1103C
LINE PRINTER
(1443 HARDWARE COMPATIBLE)
TECHNICAL
MANUAL
212188 B

COMPUTER HARDWARE INC.
2550 FAIR OAKS BOULEVARD, SACRAMENTO, CALIFORNIA 95825

TABLE OF CONTENTS

TABLE OF ILLUSTRATIONS

SECTION 1 - THEORY OF OPERATION

Part 1 - General

Types of Operation

The 1443 is capable of four types of operation:

1. Carriage Immediate - via the PROCESS BITS, the 1800 Processor-Controller (P-C) outputs a carriage control character that is immediately sent to the printer for execution. Bit B of the character specifies whether a skip to a carriage control, or VFU*, tape channel (bit B false) or spacing (bit B true) will be performed. Bit A will be false because it specifies a delayed operation. Bits 1,2,4, and 8 contain the binary value of the VFU channel number or the number of spaces to be performed.
2. Print and Space - this command causes the P-C to request 132 cycle steals for print data. Before beginning, however, the 1443 interface sends to the printer either the code for a single space, automatically loaded from the previous print and space, or the code previously loaded by a carriage delayed instruction. After all 133 characters are received and sent to the printer, the print and paperfeed are executed.

* The terms "carriage control" and "vertical format unit" (VFU) are interchangeable.

3. Carriage Delayed - similar in function to the carriage immediate except that PROCESS BIT A will be true to indicate the delayed function. The effect of this instruction is to load a carriage control character from the P-C into the carriage control latch in the 1443 interface. When a print and space instruction occurs, the stored character is sent to the printer in place of the fixed space code. The latch is then automatically reset to the space code in preparation for the next print and space instruction.
4. Space Suppress - if bit 15 of the IOCC is true, this function occurs concurrently with a printing operation. Its effect is to replace the carriage control character with zeros, preventing any paper movement.

Description

The 1443 interface consists of two cards inserted in the basic CHI 1103 line printer electronics bay. A harness connects the card circuits to a cable connector mounted on the inside of the printer cabinet. The printer signal cable is equipped with an IBM-compatible hermaphroditic connector for attachment to the 1800.

The Control I card (position 26) contains circuitry to convert commands issued by the P-C into the necessary sequence of signals to operate the printer, request data from the P-C, and report operational status to the P-C. The Data Control card contains circuitry to generate the carriage control characters for single space and space suppress, store the characters for carriage delayed

operation and to translate 1443 print data code to ASCII code which is used by the 1103 printer.

The 1443 adaptor within the 1800 P-C is a prerequisite for 1103C operation and is provided by the customer.

Part 2 - Carriage Immediate

The P-C starts the operation by issuing CARRIAGE CONTROL at the beginning of E2 of a XIO control. (See Figure 1) This supplies one of the conditions for pin 13, IC5, card position 26 (26/IC5-12) (See Figure 4). The operation is determined to be an immediate function by PROCESS BIT A generating DATA BIT A which is also applied to 26/IC5. At time 060-090, 26/IC5-12 sets the CARR IMM FF. This sends PRINT COMMAND to the printer to begin a carriage and print data loading cycle. (See V-132-C Line Printer Manual, Vol I, shipped with the printer for detailed description of printer operation). Simultaneously XEQ CARRIAGE IMM blocks the print data path at 27/IC6-1 and enables the immediate control character path at 27/IC6-6 (See Figure 5). PROCESS BITS 1,2,4,8 and B follow this path and exit to the printer as BUS BITS 1,2,3,4 and 7. They will not be accepted by the printer unless a strobe occurs.

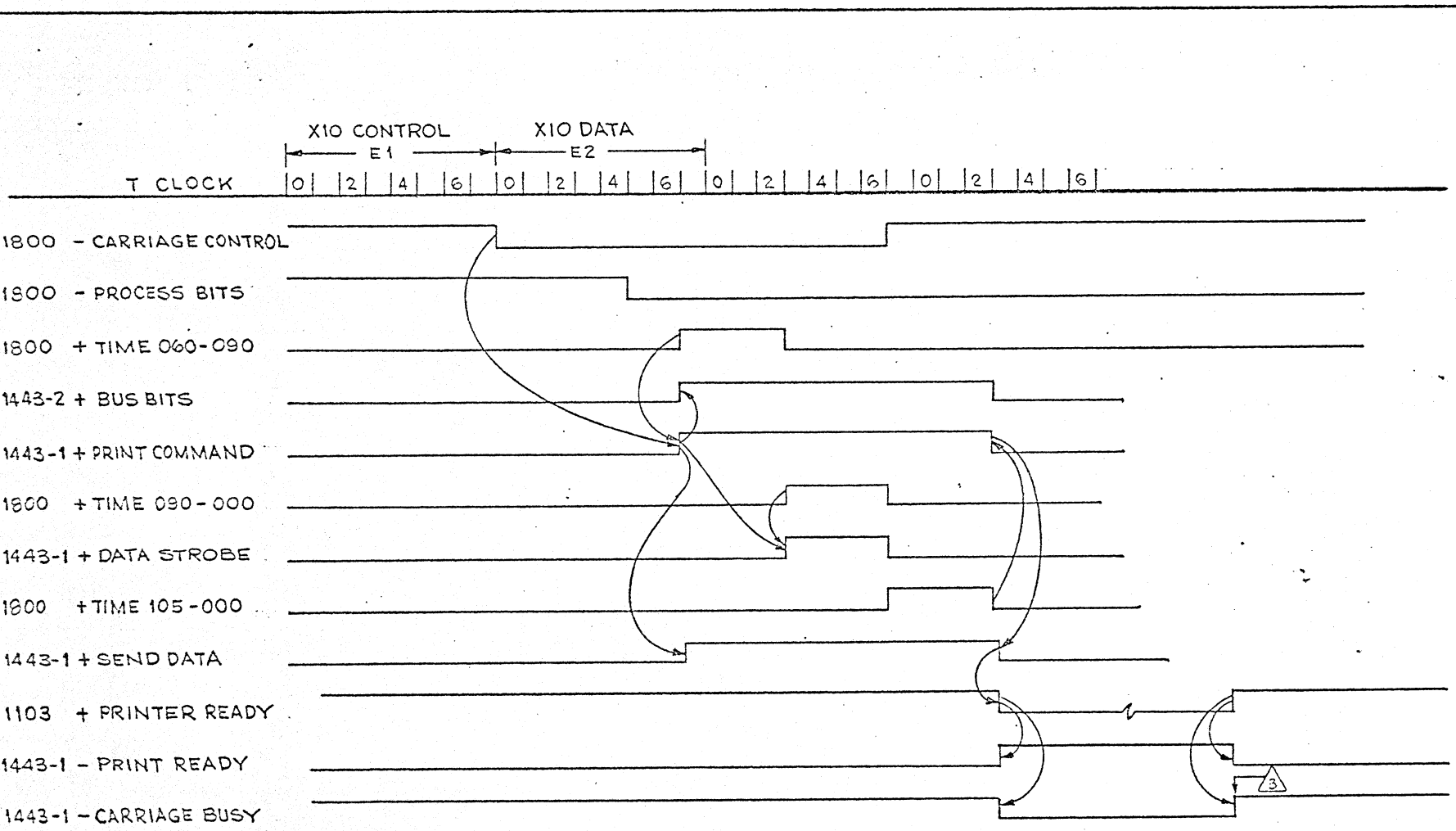
TIME 090-000 is used directly to generate DATA STROBE and the character is loaded into the printer paper feed line count register. Because no print data is needed, the printer's load cycle will be limited to this one character by dropping PRINT COMMAND.

TIME 105-000 resets the CARR IMM FF which removes the data from the printer bus and drops PRINT COMMAND. The latter causes the printer to commence its execution cycle and the spacing or skipping specified by the PROCESS BITS will occur. The printer acknowledges the termination of the load cycle and the start of the execution

cycle by dropping SEND DATA (not used in this function) and PRINTER READY, respectively. PRINTER READY generates a false PRINT READY and a true CARRIAGE BUSY for use by the CPU. When the paper feed is complete, these signals will reverse states to mark the end of the operation.

When the final paper position is reached, if that position coincides with carriage control tape channels (VFU channels) 1, 9 or 12, 26/IC-1 stores and transmits the fact to the CPU via the three CARRIAGE CHANNEL signals.

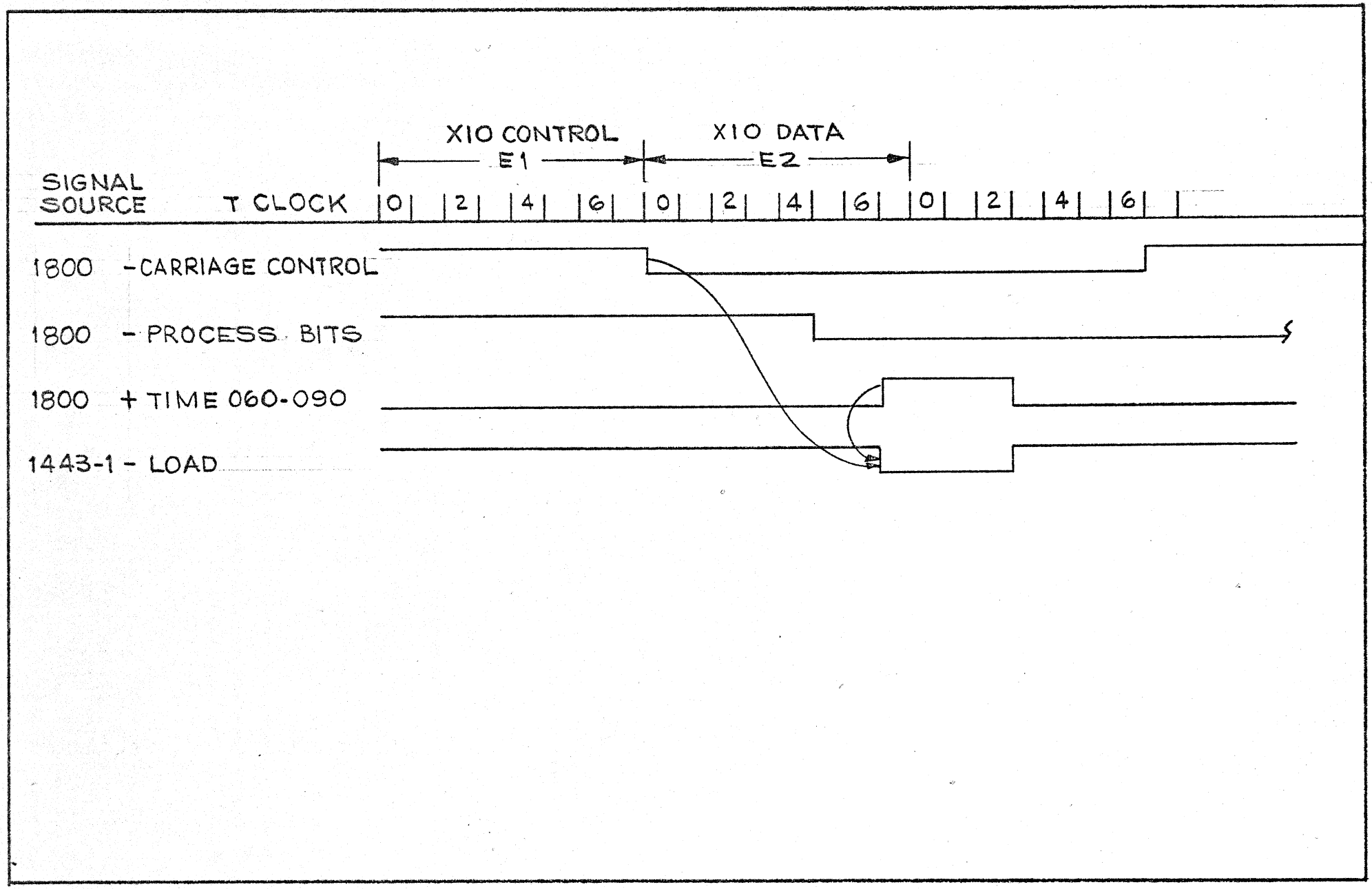
Note that if a skip to channel 1 was specified, 27/IC3-12 will block the control character path if CH 1 indicates that the printer is already at that line on the page. The result is a line space of zero. This feature does not apply to other channels.



CARRIAGE IMMEDIATE TIMING DIAGRAM

Part 3 - Carriage Delayed Load

The loading of the carriage data latches occurs when PROCESS BIT A is false during an XIO control. At TIME 060-090, LOAD CAR DELAYED is generated at 26/IC5-8. This signal gates the PROCESS BITS into the latches to replace the single space code (0X0001) that is automatically set into the latches late in any print operation. When the next print operation is executed, the new character will be used to specify the carriage operation that follows the print.



CARRIAGE DELAYED TIMING DIAGRAM

FIG. 2 PAGE 1-8

Carriage Data Load Cycle

At E1 T7 of an initiate write, the P-C generates PROCESS D CYCLE. This sets the CARR CTL FF to start the cycle by generating SEND CAR CTL. This gates the control character stored in the carriage control latches onto the printer bus to allow the lines to settle. The character may be the single space code from a previous operation or any code stored by a carriage delayed command.

At the end of E1, the 1443 adapter requests one cycle-steal to load the word count into the adapter (not shown in Figure 3). The second cycle steal obtains the first data word, which is passed to the interface via the PROCESS BITS.

The trailing edge of TIME 060-090 starts the load sequence by setting the PRINT CP CTL FF. This FF allows 26/IC-17, a four-state counter, to respond to the output of the oscillator consisting of 26/IC-12. (Because the oscillator is free running, up to 830ns may occur before 26/IC12-10 goes low and the first count occurs). The low and high states of the oscillator output are termed phase A and B, respectively (ØA, ØB). The states of the counter are t1,t2,t3, and t4, which is the stopped condition.

At t1-ØB (from 26/IC5-6), DATA STROBE is generated to load the carriage control character into the printer. RESET SCM is blocked at t2-ØB (not needed). At t3-ØB (from 26/IC16-8), the signal to shut off the clock by resetting the PRINT CP CTL FF would normally be generated. However, the CARR CTL FF (26/IC13-9) blocks the

gate and keeps the clock running for a second cycle. At the end of t3, clock FF B output (26/IC17-8) goes low and triggers the SET SINGLE SPACE O.S. (27/IC3 and C16). The 200ns pulse output is used to reset the CARR CTL FF and set the carriage data latches to 0X0001 (single space code) for a future print operation. The carriage data load cycle is now complete.

Print Data Load Cycle

With the end of the carriage data load cycle, the print data path through the read-only memory (code translator) is restored, and the first print character passes to the printer. At t1-ØB of the second clock cycle, DATA STROBE loads it into the print buffer. At t2-ØB (from 26/IC16-6), RESET SCM commands the P-C to gate out the second character of the first print data word and to keep the print clock running for another cycle to strobe it. The P-C responds by generating INHIBIT PRINT CLOCK RST which prevents resetting the PRINT CP CTL FF at 26/IC16-9 during t3-ØB. (The SET SINGLE SPACE O.S. will output at the end of all following t3-ØB's, but it has no effect and will not be mentioned further.)

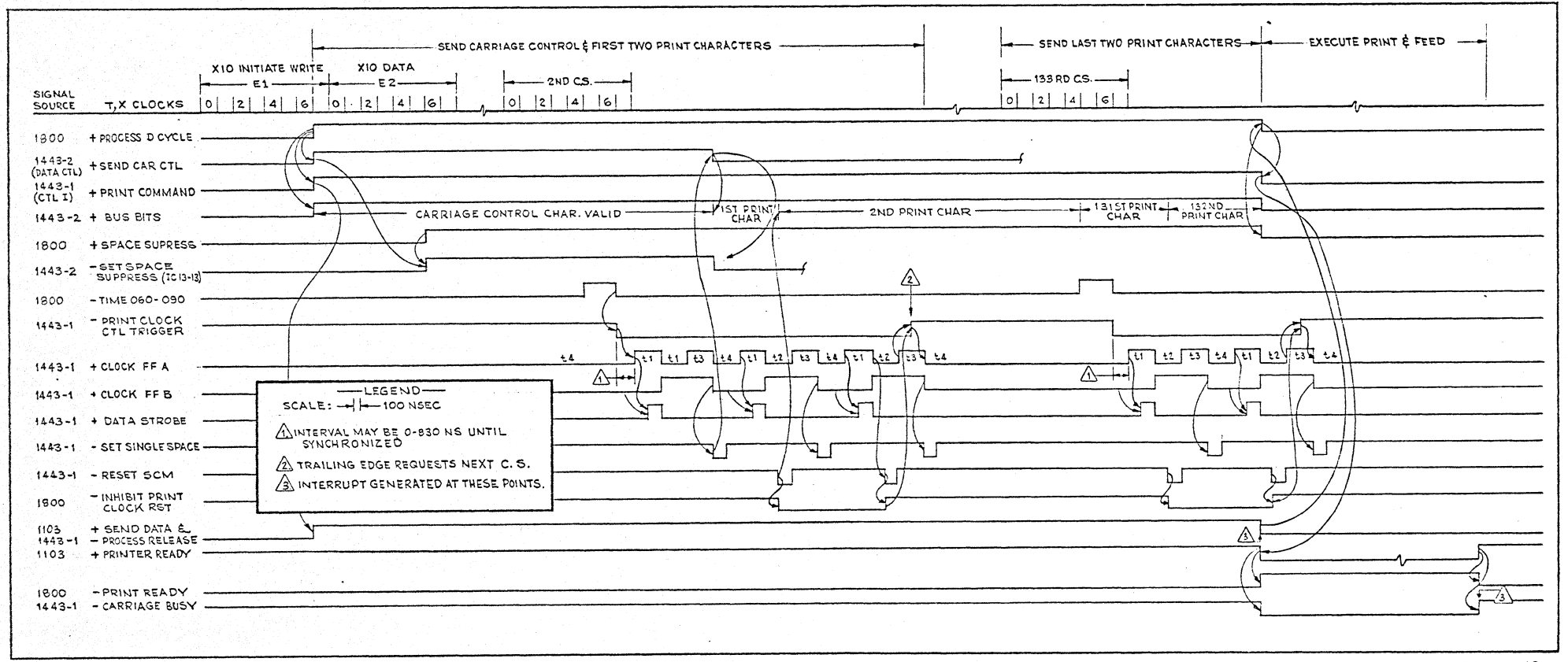
At t1-ØB of third cycle, DATA STROBE loads the second print data character. At t2-ØB, RESET SCM restores the P-C circuitry in preparation of the first character of the next data word. It also drops INHIBIT PRINT CLOCK RST to allow the t3-ØB signal to reset the PRINT CP CTL FF. This causes PRINT CLOCK CTL TRIGGER to request a cycle steal for the next word. At the end of t3-ØB (t4) both inputs to FF A are low and the clock can no longer run.

At the next TIME 060-090, the clock runs two cycles to load the first and second characters of the next data word. This action continues until the print buffer is full (132 characters) and the printer drops SEND DATA. At 26/IC8-11, PROCESS RELEASE is generated to command the P-C to end the print data load cycle.

Execution Cycle

Upon receipt of PROCESS RELEASE, the P-C ends PROCESS D CYCLE which drops PRINT COMMAND. The printer responds by executing the print and paper feed during which PRINTER READY causes PRINT READY to be false and CARRIAGE BUSY to be true.

At the completion of the operation the VFU channel information is latched and is available to the P-C.

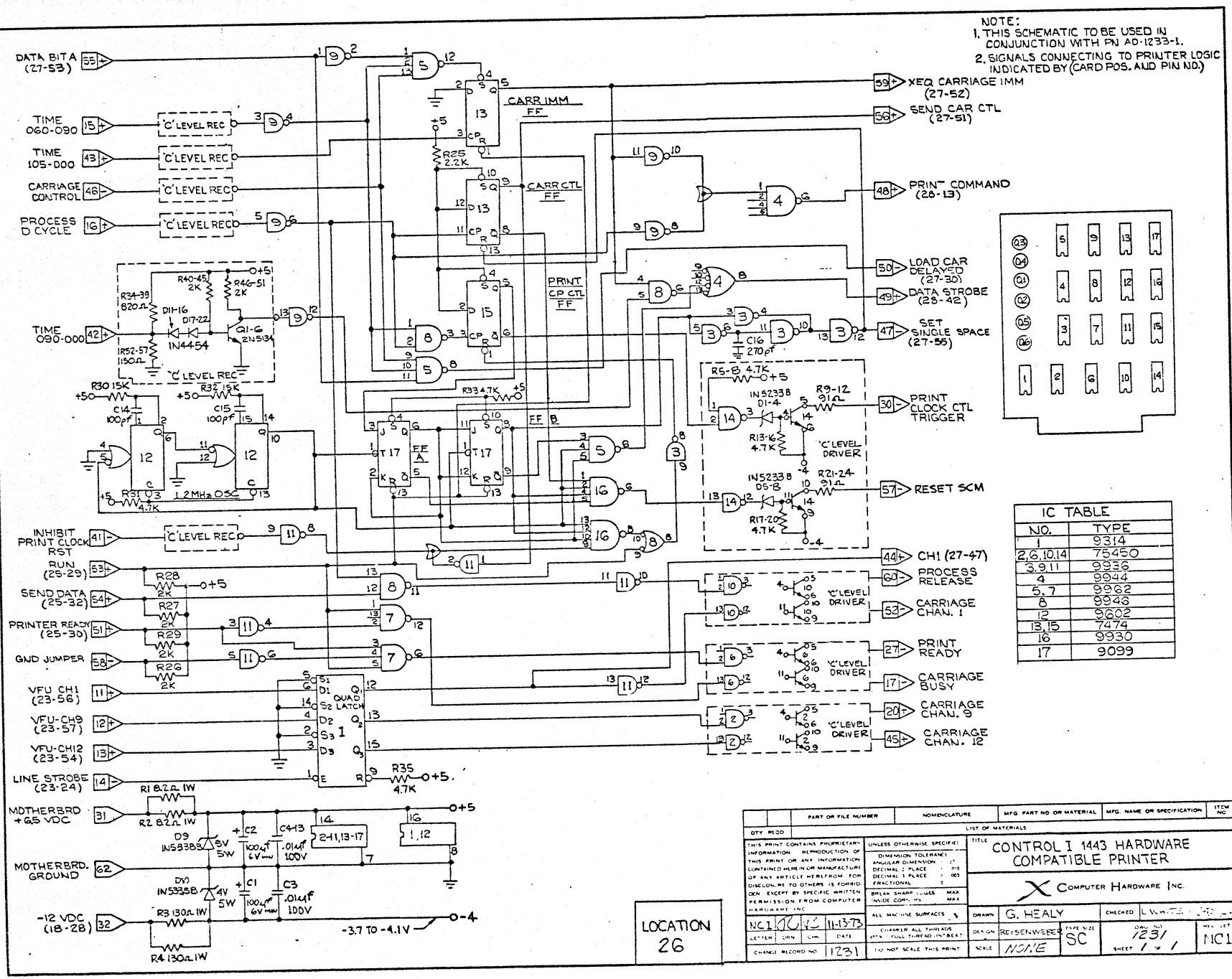


PRINT OPERATION TIMING DIAGRAM

FIG. 3 PAGE 1-12

Part 5 - Space Suppress

When the instruction specifies a space suppress during a print operation, SPACE SUPPRESS will be generated by the P-C. This signal, at 27/IC3-8, resets the carriage data latches before the carriage control character is strobed to the printer. Thus the single space code (0X0001) or a carriage delayed character is replaced by a no-op code (0X0000) and no paper feed occurs.



IC TABLE	
NO.	TYPE
1	9314
2,6,10,14	75450
3,9,11	9936
4	9944
5,7	9962
8	9946
12	9602
13,15	7474
16	9930
17	9099

				PART OR FILE NUMBER	NOMENCLATURE	MFG. PART NO OR MATERIAL	MFG. NAME OR SPECIFICATION	ITEM NO
QTY. REQD				LIST OF MATERIALS				

THIS PRINT CONTAINS PROPRIETARY INFORMATION. REPRODUCTION OF THIS PRINT OR ANY INFORMATION CONTAINED HEREIN OR MANUFACTURE OF ANY ARTICLE HEREFROM FOR DISCLOSURE TO OTHERS IS FORBIDDEN EXCEPT BY SPECIFIC WRITTEN PERMISSION FROM COMPUTER HARDWARE INC.

UNLESS OTHERWISE SPECIFIED: DIMENSION TOLERANCE; ANGULAR DIMENSION ±°; DECIMAL 2 PLACE ±.010; DECIMAL 3 PLACE ±.005; FRACTIONAL ±; BREAK SHARP EDGES MAX; INSIDE CORNERS MAX; ALL MACHINE SURFACES ; CHAMFER ALL THREADS (45° FULL THREAD DEPTH); DO NOT SCALE THIS PRINT

	LETTER	DRN	CHK	DATE
	NC1			11-13-73
CHANGE RECORD NO		1231		

TITLE: CONTROL I 1443 HARDWARE COMPATIBLE PRINTER

COMPUTER HARDWARE INC.

DRAWN: G. HEALY | CHECKED: L. WHITE

DESIGN: REISENWEBER | TYPE SIZE: SC | DWG NO: 1231 | REV. LET: NC1

SCALE: NONE | SHEET 1 OF 1

SC 1231

FIGURE 4 2-1

CHAIN TRAIN NEW BOARD # 43045

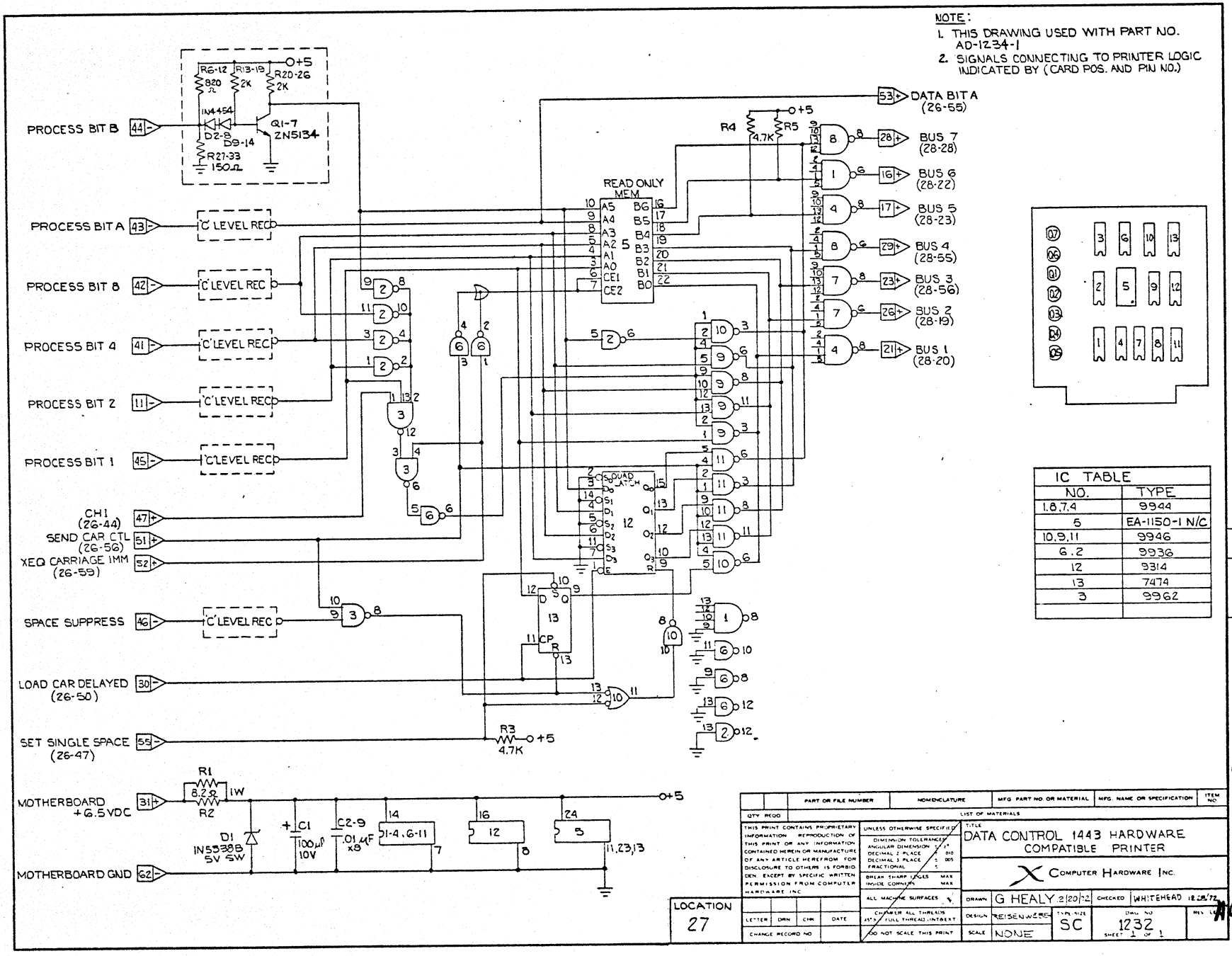


FIGURE 5

2-2

CHAINTRAIN → NEW BOARDS

AC3047

TITLE

1443 COMPATIBLE PRINTER
MODIFICATION KIT
FOR DPC MODEL V-132-C

COMPUTER HARDWARE INC.

SIGNALS FROM CPU	IBM P7 SIGNAL	IBM P7 RETURN	CHI J1/P1 SIGNAL	CHI J1/P1 RETURN	V132C BAY CARD/PIN*	CHANNEL
PROCESS BIT 1	D7	D8	B	D	27-45	B - 9
PROCESS BIT 2	D6	D8	A	C	27-11	B - 2
PROCESS BIT 4	B5	D8	F	J	27-41	B - 1
PROCESS BIT 8	D5	D8	E	H	27-42	B - 3
PROCESS BIT A	B4	D8	L	N	27-43	B - 5
PROCESS BIT B	D4	D8	K	M	27-44	B - 7
CARRIAGE CONTROL	B7	D8	R	T	26-46	A - 11
SPACE SUPPRESS	B10	D8	P	S	27-46	B - 11
PROCESS D CYCLE	D12	D8	V	X	26-16	A - 12
TIME 105-000	G4	J8	U	W	26-43	A - 5
TIME 090-000	G12	J8	Z	LB	26-42	A - 3
TIME 060-090	J4	J8	Y	LA	26-15	A - 10
INHIBIT PRINT CLOCK RESET	J12	J8	LD	LF	26-41	A - 1
SIGNALS TO CPU						
PRINT CLOCK CTL TRIGGER	B12	D8	LC	LE	26-30	A - 40
RESET SCM	J11	J8	LJ	LM	26-57	A - 33
CARRIAGE CHAN 1	J9	J8	LN	LR	26-52	A - 23
CARRIAGE CHAN 9	J7	J8	LP	LS	26-20	A - 20
CARRIAGE CHAN 12	G7	J8	LH	LK	26-45	A - 9
PROCESS RELEASE	G9	J8	LU	LW	26-60	A - 39
CARRIAGE BUSY	J6	J8	LT	LV	26-17	A - 14
PRINT READY	J10	J8	LY	AA	26-27	A - 34
CABLE SHIELD	NO CONNECTION		FF,HH		FRAME GND	

*SIGNALS ONLY SHOWN; ALL RETURNS JOINED AT P1 AND CONNECTED TO MOTHERBOARD GROUND.

TYPE-SIZE	DWG. NO.	REV. LET.
SA	1235 SHEET 1 OF 2	NC 1

FIGURE 6A

TITLE

1443 COMPATIBLE PRINTER
MODIFICATION KIT
FOR DPC MODEL V-132-C

COMPUTER HARDWARE INC.

INTERCARD SIGNALS *	FROM CARD/PIN	TO CARD/PIN
PRINTER READY	25-30	26-51
RUN	25-29	26-53
XEQ CARRIAGE IMM	26-59	27-52
SEND CAR CTL	26-56	27-51
LOAD CAR DLYD	26-50	27-30
SET SINGLE SPACE	26-47	27-55
PRINT COMMAND	26-48	28-13
SEND DATA	25-32	26-54
BUS 1	27-21	28-20
BUS 2	27-26	28-19
BUS 3	27-23	28-56
BUS 4	27-29	28-55
BUS 5	27-17	28-23
BUS 6	27-16	28-22
BUS 7 -	27-28	28-28
DATA STROBE	26-49	28-42
DATA BIT A	27-53	26-55
VFU CH 1	23-56	26-11
VFU CH 9	23-57	26-12
VFU CH 12	23-54	26-13
CH 1	26-44	27-47
LINE STROBE	23-24	26-14
GROUND JUMPER	26-62	26-58
-12 VDC	18-28	26-32

*FOR CONTINUATION OF RUN WITHIN PRINTER LOGIC, SEE MANUAL:
"DATA PRINTER CORP. MODEL V-132-C LINE PRINTER, VOL. II".

TYPE-SIZE	DWG. NO.	REV. LET.
SA	1235 SHEET 2 OF 2	NC 1

FIGURE 6B

ASSEMBLY PLAN

DASH NO.	MODEL (TYPE)	REFERENCE DATA: DESCRIPTION: SYSTEM	SOFT WR	LOGIC	MAY BE CONVERTED FROM	BASIC OEM LINE PRINTER	WORK TO BE PERFORMED: INITIAL MODIF KIT AC-1201	1443 COMPAT MODIF KIT AC-1220	1443 PCB ASSEMBLIES	PRINTER SIGNAL CABLE	CABINET DOORS	MODEL TAG DD-0829	CHI CIRCUITY DOCUMENTATION		CABLE CLAMP	ID LABEL	
-1	1103A (STANDARD MODE)	1130	CHI	2 CARDS IN CONTROLLER	-3	DA-1256-1	INSTALL -1	N/A	N/A	N/A (PART OF SYSTEM)	PAINT COLOR SPECIFIED ON WORK ORDER IN ACCORDANCE WITH DETAIL DRAWING DA-0978 SEE PANEL COLOR TABLE	INSTALL -5 PER VIEW A	N/A		INSTALL ITEM 16 PER VIEW A	INSTALL NEW ITEM 12 (4) PER VIEW A	
-3	1103B (1403 MODE)	1130	IBM & CHI	5 CARDS IN CONTROLLER	-1		INSTALL -3	N/A	N/A				N/A				
-5	1103C (1443 HARDWARE-COMPATIBLE)	1800	IBM	2 CARDS IN PTR (NO SEP. CONTROLLER)	-1, -3		INSTALL -5	INSTALL -1	INSTALL AC-1233-1 AC-1234-1	SHIP CD-1237-1			SHIP TECHNICAL MANUAL (FN 211899)				
-7	1103A (STANDARD MODE)	SAME AS -1			-5, -9 -15, -17	N/A (8)	REWORK TO -1	N/A (-1 PRESENT)	REMOVE AC-1233-1 AC-1234-1 IF PRESENT	REMOVE CD-1237-1 IF PRESENT (NEW CABLES PART OF SYSTEM)		N/A (-5 PRESENT)	REMOVE TECHNICAL MANUAL (FN 211899) IF PRESENT		N/A (ITEM 16 PRESENT)		
-9	1103B (1403 MODE)	SAME AS -3			-5, -7 -15, -17		REWORK TO -3	N/A (-1 PRESENT)									

(8) → -7, -9

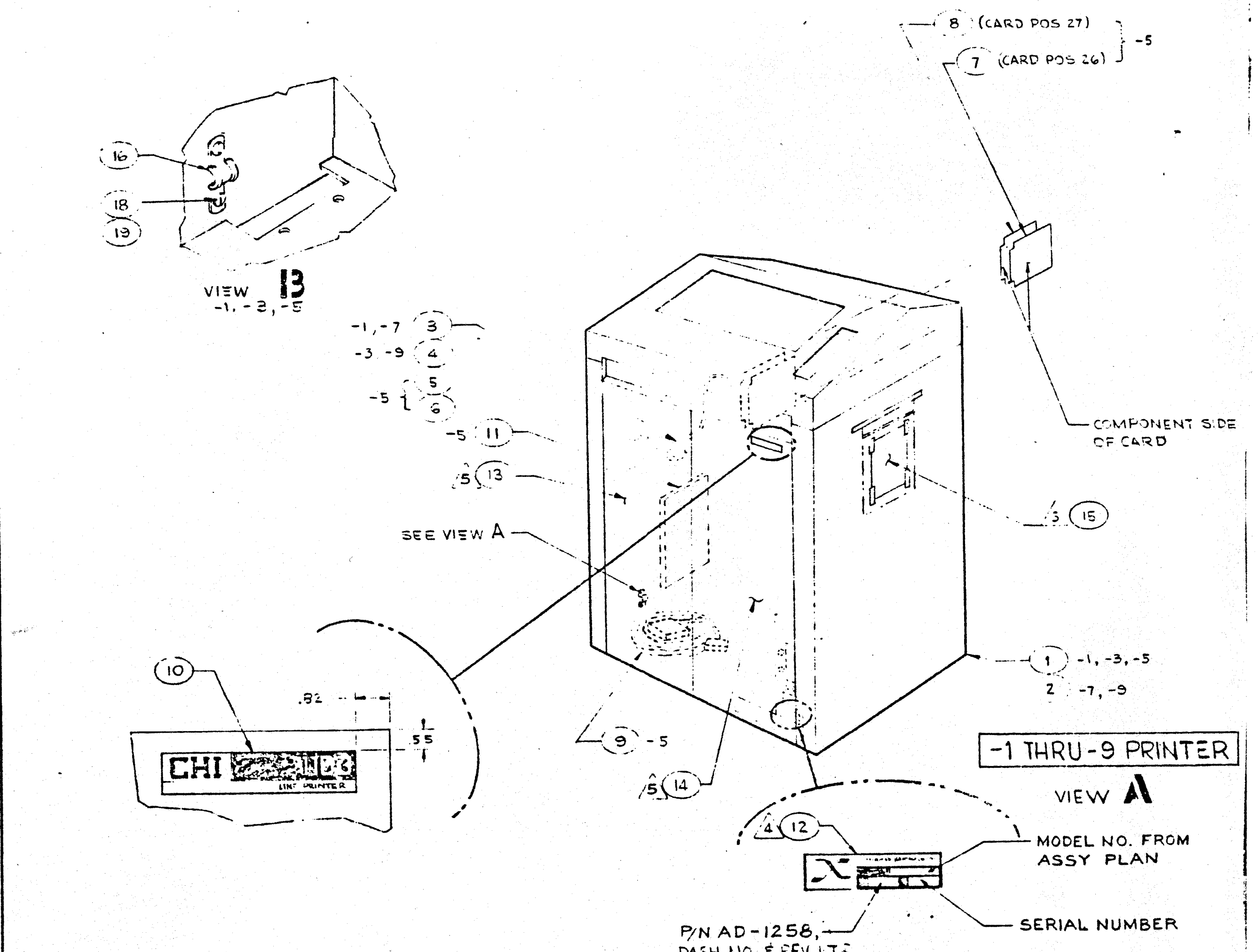
CONTINUED ON SHEET 2

NOTES:

1. THIS DRAWING USED IN CONJUNCTION WITH DATA PRINTER CORPORATION MANUAL, "MODEL V-132-C LINE PRINTER, VOLUME II, PARTS BREAKDOWN & ELECTRICAL DIAGRAMS". REFERENCE IS MADE TO THE PARTS BREAKDOWN BY "(FIGURE NO. - INDEX NUMBER)".
2. REMOVE FRONT COVER (1-3), REAR COVER ASSEMBLY (1-6) AND SIDE PANEL SUBASSEMBLIES (1-7) AS REQUIRED TO PERFORM WORK.
3. (3) RECORD WORK PROGRESS ON FORM CHI-077. ATTACH FORM TO POLYETHYLENE DOCUMENT JACKET USING MASKING TAPE. ATTACH JACKET TO PRINTER USING FILAMENT TAPE.
4. (4) AT FINAL INSPECTION, APPLY LABEL (ITEM 12) CENTERED .25 INCH BELOW VENDOR MODEL PLATE. TYPEWRITE LABEL INFORMATION AS SHOWN USING IBM MANIFOLD TYPE BALL (CODE 072).
5. (5) REFER TO APPLICABLE CHI SALES ORDER FORM FOR PANEL DASH NUMBER.
6. TEST FINISHED ASSEMBLY IN ACCORDANCE WITH CHI CHECKOUT PROCEDURE.
7. PACKAGE IN ACCORDANCE WITH CHI DWG.
8. (8) -7, -9, -15, -17 ASSEMBLIES ARE CONVERSIONS OF -5, -7, -9, -15, -17 ASSEMBLIES. THEY ARE SPECIFIED BY PRODUCTION MANAGEMENT WHEN IT IS DETERMINED ORIGINAL CONSTRUCTION IS NOT POSSIBLE. RETURN REMOVED PARTS TO STOCK.
9. ~~TEST FINISHED ASSEMBLY IN ACCORDANCE WITH CHI CHECKOUT PROCEDURE.~~

REFERENCE ONLY

MAY 4 1983



(5) PANEL COLOR TABLE (REF)

DESCRIPTION		DASH NO.	FILE NO.
SKY BLUE	RH	-1	211367
	LH	-3	211368
RED	RH	-5	211369
	LH	-7	211370
YELLOW	RH	-9	211371
	LH	-11	211373

CONTINUED ON SHEET 2

LIST OF MATERIALS

-17	-15	-13	-11	-9	-7	-5	-3	-1	PART OR FILE NUMBER	NOMENCLATURE	MFG PART NO OR MATERIAL	MFG NAME OR SPECIFICATION	ITEM NO.
													20
						2	2	2	211138	NUT W/LOCKWASH KEPS 8-32	511-051800-00	SHAKEPROOF	19
4	4	4	4			2	2	2	210146	SCREW BIND HD 8-32 X .56	1023320370111	GPL	18
						AR	AR	AR	212494	SHIELDING 19/32 FLAT	8062	BEL	17
						1	1	1	211823	CLAMP-CABLE .50 I.D.	13C04	TA MFG. CORP.	16
1	1	1	1	1	1	1	1	1	212099	WORK PROGRESS RECORD FORM	CHI-077	CHI	15
1	1	1	1	1	1	1	1	1	(5)	PANEL RH	DA-0978 (5)		14
1	1	1	1	1	1	1	1	1	(5)	PANEL LH	DA-0978 (5)		13
1	1	1	1	1	1	1	1	1	211128	LABEL, ADHESIVE BACK, IDENT	MB-0406		12
						1			211899	TECHNICAL MANUAL 1443 COMPAT PTR			11
		1	1			1	1	1	211898	LABLE 1103 IDENTIFICATION	DB-0828-5		10
						1			211875	SIGNAL CABLE, 1443 25 FT	CD-1237-1		9
						1			211897	PC ASSY, DATA CTL 1443 COMPAT PTR	AC-1234-1		8
						1			211896	PC ASSY, CONTROL I 1443 COMPAT PTR	AC-1233-1		7
						1			211895	MODIF. KIT 1443 COMPAT. PTR	AD-1220-1		6
						1			211884	MODIF KIT INITIAL 1103/1443	AC-1201-5		5
1	1	1	1	1			1		211883	MODIF KIT INITIAL 1103/1403	AC-1201-3		4
					1			1	211882	MODIFICATION KIT INITIAL, 1103 STD.	AC-1201-1		3
1	1			1	1				(8)	LINE PRINTER	(8)		2
		1	1			1	1	1	211888	PRINTER, IMPACT LINE	DC-1256-1	CHI	1

QTY REQD

DASH NO.	ASSEMBLY FILE NO.	CATALOG FILE NO.	DASH NO.	ASSEMBLY FILE NO.	CATALOG FILE NO.
-13	212024	214355	-1	211890	214351
-15	212025	———	-3	211891	214352
-17	212026	———	-5	211892	214353
			-7	211893	———
			-9	211894	———
			-11	212023	214354

LTR	DWN	CHK	DATE
A3	S.T.	G.S.	3/26/79

CHANGE RECORD NO. 1259

UNLESS OTHERWISE SPECIFIED
DIMENSION TOLERANCES
ANGULAR DIMENSION
DECIMAL 2 PLACE ± .03
DECIMAL 3 PLACE
FRACTIONAL ± .015
BREAK SHARP EDGES MAX
INSIDE CORNERS — MAX
ALL MACHINE SURFACES
CHAMFER ALL THREADS 45° X 1 FULL THREAD, INT & EXT
DO NOT SCALE THIS PRINT

TITLE: LINE PRINTER, 1103 GROUP

COMPUTER HARDWARE INC

REFERENCE

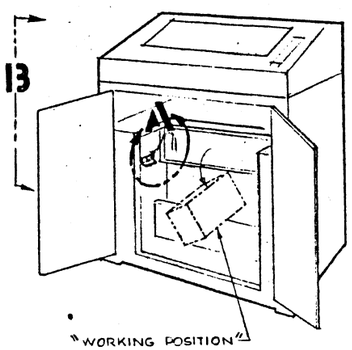
DRAWN	J.D.F. 1-17-73	CHECKED	2/13/73
DESIGN	E.L.R.	TYPE SIZE	AD
SCALE	NONE	DWG NO	1258
		REV LTR	A3

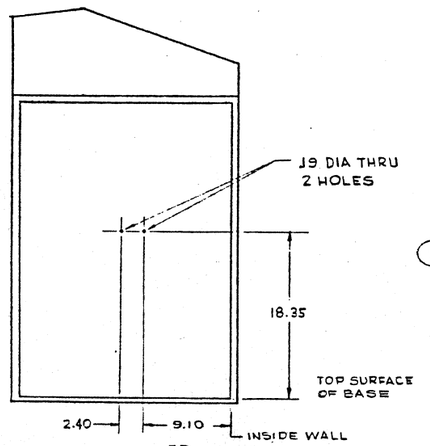
AD 1258

HARNESS ASSEMBLY PROCEDURE

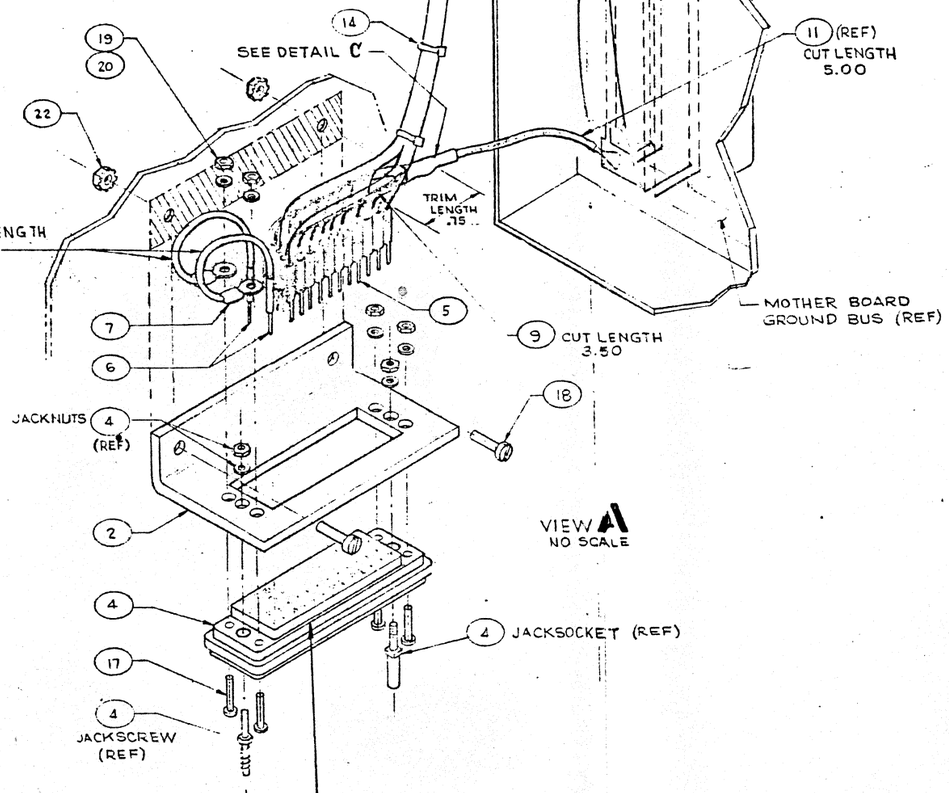
1. PREPARE CONNECTOR END OF CUT LENGTHS AS FOLLOWS:
   (A) ATTACH CONTACTS (ITEM 5) TO 21 3.5-INCH AND 21 12-INCH WIRES (ITEM 9,10). USE WINCHESTER CRIMPING TOOL 10X-0970 WITH POSITIONER 107-0976.
   (B) ATTACH CONTACTS (ITEM 6) TO TWO 3-INCH WIRES (ITEM 11). USE ABOVE TOOL WITH POSITIONER 107-0981 OR 107-0977.
2. INSTALL 3.5-INCH WIRES IN TWO ROWS OF THE CONNECTOR ASSEMBLY (ITEM 4) PER VIEW D, "BLACK". FORM INSTALLED WIRES AND TRIM TO LENGTH PER VIEW A. STRIP WIRES AND SOLDER TO 3-INCH WIRE (ITEM 11) PER DETAIL C.
3. INSTALL WHITE WIRES IN TWO ROWS OF THE CONNECTOR ASSEMBLY PER VIEW D, "WHITE". TAG FREE ENDS WITH CONTACT LETTERS USING MARKERS (ITEM 1). FORM AND BUNDLE WIRES PER VIEW A USING CABLE-TIES (ITEM 14).
4. ATTACH TERMINALS (ITEM 7) TO 3-INCH WIRES. USE AMP CRIMPING TOOL 59170. INSTALL CONTACTS IN HOLES FF, HH OF CONNECTOR ASSEMBLY.
5. SNUG JACK NUTS (ITEM 4)
6. TAG ASSEMBLY WITH AD-1220-2.

REFERENCE ONLY

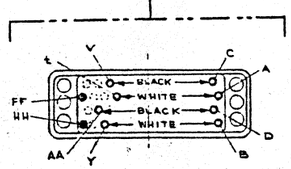




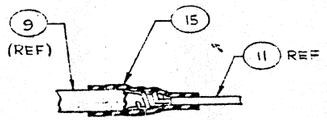
(END)VIEW B
(NO SCALE)
SIDE PANEL REMOVED



VIEW A
NO SCALE



VIEW D
SCALE: 1/1



DETAIL C
NO SCALE

INSTALLATION PROCEDURE 1

1. LIFT AND REMOVE THE LEFT-HAND SIDE PANEL SUBASSEMBLY (1-7). LOCATE, DRILL, AND DEBURR 2 HOLES PER VIEW B. (REMOVE MANUAL PRIOR DRILLING)
2. AT THE REAR, DISCONNECT PLUGS P102-106, P111-116, AND P121-126 (SEE LOGIC DIAGRAM FIGURE 1.0.0 FOR LOCATIONS). POSITION THE PLUGS AND CABLES SO THAT THEY WILL CLEAR OTHER ASSEMBLIES WHEN THE ELECTRONIC BAY IS LOWERED.

   CAUTION: A SMALL SECONDARY CABLE CONNECTS P106 TO THE MAIN FRAME SUBASSEMBLY. MAINTAIN SUFFICIENT SLACK IN THE CABLE TO PREVENT DAMAGE TO IT OR P6. DO NOT ALLOW THE CABLE TO BE PULLED BY THE WEIGHT OF THE BAY.
3. SUPPORT THE ELECTRONIC BAY (9-2) BY HAND.

   CAUTION: OBTAIN HELP IN HANDLING THE HEAVY ELECTRONIC BAY.
4. AT THE FRONT, REMOVE THE FOUR BAY MOUNTING SCREWS (9-22). LOWER AND PIVOT THE BAY ABOUT THE L.R.H. CORNER UNTIL IT IS IN THE "WORKING POSITION". (SEE LOCATOR SKETCH OF VIEW A).
5. INSERT CONNECTORS (ITEM 13) INTO BAY POSITIONS 25 AND 27, ALIGN CONNECTORS USING A BLANK PRINTED CIRCUIT CARD (PC-1229 OR 123D). SOLDER ALL PINS WITH ALIGNMENT CARD IN PLACE.
6. REMOVE THE JACKSCREW AND JACKSOCKET FROM A HARNESS SUBASSEMBLY (ITEM 1). PASS THE WIRE END OF THE HARNESS THRU THE RECTANGULAR HOLE OF A CONNECTOR BRACKET (ITEM 2) AND MOUNT THE CONNECTOR WITH HARDWARE (ITEM 17, 19, 20).
7. USE A TB-1260-1 FIXTURE TO MOUNT THE BRACKET TO THE L.R.H. CORNER MOUNTING HOLE IN THE BAY FRAME. THE BRACKET MOUNTING HARDWARE (ITEM 18,22), A BAY MOUNTING SCREW (REMOVED EARLIER) AND A 210275 HEX NUT ARE USED.
8. FORM THE HARNESS AND WIRE THE BAY PER WIRING LIST WA-1236. REMOVE TAGS, LEAVING 1 INCH SLACK, TRIM AND STRIP THE 3-INCH WIRE .25 INCH. FAN OUT THE STRANDS AND SOLDER TO THE MOTHERBOARD GROUND BUS USING MINIMUM HEAT.
9. REMOVE THE FIXTURE AND REPLACE THE ELECTRONIC BAY AND FOUR MOUNTING SCREWS.
10. MOUNT BRACKET TO THE PRINTER FRAME.
11. REPLACE THE PLUGS DISCONNECTED IN STEP 2.

NOTES

1. THIS DRAWING USED IN CONJUNCTION WITH DATA PRINTER CORPORATION MANUAL, "MODEL V-132-C LINE PRINTER, VOLUME II, PARTS BREAKDOWN & ELECTRICAL DIAGRAMS." REFERENCE IS MADE TO THE PARTS BREAKDOWN BY "(FIGURE - INDEX NUMBER)."
2. ITEMS USED PER WIRE LIST WA-1236
3. SOLDER PER MIL-S-6872 USING ITEM 24
4. RECORD WORK IN ACCORDANCE WITH ASSEMBLY DRAWING AD-1258.

-	3	211581	WIRE 30 AWG 3.50	DD-1002-63	CHI		34
-	4	211582	3.75	-65			33
-	5	211583	4.00	-67			32
-	3	211584	4.25	-69			31
-	2	211585	4.50	-71			30
-	1	211586	4.75	-73			29
-	2	211588	5.50	-77			28
-	2	211589	6.00	-79			27
-	1	211592	WIRE 30 AWG 7.50	DD-1002-85	CHI		26
							25
AR	AR	211130	SOLDER 60/40 22 GAUGE (.28 DIA)	X-100 2.5 %	GARDINER SOLDER COMPANY		24
							23
-	2	211138	NUT HEX 8-32 W/LK WASH KEPS	511-081800-00	SHAKEPROOF		22
							21
-	4	210155	WASHER 4 LOCK INT	200401511	GPL		20
-	4	211106	NUT HEX 4-40 SMALL PATTERN	7004401870621 1			19
-	2	210625	SCREW BIND HD 8-32 X .50	10083205001111			18
-	4	211107	SCREW FLST HD 4-40 X .37	10C44003706111	GPL		17
							16
AR		210346	TUBING HEAT SHRINK .25 ID	HIX-1/4-BLK	ICO/RALLY		15
AR	-	211094	CABLE TIE .62 SELF-LOCK	TY-23M	THOMAS BETTS		14
-	2	211865	CONNECTOR W/CONT 44 POS	186-29701	METHODE		13
							12
AR	-	210400	WIRE 16 AWG VIN INS BLK	DD-1002-11	CHI		11
AR	-	210464	WIRE 26 AWG IRR INS WHT	DD-1002-55	CHI		10
AR	-	210381	WIRE 24 AWG IRR INS BLK	DD-1002-29	CHI		9
							8
2	-	211900	TERMINAL RING TNG 16-14 NO.4	32439	AMP		7
2	-	211068	CONTACT PIN 16-14	100-1014P CRMP	WINCHESTER		6
42	-	210611	CONTACT PIN 26-22	100-1022P CRMP			5
1	-	211753	CONNECTOR ASSY	MRAC50PJ	WINCHESTER		4
1		211913	MARKER SET ADHESIVE BKD	TB-0551-3	CHI		3
-	1	211876	BRACKET	DC-1254-1	CHI		2
-	1	211914	HARNESS	AD-1220-2	CHI		1
-2	-1	PART OR FILE NUMBER	NOMENCLATURE	MFG PART OR STOCK NUMBER	MFG NAME OR SPECIFICATION		ITEM NO
QTY REQD.				LIST OF MATERIAL	REFERENCE ONLY		

AD 1220

FILE NUMBER
-1 211895
-2 211914

UNLESS OTHERWISE SPECIFIED
DIMENSION TOLERANCES
ANGULAR DIMENSION ± 1°
DECIMAL 2 PLACE ± .05
DECIMAL 3 PLACE ± .005
FRACTIONAL ± .015
BREAK SHARP EDGES MAX INSIDE CORNERS MAX
ALL MACHINE SURFACES √
CHAMFER ALL THREADS AT 45° X 1 FULL THREAD (INTERNAL)
DO NOT SCALE THIS PRINT

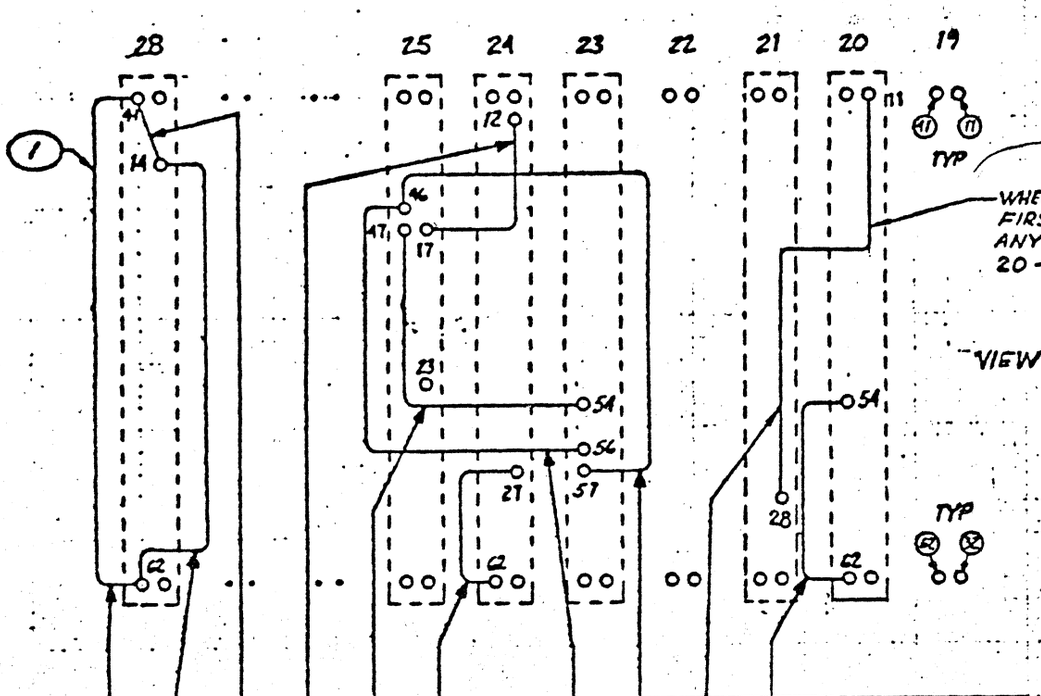
LETTER	ORIG	CHK	DATE
CHANGE RECORD NO			

TITLE: KIT MODIFICATION 1443 COMPAT PTR FOR V132C

COMPUTER HARDWARE INC.

DRAWN	J.D.P.	1-16-73	CHECKED Ronie 2/13/73
DESIGN	E.L.R.	TYPE-SIZE AD	DWG NO 1220
SCALE	NOTED		SHEET 1 OF 1
			REV. LET NC

WIRING SIDE OF CARD BAY MOTHERBOARD



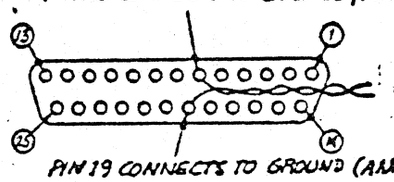
○	○			○	○		○		○	✓	-1 ASSEMBLY (STANDARD)
○			○	○	○			○	○	○	-3 ASSEMBLY (1403)
○	○			○	○		○		○	○	-5 ASSEMBLY (1443)
✓	✓	✓	✓	✓	✓		✓	✓		✓	
AUTO LINE FEED	PAPER FEED CHAN		LINE STB.	VFU CH12	DOUBLE SPACE		VFU CH1	VFU CH9	LOAD DATA	CLEAR	← LINE BEING CONNECTED
1	2	3	4	5	6	7	8	9	10	11	← JUMPER NO.

JUMPER TABLE

NOTES:

1. THIS DRAWING USED IN CONJUNCTION WITH SCHEMATIC DRAWING SA-1202 AND DATA PRINTER CORP. MANUAL, "MODEL V-132-C LINE PRINTER VOL II, PARTS BREAKDOWN & ELECTRICAL DIAGRAMS".(9-6) MEANS (FIGURE NUMBER - INDEX NUMBER).
2. IN EXISTING WIRING ONLY, A WIRE IS CONSIDERED TO BE GROUNDED IF IT CONNECTS TO A PIN THAT IS, IN TURN, WIRED TO A PIN 62 (GROUND). TO REWORK SUCH INDIRECT WIRING, RECORD POSITIONS OF ALL WIRES, REMOVE WIRES AND REWIRE PER VIEW B. CONNECT ANY OTHER WIRING INVOLVED DIRECTLY TO A PIN 62.
3. USE EXISTING JUMPER UNLESS IN POOR CONDITION. REPLACE WITH ITEM 1.
4. STRIP ITEM 1 .12 INCH AND SOLDER TO FULL LENGTH OF IC LEAD.

PIN 6 CONNECTS TO CARD 25, PIN 23 (ORANGE WIRE)



PIN 19 CONNECTS TO GROUND (ANY PIN 62) (WHITE WIRE)

WIRING SIDE OF J201

VIEW A

AC 1201

ELECTRICAL MODIFICATION PROCEDURE

1. COMPARE WIRING OF J201 (LOCATED AT BASE OF WIRING SIDE OF ELECTRONICS BAY, 9-2) WITH DETAIL A. (SEE NOTE 2 FOR OLDER EQUIPMENT.) IF NOT IN CONFORMANCE RELOCATE J201 WIRES TO CARD 25 PINS.
2. CONFIGURE ELECTRONICS BAY PER JUMPER TABLE IN VIEW B. CIRCLE "O" MEANS THAT NEW JUMPER MUST BE ADDED IF NOT PRESENT. ABSENCE OF CIRCLE "O" MEANS JUMPER MUST BE REMOVED IF PRESENT. USE OHMMETER ON X 10 SCALE TO DETERMINE STATUS OF JUMPERS. IF THE PIN 62 (GROUND PIN) INDICATED IS FILLED, USE THE NEAREST PIN 62 HAVING ROOM. USE WIRE COLOR TO CONTRAST WITH ORIGINAL WIRING. LEAVE ENOUGH SLACK IN WIRING TO ALLOW WIRING TO EXTEND BEYOND ENDS OF WIRE-WRAP PINS DURING INSPECTION. DO NOT DRESS NEW WIRING AGAINST EXISTING WIRING. (SEE NOTE 2 FOR OLDER EQUIPMENT.)
3. MODIFY CARDS IN ELECTRONICS BAY LOCATIONS 20 AND 25 PER VIEWS C,D,E,F, AND G. NOTIFY ENGINEERING IF CARD TYPE DOES NOT CORRESPOND TO ANY DRAWING.
4. RECORD WORK (MARK IN APPLICABLE CIRCLES) ON SCHEMATIC DRAWING (ITEM 4) INSTALL IN PRINTER MANUALS (SEE DRAWING FOR LOCATIONS). POSITION SHEETS AGAINST SPINE OF MANUAL, TRIM OFF ANY EXCESS LENGTH PROTRUDING OUT OF THE MANUAL AND STAPLE IN TWO PLACES AT TOP OF SHEET. WHEN STAPLING TO COVER, ENDS OF STAPLES MUST BE ON INSIDE.

QTY REQD -5	QTY REQD -3	QTY REQD -1	PART OR FILE NUMBER	NOMENCLATURE	MFG PART NO OR MATERIAL	MFG NAME OR SPECIFICATION	ITEM NO
AR	AR	AR	211548	GROMMET STRIP NYTRIM .12	CSG-13	WECKESSER CO.	5
1	1	1	212102	DWG SCHEMATIC SA-1202	—	CHI	4
3	3	3	211219	DIODE	FH-1100	FAIRCHILD	3
1	1	1	210050	RES 4.7K ½W 5%	11470142	QPL	2
AR	AR	AR	211493	WIRE 30 AWG KYNAR INSUL.	DD-1002-59	CHI	1

LIST OF MATERIALS

FILE NUMBER	
-1	211882
-3	211883
-5	211884

LETTER	DRN	CHK	DATE
E	JDF	7.7	7-17-73

CHANGE RECORD NO 1201

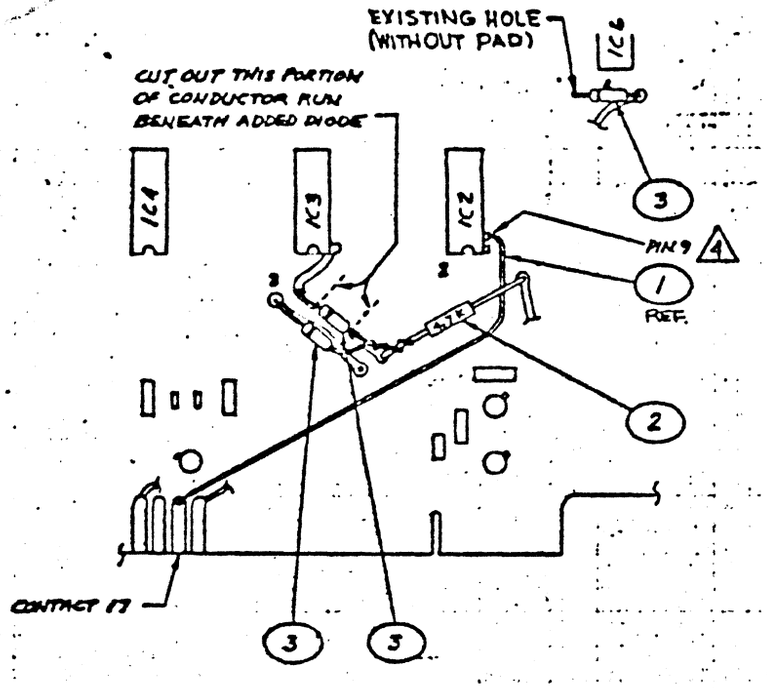
UNLESS OTHERWISE SPECIFIED
DIMENSION TOLERANCE
ANGULAR DIMENSION ±°
DECIMAL 1 PLACE ± .100
DECIMAL 2 PLACE ± .000
FRACTIONAL ±
BREAK SHARP EDGES MAX
INSIDE CORNERS MAX
ALL MACHINE SURFACES √
CHAMFER ALL THREADS (FOR FULL THREAD (INTERT))
DO NOT SCALE THIS PRINT

TITLE: INITIAL MODIFICATION KIT — DA-1256 PRINTER

COMPUTER HARDWARE INC

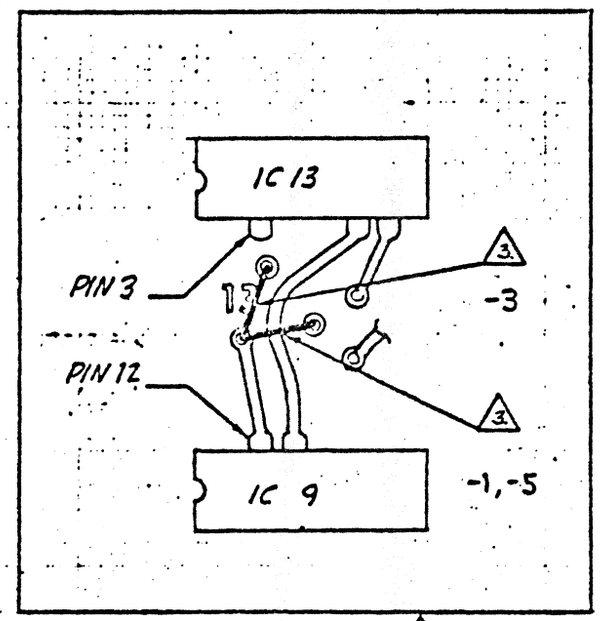
DRAWN	L WHITEHEAD 12/27/73	CHECKED	1/30/74
DESIGN	L WHITEHEAD	TYPE SIZE	AC
SCALE	ANSI E	DWG NO	1201
SHEET	1 OF 3	REV LET	E

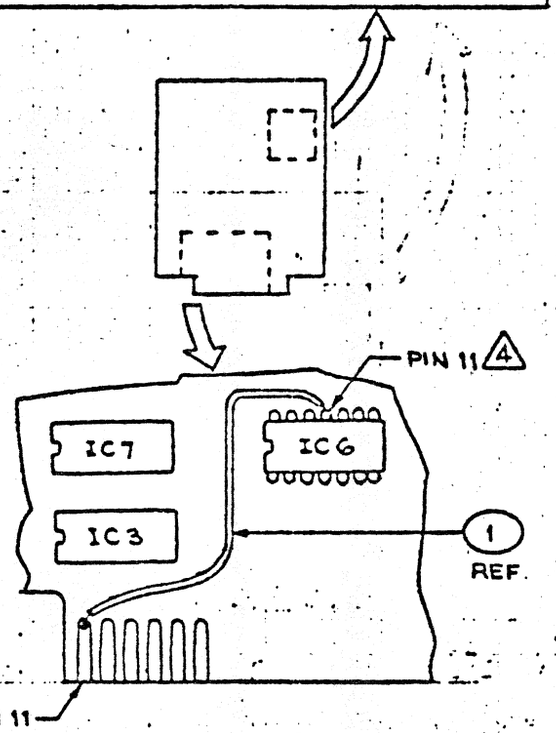
2053



COMPONENT SIDE

VIEW C

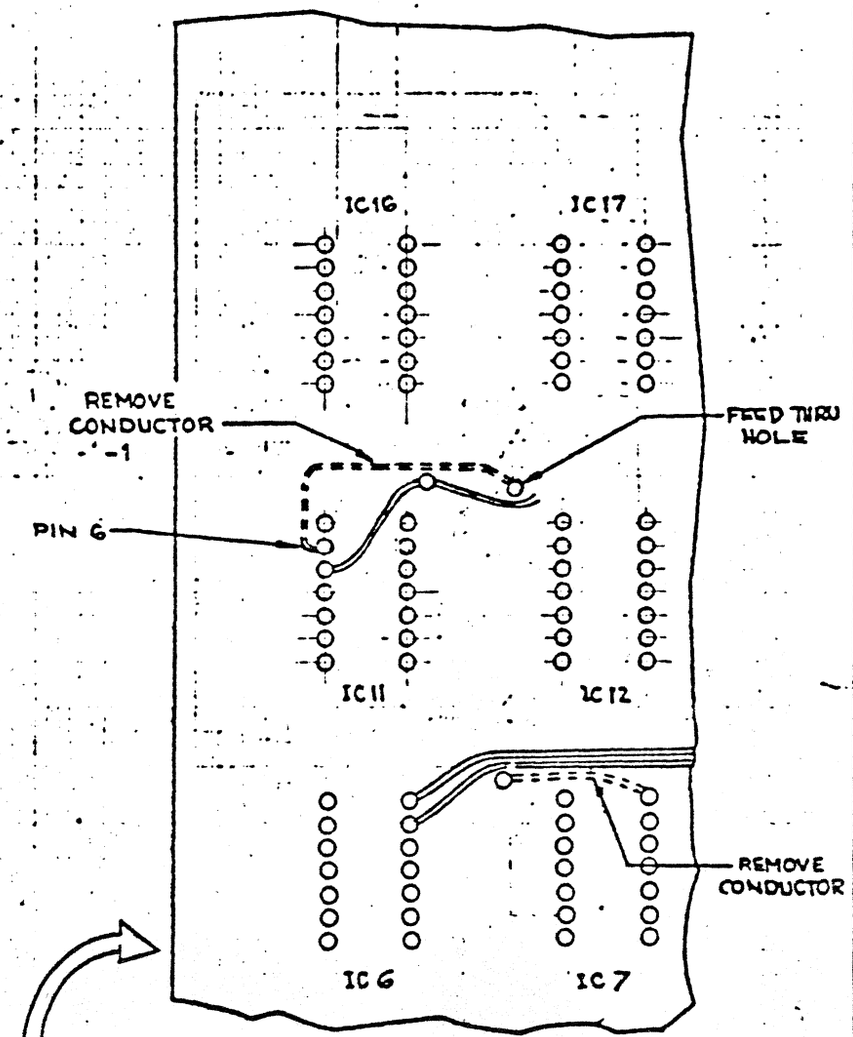




COMPONENT SIDE

2608 MEMORY CONTROL LOGIC

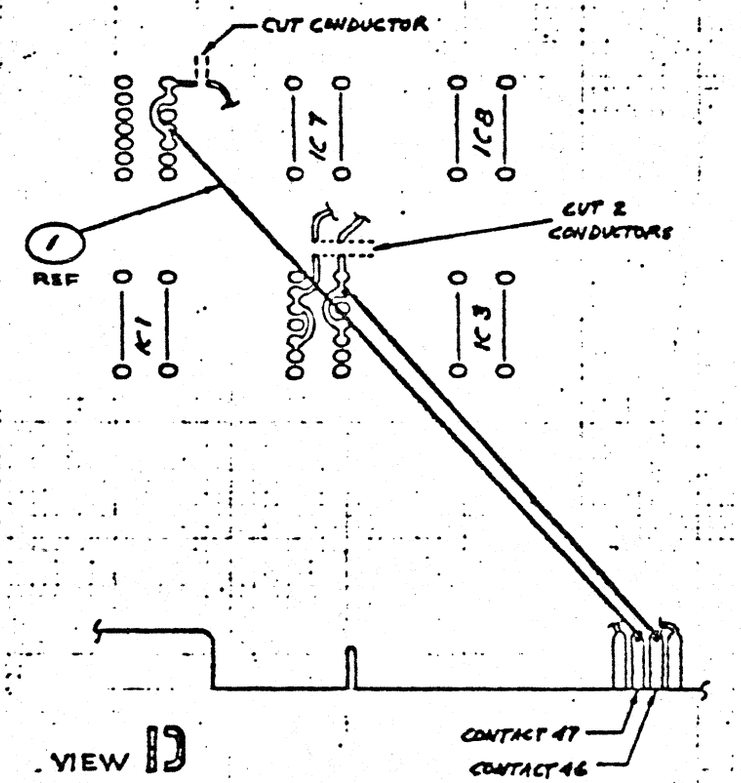
VIEW B



CIRCUIT SIDE

2622 MEMORY CONTROL LOGIC

VIEW A



VIEW D

CIRCUIT SIDE

2604 COMPARE-OUTPUT CONTROL LOGIC

AC 1201

		PART OR FILE NUMBER	NOMENCLATURE	MFG. PART NO. OR MATERIAL	MFG. NAME OR SPECIFICATION	ITEM NO.
QTY. REQD.		LIST OF MATERIALS				

UNLESS OTHERWISE SPECIFIED
DIMENSION TOLERANCES
ANGULAR DIMENSION ±1°
DECIMAL 2 PLACE ± .010
DECIMAL 3 PLACE ± .005
FRACTIONAL ±
BREAK SHARP EDGES MAX
INSIDE CORNERS MAX
ALL MACHINE SURFACES √
CHAMFER ALL THREADS (1" X 1" FULL THREAD LIMIT & EXT.)
DO NOT SCALE THIS PRINT

TITLE: INITIAL MODIFICATION KIT —DA-1256 PRINTER

COMPUTER HARDWARE INC.

DRAWN: L. WHITEHEAD 11/21/12 CHECKED: [illegible] 11/14/13

DESIGN:

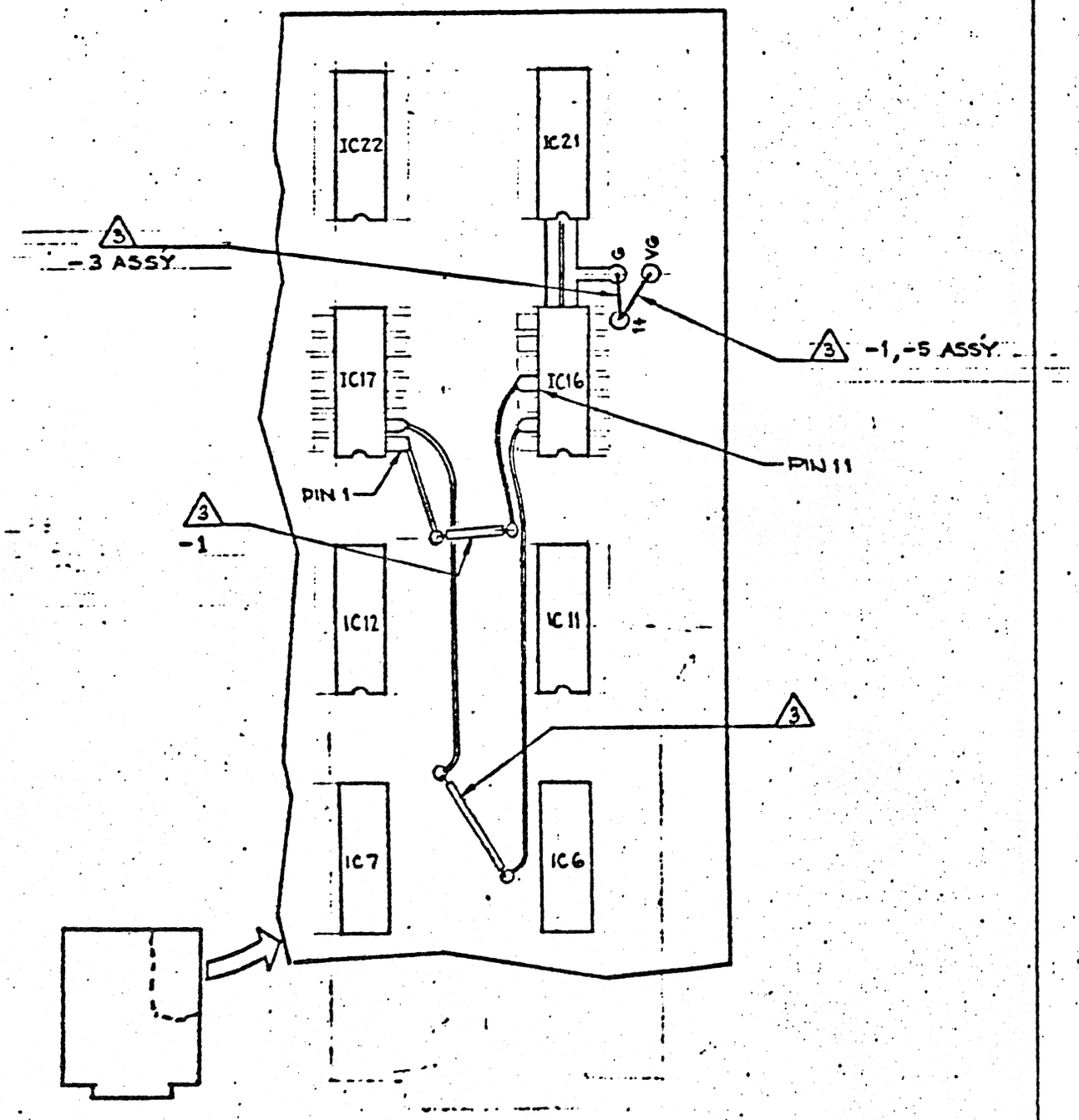
SCALE: NONE

TYPE-SIZE: AC

DWG. NO: 1201 SHEET 2 OF 3.

REV. LET: E

LETTER	DRN	CHK	DATE
CHANGE RECORD NO			1201

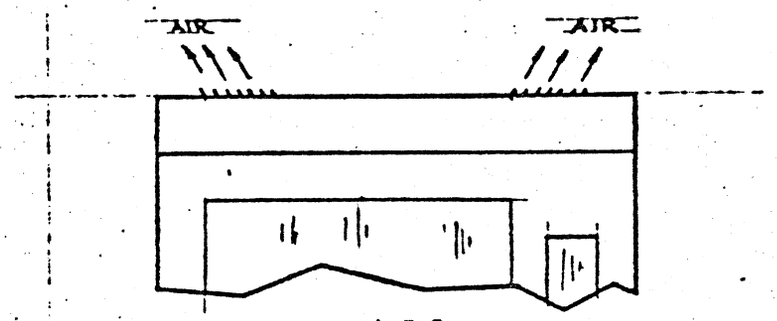


COMPONENT SIDE
2622 MEMORY CONTROL LOGIC
VIEW G

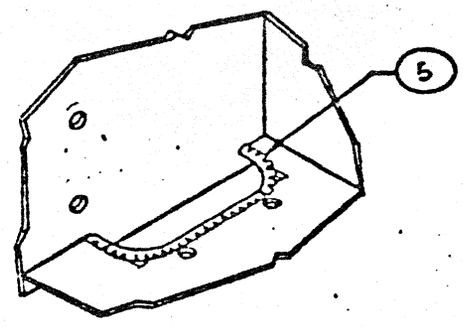
MECHANICAL MODIFICATION PROCEDURE

1) IF CANOPY FAN LOUVER PLATES (9-7) ARE NOT INSTALLED SO THAT THE FANS WILL BLOW TOWARDS THE ENDS OF THE PRINTER (SEE DETAIL H), REMOVE 4 SCREWS (4-15), FLATWASHERS (4-27), LOCKWASHERS (4-23) AND NUTS (4-20) ON EACH FAN. ROTATE THE LOWER PLATES TO THE CORRECT POSITION AND REPLACE HARDWARE.

2. BREAK OFF A LENGTH OF STRIP GROMMET (ITEM 5) AT THE CLOSEST NOTCH TO 6.00 INCHES. INSTALL IN CABLE ENTRANCE HOLE (BELOW UPPER 9-29) BY SPRINGING INTO PLACE (SEE VIEW I). REMOVE ANY INTERFERING WELDING FLASH.



VIEW H
FROM ABOVE PRINTER
(NO SCALE)



VIEW I
(NO SCALE)

		PART OR FILE NUMBER	NOMENCLATURE	MFG. PART NO OR MATERIAL	MFG. NAME OR SPECIFICATION	ITEM NO
QTY. REQD		LIST OF MATERIALS				

THIS PRINT CONTAINS PROPRIETARY INFORMATION. REPRODUCTION OF THIS PRINT OR ANY INFORMATION CONTAINED HEREIN OR MANUFACTURE OF ANY ARTICLE HEREFROM FOR DISCLOSURE TO OTHERS, IS FORBIDDEN, EXCEPT BY SPECIFIC WRITTEN PERMISSION FROM COMPUTER HARDWARE INC.

UNLESS OTHERWISE SPECIFIED
DIMENSION TOLERANCE
ANGULAR DIMENSION ±1/2°
DECIMAL 2 PLACE ± .010
DECIMAL 3 PLACE ± .005
FRACTIONAL ±
BREAK SHARP EDGES MAX
INSIDE CORNERS MAX
ALL MACHINE SURFACES √
CHAMFER ALL THREADS AT 45° FULL THREAD (INT & EXT)
DO NOT SCALE THIS PRINT

TITLE: INITIAL MODIFICATION KIT - DA-1256 PRINTER

COMPUTER HARDWARE INC.

LETTER	ERN	CHK	DATE
CHANGE RECORD NO			12.01

DRAWN | CHECKED | DESIGN | SCALE | TYPE-SIZE AC | DWG NO 1201 | SHEET 3 OF 3 | REV LET E