

RIBBON WELD SKIPOVER

1.1 INTRODUCTION

This supplement describes the ribbon weld skipover system used in the B-Series 300LPM/600LPM/1000LPM Acoustic Cabinet and 300LPM/600LPM Standard Cabinet line printers.

1.1.1 Associated Documents

300LPM/600LPM Line Printers	Maintenance Guide DpC 255137
300LPM/600LPM Acoustic Cabinet Line Printers	Maintenance Guide DpC 267714
1000LPM Line Printer	Maintenance Guide DpC 267701

2.1 PURPOSE

The purpose of the ribbon weld skipover system is to delay the program print routine (hammer fire) while the weld portion of the ribbon traverses the print station. Thus, deterioration of the ribbon at the weld area is prevented, and ribbon life is enhanced.

3.1 PHYSICAL DESCRIPTION

The ribbon weld skipover circuit consists of new ribbon cartridges, band cover interlock/weld sensor assembly, Interlock Transition Circuit Card Assembly, and new program PROMs (see figure 1).

3.1.1 New Ribbon Cartridge

The new ribbon cartridge has a conductive strip attached to the ribbon following the ribbon weld. When this strip is sensed by the printer electronics, a weld skipover signal is initiated.

3.1.2 Band Interlock/Weld Sensing Assembly

This assembly consists of a new band interlock harness assembly with an attached right hand ribbon post and ESD shield. The new ribbon post contains two metal sensing bars which detect the conductive strip on the ribbon. The sensing bars are connected to the band interlock harness through the ribbon post and are protected against ESD effects by a metal shield.

3.1.3 Interlock Transition CCA

The new Interlock Transition CCA includes circuitry for detection of and response to the presence of the conductive strip at the right hand ribbon post. This assembly contains a permanently attached ribbon cable.

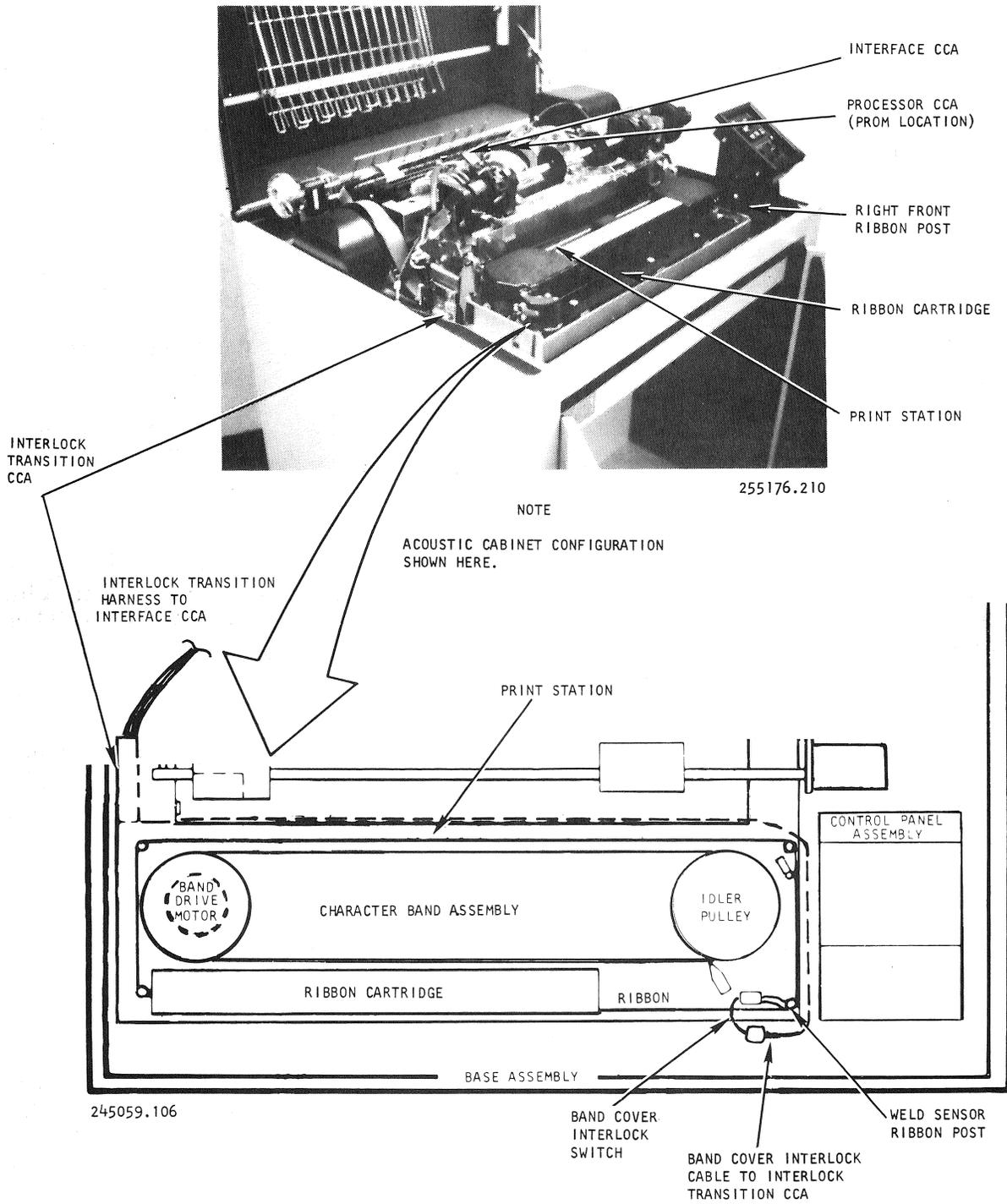


Figure 1. Component Location, Ribbon Weld Skipover

3.1.4 PROM Kits

A ribbon weld skipover routine has been added to all B-Series Standard VFU/non-VFU PROM kits. These new PROM kits can be used in existing printers without the ribbon weld skipover feature.

4.1 FUNCTIONAL DESCRIPTION (Figure 2)

A conductive strip, mounted on the ribbon following the weld seam, passes the sensing circuit, located on the right front ribbon post, once during each revolution around the ribbon path. The sensing circuit then triggers the first of two timing circuits. At that time, the first timing circuit will produce a "one-shot" window of 211-374 milliseconds duration to be used by a multiplexer as a select-deselect signal. After the first timing signal (window) is started, the second timing circuit is triggered as a free-running oscillator to pulse at a 7 to 10.7 microsecond rate. This waveform is then fed to a set-reset latching circuit located on the Interface CCA. The set-reset latching circuit is "toggled" at the oscillator rate for the duration of the first timing window. Before performing the print routine, the system microprocessor will look for this weld signal (transitions) for at least twelve (12) microseconds. If there is a transition in the signal, the microprocessor will interpret it as a ribbon weld. If there is no transition, i.e., a steady level for more than twelve microseconds, the signal will be interpreted as a normal condition or as a "band cover switch" open. "Band cover switch" open will cause a control panel status indication 03 to be displayed, and printer operation will be halted. A transition in the signal detected by the processor will cause a delay in the print routine while the weld traverses the print station.

5.1 CIRCUIT DESCRIPTION (Figures 3,4, and 5)

As the ribbon weld actuating element traverses the shorting bar on the ribbon post, signal BDTNS* is switched to ground (see figures 3 and 4). Capacitor C6 is discharged at that point to create a negative going trigger pulse at U1, pin 6. Timing Circuit U1 is configured as a monostable (one-shot) multivibrator. Triggered at U1-6, U1 will generate a one-shot waveform of 211 to 374 microseconds duration to serve as select signal for enabling multiplexer U2 "B" inputs at pin 14, and at the same time, to enable timing circuit U1 at U1-10. Timing circuit U1-9 will then oscillate at a 7 to 10 microsecond rate as a square wave input to multiplexer U2, pin 6. Multiplexer U2 will then, during the select time at pin 1, output the signals BNDTNS and BNDTNS* (U2-7 and U2-4) to the Interface CCA (see figure 5) at J1-24 and J1-22. Latching circuit U10-9 will pulse at the 7 to 10 microsecond rate for the time period allowed by the timing window from Transition CCA U1-5 (see figure 4). The square wave output from U10-9 (figure 5) is then fed to multiplexer U9, pin 6, to be transmitted to the Processor CCA via INBUS 1. The Processor CCA firmware will then look for the transition in the multiplexer output for at least a twelve microsecond period. If there is any transition in the signal, the processor will define the signal as a ribbon weld skipover signal, and will not invoke the program print routine.

Another condition may be detected by the ribbon weld skipover circuitry (figure 4, U1 and U2). If the character band cover is open, the signal BDTNS (figure 4, J4-3) is switched high (+5 VDC), and signal BDTNS* is switched low. Signal BDTNS* low will initiate the timing window and square wave as described above.

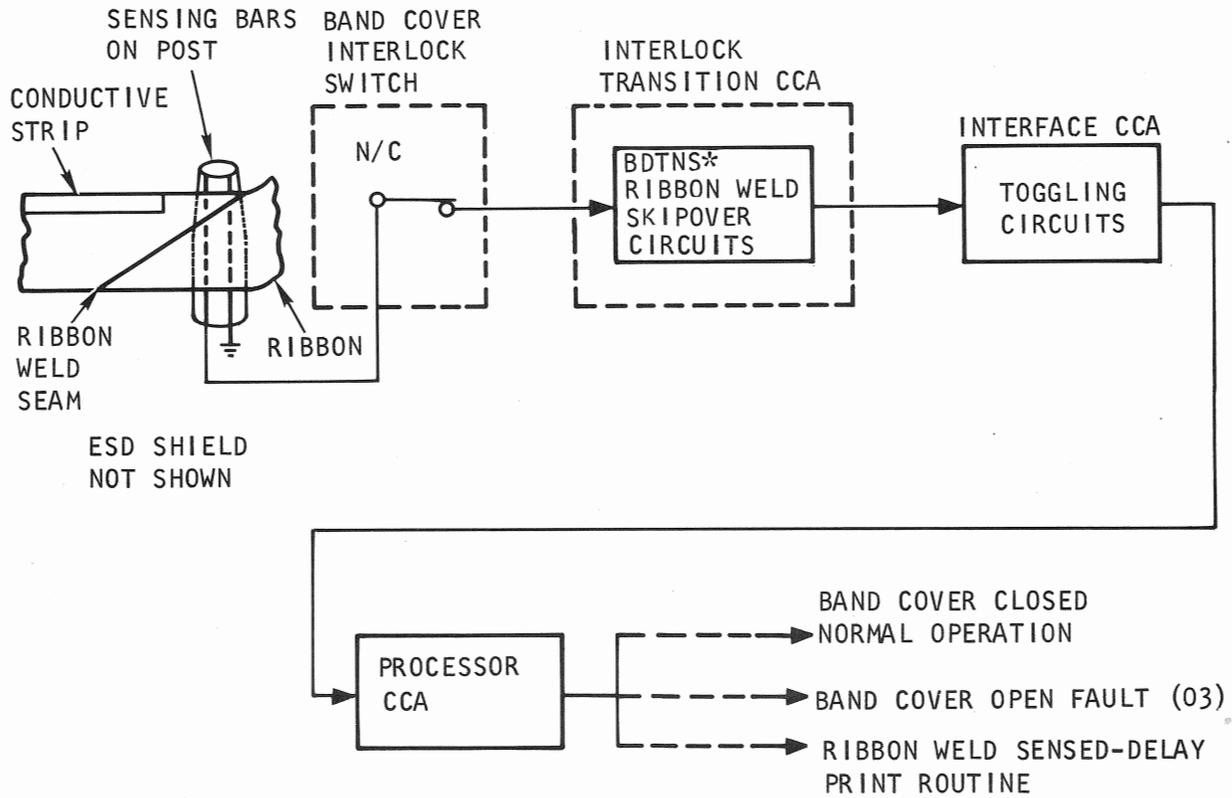
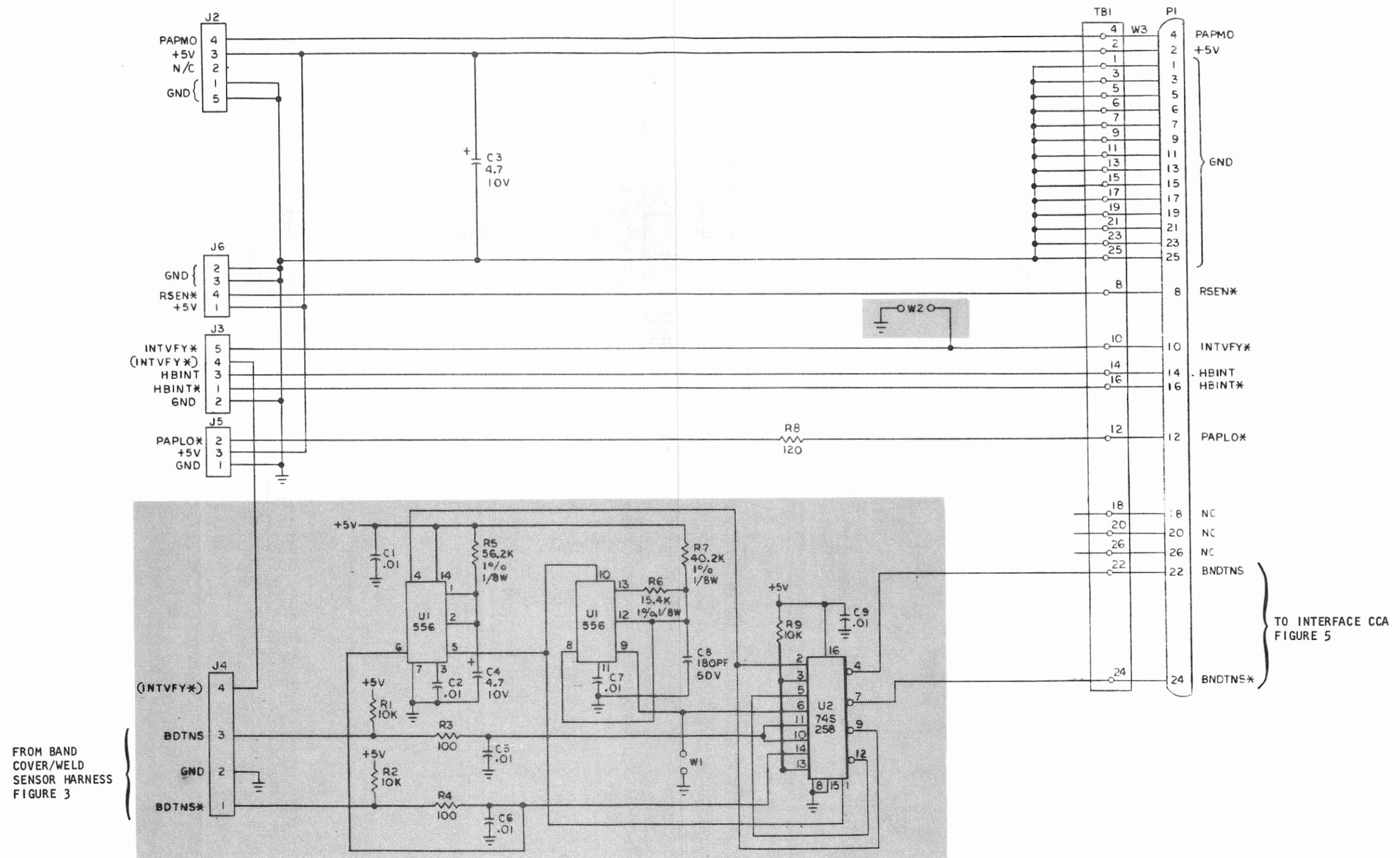


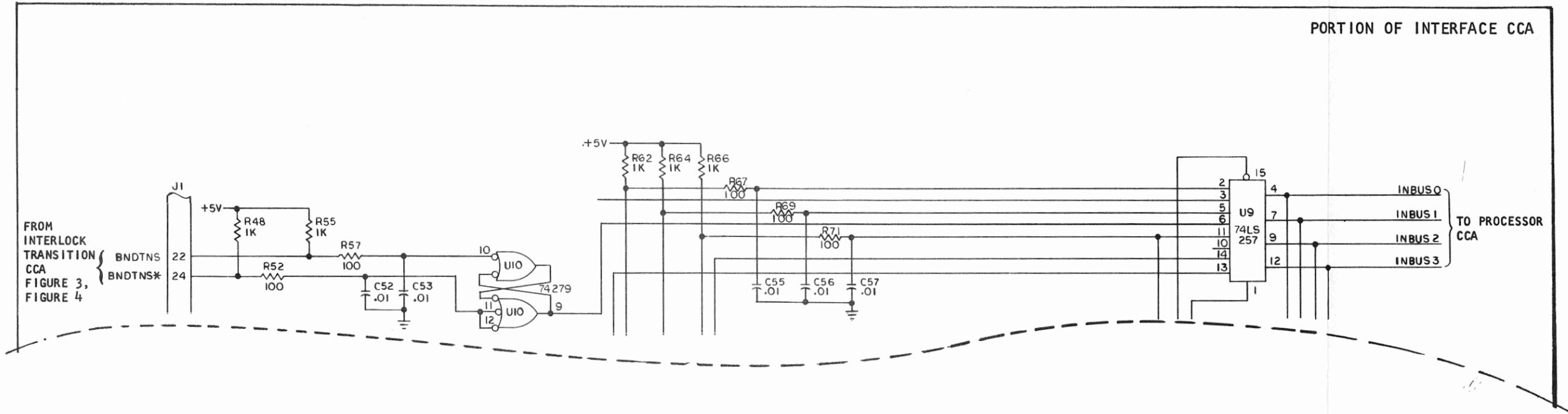
Figure 2. Block Diagram, Ribbon Weld Skipover



- 2. SCHEMATIC IS 273344
- 1. ASSEMBLY NO. IS 273340

NOTES:

Figure 4. Interlock Transition CCA with Ribbon Weld Skipover



- 2. SCHEMATIC IS 257349
- 1. ASSEMBLY IS 257345

NOTES:

Figure 5. Interlock CCA with Ribbon Weld Skipover

However, signal BTDNS switch high (+5 VDC) at U2, pins 10 and 11 will serve to disable the dynamic waveform triggered by BDTNS*. U10-9 (figure 5) will remain high as long as signal BDTNS remains at +5 VDC. In this case, the Processor CCA will not see a transition in the ribbon weld signal circuit and will interpret the level as a band interlock fault. Status indicator code 03 will then be displayed at the control panel and printer operation will halt. If a normal band cover condition (band interlock switch closed) exists, signal BDTNS will be low, and BDTNS* will be high. The ribbon weld skipover timing circuits will not be activated at this time. The Processor CCA will then interpret this as a normal condition and will not respond with a status command or inhibit the print routine. The following truth table (table 1) illustrates signal conditions required for the Processor CCA response.

TABLE 1. RIBBON WELD SKIPOVER TRUTH TABLE (Figure 4)

Transition CCA Input/Output Signal				Processor CCA Response
BDTNS	BDTNS*	BNDTNS	BNDTNS*	
0	0	0	Osc	Print Mode Inhibit as weld passes print station.
0	1	0	1	Normal condition. No action by Processor CCA.
1	0	1	0	Interpreted as Band Cover Interlock fault.
1	1	1	1	Indeterminent condition. No action.

6.1 CONFIGURATIONS (Figure 4)

Two sets of wire jumper connections are located on the Interlock Transition CCA. W1 is provided to control the use of ribbon weld skipover, and W2 extends the options for using the Interlock Verify (INTFY*) control signal. W1 is normally left open to allow ribbon weld skipover to function. Jumpering W1 will disable the ribbon weld skipover. W2 is always wired to enable the standard system interlock to work. If W2 is removed, a special interlock system must be implemented.

7.1 PARTS LISTS

The following paragraphs describe the assemblies which contain ribbon weld skipover components:

- a. Ribbon Cartridges
- b. Band Interlock/Weld Sensor Assembly

c. Interlock Transition CCA

d. PROM Kits

7.1.1 Weld Skipover Ribbon Cartridges

Two types of ribbon cartridges are available for use with the ribbon weld skipover circuit. A standard length ribbon cartridge and an extended length ribbon cartridge. Table 2 below describes the two types.

TABLE 2. WELD SKIPOVER RIBBON CARTRIDGES

Part No.	Description
273429-550	Standard Ribbon Cartridge 50 yds w/weld sensor strip; 5 Mil thickness; Black Record Ink
273430-570	Extended Ribbon Cartridge 70 yds w/weld sensor strip; 5 Mil thickness; Black Record Ink

7.1.2 Band Interlock/Weld Sensor Assembly

The Band Interlock/Weld Sensor Assembly, shown in figure 6, consists of a special harness and post assembly.

7.1.3 PROM Kits

All PROM kits for the B-Series printers will contain firmware to execute the ribbon weld skipover operation. Refer to your printer Sales Order Notice for the appropriate PROM kits.

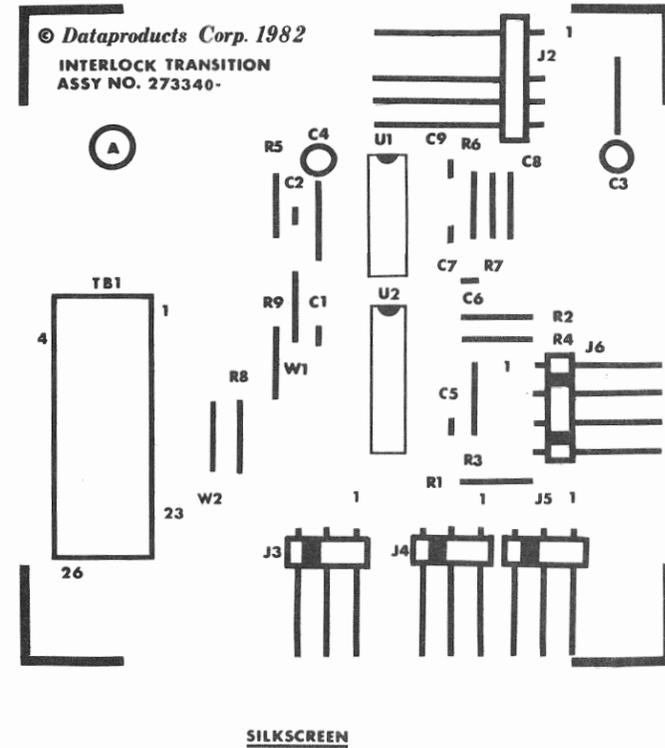


Figure 7. Interlock Transition CCA with Ribbon Weld Skipover

TABLE 5. INTERLOCK TRANSITION CCA WITHOUT INTERLOCK VERIFY

Figure & Index No.	Description	Reference Designator	Part No.	Qty
Fig. 7	Interlock Transition CCA w/o Interlock Verify		273340-001	1
1.	Capacitor, Ceramic, 10,000 pF, 20%, 100 Volt	C1,C2,C5,C6,C7,C9	801024-103	6
2.	Capacitor, Tantalum, 4.7 F, 20%, 10 Volt, Insulated Case	C3,C4	800091-475	2
3.	Capacitor, Ceramic, 180 pF, 20%, 50 Volt	C8	801311-181	1
4.	Connector Header, 5 Position, Rectangular	J2	801701-001	1
5.	Connector, PCB, Right Angle Header, 3 Position, Gold	J3,J4,J5	801034-003	3
6.	Connector, PCB, Right Angle Header, 4 Position, Gold	J6	801034-004	1
7.	Connector, Receptacle, Polarized, 26 Position	P1	801735-026	1
8.	Resistor, Film, 10K, 5%, 1/4 Watt	R1,R2,R9	800030-103	3
9.	Resistor, Film, 100 Ohms, 5%, 1/4 Watt.	R3,R4	800030-101	2
10.	Resistor, Fixed, 56.2K, 1%, 1/6 Watt	R5	800011-356	1
11.	Resistor, Fixed, 15.4K, 1%, 1/8 Watt	R6	800011-167	1
12.	Resistor, Fixed, 40.2K, 1%, 1/8 Watt	R7	800011-307	1
13.	Resistor, Film, 120 Ohms, 5%, 1/4 Watt	R8	800030-121	1
14.	Connector, Flat Cable, 26 Position	TB1	801090-026	1

TABLE 5. INTERLOCK TRANSITION CCA WITHOUT INTERLOCK VERIFY (Cont'd)

Figure & Index No.	Description	Reference Designator	Part No.	Qty
15.	Integrated Circuit, Timer, DpC 556A, TO-116, Plastic	U1	801462-001	1
16.	Integrated Circuit, Quad, 2-to-1 Data Select/Multiplexer 74S258N	U2	801719-001	1
17.	Wire, Jumper, Solid, Insulated, 22 AWG	W2	800688-001	1
18.	Cable, Ribbon, 26 Wire, 28 AWG	W3	800507-026	A/R

TABLE 6. INTERLOCK TRANSITION CCA WITH INTERLOCK VERIFY

Figure & Index No.	Description	Reference Designator	Part No.	Qty
Fig. 7	Interlock Transition CCA w/Interlock Verify		273340-002	1
1.	Capacitor, Ceramic, 10,000 pF, 20%, 100 Volt	C1,C2,C5,C6, C7,C9	801024-103	6
2.	Capacitor, Tantalum, 4.7 F, 20%, 10Volt, Insulated Case	C3,C4	800091-475	2
3.	Capacitor, Ceramic, 180 pF, 20%, 50 Volt	C8	801311-181	1
4.	Connector, Header, 5 Position, Rectangular	J2	801701-001	1
5.	Connector, PCB, Right Angle Header, 5 Position, Gold	J3	801034-005	1
6.	Connector, PCB, Right Angle Header, 4 Position, Gold	J4,J6	801034-004	2
7.	Connector, PCB, Right Angle Header, 3 Position, Gold	J5	801034-003	1
8.	Connector, Receptacle, Polarized, 26 Position	P1	801735-026	1
9.	Resistor, Film, 10K, 5%, 1/4 Watt	R1,R2,R9	800030-103	3
10.	Resistor, Film, 100 Ohms, 5%, 1/4 Watt	R3,R4	800030-101	2
11.	Resistor, Fixed, 56.2K, 1%, 1/8 Watt	R5	800011-356	1
12.	Resistor, Fixed, 15.4K, 1%, 1/8 Watt	R6	800011-167	1
13.	Resistor, Fixed, 40.2K, 1%, 1/8 Watt	R7	800011-307	1
14.	Resistor, Film, 120 Ohms, 5%, 1/4 Watt	R8	800030-121	1

TABLE 6. INTERLOCK TRANSITION CCA WITH INTERLOCK VERIFY (Cont'd)

Figure & Index No.	Description	Reference Designator	Part No.	Qty
15.	Connector, Flat Cable, 26 Position	TB1	801090-026	1
16.	Integrated Circuit, Dual Timer, PPC556A, TO-116, Plastic	U1	801462-001	1
17.	Integrated Circuit, Quad 2-to-1 Data Select/Multiplexer, 74S258N	U2	801719-001	1
18.	Cable, Ribbon, 26 Wire, 28 AWG	W3	800407-026	A/R