

THE POWER OF VISUAL SYSTEMS

WORK THAT MAKES SENSE

Visual systems are everywhere. Virtually every day we interact with highly sophisticated visual systems in our homes and in the community: hospitals, theaters, shopping malls, post offices, highways. They surround us, influencing when and how we get things done, guiding, directing, and, if need be, limiting our choices: the blue line in the hospital corridor leading us to x-ray; double lines on the roadway; parking lot speed bumps; supermarket aisle signs; the shape of our kitchen utensil holder; the size and shape of the slots in the recycling bins so we don't throw cans away in the newspaper bin.

Visual devices speed us along our way, even as they protect us from making senseless, sometimes dangerous, often expensive mistakes. They help us comply, adhere, and do the right thing. And they do this so seamlessly, we barely notice. Their power lies in the fact that, though we use them constantly, we are not really aware of their existence. We simply respond.

In the same way that visual systems help us in our communities and homes, they can help us in the workplace. As every company knows, workplace information can change quickly and often — production schedules, customer requirements, engineering specifications, operational methods, tooling and fixtures, material procurement, work-in-process, and the thousand other details on which the daily life of the enterprise depends.

1.4 Organizations need a way to rapidly and accurately update and share this information. Without that the workplace can be thrown into debilitating and long-lasting confusion, and managers and operations alike can come to consider searching, waiting, wasting precious time and making costly mistakes a way of life. This is where visual systems come in.

Because visual systems make ordinary and special workplace information available *at-a-glance*, they play a key role in the operational excellence of every company. Visual systems is a waste reduction strategy designed to share vital workplace information with the people who need it — *you!*

(continues on next page)

WHAT IS MEANT BY A *PROCEDURAL STANDARD*?

A Procedural Standard means the way by which we do things. Our methods. The sequence of steps we have to follow in order to achieve a specific tolerance, dimension or value. A specification.

Examples: *How to rivet a bolt, how to achieve a rate, how to weld, how to tighten a wheel, how to changeover a machine (in less than nine minutes).*

In other words, a Procedural Standard defines *how to make something*.

Name three — or four — *procedural standards* you are responsible for in your work. Work on your own at first. Then share your thinking with others. Thanks!

1.

2.

3.

4.

A visual workplace helps us do the right thing. It helps us execute our standards (“what is supposed to happen”). That means the visual workplace is a gigantic *adherence* framework. It is designed to help us *adhere*.

What is another word for ***adhere***? Here are a few other words: conform, follow, stick to, and comply.

The way the visual workplace helps us adhere is through dozens, even hundreds, of low-cost/high-impact *visual devices* and *visual mini-systems*.

So now, let’s define what is meant by ***a visual device***.

DEFINITION OF A VISUAL DEVICE

A Visual Device is a mechanism, gadget or thing, that is intentionally designed to influence, direct, limit or otherwise impact our behavior . .

. . . by making information vital to the task-at-hand available at-a-glance — without speaking a word — as close to the point of use as possible.

Here are three everyday examples.



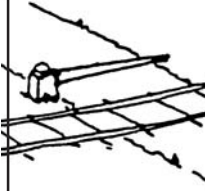



1. 10

Can you think of three more? Write or draw your response.

THE FOUR POWER LEVELS OF VISUAL DEVICES

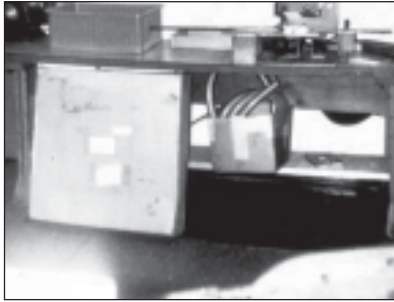
THE NEED LEADS

Visual Device Type	Visual Indicator	Visual Signal	Visual Control	Visual Guarantee*
Power Level	Passive (tells only)	Assertive (grabs us and then its message)	Aggressive (limits behavior through size and number)	Absolute (allows right response only)
Impact on our Behavior	Influences Shows Informs Suggests Indicates Tells	Alerts Warns Alarms Signals Prompts Announces	Confines Contains Hinders Obstructs Controls Constrains Limits Restricts	Compels Forces Ensures Eliminates Prohibits Inhibits Guarantees
Icon				
Workplace Application	Home-Addresses ID Labels Directions Instructions Maps Shelf Numbers Bin Addresses Painted Bench	Lights Andon Alarms Digital Boards Visual Displays Production Control Boards etc.	Border Size Kanban Squares Shelf Height Shelf Width Bin Size Container Size Pallet Size Weight Spacers Aisle Width	Detect Chutes Sensors Limit Switches Guide Pins Locator Pins Templates etc.

* Also known as mistake-proof, failsafe, bullet-proof and *poka-yoke* devices. A *Visual Guarantee* lets the process inspect itself — 100%, in process, at the source. *Visual Guarantees* are divided into three types:

- Type 1: The device contains the defect so that it is not passed on.
- Type 2: The device alerts us to an error that can cause a defect.
- Type 3: The device eliminates the possibility of error — ever.

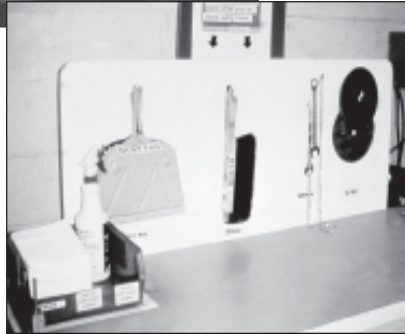
MOTION: BEFORE AND AFTER



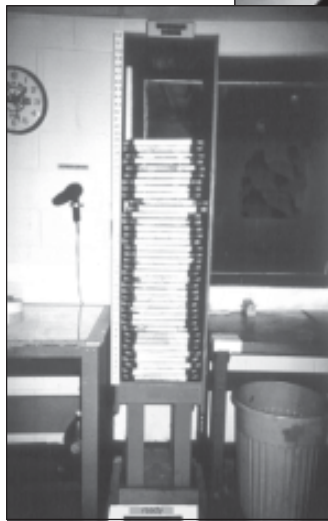
BEFORE



AFTER



BEFORE



AFTER

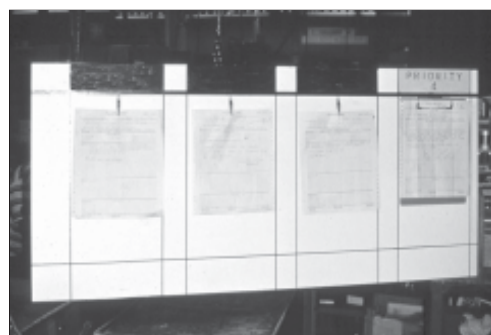
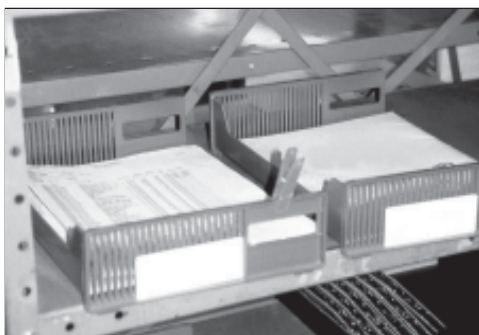
APPLYING THE NEED-TO-SHARE

When we ask ourselves the question “what do I need to share,” we become team-minded. We are asking:

What is it that I know — that others need to know (but don't) — so that they can do their work? What do I need to share?

When you notice the motion caused by your need-to-share, you discover a treasure chest of information deficits — un-answered questions — and a vast new opportunity to reduce motion through visual devices and mini-systems.

Here are two Need-To-Share visual devices.



1. 31

Can you think of two more? Write or draw your response.

EXERCISE: FIRST-QUESTION-IS-FREE

Using the space below, write down which questions you are always asked. Use the six core questions as a guide:

Where? What? When? Who? How Many? How?

Questions You're Asked
(what I need to share)

Visual Devices You Create
(your visual answer)

1. 32

YOUR WRITTEN IMPROVEMENT TIME POLICY RESOLVE AT THE TOP

Whether a company has just switched to lean production or is still using a traditional manufacturing approach, if it does not establish an *official written improvement time policy*, very little improvement will ever happen there.

We have seen this everywhere, even in companies which loudly proclaim their commitment to continuous improvement. Little or no actual time is set aside to do the very improvement the company says it wants.

It is an age-old battle — production time *versus* improvement time. Two worthy rivals attempting to occupy the same narrow 24-hour space. The issue is not which is more important. *Production is!* This is as it should be: a company is in business to sell its products and services. It must first make them. And that takes time. Production time *always* comes first.

Without a written improvement time policy, however, the danger is that needed improvements will never happen.

Too often improvement is left to chance and the ingenuity of the willing to eke out small pockets of time — and make magic happen. We all know these people. They see the vision burning brightly before them and are determined to make it happen. Time and again, these people prove — with their own mental, emotional, and physical health — the familiar adage: *Where there's a will, there's a way*.

In a sad and important way, these quiet heroes do their companies and the rest of us some bit of harm. When they make magic happen, *in the absence of a clearly defined, written improvement time policy*, they unintentionally send the message that separate time is not needed. Wise, indeed, is the company that sees through this double-think and takes steps to establish the policy nevertheless.

The lack of an official improvement time policy is one of the greatest roadblocks to change. Your Instructor will now present your company's improvement time policy.

S2: SCRUB THE WORKPLACE

Now that *only* the essentials remain in the workplace, we do a basic scrub. We bring every item to a standard level of cleanliness. We do not do this because “cleanliness is goodness” — but because each work surface must be prepared (cleaned) so that it *can hold visual information*.

In S2, we clean. First, we clean all the surfaces, walls, workbenches, the floor, steps, the tops of shelves and cabinets, the outside of equipment. All outside surfaces. Then we go inside and clean — inside cabinets, shelves, drawers, closed boxes and the details of machinery. Then we paint as needed.

And as we clean, we notice *motion*. We come to understand all cleaning for what it is: *moving without working*. It may be very necessary right now to clean — but it is still not adding any value.

In many factories, dirt simply happens. Or so it seems. When we keep our awareness of motion as the enemy, cleaning becomes a form of *inspection*.

We begin to notice opportunities to prevent or even eliminate dirt. This may mean we change the fundamental way we do things. Or we may discover how to eliminate the need to clean entirely by creating dirt-prevention devices. We come to understand that whenever we prevent dirt, we automatically prevent motion. We notice, for example, the recurrent piles of grinding chips and discover easy ways to contain them closer to their source.

When cleaning is a part of every work day, we take a closer look at tools and machinery. We notice that oil drop which precedes (often by weeks) the burning motor and a costly shutdown and repair. We dust the control panel, smell something burning, and call maintenance to check it out.

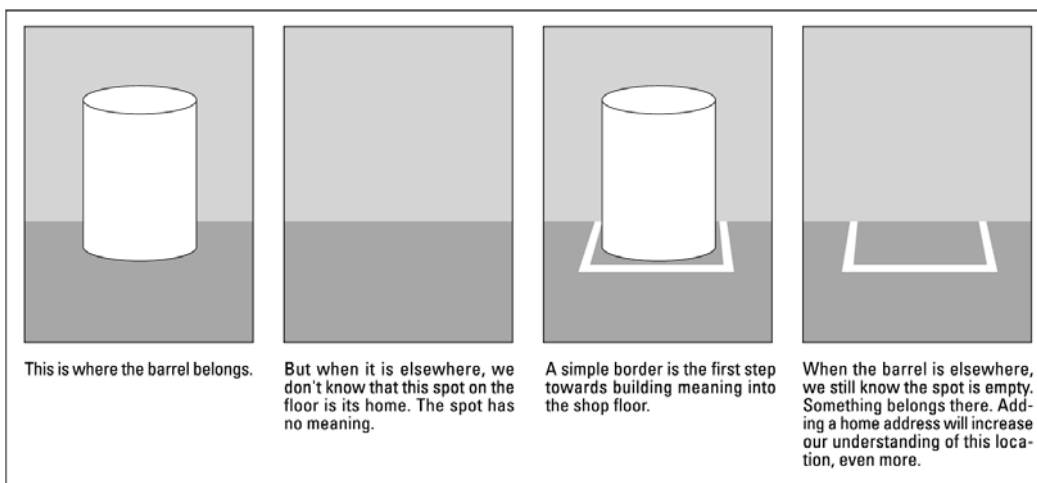
If we do not make S2 a daily habit, details such as these disappear into the “general state of confusion and rubble.” We miss the vital messages which the workplace sends us everyday in its effort to help us in our objectives.

Through S2 we also come to understand cleaning as ownership. Investing personal effort and time in cleaning and maintaining our equipment, tools, furniture, and work area increases our value for them and for ourselves. S2 builds a habit of cleanliness, an attitude of pride, and a sharpening awareness of motion, in all its many forms.

BORDERS

GIVING MEANING TO THE WORD “EMPTY”

Borders give meaning to the word “empty” on a shop floor. They tell us for sure when a space is available — and when it is has already been claimed. Borders are *the single most powerful visual device* for establishing and maintaining *Visual Order*.



BORDERS: HEAVY FORKLIFT TRAFFIC

Where forklift traffic is heavy, getting border lines to stay clear, clean, and in place can be a challenge. Tape, plastic or otherwise, will not last. Here's one procedure that worked.*

1. Before you change anything, research and verify the right approach for your plant. Always, always follow safety procedures exactly. Do it the smart way: put safety first.
2. The floor has to be clean, very clean. If your floors are concrete and your operations are greasy, you may have to go over the floor twice with an industrial strength de-greaser and then follow that with a heavy-duty, solvent-base industrial cleaner. Expect to spend 50% of the time the boundary process takes in getting the floor clean enough to hold paint.
3. Be careful about the paint and sealant you choose as well as the application method. Spray cans of traffic paint are easy to apply but can get covered over with dirt and grime within days due to the grinding weight of heavy traffic, making it nearly impossible to scrub them clean.
4. A urethane sealant may be the answer for you, but check with a reputable paint supply house first because certain combinations of paint and sealant do not work together. For example, applying an oil-base sealant over an oil-base paint may cause bubbling.
5. If this happens, you may have to start over: remove the sealer and the painted lines; then clean the surface thoroughly again (even to the point of re-applying a heavy-duty cleaner).
6. If you use latex paint for lines, you may need several coats (2-3) to get an even, solid color.
7. Many latex paints come in gallons and not in spray cans. Consider using a four-inch roller to lay down lines. Use masking tape (3/4 inch) to help keep the line edge clean and sharp.
8. Latex needs to be dry to the touch before the next coat of latex paint is laid. In general that takes about 30 minutes, depending on weather conditions. By the time one coat is finished, the start of the line may already be dried so you can begin again at that point right away.
9. Be careful: multiple coats of latex paint can produce a rubbery line. If you have laid masking tape down to keep the edges clean, pull it up as soon as the last coat is set, not dry. If the coat is too dry, the paint may pull up when you pull up the tape.
10. There may be some seepage when you apply paint over the masking tape. If this happens, you should be able to scrape the excess off.
11. After removing the masking tape, let the latex dry for 8 to 12 hours. Make sure it is well set before applying the sealant. Rope off the area if you need to protect the finish.
12. When you are ready for the urethane sealer, put on a hefty coat. You can apply this free hand with a 4-inch roller. Make sure to overlap sealant generously on both sides of the line (at least 1 inch each side). Apply a second coat after four hours for extra insurance.

* Many thanks to the associates at Fleet Engineers (Muskegon, Michigan) for developing this process.

MODULE IV: ACTION ASSIGNMENT

DUE BY NEXT SESSION

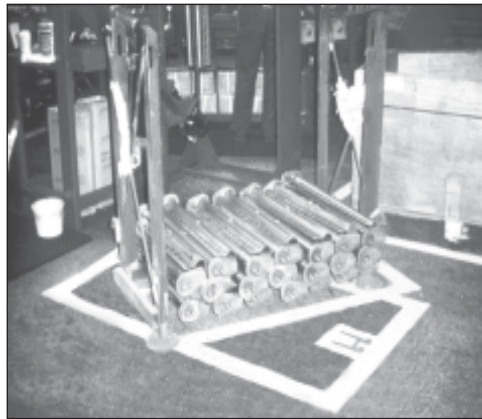
1. Your first — and most important — responsibility is to share what you have learned today with anyone in your area, not at today's session.
2. Between now and our next session, continue to notice the visual devices around you. Be prepared to share what you discover next time we meet. When you are at the supermarket, in the parking lot, in the hardware store, at the bank, at the toll booth or other public places — and in your home, notice the visual devices that are influencing, directing, or even limiting your behavior. (Begin to notice when they are not there to help you.)

Keep track of these in your memo booklet, noting what kind of a device each is:

- *Visual Indicator* (tells only)
 - *Visual Signal* (grabs our attention by changing)
 - *Visual Control* (limits us through size and number)
 - *Visual Guarantee* (allows the correct response only)
3. Working alone or with others (as appropriate), apply what you learned today about *S5: Set Locations*.
 - Implement *Automatic Recoil* — border + home address + ID label for everything that casts a shadow.
 4. Add new footage to your *Video Report Card* after you complete this action assignment. Again, use the *Video White Pages*. This video segment should not be longer than 4-5 minutes.
 - Please invite others to be in the video, do the video, and/or assist you in the video.

Thank You For Your Excellent Participation.

FLOOR BORDERS: THE LOGIC OF FLOW AND FUNCTION



+1: SUSTAIN THE 5S+1 HABIT THE KEY TO ON-GOING IMPROVEMENT

Increasing your ability to *think visually* may be compared with mastering basketball, the piano or a martial art. The road to mastery begins with learning the basics — passing/dribbling/shooting, the scales, the forms. Then it's practice, practice, practice. Only when the practice is automatic and internalized can you move on to the intermediate stages and finally mastery.

The basics of a visual workplace are cleanliness and order. These are the rules and we achieved them through the first five steps of 5S+1. The final S (*Sustain The 5S+1 Habit*) is there to ensure that, once the first five are implemented, they stabilize and spread.

Building and sustaining the 5S+1 habit through +1 *Tools* translate the principle that ***the First S is for Spirit*** into a living priority in the change process, establishing it as the foundation of the visual workplace.

- **The purpose of +1 principles, tools and practices is to recognize, reward, and strengthen adherence to the first five Ss.**
- **The result? An environment favorable to improvement where *visual thinking* can become a way of life in the organization.**
- **We accomplish this by means of the nine +1 mechanisms or tools on the next page.**

When these nine tools are in place, we have built a sound foundation for moving up *The Blueprint For A Visual Workplace* and on to more advanced visual tools—visual standards, visual displays, visual measures, visual controls, and visual guarantees.

We advance visually because a work environment based on +1 principles and practices is already well on its way to becoming a way of life in the enterprise.

VISUAL MINI-SYSTEMS HIT LIST

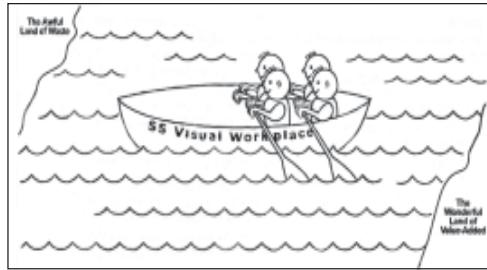
TEMPLATE

Work Area/Department _____ Week of _____

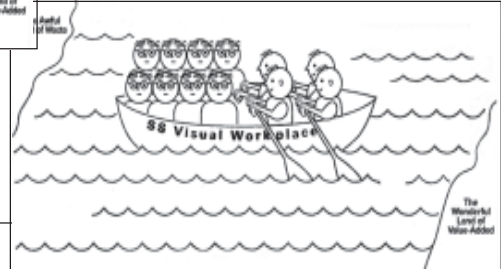
What / Where? (What spot in our area needs a mini-system?)	Who? (Sign up and find a buddy to join in.)	When? (When can you begin?)	Completed? (Check when mini-system is complete.)
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			

+1: SUSTAIN THE 5S +1 HABIT

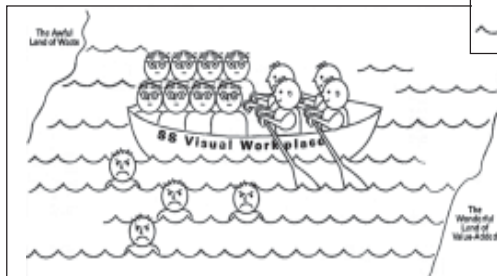
1. ROWERS ROWING



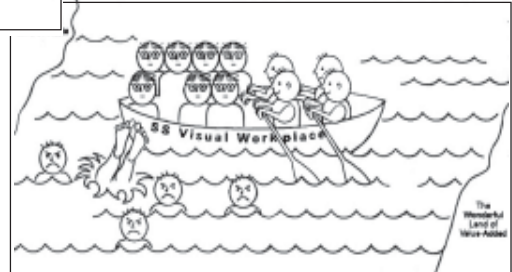
2. WATCHERS WATCH



3. GRUMBLERS GRUMBLE



4. KEEP THE ROWERS ROWING



**THE VISUAL WORKPLACE
STEERING TEAM
AT UNITED ELECTRIC
(3 YEARS AFTER FORMATION)**

5S+1 PATROL TIP #1

NOT AN AUDIT

Unlike some other kinds of checklists, the *5S+1 Clipboard Checklist* is applied by associates from the same work area for which the clipboard checklist was developed. It is not done by outsiders, but by a team of associates (working in pairs) called the **5S+1 Patrol**.

1. NOT AN AUDIT

Your *5S+1 Patrol* moves through your work area (usually once a week) to check if the items which you and your co-workers (including patrol members) agreed to *do got done* — and how well. **This is not an audit.**

Technically speaking, audits are done by people outside your department (say, by the quality group). It's a formal way for outsiders to express their opinion about your efforts. The audit scoring scale is typically pre-set and the same for everyone. An audit is more like an inspection.

Audits can be useful, especially when conducted plant wide. They become a problem, however, if conducted before individual areas have had a chance (on their own) to reach a strong level of compliance. If you are thinking about auditing the 5S+1 target areas, wait six to nine months. By then, areas may be ready to hear the feedback audits provide, even the negative feedback.

COLOR-DOT SAMPLE: MODIFIED CLIPBOARD CHECKLIST

Work Area	Patrol	Date
Last Week's Score Red___ Yellow___ Green___		This Week's Score Red___ Yellow___ Green___
Red = Time to get started. We've got a long way to go!	Yellow = We're moving in the right direction. Don't stop now!	Green = We've arrived. Now let's sustain it!

5S+1 Checklist			
A Clear, Clean, Safe & Visually-Ordered Workplace	Red	Yellow	Green
1. Have all extra U-containers been returned to the store?			
2. Is the floor free of grinder dust, with no danger of slipping?			
3. Is Press 3 free of grime, oil, and chips?			
4. Are the scrap and trash containers emptied and rinsed clean?			
5. Is the plastic border tape near the CNC in good repair?			
6. Are all safety guards on Press 3 in place?			
7. Are large fans and extra pallets in their addressed locations?			
8. Are supplies on the POUS shelf in their addressed locations?			
TOTALS (number of dots by color)			

MOTION IN THE EYES OF THE CUSTOMER

WHAT IS IT?

In the visual workplace, *motion is corporate enemy #1* — in the beginning, in the middle and just as you are finishing up. The only thing that changes is the sharpness of your focus. So what is **motion** for your customer?

Think about it. Jot your ideas below, depending on which kind of “customer” you choose to concentrate on. (Develop as many as you can.)

Name of External Customer	What Motion Means to Him/Her
1.	1.
2.	2.
3.	3.

Name of Internal Customer	What Motion Means to Him/Her
1.	1.
2.	2.
3.	3.

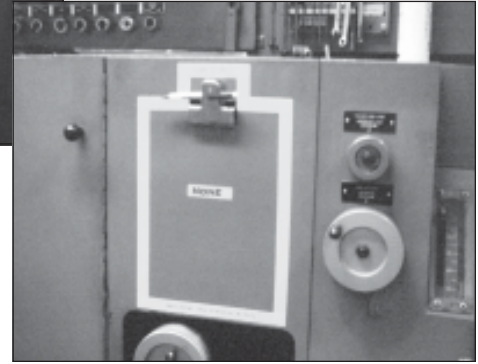
Name of External Supplier	What Motion Means to Him/Her
1.	1.
2.	2.
3.	3.

Name of Internal Supplier	What Motion Means to Him/Her
1.	1.
2.	2.
3.	3.

CUSTOMER-DRIVEN VISUAL ORDER



**SHEILA BOWERSMITH:
VISUAL THINKER
AT
DENISON HYDRAULICS**



CONTRIBUTING COMPANIES

The following is a short list of the companies whose visual devices and visual mini-systems are shared in QMI's *Visual Workplace/Visual Ordersm Video Training System*. We send them a hearty well done and a heartfelt thank you!

- Alpha Industries (Woburn, Massachusetts)
- Curtis Screw (Buffalo, New York)
- Denison Hydraulics (Marysville, Ohio)
- Fleet Engineers (Muskegon, Michigan)
- Greene Rubber (Woburn, Massachusetts)
- Hamilton Standard (Windsor Locks, Connecticut)
- Harris Corporation (Quincy, Illinois)
- Lee Industries (Muskegon, Michigan)
- Lockheed-Martin (Fort Worth, Texas)
- Seton Name Plate (Branford, Connecticut)
- United Electric Controls (Watertown, Massachusetts)