

GRAPHIC WHIZARD^{INC.}

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Web Site: www.graphicwhizard.com

GW 6000

Reference Manual

Shown with optional second head & optional stand

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Version 99-07

DECLARATION OF CONFORMITY

Application of Council Directive:

73/23/EEC
89/336/EEC

Standard to which Conformity is declared:

EN60950 for Safety
EN50081-1 & EN50082-1 for EMC

Manufacturer:

Graphic Whizard Inc.
6635 Kitimat Road, Unit 34
Mississauga, Ontario
Canada L5N 6J2

Importer:

Type of Equipment:

Numbering, Perforating, Scoring & Slitting System

Model: GW 3000

Serial Number: _____

Year of Manufacture: _____

I hereby declare that the equipment specified above
conforms to the above Directive and Standard.

Place: Mississauga, Ontario; Canada

Date: September 8, 1999



Ron Miziolek, President

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1.0 GENERAL OPERATION

The GW 6000 is a numbering, perforating, scoring, and slitting system. It operates at three speeds that is factory programmed to print 6000 sheets per hour, assuming 1 hit per page and a 15 millisecond solenoid pulse width. The operation of the machine is controlled by a microprocessor with an LED display and keypad interface.

The system allows for a maximum of two numbering heads, which can independently turn off or on for a maximum of 1 job with ten hits per head that, are stored and recalled for future use. Numbering can be done on single sheets (13# bond to 12 point card or 45 to 250 gsm paper) or multi-part carbonless forms (up to 10 parts) while simultaneously perforating, slitting and/or scoring. The unique friction feeder sends through one set at a time, even from the unglued side of a padded set. The pressure adjustable feed shaft ensures consistent registration. Perforations are done between the feed and main rollers producing a straight perforation, slit or score, avoiding tail whip. Perforating wheels are offered in a wide range of teeth configurations and can be quickly changed using the retaining ring pliers supplied. A photocell recognises the lead edge of the sheet and the microprocessor stops the sheet at the specific location(s) where numbers are required. The numbering heads are electrically operated. All this, in a compact design.

1.1 TECHNICAL DATA

Areas of use:

Paper weight:	12# - 12 point (45-250 gsm)
Paper formats:	max. 18" x 18" (45 x 45 cm)
	min. 3" x 5" (7.6 x 12.7 cm)

Electrical configuration:

Voltage:	90-135 VAC or 180-270 VAC
Frequency:	60 Hz or 50 Hz
Fusing:	115/230V, 3/5A

1.2 SAFETY REGULATIONS

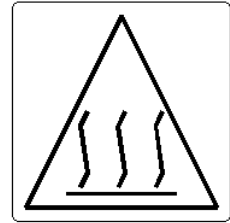
- **Before using the machine, you must read the operating instructions.**
- **Professionals must only eliminate damage or extraordinary malfunctions.**
- **Never insert your hand into the machine while it is running.**
- **Do not wear loose fitting clothing when working with the machine.**
- **Make sure that the machine stands on a level and well-ventilated positions.**

1.3 CAUTIONS CONCERNING MACHINE

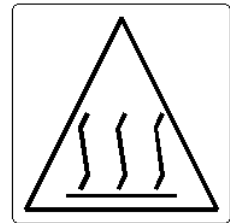


time to cool down.

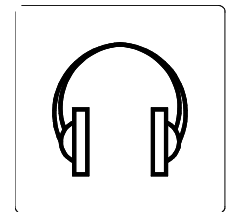
CAUTION – The solenoids may get hot during operation. Do not touch the solenoid case while the machine is running and until it has been given enough



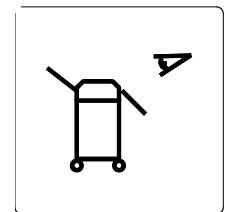
CAUTION – The motor may get hot during normal operation use. Do not touch any vicinity near motor.



CAUTION – On Electric Solenoid machines the noise levels can be excessive and hearing protection may be required.



CAUTION – Machine should never be left unattended.



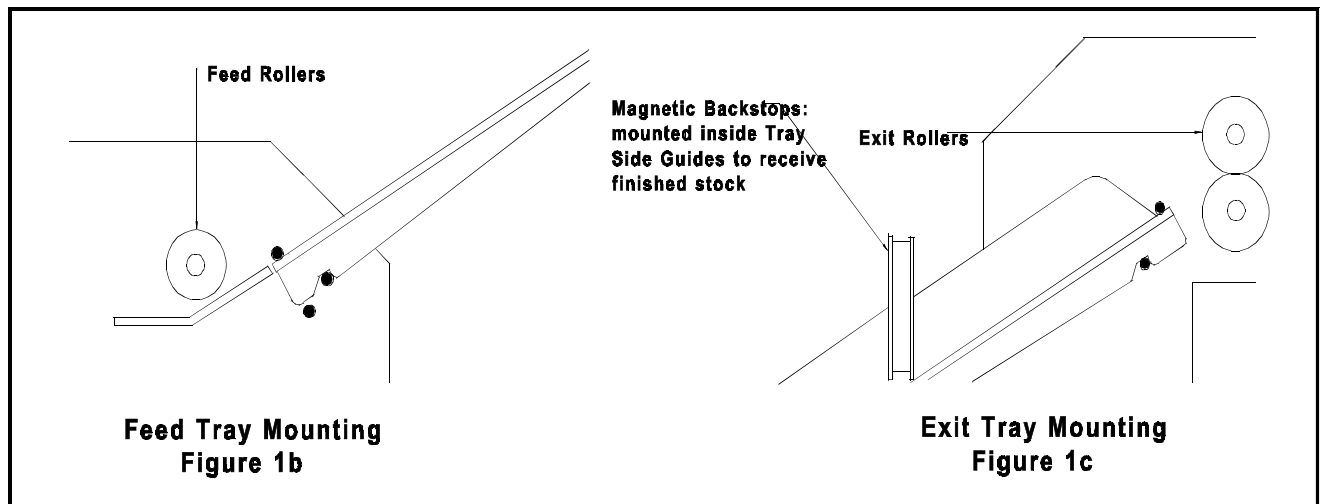
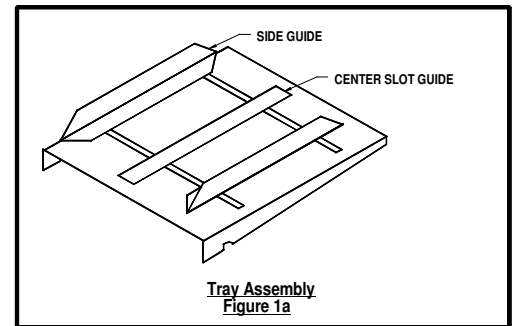
2.0 MACHINE ASSEMBLY

2.1 Feed and Exit Trays

The feed and exit tray assemblies are comprised of four components each: the tray, two tray side guides and a centre slot cover (see Figure 1a).

The trays sit in the machine on mounting pins inside the machine's side frames as shown in Figure 1b and 1c. The trays can be easily removed and stored elsewhere when not in use.

Place the tray side guides, bottom flange towards the centre and the centre slot cover on the tray as shown in Figure 1a and screw on the nylon wing nuts to secure the pieces on the tray. The operator side tray guide of both the feed and exit tray should be pulled all the way over to the operator side before tightening its two wing nuts.



Note: It is critical that the operator side tray guide be moved all the way over to the operator side of the machine to ensure that the stock being processed through the machine passes directly underneath the photocell. If the stock does not pass directly underneath the photocell, the machines will not recognise sheets and the program being run will not be initiated.

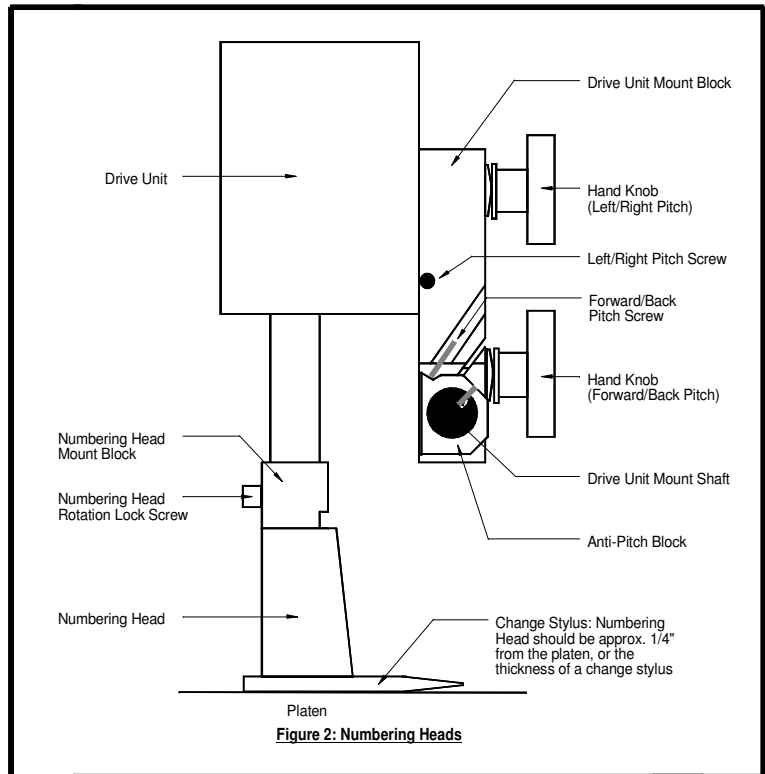
Place a pile of the stock to be processed in the feed tray and use it to align the non-operator side tray guide to the pile. Allow a fraction of an inch so that the pile flows freely up and down the tray if released from the top. Set the exit tray in a similar manner, although the accuracy of the non-operator side guide position is not critical.

As a backstop to finished stock, there are two magnets included with the machine (unless equipped with the conveyor outfeed) that are set inside the side tray guides on the exit tray. Relative

position of the magnets depends on the stock being processed, but the magnets should be set such that the stock does not slide down the exit tray too far, possibly causing sheets to get in uncollated order.

2.2 Numbering Heads

The numbering heads are already secured to the drive unit by two screws through the numbering head mount block as shown in Figure 2. The drive unit is then mounted to the drive unit mount block using the hand knob provided. While installing the drive unit, make sure the screw cap on the back of the drive unit fits in the cavity on the drive unit mount block so that the rubber plug provides some pressure against the screw cap. You may have to back out the left/right pitch screw in order to do this. Plug in the cord from the drive unit into the appropriate receptacle on the non-operator side cover (closest head to the closest receptacle). If your machine is equipped with more than one head, by convention, the numbering head and drive will refer to unit closest to the operator control panel as head #1 (**H1**) and the other will be head #2 (**H2**).

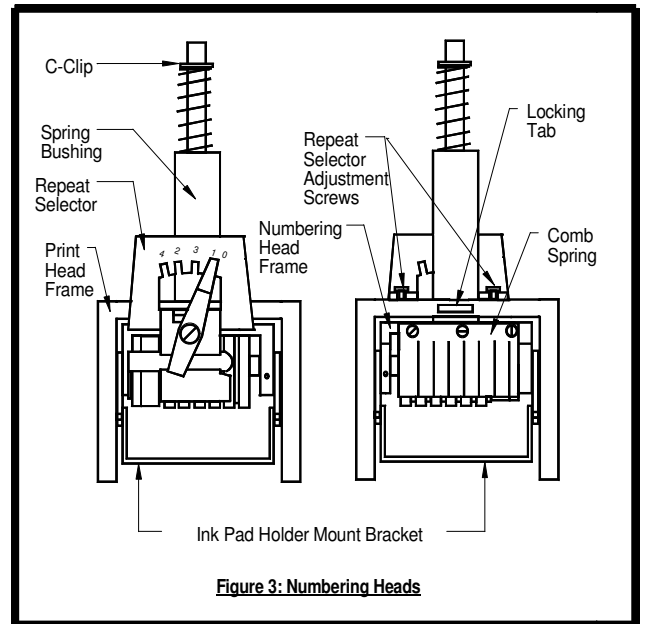


The height of the numbering head has been factory set and it is critical to the proper performance of the drive unit and numbering head. This distance is approximately 3" or the thickness of a numbering wheel change stylus. However, the numbering head must be levelled to ensure that the numbering wheels strikes the sheet square to provide a quality inked impression and a flat crash impression on carbonless sets. This will be discussed later (Section 4.11).

The numbering heads can operate through 360E. This is done by loosening the numbering head rotation screw (using the large hexdriver supplied) located on the front of the numbering head mount block. Once the screw is loose, the head is free to rotate. Tighten the screw once the desired position is achieved in order to prevent any movement during machine operation. The standard numbering head is $\frac{3}{16}$ " (4.5mm) Gothic style, reverse order, 6 digits with 2 drop wheels. The numbering head employs a pre-inked pad, which can be purchased in red or black. These ink pads will supply you with approximately 15,000 impressions. Uninked pads may be purchased if a different colour is required (Note: any ink used must be a **non-metal corrosive** one, labelled numbering machine ink).

The numbering head comes standard with six numbering wheels (a seventh numbering wheel is optional), the last two of which are drop wheels (this will be discussed later). The first 5 digits may be activated automatically. **The 6th (or 7th) digit must be changed manually.** Also available are letter prefix wheels (A-J; K-R; S-Z) and a μ prefix wheel. Modifications are possible with new numbering head orders or by special order.

The numbering heads also have a repeat function. The repeat selector (see [Figure 3](#)) allows a number to be repeated from one to four times. By leaving the repeat selector in the "0" position, the number will not change when the head returns to the print position. Using the "0" position prevents you from having to re-set the starting number when you are programming a new job (this will be discussed later). Position "1" changes the number consecutively with each stroke and positions "2", "3" and "4" repeat the number 2, 3 or 4 times respectively. The repeat functions are achieved by a mechanical ratchet action in the numbering head. When trying to use these functions, you may have to cycle the numbering head manually in order to match the number of repeats on a page to the number positions on a page.



2.3 Optional Conveyor Outfeed Plate

The conveyor outfeed plate sits in the machine in the same fashion as the exit tray. Make sure that the spur gears mesh and do not force the conveyor outfeed plate into position. The pile tray is mounted on the end of the conveyor outfeed plate, with two Phillips screws and acts as a backstop for the finished stock.

2.4 Additional Switches and Controls

The main on/off switch module is located under the feed tray on the back of the operator side plate. This module also houses the main fuseholder and power cord.

3.0 Operating Keyboard

Figure 4: OPERATING KEYBOARD

The operating keyboard is comprised of six LED segments, various buttons and a Impression Control which consist of one potentiometer knobs that control the crash strength of the numbering heads, and can be adjusted to best suit the requirements of the job. For example, you may require stronger crash numbering for carbonless sets than for single sheet bond paper. This adjustment can be done while the machine is stopped or running (see [Figure 4](#)).

The four buttons under the LED display will perform whatever function is shown directly on them.

SET/FWD - Used to set up a numbering job and incrementing the motor in a forward direction.

CLR/BWD - Used to clear programs and increment the motor backwards.

H1 - Used to control head number one, which is the head closest to the operator.

H2 - Used to control head number two, which is the head furthest away from the operator.

START - Used to start the machine.

STOP - Used to stop the machine.

Once you have plugged the machine in, turn the on/off switch to the 'on' position. The LED display will be blank for a second the two lights for the safety lid and photocell will light up. The system will do a check on each LED line segment and then look like the above.

The GW 6000 does systematic error checks, if it detects an error it will display a numeric value. A list of all possible error codes is listed on page 21.

3.1 Running a Job

The machine is capable of storing a maximum of 1 job with 10 hits for recall and future use. Ensure that there is paper in the feed tray first. Pressing the 'START' button will automatically begin the program that was previously programmed in the memory.

3.2 Stopping a Job

There are two methods of stopping the machine.

1. Once the program is running, pressing the 'STOP' button will cause the machine to finish the stock it is currently working on, move the next stock into the starting position and then stop the motor.
2. If you want to stop the machine while stock is still left in it, simply hold on to the stock in the feed tray. After about one second, the machine will automatically stop (since it is no longer seeing any new sheets). This is how it also stops when all of the stock in the feed tray is gone.

3.3 Clearing A Program

To completely clear a program from the memory insert a paper in the feed tray. Press the SET/FWD button. The paper will then feed through and stop at 75. Press the CLR button and hold it down, next press the H2 button and this will clear the memory.

3.4 Changing and Programming a Job

Whenever you wish to change or program a job, insert a piece of paper into the feed tray and press the SET/FWD button. The paper will go through the machine and stop in front of the photocell. The DIG 5 will have P indicating you are in the program mode, DP 5 will light up indicating the motor is on in the forward position, DIG 1-0 will have 75 and DP 0 will light up indicating that a

hit exists in the program. To clear the memory completely press the CLR/BWD button, while holding it down press the H2 button, you will notice DP 0 will go off, this indicates that the memory and all hits have been cancelled.

As a guide, refer to the orientation of the LED digit segments (DIG 5-0) and the Decimal point functions (DP 5-0) in the picture.

DIG 5 – Displays “P” for Program Set-up.

DIG 4 – Displays “h” only if a hit has been programmed at the current position.

DIG 3 - DIG 0 – Current paper position in steps from the paper leading edge. In run mode they act as paper count.

DP 5 – Indicates the motor direction On = Forward

DP 4 – If it is on it indicates all 10 hit positions are used.

DP 3 – No function.

DP 2 – Solenoid 1 – On indicates Head 1 will be fired at the current position.

DP 1 – Solenoid 2 – On indicates Head 2 will be fired at the current position.

DP 0 – Indicates a hit exists in the program.

Changing the position of a hit can be done by scrolling (SET/FWD or CLR/BWD) to where the previous hit existed. Once there the head will fire and you will have an “h” displayed in DIG 4, the numbers indicate the stepper count position. You will also have either DP 1 and/or DP 0 lit depending on which numbering head was activated. Pressing Either H1 or H2 will toggle the lights off or on. When DP 1 or DP 0 is off, it indicates there is no longer a hit programmed at that position. Now by scrolling with the SET/FWD or CLR/BWD buttons you can reposition the number hit.

Once all is set, press START and “SAVE” will display in DIG 5-2 and the current sheet will eject. The machine will go into the idle mode. This will show DIG 4-0 as 0’s. Any numbers on the display will be a paper count; pressing the CLR/BWD button will clear this back to zero.

To run the job, insert paper into the feed tray and press start.

3.5 SPEED CONTROL

The GW 6000 is equipped with three speeds. Slow speed is the default when you first run the program. While the program is running press 'H1 and/or H2' will increase and/or decrease the speed, indicated by the vertical lines you will notice on the far-left side of the display vertical lines. Three of these lines indicate high speed, two for medium and one for low speed.

4.0 Setting up a Job

To set up the machine for a specific job, a few items must be adjusted depending on the specific stock being run, the number of heads being used and the number of perforations, slits or scores required. In order to keep it simple, adjustments required will be discussed from the feed end of the machine to the exit.

4.1 Aligning the Feed Tray Guides

As previously mentioned, the operator side tray guide should be seated all the way to the operator side. This will ensure that the stock passes directly underneath the photocell, allowing the program being run to initiate. With a pile of the stock placed in the tray, align the non-operator side tray guide with the pile. Allow a fraction of an inch so that the pile flows freely down the tray if released from the top.

Move the center slot cover so that it is in the middle of the two side tray guides and tighten the wing nuts.

It is very important that the stock enter the machine, square, to ensure that all perfs are square and straight. To test for square feeding, place a piece of stock in the feed tray and align the lead edge with a straight edge within the machine (such as the straight edge of the feed platen, or the edge of the first shaft in the machine). Now, check that the operator side feed tray guide is parallel to the close edge of the paper for squareness.

4.2 Setting Feed Tire Pressure

The friction feed system used in automatic Graphic Whizard machines is unique. It utilises three top feed tires to feed sheets through with a consistent pull along the full lead edge of the sheet, and a continuous width sheet retarder (the strip of fine sandpaper on the feed platen) to separate sheets and prevent double feeding.

Once the feed tray and side tray guides have been assembled according to the sheet width required, you may locate the feed tires along the feed shaft. For proper sheet feeding, the position of the three feed tires along the width of the sheet is also important. Loosen the setscrews of the feed tire hubs using the small hexdriver provided in the accessory kit. Slide the feed tire hubs along the feed shaft, setting the two outer tires at about 12" in from the outside edges of the stock. The third, middle feed tire is simply centred. Keep the three setscrews of the feed tire hubs in line on the feed shaft. Tighten all setscrews (see [Figure 5](#)).

If a feed tire is set too close to the edge of the sheet, its feeding efficiency will be affected by variances in the stock such as sheet curl and inconsistent glue thickness on multiple padded forms. Improper setting of the feed tires can cause random skewing problems.

Warning: All feed and exit tires, and perf/score/slit boss wheels use setscrews to secure their positions. When tightening setscrews, do not over-tighten them. This may scar the metal shafts and inhibit the free sliding movement of the feed tire hubs or perf/score/slit boss wheels.

To ensure consistent, trouble-free feeding, the feed tire pressures must be set as loose as possible. **The feed tires should never contact the retarder strip!** Our design allows for no double feeding with substantially reduced feed pressure than the typical friction feed system. The gap between the feed tires and the feed platen should be just less than the thickness of the stock being used. Remember that we are retarding the full lead edge of the next sheet or set. When setting the feed tire pressures, you should have the sense that the feed tires are just touching the paper. It is better to set the feed tire pressure to the minimum pressure required to prevent double feeding. The remedy to correct double feeding is to turn down the both feed tire pressure adjusting screws a χ th turn until consistent feeding is achieved. If the feed tire pressure is too much, you will possibly mark or pull apart forms.

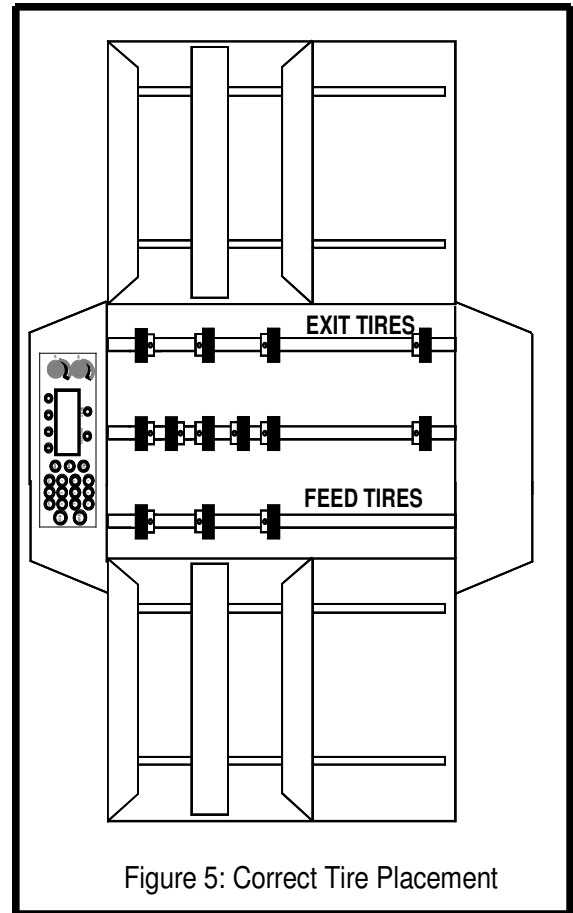


Figure 5: Correct Tire Placement

Adjustments for feed tire pressure are made with the feed tire pressure adjusting screws (see [Figure 6](#)). It is recommended to place two sheets of the stock in the feed tray with the feed tire pressure set loosely. Hold the two sheets in your hand with one sheet ahead of the other. Place the leading edge of the first sheet under the feed tires. Slowly tighten the feed tire pressure adjusting screws while jiggling the pages back and forth. The correct setting is achieved when the second page is no longer able to run under the feed tires.

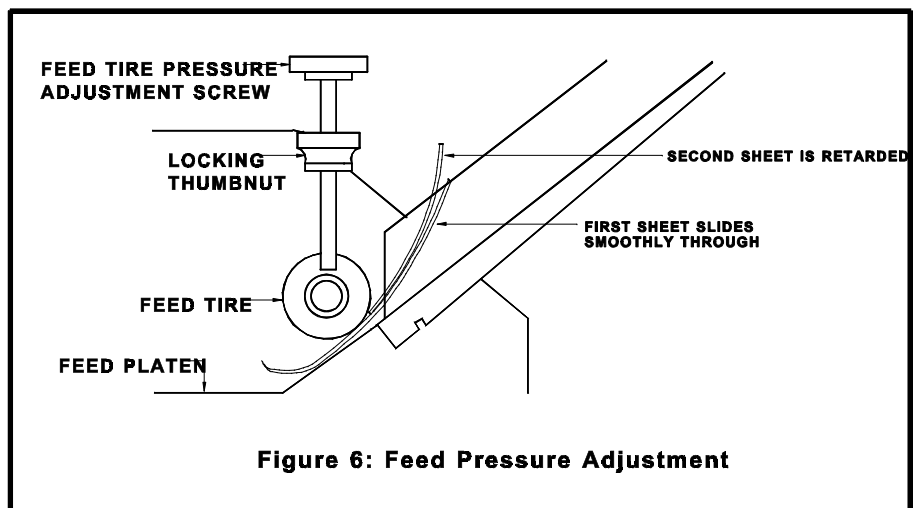


Figure 6: Feed Pressure Adjustment

All three *feed tires* should be adjusted to the same pressure setting to minimise skewing. To check that all the *feed tires* are adjusted to the same pressure, tear a strip off the stock being run and pass it under each *feed tire* separately. You should sense the same amount of drag under each *feed tire*. A tighter *feed tire* pressure on one side of the sheet will cause faster feeding of that side of the sheet (the sheet will skew or twist towards the *feed tire* with tighter pressure). To prevent this skewing, reduce pressure on the side of the *feed tire shaft* where you encounter more drag with a counter-clockwise, χ th of the *feed tire pressure adjusting screw* and increase pressure on the other side by a clockwise, χ th of that *feed tire pressure adjusting screw*. These adjustments should cause a change in the overall balance of pressure from the three *feed tires* without affecting the total *feed tire* pressure.

When you have the *feed tire* pressure set properly, you can then tighten down the white nylon thumbnuts to ensure the setting will be maintained.

Note: The only time the feed is too loose is if double feeding occurs (which the machine will detect and the message "PAPER TOO LONG" will appear on the LCD display). If the feed is too tight, the *feed tires* will try to pull only the top sheet off a set. If this occurs, loosen the *feed tire* pressure a little on both *feed tire pressure adjusting screws* evenly until this no longer happens.

With the GW 6000, carbonless sets feed best from a non-glued edge! Glue thickens the set and can cause waves on the edge, while the unglued edges tend to be more consistently flat.

Advisory: It may require several attempts to get used to this sheet-feed technique, and it is recommended that you practice a few numbering jobs with scrap paper. However, some initial trial and error experimentation will allow you to develop long-term benefits in efficiency.

4.3 Perforating/Slitting

Perforating, slitting and/or scoring can be performed with or without any numbering. As previously mentioned, if no numbering is desired, program '00' has been set aside for this task. The perforator blades are available with 2, 4, 6, 8 and 12 teeth per inch as well as Microperf. The blades can be easily interchanged using the ring pliers supplied with the machine.

Remove the *accessory holder* (see *Figure 7*) from the machine. Simply remove the *retaining clip* from the *blade hub* and pop off the blade. Place the new blade on the *blade hub* and put the *retaining clip* back on. Ensure that the *retaining clip* sits completely in the groove in the *blade hub* in order to prevent any movement of the blade.

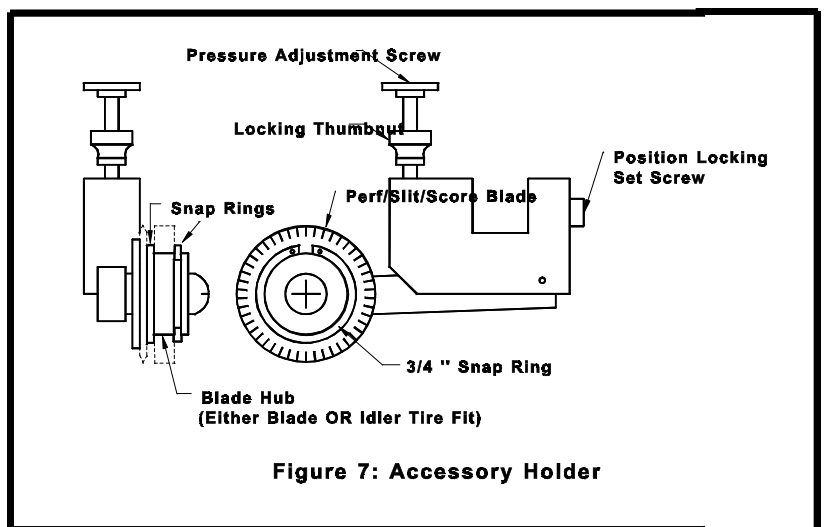


Figure 7: Accessory Holder

Using the small hexdriver, move the bottom *boss wheel* to the approximate location of the desired perforation or slit. (*Note: Keep all of the setscrews of the boss wheel in line on the shaft.*) Move the *accessory holder* to the position desired where the perf/slit blade will ride on the flat surface of the *boss wheel* (see [Figure 8](#)) and tighten the *position locking set screw* into the keyway of the square shaft (using the large hexdriver). Since you can control the depth of a perf/slit, it is critical that you locate your perf/slit wheel to the flat of the *boss wheel*. Tighten the *pressure adjustment screw* located on the top of the *accessory holder* and turn the *handwheel* at the same time. When the perf/slit blade turns with the *handwheel*, test a few sheets. Continue to make adjustments until the desired perforation depth is obtained.

To ensure a straight perforation, score or slit, run a few sheets through the machine. Using a straight edge, check if the perforation line is straight. If not, you may not have the *main tires* placed evenly across the sheet with one tire on the non-operator side. Next, flip the first inch of the lead edge of the sheet over and check to see if the perforation lines up. If it doesn't, double check that there is no excess play in the *tray side guides* and that the *operator side tray guide* of the *feed tray* is over to the operator side as much as possible. You may not be feeding the sheet into the machine, square. To ensure that the sheet is running through the machine square, you can feed a sheet into the machine using the *handwheel* and align the lead edge of the sheet with a straight edge in the machine (such as the edge of the *bottom boss shaft*). To adjust the squareness of feed, you can move the front or back of the *operator side tray guide* on the *feed tray* to make sure the sheet travels through the machine square. If you adjust the *operator side tray guide*, you must adjust the *non-operator side tray guide* as well. Run a few more sheets through and check the sheet again. Continue until the perforation lines up. Now, take the lead edge of the sheet and fold it over to the last inch of the sheet. Again, you are checking to see that the perforation lines up. If it does not line up, again check that the perforation itself is straight. If not, check the *main rollers* for equal distribution over the sheet and also check that the *feed tires* have equal pressure along the sheet. The *feed pressure adjustment screws* dictate the paper travel. The general rule to remember is that a perforation runs away from a tighter tire. If the perforation runs towards the non-operator side, then loosen the operator screw by an χ th of a turn and tighten the non-operator side by an χ th of a turn. Vice versa for a perforation that skews towards the operator side. Make adjustment to the *exit rollers* in the same way you make adjustments to the *main rollers* if the perf starts straight and then tails off. If the perforation is straight but the perforation does not line up, you may still not be feeding the sheet through square.

Whether perforating or slitting, place one of the *strippers* close to the cut. The new cut in the sheet can often cause the sheet to curl up and can cause a jam otherwise.

4.4 Scoring

Setting up a score is similar to perforating or slitting although the scoring blade will run in the groove of the bottom *boss wheel*. With a score, it is more critical to control the depth of the blade, because this controls the depth of your score. When lining up the blade and groove of the *boss wheel*, do not tighten the *boss wheel* until you have run the score blade into the groove using the *handwheel*. Once you have the blade and *boss wheel* lined up you can adjust the depth of the score and run some test sheets, adjusting the depth of the score until you are satisfied. Making adjustments for a straight score are done in the same manner as a perf/slit (as discussed in [Section 4.3](#)).

4.5 Idler Wheel Holders

On the same-keyed shaft that the *accessory holders* are mounted on, for your perf/score/slit operation, there are two *idler wheel holders*. These holders, if possible should be mounted about 1 to 12" from the outside edges of the stock being run. As the stock leaves the *feed tires*, it will then be perfed/scored or slit. The *idler wheel holders'* purpose is to equalise the force along the stock as it passes

through this section, so you do not encounter any skew, which you may encounter if you only had a perf/score/slit wheel contacting the paper before going through the *main rollers*.

4.6 Main Rollers

The *main rollers* are comprised of a bottom solid roller with 6 and 4 adjustable rollers on top. The top rollers are mounted on a spring-loaded shaft, to maintain pressure down to the bottom solid roller. The adjustable top rollers must be distributed along the shaft so that there is a roller on each end of the shaft, with the remainder distributed along the shaft. To ensure proper transport, a majority of the rollers should be on the stock, but do not load all rollers to one end of the shaft where you may encounter stock skew.

4.7 Installing Ink Pads

Loosen the large, star-shaped, lower knob on the *drive-unit mount block* and swivel the *drive unit* up. This will allow you better access to the *numbering head* itself. Slide the *repeat selector*, on the *numbering head*, over to the "0" position (see [Figure 3](#) if you are unfamiliar with the components of the numbering head). Pull down the *numbering wheel frame*, the *ink pad mount plate* swings away giving you better access to the *ink pad* and exposes the numbering wheels. Now press in the *locking tab* which sticks out from the top of the *head frame*. When you pull the *numbering wheel frame* down far enough, the *locking tab* will drop into a groove on the *numbering head shaft* and hold the head in this position. If you pull the *numbering wheel frame* too far down, the *repeat selector* may jam the head. Simply pull the *numbering wheel frame* further down and press the *repeat selector* out of the way.

Remove an *inkpad* from its package (provided in the accessory kit) and grasp the two plastic fingers on the back of the *ink pad holder*. Before inserting the *inkpad*, you must first condition the pad. Because the pad is felt it may have swollen with ink and be thicker than need be. If inserted on the *numbering head*, an inkpad with a swollen felt could cause the *number wheels* to get too much ink and create splattering or fat images. To condition the *inkpad*, use a piece of coated stock (because it is less absorbent) and place the *inkpad* on the coated stock, felt side down. Press down hard on the *inkpad* to compress the felt. You can then soak up the excess ink with the pad. Once the pad is conditioned, you gently squeeze the plastic fingers inwards on the back of the *ink pad holder* and slide it into the groove on the *ink pad holder plate*, with the ink-reservoir side of the pad sliding in first. Release the tabs and the holder.

4.8 Locating the Numbering Heads

To move the *drive unit* into the lateral position required, loosen the large star-shaped knob near the bottom of the *drive unit mount block* (refer to [Figure 2](#)). Loosen the setscrew in the *anti-pitch block* using the large hexdriver. This will allow you to slide the *drive unit* across the width of the machine. You may now move the *drive unit* to the location desired. Bring the *anti-pitch block* over to and against the *drive unit*. Now tighten the large star-shaped knob and set screw in the *anti-pitch block* to lock the *drive unit* in place.

The *anti-pitch block* and *drive unit mount block* act together when locating a number position. If the number position is slightly off, you can loosen one of the blocks and move it over the appropriate distance, using the fastened block as a reference point. Also, when going to replace the *inkpad*, you may move the *drive unit* aside, leaving the *anti-pitch block* in position as a reference when you wish to continue the job.

To turn the *numbering head* so that it prints the number in the correct rotation, first loosen the *rotation lock screw* on the *numbering head mount block*, just above the *numbering head*. The *numbering head* will then be free to rotate to the desired orientation.

When satisfied, be sure that the head has been returned to the print position and all knobs have been tightened.

Once you have the *numbering head* in the correct physical position, program the job. It is advised that you run a few test sheets to check the strength and quality of the crash impression.

4.9 Stripper Assemblies

Each machine is supplied with a minimum of 3 *stripper assemblies*. Their purpose is to keep the stock flat as it runs through the machine and to ensure that the stock does not catch on the *numbering head*. The stripper blocks are to be mounted on the keyed square shaft, pointing down, and the same shaft that the *accessory holders* are mounted on. They should normally be located close to the numbering head but not underneath the *numbering wheels* (this can damage the *numbering wheels*!) or close to where a perf/score/slit is being performed.

If you experience double images when numbering, it is possible that the *stripper* pressure is not enough to keep the stock flat for the crash and the stock is bouncing, allowing a second image to occur. If this occurs, simply bend the *strippers* down to create more pressure on the paper.

4.10 Setting Impression Control

After setting up the machine and then programming a job (*Section 3.4*), test sheets will have to be run to verify you are getting the correct impression, in other words: number sequence; crash strength; level impression; etc.

The *Impression Control Dials*, located on the *control panel* regulate the strength of the crash. Simply turn the dial clockwise if more impression is required for multi-part carbonless work. Check the bottom carbonless copies of the form to see if the impression strength is adequate. If the maximum setting is not adequate, contact your dealer.

Reminder: Carbonless impressions are created as a development process similar to developing a photograph. The numbering image will continue to darken for a full twenty-four hours but will reach about 80% of its full colour in about twenty minutes. Ink chemistry, offset powder and a number of other factors can affect both the time and the extent of the image. Your fresh impressions will be lighter than you want but trust them to darken. What you want to achieve is an even, level impression with minimal or no embossing of the stock.

If making a number of impressions on the same sheet, you may have to turn up the *Impression Control* to ensure a consistent crash from hit to hit. With the electric solenoid drive for the numbering heads, jobs requiring multiple hits on a page require more work from the solenoids. A natural consequence of an electric solenoid working more often is that the coil heats up, giving the solenoid greater resistance to the electrical impulse. When this happens, the consequence is that the hits will get lighter. By increasing the *Impression Control*, you can overcome the greater resistance the solenoid will develop against the electrical impulse. Watching the job in progress, you will also find that the longer

the job, there will be a need to increase the *Impression Control* to maintain a consistent hit over the whole job.

4.11 Flatness of Impression

It is best to check for the flatness of the impression on the bottom crash copy from a carbonless set. The inked impression will not adequately show whether the impression is truly flat while the bottom crash impression shows this quite well. Make some test impressions on carbonless, verify the flatness of the crash impression and follow the proceeding instructions.

To adjust for an uneven side to side impression (i.e. if the impression is too light or too heavy across the machine), determine in which direction the *numbering head* must pivot to flatten the crash (consult *Figure 9a*, which is viewed from the non-operator side of the machine). For adjustment '1' to pitch the *numbering head* away from the non-operator side, loosen the top *hand knob* on the *drive unit mount block* and turn the *left/right pitch screw* counter clockwise. Similarly, turn the *left/right pitch screw* clockwise for adjustment '2'. To adjust for an uneven top to bottom impression, determine in which direction the *numbering head* must pivot to flatten the crash (consult *Figure 9b*). Adjustments for forward/backward pitch are made by first loosening the bottom *hand knob* on the *drive unit mount block* and turning the *forward/back pitch screw* in the appropriate direction. After adjusting, number another carbonless set and make necessary adjustments until the *numbering head* creates an equal impression along the whole number.

4.12 Exit Rollers

The exit rollers are comprised of a bottom roller and four adjustable rollers on top. The top rollers are mounted on a spring-loaded shaft to maintain pressure down on the bottom solid roller. The adjustable top rollers must be distributed along the shaft so that there is a roller on each end of the shaft, with the remainder distributed along the shaft. To ensure proper transport, at least 2 rollers should be on the stock, but do not load all rollers to one end of the shaft where you may encounter stock skew.

Since the exit rollers follow the numbering head positions, make sure that an exit roller does not fall behind a numbering head, where you can possibly track ink, producing ghost images down the sheet.

5.0 RUNNING A JOB

5.1 Setting the Starting Number

In order to set the starting number on the *numbering head*, you will have to pivot the *drive unit* back to get clear access to the *numbering wheels*. Pull down the *numbering wheel frame* and push in the *locking tab* to engage and lock the *numbering head* with the *numbering wheels* exposed.

Each individual *numbering wheel* can be rotated to the appropriate starting number using the *change stick* provided in the accessory kit. Remember that the standard head counts backwards so the number that you set to start the job on will be the last number required.

If you do not require all the digits to print (ie. 0097 is desired instead of 000097), the last two *numbering wheels* can be dropped from profile and locked down. To do this, rotate the *numbering wheel* to the "9" position. Turn the wheel slightly past this position while also pushing down on the "9". When the correct position is reached, the "9" will drop below type height. To restore a dropped wheel to its regular print position, simply rotate the wheel in the regular direction and it will "pop" out of its sunken position and back into regular print position.

Once your number has been set, and the inkpad has been installed (see *Section 4.7*), set the *repeat selector* to "0". Now, pull the *numbering wheel frame* downward to release the *locking tab*. Gently release the *numbering wheel frame* and allow it to return to its rest position. [**Caution:** the *numbering wheel frame* is spring loaded. Once you release the *locking tab*, the *numbering wheel frame* will spring back quickly. Please make sure that you keep your fingers clear of the inner workings of the *numbering head*] If you pull the *numbering wheel frame* down too far and it locks, refer to *Section 4.4*. If you do not return the *numbering wheel frame* to its rest position, the *numbering head* will not operate when the machine is running, since it is already at the end of its available stroke-length. Now you can pivot the *drive unit* back to the print position and re-tighten the large knob.

It is advised to set the *repeat selector* to '0' while running a few test sheets so that the starting number does not change. When you are ready to start your numbering job, then change the *repeat selector* to the action desired.

5.2 Setting the Repeat Selector

The *numbering heads* can be set to repeat a number continuously ("0"), change with every crash ("1"), or change after a number of crashes (ie. "2, 3, or 4"). This setting will depend on the type of job required. The *repeat selectors* is clearly in view on the front of the *numbering head* and requires no special tools to be changed (see *Figure 3*). Remember, for 2x, 3x and 4x repeat action, you may need to run a couple of test sheets to ensure these actions match your numbering sequence, since the *numbering head* is a mechanical process separate from the number position programming.

If the repeat sequence does not match the numbering sequence on your stock, you may need to manually engage the *numbering head*. Push down on the *numbering wheel frame* as many times as it takes to complete the repeat action, counting where the sequence was on your last test sheet.

Example: Repeat action desired is a three time action. After running a test sheet, '9 9 8' is printed. The *numbering head* is in mid-sequence and to correct, push down on the *numbering wheel frame* twice to complete the repeat action. Test another sheet and the sequence printed now is '9 9 7'.

The final feeding concern is the fanning of the stock. This procedure may also take some practice, and in particular when fanning carbonless sets across the un-glued edge. The following steps should be used in order to fan the pile:

5.3 Fanning

1) Hold the paper as shown in *Figure 10*.

- 2) Lower your left hand while holding on to the pile firmly with your right hand.
- 3) Hold the pile tight with your left hand and loosely with the right.
- 4) Return the left hand to its original position.
- 5) Repeat steps 1 through 4 until adequate fanning is obtained.

Try fanning while holding the stack in a vertical, upright position, with the glued edge resting on a table. This will maintain a flat, straight edge. When loading a fanned stack into the *feed tires*, hold the back end of the stack up high (at approximately a 30 degree angle, relative to the *feed tray*) so that the lead edge slips under the *feed tires* (see *Figure 11*). Then, gently lower the stack onto the *feed tray*. Before starting the machine, rotate the *handwheel* one half turn and watch that the first sheet of the stack advances correctly, while the second sheet beneath it should be retarded from feeding into the machine. The efficiency of the feeding can be improved by increasing the spacing between the sheets of your fanned stack. Begin with small stacks (10 to 20 sheets) and build up to larger stacks as you become more confident with your fanning.

Once you have mastered the art of fanning, you can progress to back-feeding to provide continuous feeding and uninterrupted operation. To feed while the unit is operating, fan a stack and, while holding it in your right hand, carefully grasp the bottom set of the feeding stack with your left hand. Raise the back edge of this bottom set, thus slightly raising the back of the feeding stack, and slide the new stack under it. Release the new stack into the *feed tray*, letting it slide down under the feeding stack. Lower and release the back edge of the bottom set so that the stacks now sit together. This back-feeding procedure should be done while there is still sufficient stock in the *feed tray* to allow for the time needed to prepare and insert the new stack.

6.0 Maintenance

The Sprint 6000 is designed to be trouble-free through years of use. Only minor maintenance operations are required to keep it running like new.

6.1 Numbering Heads

With use, the *numbering heads* will acquire a coat of old ink, paper dust, etc. and therefore periodic cleaning is necessary. The minimum frequency of *numbering head* cleaning is once a month or when changing over colors. Detach the *numbering head* by removing the two setscrews on the *numbering head mount block*, using the larger hexdriver provided (see *Figure 12*). The head may then be cleaned with a petroleum based spray lubricant (such as WD-40 or Sprayaway RD-90) and a small brush (ie. an old toothbrush). Spray and soak the *number wheels* thoroughly. **Take care to keep the spray away from the rest of the machine.** Brush the wheels and then rotate them in order to clean every digit. Spray the *numbering wheels* a final time to rinse out the ink or dust. After cleaning, allow

the head to dry completely (ie. leave it standing overnight) or blow it dry with compressed air. Wipe the head and reinstall.

Important: Do not use solvents. Solvents will strip out the lubricants from the head, allow corrosion and impair the correct functioning of the print head.

6.2 Machine Cleaning

After each job, or midway through a very large job, clean the *feed tires*. You can use warm water to clean off paper dust or drying powder, or blanket wash or alcohol if there is ink on the *feed tires*. Any type of rubber roller rejuvenator is also good to clean the *feed tires*, the rejuvenator will also soften the rubber. This will prevent glazing of the rubber. Brand new tires will require extra cleaning for the first job or two until the rubber beds in.

In addition, always watch that paper dust or dirt does not block the photocell sensor eyes. The “green” light on the control panel marked “PHOTOCELL” can verify correct photocell operation. If dirty, simply wipe the photocell sensor eyes but **do not use solvents**. Either use a cotton swab or blow clean with compressed air.

Ensure that the trays and guides are clean.

6.3 Lubrication

The Sprint 6000 utilises ten oil-impregnated bronze bushings to support all shafts. An occasional drop of light machine oil will maintain their lubricating qualities. Wipe off any excess oil to avoid spoiling a job.

6.4 Friction Feed

Over time, the rubber components of the *feed tires* may wear or harden. Use a rubber roller rejuvenator occasionally to soften the rubber. Other than the *feed tires*, another important element of the friction feed system is the full lead edge-retarding *strip*. The abrasive agent on the *retarding strip* prevents sheets from double feeding. As the abrasive agent wears, you will encounter more double feeds and when you see the green backing of the *retarding strip* you must replace it. To replace the *retarding strip* for the feed, adjust the *feed shaft* to its highest position. Using a scribe or sharp edge, etch into the *feed platen* where the *retarding strip* ends (you will use this scribed mark as a reference point when you apply the new *retarding strip*). Peel off the old *retarding strip* (you may need a knife or razor) and remove any old adhesive with alcohol. Replace with a new self-adhesive *retarding strip*. Make sure that there is some of the *retarding strip* surface under the *feed tires* to ensure proper operation.

7.0 TROUBLESHOOTING

SYMPTOM

SOLUTION

Friction Feeder

Double-Feeding

Adjust *feed tires* down by an χ turn (feed is too loose); if the *retarding strip* is glazed or worn (you can see the green backing), replace *retarding strip* (see Section 6.4)

Creasing, marking,
or sets pulled apart

Adjust feed tires up by an χ turn (feed is too tight)

Kicking, turning

Balance adjustment on *feed shaft* required (one side is too tight); adjust feed tray guides closer together to eliminate side to side play (see Section 4.1 & 4.2 for adjustment instructions).

Not feeding paper

Feed may be too loose in which case, multiple sheets are jammed under the *feed tires*, check adjustment; if *feed tires* are smooth or glazed, clean, rejuvenate or replace; open *feed tray guides* (set too tight to paper width and pinching stock)

Print Quality

Uneven crash
impression

Adjust for crash flatness (see Section 4.11)

Faint colour or uneven
colour impression

Replace ink pad. (see Section 4.7)

Excessive inking

Clean head (see Section 6.1); condition ink pad (see Section 4.7) or replace leaking ink pad.

Too heavy (embossing) or too light a crash	Adjust <i>Impression Control</i> dial. (see Section 4.10); check <i>platen pad</i> , if there is excessive wear, the <i>platen pad</i> may require replacing.
Ink spreading, smudging or not drying	Numbering machine ink is mineral oil with pigment. The oil is absorbed by the paper leaving the pigment behind as the image. On slick or glossy stocks, the supplied inkpad will not work effectively. Non-corrosive ink must be used as a substitute (such as fountain pen ink). An important factor with alternative inks is that the <i>numbering heads</i> be cleaned immediately after a job has been run.

Registration

Inconsistent number location (poor number registration)	Check that the photocell is clear of any obstacles (see Section 6.2); if the number location seems to 'float', the <i>feed tray guides</i> may be too loose allowing sheets to skew as they feed (this will be seen more often with number locations closer to the non-operator side, furthest away from where the sheet passes the photocell; if numbers occur all over the place, the photocell may require readjustment (it is too sensitive, mis-registering the lead edge of the sheet)
Perf/score/slit line skewing	With a straight edge, check that the perf/score/slit is straight. If straight, the stock is not feeding square and the <i>feed tray guides</i> may need adjusting to ensure the stock enters square into the machine. If the perf/score/slit line is not straight but is bowed or has a tail whip, the rollers on the <i>main shaft</i> and/or the <i>exit shaft</i> may not be evenly balanced along the shaft, causing uneven pressure on one side of the stock. This causes a skew and the rollers must be evenly spaced across the shaft. A bowed line usually indicates the rollers on the <i>main shaft</i> are uneven, and a tail whip usually means the rollers on the <i>exit shaft</i> are uneven.

Numbering Heads

The *numbering heads* creating an impression are a mechanical process separate from the programming of the machine. If encountering problems with the correct operation of the *numbering head*, such as *numbering wheels* not turning, numbers partially printing, *numbering wheels* turning out of sequence, etc. the *repeat selector* or other

components may be out of alignment (refer to *Figure 4*). Being a mechanical process, alignment of the individual parts is very important. Remove the *numbering head* from the machine. Pressing down on the *numbering head shaft*, you will see the *numbering head frame* slide down the *print head frame*. While this happens, the *ink pad holder mount bracket* will swing away, exposing the *numbering wheels* (see *Figure D*).

The *numbering wheels* and *repeat action ratchet wheels* are mounted on a keyed shaft inside the *numbering head frame*. The wheels are then held in place, and refrained from spinning by the *retaining pawls*, which are forced to the *numbering wheel flats* by the *comb spring*. The *retaining pawls* must be aligned with the flats of the *numbering wheels*, or what looks like in between the *numbering wheels*. The *comb spring* must also apply a constant pressure against the *retaining pawls*. Consequently this alignment not in effect is that the *numbering wheels* may spin freely, causing partial impression or random numbering sequences.

Like the *retaining pawls*, the *changeover pawls* of the *repeat selector* must also be aligned to the flats of the *numbering wheels*. When an impression is made, the *numbering wheel frame* is propelled down the *print head frame*. The *ink pad holder mount bracket* swings away, the *repeat selector* is pushed back from the *numbering wheels* and the *numbering wheels* are then exposed to make their impression on the stock. After reaching the bottom of its stroke, the *numbering wheel frame* then returns to the top position. As this happens, the *repeat selector's changeover pawls* once again come into contact with the *numbering wheel flats*. Depending upon the action or sequence in place, the *repeat pawl* may only interact with one of the *repeat action ratchet wheels* before the *changeover pawls* interact with the *numbering wheel flats*. In most instances, the longest *changeover pawl* comes into contact with the flat of the unit wheel flat to change it over. After a "0" has been printed, there will be more *changeover pawls* changing more *numbering wheels*. When this happens, you may find the next impression, with a "9" as the last digit, printing lightly. This can be overcome by increasing the *Impression Control* to provide a stronger pulse to turn over more wheels. If you are encountering problems where numbers are not turning over, numbers are printed out of sequence, etc., then the problem may be that the *changeover pawls* of the *repeat selector* are not aligned with the flats of the *numbering wheels*.

The *repeat selector* is mounted on the *print head frame* by the two *repeat selector adjustment screws*. The *repeat selector* must be mounted to the *print head frame* squarely. If not, the *changeover pawls* will not engage the flats of the *numbering wheels* square, in this case some of the *changeover pawls* can not change their *numbering wheels*. Visually, check that the *changeover pawls*

are riding in-between the *numbering wheels*, centred on their flats. If not, the whole *repeat selector* may be moved to the proper position by loosening the *repeat selector adjustment screws*. Lastly, the *changeover pawls* must be parallel to each other.

Error Codes

Group	Condition	Error
Paper Handling Errors	01	PAPER JAM
	05	MSTP PAPER ERROR REPORTED IS UNDEFINED
	03	PAPER TOO LONG
Solenoid Errors	02-04, 06-09	Reserved
	10	CH1 OPEN
	11	CH1 SHORT
	12	CH1 HOT
	13	CH2 OPEN
	14	CH2 SHORT
	15	CH2 HOT
	16	CH1 2 HEADS
	17	CH2 2 HEADS
	18	NO SOLENOID BOARD ATTACHED
	19	LOW VOLTAGE SOLENOID BOARD ATTACHED
	20	SOLENOID TIMEOUT
	21	SOLENOID BOARD TYPE INCONSISTENT (BETWEEN MSTP AND ICPU)
22	SOLENOID ADC LIMITS ARE INCONSISTENT (BETWEEN MSTP AND ICPU)	
Motor Errors	23-28	Reserved
	29	MSTP REPORTED UNKNOWN SOLENOID ERROR
	30	MOTOR RUN TIMEOUT
	31	MOTOR TURN ON/OFF TIMEOUT
EEPROM Errors	32-39	Reserved
	40	UNABLE TO READ FROM EEPROM
	41	UNABLE TO WRITE TO EEPROM
	42	CRC INVALID FOR EEPROM PROGRAMMABLE PARAMETERS
	43	CHECKSUM INVALID FOR EEPROM SOLENOID PROGRAM
	44	TESTING FAILED DURING TEST/RE-FORMAT EEPROM
	45	EEPROM VERSION FORMAT ID# DOES NOT MATCH SOFTWARE
Memory Errors	44-49	Reserved
	50	RAM SELF-TEST READ/WRITE FAILURE
	51	CHECKSUM INVALID FOR RAM SOLENOID PROGRAM
	52	CRC INVALID FOR RAM PROGRAMMABLE PARAMETERS
	53	SETUP MODE SOLENOID PROGRAM HIT INDEX OUT OF RANGE
	54	SOLENOID PROGRAM NUMBER IS CORRUPT
Hardware Errors	55-59	Reserved
	60	AC LINE VOLTAGE OUT OF OPERATION RANGE
	61	MOTOR VOLTAGE OUT OF OPERATION RANGE
SCI Errors	62-69	Reserved
	70	ICPU SCI RECEIVE TIMEOUT ERROR
	71	ICPU SCI RECEIVE OVERFLOW ERROR
	72	ICPU SCI TRANSMIT TIMEOUT ERROR
	73	ICPU SCI INVALID ACK RECEIVED
	74	ICPU SCI CORRUPTED MESSAGE RECEIVED
75	ICPU SCI TRANSMIT ABORTED	

	76	ICPU SCI WATING PERIOD FOR MSTP MESSAGE EXPIRED
	77	ICPU SCI INVALID MESSAGE TYPE RECEIVED
	80	MSTP SCI RECEIVE TIMEOUT ERROR
	81	MSTP SCI RECEIVE OVERFLOW ERROR
	82	MSTP SCI TRANSMIT TIMEOUT ERROR
	83	MSTP SCI INVALID ACK RECEIVED
	84	MSTP SCI INVALID COMMAND RECEIVED
	85	MSTP RECEIVE OVERRUN ERROR
	86	MSTP RECEIVE FRAMING ERROR
	77-79, 87-88	Reserved
	89	MSTP SCI ERROR REPORTED IS UNDEFINED
Miscellaneous	90	MSTP ERROR REPORTED IS UNDEFINED

GW 6000 PARTS LIST

PART NO.	6K	DESCRIPTION
10-001-GW	X	Black, Preinked Pad w/holder
10-002-GW	X	Black, Preinked Pad w/holder
10-003-GW	X	Uninked pad w/holder
10-004-GW	X	Felt Insert
10-005-GW	X	Red Ink, 4 oz. bottle
10-006-GW	X	Black Ink, 4 oz. bottle
10-007-GW	X	Changestick
10-008-GW	X	3/32" Hexdriver
10-009-GW	X	5/32" Hexdriver
10-010-GW	X	Ring Pliers
10-011-GW	X	3/4" Snap Ring
10-012-GW	X	Reverse Numbering Head (6 digits, 2 drop)
10-013-GW	X	Forward Numbering Head (6 digits, 5 drop)
10-014-GW	X	Condensed Reverse Numbering Head (8 digits, 4 drop)
10-015-GW	X	Date Stamp Head (month/day/year)
10-016-GW	X	5/8" Wave Washer
10-017-GW	X	Feed Tray
10-018-GW	X	Feed Tray Side Guides
10-019-GW	X	Feed Tray Slot Cover
10-020-GW	X	Locking Wingnuts
10-021-GW	X	Feed Platen Retarding Strip
10-022-GW	X	Feed Shaft Adjust Screw
10-023-GW	X	Locking Thumbnut
10-024-GW	X	Roller Tire (feed/main/exit)
10-025-GW	X	Roller Hub
10-026-GW	X	Roller Shaft
10-027-GW	X	3/8 " Set Screw Collar
10-028-GW	X	Shaft Bushing
10-029-GW	X	Feed Shaft Bushing w/Spring
10-030-GW	X	Shaft Bushing w/Spring
10-031-GW	X	Solid Bottom Roller
10-032-GW	X	Main Platen Crash Pad
10-033-GW	X	Main Platen
10-034-GW	X	Main Platen Grommets
10-035-GW	X	Main Platen Mount Brackets

10-040-GW	X	Hand Knob
10-041-GW	X	5/16" Disc Spring
10-042-GW	X	5/16" Flat Washer
10-043-GW	X	Solenoid w/plunger
10-044-GW	X	Solenoid plunger
10-053-GW	X	Drive Unit Cover
10-054-GW	X	Print Head Mount Block
10-055-GW	X	Exit Tray
10-056-GW	X	Magnetic Tray Side Guides
10-057-GW	X	Magnets (2)
10-058-GW	X	Handwheel
10-059-GW	X	120V Modular Line Cord
10-066-GW	X	5A, 250V Slow Blow Fuse
10-068-GW	X	Impression Control Dial Knob
10-071-GW	X	½ " Cord Strain Relief
10-084-GW	X	Accessory Holder w/12 TPI perf blade
10-085-GW	X	Accessory Holder Adjust Screw
10-086-GW	X	Blade Mount Hub w/bearing
10-088-GW	X	Accessory Holder w/idler wheel
10-089-GW	X	Idler Wheel Tire
10-090-GW	X	Boss Wheel
10-091-GW	X	2 TPI Perf. Blade
10-092-GW	X	4 TPI Perf. Blade
10-093-GW	X	6 TPI Perf. Blade
10-094-GW	X	8 TPI Perf. Blade
10-095-GW	X	12 TPI Perf. Blade
10-096-GW	X	Microperf (42 TPI) Blade
10-097-GW	X	Microperf (72 TPI) Blade
10-098-GW	X	Slit Blade
10-099-GW	X	Score Blade
10-100-GW	X	Narrow Score Blade
10-101-GW	X	Double Score (1/4 " separation) w/Holder & Boss
15-005-GW	X	Red Quick Drying Ink, 2 oz. Bottle
15-006-GW	X	Black Quick Drying Ink, 2 oz. Bottle
15-036-GW	X	¾ " Keyed Drive Unit Mount Shaft
15-037-GW	X	Anti-Pitch Block
15-038-GW	X	5/16" Dogged Set Screws
15-039-GW	X	Drive Unit Mount Block (left/right pitch control)
15-052-GW	X	Solenoid Mount Angle w/tube (left/right pitch)
15-072-GW	X	Complete Drive Unit
15-073-GW	X	Complete Drive Unit w/Reverse #ing Head
30-025-GW	X	Large Clutch Feed Pulley /12k
30-037-GW	X	Rubber Foot
40-003-GW	X	Timing Pulley- 18XL037X3/8
40-103-GW	X	Timing Pulley- 18XL037X1/2
50-007-GW	X	Main Structure Shaft
50-008-GW	X	Feed Platen/8000
50-009-GW	X	Shaft Adjust Blocks
50-011-GW	X	Drive Unit Mount Shaft Bracket
50-014-GW	X	Boss Wheel Shaft
50-019-GW	X	Cross Shaft
50-020-GW	X	Exit Rollers Safety Shield
50-021-GW	X	Timing Belt- 220XL037
50-022-GW	X	Belt Tensioner

50-023-GW	X	1 3/4 " Feed Pulley
50-033-GW	X	Fan Guard
50-035-GW	OP	Stand/8000
50-037-GW	OP	Regular Caster Wheel
50-038-GW	OP	Locking Caster Wheel
90-001-GW	X	Non-Operator Side Plate
90-002-GW	X	Operator Side Plate
90-003-GW	X	Non-Operator Side Cover w/guard
90-004-GW	X	Operator Side Cover
90-005-GW	X	Stepper Motor
90-006-GW	X	Motor Ferrite Bead
90-007-GW	X	Motor Guard
90-009-GW	X	Metal Display Panel
90-010-GW	X	Main Bottom Roller
90-011-GW	X	Photocell Reflector
90-012-GW	X	Accessory Holder Mount Shaft
90-013-GW	X	Stripper Assembly
90-015-GW	X	Safety Shield w/hinge & actuator /3/6/8k
90-016-GW	X	Safety Switch w/harness /3/6/8k
90-024-GW	X	O-Ring Feed Drive Belt/3/6/8k
90-028-GW	X	HV Voltage Solenoid Board 3/6k
90-028-GW-X	X	HV Voltage Solenoid Board 3/6k: Exchange
90-031-GW	X	Low Profile Tie Mounts
90-032-GW	X	12V Cooling Fan
90-054-GW	X	Print Head Mount Screws
90-055-GW	X	Print Head Rotation Screw
90-059-GW	X	220V Line Cord
90-060-GW	X	MSTP Board 120V Connector
90-061-GW	X	MSTP Board 220V Connector
90-062-GW	X	Modular Switch w/fuseholder
90-063-GW	X	Line Filter
90-064-GW	X	Filter to MSTP Board Cable
90-065-GW	X	Board Mount Stand-Off
90-067-GW	X	Photocell Assembly
90-069-GW	X	Solenoid Connection: Board to Female Terminal
90-082-GW	X	Wire Transfer Tube
90-083-GW	X	Drive Shaft Bearing
90-084-GW	X	Drive Shaft Bearing w/Spring
90-085-GW	X	Plastic Electrical Guard
92-025-GW	X	MSTP Board
92-025-GW-X	X	MSTP Board: Exchange
92-026-GW	X	MSTP Chip
92-027-GW	X	ICPU EPROM
92-028-GW	X	HV Voltage Solenoid Board
92-028-GW-X	X	HV Voltage Solenoid Board: Exchange
92-029-GW	X	ICPU Display Board
92-029-GW-X	X	ICPU Display Board: Exchange
92-030-GW	X	Red Screen Cover
92-034-GW	X	Display Board Label/6k
94-003-GW	X	Non-Operator Side Cover w/guard

GW 6000 PARTS DIAGRAM

