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A SWIFT ENTERPRISES INVENTION STORY

Tom Swift and the NeuroSymphony

By T. Edward Fox

When Tom Swift runs into an old and dear friend with a problem, he can't help but offer to come to her rescue. His favorite Jr. High teacher has been teaching the school band for two years since the budget was cut, but now it is in danger of disappearing unless she can find a way to bring in some money.

Tom offers to help by having Swift Enterprises sponsor the band. And, while she is grateful for the offer, she must decline. A school board edict has been issued: unless she can find non-commercial money, band is gone!

Can Tom help her in her quest? Can he help her within the boundaries of the contest rules? And, can she accept his help and still honor the School Board edict?

This story is dedicated to the three men who taught band in the three schools I attended whilst still interested in playing the clarinet. Though my desire to play disappeared between Freshman and Sophomore year, I fondly recall that one hour, three time a week, when we could all squeak and blart, and oompa and thrum-tiddle-thump to our heart's content. Here is to those bygone days of split reeds and spit valves!

Tom Swift and the NeuroSymphony

FOREWORD

I know three solid facts about musical instruments:

- 1) They are broken down in to families such as woodwinds, brass and percussion (and strings, and I'm sure other things like idiophones and pots & pans with wooden spoon)
- 2) In order to properly play one, you need to practice
- 3) I never had the patience to practice, ergo I cannot play

Actually, number 3 is a lie. I can play just about anything, but I can not read music, ergo, I can *not* play to anyone's satisfaction.

There is one interesting thing I also know, and that is that the traditional piano has 88 keys broken down into 52 white and 36 black keys, some old pianos had only 85 keys, BUT there is one piano out there sporting an extra 14 keys!

That's about it other than I prefer the melodic sounds of flutes, clarinets, bassoons and the larger saxophones to the blaring of trumpets, the often just slightly off pitch trombones and the ear-vibrating beat of drums.

Oh, wait. I do know one other thing. There are many types of synthesizers out there, most of which produce close, but not exact matches for traditional instrument sounds.

Gee, and another thing is that a few years ago a complete orchestral concert was put on by young men and women all using their iPhones. Up on stage, plugged into the amplifiers via the earphone jacks. And, they not only had a great time, they were magnificent!

Victor Appleton II

CHAPTER 1 /

A REQUEST FROM A DEAR FRIEND

TOM SWIFT arrived home tired and incredibly unhappy. During the previous five weeks he had been involved in both coming up with a solution to recovering a missing satellite that had splashed down in the ocean and promptly vanished, and in working on miniaturizing and updating his line of L'il Idiot microcomputers.

Normally, one big and one small project at a time was nothing for the energetic nineteen-year-old inventor. However, the entire last year had been a non-stop rush from one adventure to another. Now, all he wanted to do was to have a big glass of icy cold limeade—perhaps with a little maraschino cherry juice—a hot shower and about fifty hours of sleep.

It was a good plan and full of promise except for the arrival of his sister, Sandy, and the reminder that he and his best friend—and Swift Enterprises' test pilot—Bud Barclay had sworn an oath three weeks earlier that the very night after the satellite was recovered, they would take the girls out to dinner and a movie.

When Tom looked and saw Sandy standing there—with her arms crossed over her chest, and *that* look on her face that said, "I will not take 'Oops! I forgot' or 'I'm bushed' for an answer"—he let out a moan.

"Please, please, please tell me that either you or Bash can't make it tonight and that you would both be happy to go out tomorrow. Or, the next day would be even better." He looked almost pleadingly at her.

Sandy Swift, blonde and eighteen, could be one of the most determined and stubborn girls in all of Shopton, New York, but

her stern stare instantly softened as she saw how serious her brother was. She came over and sat on the sofa next to him.

“Pretty rough month, Tomonomo,” she said softly and rested her head on his right shoulder. “Mother should have told me how bad off you are. I mean, I was standing right next to her in the kitchen talking about tonight when you dragged yourself in. Heck! She saw how bad off you are. Why didn’t she give me one of her—”

“You ought not to be so selfish, Sandra Swift!” their mother, Anne, said from the doorway to the kitchen. “If you had been listening instead of huffing and puffing about how late Tom was getting to be, you would have heard me say that it might be best to back off for a day or two. Remember?” Anne raised one eyebrow at her daughter.

Sandy sighed. “Sorry, Mother. Sorry, Tom. I really don’t mean to be such a brat. It’s just been too long since Bud gave me a big, sloppy kiss that I—”

“Sandra!”

Sandy leaned over and whispered in her brother’s ear, “Bet you wish Bashi would give you a big old sloppy wet one, huh?” Then, she jumped up and looked down at him.

Tom gave her a thumbs-up sign, a wan smile, and said, “And, then lots and lots of sleep. I’d better call her and beg off for tonight.”

“Nonsense,” Anne told them both. “Sandra can call Bashalli and explain the situation *without editorializing!* It’s just about six and I planned to put dinner on the table at quarter till seven. Can you stay awake that long, Tom?” She was looking at her son with concern.

“Yeah. If somebody could get me a giant glass of limeade—lots of ice, please—I will be awake for dinner. I’m starved!”

Sandy walked to the kitchen, pausing to whisper something in her mother’s ear. Anne nodded.

Five minutes Later Tom hopped into the shower and let the hot water rinse off the past three days of frustration and exertion. Fifteen minutes after that he was dressed and back downstairs. And three minutes later the front door opened and in walked Bud and a beautiful, dark-skinned woman. It was Tom’s steady girlfriend, Bashalli Prandit.

She rushed over and kissed Tom and then stood back shaking her head. “Oh, dear. You do look terribly tired. Perhaps even a quick dinner here at your home is too much.”

Tom smiled at her. “Nope. I’ve got at least one hour and a good meal’s worth of energy in me. I’m really glad you came.”

“You’re welcome,” Bud said with a mischievous grin. “Didn’t know you cared!” He almost immediately let out a little yelp of pain as Sandy punched him in the shoulder.

“Tom has an excuse. He’s the brains of the outfit. You are just the muscle, so pay attention to me,” Sandy told him looking stern and shaking a fist near his face in mock anger. She couldn’t hold her scowl and started to giggle.

The dinner made by Mrs. Swift centered around stuffed bell peppers and fresh-baked cheese rolls.

As tired as he was, Tom ate with gusto. Bud kept ahead of him on sheer intake and speed, but both boys had been almost too busy for at least five days to eat much at all. For them it was a toss up between hunger and weariness.

After dinner, Tom suggested that he might stay awake a little while longer if they had dessert outside on the patio. “The fresh air will keep my eyes open,” he promised.

He was wrong.

By the time Anne Swift brought the tray out with scoops of

fresh blueberry cobbler and ice cream, Tom was sound asleep.

“If I can get Bud’s help, I’ll take him upstairs,” Tom’s father, Damon Swift, suggested. All during dinner he had been quiet, preferring to allow Tom to catch up with Bashalli, and Sandy with Bud.

With Bud now too tired to safely drive Bashalli and himself to their respective homes it was decided that he would take the guest room and Bashalli would sleep in Sandy’s room in the hide-a-bed sofa Sandy had talked her parents into buying for her.

The following morning, both boys slept in. By the time they woke up and came downstairs, the girls were gone—Sandy to her new job at Enterprises and Bashalli to her job at Shopton’s one and only advertising agency where her talents as an artist were in constant demand.

Anne made them pancakes and bacon even though it was closer to lunch time while they sat at the table reading the previous evening’s edition of the Shopton Bulletin.

“Will you take a look at that,” Bud said handing Tom the Business section.

Tom perused the page immediately spotting the article Bud meant. “Shopton School Board to cut all non-educational programs. Gee. Other than sports, what do they have that isn’t educational?” Tom asked.

Anne sat down with a cup of coffee and said to them, “From what I gather, anything that isn’t considered essential like math, science, English, social studies, and those sort of classes. Things like the electronic lab and even home economics are on the chopping block. And, forget all about wood and metal shop.” She sighed. “I guess no other mother will become the proud owner of a laser-etched, left-handed salad fork.” She smiled at Tom.

He grinned back. It had not occurred to him, back then, to check to see if his mother was left or right handed when he had used the programmable lathe to carve the a handle of the large fork. Now, when held in her right hand, the tines always stuck out and away from the bowl causing more than one mishap with errant placement of lettuce.

Even so, everyone admitted that the laser-etched image of her face in the flat part of the handle was an excellent touch.

Tom and Bud both called into work to see if they were needed. Neither one of them had anything that could not wait another day, so they spent the afternoon sitting outside talking and reading.

Around four Bud suggested they head downtown and take a good walk. Both of them were athletic and often took brisk walks around the grounds of Enterprises. They climbed into Bud’s convertible and drove to the beautiful downtown park that had been a gift to the city from Tom’s great grandfather.

They stopped several times to let people take their pictures with the famous Tom Swift—Bud usually performing the cameraman duties—before Tom spotted a familiar face.

“Mrs. Trunbridge!” he called out and waived his hands in the air. He had to call out twice more before she spotted him. Mrs. Trunbridge had been Tom’s favorite teacher at Shopton Jr. high, at least for the one year he attended there before being skipped forward two whole grades. He tried to find time to go visit her during the Christmas holidays and any other time he could manage.

He even owed her a debt of gratitude for helping him come up with a solution to the lack of water problem faced by a small African nation.

“Why, hello, Tom. And it’s Bud Barclay, isn’t it?” she asked shaking Bud’s hand after getting a hug from Tom. “It is so nice

to see you. And, possibly fortuitous.”

“Really?” Tom asked. “How?”

“Hmmm. Well, can we go over to the little cafe on First Street? That is the one where you spilled your iced tea on me last year, isn’t it?” Her eyes twinkled. It had been that incident when Tom realized that water was condensing out of the air on the cold glass that gave him the idea for his ERB, or Endless Rain Barrel system.

It had saved the lives of the entire country, and was now in use in thirty-seven other nations providing clean drinking water where little of no running water was available.

After ordering some drinks, and a half tuna on whole wheat sandwich for Mrs. Trunbridge, she began her tale.

“I don’t know if you have seen the news, but our cold and uncaring School Board has decided that the way to balance their budget is to cut and slash anything that isn’t reading, writing, and arithmetic from all but the twelfth grade at the High School.”

Tom nodded. “We read the paper today. You teach social studies. Are you going to be okay?” He was concerned for her. On the walk over he had done the mental math. She must be about sixty and he recalled her once mentioning that she had only begun teaching at age thirty-four. She needed at least twenty-eight years to qualify for her full pension.

“Oh, my regular duties are fine and will not be cut, but it is my other class, my pet project, that is going to vanish at the end of the current term.”

She told them about how an earlier budget cut, two years before, had taken away any money used to pay the band and choir director, Mr. Meuller. And, while she had a free period that coincided with the band hour, and another teacher took on

the choir class, the current small level of funding barely kept those classes going.

Now, they were in danger of disappearing completely.

“I am so sorry to hear about that, Mrs. Trunbridge. What can you do?”

“Well,’ she began looking at him hopefully, “I managed to get the Board to agree that if I could find outside funding, that they wouldn’t try to take it for the general fund and I could use it to pay for upkeep of the marching band’s uniforms and for the three tips we want to take this spring.”

“Well, then,” Bud said slapping Tom on the shoulder, “just tell him where to send the check!” He smiled feeling that he had just solved everyone’s troubles. But, as he looked at the older woman his smile faded. “Uhhh... Tom?”

“Enterprises has a special fund for community projects. I’m not sure what amount you need, but I’m pretty certain we can provide a special grant for the music programs.”

She looked a little uncomfortable as she told them, “You see, for starters we need about twenty-five thousand dollars.”

“We can cover that,” Tom assured her.

She shook her head. “And, while I am certain that you could, there is a hitch. A big one. You see, the School Board has stipulated that no commercial money can be accepted. It has to come from recognized educational funding sources. I am afraid that Swift Enterprises is so very, very commercial and not at all educational!”

CHAPTER 2 /**SHOULD IT BE THIS DIFFICULT?**

TOM SHOOK his head. He realized that she was right. It bothered him that the School Board was giving the appearance of wanting to kill the music program rather than be reasonable and accept whatever funding came their way, no matter the source. He couldn't stop himself from asking, "Why won't they let you take funding from us? Even if it is just to finish off this year while you have more time to look for a long-term solution?"

Mrs. Trunbridge placed a hand on Tom's forearm. Patting it gently she replied, "It isn't because they are singling me out, Tom. It is just the law. If any portion of the school takes funding, even if it is specified as being for the music program, it has to go into the general fund for this school year. Then, if there is anything left at the end of the year, it can be earmarked for the purpose for which it was given."

"That's ridiculous," Bud said.

She nodded. "I know, but the law states that funding that comes after the current year is finished may be earmarked in total, but anything coming in at this point in the middle of the year must go for the good of the entire school system." She shrugged. "Any gift you might give wouldn't even be promised just to my school."

They sat there in silence for a minute before she let out a little squeak and shook her head. "Oh, where is my brain?" She began digging through her purse, eventually upending it on the table. She plucked up a small piece of paper and handed it to Tom.

"I should have given that to you right off. Read it and tell me

what you think," she requested.

Tom read it out loud so Bud could be in on the discussion.

"The New York State Board of Education announces a competition to develop a set of three or more absolutely unique musical instruments to be demonstrated at a concert that will be held April 2nd. All instruments must be non-derivative of any other current instrument and must be played/operated by music students ages 11-18, unassisted by any adult. At least one instrument in each of the following families must be presented and played: Woodwind — Brass — Strings

"Final output may have harmonic and tonal qualities similar to existing instruments but may not bear any form or design similar to instruments designed and/or build starting from the year 1500 AD. A First Place prize of \$30,000 will be awarded with Second Place earning \$15,000 and Third receiving \$5,000."

He stopped reading aloud as he looked at the small print.

"Well, at least the education folks putting this on aren't going to try to steal anything that is successful. It says here that 'All finished and demonstrated instruments will remain under full ownership of their designers.' Do you have any idea what you want to do?" he asked her.

She blushed slightly and cleared her throat. "I know that I have no right to ask you..."

"Ahhh! I see. Hmmmm."

Tom was looking uncomfortable so Mrs. Trunbridge interrupted him.

"All I could ever hope for is that you might help us understand the physics of musical sounds. I am certain that I can locate a craftsman to help with actual design and building."

"But, it sure would be great if Tom here could come up with

something really nifty that would blow the competition out of the water, wouldn't it?" Bud was grinning from ear to ear as he looked back and forth between the other two.

"Well. Bridges to cross once arrived at and all that," she responded. "Now, Tom. I have used some computer photo processing software to mix and match the various bits and bobs that go into modern instruments, and all I have managed to do is to mate a tuba with a clarinet mouthpiece, add a flute-like set of keys to a trombone, and come up with a violin that has six extra strings down the back side of the neck and a membrane inside the body to make give strings something to vibrate against." She smiled, although a bit weakly. I must admit that I got that idea from an old snare drum. Not very good, I suppose."

"I see. Well..." Tom was rubbing his jaw, a sure sign he was concentrating on the matter. Bud saw the teacher open her mouth to speak and quickly placed a hand on her forearm. She said nothing and they both sat there for two minutes while the inventor ran various scenarios through his brain. When he finally looked up he could see them looking expectantly at him.

"Okay. For starters I would like to see the drawings or files for the multi-level violin. Something in the back of my mind is telling me that you may have something there I can play around with."

"Tom'll put it all in his fancy simulation computer, Mrs. Trunbridge, and that will tell us all if it is going to work."

Tom nodded. "Something like that. But more to the point, I will be able to move pieces around and experiment with how it will sound before we ever build a prototype. When we do get around to the building process I think I can use one of our 3-D printers. It will be a great time saver. However, I'm a bit stumped about what to do for the other two instruments." He lapsed into silence again and Bud led the older woman away.

"We'll let him sit there and compute until he either falls over or comes up with something. Don't worry. I'll see that he gets home."

Mrs. Trunbridge shook her head in amazement. Of all the students she had taught in all her years, Tom Swift was the brightest, and quirkiest, of them all.

Ten minutes later Bud tapped Tom on the shoulder, breaking the inventor out of his almost dream-like state.

"Huh?"

"Don't worry, chum. You've only been in Inventorville for a quarter hour or so. I had Mrs. T head back to her class. No telling how long you might have sat there if I hadn't remembered that I've got a date with your sister and need to get back to Enterprises, pronto!"

They left the cafe moments later and Bud dropped his friend off near the entrance to Tom's underground hangar, office and small lab. The hangar usually housed Tom's first major invention, the *Sky Queen*, his Flying Lab aircraft. Across the floor from the elevator and stairs sat a cluster of four rooms. The first one was his small, private office. To one side of that was his small laboratory, and behind the two of them was a small bathroom and a bedroom he sometimes used when he worked particularly late on one of his many projects.

It occurred to him that they had not discussed how he might receive the files from Mrs. Trunbridge. He was about to make a phone call when his computer *pinged*, announcing the arrival of an email. Since all of his emails were screened by Munford Trent, ultra-efficient secretary to his father, it meant the email was important.

Tom got a big grin on his face as he saw it was from his former teacher, and that five files were attached. He got an even bigger grin after he opened up the first file. Where he had

anticipated getting a poorly manipulated photograph of a violin, he discovered that she provided him with a detailed exploded diagram. He could tell that it was from another source originally, but her additions were made with moderate skill letting him see clearly what she was hoping to accomplish.

The other files contained additional pictures and a three-page document with as many notes as she could think to send him. In all, it was an excellent start.

But, a start of what? Was it a viable instrument? Was it going to be too derivative—one of the no-no's of the contest rules? As he sat, thinking, he picked up his phone and dialed an internal number.

“Hey, Hank? I’ve got a little poser over here in the underground lab. Do you have a minute?”

“Sure, skipper. What’s up?” the man on the other end asked. Hank Sterling was Enterprises’ chief pattern maker and one of its top-notch design engineers.

“It’s not a company project, but it is a little important to me. So, if you have a half hour or so, I’d appreciate it.”

Hank promised to be over in under ten minutes. He made it in six.

As he entered the room, Tom spun the monitor around so he could see the exploded diagram.

“Uhhhh, are you going into model instrument making?” he asked with a slightly puzzled look.

Tom told him about the school’s problems and the contest. Hank asked to read the information about the competition. He whistled a few times as he read and looked at Tom’s screen more than once. When he eventually looked up, he tilted his head to one side.

“If you can’t do derivative, isn’t this split-level violin going to

be against the rules?”

Tom nodded. “Yes. I’m afraid so. But if you discount the form factor for a moment, she actually might be onto something. What I mean is, if we begin by removing the extra strings from under the neck and placing them inside the sound box, then activate them electronically according to how the player is using the original strings, I think we get away from ‘derivative’ and into the realm of ‘notable advancement’ as the rules outline. I’m talking about that part that uses the example of a twelve-string guitar being too derivative but a double-necked guitar, where one neck is a bass and the other standard rhythm setup is just on the safe side. And, that a Chapman Stick is completely within the rules.”

Hank’s eyebrows went up. “Chapman stick?”

“Yes. It has ten or twelve strings that can be strummed, bowed or even just touched to get all sorts of sounds. It’s electronic and is supposed to be a real bugger to learn, but once you hear it, it’s beautiful.” He opened a search file on the computer and showed one to Hank. He also played the accompanying audio file.

“Wow! That’s a real eye-opener. Okay, so we can build off the idea of a violin, just not come up with a fancier violin I guess.”

Tom nodded.

They played around with several designs and Hank left an hour later with five possibilities. As he left he promised, “I’ll come up with the structural designs by day after tomorrow and then we can figure out how to skin them. It’s going to be interesting to see what we come up with.”

After he left, Tom began researching instruments throughout the past five hundred years. Where he could locate a lot of information regarding successful instruments, there was considerably less about those that had not been successful.

However, he managed to locate an article about one attempt to meld a typewriter with a small wind-powered organ pipe set. It had failed due to the complexity of controlling all of the valves, and because it sounded, according to one report, “as sour as a herd of ailing sheep passing their wind interminably!”

He had to laugh, but it gave him an excellent idea. Months earlier, he had designed a one-off combination typewriter and tablet computer as a special gift to a past Enterprises employee. The more he thought about how he successfully interfaced the hundred-year plus old keyboard to the modern computer, the more convinced he became that it might be possible to set up the keyboard to interface with a synthesizer.

His face drained of color as a thought hit him. Quickly he flipped through the pages of the contest rules. “Yes!” he shouted at his ceiling when he located the paragraph he was seeking.

3.B.7.a — While traditional piano-style keyboard synthesizers may not be used in any way to control or tune or deliver instructions to the synthesizer components, electronic-based instruments are not forbidden by rules.

That left a lot of room for using electronics. In fact, he began to see many possibilities coming from his typewriter keyboard/tablet computer combination. Before leaving for the day he made notes regarding how such an instrument could be set of reproduce both existing and brand new sounds—at the same time—giving the player both single note as well as chord capability. With a satisfied nod he wrote down one final thing:

Imagine playing this with one finger being a flute, one a clarinet, one a trumpet, one a bass drum, one a harp, and all playing different parts of a single chord?

CHAPTER 3 /

THE PATH THAT LED TO A DEAD END

IN THE next two days, Tom hand-built another keyboard/tablet unit. This time he opted to use an early electric typewriter, one that could both move the platen forward and backward—something he wanted to use to shift the pitch or even the specific scale of the output—and he believed hi might make use of moving the carriage from side to side.

Hank dropped by the second afternoon and they sat at Tom’s desk reviewing the five finished designs Hank had managed to prepare.

“I’m really liking this one, skipper,” he said pointing at a device that looked more like flattened pumpkin, made from wires, than it did a musical instrument.

“Take me through it, because I can’t see how it will be played.”

Hank pressed a few keys and a a bright red “skin” appeared, covering the wire model and bringing into view a set of what looked like keys and a group of eight indentations that appeared to be slider controls.

“Well, for starters I moved all of the strings inside and divided the upper and lower chambers with an incredibly thin layer of a fabric I had the ladies in the Uniforms department make up for me. It’s mostly a mix of Kevlar, carbon and tomasite fibers in a weave that makes it almost air tight, but not quite. And, that’s one of the things that will make this work. You see, without air movement between the chambers, only the vibrations of the membrane pass anything through, and that just won’t work.”

“Okay...” Tom began, cautiously. “Why?”

“Because it is the vibrations coming down from the upper chamber that cause sympathetic vibrations in the strings in the lower chamber. Resonant harmonics.”

With Tom looking inquisitively at the screen, Hank went on to show how the upper chamber’s strings were strummed using the first four of the finger sliders, and the others were to be used in place of a bow. The actual keys tightened or loosened the strings inside to a perfect pitch and could “tune” the instrument up or down a full octave from the central positions.

“Okay. That makes some sense, but you just have a mechanical violin. What’s the differing thing?” Tom asked.

Raising a finger, Hank said, “Ah! I’m glad you asked. You see, the upper strings do play like a violin. But the lower strings vibrate at varying rates all the way from completely in the same sine wave pattern, to running completely counter. It’s going to take a bit of computer magic to keep things from going sour, but we should be able to create exactly opposite sound waves.”

Tom’s brow furrowed. “That would effectively cancel out all music. That’s how those headsets that cut outside noise to almost nothing work. Heck. We use that in the SE-11 jets!”

Hank was smiling so broadly, that he had to suck back a little saliva that threatened to escape the corner of his mouth. “Nope! Well-l-l-l-l-l, actually yes... and nope!” The sounds from the individual strings do cancel out, but that beautiful membrane will have set up it’s own vibration patterns and that lets out the most beautiful and perfect sound through a solid ring that rests against the sides.” He looked pleased with himself, even as he added, “At least, in theory.”

Tom agreed that it was worth an electronic prototype, but

asked for a review of the other four designs.

Only one other seemed to have any real merit. It was about five-feet tall, circular with a heavy tube spiraling upward starting at about the three-foot mark, and featured at least three-dozen strings around the perimeter.

Tom looked at Hank, waiting for an explanation. When none was forthcoming he ventured a guess. “Circular harp?”

Hank looked slightly disappointed, and stood up. He reached into his front pocket and pulled out a ten-dollar bill. Dropping it in front of the inventor he sat back down, saying, “I lost that bet. Bud said you’d get it on the first try, and I told him it would take you a couple tries before you made me tell you. But, basically it is just that. It is a harp that sits on a perfectly balanced central shaft. The musician turns it to get to the string they want. It will be set up with complimentary strings on either side of the circle so they can play a two-note chord. A real one will have foot pedals to pitch up and down.”

“Hmmm. Two notes at once isn’t going to be very exciting, though.”

“It will be when you take into consideration that one string is being plucked while the opposite one is being bowed.” He clicked a key on the computer and a special arced bow appeared. “It will arc away from the strings so you only get one at a time. And everything will run down to a sounding disc that will pick up the fairly quiet vibrations and then amplify it out of an orb speaker at the top.”

He sat back looking happy.

Tom had to agree that it seemed to be an interesting concept, so he also asked for an electronic prototype of the circular harp.

“Come over to the workshop in an hour,” Hank suggested with a smile. “I have been leaning toward those two myself and

have one of my best people working on the prototypes.” He stood up. “See you soon, skipper!”

When Tom arrived Hank was looking a bit glum.

“Not ready for me?” the young inventor inquired.

“No, we’re ready, but what we’ve come up with is one hit and one by-a-mile miss. I won’t even ask you to guess which one. It’s the *Punkolin*, as Herman over there had dubbed it. Does everything it’s supposed to except let any of the actual music out.” He reddened in an embarrassed blush. “We forgot to include any way to let the sound out! So, I had him add simulated sound holes—”

“—and let me guess, all you got was garbled sounds because everything relies on the vibrations to be contained. Right?”

Both Hank and Herman nodded.

“Did you try adding an electronic pickup?”

Both Hank and Herman nodded.

“Did it pretty much fail to do the trick?”

With sad faces, both Hank and Herman nodded, this time very slowly.

Tom laughed out loud. “Okay. Here’s what I suggest. Let’s do the test and demo on the circular harp, and then I’ll go back and design you a circular ring electronic pickup that will go all around the edge of the membrane. If that doesn’t do it, then I have one other idea.”

The circular harp created intriguing noise, but without an algorithm to absolutely simulate proper bowing techniques it made nothing that could be considered music.

Telling the two engineers to go ahead and fabricate a test model of the harp, Tom headed to the large office he shared with his father. He wanted some advice.

After greeting his son, Damon Swift inquired about Tom’s new project. “I hear that you are helping your old teacher, Mrs. Trunbridge. Sounds interesting from what Bud told Sandy and what she told your mother and what she finally told me.”

Tom gave him a brief rundown of the progress he was having with the synthesizer and about the computer models of the two other instruments. “Here’s the thing, Dad,” he said. “that one Hank and his assistant have dubbed a *Punkolin*—and even before Bud managed to get a name in on that one—needs an entirely new type of vibration pickup. I’m fairly certain that it should go around the entire outer edge of the membrane and also act as the seal to the inside of the chambers. But, I’m afraid that the amount of torque pulling the ring in from all directions, might make it collapse. It has to be fairly light weight and flexible or it won’t do what it is designed for. According to Hank, he has the current one handling about fifty foot-pounds in order to get the membrane tight enough to do its job. And, that ring is solid steel.”

Mr. Swift nodded several times before he answered. “If you think that you can make a rings from, oh, durastress or magnetanium—and I believe both would be suitable—then I suggest that you stop seeing this as a planar object. You are talking about a flat disc, your membrane, surrounded on virtually the same plane by a ring. Of course it will probably twist and go out of shape. But, what would stabilize that plane?”

Tom thought and then said, “Well. If it were mounted in a ball, then the stresses would be spread evenly all around and even back into the ring itself. But, we can’t to that. Everything has to be open.” He shrugged.

Mr. Swift merely smiled. “How about if you open that ball? Make it a series of arced struts in the overall form of a ball. It is still open, or at least by ninety- to ninety-five percent, and still

spreads out the forces.”

Tom walked over and placed his forehead on his father’s head. “Thanks, Dad. You keep telling me I tunnel vision things where you look at a larger picture. I guess that’s why you sign the checks around here!”

He went down the hall to his much larger and better-equipped lab and began modeling the pick-up ring and support ball. Two hours later he transferred the file to Hank and then called him. Herman answered saying that his boss had stepped out ten minutes earlier.

After thanking him, Tom tapped the TeleVoc pin under his shirt collar. The quarter-size pin was a fantastic communications device. Part brain wave sensor, part vibration pickup and part muscle tension measurement device, it took the wearer’s thought and sub-vocalized words, and sent them to any other wearer within range. Specifically to the requested receiver and in a simulation of the caller’s own voice. Entire conversations could be carried on using it. They could not be stolen and used by anyone else as each pin was pre-registered to work only with the assigned individual’s brain wave patterns.

The other plus was that for security purposes, they could be monitored to tell where each and every employee was within the company grounds, and anyone not wearing one could be detected by other measures.

Hank did not answer, and a check with Security told him that the pattern maker had left he complex.

“Great!” Tom muttered to himself. “Here we have this great communication device and it can’t get past the outer walls. Nuts!”

Just as he was saying the last part Bud came into the lab. A thought flitted across Tom’s mind but was lost when Bud

spoke.

“Hey, genius boy. Herman over in Hank’s lab just told me all about the Gourd-o-phonica and that twisty harp thing. I like the second one, but that first one looks like a real dud. Are those the things you plan to give poor, old Mrs. Trunbridge?”

Tom nodded. “Looks like it. All the other ideas we came up with, except for one I’m building, were going to lead nowhere. I do like the harp thing, but dad gave me a good idea on how to salvage the other instrument. And, even if it isn’t spectacular, as long as it works and makes nice music it has a shot. Certainly for being the most unique!” They shared a laugh.

But got serious after a minute. “So, what’s this other one you say you’ve got handled?”

“Well, not exactly handled, but it is another unique one. It will fall into the synthesizer category, but with a big difference. For starters, it will be the only instrument that requires touch typing skills.” He smiled, but saw Bud’s jaw drop and his head shake a little. “What? You appear to have a question.”

“Skipper. Think who has to play these things. Twelve and thirteen year olds. Fourteen if we’re lucky. Do you think that they have the typing skills?”

Tom nodded. “Yes. Practically every kid under the age of eight has learned to type thanks to text messaging and video games. Besides. Each school gets just one minute to set up and four minutes to play up to thirty seconds from each instrument. It isn’t like the kids are going to be performing a concert!”

“Well, okay,” said Bud, not convinced. But, even he had to admit that his own typing skills were very poor compared to most people his age. Being an athlete hadn’t left much time for video games or typing.

Ten minutes later they parted ways and Tom tried to recall the fleeting thought that Bud interrupted. It just wouldn't come to him, so he went back to making some refinements to the ring pick-up. He replaced the previous files and then closed out that part of the project.

He was deep into the final rewiring of his electric typewriter/tablet computer when he received a TeleVoc call from Hank.

"Got the design. I'll see if one of the 3D printers can make a test version from carbon fibers. Let you know!"

The next day he did. It wasn't good news.

"Sorry, Tom. The ring pickup works a lot better, but now we can't properly fit everything else inside. I think we have to call this one a no-go!"

Tom was disappointed, and asked his engineer to see if anything could be salvaged, but he knew that with just three weeks to go, there was little chance of pulling out a miracle.

Not even for Mrs. Trunbridge.

CHAPTER 4 /

2 + 2 ACTUALLY DOES EQUAL 4!

IN THE next three days before the weekend, Tom concentrated on finishing his typewriter synthesizer. Bud had dropped by several times but had not yet dubbed it something silly like *Tap-o-net* or *Touch-o-sizer*. That actually worried Tom. Bud was usually pretty quick on giving successful inventions a new name.

On the positive side, Hank and Herman had been able to construct a prototype of the circular harp. When Tom arrived on Friday afternoon for a demonstration, a third person was in the room. He almost fell down laughing. It was Bashalli, his girlfriend, sitting at the harp.

"I would suppose that I never told you that as a child in Pakistan I learned to play the harp," she said getting up and coming over to give him a hug.

"No, I have to admit that I didn't know that about you, Bash."

As she turned to go back to the harp she called out over her shoulder, "You must remember that a woman always keeps at least one little secret from her man."

"Huh?" Herman's head jerked up from the workbench and whatever it was he had been concentrating on.

"No. She said 'her man,' not Herman, Herman," Hank said with a shake of his head. "Well, skipper, we have part of what I think is a winner, assuming that the committee sees this as radical enough. After you listen to Bashalli's recital I'll tell you what I think we need to do."

Tom could see her hand slightly shaking as she readied

herself. He knew that she was not comfortable being in the spotlight, so he softly told her, "I'm sure that anything you get out of it will be better than any of us. I'll be happy even if it's Mary Had a Little Lamb."

"Odd that you should mention that..." she said giving him a mischievous grin before launching into the first twelve bars of *Für Elise*. Then she took her left hand away from the strings and continued to bow the next eight measures before stopping.

Tom, Hank and Herman stood there stunned. Each note had been precise as if she had been practicing on the new harp for weeks.

"Was that acceptable?" she asked, standing up with a look of apprehension crossing her features.

Tom's wide grin made her relax. "Beautiful!" he declared.

"I agree," Hank added, "but it is missing something. Right now it is a harp with a different shape and I don't think it will pass muster for the contest. Plus, with just this limited number of strings working at one time it doesn't give a complete sound. What do you think, Tom?"

Tom thought about Hank's words and had to agree. "But, what do you do? Add more strings?"

"I don't think so. Perhaps Bashalli has a suggestion." He nodded at the girl.

"Well, I believe that the more haunting and beautiful sounds come from it when it is bowed. Any good player can handle at least thirteen strings representing a complete octave, and I would think that the pedals could allow you to jump up or down one or more octaves quickly as I understand this does not rely on actually tightening or loosening strings."

"That's right, Miss Prandit," Herman spoke up. "It's all electronic!"

"Well then, Thomas. It would be my suggestion to have perhaps two complete octaves of strings to be plucked... no, actually it would be nice if they only needed to be touched by the left hand, and then the strings for bowing on the right."

Tom looked at Hank. "Make the lady what she wants and I think we can call this our first success. I'll give Mrs. Trunbridge a call to let her know how we're doing."

"Uh, skipper?" Hank said with a shake of his head. "If the *Punkolin* is a bust, all we have is the harp and your *Type-o-Lodian*." Seeing Tom's shoulders slump at the name he added, "That's what Bud is calling it. Don't let him know that I let it out. Okay?" Tom reluctantly nodded. "So, we have two. What's the third going to be? None of her other ideas are workable."

Taking a deep breath, Tom exhaled and told everyone, "Give me the weekend. Hopefully I'll come up with something."

Bashalli let Tom have all day Saturday to himself while she and Sandy spent the day shopping, walking, and taking in a movie. However, the next day was the fifteen-month anniversary of their first meeting and she refused to let the day go past without celebrating it with the man she had fallen in love with.

Tom was both agreeable to the interruption and worried that the loss of time might put the project in jeopardy, but his brain was at a freezing point and he realized it would do him good to get away from things for several hours.

They went for a leisurely sail across Lake Carlopa, around the small sandy island that sat near the opposite side of the lake, and then up towards the north end of the lake. They anchored in the shallows and lay on the deck getting some of the early fall sun while they watched several aircraft make their final approaches to Shopton Regional Airport.

The afternoon ended with a swim—even the shallow water

had started to get too cold for that—a quick sail back to the boat docks, and an early dinner at their favorite Mexican restaurant. Over dinner, Bashalli pulled out a small box and slid it over the table to Tom. Opening it he found a silver chain with what looked like a military-style dogtag on it. His face split into a big grin when he saw that her face had been etched into one side and the message—To my love, Thomas, on the occasion of our fifteen months together. ILY, B—on the other side.

“I love it!” he proclaimed, leaning over to give her a kiss. When they both leaned back she looked down and gasped. He had managed to place a small box of his own on top of her water glass.

Bashalli opened it up and let out another gasp. It was a bracelet with several bangles on it. A small jet, a rocket, a crescent moon, a sailboat, and a heart. Tears came to her eyes as she understood the significance of each one.

Tom said a silent thanks to Sandy who had reminded him of the significance of the date only a few days before.

After taking her home Tom headed to Enterprises. He had had a sudden idea as they had been driving to her house and wished to get it down on paper—or, in the computer—before it went away.

When Monday morning arrived, Hank and Herman got to their desk only to find identical hand-written notes from Tom stating that they were requested to be at his large lab at 10:00. No other information was given.

They left their building at 9:45 and made the four-minute walk in three and were outside of the lab door a few minutes later where Tom did not keep them waiting.

“Come on in, guys,” he called out hearing their footsteps stop at the open door. He pointed at a pair of stools sitting to his

right where he was facing the large work surface.

“Consider our interests tweaked, skipper,” Hank told him as they entered and sat. “What did that magnificent brain of your come up with, and I’m assuming that this has something to do with our little musical project.”

“It does, and I have,” Tom told them with an emphatic nod. “It should have been obvious to me a week or more ago. In fact, I think the germ of the idea did come to me back then, but I got sidetracked. So, here’s what I’ve come up with.”

He got up and grabbed a notebook computer from his desk, bringing it over to the workbench. As he sat down he reached up to his collar with both hands. When they came back down, he set his TeleVoc pin on the bench and pointed at it.

“That’s the secret,” he explained. “I want to create a variation on that, probably mounted in a device that gets worn around the neck like a low-riding set of headphones, that the instrument player puts on. For security reasons, we’ll run it at an entirely different frequency than the TeleVoc pins, but the principle is about the same. The user provides input both mentally as well as sub-vocally.”

Herman raised a hand. “Uh, what do they do? I mean, what is actually played?”

Tom grinned. “I’m glad you asked that. You see, the headset connects wirelessly with a two-part synthesizer. Their brainwaves control the instrumentation, and that can be set by just thinking of what instrument they want to play. I’m aiming at user’s choice between monophonic and up to eight note polyphonic music. Then, as they think about the notes—we might even try to make it so they are reading right off of sheet music to get the right ones—their sub-vocalized noises go to the other part and that reproduces them almost like a large choir of ethereal voices.”

“Wow,” Hank responded as the implications hit him. “Will they just play one instrument with their personal choir?”

Tom shook his head. “I don’t know. I was thinking that several people could simultaneously use the system, each one providing an individual part of the whole. At least, for live performances. Imagine five or six musicians standing on stage and thinking a hundred-piece orchestra with choir. For other things it could be used for layering.”

“I’m not sure I understand that,” Hank said.

“Well, look at the recording industry. A lot of musicians record multiple tracks to get a finished piece of music. Some, like Paul McCartney, can play so many instruments that they can be a large band all by themselves. Of course, it takes a lot of time to do that. All of the individual parts are assembled together to get the end result. I see this instrument as having that sort of application. One person, many instruments. I might even put in a recording feature. Later on, but not for this demo unit.”

He showed them the basic schematic diagram he had worked on the previous evening and that morning. “I’m having the folks in Electronics come over this afternoon once I get this finished. They will be building the circuitry. I need you two to make a pair of the headsets and the case for the synthesizer. I’ve put the drawing up in the computer.” He provided them with the access information, and they left promising to have everything finished by that Wednesday.

Tom had to laugh at himself when the test headset was presented to him. “Uh... did I mention this is supposed to be for a twelve to fifteen year old? Can you do the same thing, just at ninety percent size?”

Hank actually blushed. “Geez, skipper. I completely forgot about that. Give me the big clunker back and I’ll bring you a

pair of smaller ones. Uhh, do you want them to be adjustable?”

Tom held back the larger headset. “I’ll keep this for my testing. And, yes, adjustable is an excellent idea.”

Herman dripped the new, smaller pair at Tom’s desk in the shared office the following afternoon. “Hank’s working with the E-folks to make sure their circuits fit,” he explained.

By Friday, everything had come together and Tom had three sets of headgear and a pair of synthesizers.

“We figured they’d be plugging into a P.A. system, so we didn’t put in any amplifier. Is that okay?” Tom Davison asked.

“Sure. The contest says that anything requiring an amp can use the organizer’s unit as long as it features standard plugs. These do, so thanks!”

With eight days to go before the contest, Tom called a very nervous Deborah Trunbridge.

“Oh, Tom. That is fantastic news. I can hardly wait. based on what you said you needed I have three of my top music students ready to come over each afternoon next week to practice.”

He explained how that wouldn’t be necessary. “I would like them here on Monday, but after that I believe they should save some time and just have the instruments at school. Locked up when not in use, of course, and I do have one stipulation.”

She asked what that might be.

“At least two of these may turn out to be products that Swift Enterprises may wish to build and sell. I need your assurance that they will never leave the building and that nobody other than you and your three students see them. I’m sorry to drop this on you at this late date, but I’ve had to assure my father that I will recoup any expenses that have gone out on these.

Can you understand?”

She laughed and over the phone it almost sounded like the tinkling of bells. “Oh, Thomas Swift. Of course I understand! My goodness, gracious me. I wouldn’t have it any other way!”

Tom spent the weekend fine-tuning the software for both his *Type-o-Tone* and his *NeuroSymphony* devices. By the time the three students—one twelve-year-old boy and two fourteen-year-old girls—arrived and were escorted to the shared office, they were functioning to his satisfaction.

The harp, what Bud had dubbed the Twang Column, had been ready and working for most of the previous week.

Tom was surprised to see that the boy immediately headed to the harp, and that both girls headed to only one of the others, each. There appeared that there would be no, “I saw that first,” arguments.

Mrs. Trunbridge, who had driven them over, explained that the boy had been playing violin since he was four and had begun playing the school’s one and only harp the previous summer.

“He’s a real prodigy,” she told the inventor under her breath.

At the end of the two hours all three of the kids had huge smiles on their faces and promised Tom that they absolutely loved their instruments.

“Mr. Swift,” the tall of the girls, Tracie Tom believed her name was, told him, “we understand that these are secret. I promise not to tell anyone about them.” She held up her right hand in what Tom recognized as a Girl Scout’s hand salute.

The other two chimed in with similar promises.

“That’s great. Thank you. After Saturday it will be okay to tell everybody about how you were the very first people in the

world to play them other than the technicians who built them.”

On Saturday morning Tom, Bud, Sandy and Bashalli arrived at the school to pick up the instruments in a special delivery van. Mrs. Trunbridge met them and unlocked the music storage room.

“I have several errands to attend to,” she explained, “but here is the address and the person to whom you need to report.” She leaned over and kissed Tom on the cheek. “You can’t imagine how excited the kids are. I have no idea if we have winners in the eyes of the judges, but you have produced three miracles in my mind. Thank you!”

CHAPTER 5 /**JUDGING AND CODA**

THE FOUR arrived in Albany at noon and had to wait for an hour for the woman they were supposed to meet to get back from a lunch meeting with the contest sponsors.

“Oh, my goodness,” she exclaimed once she recognized Tom. “You’re Tom Swift! Oh, this is a pleasant surprise. We had heard a rumor that your company was building one or more instruments for your local school, but I had no idea we would be honored with your presence. Oh, this is wonderful!”

She showed them where to bring the three, crated instruments and pointed out the available electrical and amplification connections.

“I hope those will be sufficient,” she said looking apprehensive.

“Oh, absolutely,” Tom told her. “May we stay backstage until our school’s turn to play?”

“She bit her lower lip before telling them, “Well, you can but only until one minute before the allotted time. Once that begins everyone must either be on stage and ready to actually play, or out front where we can be certain that they are offering no hidden support.”

Tom grinned. “That’s fine. I just want to make certain that there is no prying or snooping.”

The contest was to start at four that afternoon, and Mrs. Trunbridge breezed in just a few minutes past two. Her three students were dressed up for the occasion with the boy in a small tuxedo and the two girls in evening gowns. All three looked calm and cool, unlike Mrs. Trunbridge who was flitting

around straightening a tie here, moving a wisp of hair there and generally working herself into a dither.

After twenty minutes Sandy took her left arm and Bashalli her right and they steered her away from Tom and the kids. “You positively must tell us what you’ve been doing since I left the Junior High,” Sandy told her.

“And, I would love to know what it is like to teach children at that age,” Bashalli added before their voices faded in the background noise.

“We love Mrs. Trunbridge,” the boy, Steven, told Bud, “but she tends to cluck and worry like an old hen.” Bud broke out in a full laugh at that. He had never gone to junior high school in Shopton, but that was exactly his impression of the older teacher since her arrival that day.

The organizers had provided curtained off areas for each school. There were nineteen of them and the closer yours was to the stage, the earlier in the program you would appear. Shopton’s was the eleventh, so they would have about one hour before they were to go on stage.

The kids sat on the chairs provided inside their area and waited until Tom unpacked their instruments.

This caused peals of laughter to come from the Shopton area, and that caused a lot of curiosity among all the other schools.

“But, what if I start to laugh,” Tracie asked.

“That’s why I want you to have some time with it. It is just a little window dressing; just a bit of fun. But, if you think it might affect your playing, then I can take it awayÆ”

“Oh, no. It’s wonderful, but I didn’t expect it. That’s all,” she told him eyeing the addition to her instrument.

When the contest began, the organizer evidently came out on

stage. From their waiting spot, Tom, Bud and the kids heard her introduce herself and the contest sponsor, Brenner Musical Instruments. She went back over the basic rules and also the prizes.

Mr. Brenner, owner of the sponsoring company, gave a short speech about the importance of music in the lives of children and within a few minutes the first school was called out.

Of the ten schools before them, Tom believed that he heard variations on at least six trumpets, seven clarinets or saxophones, three pianos plus another four organs, and ten stringed instruments so inexpertly played that it was difficult to tell what they were.

When Shopton was called Tom already had the three kids and their instruments poised at the edge of the stage area. They walked out to applause—Steven and Mary, first with their *C-Harp* and *Type-o-Tone* instruments—plus a number of “oohhh” and “ahhhh” responses to the beauty of the harp. That soon turned to laughter when Tracie walked out accompanied by a two-foot-tall white robot with short wheel-covering legs and a conductor’s baton clutched in one “hand.”

Tom followed Bud out to the seats on the side of the auditorium where they joined the girls.

Mrs. Trunbridge introduced her students and then nodded to Mary. Sitting at a small desk that had been placed on the stage, she set her instrument down, plugged it into the amplifier system and the closed her eyes. She began “typing” and as she did a variety of sounds began coming from the speakers. As her right hand left the keys and moved the platen up and down the audience was treated to the sounds of at least five instruments. The final five seconds of her play time was filled with a staccato of drum beats and a final symbol crash!

She rose and accepted the audience’s enthusiastic applause.

Steven was next and with the exception of one missed tone on the bow wide, enthralled the crowd. So much so that one woman forgot herself and called out “Encore!” when he finished.

With more than half their allotted time still available Tracie looked at Mrs. Trunbridge, who nodded and held up one finger.

The audience was a little confused when she took her headgear out from behind her back and placed it around her neck, tapping the right side. In response, the little robot raised his arm and baton and counted off four beats.

Then, the stunned audience went into awed ecstasy as she began with a short simple drumbeat to which she added a mournful horn and string sounds unlike anything they had ever heard. But the moment where most of those in attendance gasped came when her jaw began to move behind closed lips and a chorus of unworldly voices came in.

It went on for a full minute and then echoed and faded as she opened her eyes and took a small curtsy.

The crowd went wild. The applause went on for more than a full minute and the three kids stood there, astonished, taking bow after bow.

Finally, the organizer had to come on stage to usher them off and get things back on track.

Tom kissed Bashalli on the cheek and slipped backstage again.

The kids were practically numb from the experience, but all three had huge grins on their faces. Mrs. Trunbridge came back and gave them all hugs, Tom included, and kept telling them in hushed tones how pleased and proud she was of them.

The remainder of the contest progressed without anything

more than polite and encouraging applause for the rest of the school entries. Tom took the time to turn the instrument off and to start packing them away.

The organizer came back and asked him to wait. “We don’t know who will win, but if it is Shopton we will want you to bring those out on stage.”

After the final school presented two of its three instruments—the third failed to work—the announcement was made that the judges would take fifteen minutes to make their decision, “...and we have punch and cookies out in the lobby.”

The kids went out to take advantage of the free sweets while Tom and Bud were joined by the girls. Sandy and Bashalli were practically basket cases by the time the judging panel called everyone back in for their decision.

Third place went to a school from Fredonia, New York.

Second place went to the high school from Watertown.

There was a moment’s silence before the winner was announced. Bashalli was clutching Tom’s hand so hard that his fingers began to throb.

“And, this year’s winner of the grand prize, to be paid by our gracious sponsor, Brenner Instruments, is... Mineola High School, on Long Island!”

There was scattered applause but mostly the audience was mumbling. A few voices called out that the contest was rigged, and Shopton ought to be the winners!

Tom looked over at Mrs. Trunbridge. She was shrugging but trying to look brave.

“May I please have all of your attentions?” the organizer called out. “Please!” It required several minutes until the crowd was quiet enough for her to be heard without shouting.

I need to assure you that this contest was not rigged in any way. And, while the judging panel all agree that the instruments presented by Shopton Junior High School were superior to those of any other entrant, they had to be disqualified because they did not meet the eligibility requirements.”

The crowd began shouting again. The organizer came scurrying to the off-stage area and called out for the Shopton team. Tom and Bud looked at Mrs. Trunbridge who now seemed terrified.

The boys strode to the stage and followed the woman to the podium. Cheers rang out and shouts of “Give it to ‘em!” and some others who weren’t very polite.

Tom, holding up a hand, leaned into the microphone. “Please! Please. “The crowd went silent. “If you will allow me to speak for the Shopton school, I can tell you that our intention was not to fail to follow the rules. But,” her turned to the organizer, “I would like to know which one we goofed on.”

She stepped over and stood next to Tom. “It is a technicality, but we cannot make exceptions. While your school did produce a stringed instrument, one which a hope will become available in the near future so this harpist can play one, and your other instruments did sound like brass and woodwinds, they did not actually meet the qualifications for those families. I am truly sorry as I tend to agree with the audience in that yours should be the winners.

Tom nodded, resignedly, and was about to say something when she spoke back up.

“Our sponsor, Mr. Brenner, would like to say a few words at this time. Please stay here with me,” she requested.

After he took the microphone, the silver-haired man cleared his throat, looked to the side at Tom, and then spoke. “Brenner

Musical Instruments is proud to be associated with this contest and I personally hope it will be repeated next year. When we set out the rules nobody considered that we have are well into the electronic age. We were narrow-mindedly thinking of traditional instruments. Unfortunately, as we have just witnessed, this has constricted what might be designed and constructed. And, while I do want to thank all of you that spent your time and money in creating this wide variety of entries, we sort of got blind-sided by, um, Shopton.”

The audience erupted in renewed shouts to give the contest to Shopton no matter what. He motioned them to quiet down.

“Right. It also must be noted that I am responsible for an additional error in judgment. All along I have planned to offer a special prize for the absolutely most ingenious instrument, regardless of whether or not that school might have two other winners. And that, I am happy to tell you, does indeed go to Shopton Junior High and that incredible harp.”

The crowd went wild and it took three minutes for the cheering to subside.

“To continue, and if we could have the entire Shopton team out here...” he paused while Mrs. Trunbridge ushered the three children out onto the stage, “...it is a distinct pleasure to offer you what we shall be calling the Grand Prize for individual Excellence. It consist of a check for fifty thousand dollars to go to your school’s music department plus a contract to build and sell, under license, your incredible circular harp.”

It took more than an hour for the crowd to disburse—many wanted to see the three instruments up close—and to get them packed away in the van.

As they prepared to head back to Shopton, Mrs. Trunbridge approached Tom. “I want to thank you, Tom. You came through just as I knew you would. Thank you for rescuing our

music department. This is so much more than I ever expected.” She gave him a long hug.

Backing away he grinned at her. “Well, this next part may top that. I am going to get a Patent on the *C-Harp* so that only companies who pay for the rights can built them. And that Patent, is going to bring in—according to Mr. Brenner—about eighty or ninety thousand dollars a year. And that money, once I get the first eight thousand to pay Dad back for fronting us the funds, all goes right to your school and your music program.”

The older teacher’s face was blank. “I... I don’t quite understand this,” she told him. “You-you’re giving us all of the money from this?” Her eyes showed concern and confusion. They turned to joy, however, when he merely nodded.

“Yep! Consider it payback for that day I spilled iced tea on your blouse.”