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Schematic/Electrical Parts

MILTRAC, LINK MASTER, AND DRYER / SHUTTLE CONTROLLER

Read the separate safety manual before installing, operating, or servicing

PELLERIN MILNOR CORPORATION POST OFFICE BOX 400, KENNER, LOUISIANA 70063-0400, U.S.A.

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COMPONENT PARTS LIST

W6MTCPL/99391N

COMPONENT NUMBER	FUNCTION OF THIS COMPONENT	WHERE TO FIND THIS COMPONENT	MILNOR P/N	DESCRIPTION	LOCATION
	>>>CONTROL BOX LAYOUTS				
1	DETAIL-MILTRAC CONTROL BOX	W6MTCTG1	B2TAG91093	MILTRAC CONTROL BOX	SEE FUNCTION
2	DETAIL-TRANSFORMER/FUSE BOX DOOR	W6MTCTG1	B2TAG91100	BELT BOX LITE & FUSE DISPLAY	SEE FUNCTION
3	DETAIL-TRANSFORMER/FUSE BOX	W6MTCTG1	B2TAG91151	BELT BOX TRANSFORMER	SEE FUNCTION
BA	**>>PRINTED CIRCUIT BOARDS**				
BBB	BOARD-MEMORY BATTERY BACKUP	W6LMCBW	08BSBB1T	BOARD: SER BATT BACKUP-TEST	LINK MSTR BX
BBB-1	BOARD-MEMORY BATTERY BACKUP	W6MTCBWA	08BSBB1T	BOARD: SER BATT BACKUP-TEST	MILTRAC BOX
BMDL	DOWNLOADER-MEMORY	W6MTCPRA	EC63SDLA	MACH TO MACH DNLD 186 W/VGA	REMOTE
BPB	BOARD-8088 MICROPROCESSOR	W6LMCBW	08BSPDT	8088 PROCESSOR -> TESTED	LINK MSTR BX
BPB	BOARD-186 MICROPROCESSOR	W6DMCBWA	08BSPET	186 SERIAL PROCESSOR->TEST	MILTRAC BOX
BPB	BOARD-186 MICROPROCESSOR	W6MTCKB	08BSPET	186 SERIAL PROCESSOR->TEST	MILTRAC BOX
BPB	BOARD-186 MICROPROCESSOR	W6MTCPRA	08BSPET	186 SERIAL PROCESSOR->TEST	MILTRAC BOX
BPI	BOARD-PRINTER INTERFACE	W6MTCPRA	08BNOTPT	BOARD 1OUT+TICKET PRINT TEST	PRINTER STAND
BSO	BOARD-SINGLE OUTPUT	W6LMCBW	08BNOTPT	BOARD 1OUT+TICKET PRINT TEST	LINK MSTR BX
BSO	BOARD-SINGLE OUTPUT	W6MTCPO	08BNOTPT	BOARD 1OUT+TICKET PRINT TEST	PRINTER STAND
BTPE	BOARD-PRINTER EXPANSION 4-CHANNEL	W6MTCRX	08BSTPEPT	BRD:TICKET PRN EXPANS TESTED	PRINT EXP BOX
BVGA	BOARD-VGA VIDEO CONTROLLER	W6MTCBWA	08PCVGA16	SVGA BD 1024X768NI 512K ISA	LINK MSTR BX
CR	**>>RELAY-PILOT OR CONTROL**				
CRA	RELAY-ALTERNATE RANGE	W6MTCAR	09C01DDD37	RELAY 3PDT DIFGOLD 11PIN 120VAC	ALT RANGE BOX
CRD	RELAY-DATA VALID BELT LOADED	W6DMCFQ	09C01DDD37	RELAY 3PDT DIFGOLD 11PIN 120VAC	BELT CONTROLR
CRT	**>>>CRT DISPLAY MONITOR**				
CRT-1	MONITOR-MICROPROCESSOR	W6MTCBWA	08MN070VGA	MONITOR SVGA 14" .28DP NI	MILTRAC BOX
EB	**>>BUZZER OR AUDIBLE SIGNAL**				
EBSG	BUZZER-PRINTER SIGNAL	W6MTCPO	09H920	ALARM SONALERT 115V	PRINTER STAND
ED	**>>>ELECTRONIC DISPLAY**				
EDVFD	DISPLAY-MICROPROCESSOR VFD	W6LMCKPD	08BSEVFD3T	VF DISPLAY BUF-LG BD->TEST	MINK MSTR BX
EF	**>>FUSE OR FUSE HOLDER**				
EF37	FUSE-120V CONTROL CIRCUIT	W6DMCCH	09FF004AHG	FUSE BK/MDX 4 AMP 125V BUSS	BELT CONTROLR
EF37	FUSE-120V CONTROL CIRCUIT	W6DMCFR0	09FF004AHG	FUSE BK/MDX 4 AMP 125V BUSS	BELT CONTROLR
EF37	FUSE-120V CONTROL CIRCUIT	W6DMCND	09FF002AMG	FUSE BK/MDX 2 AMP 250V BUSS	NO-DRY C-BOX
EFC	**>>FLASHER**				
EFCD	FLASHER-COHORP MOVING TO DISCHARGE	W6DMCCHA	08FL007537	FLASHER 120V 1 AMP 75FFL/MIN	ON COHORP
EFCH	FLASHER-COHORP MOVING TO HOME	W6DMCCHA	08FL007537	FLASHER 120V 1 AMP 75FFL/MIN	ON COHORP

COMPONENT PARTS LIST

COMPONENT NUMBER	FUNCTION OF THIS COMPONENT	WHERE TO FIND THIS COMPONENT	MILNOR P/N	DESCRIPTION	LOCATION
EL	**>>LIGHT-PILOT OR INDICATOR**				
ELD	LIGHT-BELT DESIRES LOAD	W6DMCRR	09J070REC	LITE-STOP 4" RED LENS	BELT LIGHT BX
ELLL	LIGHT-BELT LOADED	W6DMCRR	09J070REC	LITE-STOP 4" RED LENS	BELT LIGHT BX
ELO	LIGHT-120V AVAILIBLE	W6DMCFR0	09J060G37	LAMP 1/2" GRN 125V IDI 1052QC5	BELT CONTROLR
ELP	LIGHT-BELT IN LOAD POSITION	W6DMCRR	09J070REC	LITE-STOP 4" RED LENS	BELT LIGHT BX
ELS+	LIGHT-3-WIRE	W6DMCFQ	09J060G37	LAMP 1/2" GRN 125V IDI 1052QC5	BELT CONTROLR
ELSG	LIGHT-SIGNAL	W6DMCS+	09J060WH37	LAMP 1/2" WHITE 120V TAB	BELT CONTROLR
ELUP	LIGHT-BELT IN UNLOAD POSITION	W6DMCRR	09J070REC	LITE-STOP 4" RED LENS	BELT LIGHT BX
EL0	LIGHT-120V AVAILIBLE	W6DMCCH	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	BELT CONTROLR
EL1	LIGHT-120V AVAILIBLE	W6DMCFR1	09J060G37	LAMP 1/2" GRN 125V IDI 1052QC5	BELT CONTROLR
EL2	LIGHT-120V AVAILIBLE	W6DMCFR2	09J060G37	LAMP 1/2" GRN 125V IDI 1052QC5	BELT CONTROLR
EL3	LIGHT-120V AVAILIBLE	W6DMCFR3	09J060G37	LAMP 1/2" GRN 125V IDI 1052QC5	BELT CONTROLR
EL37	LIGHT-120V AVAILIBLE	W6DMCND	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	NO-DRY C-BOX
EL4	LIGHT-120V AVAILIBLE	W6DMCFR4	09J060G37	LAMP 1/2" GRN 125V IDI 1052QC5	BELT CONTROLR
EL5	LIGHT-120V AVAILIBLE	W6DMCFR5	09J060G37	LAMP 1/2" GRN 125V IDI 1052QC5	BELT CONTROLR
EL6	LIGHT-120V AVAILIBLE	W6DMCFR6	09J060G37	LAMP 1/2" GRN 125V IDI 1052QC5	BELT CONTROLR
EL7	LIGHT-120V AVAILIBLE	W6DMCFR7	09J060G37	LAMP 1/2" GRN 125V IDI 1052QC5	BELT CONTROLR
ES	**>>POWER SUPPLY-ELECTRONIC**				
ESPS	POWER SUPPLY-MICROPROCESSOR	W6DMCBW	08PSS3401T	40 WATT POWER SUPPLY TESTED	CONTROLLER BX
ESPS3	POWER SUPPLY-PHOTOEYE	W6DMCBW	08PSL1B224	PWR SUP 100-240VAC TO 24VDC	CONTROLLER BX
ET	**>>>THERMAL OVERLOADS**				
ETB	OVERLOAD-BELT MOTOR	W6DMCMR	09FTC0010T	OL RELAY 1.0-2.9A AB#193-A3D1	CONTACTOR BX
EX	**>>TRANSFORMERS**				
EXL	TRANSFORMER-LOADING LIGHTS	W6DMCMR	09U002EBR	XFMR 120/240 PRI EBR 12VDC	BELT CONTROLR
KB	**>>KEYBOARD-ELECTRONIC**				
KBD	KEYPAD-MICROPROCESSOR	W6DMCKB	EC61KPBB	ASSY:ALPHA-NUM BELT BX KEYPD	KEYBOARD BX
MR	**>>MOTORS**				
MRB	MOTOR-BELT	W6DMCMR	MESSAGE SO	SEE SPECIFIC COMPONENT+NAMEPLATE	SIDE OF BELT
SH	**>>SWITCH-HAND OPERATED**				
SHAD	SWITCH-BELT ALLOWED TO DISCHARGE	W6DMCFP	09N405M210	SWASS M2W 1NO	REMOTE INPUT
SHAD	SWITCH-BELT 0 ALLOWED TO DISCHARGE	W6DMCFR0	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHAD	SWITCH-BELT 1 ALLOWED TO DISCHARGE	W6DMCFR1	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHAD	SWITCH-BELT 2 ALLOWED TO DISCHARGE	W6DMCFR2	09N405M210	SWASS M2W 1NO	BELT CONTROLR

COMPONENT PARTS LIST

COMPONENT NUMBER	FUNCTION OF THIS COMPONENT	WHERE TO FIND THIS COMPONENT	MILNOR P/N	DESCRIPTION	LOCATION
SHAD	SWITCH-BELT 3 ALLOWED TO DISCHARGE	W6DMCFR3	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHAD	SWITCH-BELT 4 ALLOWED TO DISCHARGE	W6DMCFR4	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHAD	SWITCH-BELT 5 ALLOWED TO DISCHARGE	W6DMCFR5	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHAD	SWITCH-BELT 6 ALLOWED TO DISCHARGE	W6DMCFR6	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHAD	SWITCH-BELT 7 ALLOWED TO DISCHARGE	W6DMCFR7	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHAD	SWITCH-DISCHARGE ALLOWED	W6DMCI	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHAD	SWITCH-DISCHARGE ALLOWED	W6DMCND	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHAL	SWITCH-LOAD ALLOWED	W6DMCI	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHAM	SWITCH-AUTO/MANUAL	W6DMCFQ	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHBAL	SWITCH-FEEDER BELT #5 LD ALLOWED	W6DMCFS5	09N405PB10	SWASS PBBK 1NO	BELT CONTROLR
SHBAL	SWITCH-FEEDER BELT #6 LD ALLOWED	W6DMCFS6	09N405PB10	SWASS PBBK 1NO	BELT CONTROLR
SHD	SWITCH-DATA VALID-BELT LOADED	W6DMCFQ	09N405PB10	SWASS PBBK 1NO	BELT CONTROLR
SHDT	SWITCH-BELT 0 ALLOWED TO LOAD	W6DMCFR0	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHDT	SWITCH-BELT 1 ALLOWED TO LOAD	W6DMCFR1	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHDT	SWITCH-BELT 2 ALLOWED TO LOAD	W6DMCFR2	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHDT	SWITCH-BELT 3 ALLOWED TO LOAD	W6DMCFR3	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHDT	SWITCH-BELT 4 ALLOWED TO LOAD	W6DMCFR4	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHDT	SWITCH-BELT 5 ALLOWED TO LOAD	W6DMCFR5	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHDT	SWITCH-BELT 6 ALLOWED TO LOAD	W6DMCFR6	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHDT	SWITCH-BELT 7 ALLOWED TO LOAD	W6DMCFR7	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHFA	SWITCH-REMOTE FORMULA SELECT ALPHA	W6DMCSD	09N041N	ROTSW 5-POLE 8-POSIT 5A125V	RM SELECT BX
SHFA	SWITCH-REMOTE FORMULA SELECT ALPHA	W6DMCSF	09N041N	ROTSW 5-POLE 8-POSIT 5A125V	FORMULA SELCT
SHFN	SWITCH-REMOTE FORMULA SELECT NUMB	W6DMCSD	09N041N	ROTSW 5-POLE 8-POSIT 5A125V	RM SELECT BX
SHFN	SWITCH-REMOTE FORMULA SELECT NUMB	W6DMCSF	09N041N	ROTSW 5-POLE 8-POSIT 5A125V	FORMULA SELCT
SHFS	SWITCH-REMOTE FORMULA SELECT 0-15	W6DMCSD	09N041N	ROTSW 5-POLE 8-POSIT 5A125V	RM SELECT BX
SHJOG	SWITCH-FEEDER BELT #5 JOG	W6DMCFS5	09N405PB10	SWASS PBBK 1NO	FEEDER BLT CNT
SHJOG	SWITCH-FEEDER BELT #6 JOG	W6DMCFS6	09N405PB10	SWASS PBBK 1NO	FEEDER BLT CNT
SHL	SWITCH-BELT IS LOADED	W6DMCFQ	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHL	SWITCH-BELT IS LOADED	W6DMCI	09N405M210	SWASS M2W 1NO	ON DRYER
SHLR	SWITCH-BELT IS LOADED RESET	W6DMCFQ	09N405PB01	SWASS BP BLUE INC	BELT CONTROLR
SHM	SWITCH-FEEDER BELT #5 MANUAL	W6DMCFS5	09N405M210	SWASS M2W 1NO	FEEDER BLT CNT
SHM	SWITCH-FEEDER BELT #6 MANUAL	W6DMCFS6	09N405M210	SWASS M2W 1NO	FEEDER BLT CNT
SHMA	SWITCH-MASTER	W6DMCFQ	09N405M210	SWASS M2W 1NO	BELT CONTROLR

COMPONENT PARTS LIST

COMPONENT NUMBER	FUNCTION OF THIS COMPONENT	WHERE TO FIND THIS COMPONENT	MILNOR P/N	DESCRIPTION	LOCATION
SHMD	SWITCH-BELT MOTOR DISCONNECT	W6DMCMR	09N042204	ROTARY DISCON 10A 600V 2POS 4P	SIDE OF BELT
SHMD	SWITCH-MOTOR DISCONNECT	W6DMCS+	09N042204	ROTARY DISCON 10A 600V 2POS 4P	SIDE OF BELT
SHPE1	SWITCH-EMERGENCY PULL CORD	W6DMCCH	09R014A	MINI-SW SPDT STAKON #V15G1C26	SIDE OF BELT
SHPE1	SWITCH-EMERGENCY PULL CORD	W6DMCFQ	09R014A	MINI-SW SPDT STAKON #V15G1C26	SIDE OF BELT
SHPE1	SWITCH-EMERGENCY PULL CORD	W6DMCS+	09R014A	MINI-SW SPDT STAKON #V15G1C26	SIDE OF BELT
SHPE2	SWITCH-EMERGENCY PULL CORD	W6DMCCH	09R014A	MINI-SW SPDT STAKON #V15G1C26	SIDE OF BELT
SHPE2	SWITCH-EMERGENCY PULL CORD	W6DMCFQ	09R014A	MINI-SW SPDT STAKON #V15G1C26	SIDE OF BELT
SHPE2	SWITCH-EMERGENCY PULL CORD	W6DMCS+	09R014A	MINI-SW SPDT STAKON #V15G1C26	SIDE OF BELT
SHS+	SWITCH-START	W6DMCFQ	09N405PG10	SWASS PBGN 1NO	BELT CONTROLR
SHS+	SWITCH-START	W6DMCS+	09N405PG10	SWASS PBGN 1NO	CONTROLLER BX
SHSFR	SWITCH-RANGE SELECT	W6DMCSD	09N405M210	SWASS M2W 1NO	RM SELECT BX
SHSG	SWITCH-SIGNAL CANCEL	W6DMCS+	09N405PY10	SWASS PB YELLOW 1NO	CONTROLLER BX
SHSMA	SWITCH-MASTER	W6DMCBW	09N405M210	SWASS M2W 1NO	CONTROLLER BX
SHSMA	SWITCH-MASTER	W6DMCS+	09N405M210	SWASS M2W 1NO	BELT CONTROLR
SHSO	SWITCH-STOP	W6DMCFQ	09N405PR01	SWASS PBRD 1NC	BELT CONTROLR
SHSO	SWITCH-STOP	W6DMCS+	09N405PR01	SWASS PBRD 1NC	CONTROLLER BX
SK	**>>SWITCH-KEYLOCK**				
SKPR	SWITCH-RUN/PROGRAM (KEY OP)	W6DMCS+	09N127C	KEYSW SPST 7A120VAC SCREW TERM	CONTROLLER BX
SM	**>>SWITCH-MECHANICAL OPERATED**				
SMDO	PROX SW-COHORP AT DISCHARGE	W6DMCCHA	09RPS18AAU	PROXSW QK CONN 18M NO-AC UNSHLD	ON COHORP
SMFB1	SWITCH-JOG LOADING BELT	W6DMCFP	09R014A	MINI-SW SPDT STAKON #V15G1C26	LOADING BELT
SMFB2	SWITCH-JOG LOADING BELT	W6DMCFP	09R014A	MINI-SW SPDT STAKON #V15G1C26	LOADING BELT
SMH	PROX SW-COHORP AT HOME	W6DMCCHA	09RPS18AAU	PROXSW QK CONN 18M NO-AC UNSHLD	ON COHORP
SMLP	SWITCH-BELT IN LOAD POSITION	W6DMCFQ	09R012	MICSW SPDT PAINTED BZE6-RN 01	END OF BELT
SMUP	SWITCH-BELT IN UNLOAD POSITION	W6DMCFQ	09R012	MICSW SPDT PAINTED BZE6-RN 01	END OF BELT
VE	**>>VALVE-ELECTRIC OPERATED**				
VECD	VALVE-MOVE COHORP TO DISCHARGE	W6DMCCHA	96R301A37	1/8" PILOT 3W-NC 110/50 120/60	ON COHORP
VECH	VALVE-MOVE COHORP HOME	W6DMCCHA	96R301A37	1/8" PILOT 3W-NC 110/50 120/60	ON COHORP
VEET	VALVE-EXTEND RAIL TARGET	W6DMCFQ	96R301A37	1/8" PILOT 3W-NC 110/50 120/60	BELT CONTROLR
VEET	VALVE-EXTEND TARGET	W6DMCSB	96R301A37	1/8" PILOT 3W-NC 110/50 120/60	DEVICE AIR BX
VET	VALVE-DROP TARGET	W6DMCND	96R301A37	1/8" PILOT 3W-NC 110/50 120/60	NO-DRY BOX
ZF	**>>RECTIFIERS**				
ZFDL	RECTIFIER-BELT DESIRES LOAD	W6DMCRR	09A020EBR	RECTIFIER (ERB) 15A/600PIV	BELT LIGHT BX

COMPONENT PARTS LIST

COMPONENT NUMBER	FUNCTION OF THIS COMPONENT	WHERE TO FIND THIS COMPONENT	MILNOR P/N	DESCRIPTION	LOCATION
ZFL	RECTIFIER-BELT LOADED	W6DMCRR	09A020EBR	RECTIFIER (ERB) 15A/600PIV	BELT LIGHT BX
ZFP	RECTIFIER-BELT IN LOAD POSITION	W6DMCRR	09A020EBR	RECTIFIER (ERB) 15A/600PIV	BELT LIGHT BX
ZFUP	RECTIFIER-BELT IN UNLOAD POSITION	W6DMCRR	09A020EBR	RECTIFIER (ERB) 15A/600PIV	BELT LIGHT BX

PELLERIN MILNOR CORPORATION
LIMITED STANDARD WARRANTY

We warrant to the original purchaser that MILNOR machines including electronic hardware/software (hereafter referred to as "equipment"), will be free from defects in material and workmanship for a period of one year from the date of shipment (unless the time period is specifically extended for certain parts pursuant to a specific MILNOR published extended warranty) from our factory with no operating hour limitation. This warranty is contingent upon the equipment being installed, operated and serviced as specified in the operating manual supplied with the equipment, and operated under normal conditions by competent operators.

Providing we receive written notification of a warranted defect within 30 days of its discovery, we will at our option repair or replace the defective part or parts, FOB our factory. We retain the right to require inspection of the parts claimed defective in our factory prior to repairing or replacing same. We will not be responsible, or in any way liable, for unauthorized repairs or service to our equipment, and this warranty shall be void if the equipment is tampered with, modified, or abused, used for purposes not intended in the design and construction of the machine, or is repaired or altered in any way without MILNOR's written consent.

Parts damaged by exposure to weather, to aggressive water, or to chemical attack are not covered by this warranty. For parts which require routine replacement due to normal wear such as gaskets, contact points, brake and clutch linings, belts, hoses, and similar parts the warranty time period is 90 days.

We reserve the right to make changes in the design and/or construction of our equipment (including purchased components) without obligation to change any equipment previously supplied.

ANY SALE OR FURNISHING OF ANY EQUIPMENT BY MILNOR IS MADE ONLY UPON THE EXPRESS UNDERSTANDING THAT MILNOR MAKES NO EXPRESSED OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE OR PURPOSE OR ANY OTHER WARRANTY IMPLIED BY LAW INCLUDING BUT NOT LIMITED TO REDHIBITION. MILNOR WILL NOT BE RESPONSIBLE FOR ANY COSTS OR DAMAGES ACTUALLY INCURRED OR REQUIRED AS A RESULT OF: THE FAILURE OF ANY OTHER PERSON OR ENTITY TO PERFORM ITS RESPONSIBILITIES, FIRE OR OTHER HAZARD, ACCIDENT, IMPROPER STORAGE, MIS-USE, NEGLECT, POWER OR ENVIRONMENTAL CONTROL MALFUNCTIONS, DAMAGE FROM LIQUIDS, OR ANY OTHER CAUSE BEYOND THE NORMAL RANGE OF USE. REGARDLESS OF HOW CAUSED, IN NO EVENT SHALL MILNOR BE LIABLE FOR SPECIAL, INDIRECT, PUNITIVE, LIQUIDATED, OR CONSEQUENTIAL COSTS OR DAMAGES, OR ANY COSTS OR DAMAGES WHATSOEVER WHICH EXCEED THE PRICE PAID TO MILNOR FOR THE EQUIPMENT IT SELLS OR FURNISHES.

THE PROVISIONS ON THIS PAGE REPRESENT THE ONLY WARRANTY FROM MILNOR AND NO OTHER WARRANTY OR CONDITIONS, STATUTORY OR OTHERWISE, SHALL BE IMPLIED.

WE NEITHER ASSUME, NOR AUTHORIZE ANY EMPLOYEE OR OTHER PERSON TO ASSUME FOR US, ANY OTHER RESPONSIBILITY AND/OR LIABILITY IN CONNECTION WITH THE SALE OR FURNISHING OF OUR EQUIPMENT TO ANY BUYER.

BIUUUD19 (Published) Book specs- Dates: 20081231 / 20081231 / 20081231 Lang: ENG01 Applic: UUU

How to Get the Necessary Repair Components

This document uses Simplified Technical English.
Learn more at http://www.asd-ste100.org.

You can get components to repair your machine from the approved supplier where you got this machine. Your supplier will usually have the necessary components in stock. You can also get components from the Milnor® factory.

Tell the supplier the machine model and serial number and this data for each necessary component:

- The component number from this manual
- The component name if known
- The necessary quantity
- The necessary transportation requirements
- If the component is an electrical component, give the schematic number if known.
- If the component is a motor or an electrical control, give the nameplate data from the used component.

To write to the Milnor factory:

Pellerin Milnor Corporation
Post Office Box 400
Kenner, LA 70063-0400
UNITED STATES

Telephone: 504-467-2787
Fax: 504-469-9777
Email: parts@milnor.com

— End of BIUUUD19 —

BIUUUK01 (Published) Book specs- Dates: 20130308 / 20130308 / 20130308 Lang: ENG01 Applic: PCR UUU

How to Use Milnor® Electrical Schematic Diagrams

Milnor® electrical schematic manuals contain a table of contents/component list and a set of schematic drawings. These documents are cross referenced and must be used together.

The table of contents/components list shows, for every component on every schematic in the manual, the component item number (explained in detail below), statement of function, parent schematic number, part number, description and electric box location. In older manuals, two component lists are provided: List 1 sorts the components by function, and List 2 by type of component. Newer schematic manuals include only the list sorted by component number.

The schematic drawings use symbols for each electromechanical component, and indicate the function of each. Integrated circuits are not shown, but the function of each microprocessor input and output is stated. Certain electrical components not pertinent to circuit logic, such as wire connectors, are not represented on the schematic.

Most machines require several schematics to describe the complete control system and all the options available on the included models. In most manuals there are some schematic pages that don't apply to your specific machine because certain options and configurations are mutually exclusive or are not necessary in all markets. You may find it helpful to mark or remove such pages. A schematic page that only applies to a subset of machines will normally state, in the title, which models and/or options it covers. Compare this with the nameplate on your machine and with your purchase records.

Each schematic is devoted to circuits with common functions (e.g., microprocessor inputs, motor contactors). Schematics appear in the manual in alphanumeric order.

1. Component Prefix Classifications and Descriptions

Component item numbers consist of up to six characters and appear as part of a component's symbol on the schematic. The first two characters indicate the general class of component, and the remaining characters are a mnemonic for the function. For example, “CD” is the code for all time delay relays, and “SR” stands for safety reset. Thus, CDSR is a time delay relay that serves as a safety reset.

The following are descriptions of electrical components used in Milnor® machines. Descriptions are in alphabetical order by the component class code (two character prefix).

> **Note 1:** Some component class codes do not have a corresponding symbol, but are represented by a box and an accompanying note describing the component. Examples of such codes are BA (printed circuit board), ED (electronic display), and ES (electronic power supply).

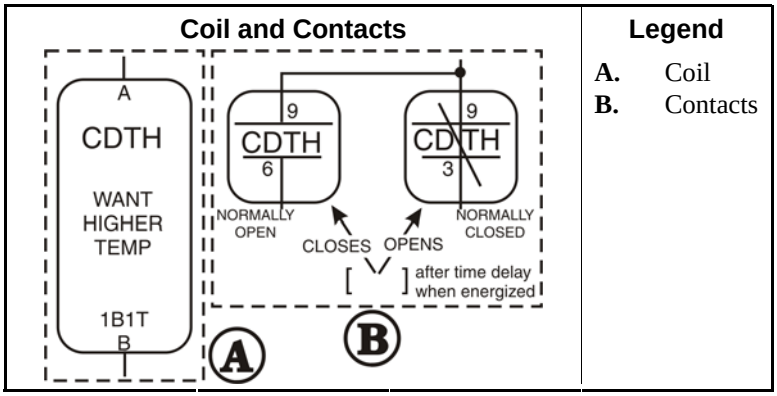
BA=Printed Circuit Board—Insulating substrate on which a thin pattern of copper conductors has been formed to connect discrete electronic components also mounted on the board.

CB=Circuit Breaker (Figure 1)—Automatic switch that opens an electric circuit in abnormal current conditions (e.g., an overload).

Figure 1: Circuit Breaker (CB)

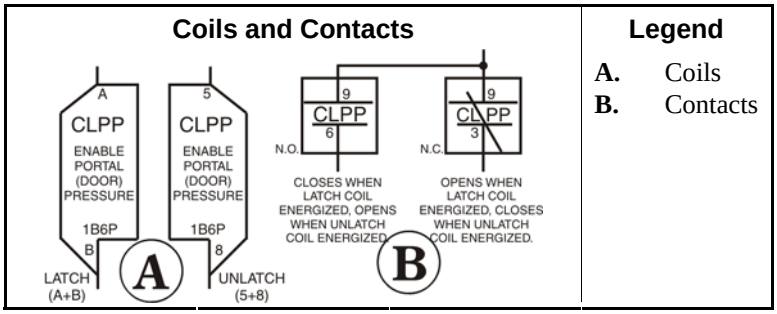
CD=Control, Time Delay Relay (Figure 2)—A relay whose contacts switch only after a fixed or adjustable delay, once voltage has been applied to its coil. The contacts switch back to normal (de-energized state) immediately when the voltage is removed.

Figure 2: Time Delay Relay (CD)



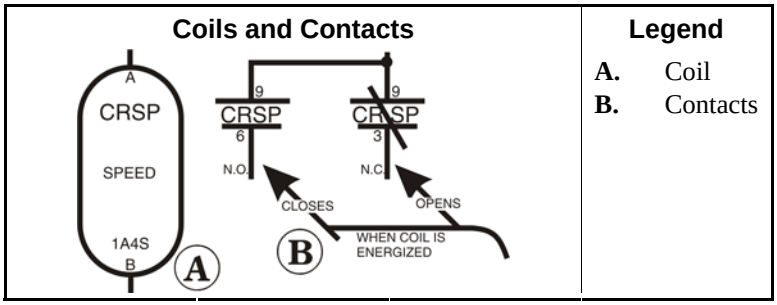
CL=Control, Latch Relay (Figure 3)—A relay which latches in an energized or set position when operated by one coil (the latch/set coil). The relay stays latched even though coil voltage is removed. The relay releases or unlatches when voltage is applied to a second coil (the unlatch/reset coil).

Figure 3: Latch Relay (CL)



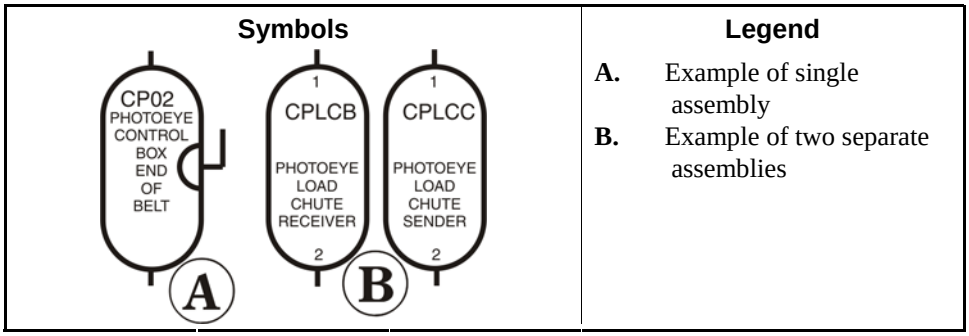
CR=Control, Relay (Figure 4)—A relay whose contacts switch immediately when voltage is applied to its coil and revert to normal when the voltage is removed.

Figure 4: Standard Relay (CR)



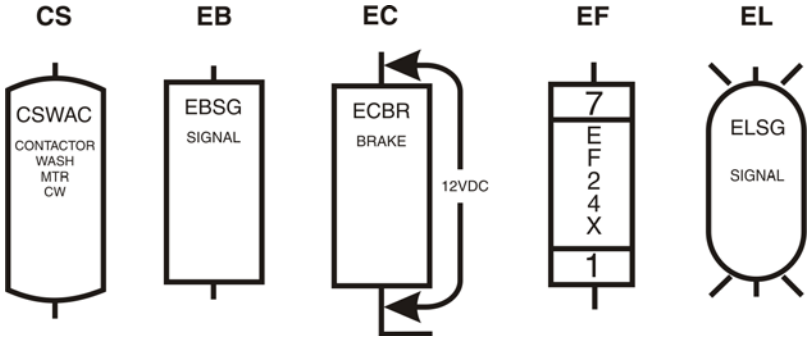
CP=Control, Photo-Eye (Figure 5)—Photo-eyes sense the presence of an object without direct physical contact. Photo-eyes consist of a transmitter, receiver, and output module. These components may be housed in one assembly with the transmitter bouncing light off of a reflector to the receiver, or these components can be housed in two separate assemblies with the transmitter pointed directly at the receiver. The photo-eye can be set to turn on its output either when the light beam becomes blocked (dark operate) or when it becomes un-blocked (light operate).

Figure 5: Photo-eye (CP)



CS=Control, Contactor/Motor Starter (Figure 6)—A relay capable of handling heavier electrical loads, usually a motor.

Figure 6: Other Control Symbols



EB=Electric Buzzer (Figure 6)—An audible signaling device.

EC=Electric Clutch (Figure 6)—A clutch consists of a coil and a rotor. The rotor has two separate rotating plates. These plates are free to rotate independent of each other until the coil is energized. Once energized the two plates turn as one.

ED=Electronic Display—A visual presentation of data, such as an LCD (liquid crystal display), LED (light emitting diode) display, or VFD (vacuum florescent display).

EF=Electric Fuse (Figure 6)—A fuse is an over-current safety device with a circuit opening fusible member which is heated and severed by the passage of over-current through it.

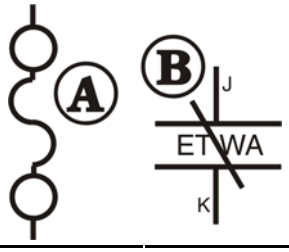
EL=Electric Light (Figure 6)—Indicator lights may be either incandescent or fluorescent.

EM=Electro Magnet Solenoid—A device consisting of a core surrounded by a wire coil through which an electric current is passed. While current is flowing, iron is attracted to the core (e.g., a pinch tube drain valve solenoid).

ES=Electronic Power Supply—A device that converts AC (alternating current) to filtered and regulated DC (direct current). The input voltage to the power supply is usually 120 or 240 VAC. The output is +5, +12, and -12 VDC.

ET=Thermal Overload (Figure 7)—A safety device designed to protect a motor. A thermal overload consists of an overload block, heaters, and an auxiliary contact. The auxiliary contact is normally installed in a safety (three-wire) circuit that stops power to the motor contactor coil when a motor overload occurs.

Figure 7: Thermal Overload (ET)

Schematic Symbol	Legend
	**A.** Heater (one per phase) **B.** Overload relay; contacts open if overload condition exists

EX=Electrical Transformer (Figure 8)—A device that transfers electrical energy from one isolated circuit to another, often raising or lowering the voltage in the process.

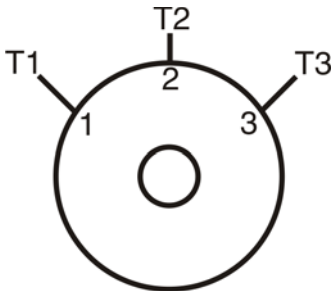
KB=Keyboard—Device similar to a typewriter for making entries to a computer.

MN=Electronic Monitor (CRT)—A cathode ray tube used for visual presentation of data.

MR=Motors (Figure 9)—Electromechanical device that converts electrical energy into mechanical energy.

Figure 8: Transformer (EX)

Figure 9: Electric Motor (MR)

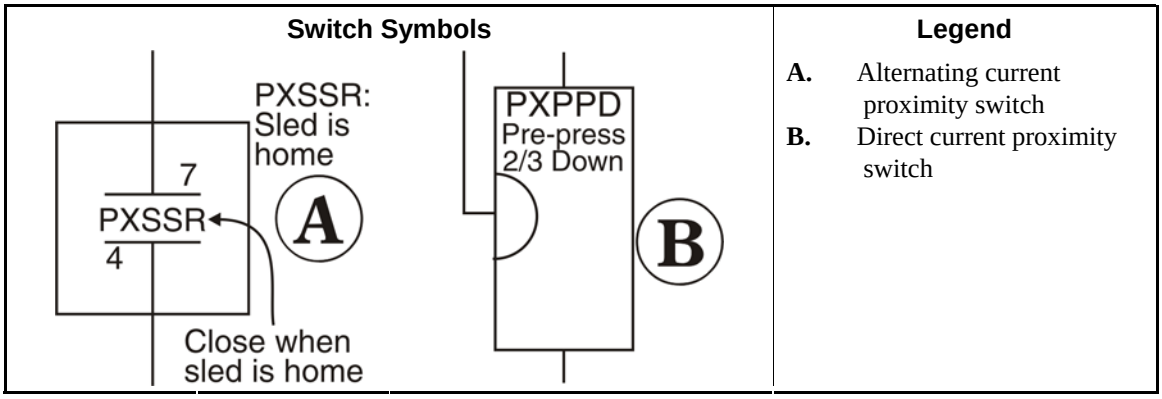


MV=Motor (Variable Speed) Inverter—To vary the speed of an AC motor, the volts to frequency ratio must be kept constant. The motor will overheat if this ratio is not maintained. The motor variable speed inverter converts three phase AC to DC. The inverter then uses this DC voltage to generate AC at the proper voltage and frequency for the commanded speed.

Note 2: Switch symbols used in the schematics and described below always depict the switch in its un-actuated state.

PX=Proximity Switch (Figure 10)—A device which reacts to the proximity of an target without physical contact or connection. The actuator or target causes a change in the inductance of the proximity switch which causes the switch to operate. Proximity switches can be two-wire (AC) or three-wire (DC) devices.

Figure 10: Proximity Switches (PX)



SC=Switch, Cam Operated (Figure 11)—A switch in which the electrical contacts are opened and/or closed by the mechanical action of a cam(s). Applications include 35-50 pound timer operated machines, Autospot, timer reversing motor assembly, and some balancing systems.

SH=Switch, Hand Operated (Figure 12)—A switch that is manually operated (e.g., *Start button*, *Master switch*, etc.).

Figure 11: Cam Switch (SC)

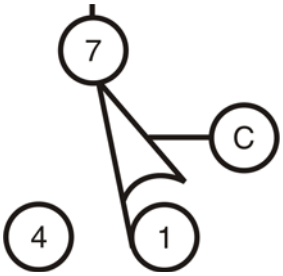
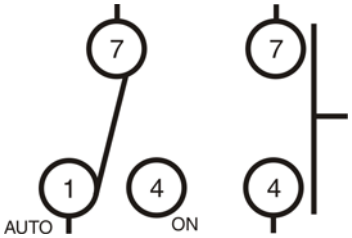


Figure 12: Hand Operated Switch (SH)



SK=Switch, Key Lock (Figure 13)—A switch that requires a key to operate. This prevents unauthorized personnel from gaining access to certain functions (e.g., the *Program menu*).

SL=Switch, Level Operated (Figure 14)—A switch connected to a float that causes the switch to open and close as the level changes.

Figure 13: Key Switch (SK)

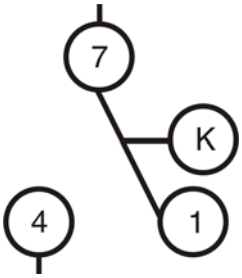
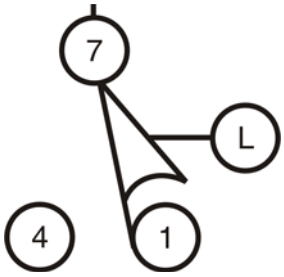


Figure 14: Level Switch (SL)



SM=Switch, Mechanically Operated (Figure 15)—A switch that is mechanically operated by a part of or the motion of the machine (e.g., door closed switch, tilt limit switches, etc.)

SP=Switch, Pressure Operated (Figure 16)—A switch in which a diaphragm presses against a switch actuator.

Figure 15: Mechanical Switch (SM)

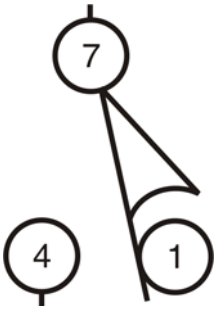
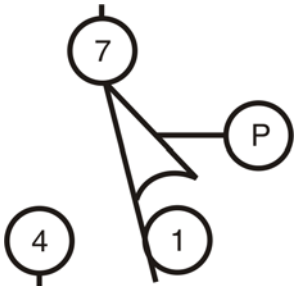


Figure 16: Pressure Switch (SP)



ST=Switch, Temperature Operated (Figure 17)—A switch that is actuated at a preset temperature (e.g., dryer safety probes) or has adjustable set points (e.g., Motometers or Combistats).

TB=Terminal Board (Figure 18)—A strip or block for attaching or terminating wires.

Figure 17: Temperature Switch (ST)

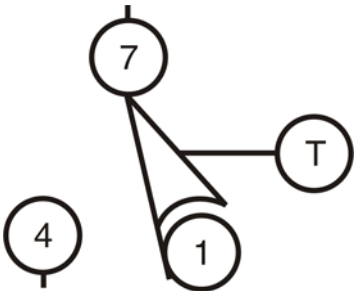
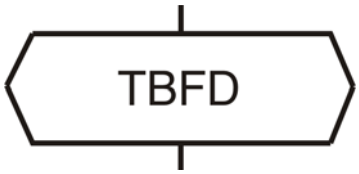


Figure 18: Terminal Board (TB)



VE=Valve, Electric Operated (Figure 19)—A valve operated by an electric coil to control the flow of fluid. The fluid can be air, water or hydraulic.

Figure 19: Electrically Operated Valve (VE)

ZF=Rectifier (Figure 20)—A solid state device that converts alternating current to direct current.

Figure 20: Bridge Rectifier (ZF)

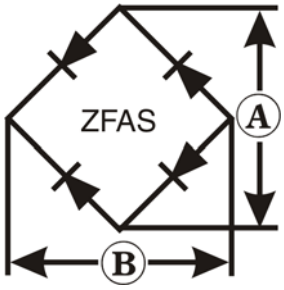
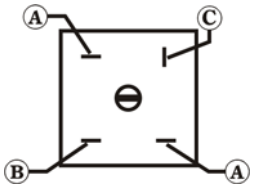
Component Symbol	Legend
	**A.** Alternating current input **B.** Direct current output

Figure 21: Bridge Rectifier

Component	Legend
	**A.** Alternating current in **B.** Negative direct current out **C.** Positive direct current out

WC=Wiring Connector—A coupling device for joining two cables or connecting a cable to an electronic circuit or piece of equipment. Connectors are male or female, according to whether they plug into or receive the mating connector.

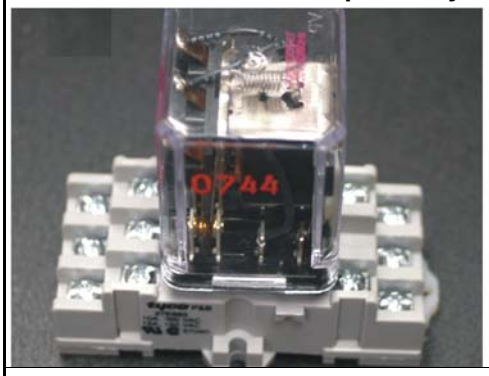
2. Component Terminal Numbering

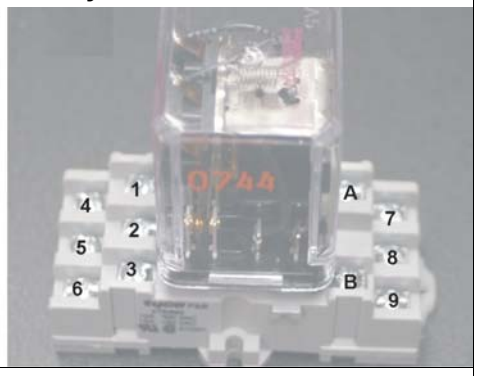
CAUTION 1: Risk of Mis-wiring—Due to electrical component manufacturing inconsistencies, the pin numbers imprinted on components such as connectors and relay bases used on Milnor machines often do not correspond to the pin numbers shown in the schematics.

- Ignore pin numbers imprinted on in-line connectors (e.g., Molex connectors) and relay bases.
- Use the pin identification illustrations herein to identify pins on these components.

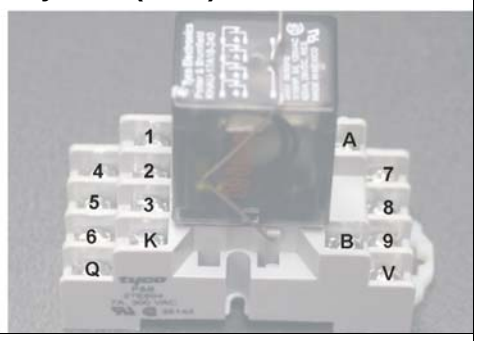
Figure 22: Plug-in Relays

11-pin Relay with Grey Base

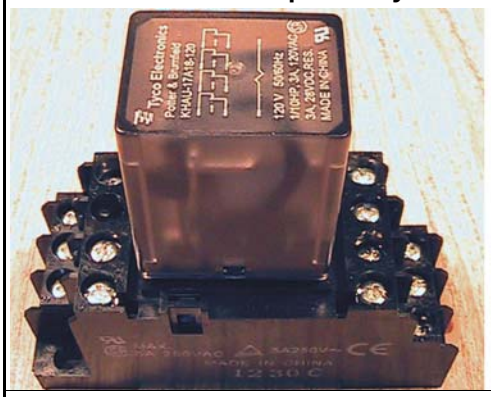


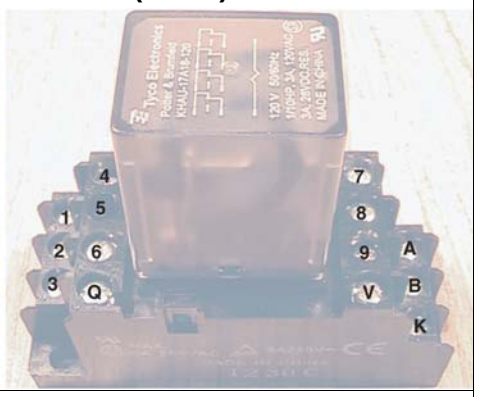


14-pin Relay with Grey Base (older)

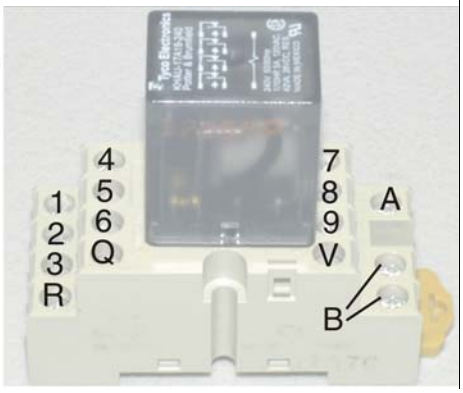


14-pin Relay with Black Base (newer)





14-pin Relay with Beige Base (rare)



Legend

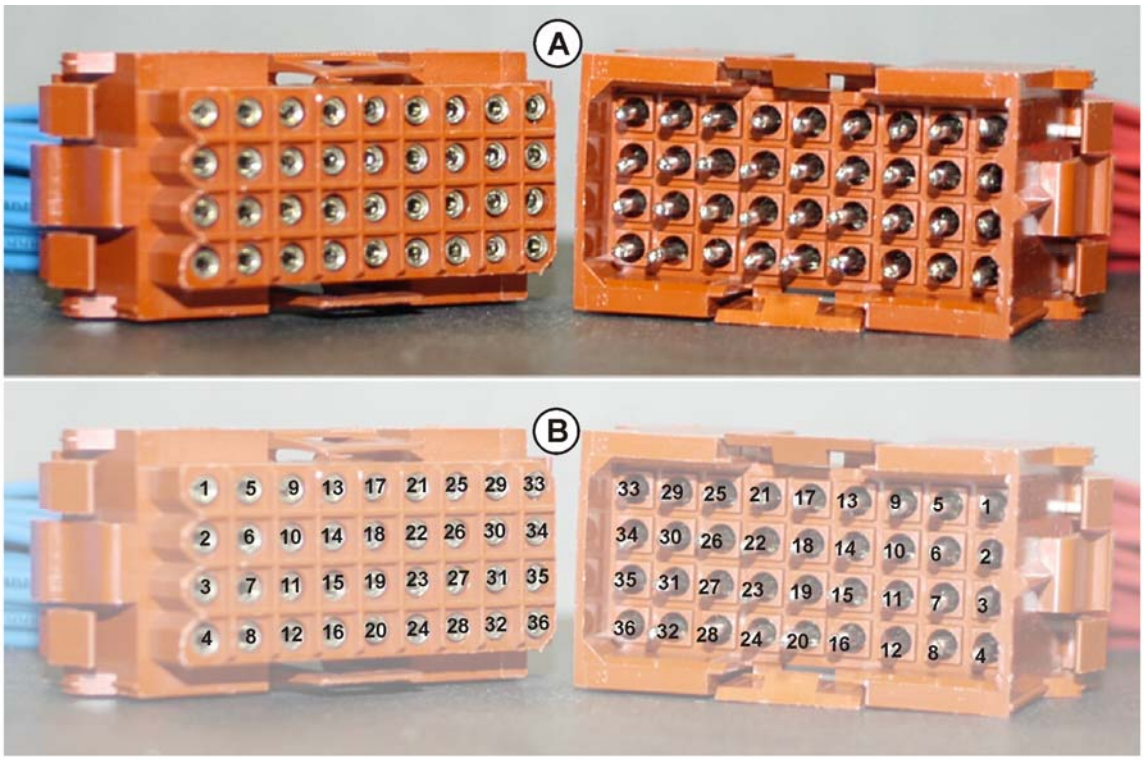
Left. View of relay and base

Right. Same view, showing pin numbers

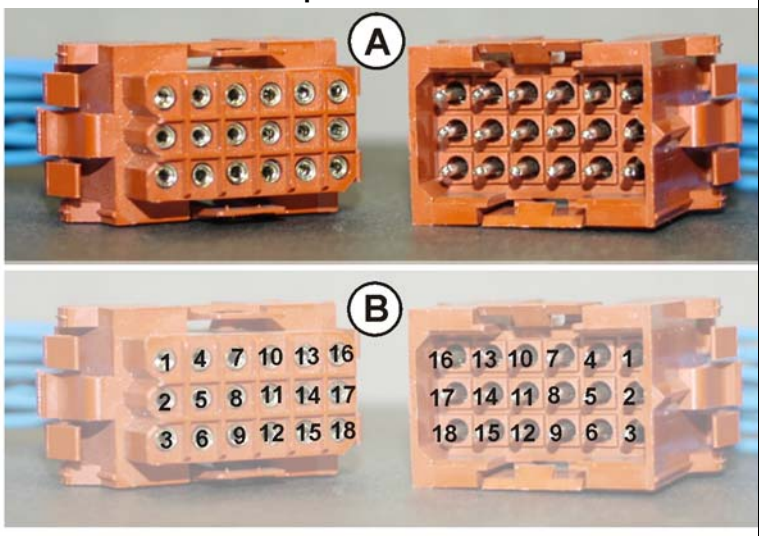
Note 3: Relay functional names ending with the letter "M" (e.g., CRxxM) are not discrete components but are a component of a printed circuit board. They are usually not individually replaceable.

Figure 23: AMP Connector Pin Locations

36-pin Connector



18-pin Connector

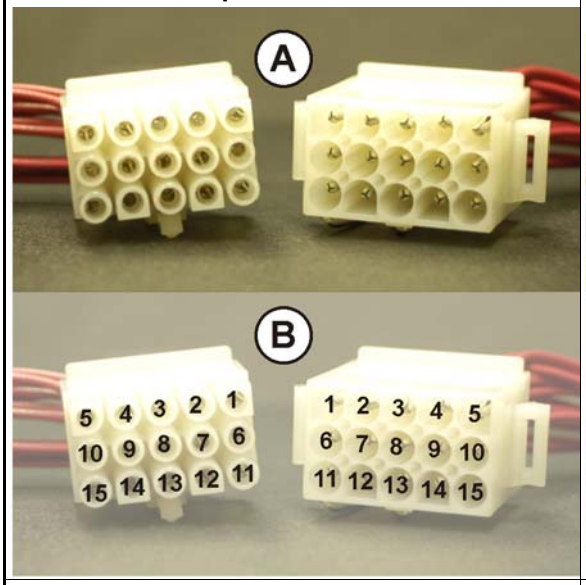


Legend

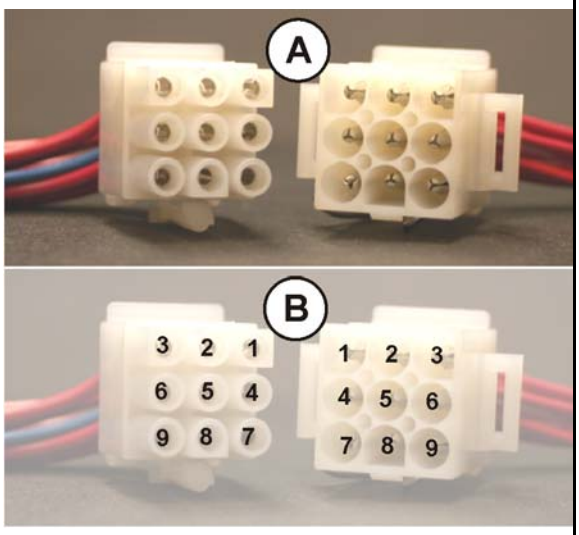
A. View of mating halves of connector
B. Same view, showing assigned pin numbers

Figure 24: Molex Connector Pin Locations

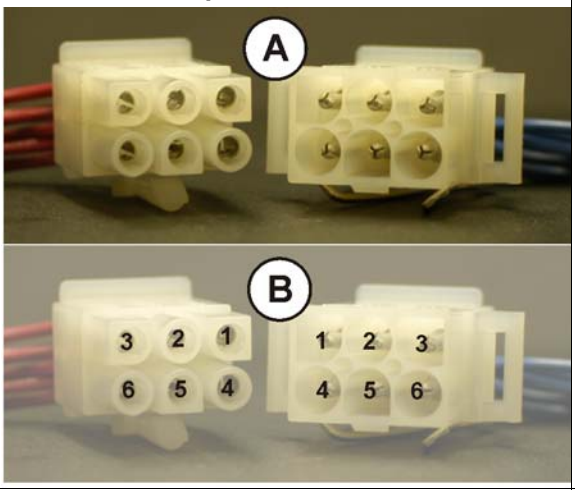
15-pin Connector



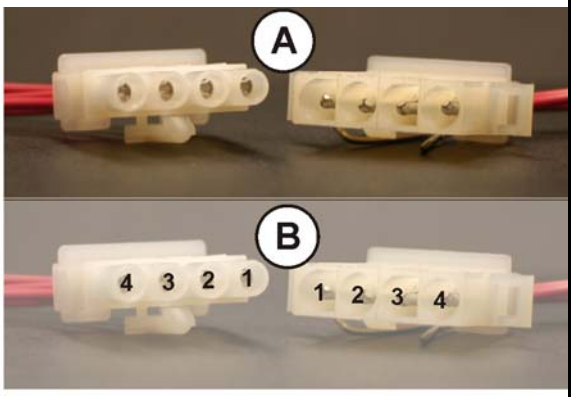
9-pin Connector



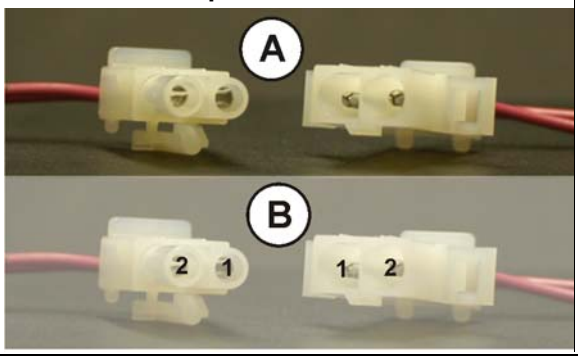
6-pin Connector



4-Pin Connector



2-pin Connector



Legend

A. View of mating halves of connector
B. Same view, showing assigned pin numbers

Figure 25: Pressure Switch

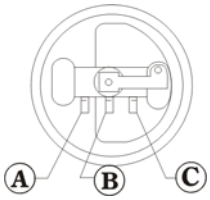
Component	Legend
	**A.** Contact 1—Normally open **B.** Contact 2—Normally closed **C.** Contact 3—Common

Figure 26: Toggle Switch

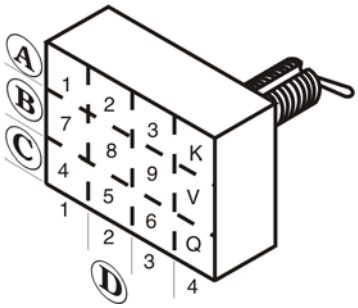
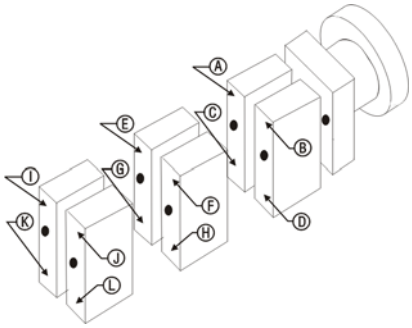
Component	Legend
	**A.** Normally closed contacts **B.** Common contacts **C.** Normally open contacts **D.** Pole

Figure 27: Switch with Replaceable Contact Blocks

Rotary or Push-button Switch Component	Legend
	**A.** Terminal 7 **B.** Terminal 8 **C.** Terminal 4 if normally open; terminal 1 if normally closed **D.** Terminal 5 if normally open; terminal 2 if normally closed **E.** Terminal V **F.** Terminal 9 **G.** Terminal Q if normally open; terminal K if normally closed **H.** Terminal 6 if normally open; terminal 3 if normally closed **I.** Terminal W **J.** Terminal X **K.** Terminal R if normally open; terminal L if normally closed **L.** Terminal S if normally open; terminal M if normally closed

3. Features of Milnor® Electrical Schematic Diagrams

Document BMP010012 (following this section) is a sample schematic, based on a schematic diagram for the Milnor® gas dryer. For the purposes of this exercise, the schematic is shown gray and explanations of the items on the schematic are shown black.

The item numbers below correspond to the circled item numbers shown on the drawing.

1. The first six characters of the drawing number (W6DRYG) indicate that this is a wiring diagram (W), identify the generation of controls (6), and identify the type of machine (DRYG=Gas Dryer). These characters appear in the drawing number of every schematic in the set.

   The characters following the first six are unique to each drawing. The two characters identified as the page number are an abbreviation for the function performed by the depicted

circuitry (S+=three-wire circuit) and establish the order in which the schematic occurs in the manual (schematics are arranged in alpha-numeric order in the manual).

Whenever circuitry changes are significant enough to warrant publishing a new schematic drawing, the new drawing number will be the same as the old except for the major revision letter (A in the example).

2. Included in the drawing title are the class of control system, the title of this circuit, and the circuit voltage.
3. Line numbers are provided along the bottom edge of the drawing. These permit service personnel in the field and at the Milnor® factory to quickly relate circuit locations when discussing troubleshooting over the phone. Page and line numbers are referenced on the drawing as explained in items five and six below.
4. Relay contacts show the page and line number on which the relay coil may be found. This is the type of cross referencing most frequently used in troubleshooting.
5. Relay coils show the page and line number on which its associated contacts are located.
6. Relay contacts and relay coils show the physical location of the relay.
7. The designation MTA applies to electronic circuit board connections. Typically, a control system will contain several different types of circuit boards and one or more boards of each type. A numerical suffix identifies the board type and a numerical prefix identifies which one of several boards of a given type is being depicted. For example, the designation 1MTA5 identifies this as the first I/O board (8 output, 16 input board) in the control system. As shown on the drawing, a pin number follows the board number, separated by a dash. Thus, 1MTA5-9 is pin 9 on this board. The numerical designations for board types vary from one control system to another. Some of the board types commonly encountered on the Mark V and Mark VI washer-extractor control and their designations are as follows:
   - MTM1-MTM8 = Mother board
   - MTA1-MTA5 = 8 output, 16 input (8/16) boards
   - MTA11-MTA14 = 24 output boards
   - MTA30-MTA40 = processor boards
   - MTA41-MTA43 = digital to analog (D/A) boards
   - MTA51-MTA55 = analog to digital (A/D) boards
   - MTA81-MTA85 = balance A-D board

   The complete listing of the boards utilized in a given control system can be found in the component list for that system.
8. Wire numbers, as described earlier in this section, are shown at appropriate locations on the schematic drawing.
9. Where diamond symbols appear at the end of a conductor, these are match points for continuing the schematic on another drawing. The page and line number that continues the circuit is printed adjacent to the diamond symbol. Where more than one match point appears on the referenced page, match diamonds containing corresponding letters.

— End of BIUUUK01 —

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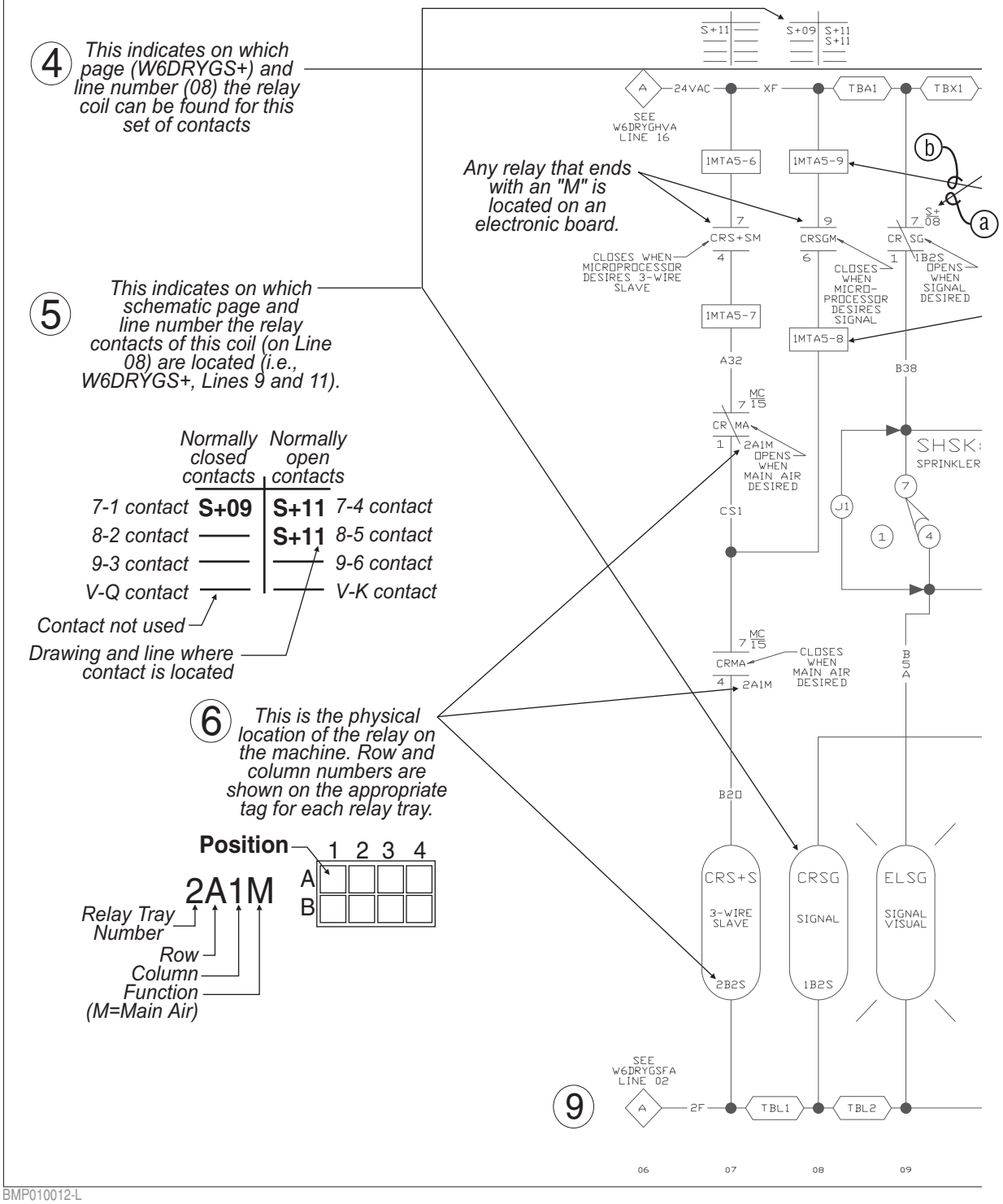
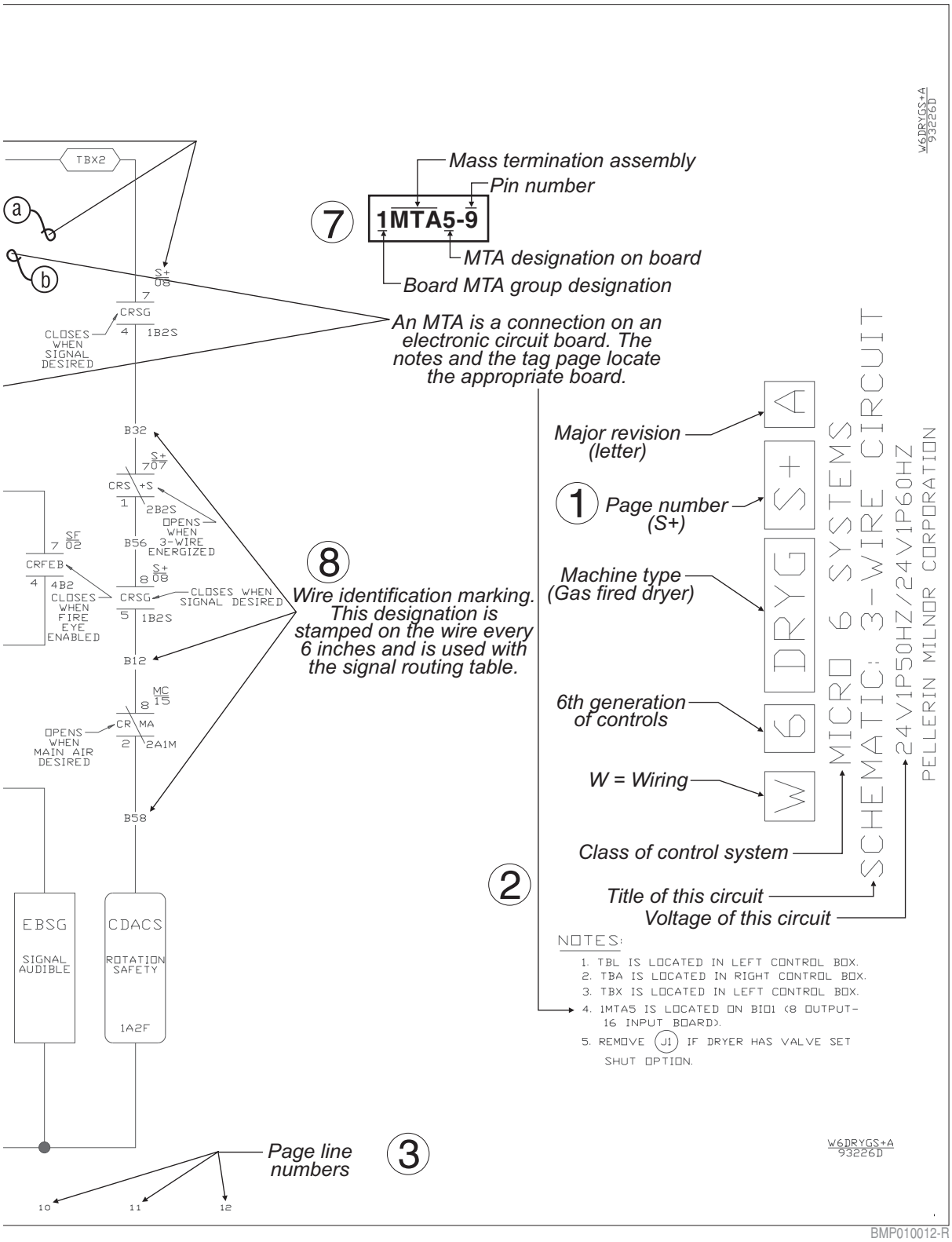
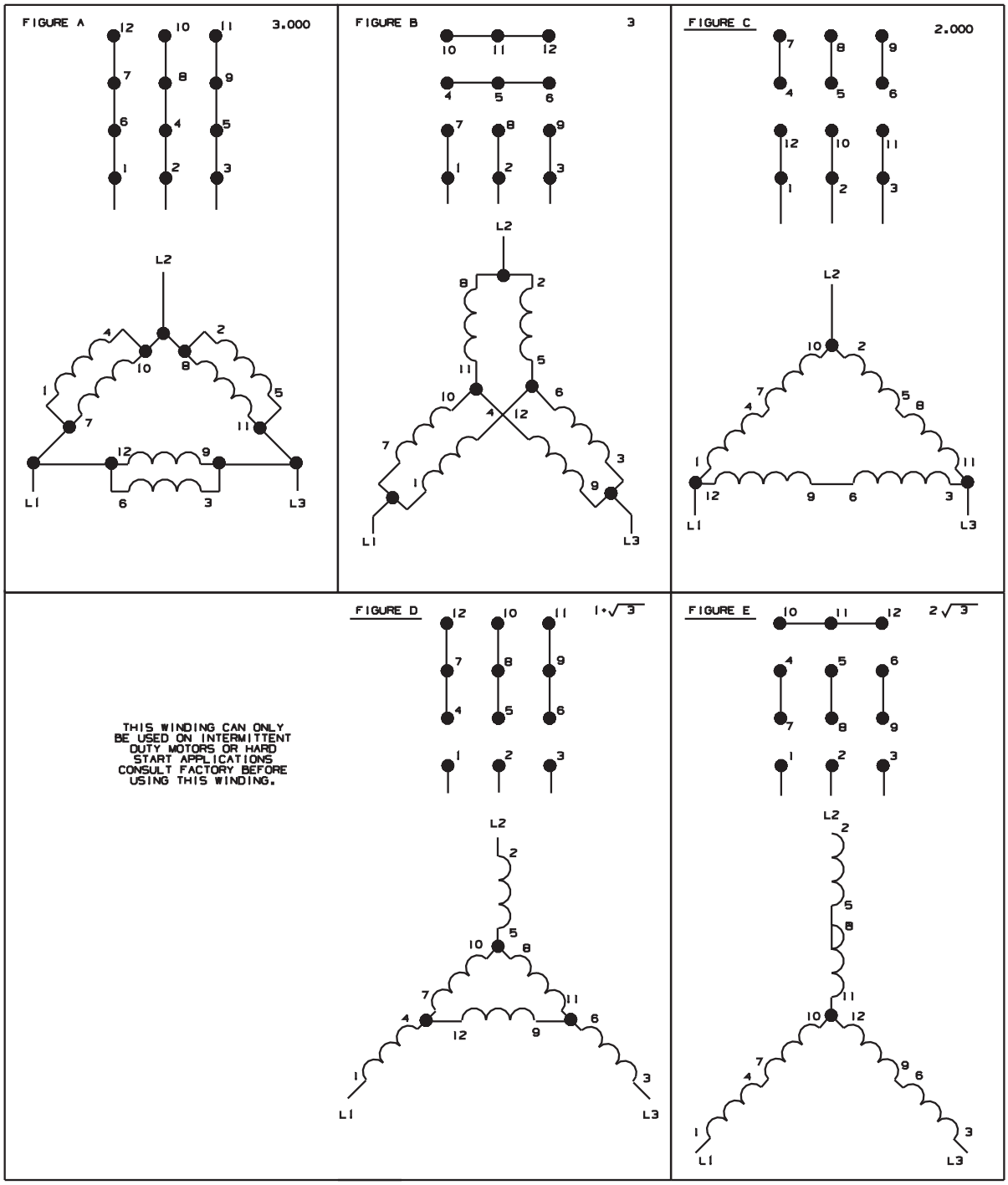

4
This indicates on which page (W6DRYGS+) and line number (08) the relay coil can be found for this set of contacts
5
This indicates on which schematic page and line number the relay contacts of this coil (on Line 08) are located (i.e., W6DRYGS+, Lines 9 and 11).
Normally closed contacts
Normally open contacts
7-1 contact S+09 S+11 7-4 contact
8-2 contact S+11 8-5 contact
9-3 contact 9-6 contact
V-Q contact V-K contact
Contact not used
Drawing and line where contact is located
6
This is the physical location of the relay on the machine. Row and column numbers are shown on the appropriate tag for each relay tray.
Position 1 2 3 4
A
B
2A1M
Relay Tray Number
Row
Column
Function (M=Main Air)
Any relay that ends with an "M" is located on an electronic board.
S+11
S+09 S+11 S+11
A
24VAC
XF
TBA1
TBX1
SEE W6DRYGHVA LINE 16
1MTA5-6
1MTA5-9
b
a
S+08
CRS+SM
CRSGM
CR SG
CLOSES WHEN MICROPROCESSOR DESIRES 3-WIRE SLAVE
CLOSES WHEN MICRO-PROCESSOR DESIRES SIGNAL
1B2S OPENS WHEN SIGNAL DESIRED
1MTA5-7
1MTA5-8
A32
B38
MC 15
CR MA
2A1M OPENS WHEN MAIN AIR DESIRED
SHSK
SPRINKLER
CS1
J1
CRMA
CLOSES WHEN MAIN AIR DESIRED
2A1M
B5A
B20
CRS+S
3-WIRE SLAVE
2B2S
CRSG
SIGNAL
1B2S
ELSG
SIGNAL VISUAL
9
SEE W6DRYGSFA LINE 02
2F
TBL1
TBL2
06
07
08
09

BMP010012-L


W6DRYGS+A
93226D
TBX2
a
b
Mass termination assembly
Pin number
7
1MTA5-9
MTA designation on board
Board MTA group designation
An MTA is a connection on an electronic circuit board. The notes and the tag page locate the appropriate board.
S+ 08
7
CRSG
4
1B2S
CLOSES WHEN SIGNAL DESIRED
B32
S+ 707
CRS
1
+S
2B2S
OPENS WHEN 3-WIRE ENERGIZED
SF 7 02
B56
CRFEB
4
4B2
CLOSES WHEN FIRE EYE ENABLED
S+ 8 08
CRSG
5
1B2S
CLOSES WHEN SIGNAL DESIRED
8
Wire identification marking. This designation is stamped on the wire every 6 inches and is used with the signal routing table.
B12
MC 8 15
CR
2
MA
2A1M
OPENS WHEN MAIN AIR DESIRED
B58
EBSG
SIGNAL AUDIBLE
CDACS
ROTATION SAFETY
1A2F
Page line numbers
3
10
11
12
Major revision (letter)
1
Page number (S+)
Machine type (Gas fired dryer)
6th generation of controls
W = Wiring
Class of control system
2
Title of this circuit
Voltage of this circuit
W 6 DRYG S+ A
MICRO 6 SYSTEMS
SCHEMATIC 3-WIRE CIRCUIT
24V1P50HZ/24V1P60HZ
PELLERIN MILNOR CORPORATION
NOTES:
1. TBL IS LOCATED IN LEFT CONTROL BOX.
2. TBA IS LOCATED IN RIGHT CONTROL BOX.
3. TBX IS LOCATED IN LEFT CONTROL BOX.
4. 1MTA5 IS LOCATED ON BIO1 (8 OUTPUT-16 INPUT BOARD).
5. REMOVE J1 IF DRYER HAS VALVE SET SHUT OPTION.
W6DRYGS+A
93226D

BMP010012-R

FIGURE	ELECTRICAL VALUES	SUFFIXES									
		B		H		M		T		U	
		50HZ	60HZ	50HZ	60HZ	50HZ	60HZ	50HZ	60HZ	50HZ	60HZ
A	1.000	208	230			200	220	220	240	200-220	208-240
B	$\sqrt{3}$				208	346	380	380		346-380	380
C	2.000	416	460	220	240	400	440	440	480	400-440	440-480
D	$1+\sqrt{3}$						600				600
E	$2\sqrt{3}$			380							



06 07 08 09 10 11 12 13 14 15 16 17

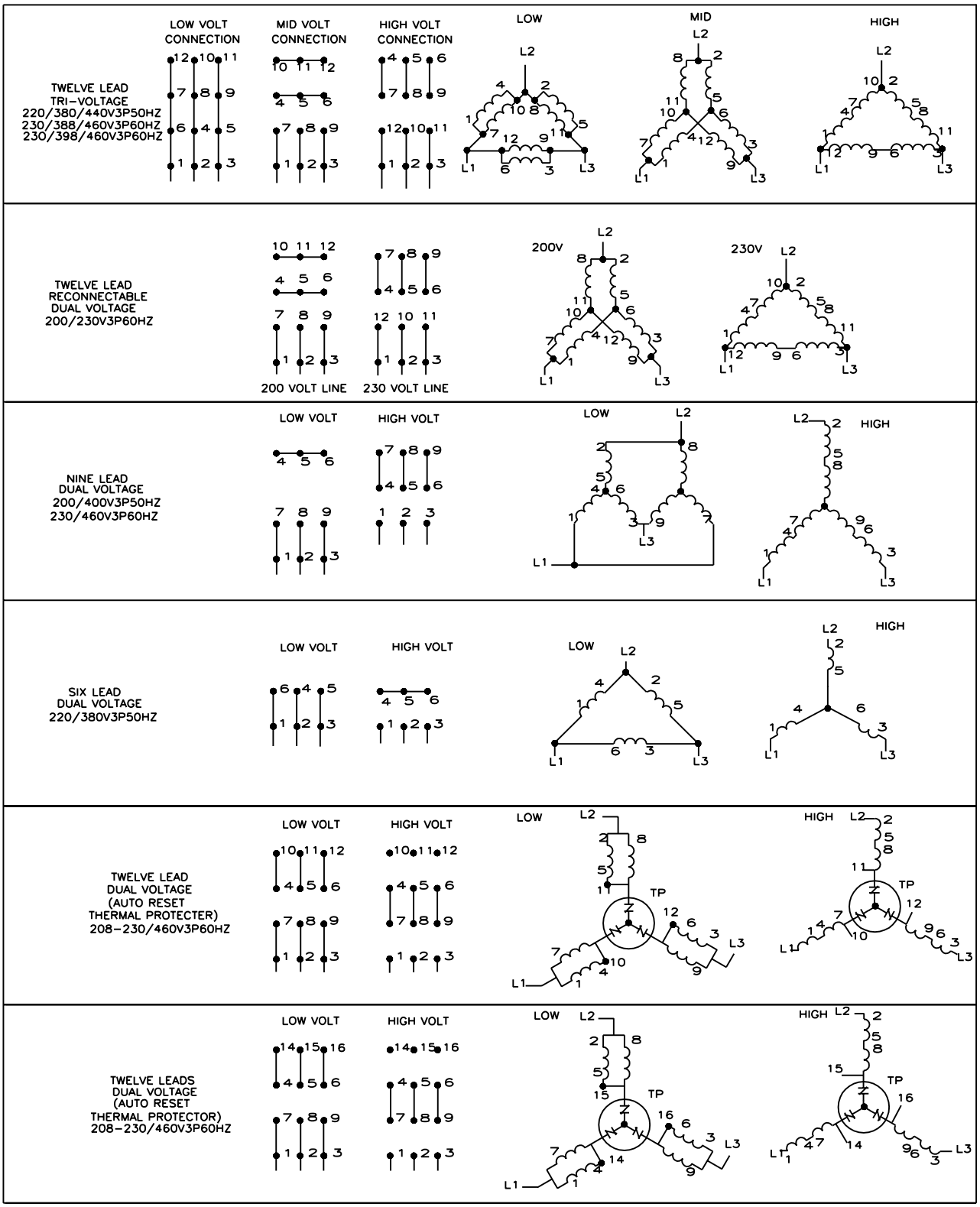
BMP850029

MOTOR CONNECTION DIAGRAMS

THREE PHASE SINGLE SPEED MOTORS WITH MULTIPLE VOLTAGE RATINGS

(ONLY FOR MOTOR SUFFIXES LISTED)

PELLERIN MILNOR CORPORATION



W80008

THREE PHASE
MOTOR CONNECTION DIAGRAMS
SINGLE SPEED MOTORS WITH MULTIPLE VOLTAGE RATINGS

PELLERIN MILNOR CORPORATION

W80008
2001253A

Miltrac Controller Schematics

1

On-Site Installation and Troubleshooting of Permanent Serial Communication Cables

Permanent serial communication cables are those that must be connected directly to microprocessor boards via MTA connectors on the board, not those installed via cabinet-mounted DIN receptacles provided for customer use (see BICWUC01 "Construction of External Serial Link Cables"). Permanent serial cables should be installed only by trained technicians.

Miltrac™, Drynet (dryer/shuttle controller) and Mildata®, whether provided separately or included with MultiTrac™, each requires its own serial communication wiring to link the controller with its subordinate machines. Portions of this wiring must be fabricated and installed on site. The portions that do not need to be field installed are those where several components to be connected are located on equipment shipped as a single unit. For example, in systems where the processor boards for all dryers and shuttles are located in a central controls mounting panel (belt box), the corresponding Miltrac data lines on each board are wired together at the Milnor factory. The field wiring need only connect to one of these boards.

All devices connected to a central controller share the same serial port on that controller. Cable routing has no bearing on the ability of the central controller to distinguish devices (this is handled by identification codes preset on each device and configured in the controller software). Hence, the devices can be connected to the controller either via direct controller-to-machine ("home run") wiring or via "daisy chaining".

1. "Home Run" Versus "Daisy Chain" Wiring

home run (recommended)—a method of linking several devices (machines) to a central controller by running a separate serial cable from the controller to each device. With this method, all serial high lines are spliced together on the controller end, as are all serial low lines.

daisy chain (discouraged)—a method of linking several devices (machines) to a central controller by running a single, segmented cable from device to device, throughout the entire bank of devices. Each serial port on a Milnor processor board has two internally-connected pins dedicated to each data line. Serial low is pins 1 and 2 and serial high is pins 3 and 4. In most cases, all four pins, as well as two unused pins (5 and 6) comprise a single, six-pin MTA connector (see Figure 1 in Section 3.1). By convention, the incoming daisy chain segment is brought in on pins 1 and 3 and the next daisy chain segment begins on pins 2 and 4.

When wired properly, either method is acceptable. However, the home run method is preferred and this is the method on which system cable diagrams prepared by Milnor are now based. Although the daisy chain approach often requires less cable, it has a major disadvantage in troubleshooting. If a wiring problem occurs anywhere along the daisy chain, all downstream machines (on the side opposite the central controller from the problem) are affected. When one or more machines are not responding properly because of a wiring problem on an upstream machine such as an "open" in a line, reversed serial high and serial low lines, or a faulty ground, the problem is often difficult to identify. With the home run approach, such a wiring problem will only affect the one machine served by the offending cable.

2. Specifications and Requirements

Because the interconnected devices may be at different ground potentials and because the field-installed cabling is particularly susceptible to electrical noise, specific cabling material and grounding procedures must be adhered to.

2.1. Cable Specifications—Most new CBW systems include MultiTrac®. MultiTrac always includes PC Miltrac (the Miltrac controller) and Online Communicator software (the Mildata data collection function). In most cases, optional Drynet (the Dryer/Shuttle controller) is also provided. Each of these controllers requires a separate serial link to communicate with its subordinate machines. Miltrac and Online Communicator typically communicate with every Milnor machine in the system. Drynet communicates with every Milnor dryer and shuttle. Hence, it is convenient to run a six-conductor serial communication cable (three serial links) between the MultiTrac console and each dryer and shuttle, and a four- or six-conductor cable between MultiTrac and every other Milnor machine. Cables serving this purpose must conform to the following specification:

- Two twisted pair (four-conductors) or three twisted pair (six-conductors), as follows:
  - » Conductive material: Tinned copper, 18 AWG (1.0mm²)
  - » Insulation: 300VAC, color coded
  - » Positive wire identification by color coding and/or wire number.
- Shielding: Braided tinned copper or foil, minimum 85% coverage
- Jacket: 600VAC insulation

Cables meeting the above specification are available from Milnor, as follows:

Four-conductor—P/N 09V300B04S
Six-conductor—P/N 09V300B06S

2.2. Conduit Requirements—Consult local codes to determine any requirement to run serial communication cables within conduit. In the absence of such a requirement, consider cable protection, and in any case observe the following precaution:

CAUTION 1: Risk of Bad Data—Inadequate shielding against electrical noise can trigger false signals.

- Do not run serial cables adjacent to, or in the same conduit with wires that provide motor power or similar. It is permissible to run serial cables in the same conduit with Milnor control circuit conductors (DC and/or AC), and with control circuit ground (earth) conductors used to ground the various controllers together.
- If serial cables are run in a cable tray, insure the tray does not also contain wires for motor power or similar **and that such conductors are not subsequently added**.

2.3. Grounding the Controllers—Connect the high voltage control circuit ground terminals (normally pin 2F) together in all controllers to be linked via a serial cable or via any other control conductors. Use 14AWG (2.5mm²) conductors with 600VAC insulation.

CAUTION 2: Risk of component damage and warranty loss—Powering up machines before controller-to-controller grounds are properly established will burn out microprocessor boards and void the warranties.

- Install secure grounds as described above before first applying power.

2.4. Grounding the Shield and Unused Wires—Ground the serial cable shield and unused wires as follows, to obtain the best protection against electrical noise and to counteract any tendancy of the spare wires to act as antennas.

2.4.1. If the "Home Run" Method Is Used—Splice together the shields and any spare wires for all cables where they converge inside the MultiTrac console or central controls mounting panel (belt

box). Connect the spliced shields and wires to signal ground (normally pin 2G or pin 7) within the cabinet. On the opposite end of each cable, leave the shields unconnected and individually cap or tape each spare wire.

2.4.2. If the "Daisy Chain" Method Is Used

1. Connect together the abutting ends of the shield at each location where the daisy chain segments meet (at each intermediate device), but do not connect them to anything else. The objective is to achieve continuity in the shield across the entire length of the daisy chain. If a segment enclosed in an electric box (a factory installed segment) falls **in the middle** of the daisy chain, install a wire inside the electric box to connect the incoming shield to the outgoing shield. Do not ground the shield inside this box.
2. Do the same as above for each spare wire.
3. On the end of the daisy chain that connects to the system controller, connect the shield and spare wires to signal ground (normally pin 2G or pin 7) within the controller's electric box.
4. On the opposite end of the daisy chain, leave the shield unconnected and individually cap or tape each spare wire.

3. Connecting the Serial Link To Subordinate Devices (Machines)

WARNING 3: Electrocution and Electrical Burn Hazards—Contact with high voltage will electrocute or burn you. Power switches on the machine and the control box do not eliminate these hazards. High voltage is present at the machine unless the main machine power disconnect is off.

- Do not service machine unless qualified and authorized.

3.1. Identifying Serial Ports—As shown in Figure 1, labels imprinted on the processor board (e.g., "1MTA32 RS485 #1") identify the serial ports. By convention, Milnor dedicates the same serial ports on different devices to certain functions (see Table 1). For example, the software for every Milnor machine that can function as a Miltrac device (press, centrifugal extractor, shuttle, dryer, etc.) is written to communicate with Miltrac via the serial port at MTA32. However, do not rely solely on the convention shown in Table 1. Always consult the system connection instructions in the device or system controller schematic manual to confirm serial link connection points.

Table 1: Serial Port Dedicated Uses

Serial Port Identification				Serial Port Function
8088 Board	**Serial Link #**	**80186 Board**	**Serial Link #**	
n/a	--	MTA29	4	Textile machines: Chemflow boards
				CBWs: peripheral boards (second port)***
				Dryers, shuttles: Drynet (dryer/shuttle controller)
				All others: not used
MTA30* (RS232) or** MTA30* (RS485)	4	MTA30* (RS232)	--	Printer****
		MTA30* (RS485)	--	Serial display (on devices so equipped)
MTA32	1	MTA32	1	Miltrac
MTA33	2	MTA33	2	Peripheral boards
MTA34	3	MTA34	3	Mildata / download****

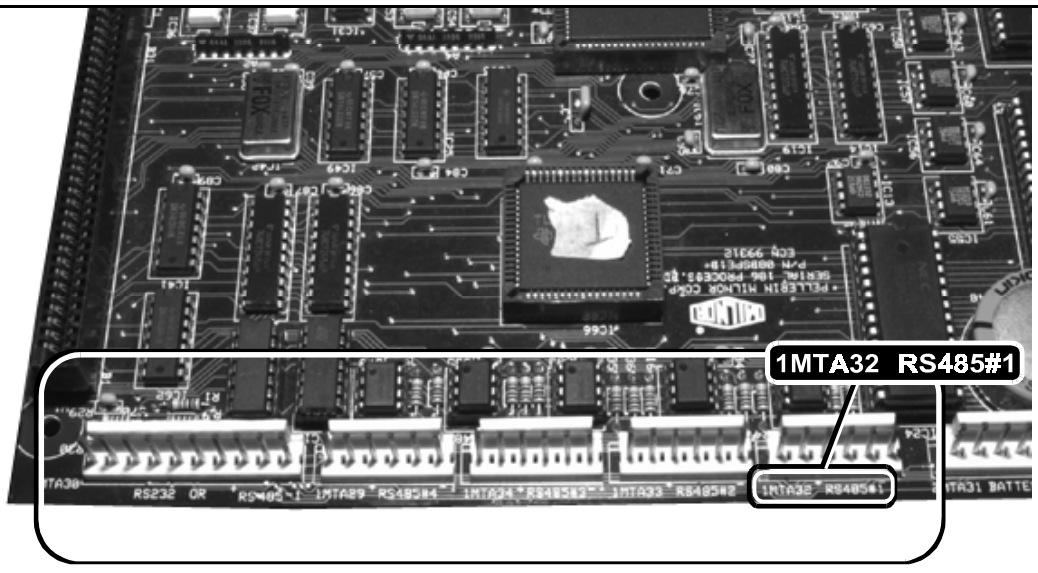
* MTA30 is a 10 pin connector. Pins 1 through 4 are dedicated to the RS485 port and pins 5 through 10 are for the RS232 port.

** On the 8088 processor board, either port, but not both, can be used. On the 80186 board, both ports are available.

*** On the CBW, this provides a second serial port for communication with the peripheral boards. Dividing the connections between two ports speeds communication in longer tunnels with many peripheral boards.

**** Typically, the MTA30 RS232 port and MTA34 are factory wired to different pins on the same cabinet-mounted DIN receptacle, for printer and download access (see BICWUC01 "Construction of External Serial Link Cables").

Figure 1: Serial Ports on Processor Board



3.2. Wiring the Serial Low and Serial High Lines—On a serial port's MTA connector, pins 1 and 2 are serial low and pins 3 and 4 are serial high (on serial ports with six pin MTA connectors, pins 5 and 6 are unused). By convention, Milnor wires the incoming serial link segment (the line coming from the system controller) to pins 1 and 3, and, when daisy chaining, it wires the outgoing serial link segment (the line that continues the daisy chain) to pins 2 and 4. For Miltrac, Milnor uses a black or blue and black striped wire for serial low and a red or blue and red striped wire for serial high (see Note 1), and recommends following this convention in the field. In any event, the serial low and serial high wires must not get crossed, as this will prevent the system from functioning.

Milnor P/N ZXUUACSIIA consists of a bag of connector components. One or more of these are provided for systems installations. The MTA connectors needed for on site fabrication of the serial cables are included in the bag.

> **Note 1:** For daisy chain segments completely enclosed within an electric box or cabinet, it is not necessary to use cable as specified above. The enclosure provides sufficient shielding from electrical noise. For these segments Milnor normally uses individual wires—black or blue/black for serial low and red or blue/red for serial high.

4. Connecting the Serial Link to the System Controller

The hardware and wiring used to terminate a Miltrac, Drynet, or Mildata/Online Communicator (Mildata) serial link at the system controller changes on occasion, with developments in the various controllers. The connections, as of this writing, are described here. However, refer to the schematic manual and any other documentation provided with the controller, which may reflect more recent changes.

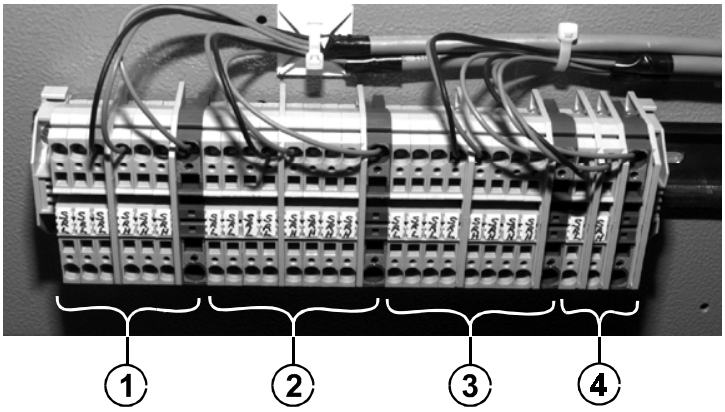
If the “home run” wiring method is used, it is unlikely that there will be a sufficient number of terminals at the controller end to accommodate all of the incoming lines. In this case, splice all corresponding lines from each device (such as Miltrac serial high) at the controller end, to a single conductor which will be used to make the connection to the system controller.

4.1. MultiTrac (containing Online Communicator, Miltrac, Optional Drynet, and Optional Device Master)—MultiTrac consolidates Online Communicator (which performs the Mildata data collection function), and the Miltrac, optional Drynet, and optional Device Master controllers. The MultiTrac console, which houses the MultiTrac PC and various machine controls, also provides a centralized location for connecting the serial cables associated with each of these control systems (see Note 2). Serial link connections are made on a single IEC terminal block in the lower front compartment (see Figure 2). Multiple serial low (SRL) and serial high (SRH) pins are provided for each type of serial link. Any pin in the group for that serial link may be used for the serial low and serial high conductors, respectively. The shield and any unused wires must be grounded within the MultiTrac cabinet only, as previously stated. Connect the shield and any unused wires to any ground pin on the terminal block in Figure 2.

> **Note 2:** The PC Device Master option utilizes a microprocessor controller as well as the PC Device Master software running on the MultiTrac PC. The only serial link required for Device Master is one that connects the microprocessor controller with the MultiTrac PC. However, because the Device Master microprocessor controller is also located in the MultiTrac cabinet, this serial link is wired at the factory.

Figure 2: MultiTrac Connection Points for Miltrac, Drynet, Mildata and Device Master Serial Links

IEC Terminal Block for Serial Link Connections



Legend

1. Drynet (dryer/shuttle controller)
2. Miltrac
3. Mildata
4. Device Master (see Note 2)

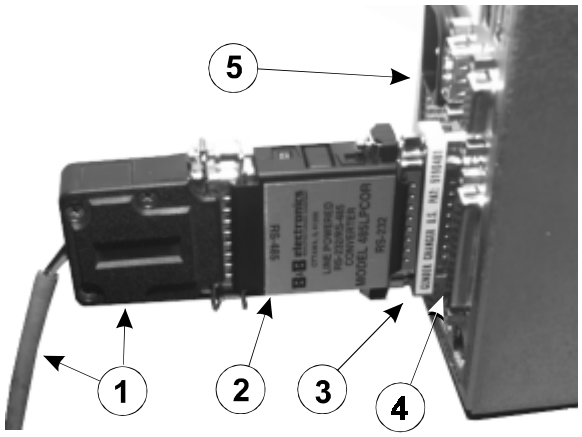
4.2. Mildata PC With MultiTrac—If the installation includes MultiTrac, the Mildata serial communication lines from each machine do not connect directly to the Mildata PC. Rather, they connect to the MultiTrac PC, where the Online Communicator software performs the Mildata data collection function (see Note 3). The data is shared with the Mildata PC via a standard PC networking connection using CAT 5 cabling.

> **Note 3:** In older MultiTrac installations, the MultiTrac-to-Mildata link functions like a daisy chain segment and the cabling connects to the Mildata PC as described in Section 4.3 above.

4.3. Mildata PC Without MultiTrac—If the system does not include MultiTrac, the Mildata PC typically uses Com 1 to communicate with the devices in the Mildata network, although this is configurable. The various components needed to adapt this port to the incoming serial link (e.g., gender converter, RS232-to-RS485 converter, wiring harness) are provided with the PC. The assembled components, as currently used, are shown in Figure 3. The last component in this group, and the one that the incoming Mildata serial link connects to is a 9 pin male DIN connector. A 9 pin female DIN connector and pins are provided in a bag with the PC, for field wiring. When the Mildata daisy chain is fabricated on site, the female DIN connector is wired to the end of daisy chain closest to the PC. Depending on the distance, the customer may want to fabricate an extension cable with the appropriate 9 pin DIN connectors on each end to run between this point and the PC.

Figure 3: Serial Link-To-Com Port Adapters on Mildata PC

Assembled Components



Legend

1. Wire harness with 25-pin connector, one end (shown) and 9-pin male DIN connector, other end (not shown)
2. RS232-to-RS485 adapter
3. Gender converter
4. Com port on PC
5. Rear of Mildata PC

4.4. Older Drynet (Dryer/Shuttle) Controller—Older dryer/shuttle controllers consist of a dedicated PC with Drynet software and some machine controls (i.e., Power switch, Start and Stop buttons for each dryer and shuttle) mounted in a free-standing cabinet. On these units, the Drynet serial link is connected directly to a com port on the Drynet PC in the same manner as described in Section 4.3 for a Mildata PC without MultiTrac.

4.5. Older Miltrac Controller—The older Miltrac is a microprocessor controller with a processor board similar to that used in machines (see Section 4.1 for PC Miltrac). The board contains serial ports accessed via MTA connectors the same as on the processor boards used by machines. As with machine processor boards, 1MTA32 is dedicated to Miltrac serial communication. However, on the Miltrac processor board, a second port: 1MTA33, is also dedicated to Miltrac communication, to speed communication in larger Miltrac systems. Miltrac controlled devices 0 through 19 must communicate with 1MTA32 and devices 20 through 39 must communicate 1MTA33 via a separate serial link. Note that regardless which port on the Miltrac processor board a device communicates with, the Miltrac serial port on the device's own board is always 1MTA32.

5. Troubleshooting Reminders for the “Daisy Chain” Method

When troubleshooting communication problems in a system that uses daisy-chaining, the technician will often want to isolate certain devices for testing by disconnecting the serial link from the other devices. Remember that continuity in each of the two serial lines across the entire serial link is provided by the internal connections between pins 1 and 2 (serial low) and between pins 3 and 4 (serial high) on each board. As soon as you remove an MTA connector from the board, the link is broken not only to this machine but to all machines downstream of this connection point (on the side opposite the system controller). If you only want to remove one machine from the link, you must jumper pins 1 and 2 together and pins 3 and 4 together on the removed MTA connector so the downstream machines will remain connected.

— End of BICCUC01 —

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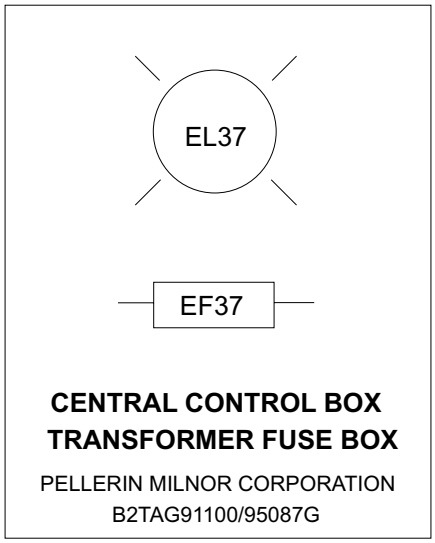
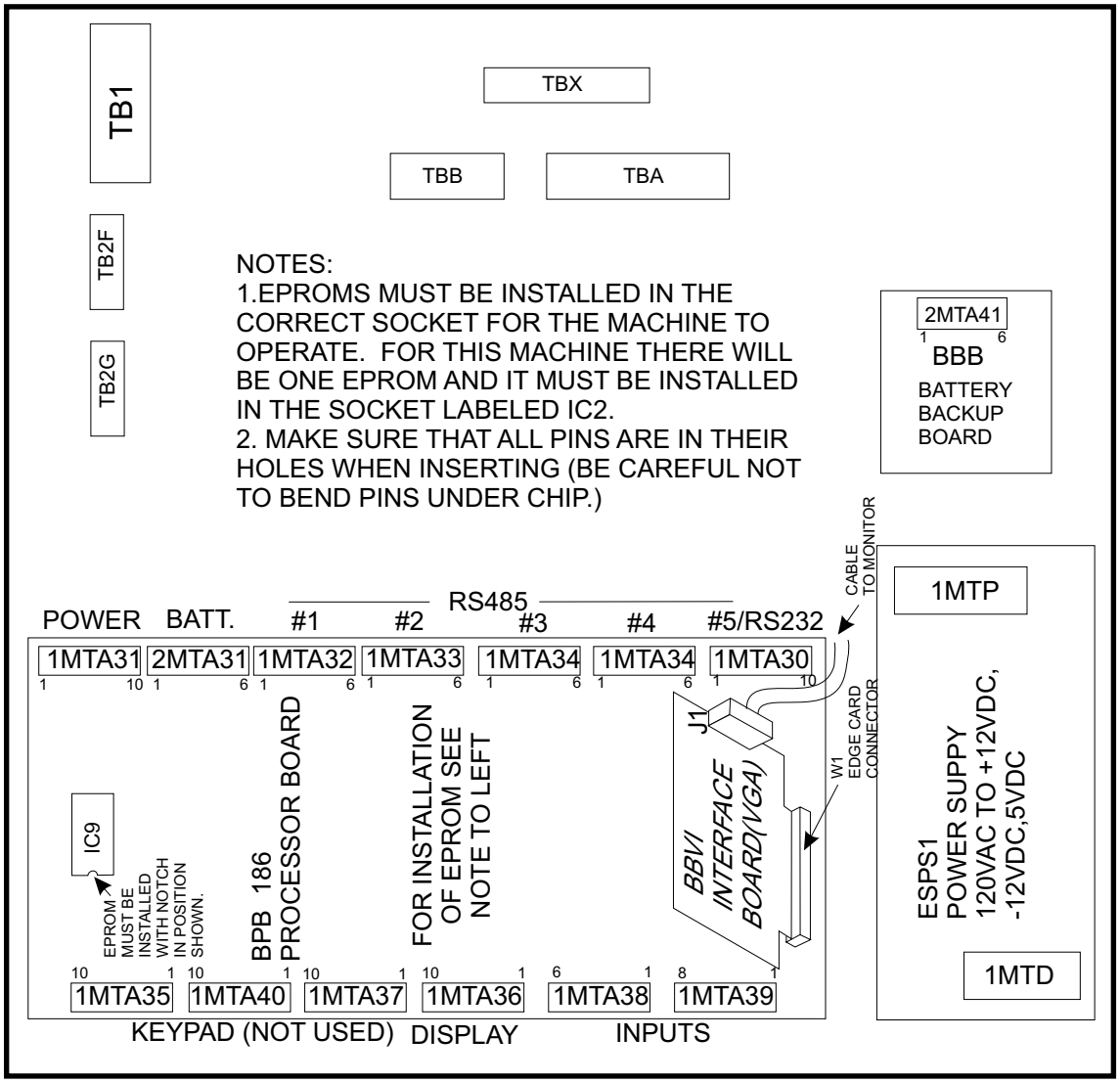


CENTRAL CONTROL BOX
TRANSFORMER FUSE BOX

PELLERIN MILNOR CORPORATION
B2TAG91100/95087G

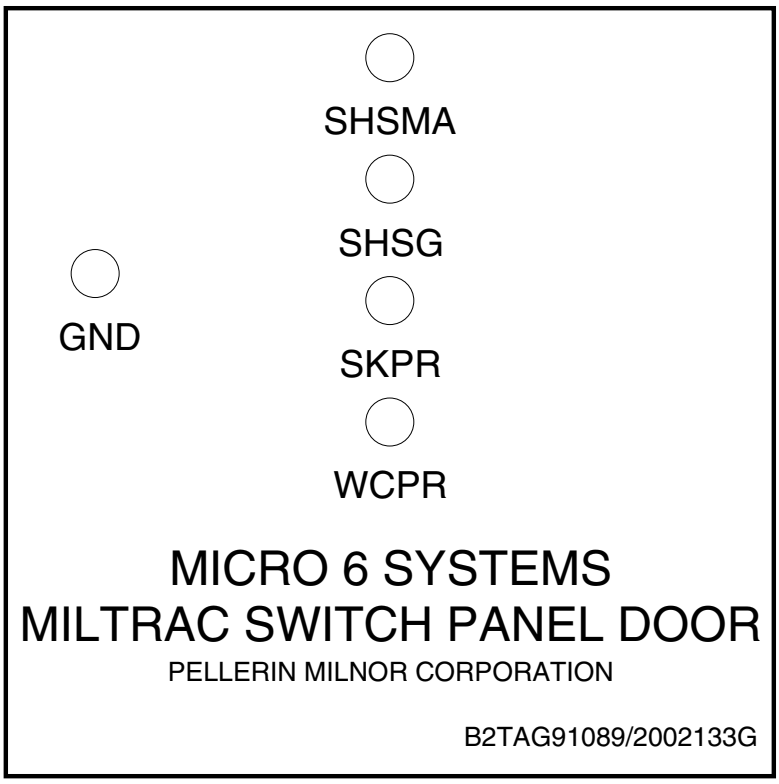


MICRO 6 SYSTEM
MILTRAC CONTROL BOX

PELLERIN MILNOR CORPORATION

W6MTCTG1
2004174B

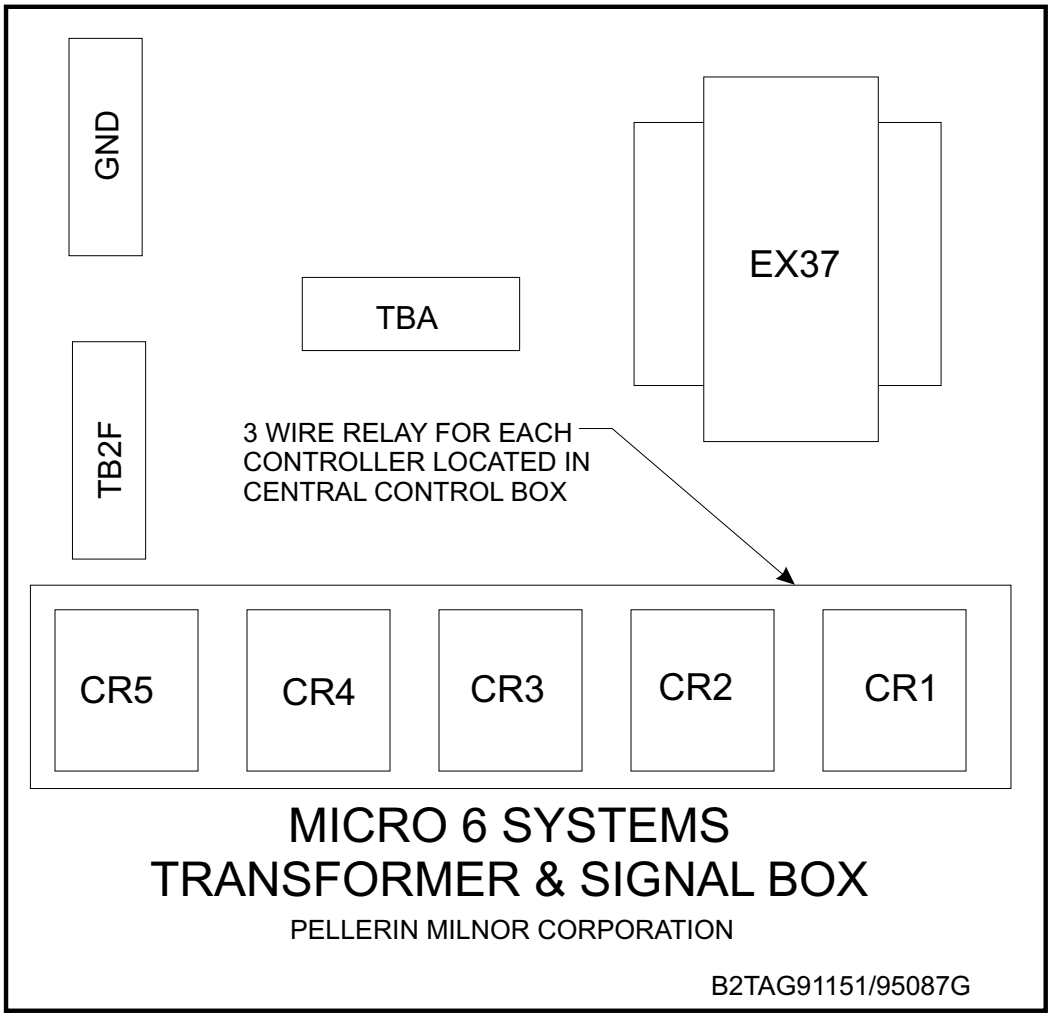
B2TAG91093
95192G



MICRO 6 SYSTEMS
MILTRAC SWITCH PANEL DOOR

PELLERIN MILNOR CORPORATION

B2TAG91089/2002133G



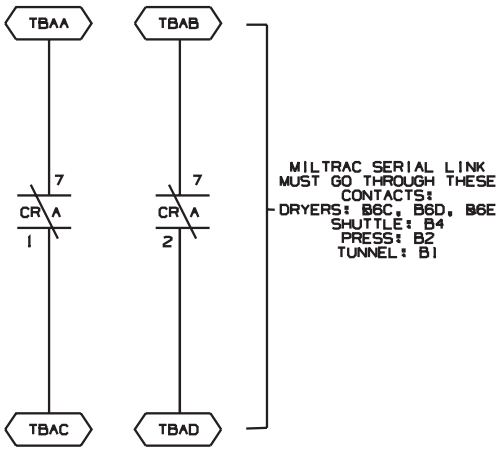
MICRO 6 SYSTEMS
TRANSFORMER & SIGNAL BOX

PELLERIN MILNOR CORPORATION

B2TAG91151/95087G

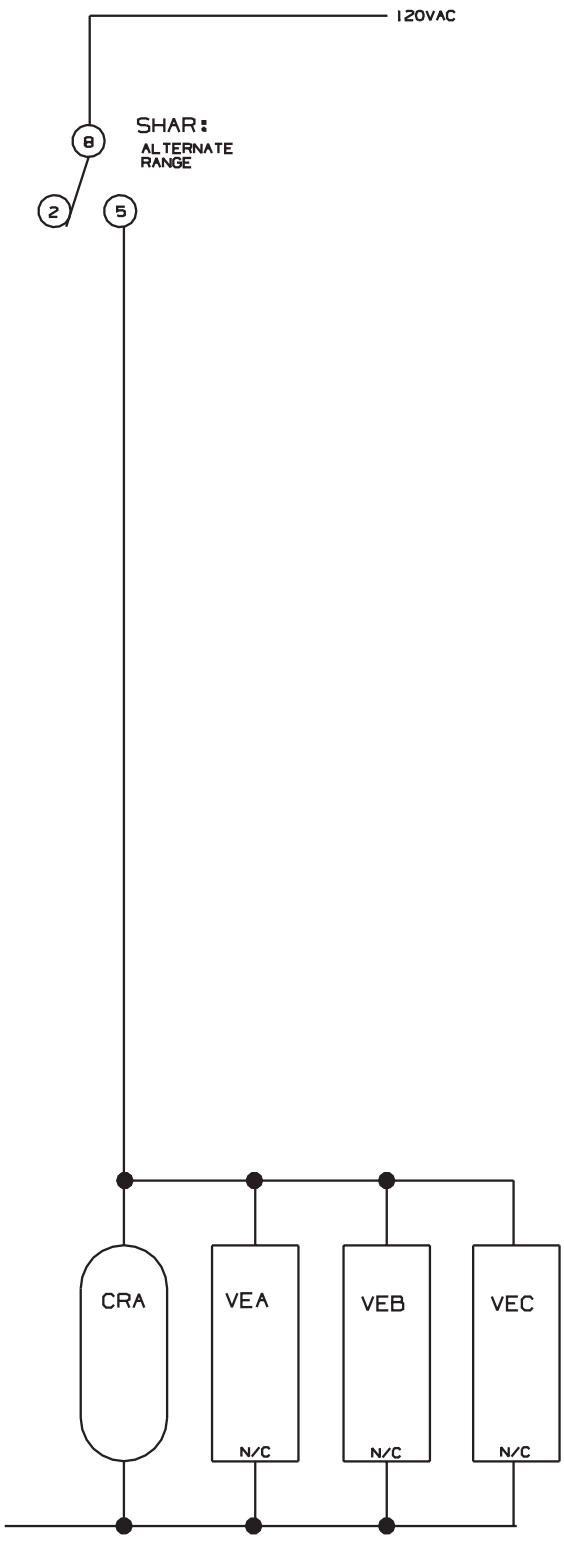
W6MTCTG1
MICRO 6 SYSTEMS
CONTROL BOX LAYOUTS

PELLERIN MILNOR CORPORATION



00 01 02 03 04 05 06 07 08

W6MTCAR
961318



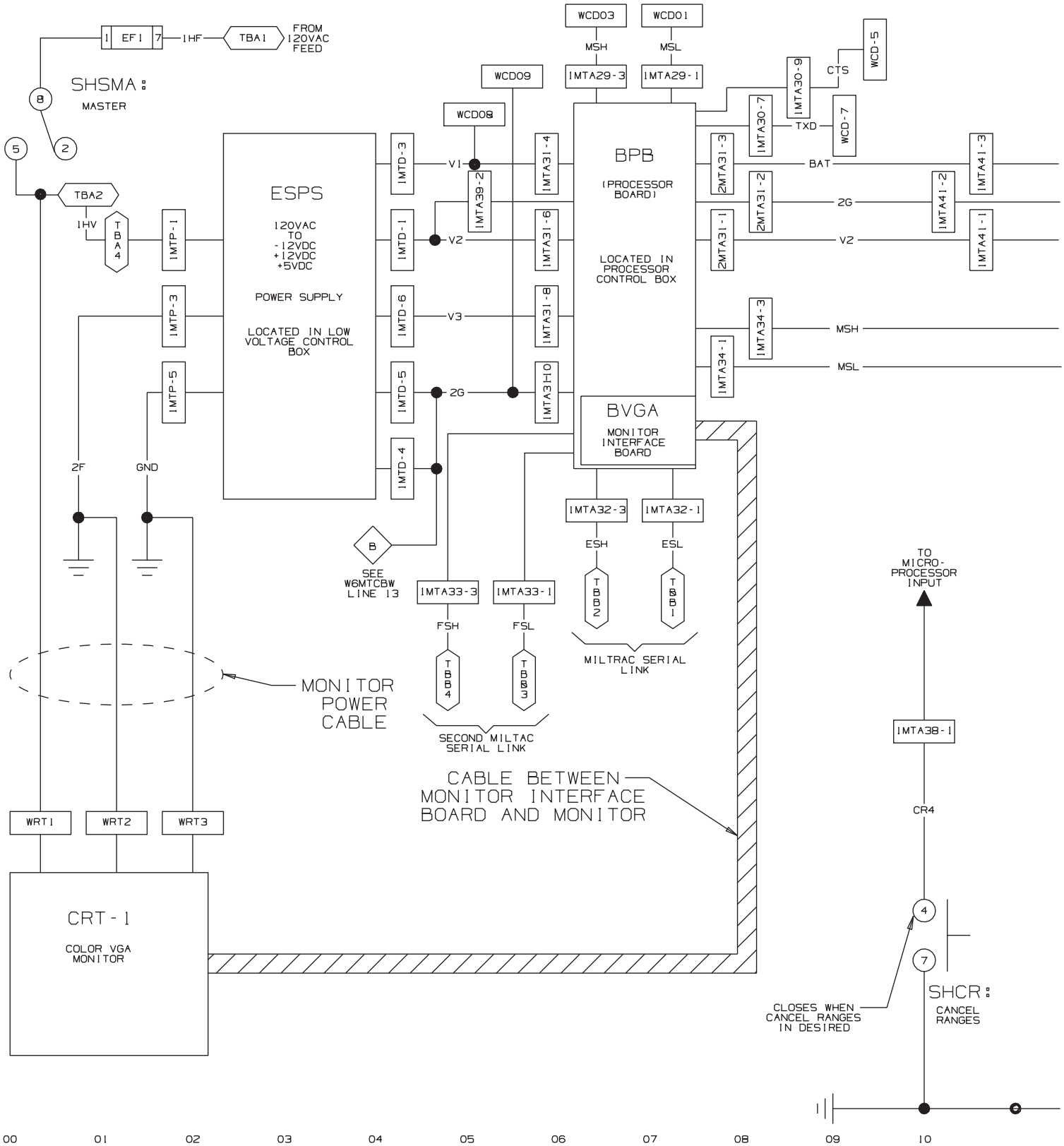
W6MTCAR
MICRO 6 SYSTEMS
SCHEMATIC: ALTERNATE RANGES

PELLERIN MILNOR CORPORATION

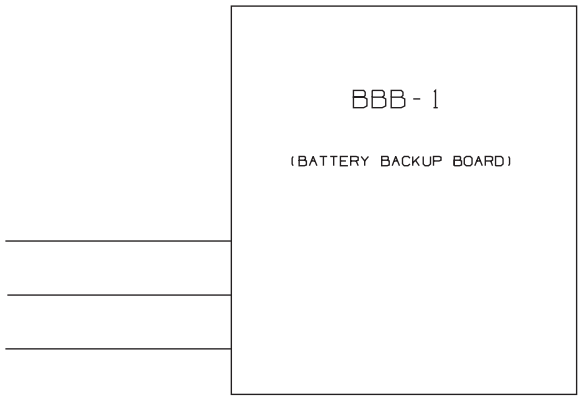
NOTES:

1. HOME TARGET FOR SHUTTLE B IS NORMALLY EXTENDED AND IS RAISED UP BY VEA.
2. OOPS TARGET BETWEEN SHUTTLES A AND B ARE NORMALLY EXTENDED AND RAISE UP BY VEB.
3. OOPS TARGET TO STOP SHUTTLE A IN CROSSOVER IS NORMALLY RETRACTED AND DROPS BY VEC.

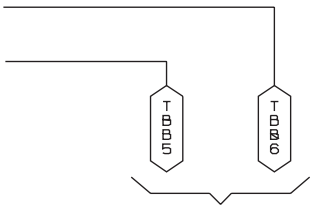
09 10 11 12 13 14 15 16 17 18 19



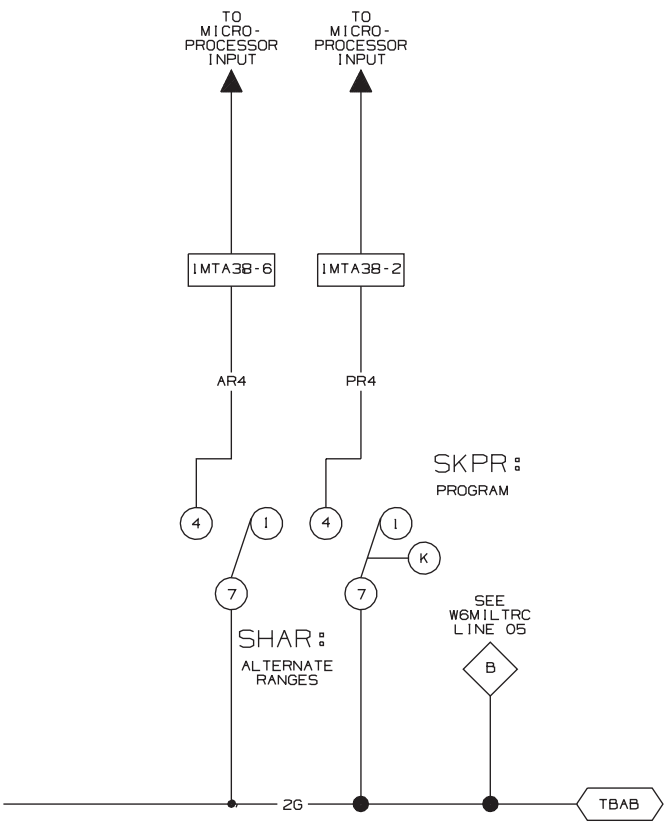
W6MTCBWA
993918



WIRE NO.	VOLTAGE	WIRE COLOR
V1	+5VDC	BLUE
V2	+12VDC	BLUE/ORANGE
V3	-12VDC	BLUE/BLACK
2G	GROUND	BLUE/WHITE
SRH	SERIAL LOW	BLUE/RED
SRL	SERIAL HIGH	BLUE/BLACK
INPUTS	-	BLUE/BLACK
-	24VAC	BLUE/RED
-	120VAC	RED
2F	CONTROL GROUND	RED/WHITE



MILDATA CONNECTION
(ALL BELT BOX MILDATA DEVICES
ARE CONNECTED TO THIS POINT).

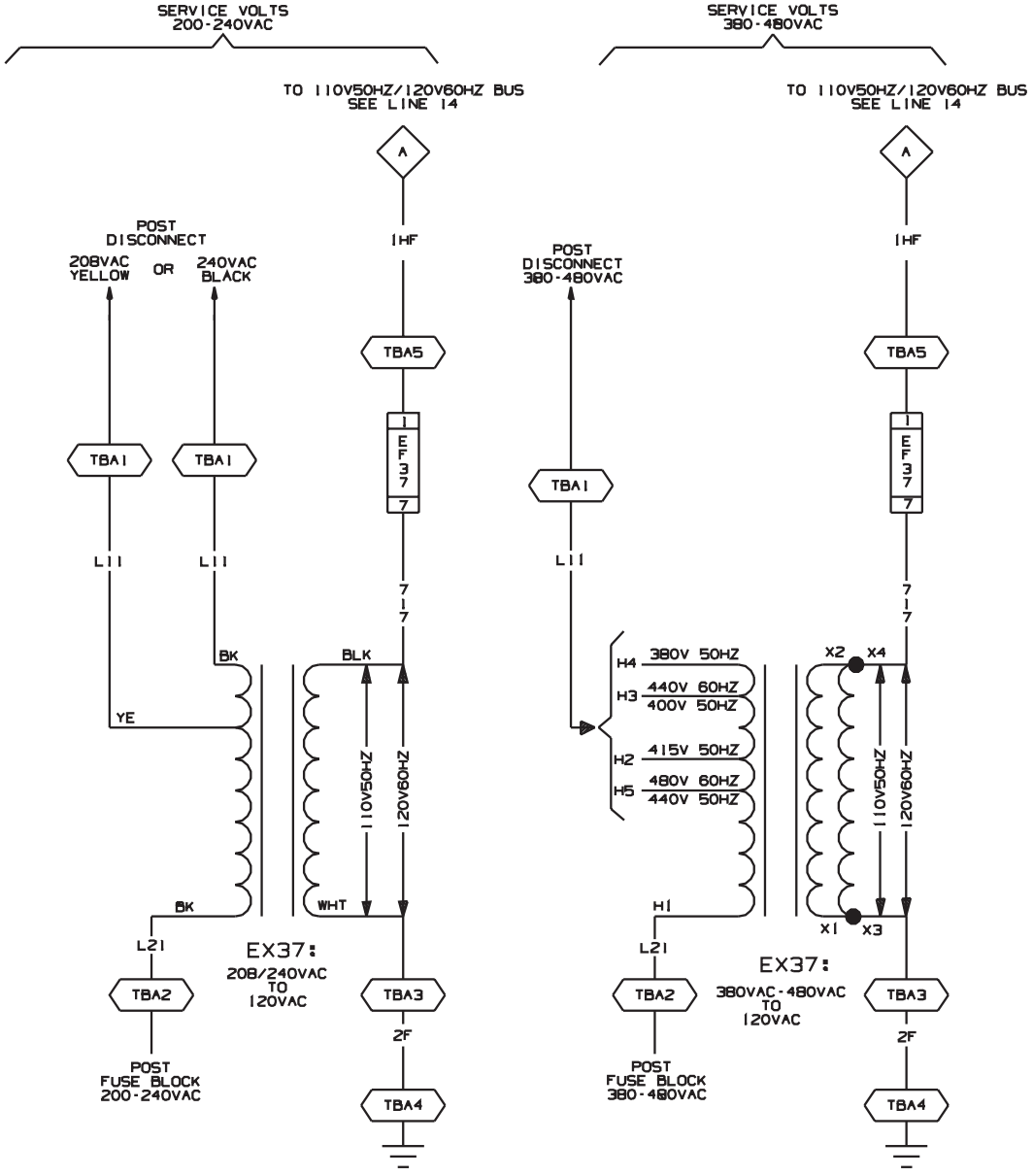


NOTES:

1. SCHEMATIC SHOWN WITH MILTRAC MOUNTED IN CONSOLE. IF MOUNTED IN CENTRAL CONTROL BOX TERMINAL STRIP DOES NOT EXIST AND FUSING COMES FROM CONTROL BOX TRANSFORMER.
2. SEE W6MTCKB FOR KEYBOARD WIRING.
3. 1MTD, 1MTP IS LOCATED ON ESPS (POWER SUPPLY).
4. 1MTA31, 1MTA32, 2MTA31, 1MTA38, 1MTA39 IS LOCATED ON BPB 186 (PROCESSOR BOARD)
5. 1MTA41 IS LOCATED ON BBB-1 (BATTERY BACKUP BOARD).
6. REFER TO SCHEMATIC W6DIN FOR DIN PIN CONNECTIONS.

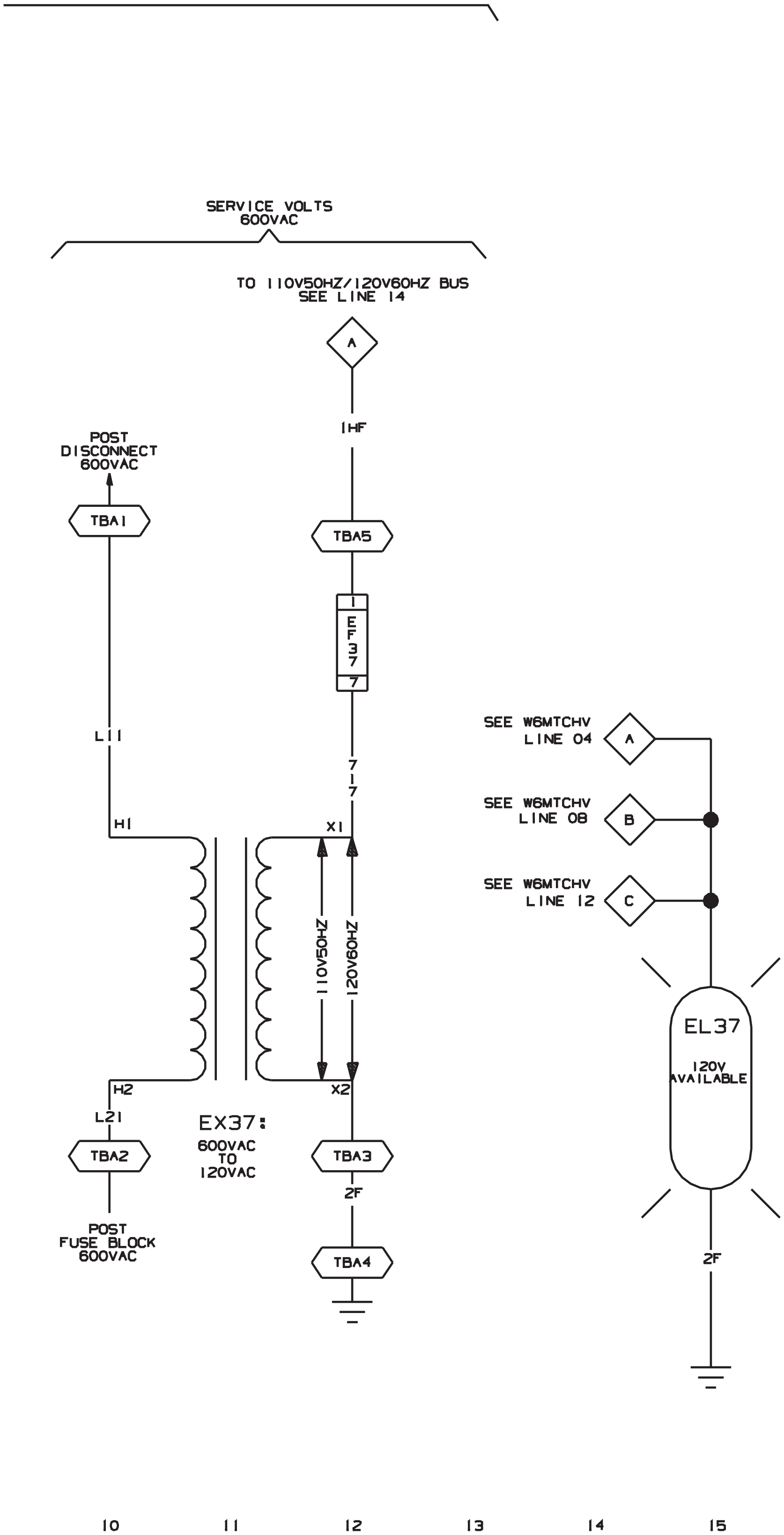
W6MTCBWA
MICRO 6 SYSTEMS MARK II
SCHEMATIC: MILTRAC CONTROLLER
PELLERIN MILNOR CORPORATION

CONTROL CIRCUIT POWER



LITHO IN U.S.A.

00 01 02 03 04 05 06 07 08 09

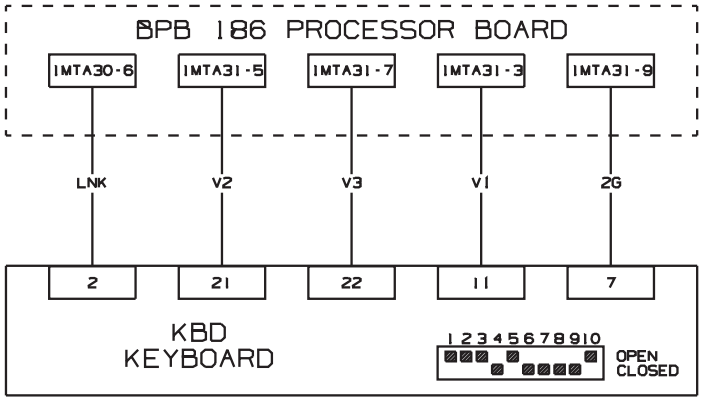


W6MTCHV
MICRO 6 SYSTEMS
SCHEMATIC: SOURCE TO 110V50HZ/120V60HZ
CONTROL CIRCUIT POWER

PELLERIN MILNOR CORPORATION

W6MTCHV
94517B

W6MTCHV
94517B



00 01 02 03 04 05 06 07 08 09 10

W6MTCKB

945178

W6MTCKB

MICRO 6 SYSTEMS

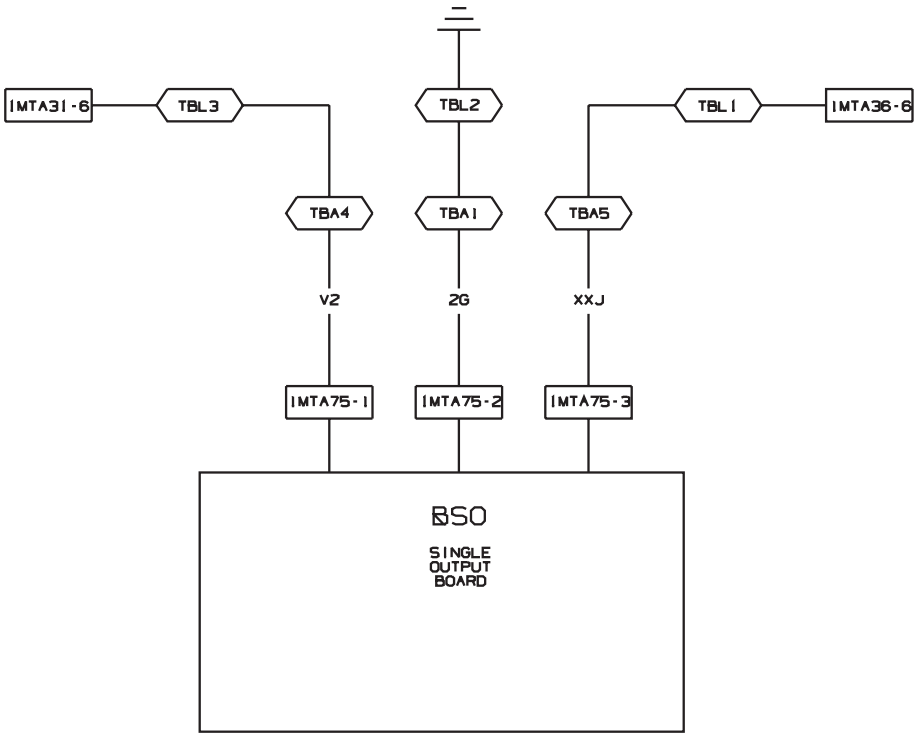
SCHEMATIC: SERIAL KEYBOARD

PELLERIN MILNOR CORPORATION

NOTES:

1. 1MTA30 & 1MTA31 ARE LOCATED ON BPB (PROCESSOR BOARD).

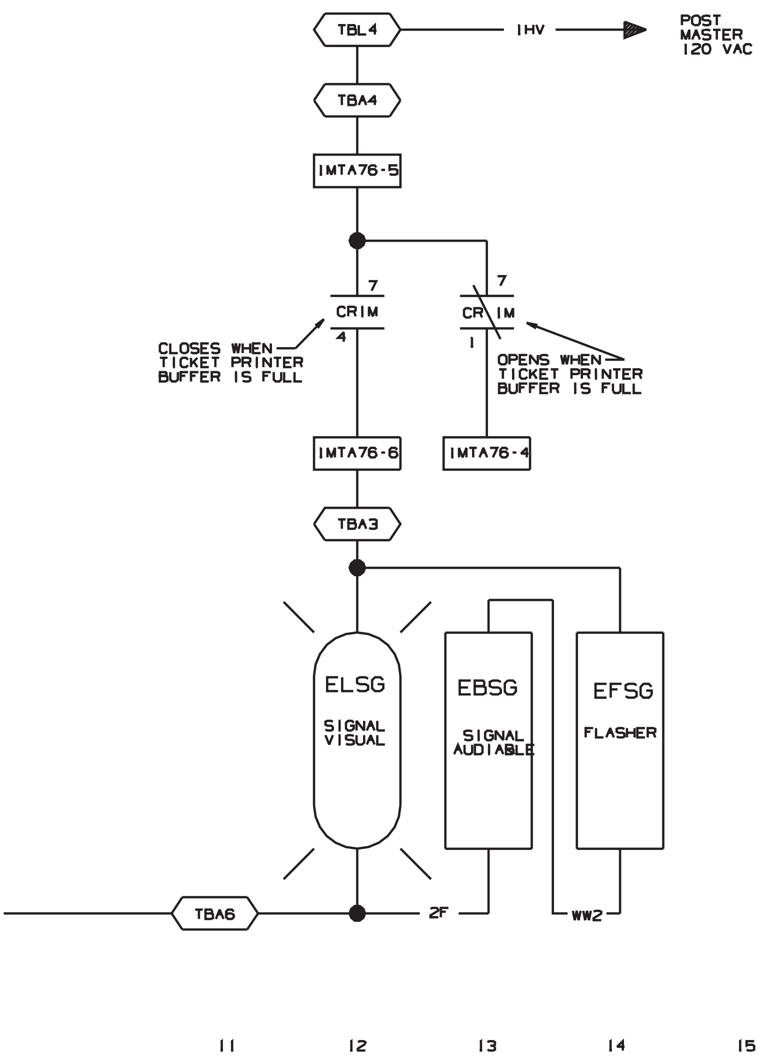
11 12 13 14 15 16 17 18 19



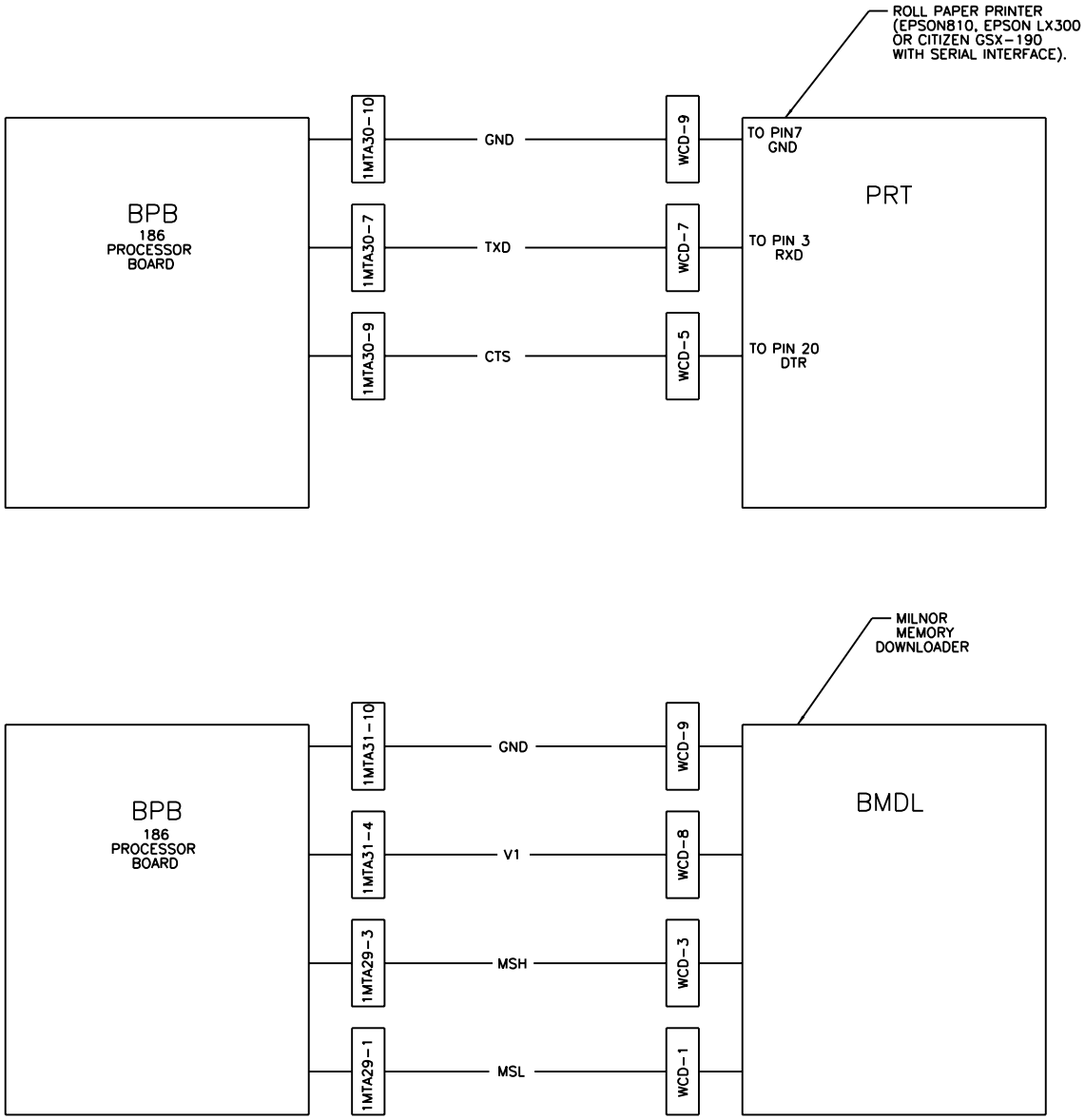
00 01 02 03 04 05 06 07 08 09 10

W6MTCPO
945178

W6MTCPO
MICRO 6 SYSTEMS
SCHEMATIC: SINGLE OUTPUT BOARD
PELLERIN MILNOR CORPORATION



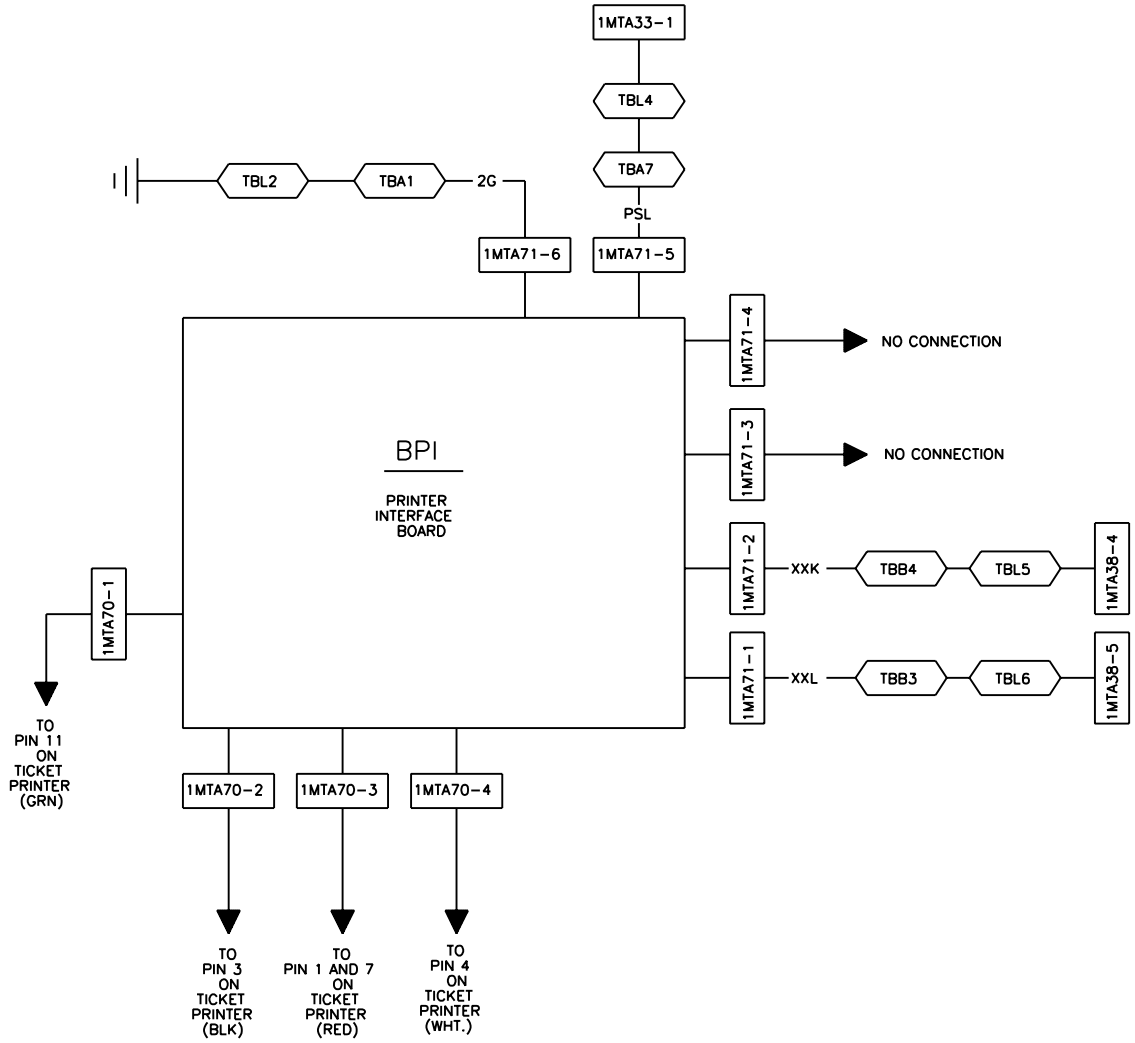
NOTES:
1. TBA IS LOCATED IN SINGLE OUTPUT BOARD CONTROL BOX.
2. 1MTA76 IS LOCATED ON SINGLE OUTPUT BOARD.
3. 1MTA34 IS LOCATED ON PROCESSOR BOARD.
4. TBL IS LOCATED IN MILTRAC.



00 01 02 03 04 05 06 07 08 09 10

W6MTCPRA
2001125B

W6MTCPRA
MICRO 6 SYSTEMS
SCHEMATIC: PRINTER INTERFACE
PELLERIN MILNOR CORPORATION



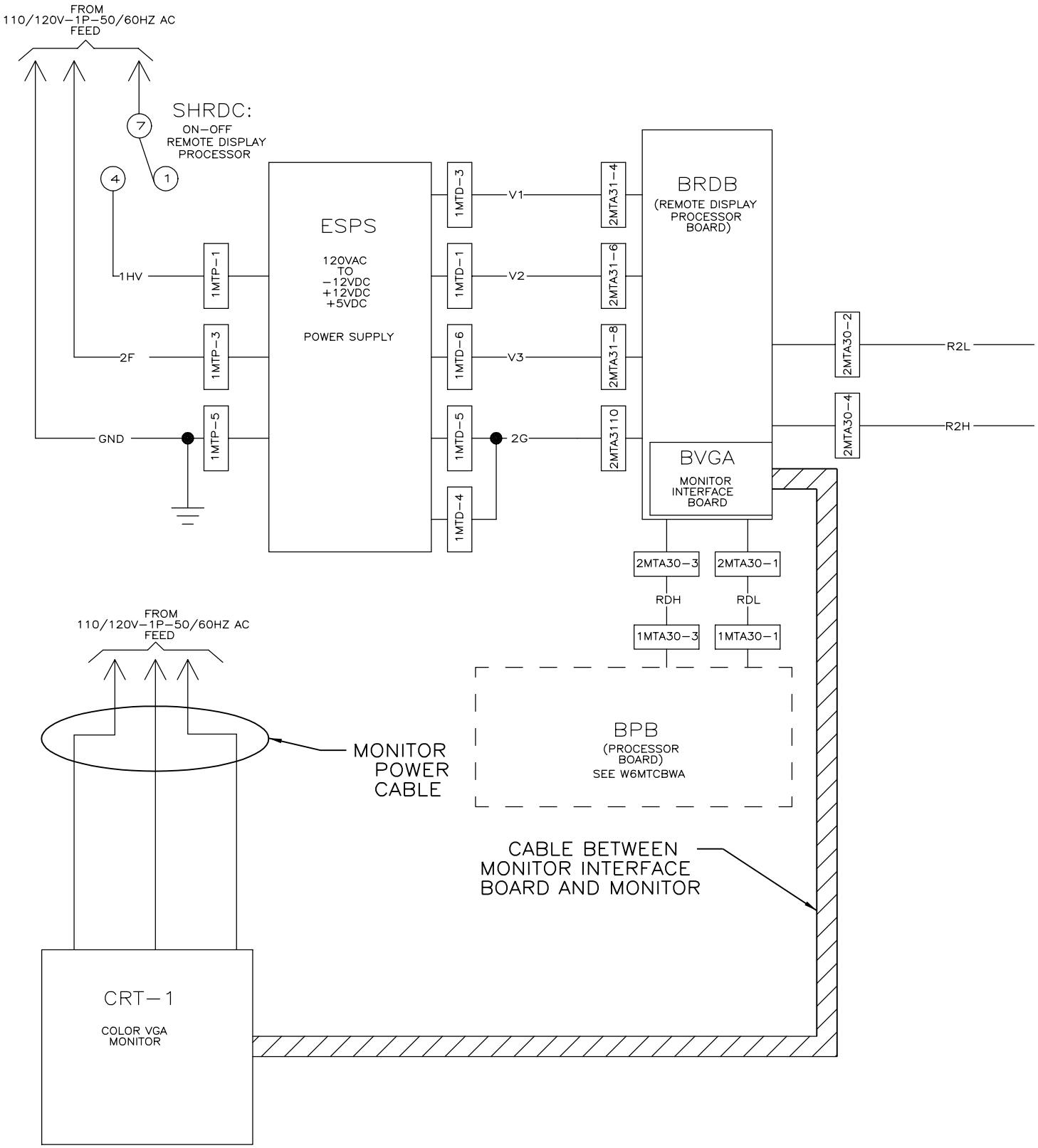
NOTES:

1. TBB IS LOCATED ON TICKET PRINTER.
2. 1MTA70, 1MTA71 ARE LOCATED ON PRINTER INTERFACE BOARD.
3. 1MTA30, 1MTA33, 1MTA38 ARE LOCATED ON 186 PROCESSOR BOARD.
4. CONNECTIONS FROM MILTRAC TO TICKET PRINTER CONTROL BOX (CONTAINS PRINTER INTERFACE BOARD AND SINGLE OUTPUT BOARD)
5. TBL IS LOCATED IN MILTRAC.

	WIRE	WIRE #	TICKET PRINTER	MILTRAC
	SHIELD	2G	TBA1	SIGNAL GROUND
	SHIELD	XXK	TBB4	1MTA34-5
	SHIELD	XXL	TBB3	1MTA34-6
	SHIELD	PSL	TBA7	1MTA33-2
SEE W6MTCPO	SHIELD	V2	TBA4	1MTA31-6
SEE W6MTCPO	SHIELD	XXJ	TBA5	1MTA34-4
SEE W6MTCPO	18 AWG	1HV	TBA2	120VAC POST-MASTER SWITCH
	18 AWG	2F	TBA6	CONTROL GROUND

SHIELD = SHIELDED CABLE - PLEASE NOTE THAT ALL SPARE WIRES MUST BE GROUNDED ON 1 SIDE ONLY.
18 AWG = 18 AWG 600V WIRE

11 12 13 14 15 16 17 18 19


FROM
110/120V–1P–50/60HZ AC
FEED
SHRDC:
ON–OFF
REMOTE DISPLAY
PROCESSOR
7
4
1
1HV
2F
GND
1MTP–1
1MTP–3
1MTP–5
ESPS
120VAC
TO
–12VDC
+12VDC
+5VDC
POWER SUPPLY
1MTD–3
1MTD–1
1MTD–6
1MTD–5
1MTD–4
V1
V2
V3
2G
2MTA31–4
2MTA31–6
2MTA31–8
2MTA3110
BRDB
(REMOTE DISPLAY
PROCESSOR
BOARD)
BVGA
MONITOR
INTERFACE
BOARD
2MTA30–2
2MTA30–4
R2L
R2H
2MTA30–3
2MTA30–1
RDH
RDL
1MTA30–3
1MTA30–1
FROM
110/120V–1P–50/60HZ AC
FEED
MONITOR
POWER
CABLE
BPB
(PROCESSOR
BOARD)
SEE W6MTCBWA
CABLE BETWEEN
MONITOR INTERFACE
BOARD AND MONITOR
CRT–1
COLOR VGA
MONITOR
00
01
02
03
04
05
06
07
08
09
10
W6MTCRD
2001125B

WIRE NO.	VOLTAGE	WIRE COLOR
V1	+5VDC	BLUE
V2	+12VDC	BLUE/ORANGE
V3	−12VDC	BLUE/BLACK
2G	GROUND	BLUE/WHITE
SRH	SERIAL LOW	BLUE/RED
SRL	SERIAL HIGH	BLUE/BLACK
INPUTS	—	BLUE/BLACK
—	24VAC	BLUE/RED
—	120VAC	RED
2F	CONTROL GROUND	RED/WHITE

TO MTA30 PINS 1 & 3 ON ADDITIONAL REMOTE DISPLAY PROCESSOR BOARDS IF ADDITIONAL REMOTE DISPLAYS ARE REQUIRED.

W6MTCRD

MICRO 6 SYSTEMS MARK II

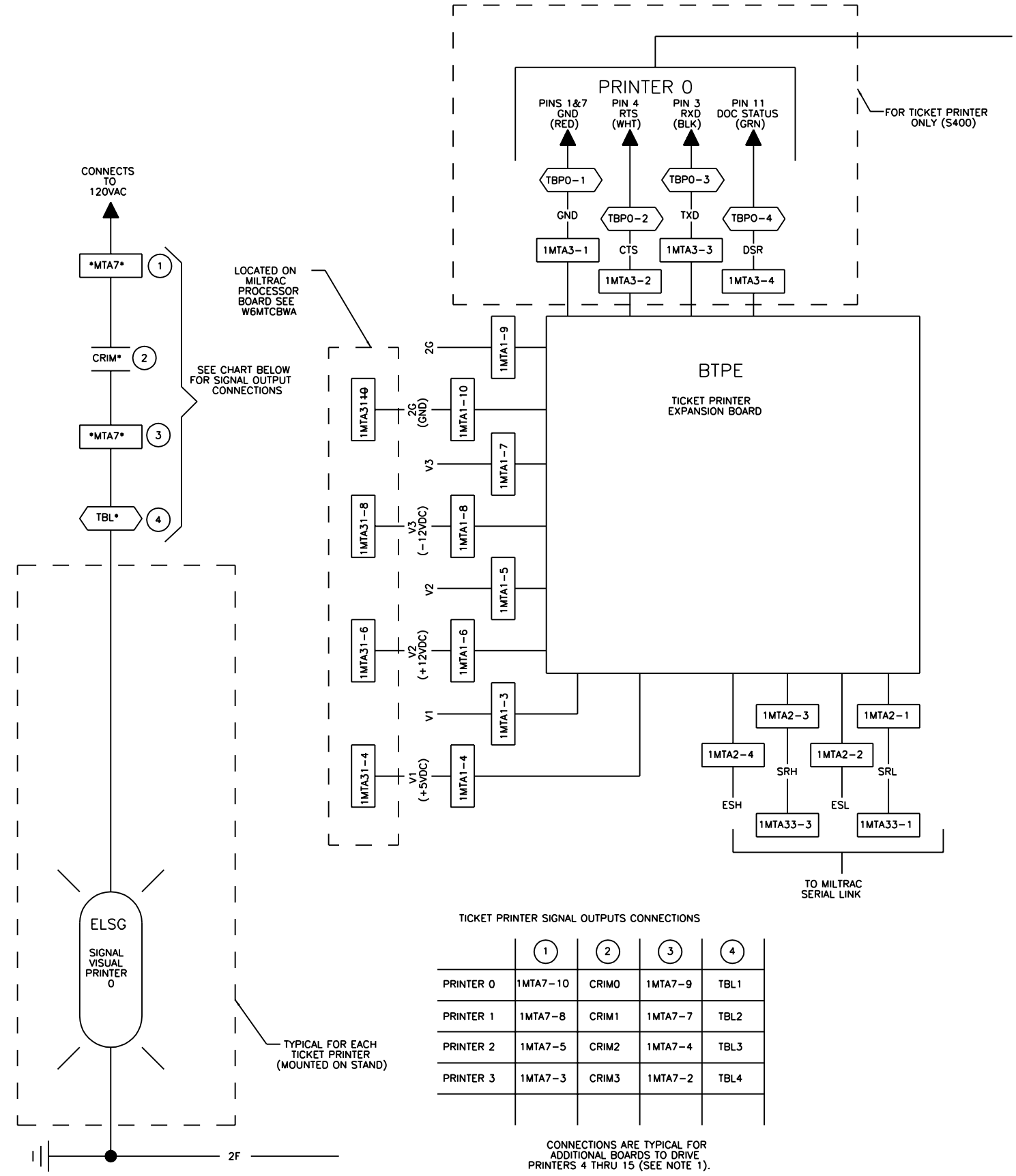
SCHEMATIC: MILTRAC REMOTE DISPLAY CONTROLLER

PELLERIN MILNOR CORPORATION

NOTES:

1. 2MTA30 AND 2MTA31 ARE LOCATED ON BRDB (REMOTE DISPLAY PROCESSOR BOARD)
2. 1MTD, 1MTP ARE LOCATED ON ESPS (POWER SUPPLY).
3. 1MTA30 IS LOCATED ON BPB (186 PROCESSOR BOARD)

11 12 13 14 15 16 17 18 19

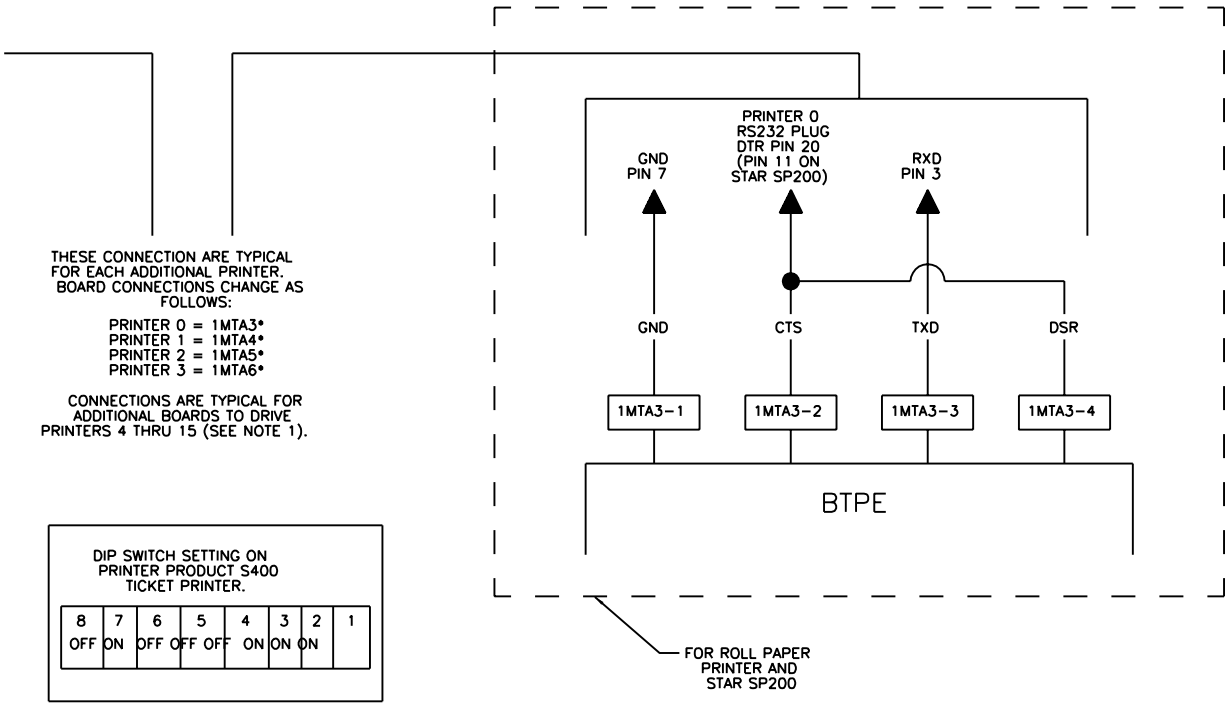


TICKET PRINTER SIGNAL OUTPUTS CONNECTIONS

	1	2	3	4
PRINTER 0	1MTA7-10	CRIM0	1MTA7-9	TBL1
PRINTER 1	1MTA7-8	CRIM1	1MTA7-7	TBL2
PRINTER 2	1MTA7-5	CRIM2	1MTA7-4	TBL3
PRINTER 3	1MTA7-3	CRIM3	1MTA7-2	TBL4

CONNECTIONS ARE TYPICAL FOR ADDITIONAL BOARDS TO DRIVE PRINTERS 4 THRU 15 (SEE NOTE 1).

W6MTCRX
2001125B



DIP SWITCH SETTING ON PRINTER PRODUCT S400 TICKET PRINTER.

8	7	6	5	4	3	2	1
OFF	ON	OFF	OFF	OFF	ON	ON	ON

DIP SWITCH SETTING FOR EXPANSION BOARD

1. SWITCH #1 SETS TYPE OF PRINTER
   OFF = TICKET PRINTER (PRINTER PRODUCTS = S400 TICKET PRINTER).
   ON = ROLL PAPER PRINTER AND STAR SP200.
2. SWITCHES #2-4 SETS THE ADDRESS OF THE EXPANSION BOARD. A MAXIMUM OF 4 EXPANSION BOARDS ARE POSSIBLE ALLOWING A TOTAL OF 16 PRINTERS,

BOARD #	SW#2	SW#3	SW#4
1	OFF	OFF	OFF
2	OFF	ON	OFF
3	OFF	OFF	ON
4	OFF	ON	ON

3. SWITCH #5-7 SET BAUD RATE OF PRINTER. (MUST MATCH PRINTER BAUD RATE).

BAUD RATE	SW#5	SW#6	SW#7
9600	OFF	OFF	OFF
4800	ON	OFF	OFF
2400	OFF	ON	OFF
1200	ON	ON	OFF
600	OFF	OFF	ON
300	ON	OFF	ON
150	OFF	ON	ON
75	ON	ON	ON

4. SWITCH #8 SET TYPE OF PAPER TO BE USED ON TICKET PRINTER. (PRINTER PRODUCTS S400)
   ON = ROLLED PAPER
   OFF = TICKETS
   IF ROLLED PAPER PRINTER SET SWITCH #8 OFF.

DIP SWITCH SETTINGS ON CITIZEN GSX-190 PRINTER WITH SERIAL INTERFACE BOARD

1	2	3	4	5	6	7
OFF	OFF	OFF	ON	OFF	ON	OFF

(9600 BAUD, DTR PROTOCOL
8 DATA BITS, EVEN PARITY)

DIP SWITCH SETTINGS ON STAR SP200 PRINTER

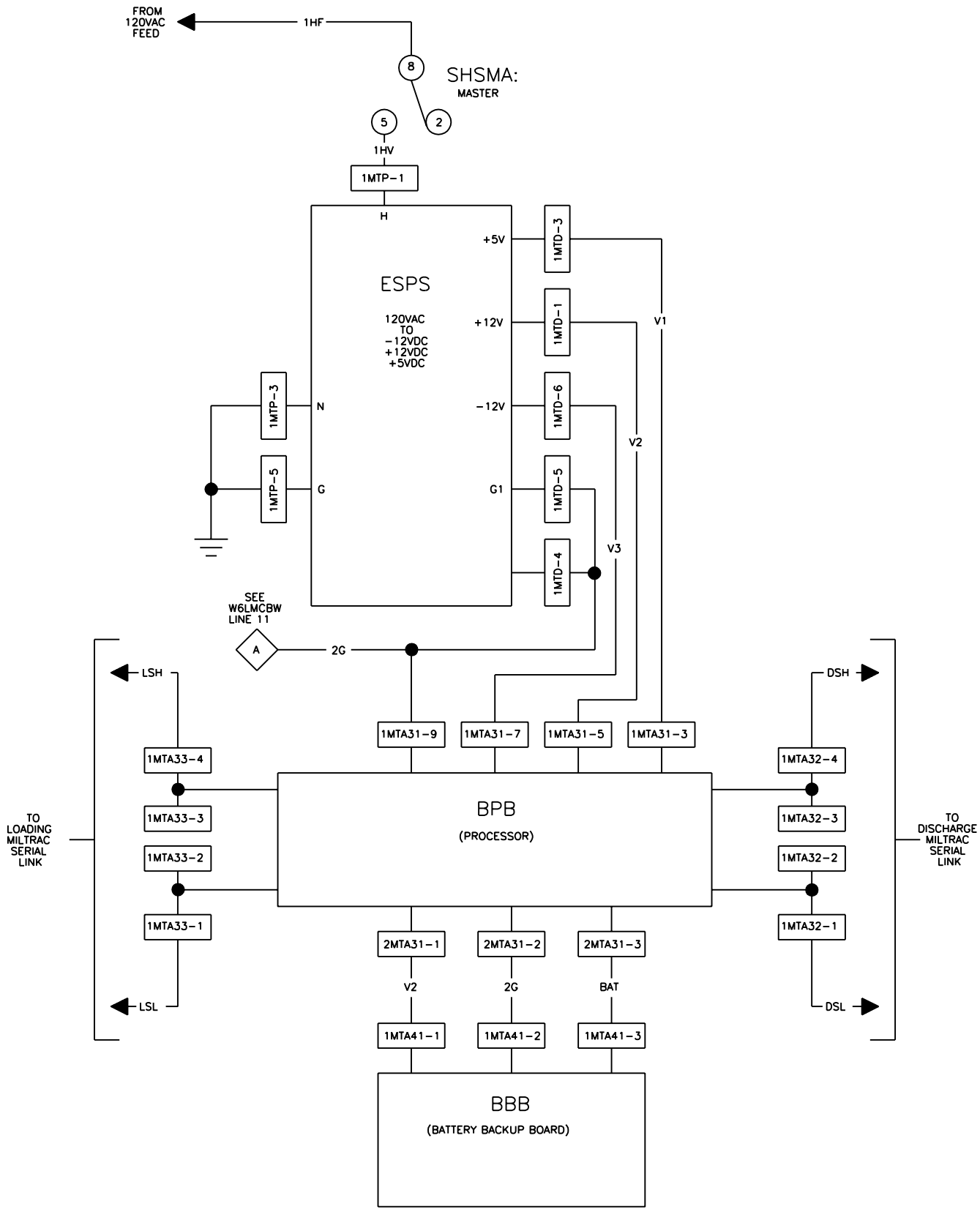
1	2	3	4	5	6	7	8	9	10
ON	ON	ON	ON	ON	ON	ON	ON	OFF	OFF

NOTE:
STAR SP200 MILTRAC SOFTWARE MUST BE 94000 OR LATER.

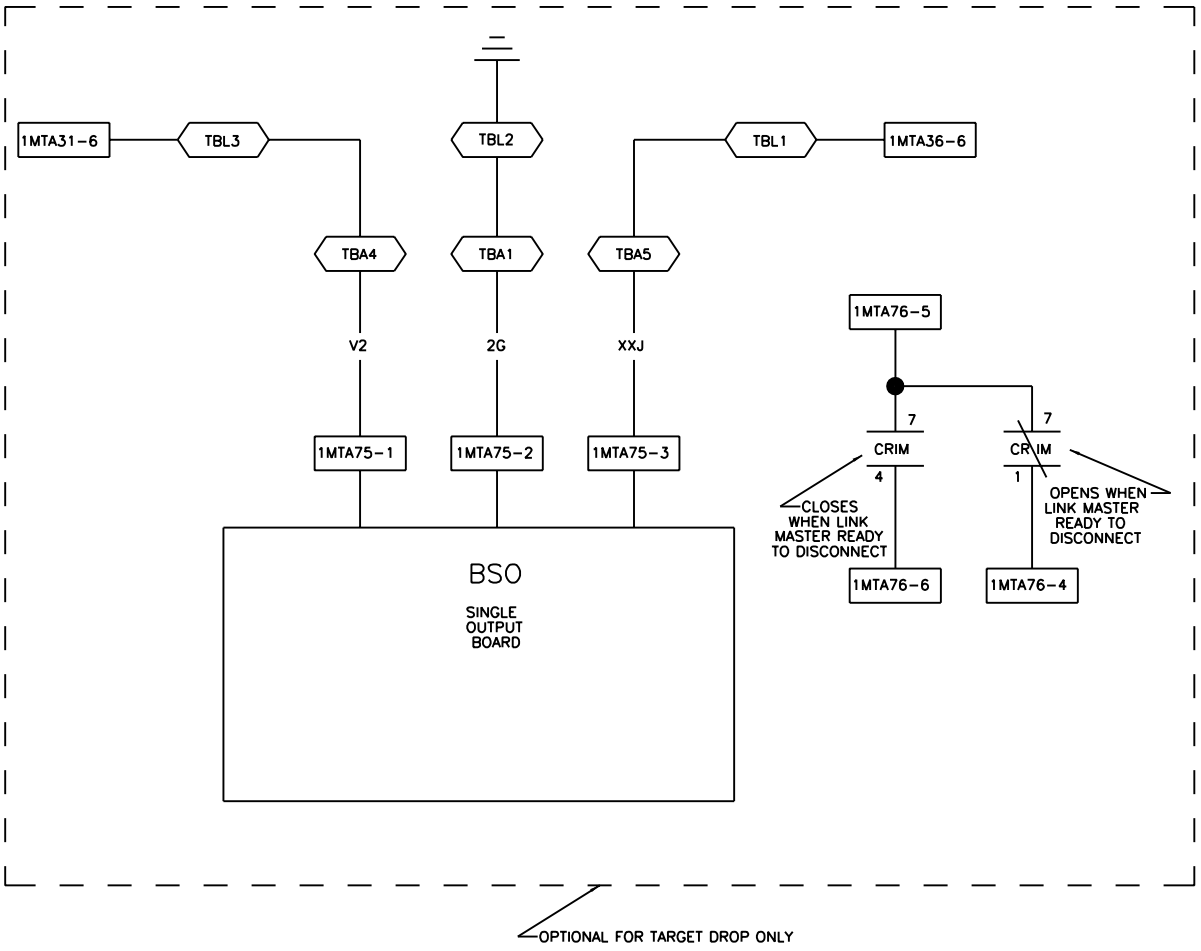
W6MTCRX
MICRO 6 SYSTEMS
SCHEMATIC: PRINTER INTERFACE BOARD — EXPANDED
PELLERIN MILNOR CORPORATION

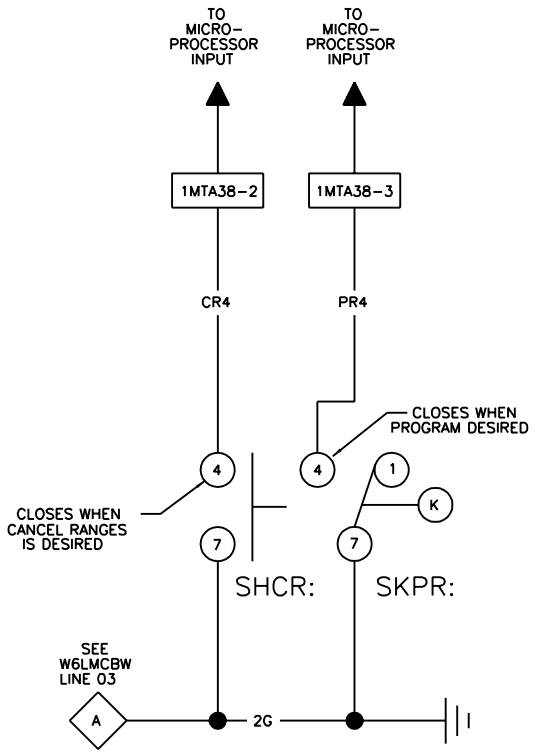
11 12 13 14 15 16 17 18 19

Link Master Schematics 2



W6LMCBW
2005195B





NOTES:

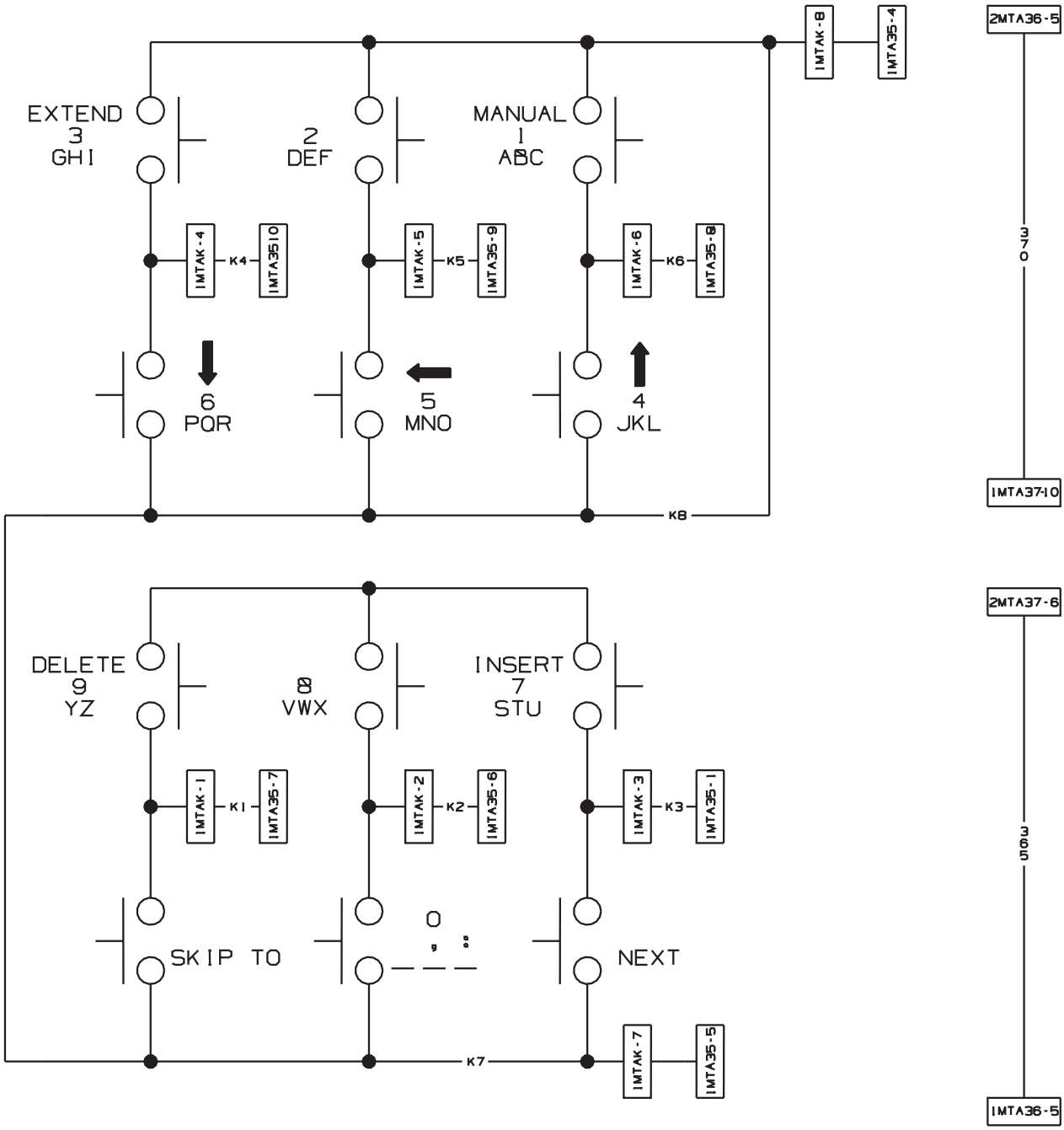
1. 1MTD, 1MTP ARE LOCATED ON ESPS (POWER SUPPLY).
2. 1MTA31, 2MTA31, 1MTA32, 1MTA33, 1MTA38 ARE LOCATED ON BPB (PROCESSOR BOARD).
3. 1MTA41 IS LOCATED ON BBB-1 (BATTERY BACKUP BOARD).
4. 1MTA76 IN LOCATED ON SINGLE OUTPUT BOARD.

WIRE NO.	VOLTAGE	WIRE COLOR
V1	+5V	BLUE
V2	+12V	BLUE/ORANGE
V3	-12V	BLUE/BLACK
2F	CONTROL GND.	RED/WHITE
LSH,DSH	SERIAL LINK HIGH	BLUE/RED
LSH,DSL	SERIAL LINK LOW	BLUE/BLACK
2G	GROUND	BLUE/WHITE

11 12 13 14 15 16 17 18 19

W6LMCBW
MICRO 6 SYSTEMS
SCHEMATIC: LINK MASTER CONTROLLER

PELLERIN MILNOR CORPORATION



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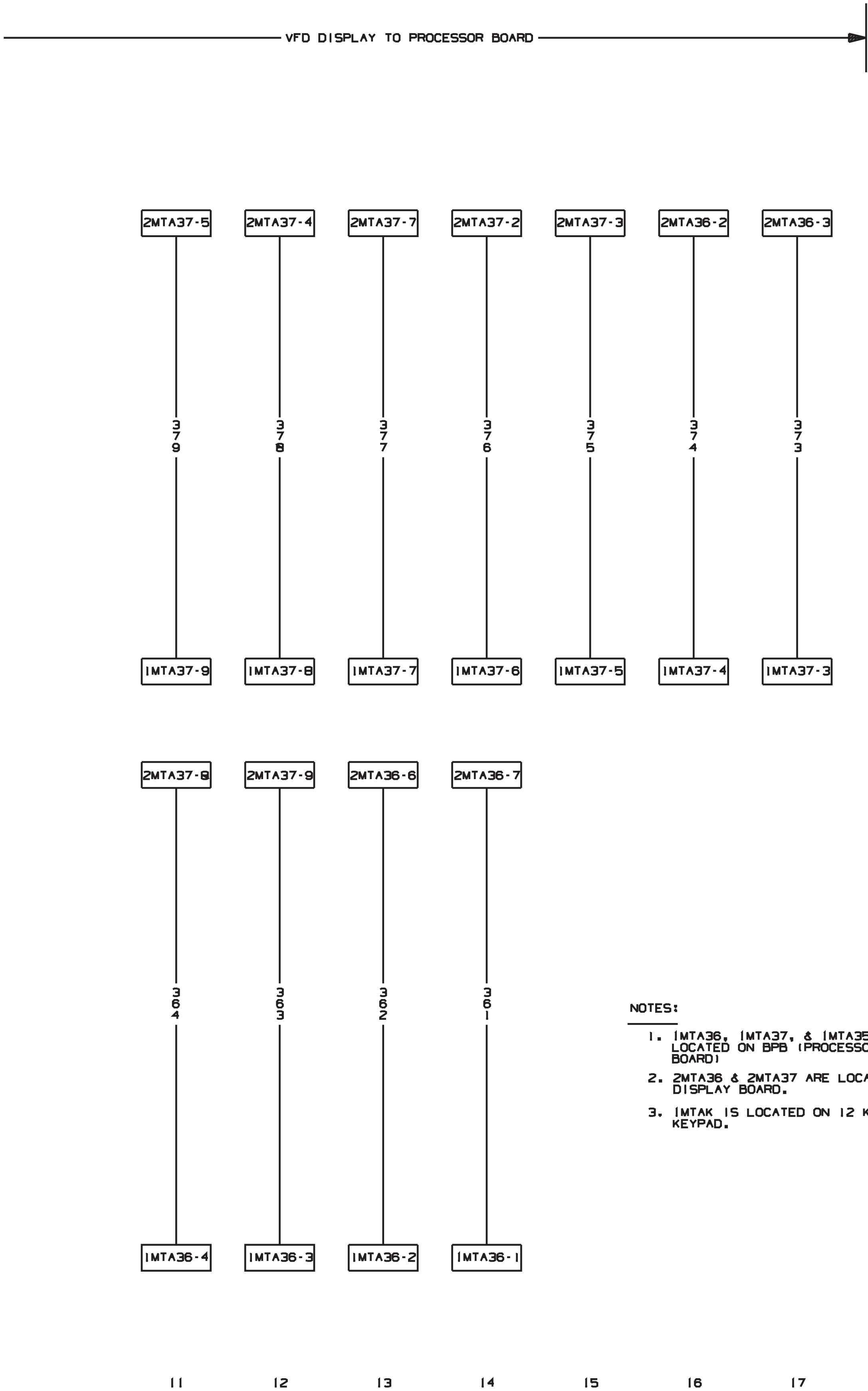
W6LMCKPD
94517B



NOTES:

1. 1MTA36, 1MTA37, & 1MTA35 ARE LOCATED ON BPB (PROCESSOR BOARD)
2. 2MTA36 & 2MTA37 ARE LOCATED ON DISPLAY BOARD.
3. 1MTAK IS LOCATED ON 12 KEY KEYPAD.

W6LMCKPD

MICRO 6 SYSTEMS SERIAL CONTROLS
MARK II

SCHEMATIC: VACUUM FLUORESCENT
DISPLAY + KEYPAD

PELLERIN MILNOR CORPORATION

Dryer / Shuttle Controller Schematics

3

Dryer/Shuttle Controller Wiring Connections

IMPORTANT NOTE ABOUT DRYER/SHUTTLE CONTROLLER WIRING CONNECTIONS

Each Dryer and Shuttle uses a serial link (RS485 ports) to communicate with the Dryer/Shuttle Controller P.C. by a RS232 to RS485 converter at the rear of the computer. The Dryer/Shuttle Controller uses serial port #4 (1MTA29) on each Dryer and Shuttle's processor for this communication link. The serial connection is comprised of two connections, low (usually black wire) and high (usually red wire). Crossing the high and low connections or connecting the serial link to the wrong port will prevent the Dryer/Shuttle Controller from communicating. Serial link wiring must be a 18AWG ($1.0mm^2$) twisted pair, 300VAC color coded insulation with a minimum of 85% braided shield or equivalent. The serial link shield must be grounded to a ground terminal at one end only. Each separate device connected by a serial link must also have a 14AWG ($2.5mm^2$) 600VAC insulated ground conductor connected between each device's ground terminal. Addition control wiring must be 18AWG ($1.0mm^2$) with 300VAC color coded insulation.

When connecting multiple Dryers or Shuttles to a Dryer/Shuttle Controller the serial link (1MTA29) is connected from machine to machine and then to the Dryer/Shuttle Controller RS485 converter. The serial link on each processor boards has 2 pins (the 2 pins are internally connected on the board) to allow connecting a group of devices together and then on to the Dryer/Shuttle Controller.

Wiring Connections from Shuttle to a Dryer/Shuttle Controller

Shuttle Control Box	**to**	**Dryer/Shuttle Controller**
TB-4		Shuttle # TBC-4
TB-5		Shuttle # TBC-5
TB-15		Shuttle # TBC-15
TB-16		Shuttle # TBC-16
TB-18		Shuttle # TBC-18
Shuttle Proc. Box	**to**	**Back of Dryer/Shuttle Computer**
1MTA29-1 or 2 (Serial Link #4 Low)		RS485 to RS232 Converter -
1MTA29-3 or 4 (Serial Link #4 High)		RS485 to RS232 Converter +

Dryer/Shuttle Controller Wiring Connections

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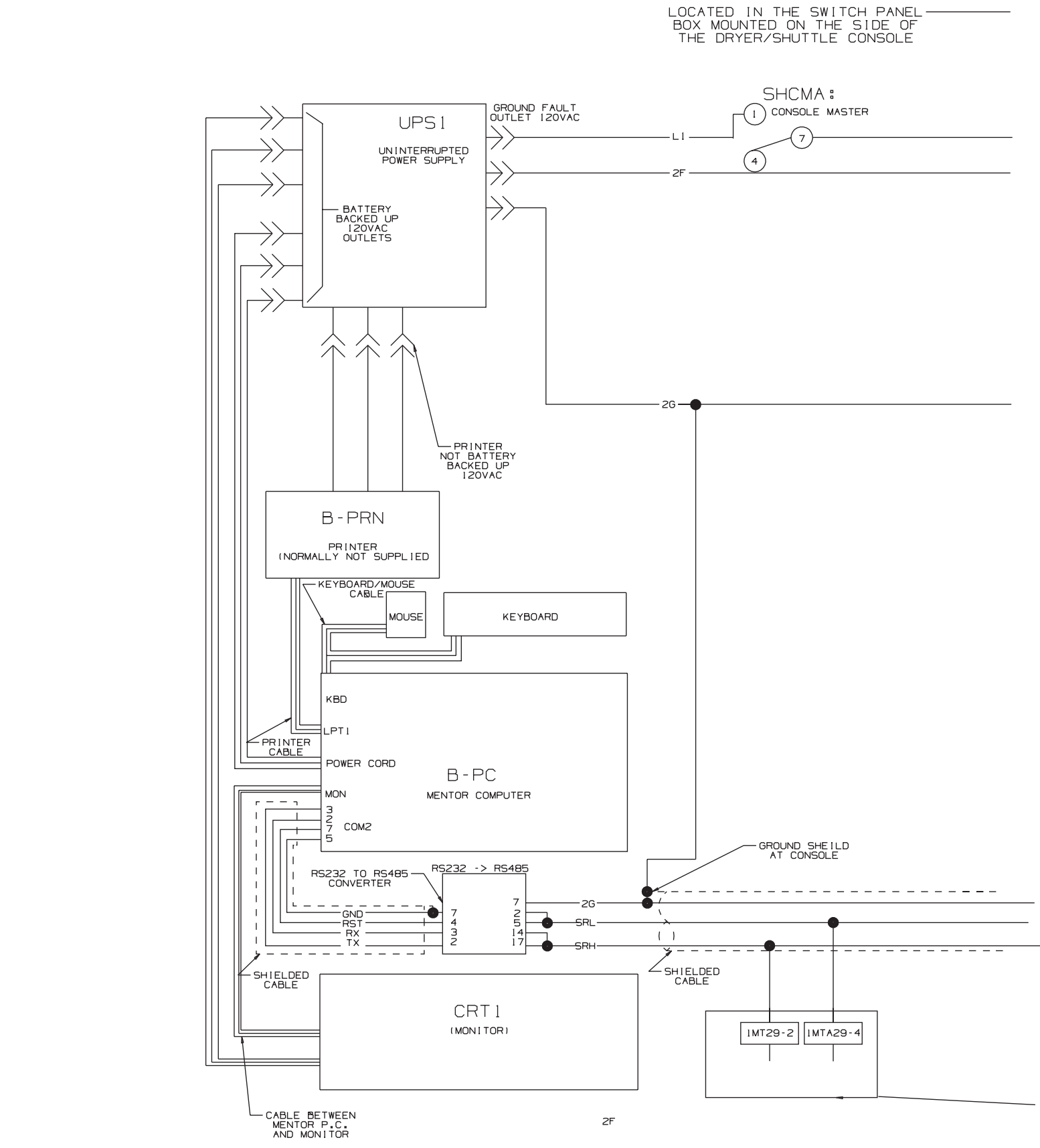
Dryer/Shuttle Controller Wiring Connections

Wiring Connections from Dryer to a Dryer/Shuttle Controller

Dryer Control Box	to	Dryer/Shuttle Controller
TBA-4		Dryer # TBC-4
TBA-5		Dryer # TBC-5
TBA-11		Dryer # TBC-11
TBA-12		Dryer # TBC-12
TBA-13		Dryer # TBC-13

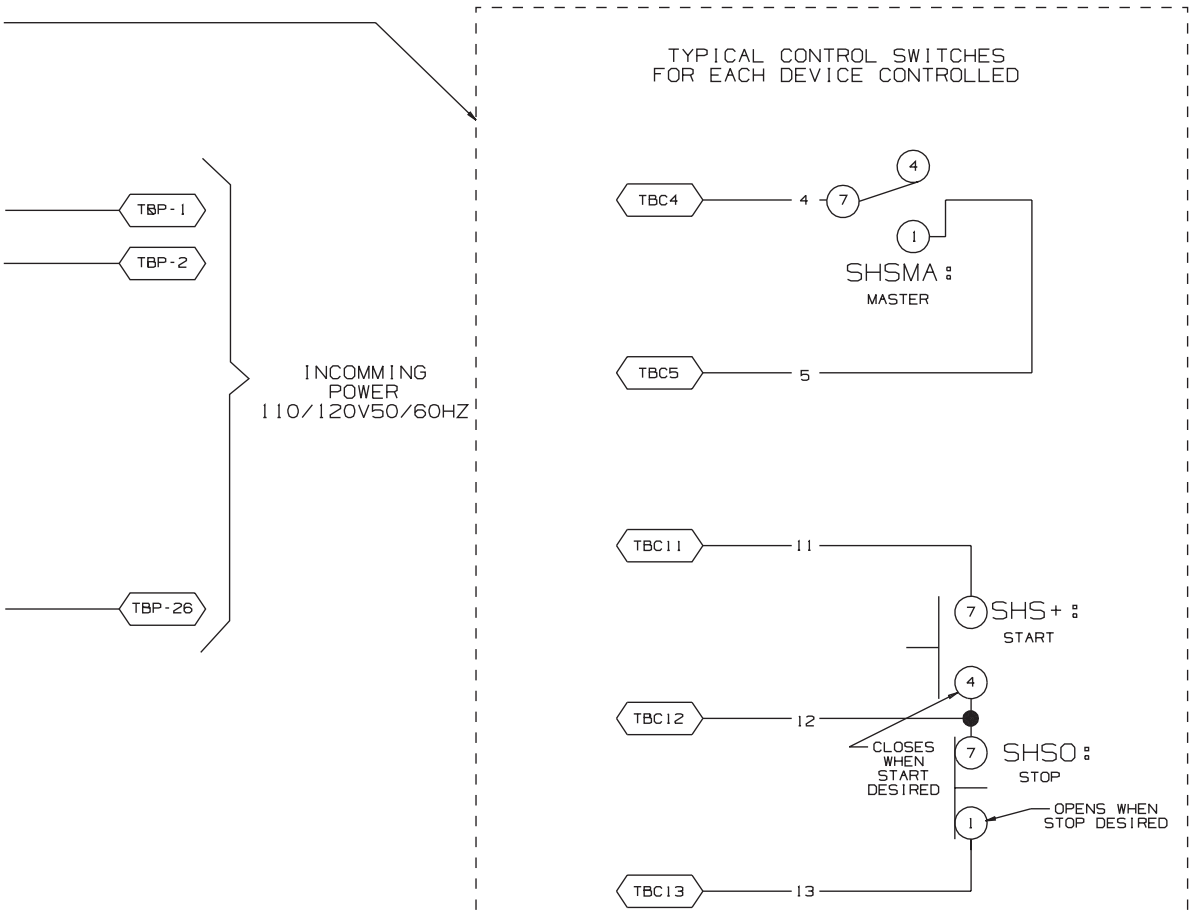
Dryer Proc. Box	to	Back of Dryer/Shuttle Computer
1MTA29-1 or 2 (Serial Link #4 Low)		RS485 to RS232 Converter -
1MTA29-3 or 4 (Serial Link #4 High)		RS485 to RS232 Converter +


LOCATED IN THE SWITCH PANEL BOX MOUNTED ON THE SIDE OF THE DRYER/SHUTTLE CONSOLE
SHCMA:
1 CONSOLE MASTER
7
4
UPS1
UNINTERRUPTED POWER SUPPLY
GROUND FAULT OUTLET 120VAC
L1
2F
BATTERY BACKED UP 120VAC OUTLETS
2G
PRINTER NOT BATTERY BACKED UP 120VAC
B-PRN
PRINTER (NORMALLY NOT SUPPLIED
KEYBOARD/MOUSE CABLE
MOUSE
KEYBOARD
KBD
LPT1
PRINTER CABLE
POWER CORD
B-PC
MENTOR COMPUTER
MON
3
2
7 COM2
5
GROUND SHEILD AT CONSOLE
RS232 TO RS485 CONVERTER
RS232 -> RS485
GND
RST
RX
TX
7
4
3
2
7
2
5
14
17
2G
SRL
SRH
SHIELDED CABLE
SHIELDED CABLE
CRT1
(MONITOR)
IMT29-2
IMTA29-4
CABLE BETWEEN MENTOR P.C. AND MONITOR
2F
00
01
02
03
04
05
06
07
08
09
10

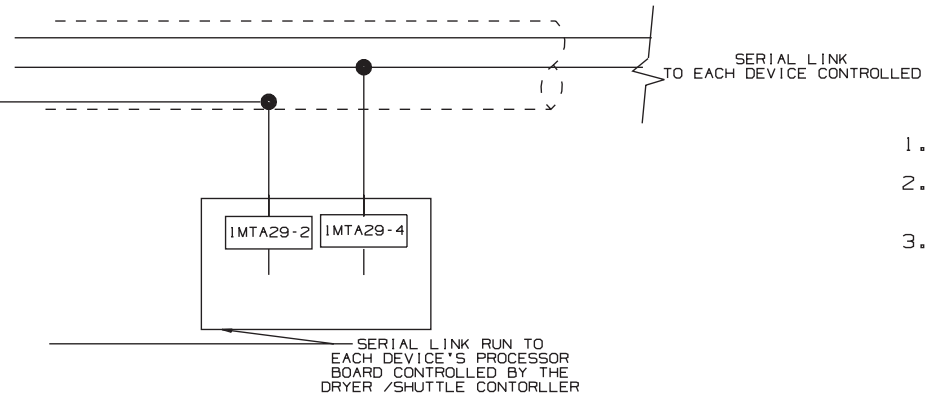
W6DRSHT1

SCHEMATIC: DRYER/SHUTTLE CONSOLE

PELLERIN MILNOR CORPORATION



WIRE NO.	VOLTAGE	WIRE COLOR
V1	+5VDC	BLUE
V2	+12VDC	BLUE/ORANGE
V3	-12VDC	BLUE/BLACK
2G	GROUND	BLUE/WHITE
SRH	SERIAL HIGH	BLUE/RED
SRL	SERIAL LOW	BLUE/BLACK
INPUTS	-	BLUE/BLACK
-	24VAC	BLUE/RED
-	120VAC	RED
2F	CONTROL GROUND	RED/WHITE



11 12 13 14 15 16 17 18 19

NOTES:

1. TBP IS THE TERMINAL STRIP IN REAR OF THE DRYER/SHUTTLE CONTROLLER.
2. 1MTA29 IS THE SERIAL LINK CONNECTION ON EACH DEVICE'S PROCESSOR BOARD BEING CONTROLLED BY THIS DRYER/SHUTTLE CONTROLLER.
3. TBC IS LOCATED IN THE SWITCH PANEL BOX MOUNTED ON THE SIDE OF THE DRYER/SHUTTLE CONTROLLER.