crown International business plans. For the last several years the economy has been puzzling economists, politicians, astrologers, and others who attempt to make a living guessing what might happen next.

Parts of the U.S. economy are already in recession, including most of New England and the automotive industry. Other parts of the economy continue to show some signs of strength, including many service industries, aircraft, and computers. What has been happening in the economy recently has been referred to as a "soft landing," in which the economy will slow down in growth, but will not actually begin to shrink. In an official recession, the economy not only slows down but also gets smaller for a few quarters. Most people, willing to make a guess in public, now see the economy remaining slow, and maybe going backwards, for the first half of 1990, and then beginning to recover in the second half of the year. Around the world, the nations which make up our trading partners are also expecting to get through 1990 without much economic shifting up or down.

For us this is not necessarily good news or bad news. We can confidently suppose that a slow

economy will produce less sales for us than would a booming economy. But we still have only a very general idea of exactly how many less MT-1200's and PCC-160's and 8607's the slowdown will mean. A lot of other factors, like competitive companies and new product developments, seem to affect our sales more than does the overall state of the economy.

In 1989, when we predicted very little growth for the Amcron and Crown Divisions, they grew 10-15%. Techron, which we expected to grow substantially, instead stayed flat. Corporate growth for the year should come in at 6-7%. For 1990, we are expecting that the Crown and Amcron growth will be much less due to the uncertain economy and increasing competition. At the same time, we are expecting Techron to resume a stronger growth pattern based on strong early orders for MRI product. This should produce overall corporate growth in the range of 10-15%.

There will be a strong emphasis on improving profitability in each division, along with aggressive new product planning. An integral part of 1990 and beyond will be the continued development of Crown International's corporate Quality Improvement Program. Every part of our business needs to get better constantly in order to support continued growth and improvement of profitability.



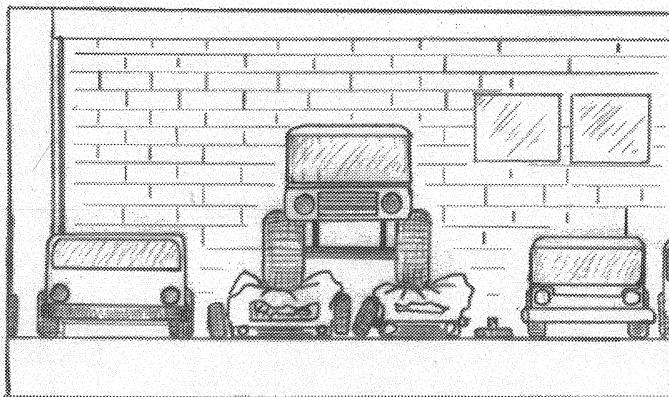
## Cartoon Contest

Win a free Crown T-shirt; enter the Crown Crier Cartoon Contest. Each month a new winner will be selected. All cartoons should be drawn in black ink on white paper (no color or pencil drawings). Please send your cartoons along with your name to the editor, Libby Marshall.

## And the Cartoon Contest Winner is...

Greg Donner

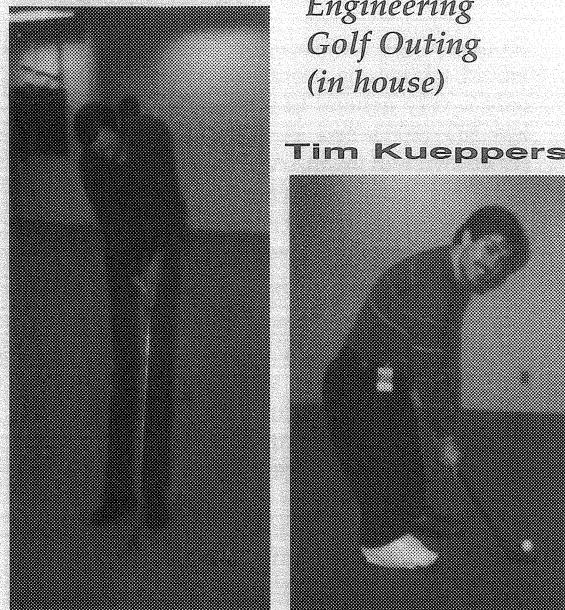
(who has a novel solution to parking at Crown)



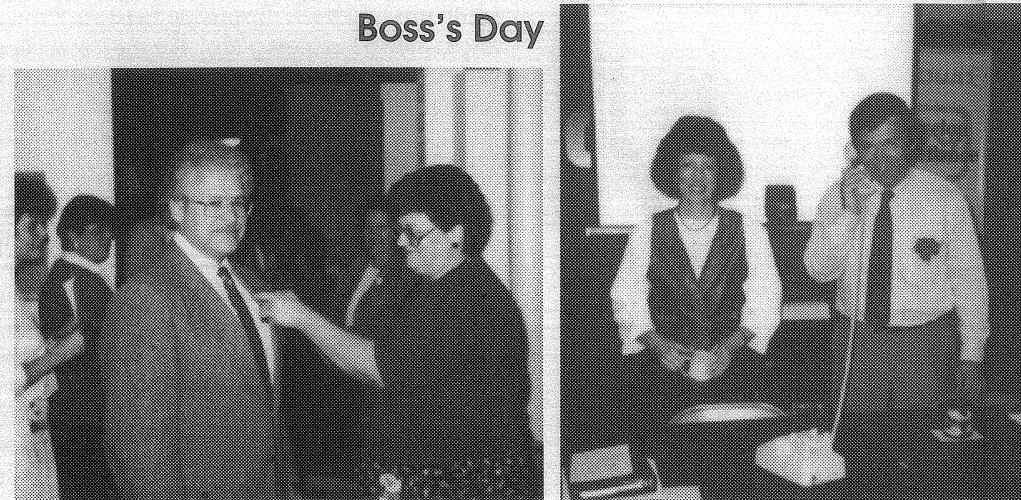
The final solution.

Craig Schroeder

Engineering  
Golf Outing  
(in house)



Tim Kueppers



Boss's Day

Sheryl to Dave, "Give me a raise and I won't stick this pin any deeper!"

Team of Two.  
Helen Blackwood & Mike Moon



Rhonda Chapman will type anything—even a pre-QES letter scratched by Don Florea, QA mgr.

Gloria Baloy-Curry Tammie Putz Rhonda Jones Bobbie Roll Stacey Prather Bob Price Robert Smith



Will the real mummy please grunt or something!



Which Mitch is Mitch?

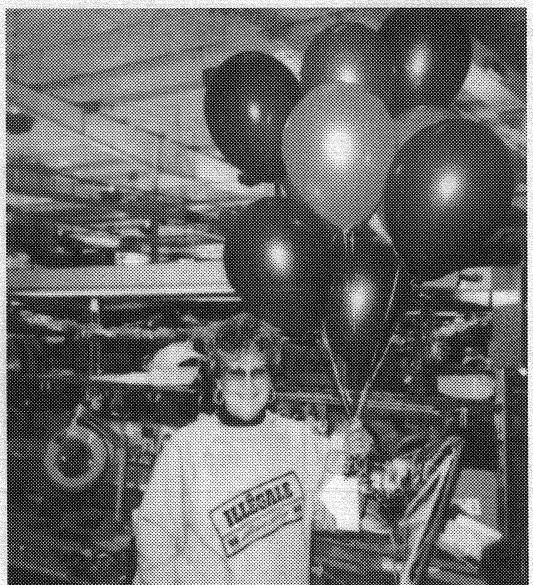


1. Would you buy a car from these guys? 2. Would you trust them with your money?

Ed Weidenhaft & Ross Swinehart



Now you know why Gerry married him.  
Clay Barclay



Yvette Winther

Hey! What's all the fuss with the balloons about?!

Dan Lutz



Jim, when did you and the band get the new wheels?



## A Hearty Carry-In Welcomes Techron to Plant 1



# MRI 1990

By Howard King

**Magnetic Resonance Imaging (MRI)**, the most recent method of diagnostic imaging in the medical field, is important to Crown International. The Techron division manufactures and markets gradient amplifiers for the medical systems used in MRI. Gradient amplifiers are the heart of the imaging process. They send power to coils creating magnetic fields which align the hydrogen atoms in the body. Radio frequency (RF) energy is released creating signals for computer generated images. Techron amplifiers are the highest powered and the most reliable amplifiers of this type in the world.

MRI is an outgrowth of 40 years of technology established for analyzing chemicals. The technology as applied to the medical field in imaging the human body began in the United Kingdom over ten years ago. MRI offers advantages over X-ray techniques, the most prominent being no harmful radiation. Another advantage is the superior image quality of soft tissue of the body, allowing the observation of abnormalities which would be obscure in X-ray images.

Scientists associated with the MRI investigation community continue to develop techniques relating to angiography, blood flow analysis, cardiology, heart function in real time, spectroscopy and chemical analysis of the body. There

are other existing methods of obtaining the information mentioned above but MRI technology offers superior results.

The high cost of a scan is a disadvantage which the MRI community will have to overcome to become competitive with existing techniques. One way of reducing cost is to increase the efficiency of the gradient amplifiers and subsequently the acquisition of data. Our bi-level amplifier has succeeded in sending more energy to the coils with less wasted heat inside the amplifiers than ever before possible but more can be done.

What are some demands placed on those participating in this exciting technology? Physicists must develop more efficient waveforms to achieve higher gradient field strength; design engineers will have to develop more efficient gradient coils; and product engineers will have to design and build more efficient gradient amplifiers.

The year of 1990 is going to be challenging for those who participate in MRI. More new systems will be manufactured and sold than in previous years. Many of the existing MRI systems will be upgraded, improving throughput, which means Techron must make replacement gradient amplifiers and other modifications. The MRI market continues to grow and indicates success for Crown International in 1990.



## Copies Available

We have copies of "The World According to Student Bloopers" by Richard Leiderer, which **Larry Shallenberger** read to us at assembly last fall. This history of the world is composed of genuine quotes collected by teachers around the country. For example:

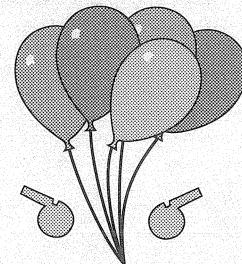
"The government of England was a limited mockery. Henry VIII found walking difficult because he had an abcess on his knee. Queen Elizabeth was the 'Virgin Queen.' As a queen she was a success. When Elizabeth exposed herself before the troops, they shouted 'Hurrah.' Then her navy went out and defeated the Spanish Armadillo."

Call the editor for a copy of this unique history.

## Balloons and Whistles for Amcron

By Libby Marshall

On behalf of Amcron **Lauri Chupp** thanked the Shipping Department, during an assembly, for shipping \$825,239 worth of product Thanksgiving week. Not only was this profitable for Amcron, it also contributed to the bonus for all employees. **Maggie Fredrickson, Chuck Brenneman, John Balzano and Lynn Wise** accomplished this during a three-day workweek without one of their regular workers, **Supervisor Jim Putz**. The concentrated effort and persistence of his team in his absence certainly demonstrates quality.



**Bill Goheen** expressed his pleasure at the results of the Quality Education Series (QES) recently completed. Amcron Division focused their class project on responsiveness to customer inquiries and orders. Their ability to respond with quotes, ship dates and other information within 24 hours has increased from 58%, when charting began, to 88% in eight weeks' time. Figures aren't in yet, but it appears that there is steady improvement in same-day shipments, another goal.



## TOPS Invitation

**Take Off Pounds Sensibly (TOPS)** will meet every Thursday in the assembly area of Crown International. The "weigh-in" time runs from 6:15 pm until 6:55 pm. The meeting starts promptly at 7:00 pm.

All (ladies, gentlemen, teens) are welcome to attend.

For more information, contact **Sabrina Gall** at extension 406 or 875-6749.

## Employee Committee for 1990

The Crown International Employee Committee for January through December, 1990, will be comprised of: **Rhonda Chapman, Kelly Dillon, Tammie Putz, John Balzano, Robert Smith**.

## Nightshift on Quality

Quality Assurance. Whose job is it? QA's? Inspectors? How about you and me?

Implementing quality is not an easy job. It is a job for all—everyone must contribute in a spirit of cooperation and understanding.

In mid-October, the night-shift supervisor, **Richard Moore**, began working with not only his coordinators and technicians but his entire workforce. He chose to involve all of the production employees of Plant 2A because all had a stake in Quality.

Each person on Line 2, Prep-Pack and Modules has participated in weekly or bi-weekly meetings to research how quality can be improved in each department of the second shift.

One improvement to come from these meetings is to develop better communication between the first and second shifts. This has been acted upon by **Richard and Brenda Mortimer** who have begun to hold joint workforce meetings. It further illustrates how quality involves all workers in all departments. For example, keeping samples up-to-date helps the assemblers improve their jobs.

With this kind of cooperative thinking 1990 will be a quality year for all.

Pam Fothergill



# A Word from the President

By Clyde Moore

The most important area of quality for Crown International is what the customer perceives that we do for him. As one of our corporate principles states, we are committed to "Serving People," and that begins with our customers. But what does it mean to serve the customer?

Customers need to know they are important, not just their money. To achieve that we are committed to:

1. Quality products. It has been our way of serving people well in the past. We want to continue ensuring that our products have the features and the benefits our customers need.
2. Supporting the customers for the future. What will they need or want in three years? And what do we need to do or become as a company to be able to support their future needs?

When we look at the future, we discover that Crown International has grown so large and diverse that it is not able to effectively focus on the needs of our different customer groups. Our industrial customers, which we sell to directly and who purchase high volume, have different needs in terms of product, training, sales organization, marketing information, engineering and

services support, and manufacturing than our customers in the commercial audio and music industries. No one person or department can know enough to serve them all effectively. The same is true between our United States customers and those outside the United States who have different government regulations, cultures and requirements. It is obvious that to serve our highly technical customers in a manner to which they have been accustomed we need to specialize.

At Crown International I have chosen to make "divisionalization" a process, not an event. We are moving continually in careful steps from one large organization to three divisions with strong customer-focused leadership. This was done first by splitting the sales and marketing organizations into three divisions. Engineering and the manufacturing assembly areas will come next. We have defined leadership and clear mission statements for each of these divisions, focused on being responsive to specific customer groups.

Our commitment for the future is to serve our customers. Divisionalization as Amcron, Crown and Techron will help us, as a corporation, ensure that we can uphold that commitment.



## Improving Quality at Crown

By Terry E. Frick

Crown International has undertaken a two-prong plan to improve manufacturing quality. This consists of Education and Continuation.

### Education

An in-house training program of 60 managers and selected staff has been completed. The 20-hour program, known as the Quality Education System (QES), has equipped management with the training it needs to fulfill its leadership role in the Quality Improvement Process (QIP).

In March the next phase of the training begins with a 10-hour mini-course for each employee. These 10-hour sessions or Quality Work Groups (QWG) will be led by selected members of the earlier QES sessions under the supervision of **Larry Green** and **Dan Lutz**.

Each QWG group will be composed of normal everyday work groups and will focus on those relevant issues necessary to improve the quality of the group's work.

### Continuation

Each participant of a QES course has submitted a project definition which they must finish in order to fulfill the course requirements. Their assign-

ment was to identify a significant opportunity for quality improvement or reduction in the "hassle" associated with their own job. A number of teams were formed to work on large projects. It was estimated that if all the problems they have identified could be eliminated, the cost savings to the corporation could exceed \$1,000,000.

One participant has shared the concepts learned in the QES course with Line 9 where the *Com-Tech™* family of amplifiers are produced. The result was a dramatic reduction in assembly errors—zero defects produced in five out of the last six weeks!

The awareness of the need to meet customer requirements is spreading throughout the company. Employees are realizing that the customer is not the only "purchaser" of the product but also the other department(s) or person(s) which receive the result of the work.

The Quality Improvement Team (QIT), made up of the executive leadership, QES instructors and Quality Assurance Manager, has identified over \$4,000,000 in wasted effort due to failure to meet quality standards. Efforts are now under way to track and display the improvements which result from the QIP.



# Christmas Reflections

By Libby Marshall

The Crown Christmas banquet, December 1, provided the foundation for the holiday season for employees, board members, spouses and friends. It was a treat for all and offered good food and a chance to talk to the spouses and guests of our work friends and others. The beauty of the decorations, the music of the chorale and accompanist, Marcia Gall, and Robin and Joe Wisler's songs added to the treat. We laughed at Act II Associates and Santa Sam Helm. But more than the treats, Clyde Moore's

comments and retelling of the Christmas story from Luke clearly stated what Christmas is about.

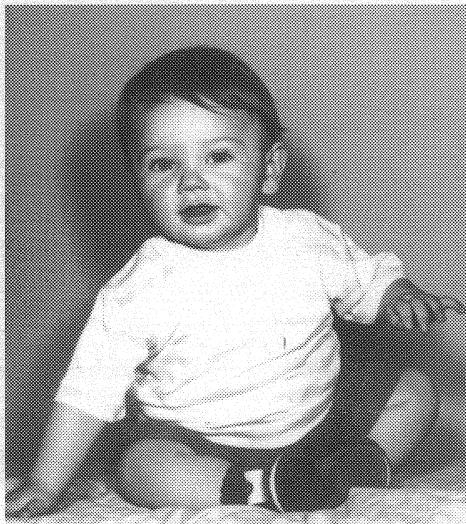
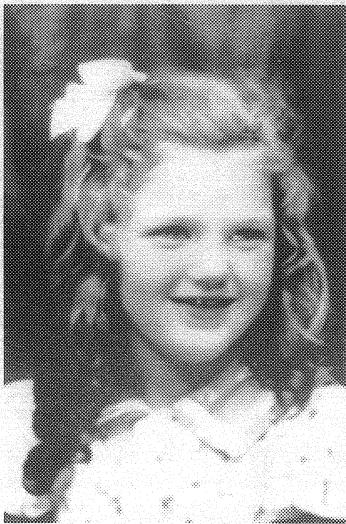
We left not just with smiles but also with the calm assurance of the true beauty of Jesus' birth in Bethlehem long ago. Whatever else the holidays brought, we know that we shared the best—the basis for the Christmas cheer.

Thank you to the management and Co-Chairman Patti Smith and Gerry Barclay and all the others who made it happen.



## Who is pictured below?

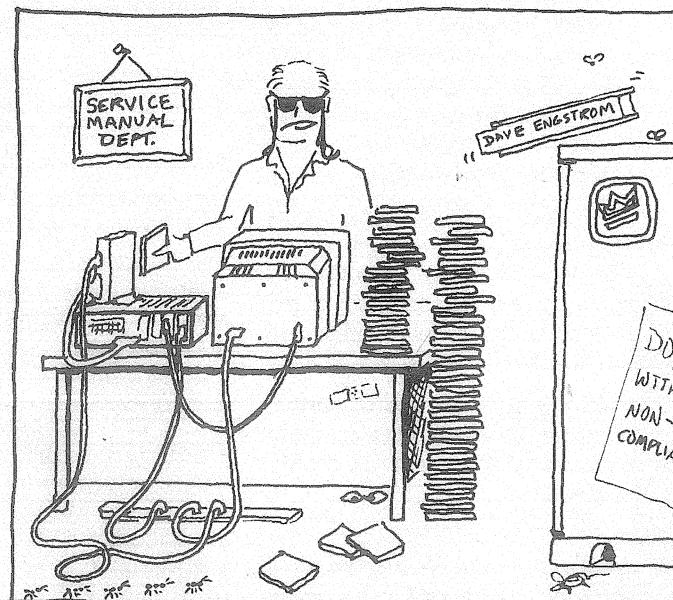
Hint: They are closely related and both work in Plant 1.



## NEAR SIDE

THIS WEEK  
THE COST OF  
NON-COMPLIANCE.

AUTHOR: UNKNOWN.



DAVE ENGSTROM RELUCTANTLY CORNERS THE MARKET IN REMOVABLE HARD DISKS IN AN ATTEMPT TO KEEP UP WITH PRODUCT CHANGES FROM ENGINEERING. ☺

Luke 2:6 "...and while they were there, the time came..."

...it is time  
to quiet ourselves...to reflect  
upon all the gifts we are...and  
have...and can imagine.

to give thanks from our  
deepest selves.

to surrender to the love  
that came before us,  
lives now among us,  
and is forever, beyond us.  
...it is time.

Julie LaFollette

If you could prognosticate procrastination in the proletariat sector of the work place, you could promulgate your own propensity towards procrastination and feel not at all guilty, and thereby propitiate your guilty conscience for procrastination, simply because everybody else is doing it, and you knew it before hand. And let's face it, there's something to be said for being punctilious in that respect. At least you don't have to "stand alone!" You'll have lots of company.

Vern Pavasco

## CROWN CRIER

The Crown Crier is the monthly newsletter for Crown International employees. Its purpose is to be informative, inspirational and entertaining.

Your involvement is highly prized. Please contact a CC Reporter with any material you would like to see in future issues.

Publisher: Beryl Moore  
Editor: Libby Marshall  
Reporters: Sabrina Gall,  
Angie Gropp, Art Rowe

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