Published Manual Number/ECN: ME6HCSA1CE/2014085A

- **Publishing System: TPAS2**
- **Access date: 02/20/2014**
- **Document ECNs: Latest**

Schematic/Electrical Parts

Shuttle Call Controller

Mark V Machine Interface

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

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

Table of Contents
ME6HCSA1CE/14085A

COMPONENT PARTS LIST

W6DT5PL/2000122N

COMPONENT NUMBER	FUNCTION OF THIS COMPONENT	WHERE TO FIND THIS COMPONENT	MILNOR P/N	DESCRIPTION	LOCATION
BA	**>>PRINTED CIRCUIT BOARDS**				
BBB-1	BOARD-MEMORY BATTERY BACKUP	W6DT5D	08BSBB1T	BOARD: SER BATT BACKUP-TEST	SHUT CALL BOX
BDIO1	BOARD-8OUTPUT/16INPUT #1	W6DT5A	08BS816BT	BOARD:SERIAL 8OUT-16IN-TEST	SHUT CALL BOX
BDIO2	BOARD-8OUTPUT/16INPUT #2	W6DT5B	08BS816BT	BOARD:SERIAL 8OUT-16IN-TEST	SHUT CALL BOX
BDODP	BOARD-OUTPUT-DATA PASS	W6DT5DP	08BSO16BT	BOARD:SERIAL 16 OUTPUT-TEST	SHUT CALL BOX
BPB	BOARD-PROCESSOR	W6DT5D	08BSPDT	8088 PROCESSOR -> TESTED	SHUT CALL BOX
CR	**>>RELAY-PILOT OR CONTROL**				
CRDA1	RELAY-DISC ALLOWED DEVICE 1	W6DT5E	09C01DDD37	RELAY 3PDT DIFGOLD 11PIN 120VAC	SEQUENCER BX
CRDA2	RELAY-DISC ALLOWED DEVICE 2	W6DT5E	09C01DDD37	RELAY 3PDT DIFGOLD 11PIN 120VAC	SEQUENCER BX
CRDA3	RELAY-DISC ALLOWED DEVICE 3	W6DT5E	09C01DDD37	RELAY 3PDT DIFGOLD 11PIN 120VAC	SEQUENCER BX
CRDA4	RELAY-DISC ALLOWED DEVICE 4	W6DT5E	09C01DDD37	RELAY 3PDT DIFGOLD 11PIN 120VAC	SEQUENCER BX
CRDA5	RELAY-DISC ALLOWED DEVICE 5	W6DT5E	09C01DDD37	RELAY 3PDT DIFGOLD 11PIN 120VAC	SEQUENCER BX
CRDA6	RELAY-DISC ALLOWED DEVICE 6	W6DT5E	09C01DDD37	RELAY 3PDT DIFGOLD 11PIN 120VAC	SEQUENCER BX
CRDA7	RELAY-DISC ALLOWED DEVICE 7	W6DT5E	09C01DDD37	RELAY 3PDT DIFGOLD 11PIN 120VAC	SEQUENCER BX
CRDA8	RELAY-DISC ALLOWED DEVICE 8	W6DT5E	09C01DDD37	RELAY 3PDT DIFGOLD 11PIN 120VAC	SEQUENCER BX
CRDA9	RELAY-DISC ALLOWED DEVICE 9	W6DT5E	09C01DDD37	RELAY 3PDT DIFGOLD 11PIN 120VAC	SEQUENCER BX
CRDA10	RELAY-DISC ALLOWED DEVICE 10	W6DT5E	09C01DDD37	RELAY 3PDT DIFGOLD 11PIN 120VAC	SEQUENCER BX
CRDB*	RELAY-DISCHARGE ALLOWED	W6DT5E	09C01DDD37	RELAY 3PDT DIFGOLD 11PIN 120VAC	SEQUENCER BX
CRDC*	RELAY-DISCHARGE ALLOWED	W6DT5E	09C01DDD37	RELAY 3PDT DIFGOLD 11PIN 120VAC	SEQUENCER BX
CRSLP	RELAY-IN LOAD POSITIION	W6DT5E	09C01DDD37	RELAY 3PDT DIFGOLD 11PIN 120VAC	SHUT CALL BOX
EL	**>>LIGHT-PILOT OR INDICATOR**				
ELD*	LIGHT-DISCHARGE DESIRED	W6DT5F	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	ON WASHER
ELDA1	LIGHT-DISCHARGE ALLOWED DEVICE 1	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX
ELDA2	LIGHT-DISCHARGE ALLOWED DEVICE 2	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX
ELDA3	LIGHT-DISCHARGE ALLOWED DEVICE 3	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX
ELDA4	LIGHT-DISCHARGE ALLOWED DEVICE 4	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX
ELDA5	LIGHT-DISCHARGE ALLOWED DEVICE 5	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX
ELDA6	LIGHT-DISCHARGE ALLOWED DEVICE 6	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX
ELDA7	LIGHT-DISCHARGE ALLOWED DEVICE 7	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX
ELDA8	LIGHT-DISCHARGE ALLOWED DEVICE 8	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX
ELDA9	LIGHT-DISCHARGE ALLOWED DEVICE 9	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX
ELDA10	LIGHT-DISCHARGE ALLOWED DEVICE 10	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX
ELDD1	LIGHT-DISCHARGE DESIRED DEVICE 1	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX

COMPONENT PARTS LIST

W6DT5PL/2000122N

COMPONENT NUMBER	FUNCTION OF THIS COMPONENT	WHERE TO FIND THIS COMPONENT	MILNOR P/N	DESCRIPTION	LOCATION
ELDD2	LIGHT-DISCHARGE DESIRED DEVICE 2	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX
ELDD3	LIGHT-DISCHARGE DESIRED DEVICE 3	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX
ELDD4	LIGHT-DISCHARGE DESIRED DEVICE 4	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX
ELDD5	LIGHT-DISCHARGE DESIRED DEVICE 5	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX
ELDD6	LIGHT-DISCHARGE DESIRED DEVICE 6	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX
ELDD7	LIGHT-DISCHARGE DESIRED DEVICE 7	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX
ELDD8	LIGHT-DISCHARGE DESIRED DEVICE 8	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX
ELDD9	LIGHT-DISCHARGE DESIRED DEVICE 9	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX
ELDD10	LIGHT-DISCHARGE DESIRED DEVICE 10	W6DT5E	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	SEQUENCER BX
ES	**>>POWER SUPPLY-ELECTRONIC**				
ESPS1	POWER SUPPLY-PROCESSOR BOX	W6DT5D	08PSS3401T	40 WATT POWER SUPPLY TESTED	PROCESSOR BX
SH	**>>SWITCH-HAND OPERATED**				
SHD*	SWITCH-DISCHARGE DESIRED	W6DT5F	09N405PB10	SWASS PBBK 1NO	ON WASHER
SHDC*	SWITCH-DISCHARGE CANCELLED	W6DT5F	09N405PB10	SWASS PBBK 1NO	ON WASHER
SHSG	SWITCH-SIGNAL CANCEL	W6DT5D	09N405PB10	SWASS PBBK 1NO	SHUT CALL BOX
SK	**>>SWITCH-KEYLOCK**				
SKPR	SWITCH-RUN/PROGRAM (KEY OP)	W6DT5D	09N127C	KEYSW SPST 7A120VAC SCREW TERM	SHUT CALL BOX

2

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).

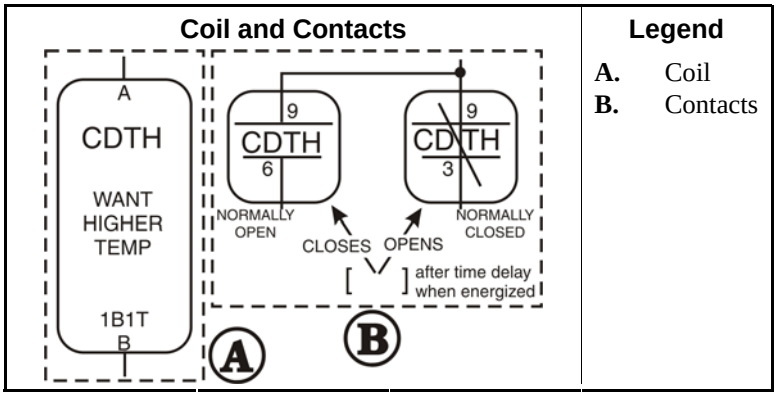
BA=Printed Circuit Board—Insulating substrate on which a thin pattern of copper conductors has been formed to connect discrete electronic components also mounted on the board.

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)

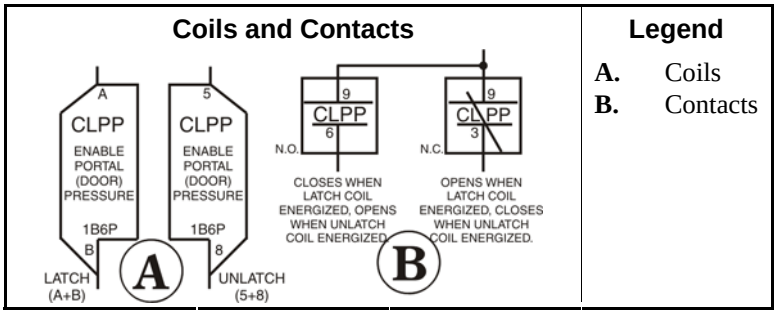
CD=Control, Time Delay Relay (Figure 2)—A relay whose contacts switch only after a fixed or adjustable delay, once voltage has been applied to its coil. The contacts switch back to normal (de-energized state) immediately when the voltage is removed.

Figure 2: Time Delay Relay (CD)



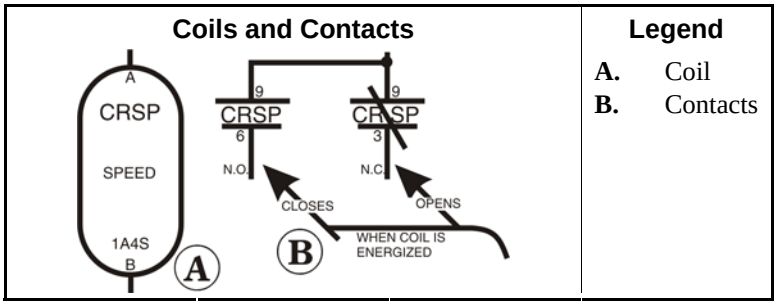
CL=Control, Latch Relay (Figure 3)—A relay which latches in an energized or set position when operated by one coil (the latch/set coil). The relay stays latched even though coil voltage is removed. The relay releases or unlatches when voltage is applied to a second coil (the unlatch/reset coil).

Figure 3: Latch Relay (CL)



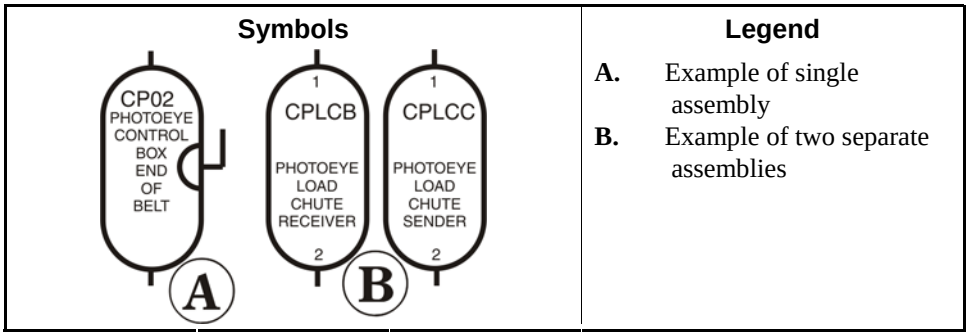
CR=Control, Relay (Figure 4)—A relay whose contacts switch immediately when voltage is applied to its coil and revert to normal when the voltage is removed.

Figure 4: Standard Relay (CR)



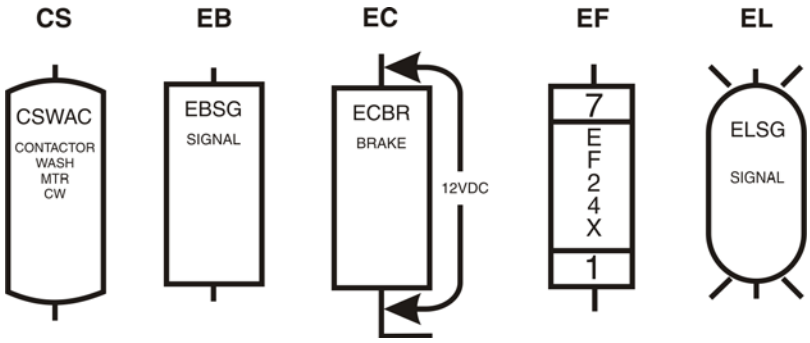
CP=Control, Photo-Eye (Figure 5)—Photo-eyes sense the presence of an object without direct physical contact. Photo-eyes consist of a transmitter, receiver, and output module. These components may be housed in one assembly with the transmitter bouncing light off of a reflector to the receiver, or these 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.

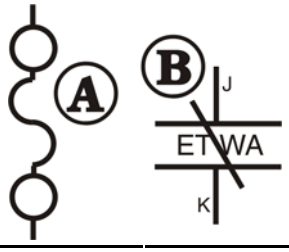
EL=Electric Light (Figure 6)—Indicator lights may be either incandescent or fluorescent.

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.

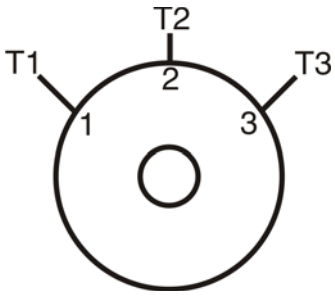
KB=Keyboard—Device similar to a typewriter for making entries to a computer.

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)

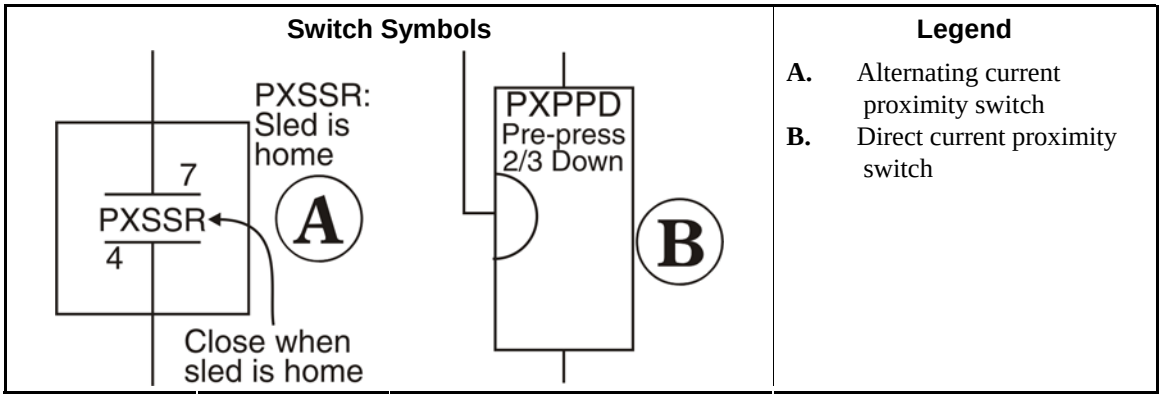


MV=Motor (Variable Speed) Inverter—To vary the speed of an AC motor, the volts to frequency ratio must be kept constant. The motor will overheat if this ratio is not maintained. The motor variable speed inverter converts three phase AC to DC. The inverter then uses this DC voltage to generate AC at the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

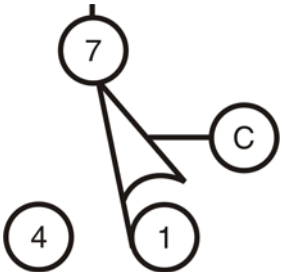
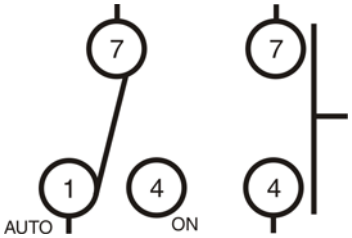


Figure 12: Hand Operated Switch (SH)



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)

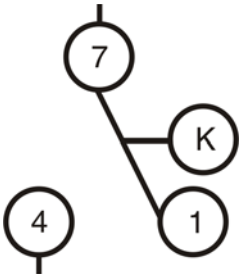
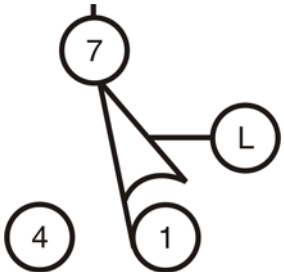


Figure 14: Level Switch (SL)



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)

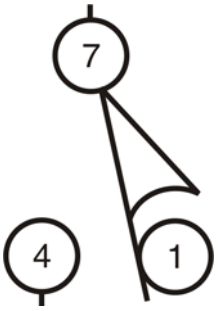
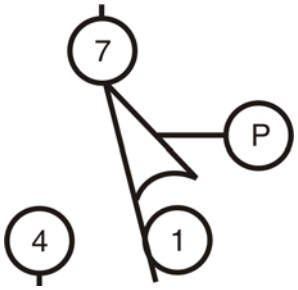


Figure 16: Pressure Switch (SP)



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)

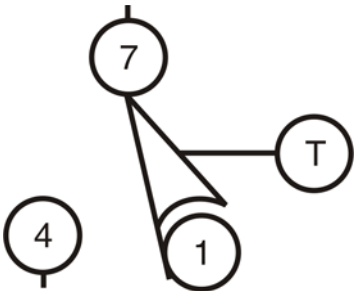
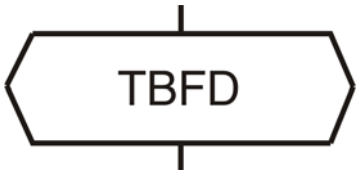


Figure 18: Terminal Board (TB)



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)

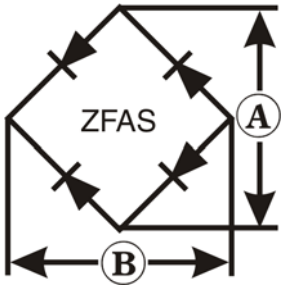
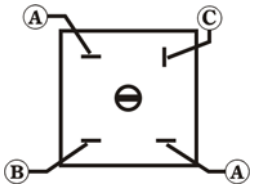
Component Symbol	Legend
	**A.** Alternating current input **B.** Direct current output

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.

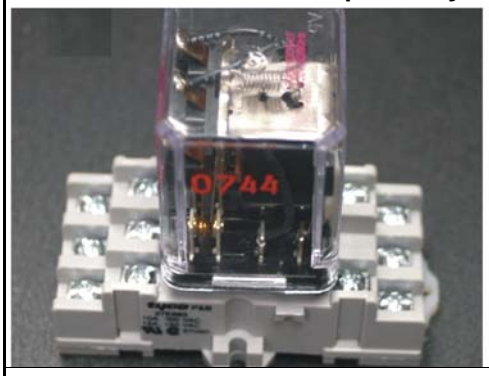
2. Component Terminal Numbering

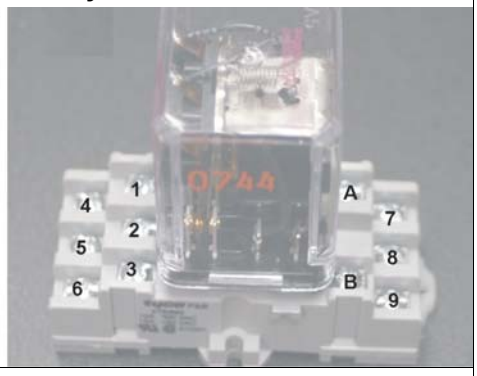
CAUTION 1: Risk of Mis-wiring—Due to electrical component manufacturing inconsistencies, the pin numbers imprinted on components such as connectors and relay bases used on Milnor machines often do not correspond to the pin numbers shown in the schematics.

- 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.

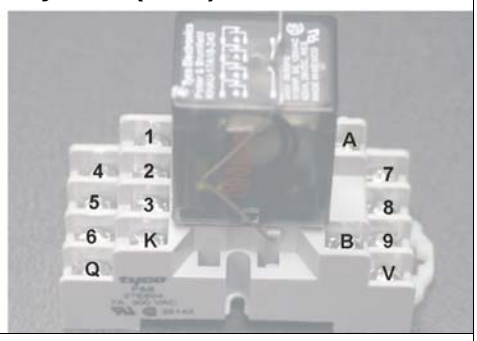
Figure 22: Plug-in Relays

11-pin Relay with Grey Base

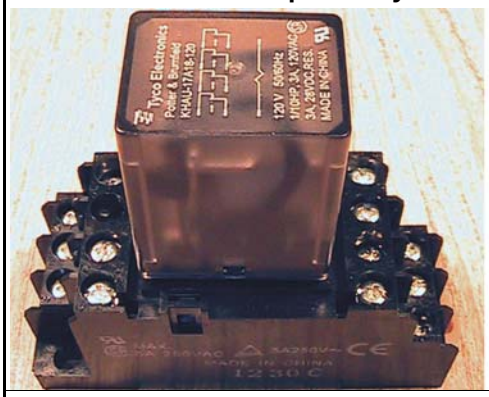


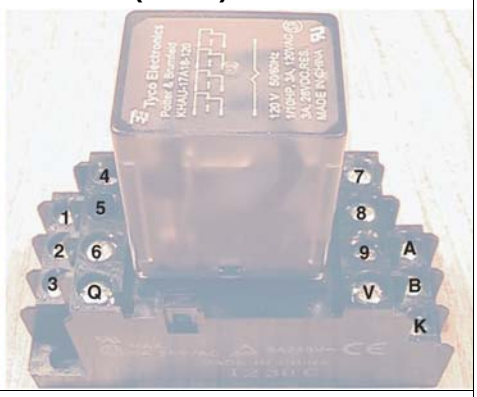


14-pin Relay with Grey Base (older)

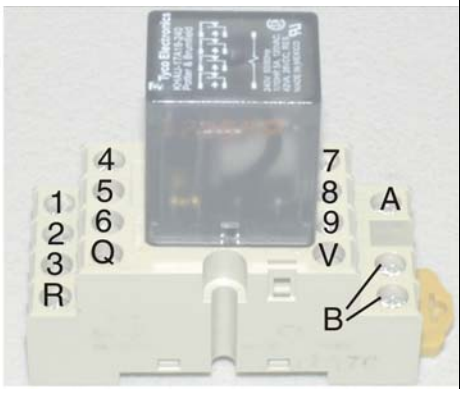


14-pin Relay with Black Base (newer)





14-pin Relay with Beige Base (rare)



Legend

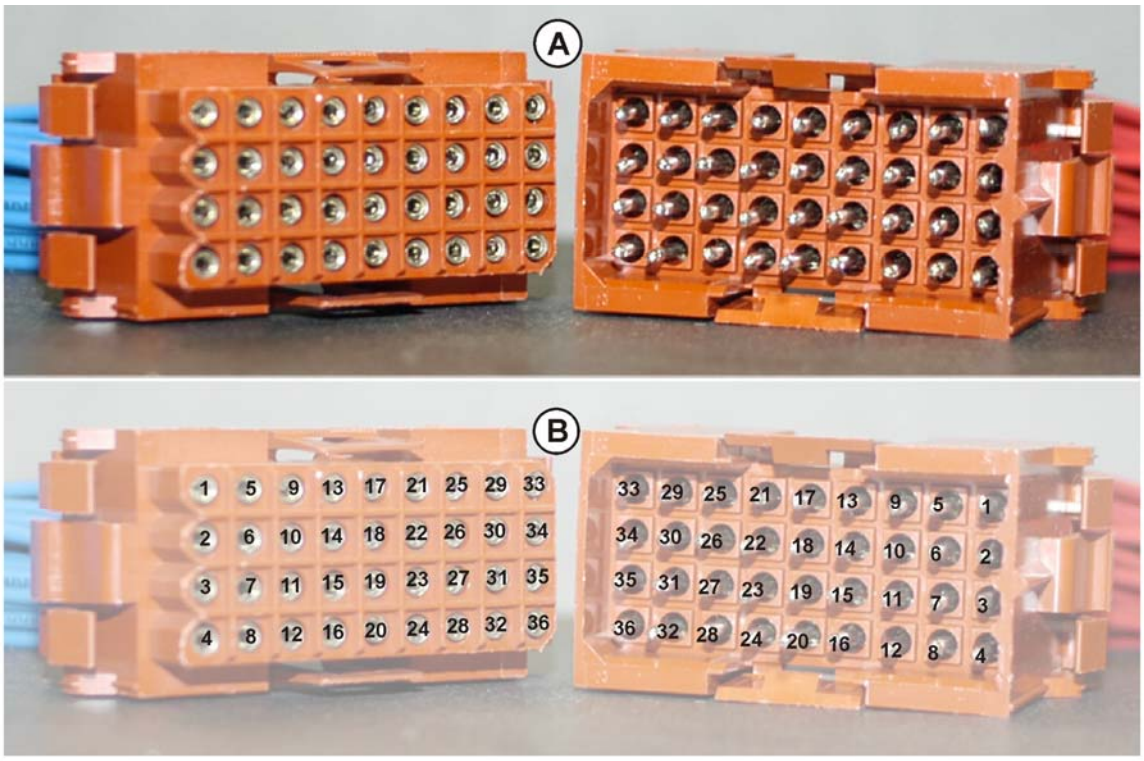
Left. View of relay and base

Right. Same view, showing pin numbers

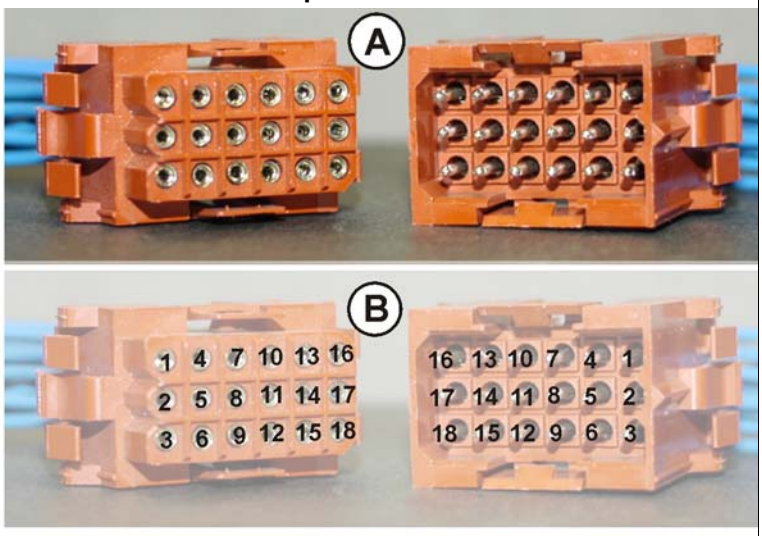
Note 3: Relay functional names ending with the letter "M" (e.g., CRxxM) are not discrete components but are a component of a printed circuit board. They are usually not individually replaceable.

Figure 23: AMP Connector Pin Locations

36-pin Connector



18-pin Connector

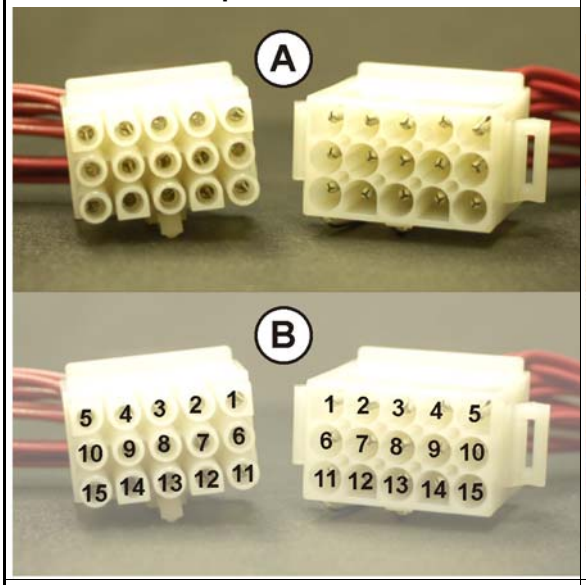


Legend

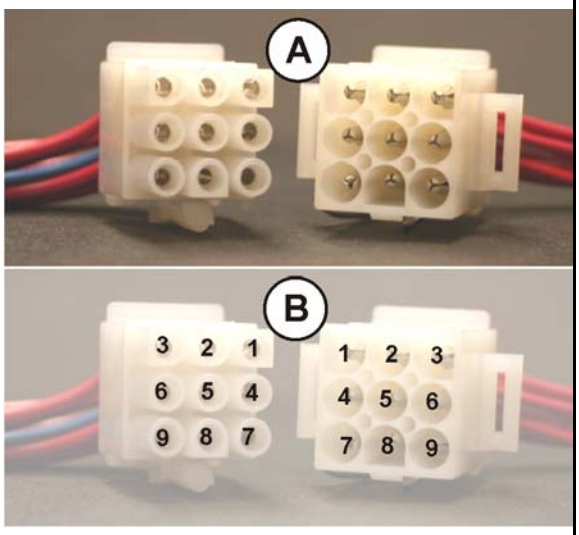
A. View of mating halves of connector
B. Same view, showing assigned pin numbers

Figure 24: Molex Connector Pin Locations

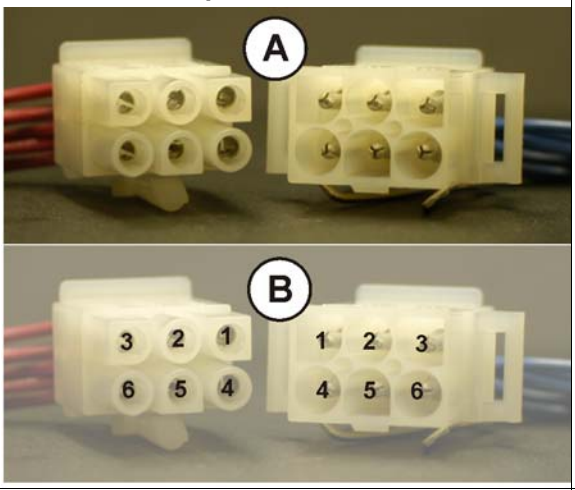
15-pin Connector



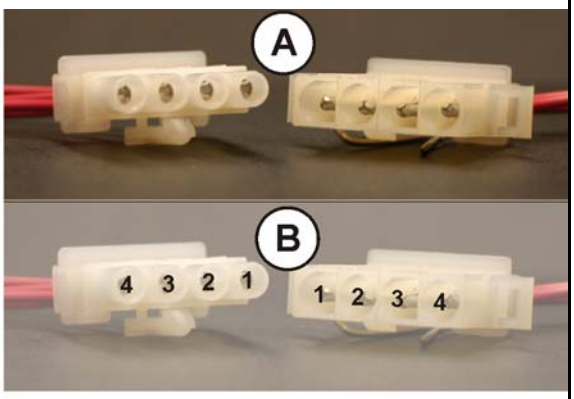
9-pin Connector



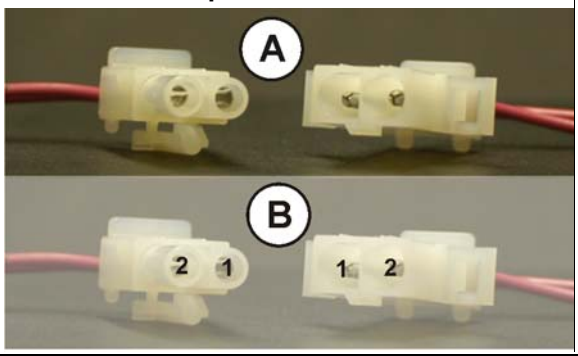
6-pin Connector



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

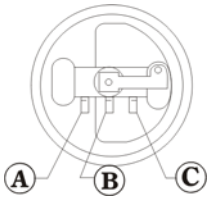
Component	Legend
	**A.** Contact 1—Normally open **B.** Contact 2—Normally closed **C.** Contact 3—Common

Figure 26: Toggle Switch

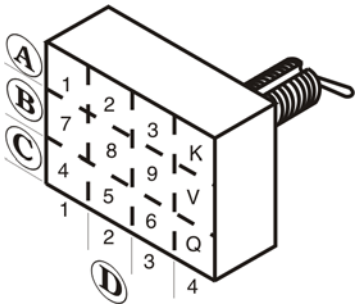
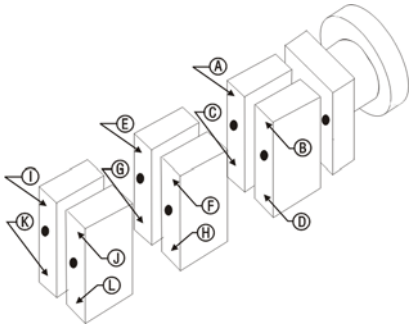
Component	Legend
	**A.** Normally closed contacts **B.** Common contacts **C.** Normally open contacts **D.** Pole

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).

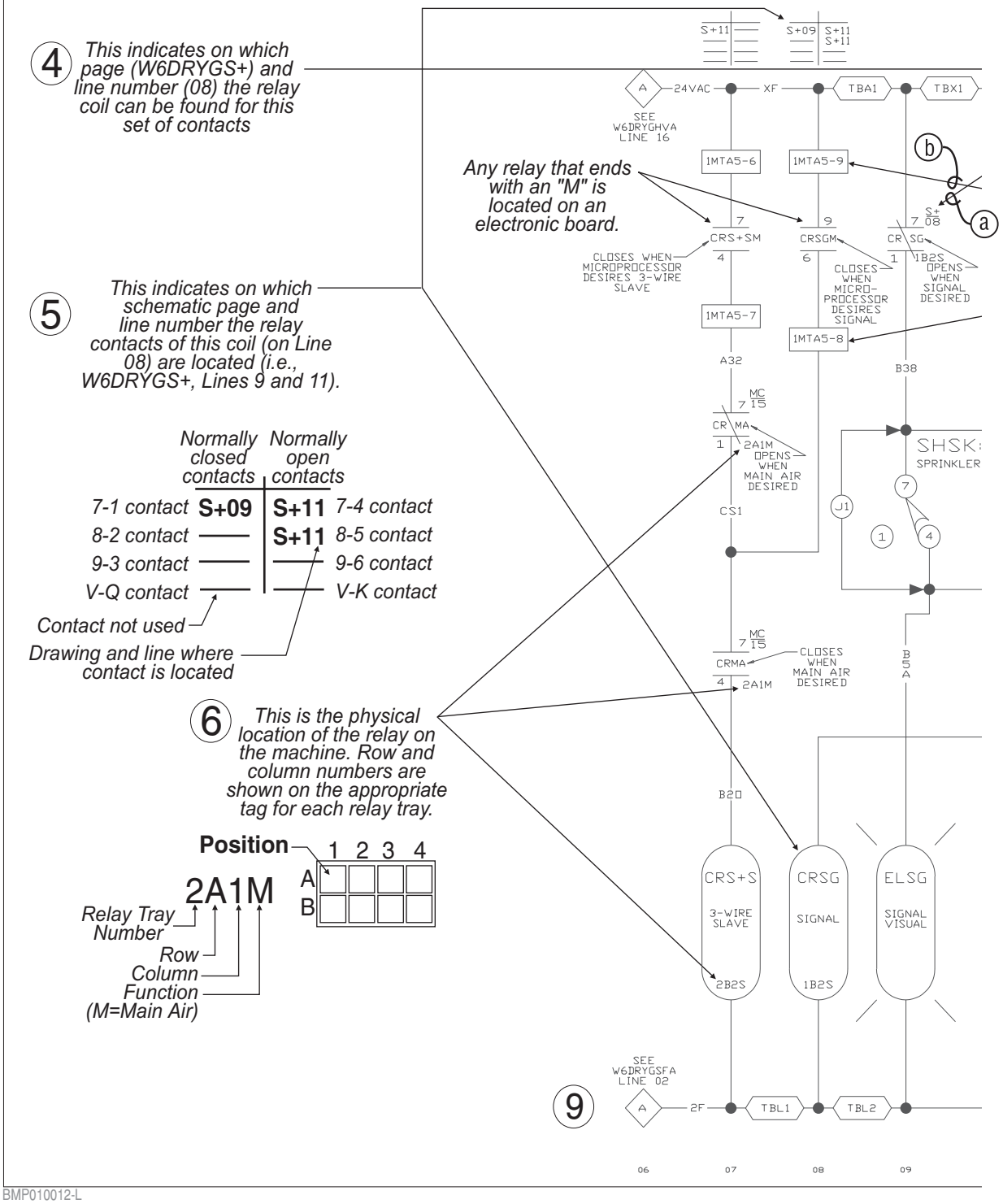
Whenever circuitry changes are significant enough to warrant publishing a new schematic drawing, the new drawing number will be the same as the old except for the major revision letter (A in the example).

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

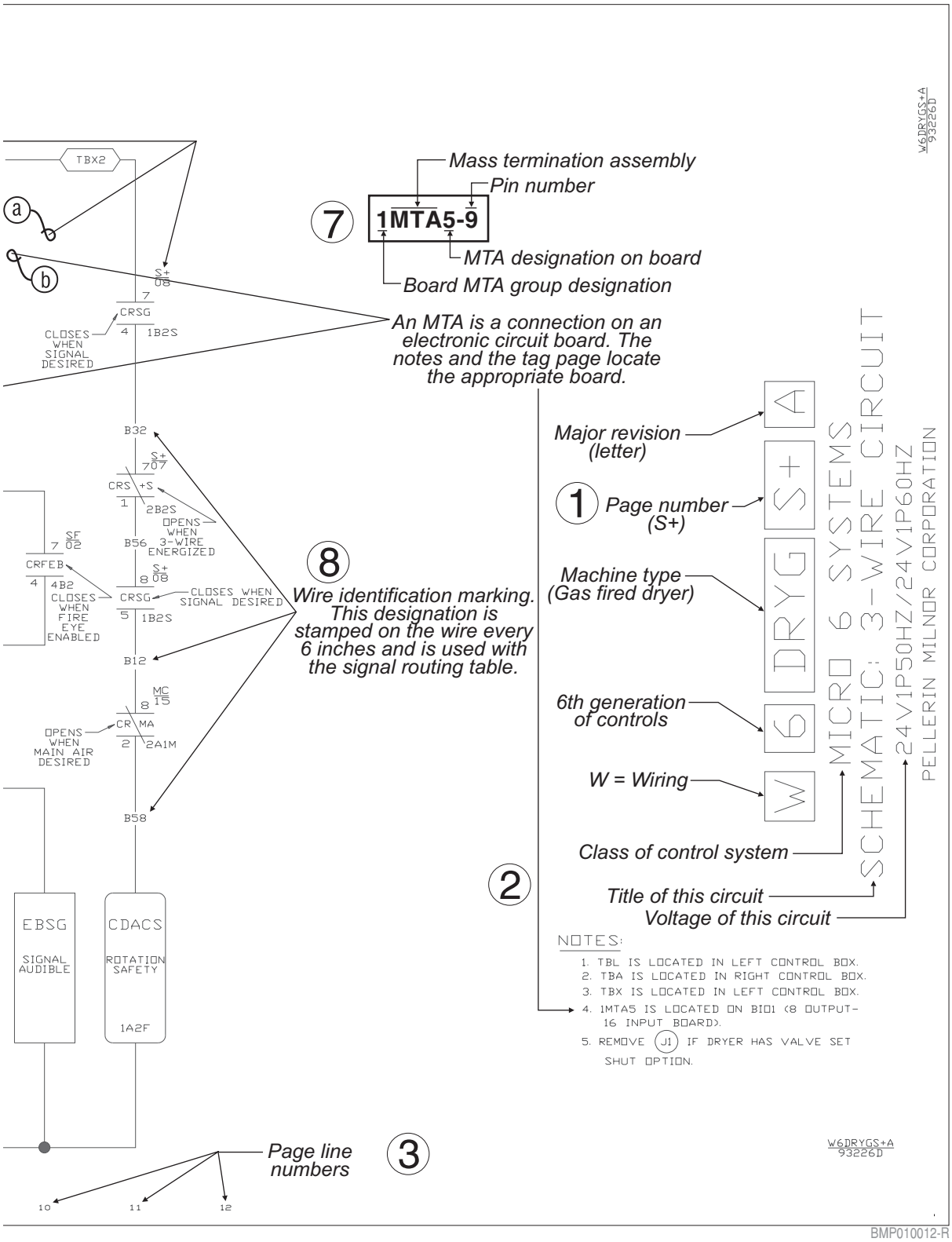
   The complete listing of the boards utilized in a given control system can be found in the component list for that system.
8. Wire numbers, as described earlier in this section, are shown at appropriate locations on the schematic drawing.
9. Where diamond symbols appear at the end of a conductor, these 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 —

This page intentionally left blank.


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
CLOSES WHEN MAIN AIR DESIRED
B20
B5A
CRS+S
3-WIRE SLAVE
2B2S
CRSG
SIGNAL
1B2S
ELSG
SIGNAL VISUAL
SEE W6DRYGSFA LINE 02
9
2F
TBL1
TBL2
06
07
08
09

BMP010012-L


W6DRYGS+A
93226D
TBX2
a
b
S+
08
7
CRSG
4
1B2S
CLOSES WHEN SIGNAL DESIRED
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.
B32
S+
707
CRS
+S
1
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
MA
2
2A1M
OPENS WHEN MAIN AIR DESIRED
B58
EBSG
SIGNAL AUDIBLE
CDACS
ROTATION SAFETY
1A2F
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
Page line numbers
3
10
11
12

BMP010012-R

FIELD WIRING THE COSLIDE/COSTIK/ COLOOSE SYSTEM WHEN USING A MANUAL LOAD CONVEYOR

The systems require electrical connections between the Belt Controller and the Central Control Box which must be field wired. The Belt Controller is located on the conveyor itself.

Connections

Group 1—Non-dry code data.

Belt Controller	Reason	Central Control Box
TBD5	24VAC	TBA*A
TBD7	120VAC	120VAC in transformer box
TBA2	Ground	TBAK
TBA7	Discharge Desired	WCB**
TBA8	Discharge Cancel	WCD**

"*" represents Belts "**" represents connector for Device

Group 2—The following are the connections for dry code data and must be made using a 12 conductor shielded cable. Connect the shield and all spare wires to ground on the Shuttle Belt Control Box side only. Leave these wires disconnected on the Dryer Control side.

Shuttle Belt Control Box	Dryer Control
WCX04	WCX*01
WCX03	WCX*02
WCX02	WCX*03
WCX01	WCX*04
WCX05	Ground

"*" represents Belts

Operating Sequence

1. The operator loads the goods onto the conveyor manually.

2. The operator selects the desired Dry code on the rotary switch on the belt controller then presses the Data Valid and Belt Loaded buttons, whereupon the belt desire to discharge.

3. When the belt is allowed to discharge, the shuttle (COSLIDE, COSTIK, or COLOOSE) moves to the load station. Then shuttle enables a relay which says “shuttle in load position.” The shuttle belt and loading belt start to run. When the photoeye is blocked on the shuttle, the shuttle belt stops. The loading belt stops after its photoeye is clear for “X” seconds, where “X” is the number of seconds programmed in the configure decision that specifies how long to keep the shuttle at the loading belt after the photoeye is blocked. This ensures all goods are transferred to the shuttle.

4. The shuttle goes home and waits to be allowed to discharge.

FIELD WIRING THE MANUAL COSLIDE/COSTIK/ COLOOSE SYSTEM WHEN USED TO UNLOAD A WASHER EXTRACTOR

Connections

Group 1—Call/Cancel switches

Allied Discharge/Cancel Sequencer Control Box	Call/Cancel Switch Panel located on Washer-Extractor
Not Used	WCU*1
TBA*D	WCU*2
WCD1-10	WCU*3
WCB1-10	WCU*4
TBAA-M	WCU*5
TBAK	WCU*6

Group 2—Device flag down valves

Allied Discharge/Cancel Sequencer Box	Valve Set for Load Station Target for the Washers
TBBA	Washer-1
TBBB	Washer-2
TBBC	Washer-3
TBBD	Washer-4
etc.	etc.
TBAK	Ground for Flag Down Valves

Connection Notes

1. "*" represents the washer.

2. If system has COLOOSE, the following pin (fully retracted) must be grounded:
- For machines with controls prior to Mark 5: pin 4MTA4-01
- For machines with Mark 5 controls: pin 4MTA4-18

3. If system does not have a call station, the following pin (device desires to transfer load to shuttle) must be grounded:
- For machines with controls prior to Mark 5: pin 3MTA4-01
- For machines with Mark 5 controls: pin 3MTA4-18

Operating Sequence

The shuttle conveyor (COSLIDE, COSTIK, or COLOOSE) always receives from an allied (non-Milnet®) controlled) device and discharges to a Milnet® controlled device. The washer-extractors are blind to (do not communicate with) this system except for two switches and a light on the Tilt Control Panel. The two switches ("Discharge Desired" and "Discharge Cancel") provide inputs to the Allied Discharge/Cancel Sequencer Control Box. The light is "Discharge Desired."

1. When a washer is allowed to discharge, the COSLIDE will start moving toward it.

2. When the COSLIDE gets to the load station, the operator extends the COSLIDE and then tilts the washer to discharge the machine. There are *bump switches* on the COSLIDE to advance the belt to help in the unloading to the washer. These switches are disabled when the discharge photoeye is blocked.

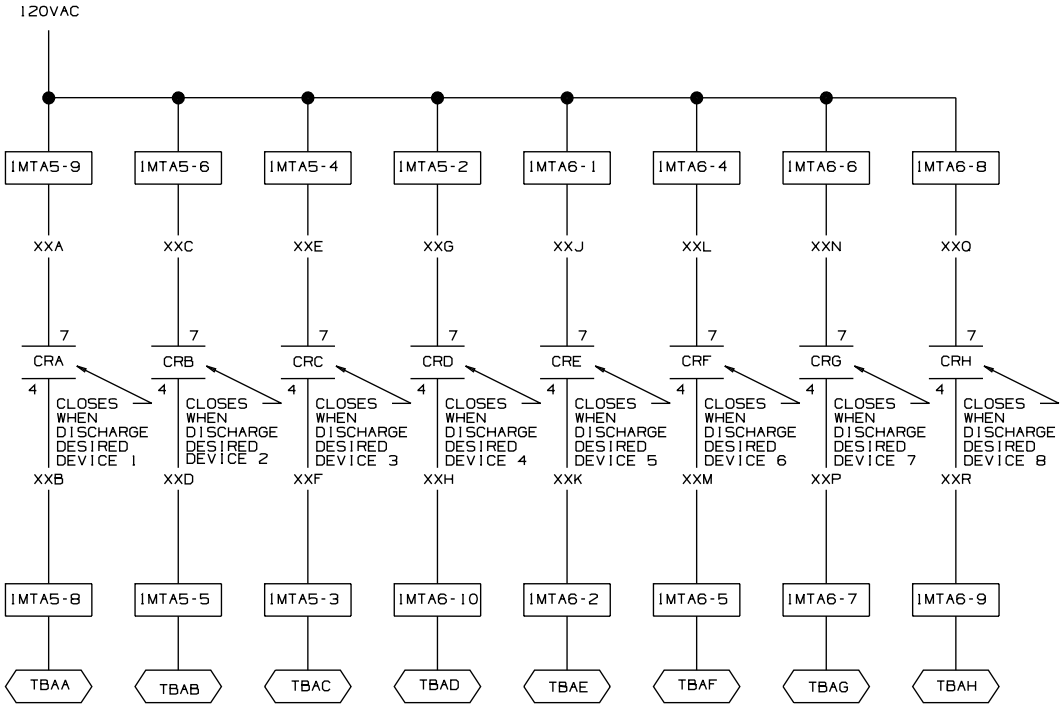
3. After the washer is fully discharged, the washer must be tilted back down and the COSLIDE retracted.

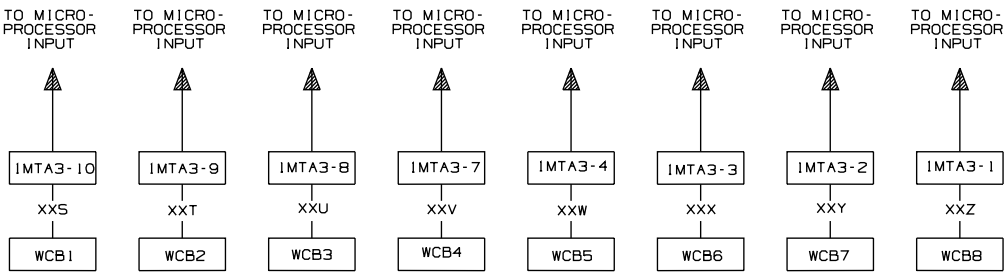
4. Data is given to the shuttle via a *rotary switch.* The operator presses the *Data Valid switch*, then the *Shuttle Loaded switch.* The COSLIDE then goes home.

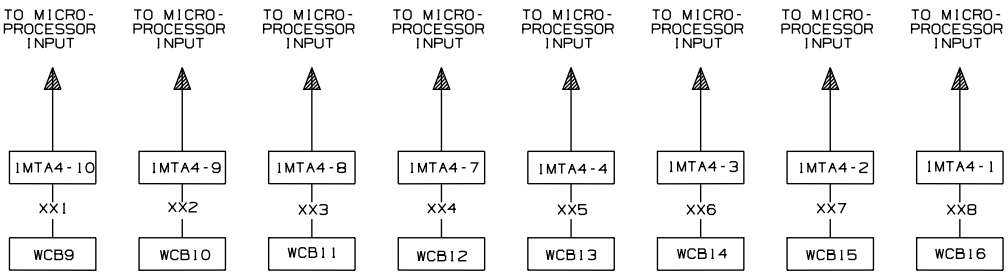
5. If a discharge destination is allowed, the COSLIDE then moves to that destination and discharges.

6. After discharging, the COSLIDE will go home and desire to load again.

This page intentionally left blank.

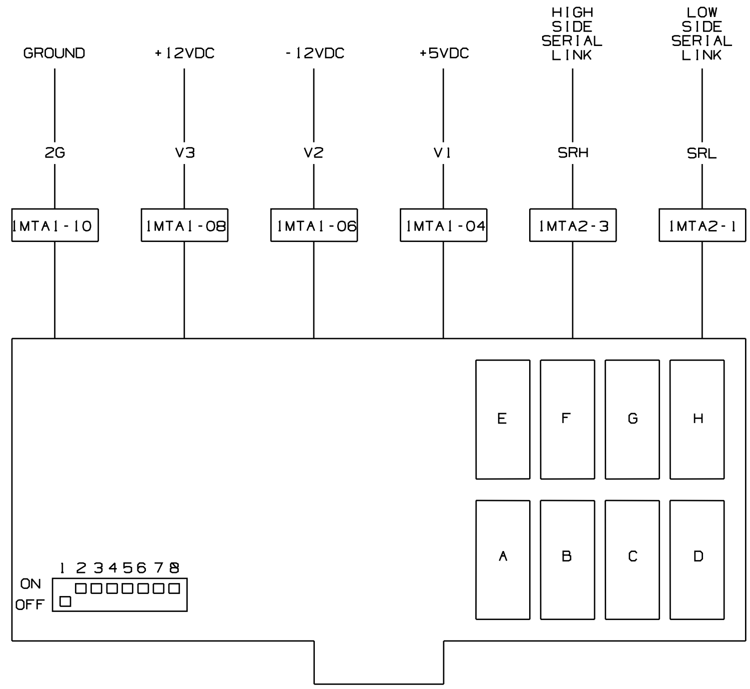






00 01 02 03 04 05 06 07 08 09

W6DT5A
2000122B



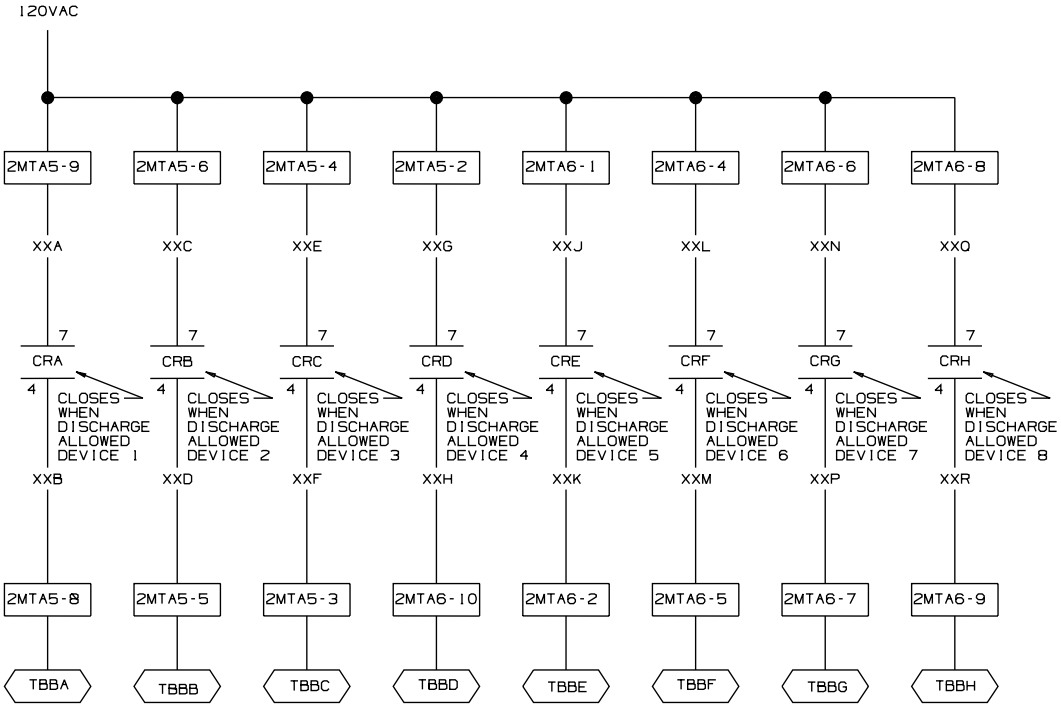
W6DT5A

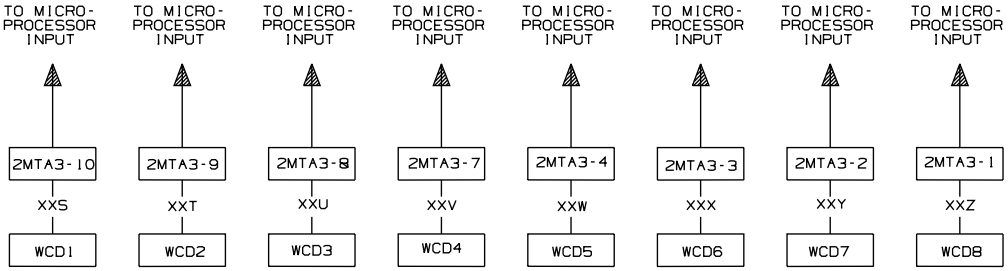
MICRO 6 SYSTEMS SCHEMATIC: SHUTTLE CALL

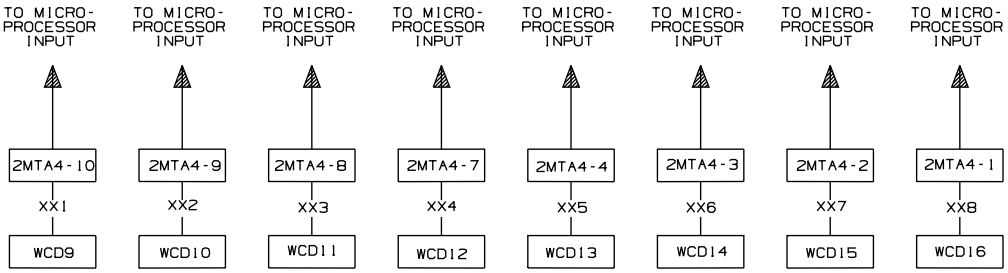
PELLERIN MILNOR CORPORATION

XXS : DEVICE 1 DESIRES DISCHARGE
XXT : DEVICE 2 DESIRES DISCHARGE
XXU : DEVICE 3 DESIRES DISCHARGE
XXV : DEVICE 4 DESIRES DISCHARGE
XXW : DEVICE 5 DESIRES DISCHARGE
XXX : DEVICE 6 DESIRES DISCHARGE
XXY : DEVICE 7 DESIRES DISCHARGE
XXZ : DEVICE 8 DESIRES DISCHARGE
XX1 : DEVICE 9 DESIRES DISCHARGE
XX2 : DEVICE A DESIRES DISCHARGE
XX3 : DEVICE FINISHED
XX4 : NOT USED
XX5 : NOT USED
XX6 : NOT USED
XX7 : NOT USED
XX8 : NOT USED

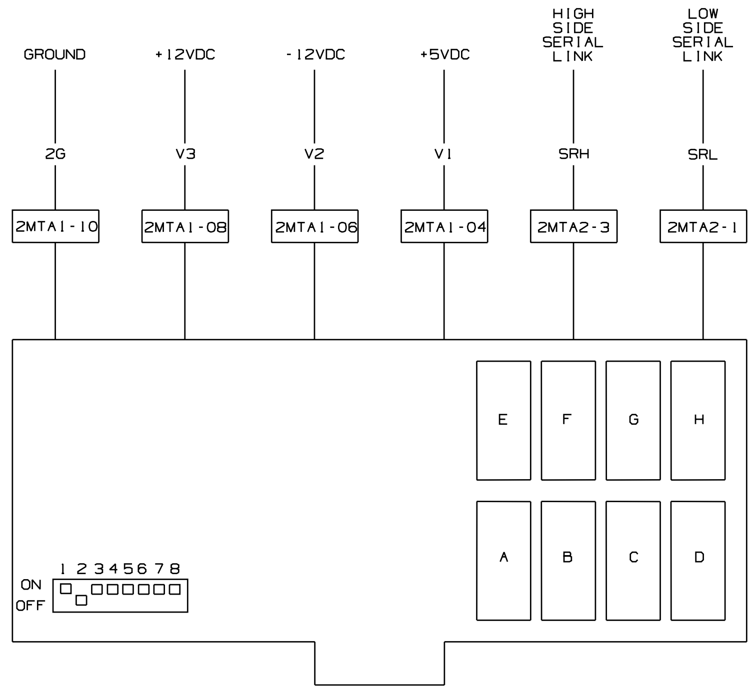
10 11 12 13 14 15 16 17







00 01 02 03 04 05 06 07 08 09



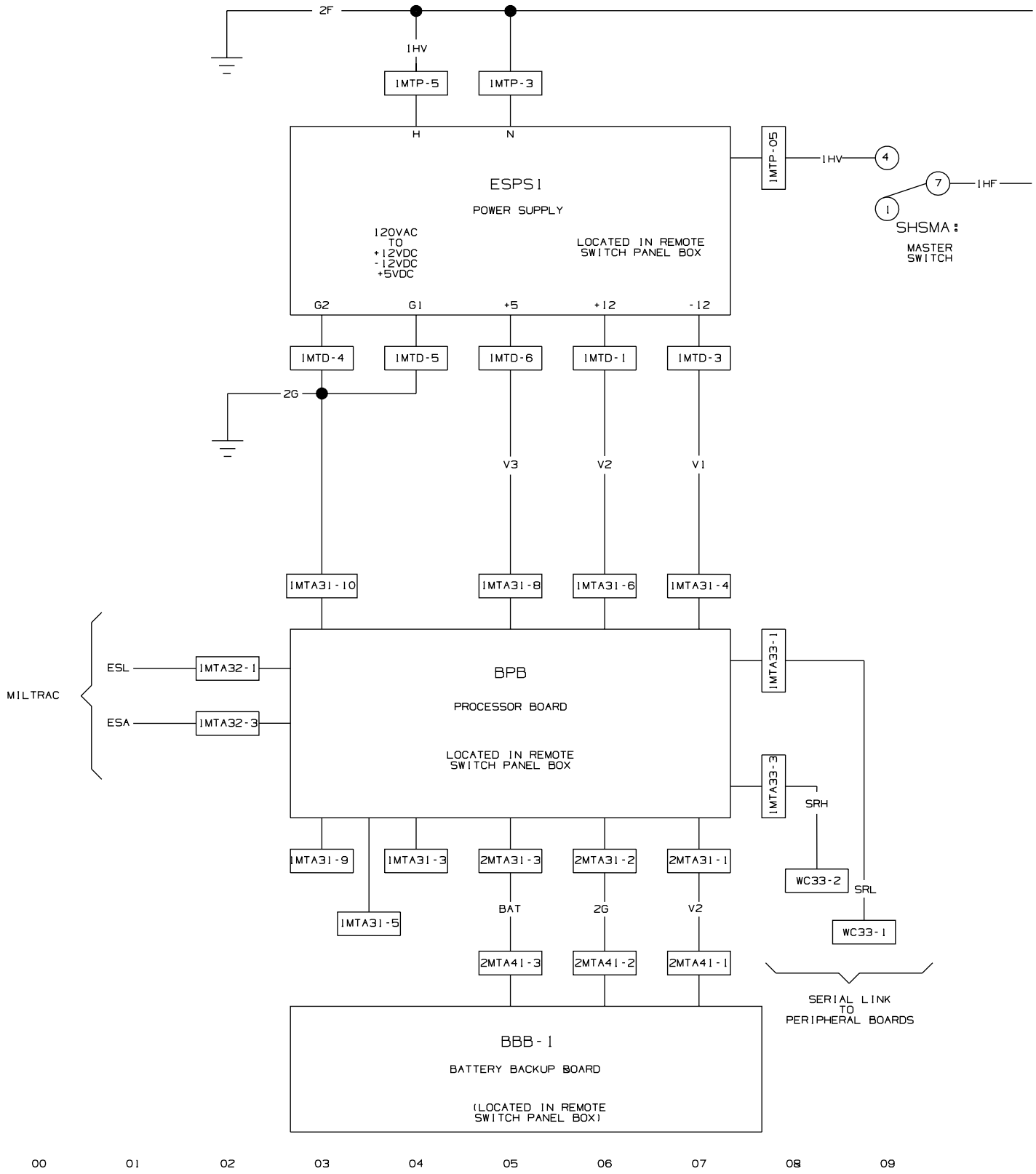
XXS = CANCEL DISCHARGE DEVICE 1
XXT = CANCEL DISCHARGE DEVICE 2
XXU = CANCEL DISCHARGE DEVICE 3
XXV = CANCEL DISCHARGE DEVICE 4
XXW = CANCEL DISCHARGE DEVICE 5
XXX = CANCEL DISCHARGE DEVICE 6
XXY = CANCEL DISCHARGE DEVICE 7
XXZ = CANCEL DISCHARGE DEVICE 8
XX1 = CANCEL DISCHARGE DEVICE 9
XX2 = CANCEL DISCHARGE DEVICE 10
XX3 =
XX4 =
XX5 =
XX6 =
XX7 =
XX8 =

W6DT5B

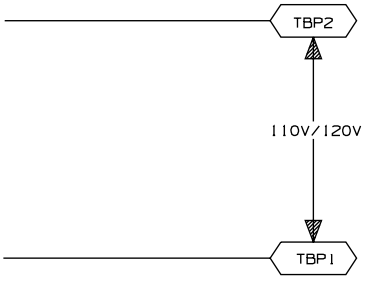
MICRO 6 SYSTEMS
SCHEMATIC: SHUTTLE CALL

PELLERIN MILNOR CORPORATION

10 11 12 13 14 15 16 17

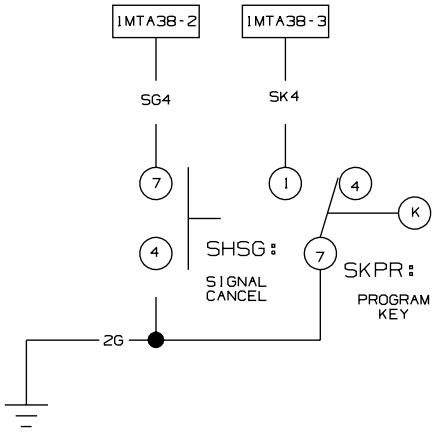


W6DT5D
20001228



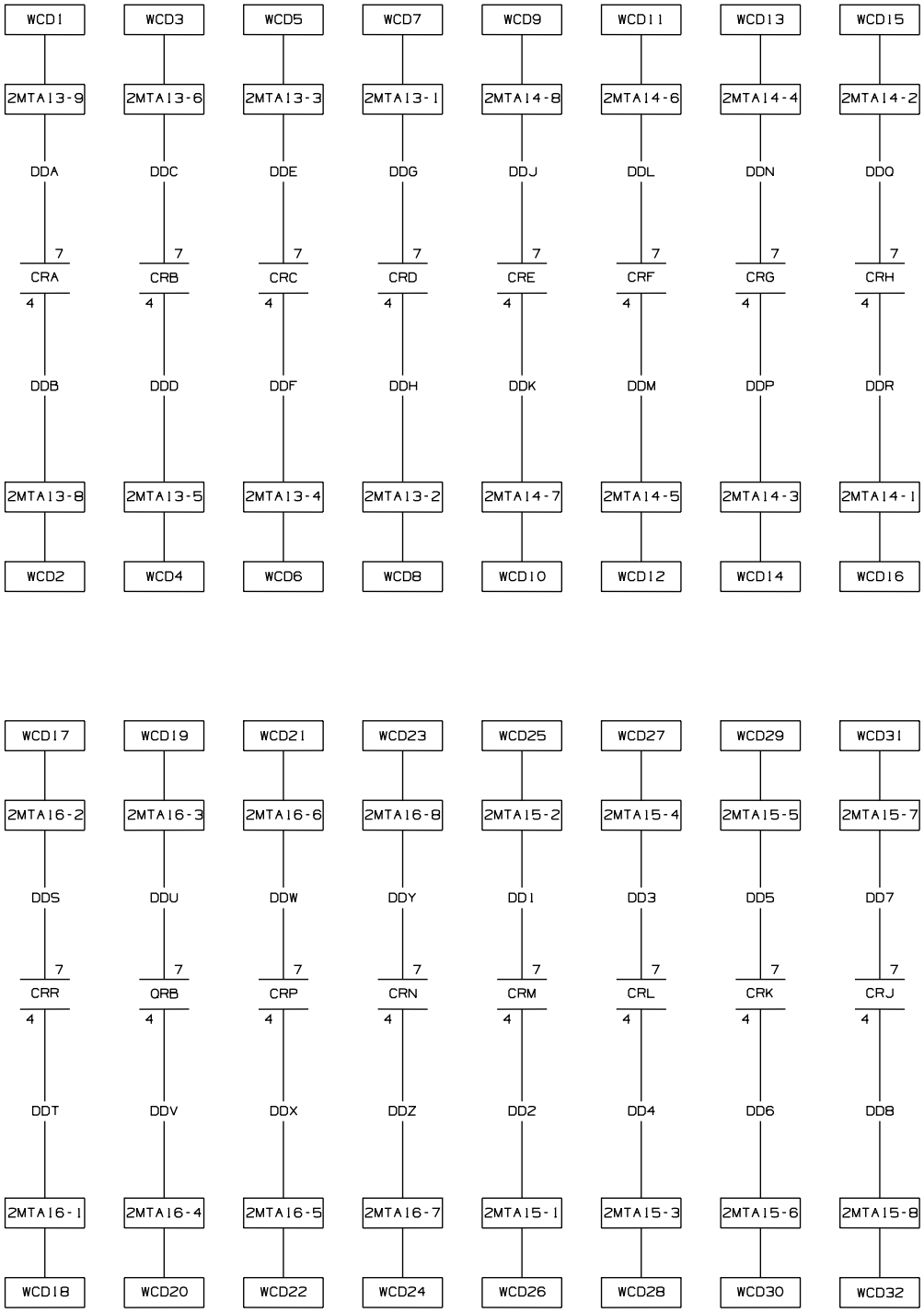
WIRING COLORING CODE

WIRE NO.	VOLTAGE	WIRE COLOR
V1	+5VDC	BLUE
V2	+12VDC	BLUE/ORANGE
V3	-12VDC	BLUE/BLACK
2G	SIGNAL GROUND	BLUE/WHITE
SRH	SERIAL HIGH	BLUE/RED
SRL	SERIAL LOW	BLUE/BLACK
ESH	MILNET HIGH	BLUE/RED
ESL	MILNET LOW	BLUE/BLACK
2F	CONTROL GROUND	RED/WHITE
24VAC	LOW VOLTAGE CONTROL	RED/BLUE
120VAC	HIGH VOLTAGE CONTROL	RED
INPUTS	INPUTS TO MICRO	BLUE/BLACK
OUTPUTS	OUTPUTS FROM MICRO	RED/BLACK
MSL	MAID LOW	BLUE/BLACK
MSH	MAID HIGH	BLUE/RED

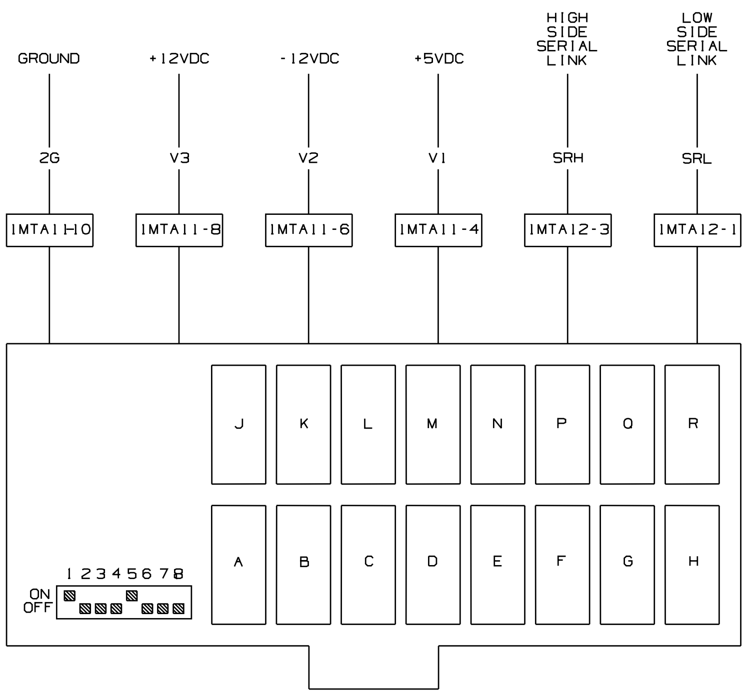


W6DT5D
MICRO 6 SYSTEMS
SHUTTLE CALL
SCHEMATIC: BOARD TO BOARD WIRING
110V1P50HZ/120V1P60HZ
PELLERIN MILNOR CORPORATION

10 11 12 13 14 15 16 17



00 01 02 03 04 05 06 07 08 09



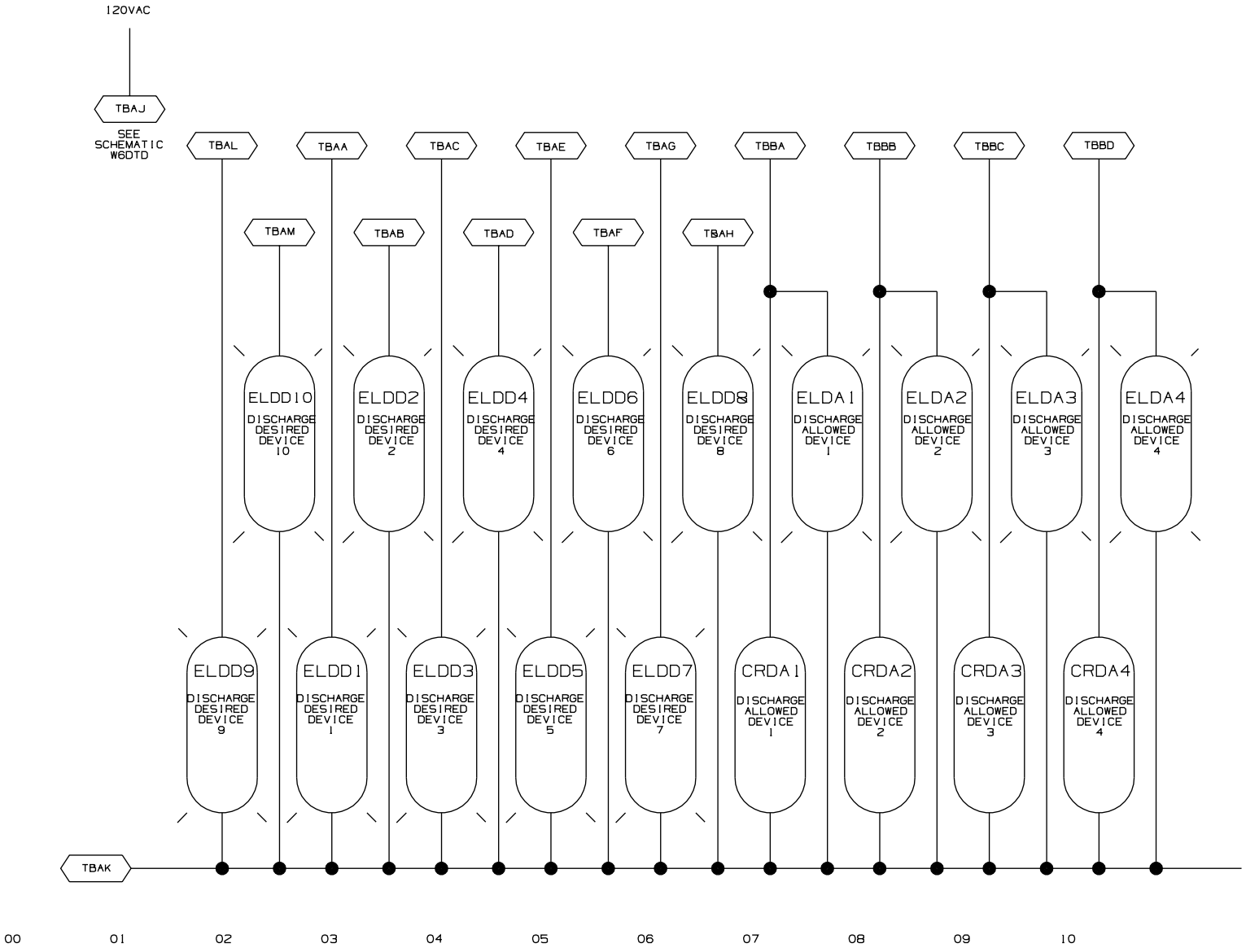
NOTES:
1. THIS DATA IS CONFIGURABLE.

W6DT5DP

MICRO 6 SYSTEMS
SCHEMATIC: SHUTTLE CALL CONTACT DATA PASS
(16 OUTPUT)

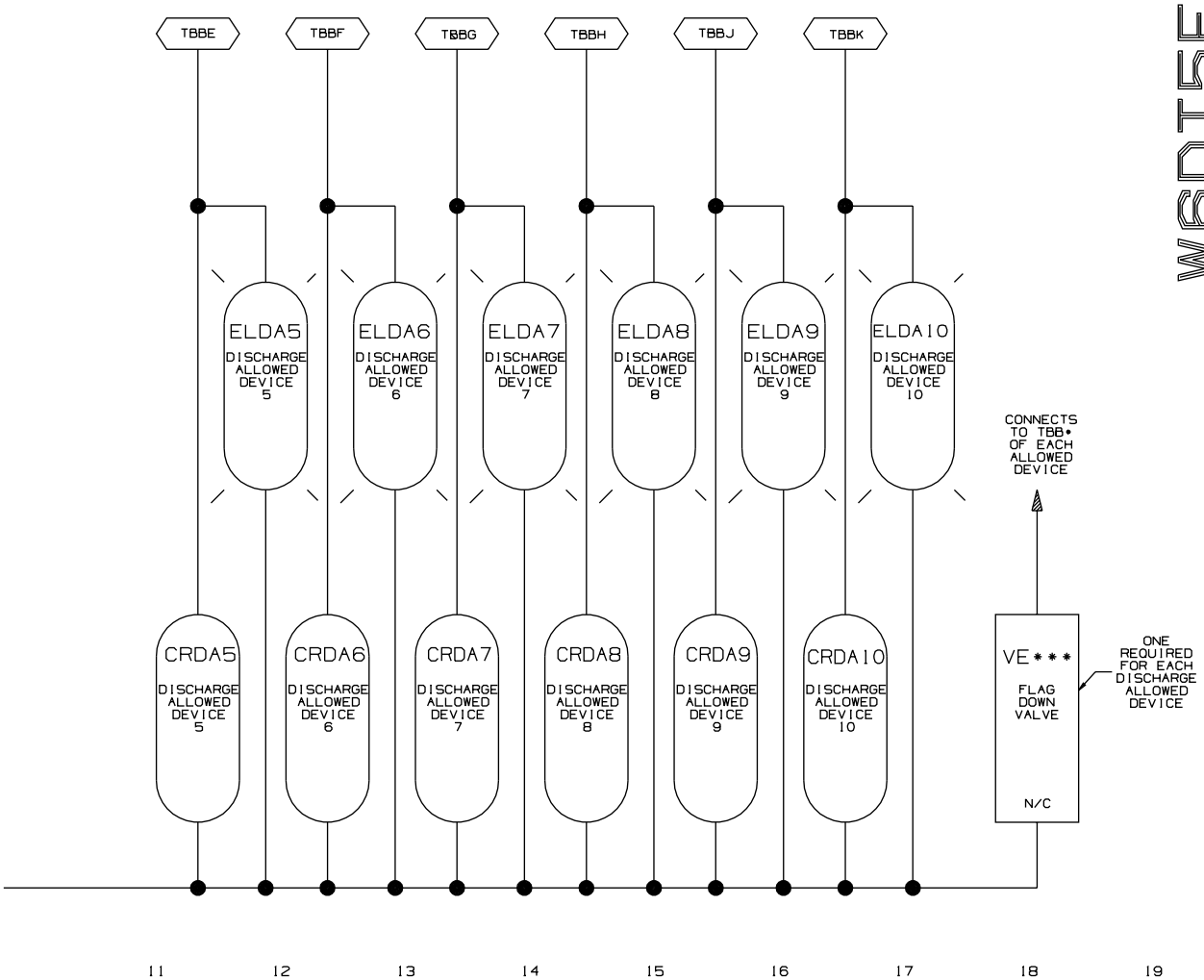
PELLERIN MILNOR CORPORATION

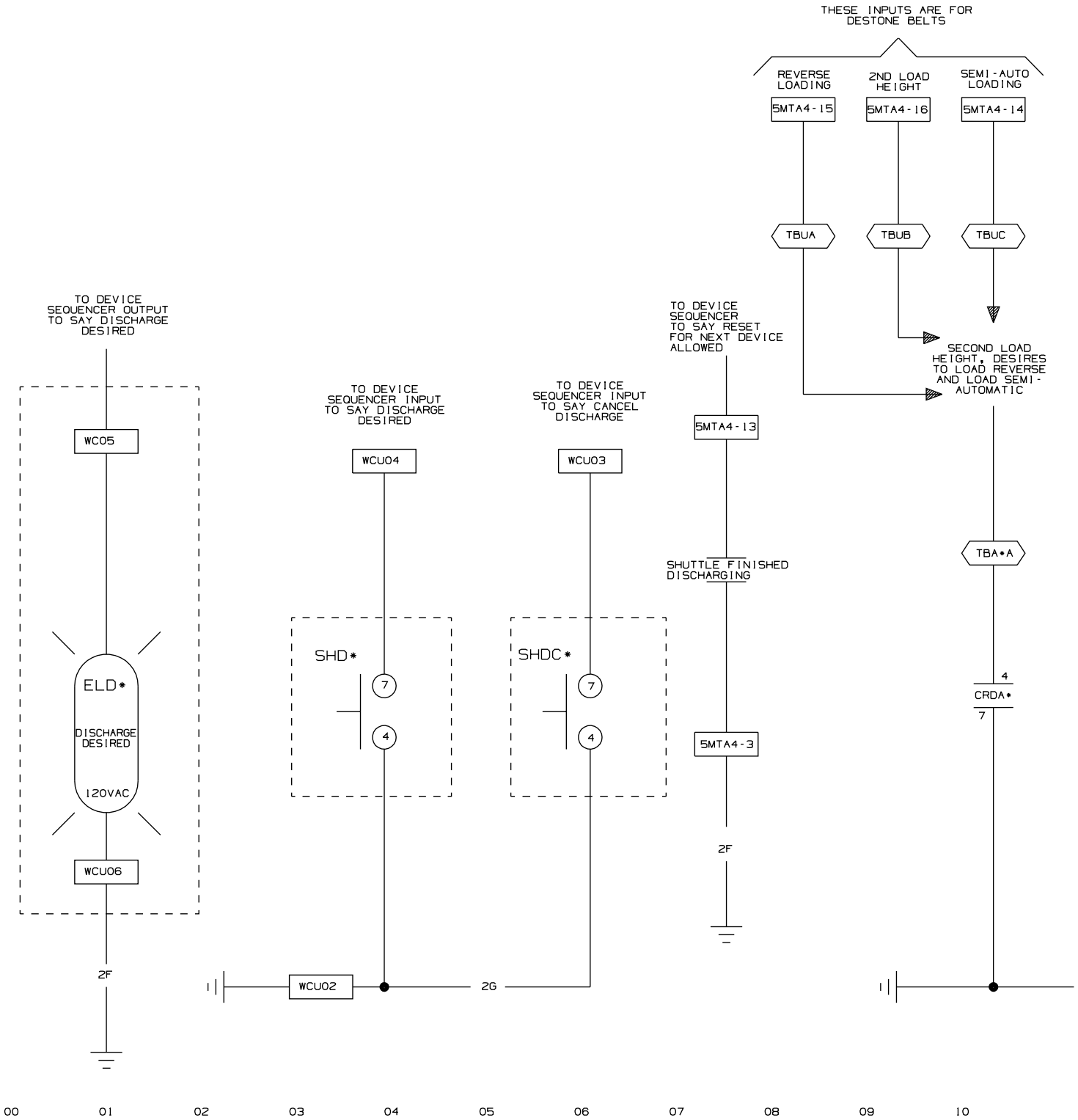
10 11 12 13 14 15 16 17


120VAC
TBAJ
SEE SCHEMATIC W6DTD
TBAL
TBAA
TBAC
TBAE
TBAG
TBBA
TBBB
TBBC
TBBD
TBAM
TBAB
TBAD
TBAF
TBAH
ELDD10 DISCHARGE DESIRED DEVICE 10
ELDD2 DISCHARGE DESIRED DEVICE 2
ELDD4 DISCHARGE DESIRED DEVICE 4
ELDD6 DISCHARGE DESIRED DEVICE 6
ELDD8 DISCHARGE DESIRED DEVICE 8
ELDA1 DISCHARGE ALLOWED DEVICE 1
ELDA2 DISCHARGE ALLOWED DEVICE 2
ELDA3 DISCHARGE ALLOWED DEVICE 3
ELDA4 DISCHARGE ALLOWED DEVICE 4
ELDD9 DISCHARGE DESIRED DEVICE 9
ELDD1 DISCHARGE DESIRED DEVICE 1
ELDD3 DISCHARGE DESIRED DEVICE 3
ELDD5 DISCHARGE DESIRED DEVICE 5
ELDD7 DISCHARGE DESIRED DEVICE 7
CRDA1 DISCHARGE ALLOWED DEVICE 1
CRDA2 DISCHARGE ALLOWED DEVICE 2
CRDA3 DISCHARGE ALLOWED DEVICE 3
CRDA4 DISCHARGE ALLOWED DEVICE 4
TBAK
00
01
02
03
04
05
06
07
08
09
10

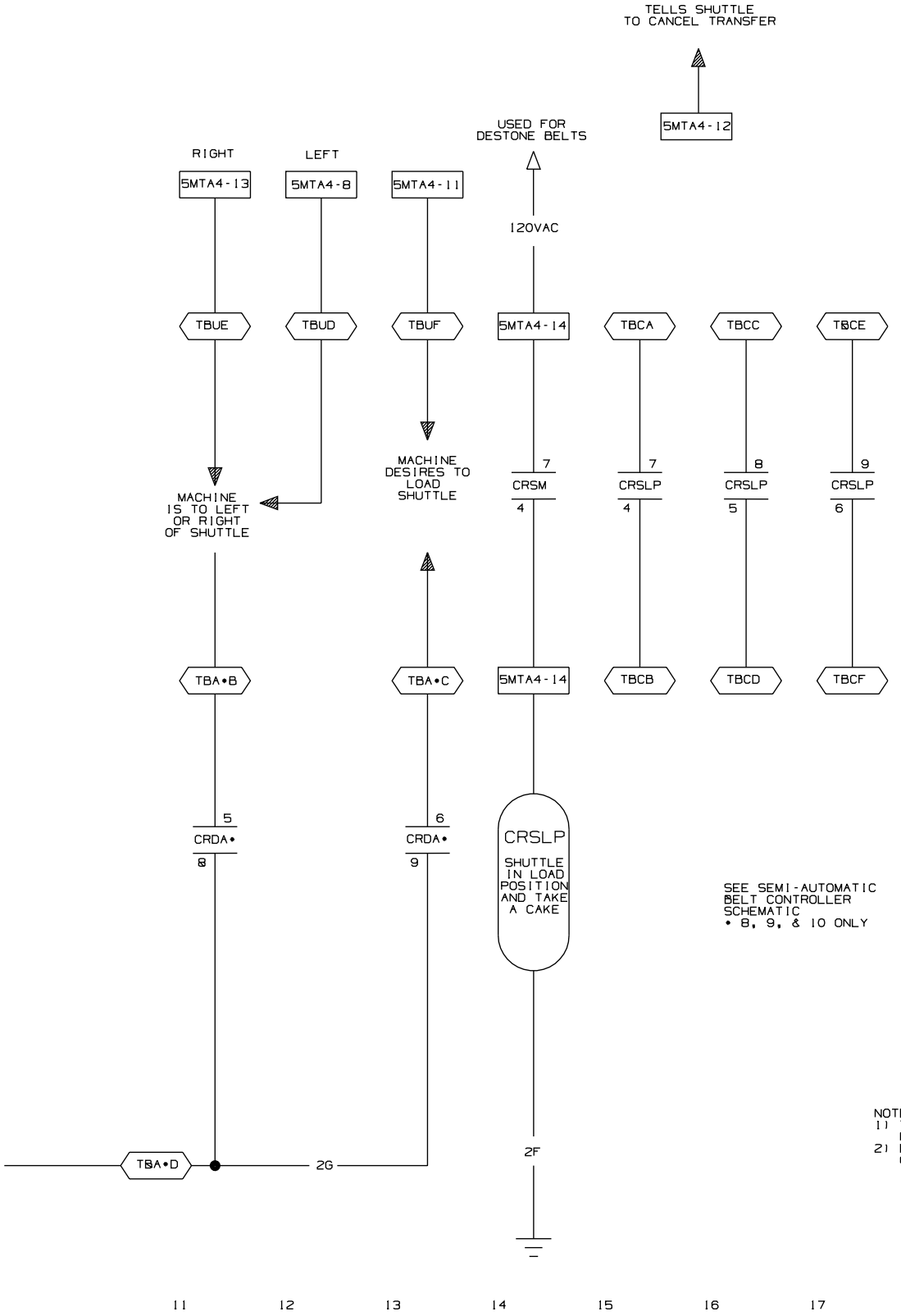
W6DT5E
MICRO 6 SYSTEMS
SCHEMATIC: SHUTTLE CALL

PELLERIN MILNOR CORPORATION





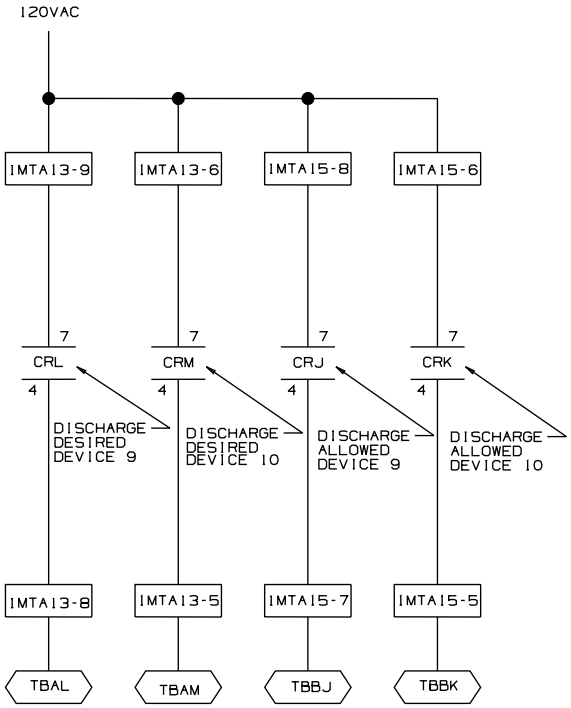
W6DT5F
2000122B

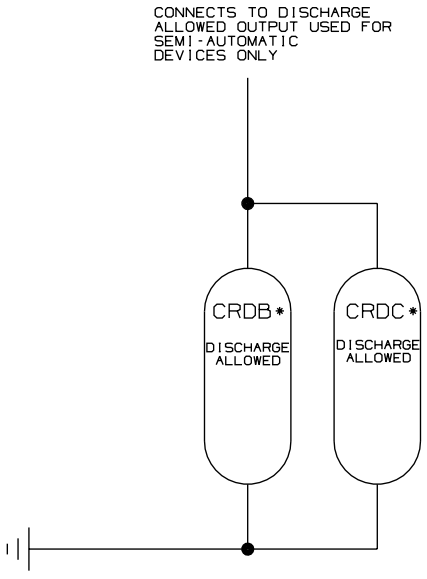


W6DT5F
MICRO 6 SYSTEMS
SCHEMATIC: SHUTTLE CALL

PELLERIN MILNOR CORPORATION

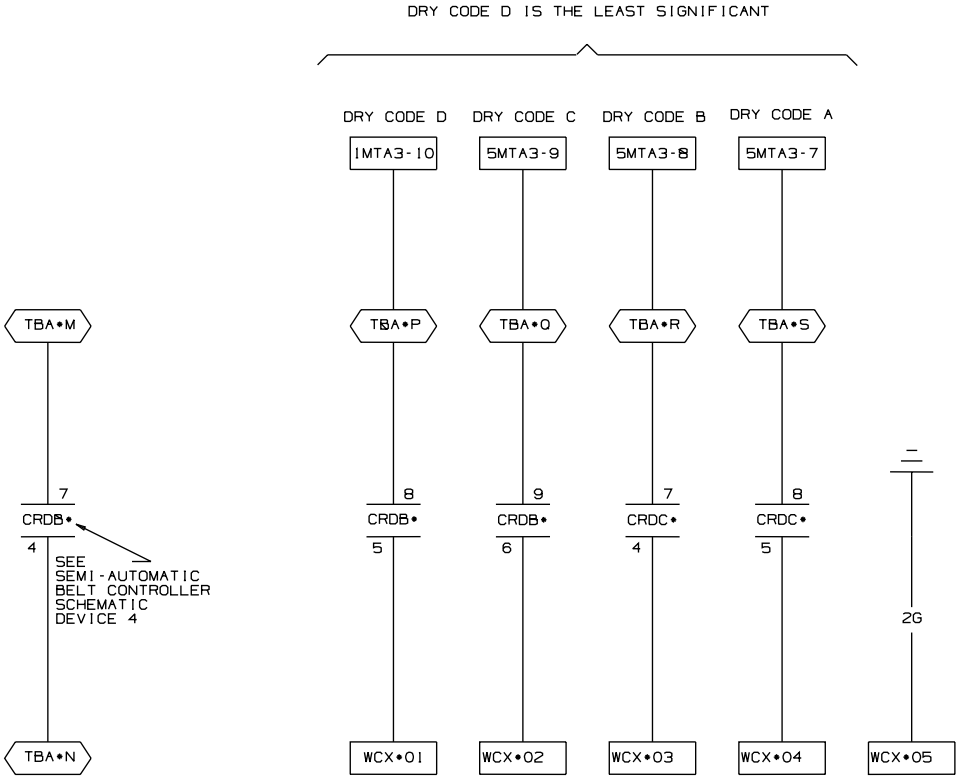
NOTES:
1) THE • NOTES THE MACHINE NUMBER
2) DOTTED LINES ARE COMPONENTS ON W/E





00 01 02 03 04 05 06 07 08 09

W6DT5G
20001228



W6DT5G
MICRO 6 SYSTEMS
SCHEMATIC: SHUTTLE CALL

PELLERIN MILNOR CORPORATION

NOTE:
• = DEVICE NUMBER

10 11 12 13 14 15 16 17