

CHAPTER VI

TRANSPPOSITIONS AND OTHER ASSEMBLY TROUBLES

Harding says this is "a little subject with a big answer," and I am afraid he is right. Nevertheless, we can break it down considerably.

One of the major trouble areas is in the keyboard.

Keyboard Transpositions

Anything that causes or allows erratic action of the cams will result in transposition. See *Delayed Action Response*, page 13. For a quick check, here are reminders (these items are covered previously; this is merely a check list):

Free end of the cam yoke may be gummy or burred; trigger gummy; kink in the hinge wire; overmotion spring (on Linotype) rests on top of the pivot end of the cam; dry cam; cam teeth filled or worn smooth; cam rubbing on stop strip teeth; glazed rubber roll; belt slipping; friction pulley slipping on rubber roll shaft; grooves in the rubber roll which reduce diameter and make some mats fall faster.

Keyboard causes can of course go on up through the keyrods and into the verge rack or the magazine itself. And remember that anything that makes a mat drop fast will have the same effect as something that makes it drop slowly. The keyrods should not bind in their guides. The keyrod should strike the verge squarely. Magazine and matrices must be clean and in good condition. The big trouble is that many things that usually cause mats to fail, often merely cause them to hesitate; this makes them hard to spot. A sprung magazine or bent mats can cause transpositions.

Watch the speed of the keyboard. Over 275 r.p.m. you may have transpositions with the heavier mats. Note that normally the capitals, falling a shorter distance but traveling farther on the belt, reach the assembler about the same time as the lower case.

Verges must be free and must have sufficient spring tension to pull them promptly back into place. The assembler entrance plate and guides must be

set so mats come smoothly, with support from the plate, and without striking the guides.

Matrix belt should be fairly square at the edges. Assembler entrance covers must be properly set.

The matrix catch spring should be free in its slot. When it is pressed to the left side, it should be level with the surface or below.

The chute spring must allow thick matrices to pass freely. It also must be set high enough (vertically; not in relation to the chute rail springs) so that it will not retard the tops of matrices momentarily as they go into the assembling elevator. This can be observed with the unaided eye.

The star wheel, if worn, may fail to push mats inside the pawls, thus allowing a second mat to jump over.

Other causes: star tension too weak, allowing thick matrices to hold back momentarily. Insufficient tension on assembling elevator retaining pawl springs, so the mats sometimes fall back. Weak brake spring, whereby thick mats are driven too far over and then tip to the right.

Spaceband Transpositions

These may be due to any of the above causes, but spacebands have eccentricities peculiar to themselves. See *Spaceband Transpositions*, page 92.

Machines Using Large Mats

On machines using 18 and 24-point display mats, the large mats will necessarily come more slowly, especially if from an auxiliary. Allow for this. If a newer machine, the star wheel may be slower, or it may be the big size or a three-cornered one. These do not seem to assemble 6 and 8-point as well as the old style. The plain fact is that no machine will assemble 6 and 24-point with equal facility. Go slower on your keyboard work on the small sizes — and don't forget to set your chute spring up and down according to the size you are using.

The Sennett Positive Assembler

QUESTION in *The Graphic Arts Monthly*: We have a machine that regularly gives us twenty transpositions per galley, no matter how careful the operation. Two different operators run it, so it does not seem to be a human fault. We have tried everything — even bringing in two professional machinists — without much relief. Would a Sennett Positive Assembler, from the H. B. Rouse Co. at Chicago, be worth the money? — I. T. T., Tazewell, Va.

It is true that the Sennett assembler is a good piece of machinery. While most machines yield to the treatment prescribed here, and while that should be given first (for if there is a keyboard malfunction, the Sennett assembler

can't help much), sometimes they don't. In such cases I recommend the Sennett, which brings the mat closer to the star wheel via the belt, as on newer Intertypes.

HARDING says he knows from experience that there are times when the Sennett Positive Assembler is the only answer — but, he adds, check everything else first. It is possible to install a Sennett and still have trouble because the reason is elsewhere.

When Absolutely Everything Fails

QUESTION: We are having a young war in our shop. Our night operator gets along fine, but the day operator has transpositions. He constantly readjusts the machine; then the night operator adjusts it back again, and the day operator accuses him of sabotage. Something has to be done or we are going to lose an operator. How can we stop these transpositions? — S. B. C., Salida, Colo.

LOOMIS: This is a question I am glad to answer on paper. It is difficult to answer personally, for the fault is human.

Take a baseball pitcher. His case is easily seen because so much depends on him. One day he has his stuff; the next day he hasn't. It is the same with operators. Over the years I have heard many complaints about transpositions, and have tried conscientiously to correct them. On a certain large paper where I was night machinist a night operator complained at intervals. One week he was particularly disgruntled, and one night he almost walked out. I assumed (as do night machinists everywhere) that the day side was screwing things up. I'd get it fixed and the night operator would say it was fine, but the next night — bang! no dice.

One night this operator very nearly walked off the floor. I was extremely busy, and I told him I'd fix it after he left. But I forget it. The next night he had a grin on his face. "It's wonderful!" he said. "You really hit the trouble this time." I kept discreetly silent, but I was curious. I found out the machine had not been used or touched during the day. So the machine that night was exactly the same as it had been the night before! Then what had changed? The answer was inescapable: the operator was different.

Since then I have observed many operators. Without any desire to be tricky, I have tested them and kept the results to myself. I have also watched my own operating, for I have held many machinist-operator jobs, and I have many times found that one day I was bothered with transpositions, the next day none, the next day bad again — and in the meantime no one had touched the machine.

This was the final proof: the teletypesetter. I have seen a machine run for hours on teletypesetter without a transposition, but stop the tape for one day and put the machine into manual operation and you have transpositions, and

the teletypesetter is blamed, but put the machine back on tape the third day and there is no trouble.

I have gone into this at length, for it is hard to convince a good operator that he has off days. The difference is subtle, and crops up only with something demanding, like ball pitching or operating. The secret of good operating is rhythm, which means even spacing between letters. The teletypesetter does it perfectly. It is mechanical and not subject to off days in timing. Humans are. After operating teletypesetters, I am convinced that most of the transposition trouble is human — given, of course, a machine in reasonably good shape. That does not require a keyboard overhaul every three months. I have seen teletypesetters run for three years without even a keyboard cleaning. The one essential thing is that the machine be in good shape to start with. The teletypesetter installation men know that and take care of it. (All this is contrary to what many "authorities" say, especially some members of the I. T. U., to which I have belonged since 1922. But they have a cause. I do not. I am interested only in facts.)

Therefore, if your machine has been running well but suddenly starts transposing and jumbling, give it a chance before you start overhauling. Transpositions do not develop suddenly: they grow — if mechanical. If they start suddenly, the fault probably is you — and you needn't be embarrassed.

Oddly enough, a hangover is not as productive of this situation as some other factors. I am not a psychologist, but I know that emotional turmoil or tension or whatever you want to call it, will cause this trouble. It is worth noting that sometimes the reaction is delayed for several days; it is also true sometimes you cannot trace the origin. Sometimes an operator is just "off," and sometimes it lasts for several days. However, when excessive transpositions go over two days, give a thought. Did they occur abruptly, or have they been growing?

There is a remedy for this even when caused by the operator: slow down, be deliberate. In a couple of hours, very often you will be back in the groove and can gradually increase speed.

It is only fair to note that HARRY G. POTTLE, writing in *Who's Who in the Composing Room*, does not entirely agree with me, for he says "a machine operated by a teletypesetter will also transpose at times." This is true — but I do not think we are as far apart as it might seem. He goes on to say that "a new machine with new matrices will set perfect proofs if its escapement and assembling mechanism are adjusted properly." I agree that any machine will transpose at times, but when these times become more than two or three an hour, it is too much, and when it develops abruptly and without warning, it is likely due to the operator — and I think Harry will agree with me. I have always been most loath to blame troubles of this nature on the operator, as I think a good many operators would testify; it is only in the last ten years that I have become convinced that a certain type of transposition is due almost entirely to an off day.

Why Do Mats Jump Out of the Assembling Elevator?

QUESTION: Within an hour of operation, at least twenty mats will jump out of the assembling elevator. I have let them lie on the floor for an hour just to be sure, and have picked up that many. This is getting my goat. Can it be fixed? — O. S. S. C., Montgomery, Ala.

HARDING: Indeed it can. Anything, of course, that causes transpositions of mats or spacebands will cause a certain amount of jumping out, but there are other things to check first: strong star wheel, weak brake spring.

If the operator customarily allows the assembling elevator to fall unsupported, the brake release operating lever will become pounded and allow the assembling elevator to seat too low; this will cause jumping out.

LOOMIS: What Harding says is correct, and I have only emphasis to add. Within my experience, most of this trouble comes from two causes: 1, too stiff a star wheel; 2, the assembling elevator gate is too tight or too close to the back of the assembling elevator. Occasionally the assembling elevator pawls are unusually strong and do the same thing. The gate must be set so there is clearance for a new mat — about .005" space. The star wheel in normal operation slips a fraction when it hits a mat, and gives the mat a chance to settle. If the spring is too strong, there is no slippage, and the mat may get thrown a couple of blocks.

Otherwise, all the factors pertaining to assembler, assembler slide, assembling elevator, spacebands (which are treated in the next chapter), and keyboard, verges, magazines, and channel entrance partitions, are pertinent. Anything that delays a mat momentarily may cause jumping out as well as transposition.

Observe: If the peripatetic mat is always the same letter, look in the keyboard or above. If they are fairly well scattered, look to the assembler functions.

Mats Clicking on the Way Down

LOOMIS: One last word: On a machine where mats jump out or transpositions occur, you will sometimes hear an erratic clicking as the mats fall. It does not occur on every mat, but occasionally or frequently. It's a click louder than the usual steady dull click of mats falling normally, and if you listen you will easily detect it as you set type. This indicates that mats are hitting an obstruction which slows them down until they are hit by the next mat. With only a sixth of a second between mats, there is no time for loitering.

Look first to the small assembler cover and see that it does not protrude past the edge of the large one. See that there is not too much space between

the large cover and the matrix delivery belt support plate — preferably not over six points. Be sure these mats are not catching at the upper ends of the chute rail springs. Also, if your entrance guides at the lower ends have at some time been bent unusually straight, a mat may drop straight down, get smacked by the belt, and be tossed up against the next guide. By this time a later mat can hit it. The guides should be curved at the bottom to usher the mat onto the belt with ease.

Most of these points have been covered in other connections, but are worth repeating here in answer to the question.

When the First Mat or Usually a Heavy Mat Jumps Out

LOOMIS: This indicates loose brake spring, no assembler buffer at the right end (allowing the assembler slide to bounce back and leave a crack), too much speed on the mat delivery belt (I prefer the delivery belt to run below 600 r.p.m.), or lack of adjustment of the chute spring.

In regard to delivery belt speed and rubber roll speed: on most machines these are set so that if one is right, both are right — unless they have been changed later. (Sadly enough, this often is the case. If m-o's did not fool with machines, life would be much simpler. Also, perhaps they would not be human, but flying saucer pilots. Nevertheless, I once knew a woman in Deadwood, S. D., who had been the sole operator of a Model 8 from the day of its installation, who had no wrenches and only one tool — a screwdriver that never had been used for anything but changing liners. The machine was six years old when I got there, and her only complaint was that two letters didn't always drop!)

When I got my Model 15 running at $6\frac{1}{2}$ lines a minute, with a 4" pulley on the intermediate shaft, the keyboard rolls were doing 350 r.p.m. and the mat delivery belt pulley 750. The proper place to correct this is at the intermediate shaft pulley, but what I wanted — a $4\frac{1}{2}$ " or $4\frac{3}{4}$ " — was not available, so I used V-pulleys and cut down the two speeds separately. The rubber rolls now are 300 — not what I aimed at but probably all right, for the magazine on a 15 has more slant — and the mat delivery pulley is turning 535. This may not be the final word, but she is beginning to feel like a real machine.

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