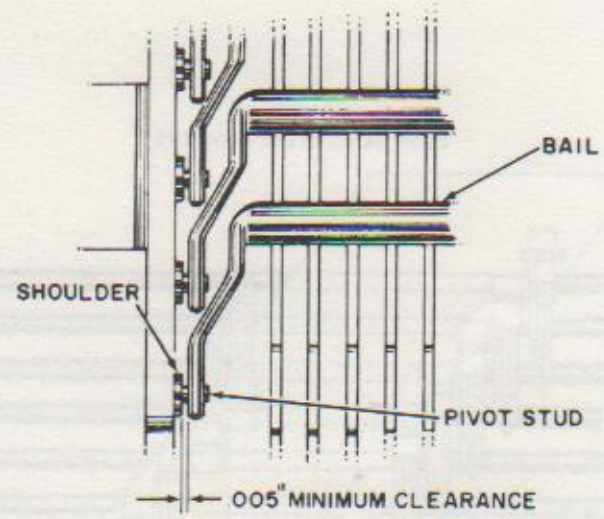
SELETTORE

Friden 2200/2300 SERIES MACHINES

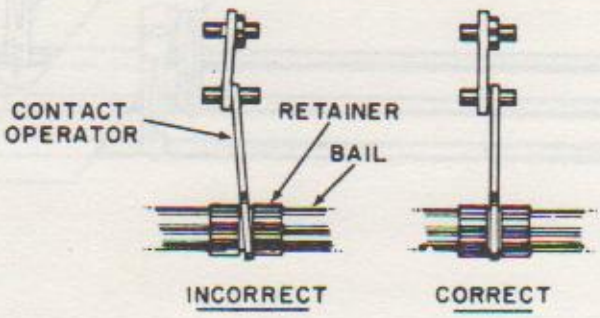
SELECTOR

ADJ. 1. CONTACT BAIL END PLAY



There should be a minimum of .005" clearance between the ends of the contact bails and the shoulders on their pivot studs. Form the ends of the bails to obtain the adjustment. Check to see that the bails operate freely.

ADJ. 2 CONTACT ALIGNMENT



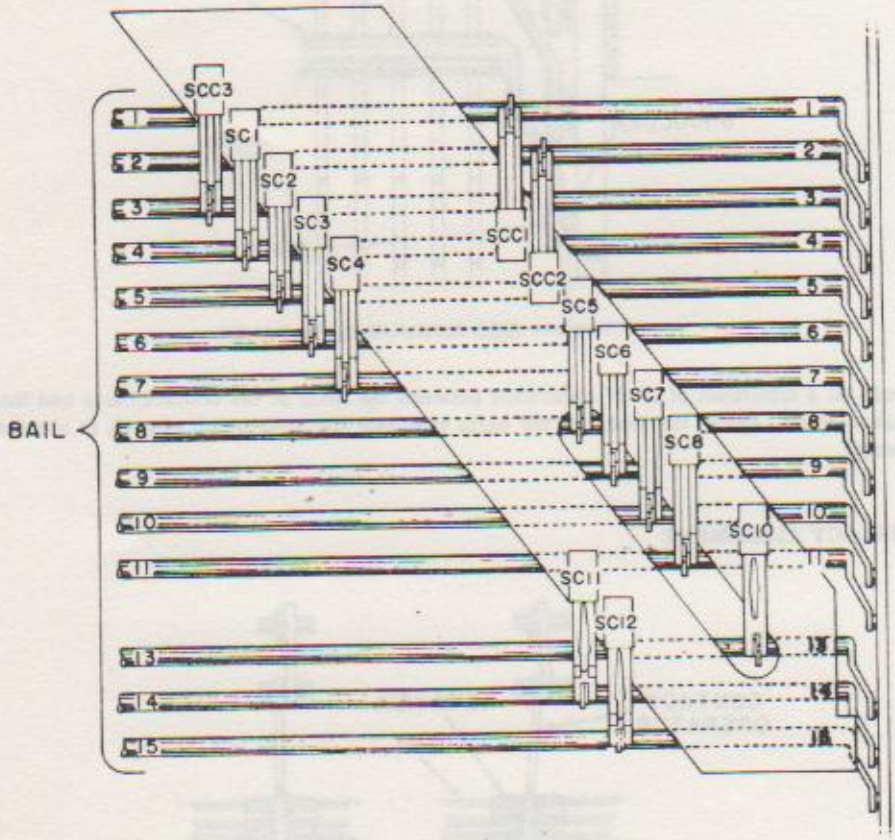
Check to see that all contact stackups are vertically aligned. The mating contacts should be no more than .015" out of alignment and the contact operators should not bind. When necessary, loosen the contact assembly mounting screws to align the contacts and operators.

Friden 2200/2300 SERIES MACHINES

ADJ. 3 CONTACT LOCATIONS

NO

2200 SERIES FLEXOWRITERS



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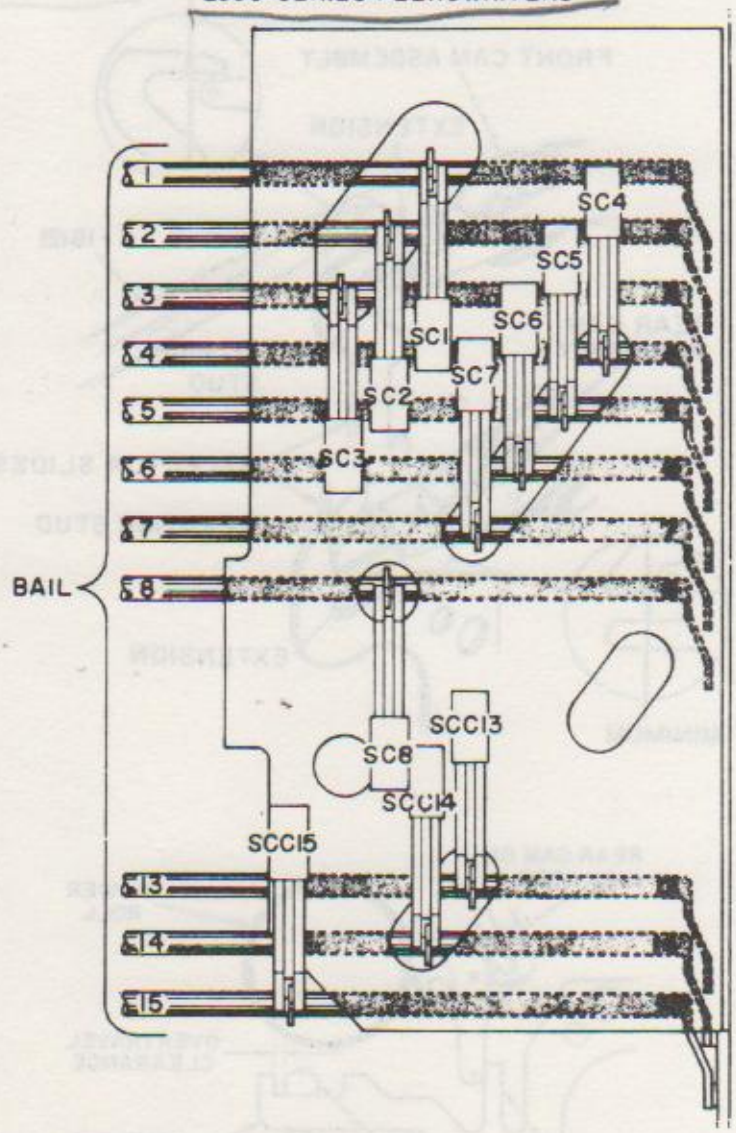
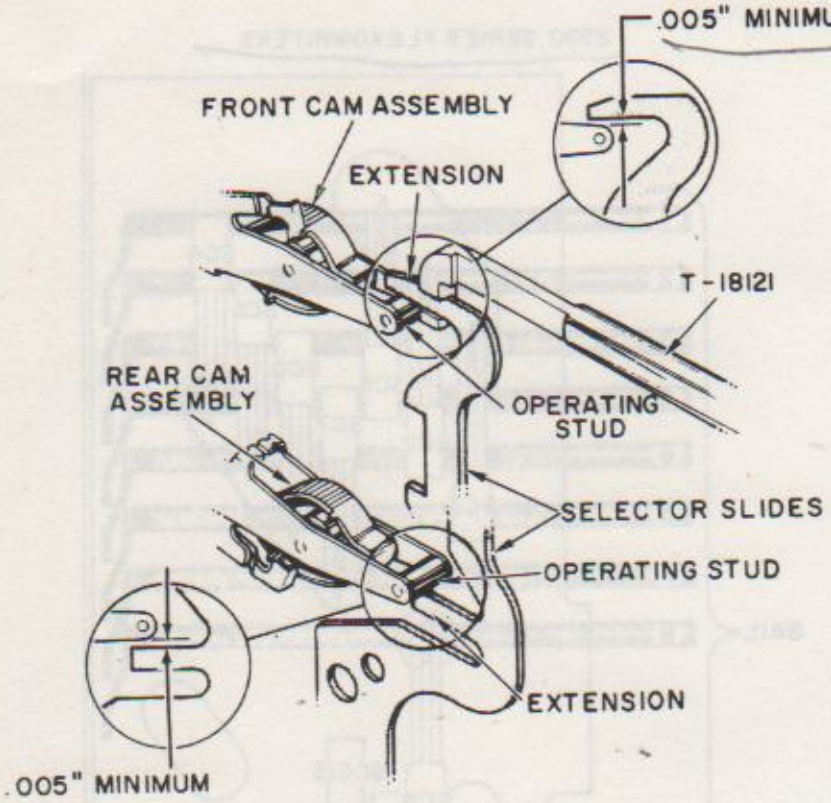
2300 SERIES FLEXOWRITERS

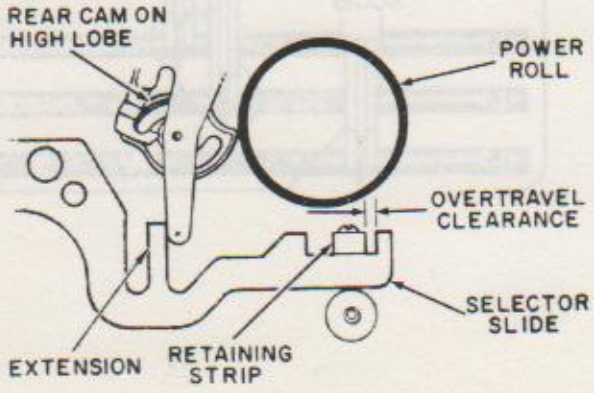


Friden 2200/2300 SERIES MACHINES

ADJ. 4A PRELIMINARY SELECTOR ADJUSTMENTS

Ne teniamo conto se si bloccano.





The selector slide extensions provide a means of adjusting the pulse length of the selector common contacts to an individual keylever when it can not be obtained by the over-all adjustment of the contacts. These adjustments are covered later in this section; however, some preliminary adjustments of the machine are necessary.

1. The cam assemblies should have the proper clearance to the power roll (refer to the writing machine section - ADJ. 7).

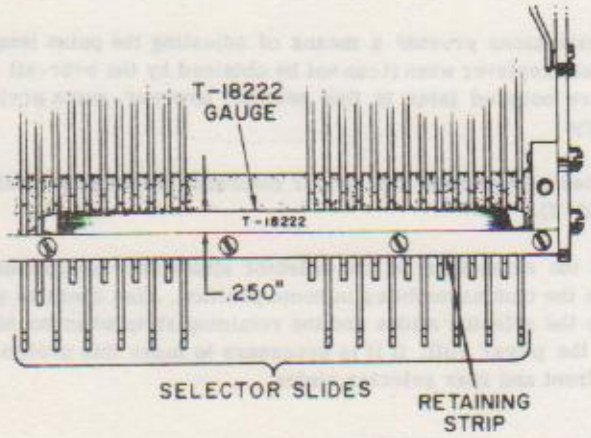
2. Check to see that the extensions on the selector slides have a minimum of .005" clearance to the operating studs on the cam assemblies in home position. Also check to see that there is overtravel clearance between the selector slides and the retaining strip when the high lobe of the cam assemblies are against the power roll. If it is necessary to make this preliminary adjustment, form the extensions on the front and rear selector slides.

ADJ. 4B CONTACT AIR GAP ADJUSTMENTS

2200/2300 SERIES SELECTOR CONTACTS

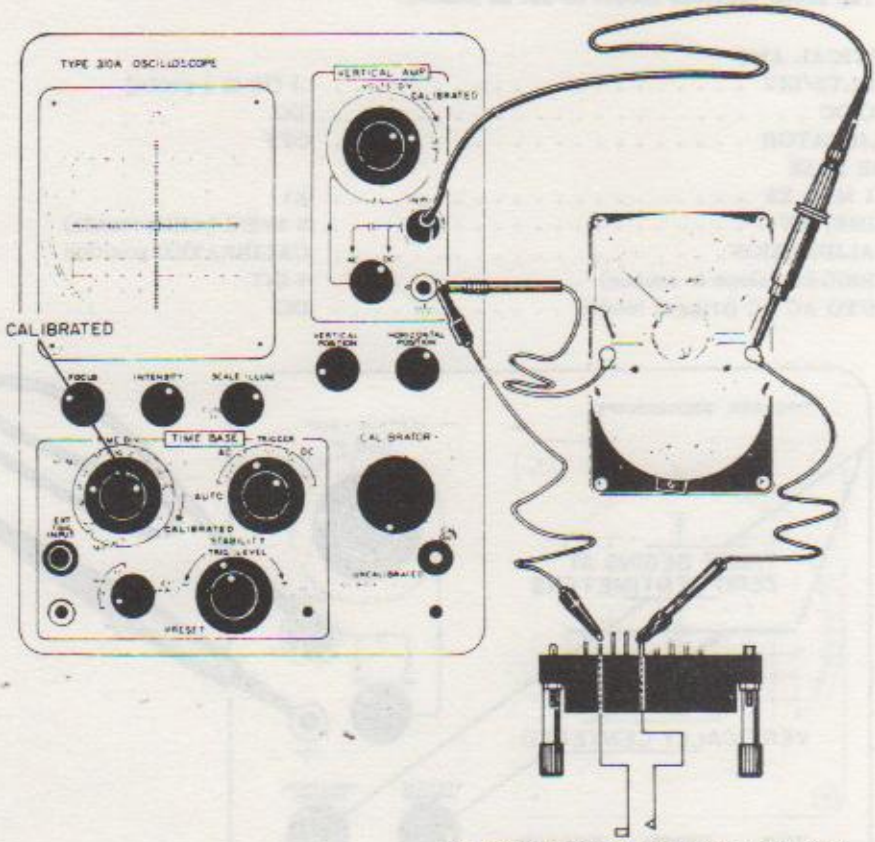
OPERATOR	AIR GAP	LOCATION		PULSE LENGTH
		COMMON CONTACTS (SCC-)		
GREEN	.024" TO .029"	CAR. RET., TAB, BACKSPACE		20 TO 35 MS
BLACK		ALL OTHERS		
		CODE CONTACTS (SC-1 TO 8)		
GREEN	.016" TO .021"	CAR. RET., TAB, BACKSPACE		PRECEDE THE COMMON PULSE BY A MIN. OF 2 MS
BLACK		ALL OTHERS		
		SC-10 CONTACTS (MODEL II)		
BLACK	.020" TO .025"	NORMALLY OPEN CONTACTS		20 TO 30 MS
	.020" TO .025"-SLIDE MOVED .250" FROM HOME POSITION REFER TO N/C CONTACT ADJUSTMENT	NORMALLY CLOSED CONTACTS		
		SC-11-12 CONTACTS (MODEL II)		
BLACK	.024" TO .029"	NORMALLY OPEN CONTACTS		20 TO 30 MS
	MAKE BEFORE BREAK	NORMALLY CLOSED CONTACTS		
		BRIDGE CONTACTS (SB-)		
2021296	.045" TO .050"	N/O	CAR. RET., TAB, BACKSPACE	20 TO 30 MS
2021297	.032" TO .037"	N/O	ALL OTHERS	
	.032" TO .037"-SLIDE MOVED .250" FROM HOME POSITION REFER TO N/C CONTACT ADJUSTMENT	N/C	ALL	

1. N/O Contacts - Make a preliminary adjustment of all normally open contacts to the air gap specified on the contact adjustment chart with the selector slides fully restored.



2. N/C Contacts - The air gap specified on the timing chart for normally closed contacts should be set with the slide extended .250" (1/4") from its normal rest position. The keylever trip gauge (T-18222) may be inserted between the selector slides and the retaining strip to hold the slides correctly positioned. Adjust the contacts to the air gap specified on the contact adjustment chart.

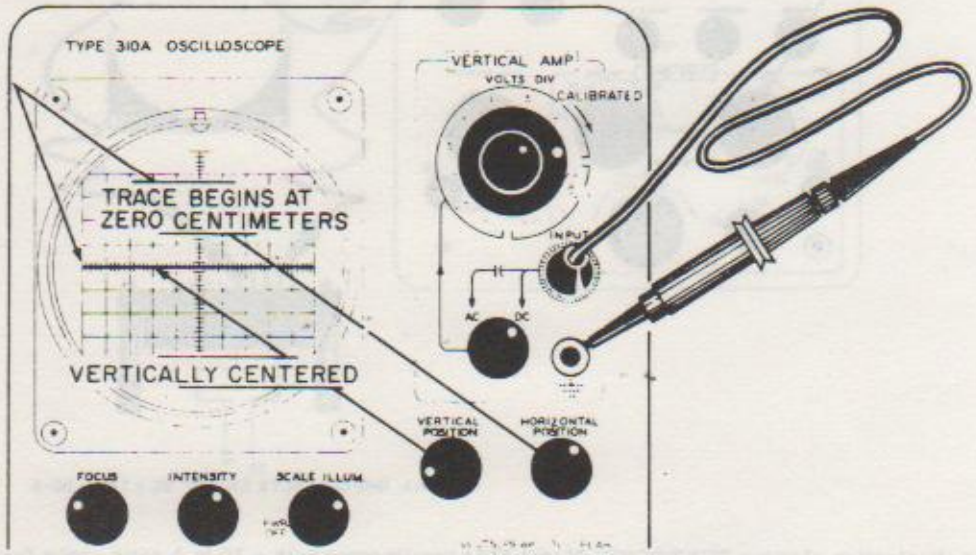
ADJ. 4C SELECTOR CONTACT SCOPING (All N/O Contacts Except Selector Code Contacts - SC1-8)



The illustration shows a TEKTRONIX Model 310A oscilloscope with a 10 to 1 ratio probe (not required) being used; however, a comparable scope with a calibrated time base (horizontal sweep) and the capacity to trigger on an external signal may be used in the following adjustments. The set up of the controls and wiring applies to most TEKTRONIX oscilloscopes and will generally be the same for other makes. The meter is being used only as a convenient source of D.C. voltage and the meter deflection is of no concern. Although a meter is ideal, a circuit tracer or similar device may be used; however, polarity must be observed. The V-O-M terminal on the meter is at approximately minus one and a half volts DC in relation to the COM terminal when the meter selector is on the X1 scale. The scope controls are set accordingly.

1. Setup - Make the connections between the scope, meter and the contacts to be checked as illustrated, with the selector in position and the machine standing on its back. The meter should be on the X1 scale. The scope controls should be set as follows:

VERTICAL AMP	
VOLTS/DIV	.1 (10 to 1 probe)
AC DC	DC
CALIBRATOR	OFF
TIME BASE	
X1 MAG X5	X1
TIME/DIV	5 MSEC (milliseconds)
CALIBRATION	CALIBRATED position
TRIGGER (slope & source)	+INT
AUTO AC DC (trigger mode)	DC



VERTICAL POSITION - HORIZONTAL POSITION Controls

It is necessary to calibrate the vertical and horizontal positioning of the trace for pulse length measurement and reliable triggering. Turn the STABILITY control to the free running position (full right) to obtain a constant trace and with the probe temporarily disconnected from the scoping circuit and connected to a ground terminal on the scope, adjust the VERTICAL POSITION control to center the trace vertically on the screen. Adjust the HORIZONTAL POSITION control so that the trace begins at exactly zero centimeters (first vertical grid line on the left side of the screen). Reconnect the probe to the scoping circuit.

TRIGGER LEVEL & STABILITY Controls

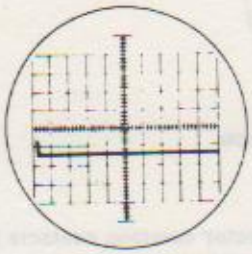
These controls are adjusted somewhat by a trial and error method. The following procedure is recommended as a starting point:

A. Connect the set of contacts to be observed into the circuit previously illustrated.

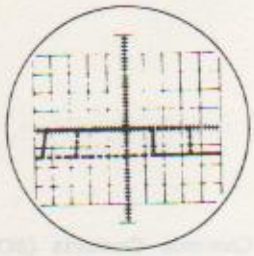
B. Turn the STABILITY control to the free run position (full right) and back to the left until the trace just disappears.

C. Turn the TRIGGER LEVEL control toward the + position (to the right) and then turn it slowly to the left until a trace just flashes across the screen. When this point is reached, back the control up to the right very slightly.

D. Readjust the STABILITY control by turning it to the right until the scope is free running (constant trace) and back to the left until the trace just disappears.

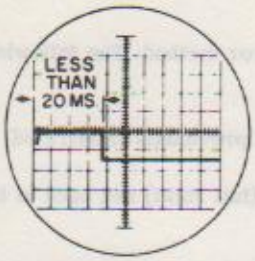


TRACE AT NEGATIVE LEVEL

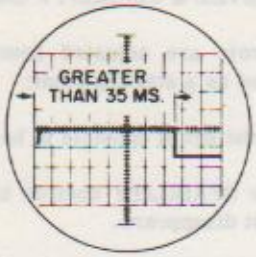


TRACE DISPLAYING RANDOM PULSES

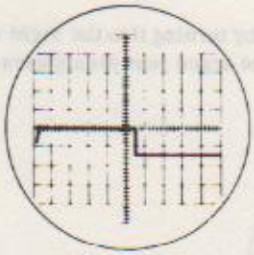
E. Strike a keylever associated with the contacts being observed (machine turned on) and observe the trace on the scope. If there is no trace, the final setting of the TRIGGER LEVEL may have been too far to the right. If there is a trace at a negative level as the keylever is operated, the TRIGGER LEVEL may not have been turned far enough to the right. If necessary, readjust the TRIGGER LEVEL until the proper trace appears. If still no trace can be obtained, turn the STABILITY control to the right (free run position) and strike the same keylever. If the pulse length of the contacts appears randomly along the horizontal axis, it will indicate that there is a pulse going into the scope but that the difficulty is in setting the trigger controls (slope-mode-level-stability). When not even a random pulse can be obtained, recheck the entire setup including the wiring and keylever selection.



SHORT PULSE DURATION



LONG PULSE DURATION



CORRECT PULSE DURATION
(20-35 MS.)

2. Selector Common Contacts (SCC-) - Hook up the selector common contacts to be checked and strike every keylever that operates that particular set of common contacts.

If most of the keylevers operate the common contacts near their minimum specified length of time (20 milliseconds) and the pulse length of some keylevers is under specifications, the common contacts may be adjusted toward their minimum specified air gap which will tend to increase the pulse length. When most of the keylevers operate the common contacts near their maximum specified length of time (35 milliseconds) and the pulse length of some keylevers is over specifications, the common contacts may be adjusted toward their maximum specified air gap which will tend to decrease their pulse length.

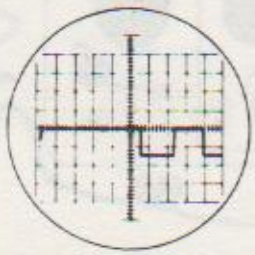
NOTE: The adjustment of the common contact air gap will affect the pulse length of the common contacts for all associated keylevers and the over-all range of pulse length should be considered before adjusting the common contacts.

When the majority of keylevers associated with the common contacts under observation show a pulse length in the mid-range of adjustment (25 to 30 milliseconds) and some keylevers are over or under the specified pulse length, their selector slide extensions should be formed, being careful to maintain the requirement outlined in ADJ. 4A PRELIMINARY SELECTOR ADJUSTMENTS. Adjusting the selector slide extension closer to the operating stud on the cam assembly will increase the pulse length for that particular keylever and forming the extension away from the operating stud will decrease the pulse length for the keylever associated with that selector slide.

3. SC-10, 11 & 12 (MOD. II) & SB (selector bridge) Normally Open Contacts - The connections and scope control settings for these contacts are the same as previously illustrated for all N/O contacts except SC 1-8. In the case of SC-10, 11 & 12 contacts there is more than one keylever which operates these contacts, and the pulse length from the operation of all cams associated with these contacts must be considered before making any adjustment. When adjustment is necessary to make all associated leylevers operate a particular set of contacts within the specified limits, adjust those contacts toward their maximum or minimum specified air gap.

   NOTE: If the proper pulse length for a particular key cannot be obtained within the limits of the specified air gap, this is an indication that the selector slide extensions may be maladjusted. In this instance it would be necessary to recheck the pulse length for the common contacts associated with that particular keylever, so that the selector slide extension may be correctly adjusted.

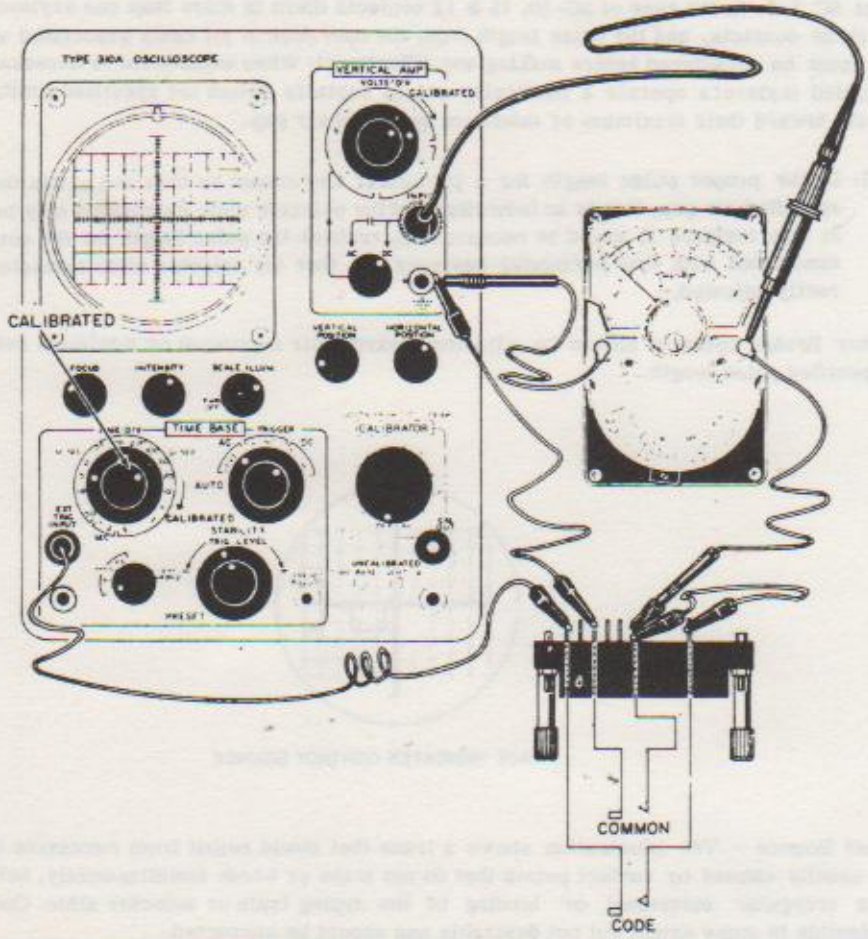
   Selector Bridge contacts should be adjusted toward their maximum or minimum settings to obtain the specified pulse length.



TRACE INDICATES CONTACT BOUNCE

4. Contact Bounce - The illustration shows a trace that would result from excessive contact bounce. It is usually caused by contact points that do not make or break simultaneously, but can be caused by an irregular movement or binding of the typing train or selector slide. Contact bounce is permissible to some extent but not desirable and should be corrected.

ADJ. 4D SELECTOR CODE CONTACT SCOPING (SC1-8)



As specified in the contact adjustment chart, the code contacts are to close at least two milliseconds before the common contacts close. This requirement is obtained by adjusting the air gap of the code contacts within the specified limits. A rough approximation of the adjustment can be obtained by visual inspection of the contacts. The following procedure is given in the event that certain auxiliary output units require a more accurate setting of the contacts. The setup of the scope for the code contact adjustment is similar to the setup used for the normally open contact adjustment, but in addition, provides a means of observing the common contact pulse length in relation to the operation of the code contacts.

1. Setup - Make the connection between the scope, meter and the contacts to be checked as illustrated, with the selector in position and the machine standing on its back. The meter should be on the X1 scale. The scope controls should be set as follows:

VERTICAL AMP	
VOLTS/DIV	.1 (10 to 1 Probe)
AC DC	DC
CALIBRATOR	OFF
TIME BASE	
X1 MAG X5	X1
TIME/DIV	5 MSEC
CALIBRATION	CALIBRATED position
TRIGGER (slope & source)	- EXT
AUTO AC DC (trigger mode)	DC

VERTICAL POSITION - HORIZONTAL POSITION Controls

It is necessary to calibrate the vertical and horizontal positioning of the trace for time measurements and reliable triggering. Turn the STABILITY control to the free running position (full right) to obtain a constant trace and with the probe temporarily disconnected from the scoping circuit and connected to a ground terminal on the scope, adjust the VERTICAL POSITION control to center the trace vertically on the screen. Adjust the HORIZONTAL POSITION control so that the trace begins at exactly zero centimeters (first vertical grid line on the left side of the screen). Reconnect the probe to the scoping circuit.

TRIGGER LEVEL AND STABILITY Controls

These controls are adjusted somewhat by a trial and error method. The following procedure is recommended as a starting point:

A. Connect the particular set of code contacts and common contacts to be observed into the selector code contact circuit previously illustrated.

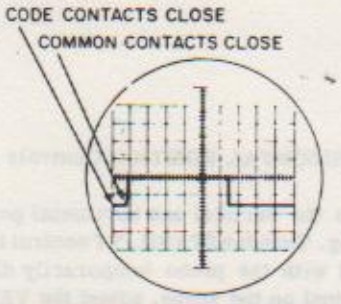
B. Turn the STABILITY control to the free run position (full right) and back to the left until the trace just disappears.

C. Turn the TRIGGER LEVEL control toward the minus position (to the left) and then turn it slowly to the right until a trace just flashes across the screen. When this point is reached, back the control up to the left very slightly.

D. Readjust the STABILITY control by turning it to the right until the scope is free running (constant trace) and back to the left until the trace just disappears.

E. Strike a keylever which will operate both the code and common contacts connected into the circuit with the machine turned on to observe the trace on the scope.

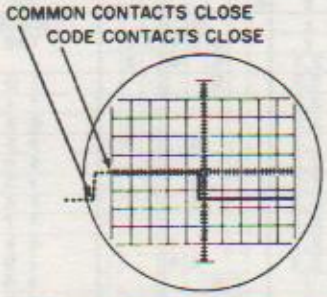
NOTE: A slight readjustment of the TRIGGER LEVEL control may be necessary to obtain a consistent trace. It is important to be certain that the proper keylever is depressed since electrical "noise" from the operation of the machine can trigger an unstable trace even though the proper code contacts do not close. An unstable trace can also be caused by noise generated from a neon light too close to the scope. If "noise" still continues to cause an unstable trace, the trigger mode control (AUTO-AC-DC) may be set in the AC position. This will lessen the effect of "noise" on the scope, but will require a more exact setting of the TRIGGER LEVEL and STABILITY controls as outlined in steps C & D.



CODE CONTACTS CLOSED BEFORE COMMON CONTACTS.

2. Selector Code Contact Adjustment (SC1-8)

The trace across the screen is shown to be starting as the code contacts close. The trace begins at the minus one and one half volt level indicating that the common contacts are not yet closed. A few milliseconds later, the common contact do close which causes the trace to rise to zero volt level and remain there until the common contacts open.



COMMON CONTACTS CLOSED BEFORE CODE CONTACTS.

In the case where the common contacts close before the code contacts, the trace will begin at the zero volt level and remain there until the common contacts open. In this instance, it would be necessary to decrease the air gap of that particular set of code contacts within the limits specified (.016" to .021") to obtain a closure of the code contact at least 2 milliseconds before the closing of its associated common contacts.

NOTE: If the adjustment can not be obtained with the code contacts set at their minimum air gap, the adjustment for the common contact pulse length should be rechecked.

Friden 2200/2300 SERIES MACHINES

2201		TAPE CHANNELS								2301	
KEY	SCC	8	7	6	5	4	3	2	1	KEY	SCC
CR	2	8								CR	15
SPACE	2				5					SPACE	15
TAB	2			6	5	4	3	2		TAB	15
BACK SP	2,3			6		4		2			
) 0	2,3			6						) 0	13
! 1	2,3								1	! 1	13
@ 2	2,3							2		@ 2	13
# 3	2,3				5			2	1	# 3	13
$ 4	2,3						3			$ 4	13
% 5	2,3				5		3		1	% 5	13
¢ 6	2,3				5		3	2		¢ 6	13
? 7	2,3						3	2	1	? 7	13
* 8	2,3					4				* 8	13
(9	2,3				5	4			1	(9	13
a A	1		7	6					1	a A	15
b B	1		7	6				2		b B	15
c C	1		7	6	5			2	1	c C	15
d D	1		7	6			3			d D	15
e E	1		7	6	5		3		1	e E	15
f F	1		7	6	5		3	2		f F	15
g G	1		7	6			3	2	1	g G	15
h H	1		7	6		4				h H	15
i I	1		7	6	5	4			1	i I	15
j J	1		7		5				1	j J	15
k K	1		7		5			2		k K	15
l L	1		7					2	1	l L	15
m M	1		7		5		3			m M	15
n N	1		7				3		1	n N	15
o O	1		7				3	2		o O	15
p P	1		7		5		3	2	1	p P	15
q Q	1		7		5	4				q Q	15
r R	1		7			4			1	r R	15
s S	1			6	5			2		s S	15
t T	1			6				2	1	t T	15
u U	1			6	5		3			u U	15
v V	1			6			3		1	v V	15
w W	1			6			3	2		w W	15
x X	1			6	5		3	2	1	x X	15
y Y	1			6	5	4				y Y	15
z Z	1			6		4			1	z Z	15
F1 MNP STOP	2					4		2	1	STOP	
F2	2				5	4	3			NP (AUX SP)	
F3 PR RES	2			6		4	3			PR (AUX 0)	
F4	2		7			4	3			ON1	14
F5	2		7	6		4	3	2		ON2	14
F6	2			6		4	3	2	1	OFF	14
F7	2		7		5	4	3	2		FC ON	14
F8	2					4	3		1	TSR (AUX 1)	
F9	2					4	3	2		SW (AUX 2)	
F10	2				5	4	3	2	1	DS (AUX 3)	
F11	2		7			4	3	2	1	FP (AUX L)	
F12	2		7		5	4	3		1	AID (AUX J)	
F13	2			6	5	4	3		1	DUP (AUX /)	
UPPER CASE	1		7	6	5	4	3			UPPER CASE	15
LOWER CASE	1		7	6	5	4		2		LOWER CASE	15
;:	1		7	6		4		2	1	;:	15
,"	1			6	5	4		2	1	,"	15
"-	2,3		7							"-	13
:/	2,3			6	5				1	:/	13
_%	2,3		7		5	4		2	1	_%	13
¡B	2,3		7	6	5					¡B	13
± +	2,3				5	4		2		PI-1 (AUX B)	
1/4 1/2	2,3		7	6		4	3		1	PI-5 (AUX A)	
' *	2,3		7			4		2		PI-2 (2, 8, -)	
TAPE FEED			7	6	5	4	3	2	1	TAPE FEED	

The adjustment of a particular set of code contacts must be checked in relation to all of the common contacts associated with them. For example, the SC-3 code contacts can be operated by the numeric 4 keylever, the letter D keylever and the OFF (F-6 Mod II) keylever. Each of these keylevers operate a different set of common contacts, therefore, the SC-3 code contact adjustment must be checked in relation to all three of the common contacts.