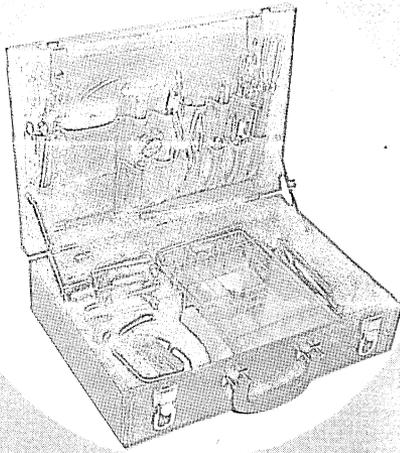




# *ET News Letter*

January 30, 1959



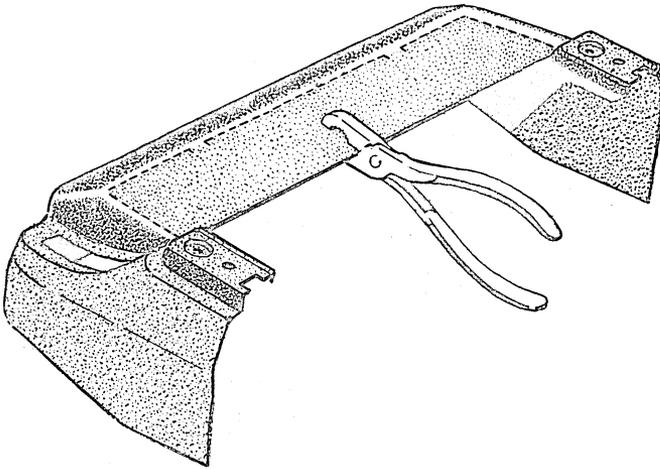
YOUR SUGGESTIONS NEEDED IMMEDIATELY

TO FIRM FINAL SERVICE CASE - POWER CLEANER DESIGN.

DISTRIBUTION TO ALL ET CUSTOMER ENGINEERS PENDING.

## BREAK-OUT SECTION OF MODEL C CASE

Most manufacturers of automatic letter writing equipment, dictating equipment, and other office equipment attaching to typewriters, are making changes necessary to adapt their equipment to the Model C. For information concerning the brackets and/or other hardware involved, contact a local representative of the company concerned. A break-out section has been provided in the Model C lower case, however, to accept linkage from machines which operate the key-levers from below. This section can be broken out as follows: (NOTE: Wear your safety glasses - Be careful of sharp edges.)



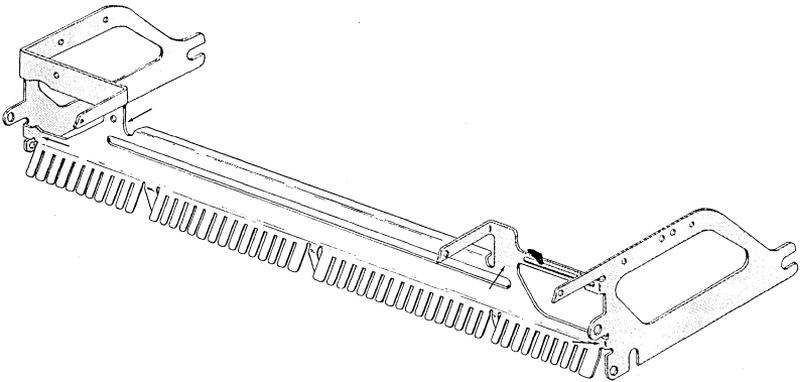
1. Remove the bottom case section and turn upside down.
2. With gas pliers, or other heavy pliers, grasp the case at the center of the break-out section and push down forcefully until the metal breaks away. Continue to break away the case section to both sides, up to the "Score Line" in the case (See illustration).
3. After the metal is broken away as smoothly as possible, remove burrs and sharp edges with a file.

For a smoother break-out, a hack saw can be used to saw along much of the "Score Line".

## MODEL C KEYLEVER ALIGNING FIXTURE

A useful tool for holding key levers in alignment during bearing support removal can be made from a spare bearing support (part #1118217) as follows:

1. Cut the ends from the bearing support assembly along lines indicated by arrows in the illustration below.
2. File the cut surfaces to remove burrs and sharp edges.



By inserting this "guide comb" between the key levers at a point immediately in front of the key lever "adjusting lugs" and by inserting the small fulcrum wire through the pilot hole in the key levers, (small hole to the front of pivot hole) the typewriter bearing support assembly can be removed without disturbing alignment of the key levers. With this arrangement, it becomes a relatively simple matter to install another bearing support since the key levers can now be reconnected to it as a "unit".

This tool will prove particularly valuable in converting from carbon ribbon to fabric since the fabric ribbon feed mechanism is shipped assembled to a bearing support.

## CORRECTIONS-MODEL C PARTS CATALOG

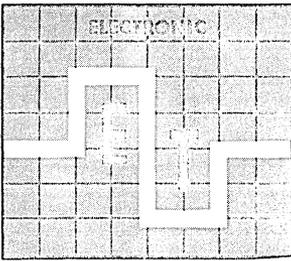
### CARRIAGE AND RAILS SECTION (STANDARD)

Reference No. 182, 183 and 184 on the rear rail correspond to part numbers 1115737 (screw), 1106589 (eccentric) and 1117635 (pawl release lever).

### CARRIAGE AND RAILS SECTION (EXECUTIVE)

Following parts are not illustrated or listed: 1117422 (screw, pawl release lever) and 1117419 (pawl release lever). Reference No. 76 should reflect part numbers 1115827 thru 1115835.

RIBBON MECHANISM - Fabric (Standard Section Ref. No. 146), (Executive Section Ref. No. 279) Spool Assembly-Take up, part number 1118359.



## FILTER CAPACITOR SHIELD

To prevent an annoying scratch or cut, bevel the sharp square corners on the filter capacitor lucite shield in the 632 Power Supply. A quick method is to cut each corner with the diagonal pliers and lightly file or sand any rough edges. (CAUTION.....Cover the relays)

? ? ? RELAYS 297, 298, 299, 331 ? ? ?

All demonstrator machines, serial #11 through 10046, have been modified to the new program level. The following relays were added to accomplish this change:

- Relay #297 Multiply - Column Shift Relay  
Delays  $C_2$  by dropping relay 156 when RO & CS-2 is performed in a  $C_1$  multiply cycle.
- Relay #298  $C_2$  Multiply - Column Shift Interlock  
Provides hold for Relay 156, when Multiply with RO & CS is programmed during  $C_2$ .
- Relay #299 Auto Functions - RO & CS-2 "Prime"  
Parallels Relay 281.
- Relay #331 Multiply Reverse Program Relay  
Reverses A-C and B Read Delay Lines during multiplication.

Refer to: New Program Level, News Letter #56 Page 3.

## LOOSE TOP COVERS

A new thicker Formica Top, same part number 1119930, may be substituted using larger wood screws on all 632 Demonstrators (above serial #10) to replace those damaged or loose due to repeated shipping.

## LOSING HIGH ORDER DIGITS

Loss of all but the units digit may occur during keyboard entry if relay 13BL n/o has an excessive air gap with respect to 13BU n/o. The operation of 13BL establishes a hold for relay 110 and drops relay 107. If relay 110 is not held, a back circuit results from the plus 150 volt supply through one restore magnet coil to the latch trip coil of relay 109.

## DIAGRAM ERROR, 6 & 4 DIGIT CAPACITY

Section 47B of Wiring Diagram #1127000-A should be marked to show a jumper on relay 122 from the #2 n/o terminal to the #3 n/o terminal for digit capacities of 6 and 4.

## RC VALUES --- KEYBOARD RESTORE CIRCUIT

Sections 17B and 18B of wiring diagrams 1127000-A fail to show values of the capacitors and resistors in parallel with each restore coil. These are as follows:

Capacitor	#1127085	.15MFD	500VDC
Resistor	# 512400	200 ohm	1 watt 5%

### CORRECTION - NEWSLETTER # 58, PAGE 8

The part number for replacement tube socket terminals should read #303644, as listed in the 632 Parts Catalog.

### CORRECTIONS - 632 PARTS CATALOG

Relay Gate - Page 9, Reference #18, Change part #441662 to 444044. Also change 32 position to 16 position.

Typewriter - Page 17, Add:

1105524	Cam-Backspace (Repeat)
1071322	Cam-Backspace, Card Punch (Non-Repeat)

Arithmetic Unit Covers - Page 23, Reference #13 Change #1127263 to 1262924 and add: (Includes Nameplate).

### "BITS TO BITE"

If a machine lock-up occurs during multiply-low order test in calc. one on a customer level machine, what position will the carriage assume, with respect to the Field?

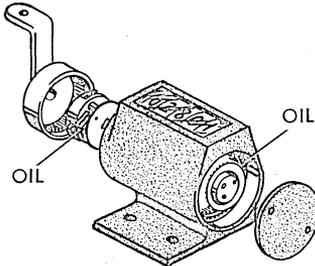
(Answer in next issue)

"Bits to Bite" will appear in each 632 News Letter. Comments and/or contributions are welcomed for this article. Answers to all questions may be found in published 632 material. Therefore suggestion awards will not be offered for questions published. Address all correspondence to: ET Technical Engineering, Department 903, Lexington, Kentucky.

# Service Savers

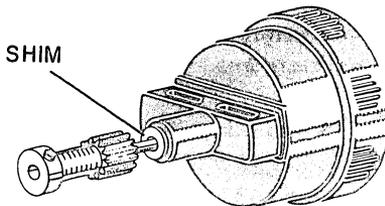
## KEYSTROKE COUNTER LUBRICATION

Failure of the keystroke counter can usually be corrected by placing a small amount of oil in the mechanism. Points to oil are indicated by arrows on the illustration below.



The counter ratchet assembly may be removed by removing the wire clip from the counter shaft. The assembly can then be washed thoroughly and re-lubricated. To lubricate the planetary gear system it is necessary to unscrew the end plate. This may be done by using a small punch and tapping the end plate counter. Care should be exercised not to over-lubricate as this will cloud the indicator window after use. If failing still occurs, the counter should be replaced.

## CENTRIFUGAL GOVERNOR BINDING



Occasionally the centrifugal governor bronze shaft bushing is assembled too far into the governor housing causing the pinion gear to bite into and bind on the governor housing. This results in retarded carriage movement and type crowding.

This condition can be overcome by placing a thin shim (#1090058) between the gear pinion and the governor housing.

## CE SAFETY PRACTICE CARD

A CE Safety Practices Card, enclosed with this issue of the News Letter, includes many safety precautions for ET Customer Engineers. The card also illustrates the standard technique for Artificial Respiration.

These safety practices should be observed by all CE's. Place this card in your Leather Call Report Folder for easy reference

KNOWING SAFETY RULES IS NOT ENOUGH  
OBSERVE THEM-FOLLOW THEM  
USE GOOD JUDGEMENT

### IDENTIFICATION - ALLEN AND BRISTO WRENCHES

The following chart identifies Allen and Bristo wrenches by some of the ET screws which they fit.

PART NO.	WRENCH	SCREWS WHICH WRENCH FITS
9900028	Bristo 6 Flute	Model C Ribbon Spool Shaft Collar Set Screw ( Part Number 257957 ).
9524402	Bristo 4 Flute	Centrifugal Governor Collar. Pin-feed Form Guide Set Screw.
9524403	Bristo 6 Flute	Motor Pulley, Platen Knobs, Power Roll Pulley Set Screws.
9524404	Bristo 6 Flute	Clutch Bracket Set Screws. Form Line Selector Stop Set Screws. Rail Set Screws.
9900029	Bristo 6 Flute	Tab Set Finger Set Screw.
9900019	Bristo 6 Flute	Form Line Selector Gear Set Screw.
9003444	Allen	Proportional Ribbon Feed Roll Shaft Collar Set Screw. Justowriter Motor Governor Collar Set Screw.
9001440	Allen	Model 01 G.E. & Westinghouse old-style-governor set screws, Model A V-Belt Motor Pulley Set Screws.

## ORDERING TECHNICAL REVIEW NO.12

When ordering Field Training Outline Models C1 and C4, or Technical Review No. 12, Model C Fabric Ribbon Mechanism, please order by description rather than form number. These two publications were accidentally assigned the same form numbers.

### CORRECTIONS-MODEL C REFERENCE MANUAL

#### MODEL C1 SECTION, FORM NUMBER 241-5002-0.

Page 9, Keylever Removal. Add; "Remove keylever stabilizer" between steps 2 and 3.

Page 12, Mainspring, Adjustments. Reverse steps A and B.

Page 17, Margin Release Adjustment should read "Adjust so the margin control lever clears the underside of the margin stop by .010" to .015".

Page 20, Figure 16, Twenty Inch Carriage. Change arrow to read, "add last trucks 1/2" to the left of the dotted line".

Page 21, Carriage and Rails, Adjustments. Omit step 4.

Page 26, Tab Lever Mounting Bracket, Removal. Omit step 7.

Page 31, Figure 28. Clutch latch and rear clutch lever links should be in center hole of clutch latch and clutch lever bellcranks.

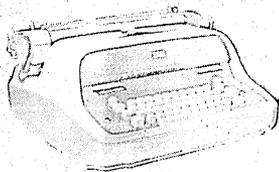
Page 44, Adjustment 12. Add; "Reverse lever should overthrow reverse lever latch by .010" to .020".

Page 48, Adjustments 19 and 20. Change to "with the rewind lever at rest".

#### MODEL C4 SECTION, FORM NUMBER 241-5003-0.

Page 3, Carriage and Rails, Removal. Add between steps 9 and 10:  
Disconnect Pawl Release Link.  
Disconnect Decelerator Arm Springs.  
Disconnect Tab Lever Spring.

Page 7, Tabulation, Adjustment 7. Add; "Also, the carriage must be resting on the 1 or 5 escapement pawl when making this adjustment".



# ET News Letter

April 27, 1959

## SERVICE CASE - POWER CLEANER

### "JUST AROUND THE CORNER"

As a result of many suggestions and returned questionnaires from Customer Engineers all over the country, the new Service Case, Parts Kit and Power Cleaner, redesigned to your specifications, will soon be released to all ET Customer Engineers. We, in the ET Plant Customer Engineering Department, are extremely enthusiastic about these new tools - tools designed BY ET Customer Engineers FOR ET Customer Engineers.

Many letters have been received concerning the tremendous customer acceptance of the Service Case and Power Cleaner. A few of these are shown below:

Bob Day, Chicago Downtown, reports:

"The first thing I would like to say under this heading is the fact that I received such friendly curiosity and interest in the Power Cleaner and how nicely it fits into the new bag. People liked to talk about it, operators and customers felt that I was really giving them 'something for their money'. The combination bag and the interest it created seemed to 'break the ice' of many normally tight-lipped individuals. I feel this actually improves customer relations. Friendly interest."

R. B. Allison, Wilmington, reports:

"This (power cleaning) has meant an increase of approximately 60 ET's to our maintenance accounts."

W. L. Mansberger, Evanston, reports:

"The customers are quite impressed. They have a feeling of pride once their machine has been inspected with the use of

the Power Cleaner. Operators and management see easily the advantages of the cleaner and do not hesitate to express their appreciation. Operators wish to stay and watch their machine being cleaned."

J. L. Petkus, CE Manager, Minneapolis, reports:

"The new Service Case has been tried by all Customer Engineers and enthusiastically received. The Case certainly is a big improvement over the old type. It is a lot easier to carry, does not bulge out after usage and carries just as much. The parts are a lot more accessible. The Case is attractive looking and does attract a lot of attention. It is impossible to disarrange tools and parts."

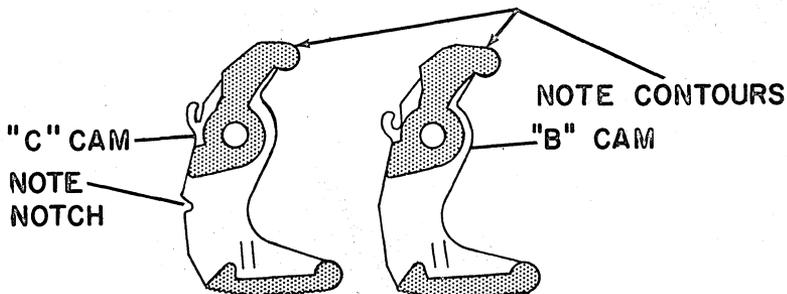
J. F. Crysler, Cleveland, reports:

"One customer commented that this should give him the cleaning he was paying for."

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## LETTER CAM IDENTIFICATION

The Model C & Model B letter cams have a different design contour at the trip lever contact point and when used interchangeably, may cause a touch problem. Model C letter cams can be identified by the notch in the rear of the cam and also by the trip lever contour as shown in the illustration below.



Model C cams used in Model B ET's result in a low tripping point and, in some instances, the keylever will bottom in the guide comb before tripping the cam.

## "C" KEYLEVER REMOVAL

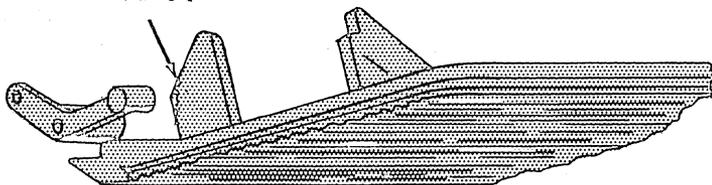
The keylever removal on the Model C Standard can be accomplished as follows:

1. Remove machine from bottom case.
2. Remove fulcrum wire from keylever by moving it either to left or right and "following" it through with the small fulcrum wire supplied in the tool kit. NOTE: Place scribemark on keylever bearing support before loosening screw that holds fulcrum rod in place.
3. Loosen the 4 front frame screws.
4. Loosen the 2 front guide comb screws.
5. "Rock" the top of the front guide comb toward the front of the machine. NOTE: Push out slightly on side frames to "Rock" guide comb.
6. Push the rear of the keylever down between the 2 nearest cams.
7. With duck bill pliers, or other suitable tool, push the keylever first to the front, then pull up and at the same time push forward on the keylever until it is free.
8. Replacement can be accomplished in the reverse order. NOTE: Push down on all keybuttons when returning the guide comb to its normal position.

On the Model C Executive it will be necessary to move the spacebar keylever (s) to the front somewhat.

### TOP COVER INTERLOCK NO. 1118331

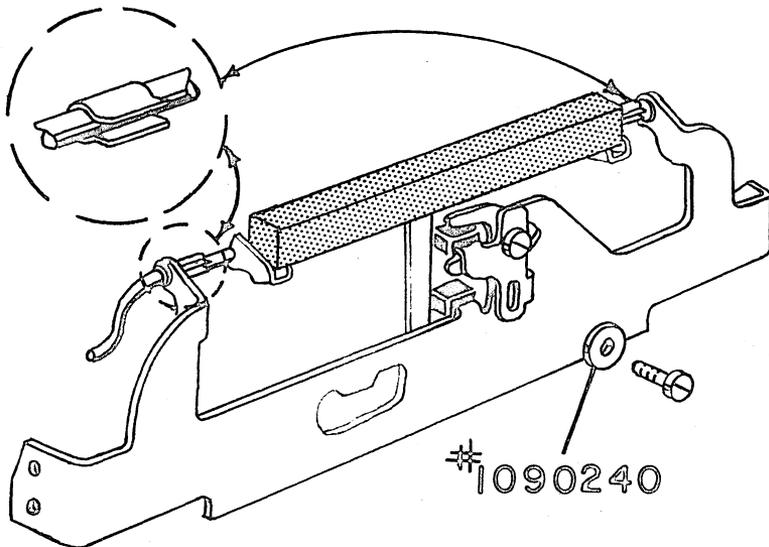
LINE A



Where breakage of this part is a problem, it may be helpful to lengthen the interlock connecting link. CAUTION: Insure that the sensing finger fully engages the opening of the spool hub when the top cover is closed.

On certain machines it will not be possible to adjust this condition out without affecting ribbon reverse. On these machines interlock breakage can be eliminated by removing material from the bottom of the interlock camming surface as indicated by line A in illustration above.

## NEW RETAINER USED ON "C" SPACEBAR



Retainer clips (Part #1110093, used to hold feed rolls in position on feed roll shaft) are now used on the Standard Model C spacebar shaft, in place of the neoprene sleeves, to reduce lateral motion of the spacebar keybutton. The retainers are placed on the inside of the bracket which supports the spacebar shaft. (See illustration above)

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### CRIPPLING "C" SPACEBAR

The repeat spacebar feature on the Model C Standard machine can be easily crippled by installing a washer between the head of one of the spacebar stop screws and the spacebar slide. This will secure the slide rigidly to the frame and prevent depression of the spacebar into repeat position. (See illustration above which shows location and part number of washer).

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### HINT: "C" SHIFT ADJUSTMENT

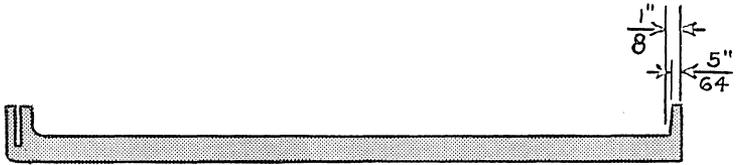
If shift hang-up or noise is a problem, check the pusher-to-pin clearance adjustment. This adjustment should be held to a minimum of 1/64" to alleviate either or both of these conditions.

## "C" KEYBUTTONS AFFECTED BY CLEANING FLUID

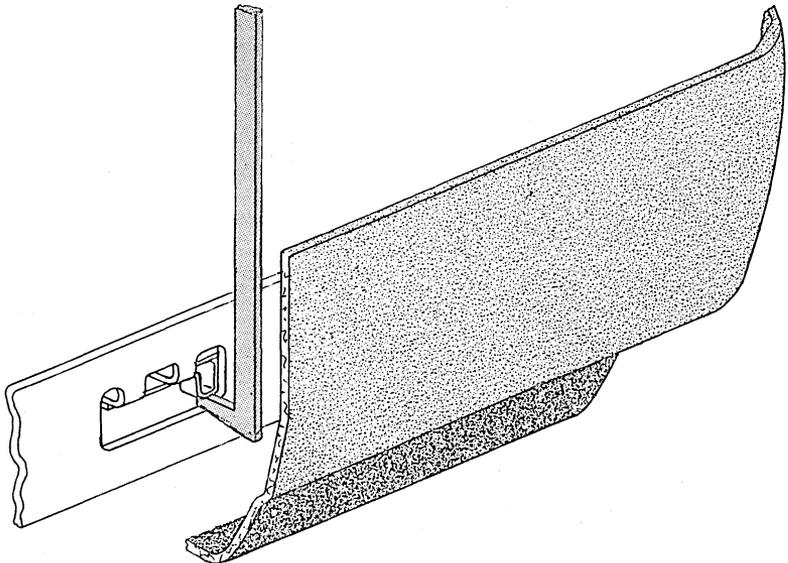
IBM Cleaning Fluid or similar cleaners should not be used to clean Model C Polystyrene Keybuttons. These cleaners tend to dissolve this material.

Use NL concentrate or similar cleaner when keybutton cleaning becomes necessary.

### T.K.O. BENDER CHANGE

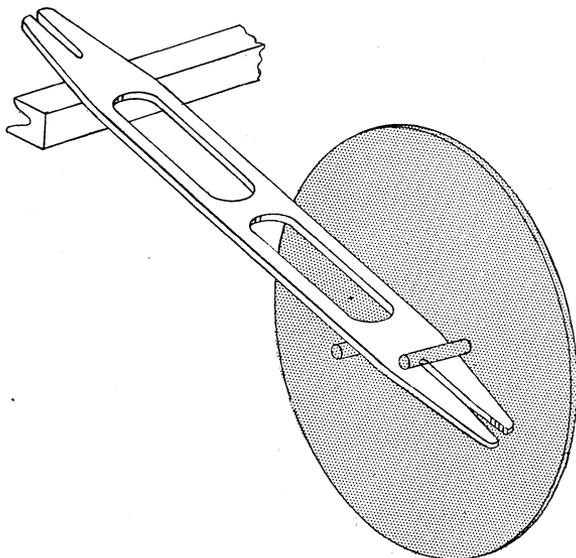


One end of the TKO Bender (Tool #9504486) has been modified to permit its being used to adjust the spacebar adjustable spring support (Part #1117916) on Model C Standard ET's. By placing the tool in the hole provided in the front frame, as shown in the illustration, the adjustable support can be easily formed upward or by placing tool in U portion of the support can be formed downward as desired without removing the bottom cover.



This tool modification can be made to your TKO Bender by grinding the tool to the dimensions as shown in the above illustration.

## ADJUSTING "C" RIBBON TAKE-UP



If carbon ribbon breakage is a problem between the feed rollers and the take-up spool, check for excessive rewind torque. (Torque beyond 150 grams, measured at the 1 inch diameter of the empty spool, is considered excessive). An easy check can be made by installing the latest style aligning wrench, #9504487, into the spool as illustrated. (NOTE: The end with the deepest slot should be inserted between the hub and pin so that the end of the slot is covered by the top peg). If the torque is in excess of approximately 150 grams, the weight of the wrench hanging toward the rear will not be sufficient to prevent rotation of the take-up spool.

Where excessive torque is a problem, reduce it by one or more of the following steps:

1. Reduce the length of the fabric clutch spring cover if it appears to be too long. A cover that is excessively long will result in added drag between the driving and driven members which in turn will result in added rewind torque.
2. Eliminate any bind or burrs and check for proper lubrication. (Molycote is a satisfactory lubricant for this mechanism).
3. If steps one and two do not help, replace the spring and/or hub.

NOTE: Cutting coils from the spring and polishing the hub are not recommended procedures since they are not appreciably effective in reducing take-up torque but frequently result in varying or pulsating tension.

# Service Savers

## THESE ARE TOOLS NOT RULES

In the case of persistent wrinkling of stencils, a small amount of talcum powder can be sprinkled between stencil and stencil backing sheet. This has proven to eliminate wrinkling problems when standard adjustments will not take care of it.

\_\_\_\_\_ - J. A. Christo, Dallas

The word "ON" stamped on switch and lead assembly is toward front of ET when switch is installed. A visual check, on installation will prevent a reverse switch.

\_\_\_\_\_ - R. C. Nitsch, Lubbock

When cleaning or changing type, if rubber stop used in packing machines is inserted over stop screw, basket will not move.

\_\_\_\_\_

When replacing ribbon lift guide, first measure length of old guide and mark on piece of paper - then change clevis and match new guide on slip of paper. Next, match curvature of old guide with new and form new one to match. This will eliminate necessity of removing guide to reform and eliminate lost time in adjusting link.

\_\_\_\_\_

When installing trip lever spring, depress keylever with switch on and hold down. Turn switch off so line lock holds keylever down. This keeps trip lever to front of machine and simplifies installation of spring.

\_\_\_\_\_

Binds in keylevers that prevent keylevers from restoring after being bottomed in guide comb appear to be a result of gummy rubber in bottom of slots. There may actually be a bind between keylever and comb due to guide being tilted. The screws on both sides of comb can be loosened and comb can be tilted to overcome binds.

\_\_\_\_\_

When replacing or installing a repeat plunger and spring, form end loop of spring to hold plunger shaft tight. This will enable you to hold onto spring and guide plunger into place.

Having trouble with operators who wish to type on bottom edge of page (last 6 line spaces)? A good correction is to suggest that she try using a legal size sheet of onionskin paper between original and first carbon sheet. The embossing of the original and the added sheet creates an interlocking action of the two and onionskin sheet remains between feed rolls and platen holding pack very nicely.

---

To stop top cover rattles on early Model A or B ET's, try cutting small diameter tip off rubber Model B top cover bumper. Slip large diameter part of bumper over one hinge screw on each side and re-tighten hinge screws. This causes bumper to "mushroom" around head of screw making a very effective bumper.

- D. R. Ethridge, Jefferson City

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If paper and/or envelopes catch on carbon ribbon corner guides when they are inserted into ET, and if corner guides are properly adjusted front paper scale may be formed up high enough to prevent the envelope or paper from catching under ribbon guide.

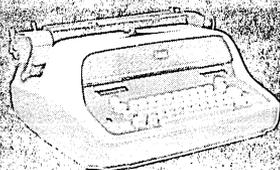
- W. J. Long, Kansas City

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A letter cam which repeats occasionally can be stopped from repeating by shortening cam spring (from cam shoe to cam lever) about 1/4". This can be accomplished very quickly and produces no ill effects. A good test, after making this adjustment, is to move impression indicator to 10 with machine in upper case.

---

Aid in re-attaching ET to desk. When an ET is bottom mounted to desk, CE will find it helpful to have in his possession two Model A positioning pins with hex portion ground off flush with pin. Screw pins loosely into ET, place ET and desk pad in position (pins extending down through screw holes in desk), unscrew and withdraw pins; desk pad and ET are now correctly aligned over holes in desk and mounting screws may be easily inserted and tightened.



# *ET News Letter*

July 1959

## "C" IMPROVEMENTS

Several improvements have recently gone into the Model C ET to improve quality and reduce unnecessary service calls. These improvements are a result of the helpful information which you have supplied the Plant since the release of this new product. A few of these improvements are listed below for your information:

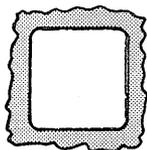
### IMPROVED "C" RIBBON GUIDE

An improved left hand carbon ribbon guide is now available which provides a greater range of adjustment for better ribbon tracking into the ribbon feed rollers. This improvement helps to insure a more positive ribbon feed operation. The guide part number, 1117841, remains unchanged.

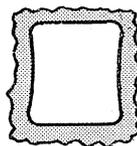


### IMPROVED "C" KEYPLATE

The C keyplate keybutton openings have been changed to an "hour-glass" opening to minimize keybutton binds. The illustration below of the new keyplate opening is exaggerated in order that you will recognize this improvement.



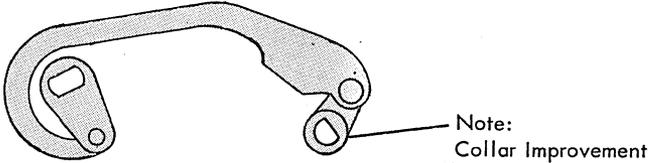
OLD



NEW

## IMPROVED "C" FEED ROLL & DETENT LEVERS

The Model C feed-roll-release lever (Part #1115364) and detent-release link (Part #1115377) assemblies have been modified as shown below to incorporate a "D" shaped opening in the collar. This improvement plus longer set screws (Part #151720) in the collar will prevent slippage of the lever shafts in the collars and will help minimize stripping of the collar threads.

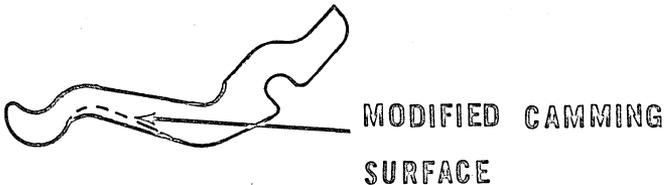


## CORRECT CATALOG FOR THIS "C" IMPROVEMENT

The decelerator cam springs have been replaced with a stronger spring, Part #1117699. On Pages 8 & 32, Model C Section of the Parts Catalog REMOVE Part #1090337, references 24 and 25. ADD Part #1117699.

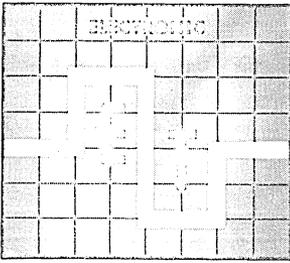
## IMPROVED "C" BAIL

The Model C paper bail pressure arms have been modified to insure restoring of the paper bail to its rest position. The camming surface of the left and right hand spring-loaded pressure arms have been modified as shown in the illustration below. The bail arm rollers have been slotted to keep the pressure arms on the roller. Part numbers of the pressure arms and paper bail arms remain the same.

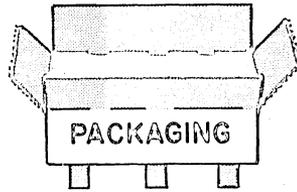


## TOOL ORDERS

The Parts and Supplies Order Department is constantly receiving orders for tools that are not shown in either the current catalog tool section or current CEM's and ET CE Bulletins. This places an extra burden on the Order Department in their attempts to ship the tools that you request. Ordering only those tools shown in current publications, will help expedite delivery of tools to you.



## IBM 632 CARD PUNCH



When installing a 632 card punch, the top of the carton must be opened first and the reading board removed before attempting to unpack the machine. This will prevent injury from the reading board falling out of the outside carton when lifted off the machine.

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### LOSING HIGH ORDER DIGITS

A bouncing keyboard common contact, caused by weak downward strap tension, has been found to latch trip relay 109, resulting in the loss of several or all high order digits. The strap should have sufficient tension to follow the bail finger during the opening movement and prevent the contact from bouncing closed momentarily.

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### INTERMITTENT FAILURES, RELAYS

Weak contact tension has been found to cause machine failures, especially in 12 position wire contact relays #102 and #110. Approximately 15 to 18 grams of tension should be measured on each pair of wires to just break the normally closed contact.

Refer to the Relay Reference Manual, Form #22-5857, Pages 1-5 and 1-6, for proper adjustments. Wire contact tension may be changed if necessary, rather than replacing the relay.

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### INSPECTION POINTS

Relay points 183-3 and 149-4 should be added to the preventive maintenance list (CEM #19) to be cleaned on each inspection.

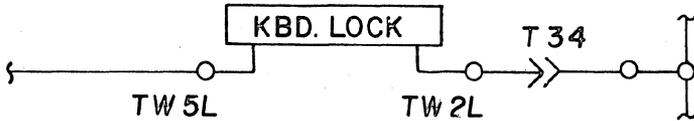
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### BACK CIRCUIT "BONER"

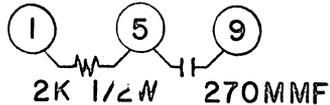
When replacing the bottom cover on the ET, make certain that cables are properly positioned to prevent shorts or binds to functional cam contacts. Example, if the carriage return cam contact is held closed by the cable, the card will not move in the card punch on a space operation.

## WIRING DIAGRAM CORRECTIONS

Terminal points of the line lock magnet on Section 24B of wiring diagram #1127000A should be noted as follows:



Values of the Resistor and Capacitor on all switch core sockets are 2K 1/2W and 270 MMF. These should be noted on wiring diagram #1127100A section 03-04.



## PROGRAM CARD DUPLICATION

When duplicating program cards, be sure to turn the print switch off. Multiple punching in a single column can cause damage to the code plate.

## IMPROVED FEELER GAGE

A new feeler gage, same part number 9900024, is now available for servicing the IBM 632. In addition to the .010" blade, five more blades are now included. These are: .002", .003", .005", .015", and a new .030" wire blade for more convenient keyboard restore magnet adjustment.

## BITS TO BITE

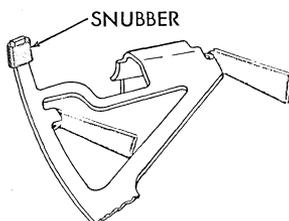
Should both T-18 and T-19 triggers turn on at the same time? If so, when?

(Answer in next News Letter)

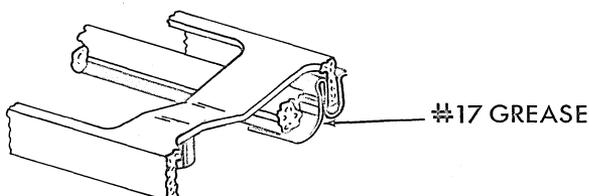
Answer to question in News Letter #60: If relay 102-6 N/C failed to make, the Electronics would reset and would not start or run. The machine would lock-up.

## ADDITIONAL "C" NOISE REDUCTION

A small plastic snubber (Part #1118848) is now used on the ends of the universal bar to reduce the ringing noise of the U-bar as it strikes the rear of the segment. This improvement is now going into all "C's".



A 1/2" spring type clip (Part #1118847) is now being placed between the impression control shaft and the cam knockout bar to reduce the "hollow" sounding noise during normal typing. The clip makes the K.O. bar more rigid and, as shown by actual testing experiences, reduces noise to a more acceptable level.



## LARGE A-B & C CATALOGS OBSOLETE

THE LARGE A, B, AND C CATALOGS ARE NOW OBSOLETE. USE ONLY THE NEW SMALL ET PARTS CATALOG WHEN ORDERING MODELS A, B, AND C ET PARTS. MANY PART NUMBERS SHOWN IN THE LARGE PARTS CATALOGS (ESPECIALLY IN THE LARGE "C" CATALOG) ARE NO LONGER AVAILABLE. MODEL 01 PARTS SHOULD CONTINUE TO BE ORDERED FROM THE LARGE MODEL 01 CATALOG.

## IMPORTANT - ADD PRICES TO PRICE LIST

Price for all 13" and 17" Standard Model C Color Conversion Bills of Material is \$60.00. Price for all 13" and 17" Executive Model C Color Conversion Bills of Material is \$75.00.

Price for all Ribbon Conversions is \$35.00.

# *Service Savers*

## THESE ARE TOOLS - NOT RULES

Installation of the Model C rear cover can be more easily accomplished by dropping the rear cover screws straight down. The screws will usually fall right into their holes.

M.E. Taulli, San Antonio  
C. N. Russell, San Antonio

---

If the Model C plastic cover interlock arm becomes broken and a replacement part is not available, the machine will operate by removing the interlock spring. This temporary measure allows the left hand sensing finger to engage the ribbon spool for proper reversing until replacement parts are available.

L. D. Gaines, South Bend

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Shift cams can be removed from Executive Model B ET's by removing the power roll and the cam knockoff bar eccentric shaft. It is not necessary to remove the cam knockoff bar assembly. The K.O. bar springs must be unhooked but it will not be necessary to remove the dowel pins.

---

When it becomes necessary to adjust a connecting link clevis more than three half turns, it is a good indication that something else is causing the problem, possibly a broken part.

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On Model B ET's use the T-bender to adjust (by forming) switch operating link for desired length without removing front case.

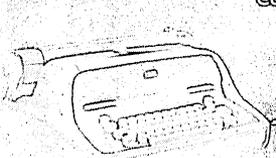
---

Check for positive action of the electrical switch by slowly operating the switch lever in both directions and observe toggle action.

---

Before attempting to "form" top covers on "B" ET's to eliminate rattles, try the following:

- a. Tighten mounting screws.
  - b. Squeeze the open ends of the hinges together slightly.
-



# *ET News Letter*

September, 1959

## FABRIC AND CARBON RIBBON

Button Latch Lug Adjustment Easier with New Marked Link Lug

R. H. Ribbon Spool Gate - New Design

Uneven Tracking - Ribbon Lift Toggle Not Forming Straight Line

Intermittent Ribbon Feed with Clean Clip Binding on Top Cover

New Transfer Wheel Ring Stays On

Clip Replaces Screw to Prevent Breaking Sensing Finger Bracket

Ribbon Bunching Prevented by Increased Spool Tension

Excess Ribbon Lead Blocks Gate

New Primary Cam Interlocks Ribbon Loop

Undersize Pressure Rollers Cause Crowding

Erratic Ribbon Feed Caused by Loose Nut on Pressure Rollers

New Design of Ribbon Spool Hinge Eliminates Spool Binds

Excessive Carbon Ribbon Feed - Take-Up Drive Spring Binding

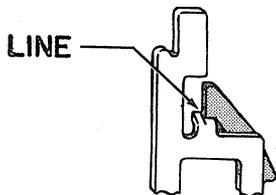
Ribbon Link Drive Lever - Two Link Holes - Used for Carbon and New Fabric Ribbon

Eliminate Carbon Ribbon Twist - Form Supply Spool Follower

Ribbon Reverse Failure - L.H. Sensing Finger Shaft - Clip Opening should face Outside of Machine

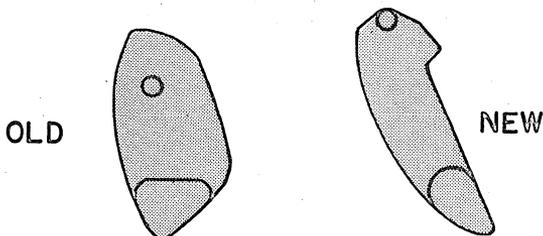
NOTICE — Future Electronic News Letters will be published separately.

### BUTTON LATCH LUG ADJUSTMENT



The edge of the button latch hook should be centered on the button link lug when the reverse lever is latched and the rollers are on the highest point of the primary cam. This is done by forming the lug on the button latch. A new button link is forthcoming which will have a line inscribed on lug. The bite of the button latch hook should be to the line or .015 short.

### RIGHT HAND RIBBON SPOOL GATE



On machines prior to Serial No.1116531 the gate of the R.H. Spool Assembly was very blunt. Occasionally the right sensing finger would ride over the gate instead of reversing. This has been corrected as shown below. If this problem is encountered, the R.H. spool assembly Part No.1118359, should be replaced.

### UNEVEN TRACKING

Uneven tracking of type on the ribbon is sometimes caused by the ribbon lift toggle not being brought into a straight line in the operation of all cam levers. The variation is caused by differences in the cam lever hooks, a crooked ribbon lift bail vane, and different impressions of the various type characters. A difference in impression from one character to another affects the momentum of the ribbon lift mechanism. This will cause the ribbon lift toggle to be thrown into a straight line by some cam levers and not by others.

This condition can be corrected by lengthening the ribbon lift operating link slightly to insure that all cam levers will straighten the ribbon lift toggle. Those which are already doing so will only cause it to go slightly past center without raising the ribbon further.

Lengthening the ribbon lift operating link may raise the ribbon lift off its vinylite stop. It may become necessary to shim up the stop to allow the lever to rest on it. The adjustments of the ribbon lift guide clevis and the rear lug of the positioning plate should be re-checked after adjustment for even tracking.

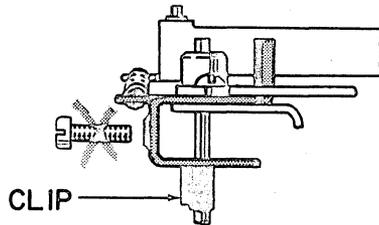
### FABRIC RIBBON CLEAN CLIP

If intermittent ribbon feed failures occur, check the clean clip. It may be rubbing against the top cover.

### TRANSFER WHEEL RING

Machines manufactured after approximate serial #117754 will have a smaller diameter transfer wheel ring #1118288. This will minimize the possibility of the ring coming off. The success of this depends on proper adjustment of the mechanism.

### L.H. SENSING FINGER BRACKET SCREW



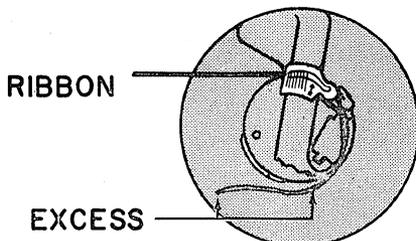
Screw #52603 may be replaced with a retainer clip #1110093. The clip is placed directly on the shaft of the LH spool. This will eliminate breaking the sensing finger bracket by overtightening the screw.

### RIBBON BUNCHING

In many cases the ribbon has a tendency to spill off in front of the sensing finger. If this condition exists, additional tension should be applied to the spools. The added tension will cause the ribbon to be wound tighter and eliminate the spill off. Care must be exercised not to apply too much as it will affect tracking.

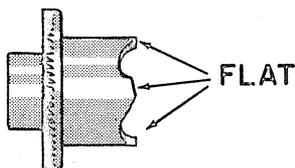
Spring washer #1072477 may be used between the collar or grip clip and bracket. For fast installation, split the washer, drop collar and insert, then adjust.

### PROPER RIBBON INSERTION - PLASTIC CLIP



Ribbon reverse failure can occur if too much ribbon is pulled beyond the plastic clip. The end of the ribbon will block the gate and prevent the sensing finger from entering and reversing the ribbon.

### RIBBON REVERSE CAM

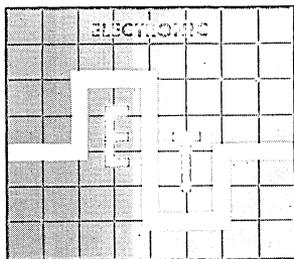


The four high points of the ribbon reverse primary cam, are now made flat. This acts as an interlock to prevent looping of the ribbon if the rewind button is actuated after a rewind operation. The part number remains the same.

### UNDERSIZE RIBBON FEED PRESSURE ROLLERS

A limited number of under-sized carbon ribbon feed roll pressure rollers were installed on machines. If crowding problems are encountered, check for this condition. Replace all pressure rollers found to be undersized.

They can be detected by observing the pressure rollers in the closed position. The gear teeth should not bottom.



## 632 OPERATION

The 632 was designed for a minimum of operator decision through the flexibility of programming by carriage position. Because the carriage must be positioned correctly for proper reading of the program, certain operator precautions are necessary. Any of the following errors will cause incorrect results that may be difficult to diagnose from typed results:

1. Operating the ET tab key during calculation.
2. Operating the ET carriage return key during calculation.
3. Operating the spacebar during calculation.
4. Operating the REKEY button during calculation.
5. "Flicking" the final total switch by releasing it too soon. The "T" will not print at the end of the field. Calculation cycles will not be suppressed as required.
6. Restricting motion of the carriage during automatic typing or calculation.
  - (a) Catching of forms or excess drag of forms.
  - (b) Material on desk in path of carriage.
  - (c) Placing hands on carriage to lift paper bail, erase, straighten paper, tear off forms, etc.
7. Going through fields in improper sequence or going through wrong fields.

Depression of the shift key will prevent starting or auto-starting in a field.

Operators should be aware of these precautions. Be certain the machine is operating properly before assuming operator error, however.

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### RELAY REFERENCE MANUAL CORRECTIONS

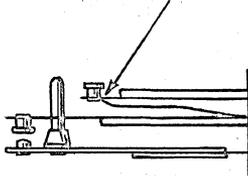
Specifications for the longer Duo Relay used in the Relay Gate of the 632 (#282408) have been changed to:

Armature Air Gap	.015" to .017"
Pick Time	10.5 milliseconds maximum (No Minimum)
Drop Time	5.0 milliseconds maximum (No Minimum)

These corrections should be made in the Relay CE Reference Manual, Form #22-5857, page 2 - 12.

## DUO RELAY STRAP CATCHING

If you have been looking at duo relay points or performing preventive maintenance and wonder why the machine will suddenly not operate, look for this:



A n/o point tension strap that has hooked behind the riveting of the n/c point above it.

This does not happen under machine operation, only by manual lifting of a n/o point.

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## CARD JAM

A card jam at the punch station will result with present circuits if the release key is held down for more than one card. Release the key between cards.

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## EDGE CONNECTORS - SERVICE AID

Accidental shorting between the -100 and 200 volt lines to a circuit containing diodes usually damages the diodes. With the present edge connector locations this is easy to do with a probe tip.

Move the wires in edge connector Pb to Qa and from Ne to Pe. This will relocate the -100 and 200 volt lines away from these danger spots! You will see this change soon in machines being shipped from the Plant.

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## "BITS TO BITE"

Based on trouble reports from the Field: What would happen if 102-6 n/c (relay wiring diagram, Section 37A) had too little tension, bounced, or failed to make contact because of being dirty?

(Answer in next News Letter)

Answer to question in News Letter #59: Space after Type (Symbol Space).

### LOOSE NUTS ON CARBON RIBBON PRESSURE ROLLERS

Improper ribbon feed can result from insufficient tension of the spider spring. This tension is controlled by the degree to which the nut is tightened on the ribbon feed pressure roller. Too little tension will let the roller slip on its shaft and erratic feeding results.

### CARBON RIBBON REWIND SPOOL HINGE #1117815

The rewind spool hinge dimensions have been changed to allow more space for the take-up spool. This will eliminate binds between the mounting plate, hinge, and rewind spool.

### EXCESSIVE CARBON RIBBON FEED

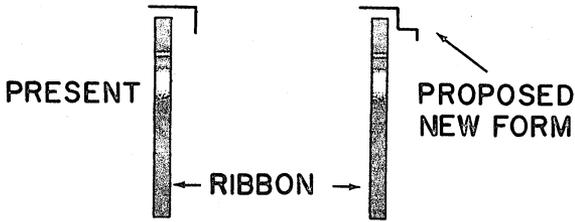
A binding take-up drive spring will cause ribbon breakage and tend to feed constantly. Binds at this point cause the ribbon to be pulled through the pressure rollers. When this free feed is interrupted by a striking typebar, the ribbon can break.

### RIBBON LINK DRIVE LEVER

The ribbon link drive lever #1118266 now has two link holes and is used on both fabric and carbon ribbon Standard ET's. This change was effective with approximately serial #1153253. For machines equipped with this improved part, ribbon conversions can be accomplished without replacing the lever.

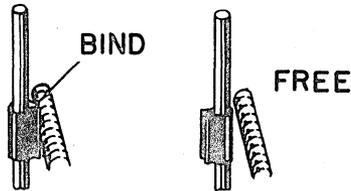
Ribbon conversion B/M's #1271009 and #1270860 will no longer include feed levers. Therefore, when planning conversions on machines prior to this change, it will be necessary to order separately lever #1118266.

### CARBON RIBBON TWISTING



It has been found that a twist develops in the carbon ribbon due to a loop of ribbon falling off the supply spool as the ribbon is fed. This can be eliminated by forming the supply follower, #1117730, where it rests on the supply spool. Form this follower to conform to the ribbon. This is done by making two right angle bends near the right extension.

### RIBBON REVERSE FAILURES



When installing clip #1110093 on the L.H. sensing finger shaft, care should be exercised to insure that the open portion of the clip faces toward the outside of the machine. Failure to do this can result in a bind in the sensing finger thereby preventing ribbon reverse. The bind is caused by the clip contacting the sensing finger spring part number 1107794.

September 21, 1959

## MODEL "C" DECIMAL TAB

To minimize failure of the interposers to restore, the Plant has substituted spring #1090162 for spring #1118094 on the restoring bail. This change was effective with approximate serial #1174214.

Where failure of the interposers to restore is experienced in the Field, it is suggested that the above change be made. (Spring #1090162 is a Model "A" and "B" impression-indicator detent spring.) The lighter spring does not compress the rubber bail stop, Part #1118139, as much and could reduce bail overlap — see adj. #2, Model "C" Decimal Tab Section, ET Reference Manual. This spring change can be made from the bottom of the machine without removing covers.

**CAUTION:** This new spring is weaker than spring #1118094 and will not restore all interposers simultaneously; it will restore approximately three reliably. THEREFORE, OPERATORS SHOULD BE CAUTIONED AGAINST DEPRESSING DECIMAL KEYS WHEN THE SWITCH IS OFF OR WHEN THE MACHINE IS UNPLUGGED. This will cause the carriage to become locked when the carriage return is operated.

### Restoring Bail Latch - Part #1118140

Within serial numbers 1130500 and 1172400 approximately 300 were shipped on which the restoring bail latch was not hardened to specification. This part should be replaced on ALL Decimal Tabs in this serial number range. Sufficient latches will be sent from Lexington to Branch Offices having these machines without originating a P & S Requisition. DO NOT ORDER parts to accomplish this change.

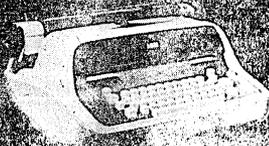
### Service Hint

When the color control linkage is in-operative, it is possible to move from the stencil position to any of the ribbon lift positions by pulling upward on the ribbon lift guide. The ET dispatcher should be instructed to use this information to reduce emergency calls.

## Defective Parts Return

When defective parts are returned from the Field to the Technical Engineering Department for investigation, the following information must be included:

1. Part name and part number .
2. Machine code and serial number .
3. What is wrong with the part?
4. What trouble did this cause in the machine?



# *et News Letter*

October 1959

## CONTENTS

BACKSPACE BELLCRANK STUD

ESCAPEMENT PAWL WEAR

TOP COVER SPRING

COVER GROUNDING CLIP

TYPE PILING

IMPRESSION INDICATOR

FABRIC RIBBON DRIVE SHAFT

FABRIC RIBBON CORNER GUIDE (L.H.)

VALVESPOUT OILER

DULITED LETTER CAM LEVERS

SAFETY TIP

## BACKSPACE BELLCRANK STUD (PN 1108497) BREAKAGE

The backspace bellcrank stud has been modified to reduce breakage. This modification was the elimination of the offset between the end of the stud threads used in mounting the stud to the rear rail and the hexagonal portion of the stud. Prior to this change a washer was inserted between the stud and the rear rail to reduce the strain at the point of breakage.

## ESCAPEMENT PAWL WEAR, PAGE #1117961 & 1117962

Changes in the hardening process of the escapement pawl and escapement rack were made in all machines after serial #1164288. If escapement pawl wear occurs on machines below this serial number, the escapement rack must also be replaced or the trouble will re-occur.

## SPRING, TOP COVER, PART #1118769

Effective October 7, 1959, cover springs will be manufactured from hard drawn music wire in place of oil tempered wire to eliminate breakage. These springs must be replaced on all Standard ET's below serial #1203444 and Executive ET's below Serial #2026504.

## NEW STYLE COVER GROUNDING CLIP #1118345

The cover electrical grounding clip is now made of heavier stock and should be mounted under the forward left hand screw of the bracket that holds the cover shaft assembly.

## TYPE PILING

Occasional type piling may be caused by the escapement trip link clevis. If the clevis is too tightly closed, it will grip the escapement "U" bar during spacebar operation instead of sliding in the elongated slot. This prevents the trip lever from restoring, causing an occasional condition of piling.

## IMPRESSION INDICATOR CREEPING

Creeping of the impression indicator during typing can be corrected by hooking the cam KO bar springs, Part #1115747, in the next forward cut-out in the side frames. This bends the springs around the impression control shaft slightly, creating sufficient drag to prevent movement during typing.

## FABRIC RIBBON DRIVE SHAFT

A few drops of oil on the fabric ribbon drive shaft bearings at each inspection will prevent premature bearing wear.

## LEFT HAND FABRIC RIBBON CORNER GUIDE – MODEL C

The left hand fabric ribbon corner guide is especially designed for the bi-colored ribbons.

In a number of cases the customer may desire a reversal (top and bottom) of color positions on a bi-colored ribbon. If this problem is encountered, a half twist between the left ribbon spool and the corner guide will place the ribbon in the desired typing position. After one complete feeding of the ribbon from left to right the ribbon will feed and remain in the desired typing position. This need only be done when the operator installs a new bi-colored ribbon.

## CHANGEABLE TYPEBARS ALIGNMENT

Alignment of changeable typebars can be held more reliably by filing or grinding a small portion of the leading edge of the changeable bar where it enters the throat of the type guide. If the changeable bar is on the left side of the type basket, grinding should occur on right edge; if on the right, the left edge.

## CLEANING CLOGGED VALVESPOUT OILER SPOUTS

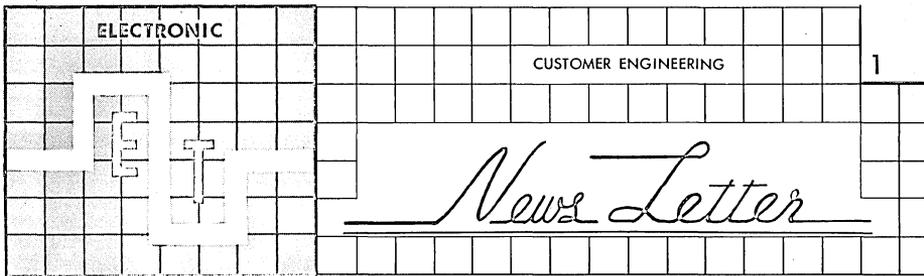
Should clogging of the valvespout oiler occur which cannot be corrected readily by ordinary means, the screw cap at the tip of the spout can be removed for easier access. This can be accomplished through the use of two pliers, one to hold the spout and one to unscrew the cap counter clockwise beyond its normal functional limits until it is removed. A fine wire can then be used to dislodge any obstructions.

## DULITED LETTER CAM LEVERS

Machines are currently being manufactured in which the letter cam levers are dulited rather than chrome plated, resulting in a black finish to the lever. These cam levers may be interchanged with the previous lever. Some ET's were manufactured in which both dulited and chrome plated levers were installed.

## SAFETY TIP

The soldering iron should not be equipped with a bulb and used for a trouble light. As the soldering fixture is not shielded, accidental breakage of the bulb could result in a glass and electrical shock hazard.



October 7, 1959

The Electronic News Letter is now being printed separately. The volume of items is sufficiently large that separate publications will be easier to handle. Each ET Customer Engineer will continue to receive copies of both ET and Electronic News Letters.

## CONTENTS

- News in the Gates - Cover, plating, air filter, capacitor, blower leads
- Vibration Test for Intermittent Failures - Screw driver handle
- 632 Wire Relay Contact Tension
- Program Tape Errors - No cellophane tape
- Triggering the Oscilloscope in Relays
- Resonant Transformer - Low output symptoms - shorted rectifiers
- Losing High Order Digits - 13 BL to short on transfer
- Duo Relay Points Arcing - Investigate circuit
- Intermittent Failures - RC blocks
- Corrections - CEM's and Parts Catalog
- What's the Serial? - Record in the ET
- Cable Damage - Move cables before mounting hardware
- Safety in Numbers - Never work alone
- New Tools and Supplies Listing
- Wiring Diagrams Lost? - Order new ones
- Formscarrier Conversion - 632 is different
- New Look in Companion Keyboard - Large on all models
- Too Many Relays? - Shorted #1 rectifier in relay gate
- Digit Capacity Changes Made Easy - Binary wiring

## NEWS IN THE GATES

Lower electronic cover panel omitted, cadium plating replaces paint, redesign of air filter holder, filter capacitor reduction and solderless connectors on blower motor leads.

The lower electronic cover panel, Part #1119643, is no longer required on the electronic gate. Future machines will be shipped without this cover.

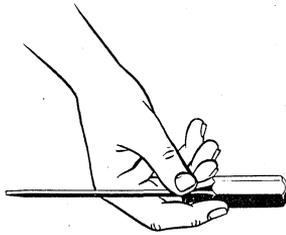
The power supply plates, relay gate and the electronics gate are now being cadium plated. This provides better visibility.

The air filter adapter, #1119637, has been modified. The same air filter #1119610 is still used.

Two of the five 150 volt filter capacitors (Part #515386, C8 and C9) are no longer required in the power supply. Recent investigations indicate that more than ample filtration is obtained with the three remaining capacitors.

Solderless connectors have replaced the Blower Motor terminal strip providing a faster method of removal or assembly.

### VIBRATION TEST FOR INTERMITTENT FAILURES



Here's a good method for vibrating the 632 electronic panel. Using the large screw driver as shown, tap on the retaining bars until a failure appears during automatic operation of an add, subtract, or multiply test tape.

Removal of the retainer bar and tapping on the individual units will further localize the faulty unit.

**REMEMBER:** Mechanical vibration will be transmitted throughout the gate, therefore some degree of patience and skill may be required to finalize the exact location of trouble. In some cases the oscilloscope may be especially helpful in localizing the defect.

## 632 WIRE RELAY CONTACT TENSION

(8 to 10 grams tension maximum for each pair of contact wires in the counter bit relays) Increased contact tension in wire relays picked through the hold coil will result in excessive pick or contact transfer time.

Relays 153 through 157 are sometimes picked through their hold coils. Relays 328 and 329 are always picked through their hold coils. The tension of each contact in these relays should be adjusted for approximately 8 to 10 grams. This will assure proper pick time when they are picked through the hold coil.

## PROGRAM TAPE ERRORS

Avoid the use of cellophane tape for program error repairs.

Never depend on cellophane tape for an error correction on the 632 mylar tape. Reports indicate an increasing number of service calls resulting from worn or loose cellophane tape on the customer's program tape.

Properly punched program tapes are the responsibility of the 632 Sales representative. Any customer tape found with cellophane tape should be replaced immediately. All service calls resulting from an improper program tape must be reported on Customer Engineering Service Code 56.

## TRIGGERING THE OSCILLOSCOPE IN RELAYS

Use capacitive coupling for the trigger input and filter out noise through an additional capacitor from trigger point to ground.

Noise presents a problem in obtaining good trigger stability when using the oscilloscope to observe relay performance. A good method for overcoming this problem is to use an external .047 mfd 400 V capacitor, IBM Part #326370, on the trigger input lead.

Loop the trigger lead around the input terminal (refer News Letter #56) and connect the .047 capacitor between the lead tip and ground. Noise spikes will be reduced to a lower magnitude by the .047 capacitor and blocked from the scope by the capacitive coupling of the trigger lead looped around the input terminal.

## RESONANT TRANSFORMER - LOW OUTPUT SYMPTOMS

When secondary voltage is not present, check for shorted components attached to the secondary windings.

An apparently defective main power transformer may be the result of a shorted rectifier or capacitor in one of the secondary circuits.

If this condition is suspected, first check the primary voltage and the continuity of the primary windings. Next, check the filament voltage. Connect an AC volt meter to the tube socket filament buss wires, top row and bottom row, for a 12 volt reading.

If no voltage is present, turn the machine off and remove the two leads from the outer plates of the 200 V rectifier, CR-1. These may be removed at the terminal strip, however, the rectifier is more accessible. If voltage is recorded when the machine is turned on, the 200 V circuit is at fault. If not, repeat this procedure in the +150 and - 100 volt circuits, observing filament voltage readings each time.

NOTE: Discharge the filter and resonant capacitors before touching their leads. Remember, while actually working in the power supply, the power cord plug must be removed from the outlet.

## LOSING HIGH ORDER DIGITS

The drop of relay 110, resulting in the loss of all high order digits, may occur if relay point 13 BL N/C breaks before 13 BL N/O makes. These points should be adjusted for a "shorting" action during the pick of relay 13.

## DUO RELAY POINTS ARCING

When excessive arcing is noticed in a duo relay contact, investigate the circuit for a possible cause. Loose pin connections, shorted diodes or capacitors, or diodes reversed may be the offenders.

## INTERMITTENT FAILURES

Loose RC components and broken terminals result in intermittent failures.

Quite often, arc suppression (RC) blocks are the cause of intermittent failures. Typical troubles found in the large, covered, RC units are:

1. Loose resistors, capacitors or diodes.
2. Component leads or terminal pins shorting. (Both inside, and in the wiring to the back.)
3. Broken base terminals.

The small terminals connecting the three hole RC terminal positions may break in the web between the holes, resulting in intermittent contact.

Some of these RC base terminals have been found to be brittle. Care must be exercised in replacing tapered pin terminals in RC blocks to prevent breakage of these base terminals. It's a good idea to completely remove a broken terminal to prevent using it in the future.

Careful, don't push the resistors, capacitors or diodes together and create a short when replacing the RC cover.

## CORRECTIONS

OOPS! Pardon our mistake. Please make the following corrections:

632 CEM #21, Page 5, T-19 (K-22)

Correct Trigger H5-5 to read Trigger H5-3.

632 CEM #22, Page 2

Correct Part #1127442 to read #1127422 Striker, Latch Relay Gate

632 Parts Catalog Section

Companion Keyboard, Page 13, Ref. 13

Correct #1119931 to read Switch ON

Correct #1119933 to read Switch Final Total and Subtotal

Electronic Gate - Inside, Page 9, Item 13

Correct Part Number to read 1119692

Power Supply, Page 5, Ref. 26

Change Ref. 51 to 61 (2 places)

Power Supply, Page 5, Ref. 46

Add: 218794 Fuse 10 amp (for 115 V machines)

107667 Fuse 6 1/4 amp (for 230 V machines)

## "WHAT'S THE SERIAL?"

Dot the 632 serial number on the service sticker in the typewriter. Next time it will be easier to find.

## CABLE DAMAGE

Beware of cable damage when mounting hardware.

A few moments may be well spent moving cabling from between relay mounting channels when installing new hardware such as a relay base. The mounting screws might pierce the cables resulting in a most difficult problem.

## SAFETY IN NUMBERS

**REMEMBER!!** Never service electrical equipment unless another person is in the room or immediate area with you. In the event of an emergency, someone must be present to render assistance. This is a strict IBM safety rule.

## NEW TOOLS AND SUPPLIES LISTING

Refer to ET Parts Catalog for all 632 tools.

A complete listing of all ET tools is now available in the small ET Parts Catalog. The following new 632 tools may be found in this section:

158645	Grease Gun
265390	Grease, Silicone (for Punch Clutch)
450054	Dowel Puller
450692	Tape, Black Vinyl
450694	Wire Strippers
460028	Code Plate Aligning Tool (2 required)

All tools required for servicing the IBM 632 are now available by one tool number, #9900056, however, supplies such as grease and tape are not included. These must be ordered by individual part numbers, as required. Refer to Page 24, Tool Section, ET Parts Catalog. This tool set includes the above mentioned items and all 632 tools announced in ET Bulletins #17, #23, and #30 (except the Oscilloscope).

## WIRING DIAGRAMS LOST ?

Machine Wiring Diagrams and Relay Function Charts are available from Lexington if the original prints are lost.

Request replacement copies from Technical Engineering, Department 903, Lexington Plant. Be sure to specify machine model and serial numbers and special features, if required.

## FORMSCARRIER CONVERSION

Conversion from a Model B Formscarrrier to a 632 Formscarrrier may be accomplished locally.

Often, the customer wishes to use his old Formscarrrier attachment on his new 632 typewriter. By having the sales representative order the 632 with a lift platen ET for a Formscarrrier application, the only modifications required will be to change the front support bracket of the Formscarrrier and the carrier stop, Part #1119765 and 1127129.

If the 632 LP typewriter does not have the provisions for a Formscarrrier, it will be necessary to change the carriage tie rod and add two carrier support brackets #1076932 to the side frames. The Formscarrrier support rod (tie rod) raises the front of the carrier, allowing additional clearance over the rear case. The offset rod consists of two lever assemblies #1119762, the support rod 12" #1119763, 16" #1127128, and four nuts #1090670.

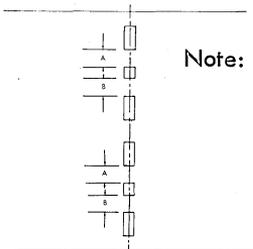
Refer to 632 ET Parts List in the large 632 Parts Catalog, Page 19.

## 632 PROGRAM TAPE REGISTRATION

An off-registration tape punch occasionally results in intermittent 632 operation.

Program tape registration should be checked before adjusting the 632 sensing unit registration. Never use the printed lines on the mylar tape for a reference point or guide.

Check punch registration by observing the location of the tape feed hole with respect to two adjacent punched holes. Vertically, the small square feed hole should be centered between two punched holes, channels 2, 3 and 5, 6. Horizontally, an imaginary center line should pass through the center of both feed and punched holes.



Note: Dimensions A & B should always be equal.

Refer to Model B Electric Typewriter Reference Manual, modified for Data Processing equipment, form #223-6652, for detailed tape punch adjustments — this information will appear in the 632 Reference Manual at a later date.

A good visual check and adjustment of the program tape punch may prevent future service problems.

### NEW LOOK IN COMPANION KEYBOARD

All 632's, beginning with Serial #11179, will be equipped with the new style large keyboard. The punch keybutton arrangement remains unchanged, however, the Standard machine keybutton arrangement is centered in the large keyplate. This standardizes keyplate sizes and side covers. The 6.3 V ready lamp is now being installed in the Standard 632's as well as all punch machines now in production. The 55 V slide base lamps will still be available for Standard machines with the 48 V lamp circuit.

Part numbers are already included in the Parts Catalog.

### TOO MANY RELAYS?

A relay race or lock-up may be caused by a shorted rectifier in the pick circuit to relay 114. During a space after type operation, it would establish a back circuit to the program read unit, allowing additional program relays to pick (depending on the holes punched in the program tape). This same diode could also cause extra program relays to be picked without causing races or lock-up.

### DIGIT CAPACITY CHANGES MADE EASY

Remember the following items:

1. Use RC 127-1 as a common point.
2. Relay 123 is the alternate, 122 is the maximum.
3. Mentally assign binary numbers to the back side of relays 123 and 122 using only the N/O points.
4. Do not use 123-1 points.

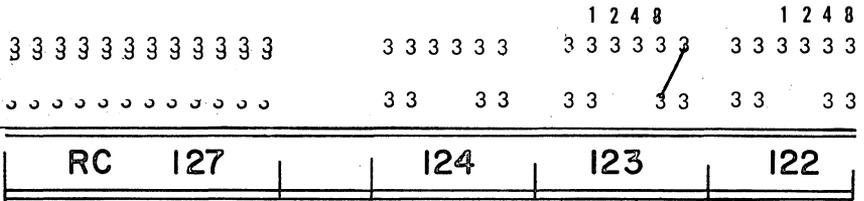
If we assign binary numbers to relays 123 and 122 as follow, the digit capacities will be chosen with little effort.

123-5 1 bit  
 123-4 2 bit  
 123-3 4 bit  
 123-2 8 bit

122-4 1 bit  
 122-3 2 bit  
 122-2 4 bit  
 122-1 8 bit

Example — Given a Digit Capacity of 10 and 6, Jumper from RC  
 127-1 to 123-4 and 3, to 122-3 and 1.

Try it — it's easy!! (and faster, too !)

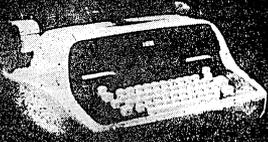


### BITS TO BITE

Will the 632 multiply a negative number and could the product be shifted two places in the same calculation cycle?

(Answer in next Electronic News Letter)

Answer to question in ET News Letter #61: Yes — Both T18 and T19 are turned on at the start of C time by plate pull-over.



# *ET News Letter*

October 1959

## CONTENTS

### SERVICE HINTS:

TWO PIECE KEYLEVER

FABRIC RIBBON FEED NOISE

CARD HOLDERS

HEKTOWRITER AUXILIARY CARRIAGE BIND

TENSION TAPES

BOLTING ET TO DESK

SPRING SCREW STARTER

### PARTS ORDERING:

POWER ROLLS

TOLL BILLER KEYBUTTONS

### CATALOG CHANGES:

MODEL C CARRIAGE & RAILS

DECIMAL TAB

## TWO PIECE KEYLEVER

When installing a two piece keylever in the Model "C", considerable time saving can be realized if the lower projection on the standard keylever is broken off near the point of contact to the resilient keyboard control spring. This will facilitate removal of the standard keylever.

## MODEL C FABRIC RIBBON FEED NOISE

A difficult to trace noise which occurs during ribbon feeding can be corrected by forming the tip of the keyplate under the ribbon control buttons. The noise is a result of the ribbon feed arm contacting the lip of the keyplate as it moves upward during ribbon feed.

## CARD HOLDERS

Installation of Model C card holders on Model B ET's with new front rail dust covers will help to hold small cards more firmly against the platens.

## HEKTOWRITER — CARRIAGE BIND

A hard-to-find bind in the Hektowriter auxiliary carriage may be caused by a flat having been worn on the center rollers when a binding condition occurs. Replacement may be necessary.

## CARRIAGE TENSION TAPES

To prevent carriage tension tapes from coming off the tension tape pulley, a "C" clip, Part #60488, may be installed to the rear of the pulley on the power frame boss.

## BOLTING ET'S TO DESK

A fulcrum wire may be used to mark the operator's desk prior to drilling holes to bolt down an ET. This can be accomplished by raising the top cover of the ET and dropping the fulcrum wire vertically through the bolt down holes. The wire now serves as a center punch in marking the desk.

An alternate method that may be used is to insert sharpened Model A positioning pins in the machine bolt down holes and exerting a slight amount of pressure on the machine when it is properly positioned. Desk mounting holes can then be drilled accurately.

## CLEVIS SPINNER

Use the spring screw starter #9002145 to install clevises. The clevis is held with the screw starter and can easily be spun on to the link.

## POWER ROLL ORDERING MODELS A, B, AND C

The Lexington Parts and Supplies Department continues to receive orders for solid shaft power roll (1078498) which is now obsolete. The Model C power roll (Part #1117828) should be substituted in all instances where the 1078498 power roll was formerly used.

## TOLL BILLER SKIP TAB KEYBUTTON

Incorrect substitution information has been given on part #1107487, Toll Biller Skip Tab Keybutton. This part will now be shipped whenever ordered. All substitution records in the field should delete the card for this part as being replaced by 1095476, Locking Bar Assembly.

## PARTS CATALOG CHANGE

Model C Carriage and Rails, Page 02, Item 52 — Change P/N from 1090003 to 1107956 for 13" carriage only.

## CATALOG ADDITIONS

### Decimal Tab

Page 49 B, Reference Number 37, Part #1118150

Change to read Cable Assembly Selector 100M

Add under Reference Number 37:

Part #1118151 Cable Assembly Selector 1, 10, 1M, 10M

Part #1118152 Cable Assembly Selector 0, 100, 1T, 10T, 100T



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## CONTENTS

### SERVICE HINTS:

BELTS OFF

RIBBON BUNCHING

RETURN TAPE-CARRIAGE

SHIFT

OILING

PLASTIC STEEL

DETENT RELEASE-WEAR

### INFORMATION:

SHIPPING GROUPS

SEGMENT GUIDE SPRING

### PUBLICATION CORRECTIONS:

## BELTS OFF AS A RESULT OF SHIPPING

To prevent belts from coming off the pulleys during shipment a strip of cardboard is being wedged between the intermediate pulley and the frame. This causes the belts to be moved toward the flanges on the pulleys, thereby preventing them from slipping off. The strip of cardboard extends upward and is bent over into the type basket, making it accessible for removal. This preventive action was started with Standard ET #1210752 and Executive ET #2028229.

## SPOOL TENSION SPRING (PART #1118340)

Ribbon Bunching - Increased drag may be applied to the ribbon spool shafts by moving the ends of the spool tension spring P/N 1118340 up the sides of the spool mounting bracket. This may be varied by moving one or both ends of the spring, however this should not be done unless absolutely necessary. (See Newsletter 62, Page 3 for additional information.)

## RETURN TAPE-CARRIAGE

If clutch pulley tension spring fails to keep proper tension on carriage return tape during operation, it might be caused by interference of switch operating link with the clutch pulley assembly. Reposition link by forming.

## SHIFT FAILURE

Occasional shift failure may be traced to binds in the shift toggle links. If this condition exists lubricate the oiler link bearing surface with IBM #17 grease and the mounting stud with IBM #6.

In a number of cases shift failures may be traced to insufficient toggle action of the shift toggle springs. It may be necessary to adjust the shift stop screws up or down to obtain proper toggle action. In doing this, even top and bottom may be lost. Even top and bottom should then be adjusted by the eccentric on the segment. Care should be taken in the eccentric adjustment to maintain a parallel position of the segment. If the segment is not maintained parallel the printed material may appear as italic or vice versa.

## OILING

Oiling hard-to-get-at places, such as the motor oil hole (R. H.), may be accomplished with the aid of a fulcrum wire. The fulcrum

wire is placed in the oil hole and the oil is then allowed to flow down the fulcrum wire.

### USE A "PLASTIC STEEL"

When mounting screws break off below the surface of the rear rail it is often difficult to drill out the case hardened screw without damage to the threads in the rail. Good results can be obtained through use of a "plastic steel" which can be purchased locally in hardware stores.

Use a drill the same size as the screw, leaving a clean hole. Plastic steel is then inserted in the hole and a screw coated with grease turned into it and left until the plastic has hardened (approx. 2 hrs). The screw can then be removed and the part which it held replaced. The job is now complete. This product can also be used to secure studs which have worn loose.

### WEAR OF DETENT RELEASE ASSEMBLY MODEL "C" IVI

To prevent rapid wear of the detent release assembly (Part Number 1116858) of the Model C IVI, lubricate the camming surface with #17 grease. This is at the point where the detent release contacts the detent arm assembly.

### SHIPPING GROUPS

The plastic bag which contains the lead cord, instruction book and other accessories can be identified with specific carriage length ET's by a 1/8" wide stripe in the top part of the zipper. The coding of the stripe is as follows:

Clear	- 13" Carriage
Red	- 17" Carriage
Blue	- 20" Carriage
Black	- 24" Carriage
Red and Blue	- 30" Carriage
Red and Black	- Lift Platen

This information should prove helpful in all handling of new ET's by Branch Office personnel.

### SEGMENT GUIDE SPRING

A number of nickel plated segment guide springs are being sent to the Field or are installed in new machines. These springs are of good quality and may be used with no adverse affects.

## PUBLICATION CORRECTIONS

### Model C Parts Catalog Correction

Motor and Drive Section, Page 13, Item 90, change part number of Power Roll Pulley to #1117827 (used with carbon ribbon only).  
Price .80

### CEM #478 Correction to Records

File after CEM #477

### Newsletter #65 Correction

Page 2, Item 2 should read "Escapement Pawl Wear, Part #1117961 and Part #1117962".

### Newsletter #66 Correction

Page 3, Item 1 should read "Screw Starter, Part #9900060".



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### SERVICE HINTS:

FORMING REAR LUG ON RIBBON LIFT MECHANISM  
POSITIONING PLATE

SHOP HANDLING OF ET

REPOSITIONING WIRE REPLACEMENT

REMOVING PLATEN VARIABLE BUTTON - MODEL C

KEYLEVER BEARING SUPPORT MOVEMENT - MODEL C

MAINSRING TENSION - DECELERATOR REMOVING

MARGIN CONTROL BELL CRANK REPLACEMENT

### INFORMATION:

MODEL C SPACEBAR TOUCH

FEED ROLL RELEASE LEVERS & METHOD OF SECURING

BACKSPACING ON ROBOT OPERATED ET

SHIFT CAM - SLIPPING ON POWER ROLL

LINESPACE PROBLEMS

## FORMING REAR LUG ON RIBBON LIFT MECHANISM POSITIONING PLATE

The rear lug on the ribbon lift mechanism may more easily and accurately be adjusted by moving the carriage to the left and inserting the small T bender down through the rails.

This adjustment is made for purposes of ribbon lift limitation.

## SHOP HANDLING OF ET

Positioning pins (Part Number 1090746) screwed into the four base foot mounting holes (use the four shipping stud holes on the Model C) will raise the ET making it easier to move and slide on a workbench during shop work.

## REPOSITIONING WIRE REPLACEMENT

To facilitate insertion of the repositioning indicator wire, round the tip of the wire with a stone and lubricate. The wire will then more readily slide into position without disassembly of the mechanism.

## REMOVING PLATEN VARIABLE BUTTON - MODEL C

The utilization of the smooth side of a cog belt makes the removal of the Model C platen variable button an easy matter. This is accomplished by wrapping the belt around the button and gripping the belt in the same manner used to loosen the centrifugal governor cover. Refer to News Letter #46, page 3.

## KEYLEVER BEARING SUPPORT MOVEMENT - MODEL C

Upon loosening the keylever bearing support screw (Part Number 58207) prior to keylever fulcrum wire movement, the keylever bearing support (Part Number 1118217) may also move.

In order to maintain the proper adjustment of the keylever bearing support, a locating mark may be scribed on both the side frame and the keylever bearing support before loosening this assembly. A "+" mark for this purpose would reference movement in any direction.

## MAINSRING TENSION - DECELERATOR REMOVING

In the event it becomes necessary to remove the decelerator, the proper amount of mainspring tension may be retained in the following manner.

1. Mark the lug on the main spring drum upon which the tension tape is located.
2. Count the number of turns necessary for complete unwinding.
3. After replacing the decelerator or carriage tension tape, rewind the mainspring to the referenced tension and re-install the tension tape.

Differences in machine speed before and after mainspring related work can thus be minimized.

### MARGIN CONTROL BELLCRANK REPLACEMENT

When replacing the margin control bellcrank P/N 1117433, the mounting stud P/N 117434 and mounting nut P/N 1090037 should be adjusted so the bellcrank, while still free to rotate, has a minimum of side play. Because of manufacturing specifications the shoulder of the stud is .050" long while the thickness of the bellcrank is .062". From this it can be seen that tightening the stud completely will bind the bellcrank. The correct procedure is to adjust the stud for proper side play of the bellcrank and then tighten the stud lock nut.

### MODEL C SPACEBAR TOUCH

In spacebar repeat touch problems, use spring (Part Number 1102139) for a heavy touch of 31 ounces and spring (Part Number 1117933) for a light touch of 18 ounces. Normal Model C repeat spacebar tension is 24 ounces.

### FEED ROLL RELEASE LEVERS, METHOD OF SECURING

Effective with approximate Standard Serial #1214227 and approximate Executive Serial #2029377 a Grip Clip P/N 1115058 is being installed on the inside of the R. H. Carriage End Cover to prevent the Feed Roll Release Lever from falling off if the set screw becomes loose. The Feed Roll Release Lever is now removed at the same time as the Carriage End Cover. These parts are available for Field use.

### BACKSPACING ON ROBOT OPERATED ET

For increased efficiency and speed when underscoring on a robot-operated typewriter, the underscore can be made into a dead or non-escaping typebar. This is done by removing a portion of the typebar where it contacts the U-bar.

The robotyper or autotypist roll is then cut to first underscore, then type the character underscored, then underscore, etc, until the word or words desired are all underscored.

For additional efficiency, a lower case underscore typebar may be used. The procedure outlined also lessens the backspace work load.

### SHIFT CAM - SLIPPING ON POWER ROLL

Some cases of the Shift Cam slipping on the Power Roll can be attributed to insufficient tension on the Pusher and Lever Spring (P/N 1098149.) This tension may be increased by moving the rear end of the spring from the spring stud to the tapped hole directly behind the Pusher and Lever Assembly.

### LINESPACE PROBLEMS

If line space problems are occurring, there are three areas that may be checked:

1. The number of teeth in the ratchet, correct number is 199.
2. The angle of the ratchet driver does not correspond to the platen ratchet.
3. The platen clutch housing boss extends down and does not allow the platen ratchet driver to seat properly.



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## CONTENTS

### MODEL "C" DECELERATOR INFORMATION

INSUFFICIENT SIDE PLAY - CARRIAGE RETURN AND TABULAR DECELERATOR ARMS.

POSITION OF CARRIAGE RETURN SPRING CLUTCH CLAMP (PART NO. 1117571)

ARM MOVEMENT IN RESTORING - CARRIAGE RETURN AND TAB DECELERATOR ARMS.

BINDING ON CARRIAGE RETURN

DEFECTIVE BRISTO SET - SCREWS (PART NO. 257969)

## INSUFFICIENT SIDE PLAY - CARRIAGE RETURN AND TABULAR DECELERATOR ARMS

The Model C-1 Reference Manual Section (Form No. 241-5002-0), page 25, outlines adjustments for positioning the spring clutch collars on the shaft to allow the decelerator arms to rotate freely without exceeding .003" end play on this shaft. Overall play in the shaft is given as .003" also.

Plant tests conducted on defective assemblies returned to Lexington indicate that these tolerances may be incorrect. The correct tolerances are .003" to .005" on both the spring clutch collar and the end play of the shaft. The Reference Manual is to be changed accordingly.

When making these adjustments check for interference between the drum gear assembly and the centrifugal governor collar.

## POSITION OF CARRIAGE RETURN SPRING CLUTCH CLAMP (PART NO. 1117571)

Failure of the decelerator to operate properly on carriage return can often be traced to the position of the decelerator spring clamp on the spring clutch. This clamp should be positioned so as to overlap the decelerator hub assembly (Part No. 1117570) by 1/16".

## ARM MOVEMENT IN RESTORING - CARRIAGE RETURN AND TAB DECELERATOR ARMS

Reports have indicated that the clutch springs may be too long. This can restrict the movement of the decelerator arms. If this problem cannot be corrected through increasing the side and end play adjustments previously mentioned, the offending clutch spring should be replaced.

The ends of the spring clutches nearest the decelerator arms may have sharp ends which retard arm movement. Stoning or careful forming will correct this.

## BINDING ON CARRIAGE RETURN

In a limited number of decelerator assemblies of recent manufacture, the chamfer on the decelerator hub assembly (Part No. 1117570) has been excessive. The amount of chamfer should be held to .005", but in some cases, it was found that some have approximated .014".

A bind in the carriage return decelerator cam arm (Part No. 1117568) can be caused by a loop of the carriage return spring clutch that is allowed to drop into the excessive chamfer.

Binds may also be caused by chips becoming dislodged from a chipped chamfer edge which lodge under the carriage return spring clutch. Erratic deceleration on carriage return and failure of the carriage return decelerator arm to restore are symptoms of this. The tolerances between the spring clutch and their operating surfaces are very small. Almost any amount of foreign material in this area will cause a bind.

If either of these conditions is a problem, remove the hub assembly (Part No. 1117570) and the spring clutch. Carefully clean the spring and its operating surfaces; lubricate with molycote; and reassemble. If the hub is suspected, replace it.

#### DEFECTIVE BRISTO SET - SCREWS (PART NO. 257969)

Bristo set - screws (Part No. 257969), used to hold the decelerator hub and collars, may be found difficult to loosen and tighten. This is because of broken splines in their heads. Replace them with acceptable set - screws of the same part number.



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### TE INFORMATION

8500 DRIVE MOTOR (HOWARD)

VOLT-OHM METER (PART NO. 801907)

611D TRANSMITTER - 6550 TUBE FAILURE (PART NO.  
505253)

OVERPRINTING WITH 8400 CONSECUTIVE SPACING  
TIME RECORDER

TE PARTS HANDBOOK CHANGES

REMOVAL OF TE PARTS FROM E.P.C.'s

— IBM —

## 8500 DRIVE MOTOR (HOWARD MANUFACTURE)

A severe impact against the brush cap of the new style "Howard" drive motor (Part No. 53415) can force the brush holder against the commutator causing the motor to bind. The damage can occur in shipment or field handling.

The brush holders can be easily reset. By removing the brushes and armature, a thin pin punch or brass rod can be inserted through the hole of one brush holder to contact the inside edge of the opposite brush holder. By lightly tapping against the punch or rod, the offending brush holder can be repositioned to clear the commutator. Check for freedom of the armature and shaft as the motor is re-assembled.

The end play of the motor shaft is balanced by several thin steel and white nylon washers. Be careful not to lose or displace any of these spacers while disassembling the motor.

The three tapped 5-40 holes in the mounting plate on the base of the motor are not centered. When re-assembling this style motor, the mounting strap should be turned so that the tapped holes are closest to the shaft end of the motor, or the motor will be positioned too far forward in the 8500 for the motor coupling to properly engage the shaft of the gear reduction housing.

Brush caps, brushes and brush springs for the Howard drive motor have not been assigned part numbers. However, they are available as N. P. N. items when an RPQ and a P & S Requisition is submitted directly to the Lexington Parts Order Department.

The brushes, brush caps and brush springs for the Delco & GE type motors are still available for field maintenance. These items are illustrated in the 8500 section of the TE Parts Handbook.

## VOLT - OHM METER (PART NO. 801907)

The Lexington Parts Order Department now stocks the one (1) ampere fuse for the volt ohm meter (Part No. 801907). These may be ordered by P & S Requisition in the normal manner. The following information is supplied:

<u>PART NO.</u>	<u>DESCRIPTION</u>
801424	Fuse - one (1) ampere - 600 volts (OVER)

## 611D TRANSMITTER - 6550 TUBE FAILURES (PART NO. 505253)

Preliminary investigation of 6550 tube failures indicates that the trouble is an open filament. However, closer examination has proved that the open circuit exists in the tube pin connections. Resoldering of tube pins, (pins 2 and 7) may result in a perfectly operating tube.

## OVERPRINTING WITH 8400 CONSECUTIVE SPACING TIME RECORDER

IBM discontinued manufacture of all time cards during 1959. Customers are purchasing time cards of other manufacturers. It has been reported that some of these cards do not meet the tolerances permissible for satisfactory operation of the 8400 recorder. Excessive side play will cause overprinting. The card widths should be held very closely to 3.250" and 4.200" respectively for #2 and #4 receivers. The customer should be advised, whenever there is a variance of card widths, that this is the direct cause of his overprinting problems.

## TE PARTS HANDBOOK CHANGES

TE Parts Handbook Section 037, Figure 7, Reference Item A3, Part No. 74821 - motor assembly - synchronous; should be changed to Reference Item A3, Part No. 74829 - motor assembly - synchronous.

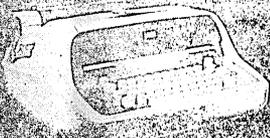
## REMOVAL OF TE PARTS FROM E.P.C.'s

Effective January 1, 1960, TE parts will not be available from the five Emergency Parts Centers. Branch Offices will then submit all orders for TE parts directly to the Parts Supply Order Department, Lexington Plant.

The TE section of the Emergency Parts Centers' Parts listing should be removed and destroyed.

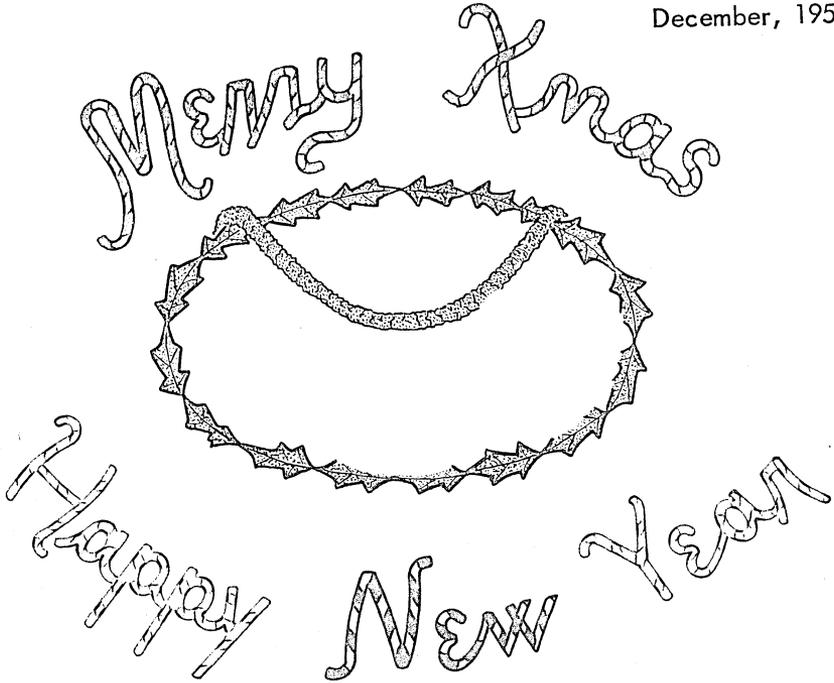
The need to order TE parts from the E.P.C. is not critical since no new products are being introduced. TE maintenance is now committed to the repair of existing equipment. Branch Office experience of local TE needs should be adequate to plan and procure all TE parts through regular and rush parts orders from the Plant.

The majority of TE requests to the E.P.C.'s have been forwarded to the Lexington Plant for several months, resulting in a one to three day delay. By communicating directly with the Lexington Plant, the availability of a TE item will be known within 24 hours.



# *ET News Letter*

December, 1959



The enthusiasm and hard work of each member of ET Customer Engineering has made 1959 a year of great accomplishment for the ET Division and IBM. With announcement of the Model "C" the stage was set for breaking of all records for customer acceptance of IBM Electric Typewriters. The second million machines to be placed in our customers' offices will roll off the Lexington assembly lines in a few short years, rather than the twenty-five years necessary to deliver the first million. A large part of the credit for such success goes to you, the 2500 members of the ET Customer Engineering organization.

The Customer Engineering staff at ET HQ and the Lexington Plant join me in wishing you and your families a joyful Christmas season and a New Year of happiness, good health and success for 1960.

Sincerely,

*J. E. Boaz*  
J. E. Boaz

## C O N T E N T S

### INFORMATION:

CARRIAGE RETURN TAPE WEAR - MODEL "C" 13" AND 17" CARRIAGES

CARRIAGE TENSION TAPE GUIDANCE - MODELS "B" AND "C"

REWIND RELEASE LATCH SPRING - MODEL "C" CARBON RIBBON

41 TOOTH LINESPACING - FIELD CONVERSIONS

RIBBON LIFT BAIL MOUNTING CHANGE

### SERVICE HINTS:

CAM CLEARANCE - MODEL "C" POWER ROLL REPLACEMENT

STRIPPED SET-SCREW THREADS - MODEL "C" FABRIC RIBBON FEED DRIVE GEARS

LEVELING ET'S ON UNEVEN DESKS

PREVENTION OF MACHINE SLIPPAGE ON DESK

CARBON PAPER STAIN REMOVAL

## CARRIAGE RETURN TAPE WEAR - MODEL "C" 13" AND 17" CARRIAGES

Excessive carriage return tape wear, approximately 4 inches from the end of the tape which attaches to the linespace mechanism, can be traced to an excessive projection of the screws used to mount the shock-mounted escapement racks. Additional washers (Part No. 56722) can be placed under the head of the present screw (Part No. 10170) or screw (Part No. 1115734) can be substituted. This screw will be used in future manufacture.

CEM 478 which announced the rubber shock-mounted racks should be changed accordingly.

## CARRIAGE TENSION TAPE GUIDANCE - MODELS "B" AND "C"

Spacebar equalizing rod bushing (Part No. 1073866) will be utilized in production and can be used in the field to prevent the carriage tension tape from coming off of the tension tape pulley (Part No. 1000540).

To install, slide the bushing over the frame projection to the left of the pulley sufficiently to reduce the clearance between the projection and the rear flange of the pulley.

## REWIND RELEASE LATCH SPRING - MODEL "C" CARBON RIBBON

The rewind release latch spring (Part No. 1117789) has been increased in length in the area of the spring tail. A hook can be formed on those springs prior to this change to prevent them from coming loose where they are held by the rewind release plate. The spring should then be moved to the rear of the latch and the rear of the plate extension.

## 41 TOOTH LINESPACING - FIELD CONVERSION

It is necessary to grind away a portion of the index pawl carrier in the area directly above the feed roll release shaft when field installing 41 tooth ratchets and associated parts. If this is not done full movement of the carrier to effect complete linespacing will not take place.

## RIBBON LIFT BAIL MOUNTING CHANGE

The ribbon-lift-bail stud nut (Part No. 7341) is no longer used. Elastic stop-nut (Part No. 103372) is now used in manufacture and for replacement purposes to eliminate stud breakage.

(OVER)

## CAM CLEARANCE - MODEL "C" POWER ROLL REPLACEMENT

Note cam clearance before replacing a cam or performing an operation requiring power roll removal. The L. H. power roll bearing retainer assembly has sufficient tolerance in its three mounting screw holes to permit a change of letter cam and functional cam clearance near the bearing retainer assembly. An impression variation or functional cam malfunction may result.

Letter cam clearance of .015" to .020" should be checked and adjusted after removal and replacement of the power roll. Proper functional cam clearance must also be reviewed.

## STRIPPED SET-SCREW THREADS - MODEL "C" FABRIC RIBBON FEED DRIVE GEARS.

Stripped set-screw threads in the nylon ribbon feed drive gears (Part No. 1118312) are quickly repaired with an 8-32 bottom tap. If a bottoming tap is not available, grind the point flat on a regular tap. The nylon is easily threaded and a new 8-32 set-screw installed, without disassembly or gear removal.

## LEVELING ET'S ON UNEVEN DESKS

Leveling can be accomplished by inserting a washer between the foot pad and the bottom case on Model "C" typewriters. A convenient washer to use is the washer that is installed between the bottom case and the six mounting screws in the shipping parts of each new ET. A maximum of two per foot pad can be used on the Model "C". Models "A" and "B" will accommodate more if necessary.

## PREVENTION OF MACHINE SLIPPAGE ON DESK

Wipe the feet of the ET and point of contact on the desk with cleaning fluid for better gripping action during operation. A bolt down may be averted.

## CARBON PAPER STAIN REMOVAL

Stubborn carbon paper stains can be removed from machine covers through the use of denatured alcohol. Field tests have proven its effectiveness. Caution: Alcohol is inflammable and must be handled with care.