



**Model TR-6-2 & Accessories
Fixture Interface Module
INSTRUCTION MANUAL**

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Overview

The Model TR-6-2 is a general purpose test fixture interface. It is configured for convenient wire-wrapping or may be plugged directly into the cable attached to the Model TR-6 Functional Test System. The module may be mounted inside a test fixture or external to the System. The Model TR-6-2 has a number of plug-in accessories which are described later in this manual. The basic functions of the Model TR-6-2 and accessories are as follows:

- Model TR-6-2 General purpose test fixture interface, with relay drivers for eight power relays or four TR-6-2-SWOs. Includes 3"x 3" breadboard area and sockets for two TR-6-2-DMMs and a TR-6-2-CT.
- Model TR-6-2-THC 50 position interface cable that connects the Model TR-6-2 to a Model TR-3-2 test interface block
- Model TR-6-2-RLY Plug-in 10 Amp, 2 Form C relay
- Model TR-6-2-SWO Plug-in 17 Form C relay
- Model TR-6-2-SWC 17 position interface cable that connects the Model TR-6-2-SW0 to a Model TR-3-2 test interface block
- Model TR-6-2-CT Plug-in dual channel Universal Counter/Timer buffer and prescaler
- Model TR-6-2-DMM Plug-in low frequency differential buffer amplifier

The Model TR-6-2 and its accessories are described in detail in this manual, along with applications information. Schematics are included at the end of the manual.

Model TR-6-2 Fixture Interface Module

The Model TR-6-2 Fixture Interface Module is designed to be used inside or near the UUT fixture to help support functional test operations. Connecting to the Model TR-6, it provides a number of special capabilities with wire-wrap terminals for connection to the UUT and test point electronics. The basic module contains fundamental capabilities, and by setting jumpers and adding components as necessary, you can perform a number of specialized functions.

Under automated control of the Model TR-6, it provides power relays that can be used to switch power supplies or other signals to the UUT, an optional interface to the

counter/timer that allows you to redrive or frequency-divide low-level UUT oscillator signals, optional dual instrumentation amplifiers that can buffer and differentially amplify low level signals for the DMM, two shunt locations for current monitoring and a bread-board area for custom circuitry.

The Fixture Interface includes stand-offs for easy mounting inside the fixture or on any flat surface. The 50-pin ribbon cable from the Model TR-6 back panel can be directly plugged into the Fixture interface, or when used inside a Model TR-3-XXXX vacuum test head, the special Model TR-6-3-THC plugs directly from the Fixture Interface to the inside of the fixture wiring block connected to the Model TR-6.

The basic Fixture Interface contains two power relays, connectors and interface circuits. You can install your own components to tailor it to your application or purchase kits from CheckSum to populate it as necessary. The Model TR-6-RLY is an additional power relay (up to 8 can be installed), the Model TR-6-CT is the counter/timer interface, the Model TR-6-2-DMM is the DMM signal conditioner interface parts, and the Model TR-6-2-SWO allows change-over of test points from one source to another (or isolation of the test points to eliminate loading).

Mechanical

- Size: 8" x 6.9" x 2.5" (with relays installed)
- Mounting: 8-3/4" x #6 screws (not included)

Relay Switching

- Contact Rating: 10A, 250VAC, 240VA
- Two DPDT Power Relays Installed (socketed for six additional).
- Control using Model TR-6 Digital Output

Plug-in Modules

- Socketed for two TR-6-2-DMM signal conditioners
- Socketed for one TR-6-2-CT UCT signal conditioner
- A TR-6-2-SWC can be installed in each pair of relay sockets (maximum four)

Breadboard Area

- 3" x 3" with plated through holes on .1" centers. All holes on one edge are grounded.

Input/Output

- Model TR-6 interface via 25x2 pin header or 25x2 wire-wrap header
- Standard dual power relays via dual 4-pin header. Optional relays via wire-wrap pins.

Installation

The TR-6-2 has eight mounting stand-offs that facilitate easy chassis mounting. The assembly is typically mounted in the fixture head such as the CheckSum TR-3-1620 or CheckSum TR-5-1216.

When mounted inside the TR-3-1620, the interface to the System electronics is usually via the TR-6-2-THC cable as described below, and connection to the test board wire wrapped from the TR-6-2 to the underside of the test probes. When mounted in the TR-5-1216, input and output would usually be done via wire-wrap posts.

The Model TR-6-2 can be mounted external to the test fixture. Connector P4 is configured to allow direct connection to the cable coming from the rear of the Model TR-6 System Module. The pin-out of P4 is shown on the third page of the schematics at the end of this manual, and is identical to the pin-out of the connector on the rear of the Model TR-6 System Module.

Model TR-6-2-THC Interface Cable

The Model TR-6-2-THC is specifically designed for interfacing the Model TR-6-2 directly with a Model TR-3-2 interface block mounted inside a Model TR-3-XXXX Vacuum Test Head.

The TR-6-2-THC Cable is 20" long with a 25x2 connector on one end and a three 17x1 connectors on the other. The 25x2 connector should be plugged into P4 on the TR-6-2 assembly. The three 17x1 connector should be plugged into the appropriate TR-3-2 interface block so that it aligns with the correct signals routed from the Model TR-6, through the Model TR-3 Vacuum Receiver and TR-3-1 Wiring Test Points. In the standard CheckSum configuration, the TR-6 connections are on Interface Block K as follows:

TP1601	K103	TP1602	K104
TP1603	K105	TP1604	K106
TP1605	K107	TP1606	K108
TP1607	K109	TP1608	K110
TP1609	K111	TP1610	K112
TP1611	K113	TP1612	K114
TP1613	K115	TP1614	K116
TP1615	K117	TP1616	K118
CHASSIS GND	K119	RELAY 2 NC	K120
RELAY 1 NC	K121	RELAY 2 COM	K122
RELAY 1 COM	K123	RELAY 2 NO	K124
RELAY 1 NO	K125	RELAY 4 NC	K126
RELAY 3 NC	K127	RELAY 4 COM	K128
RELAY 3 COM	K129	RELAY 4 NO	K130
RELAY 3 NO	K131	UCT CH2 IN	K132
UCT GATE IN	K133	UCT CH1 IN	K134
SQRV OUT	K135	ANALOG GND	K136
SINE OUT	K137	DCV OUT	K138
DMM IN LOW	K139	DMM IN HI	K140
DIGIO1	K141	DIGIO2	K142
DIGIO3	K143	DIGIO4	K144
DIGIO5	K145	DIGIO6	K146
DIGIO7	K147	DIGIO8	K148
EXTERNAL I/O	K149	+5V FUSED	K150
-12V FUSED	K151	+12V FUSED	K152

Refer to page 3 of the schematic section for P3 and P4 pin-out on the Model TR-6-2.

Model TR-6-2-RLY Relay

The Model TR-6-2-RLY is a plug-in relay for the Model TR-6-2. The TR-6-2 is normally configured with 2 relays installed. Six TR-6-2-RLYs may be installed for a total of eight. (Note that each TR-6-2-SWO installed uses up two of the relay sockets.) Connection to the additional relay is done via wire-wrap pins.

Specifications

- Contact Configuration DPDT (2 Form C)
- Contact Rating 10A, 250VAC, 240VA
- Control using Model TR-6 Digital Output

Installation and Operation

The relays can be plugged into sockets K1 through K8 and are controlled by the test type DIGO. For detailed information on the DIGO test type refer to the Model TR-4/6 Instruction Manual.

The DIGO range for controlling TR-6 functions is 13. Each bit is assigned a value in the highlimit and each bit is set high by including this value in the HighLimit column of the test program. A relay is turned on when its bit is set LOW and OFF when its bit is set HI. The relay number and assigned bits are as follows:

Relay	Assigned Bit
K1	1
K2	2
K3	4
K4	8
K5	16
K6	32
K7	64
K8	128

For example, to turn on relays 3 and 6, you would enter the following in the test file:

DIGIO Test Range = 13 Limits, High= 219

Model TR-6-2-SWO Switch-Over Module

The Model TR-6-2-SWO is a 17-pole double-throw relay. Each TR-6-2-SWO uses up two relay sockets. A maximum of 4 may be installed in a Model TR-6-2.

Typical Applications:

Install in series with solid-state multiplexer test points from a Model TR-4-1 when the test points need to be isolated during power-up. Isolation will be required when voltages over 12 volts are present during functional test. Isolation may also be required to reduce the loading effects of MDA wiring during functional test.

Use as a change-over between analog test points from the Model TR-4-1 to digital test points from the Model G-80.

Input Output:

Three 17 pin wire wrap headers are provided for the common, normally open and normally closed connection. Refer to page 5 of the schematics for pin-out configuration.

Installation and Operation:

Install in two adjacent power relay sockets on the TR-6 assembly. All change-over contacts are energized simultaneously by setting the digital bit for the relay socket with the highest reference designator. For example, if a TR-6-2-SWO is installed in relay sockets K1 and K2, bit 2 should be set low to energize the change-over switch as follows:

DIGIO Test Range = 13 Limits, High= 253

Specifications:

- Contact Configuration 17PDT (17 Form C)
- Contact Rating 1A, 250VAC, 220VDC, 30VA, Silver with gold overlay.
- Control Using Model TR-6 Digital Output.

Model TR-6-2-SWC Interface Cable

The Model TR-6-2-SWC interface cable is specifically designed for interfacing the TR-6-2-SWO directly with a Model TR- 3-2 interface block mounted inside a Model TR-3-XXXX Vacuum Test Head.

The TR-6-2-SWC is 20" long with a 17x1 connector on each end. This connector is designed to plug directly on .1" space wire-wrap pins.

Model TR-6-2-CT Counter/Timer Conditioner Kit

The Model TR-6-2-CT is a dual-channel high-speed comparitor with selectable 1/2/4/8/16 dual divider. The kit includes the following:

U1	EL2252CN	Dual Comparitor
U2	74F393N	Dual Binary Divider
J1,J2	SMA Jack	

Installation:

Plug the EL2252CN in to socket U1, observing correct orientation. Plug the 74F393N in to socket U2, observing correct orientation.

The SMA jacks may be installed in J1 and J2, or wires may be soldered directly to the center connections.

For jumper installation, refer to the page 1 of the schematic section. If you plan to use the Universal Counter through the test point matrix of the TR-4-1 or TR-6-1, you should not connect the Channel 1 jumper, as this will be in parallel with that input.

J2/UCTCH2IN should be the first channel used by the conditioner as this is not routed through the switching matrixes. If you do not wish to feed the signals directly in to the UCT inputs, then the appropriate divider output may be wire-wrapped to one of the test points (TP1601 to TP1616) on P3, the TR-6 System Module connector.

Specifications:

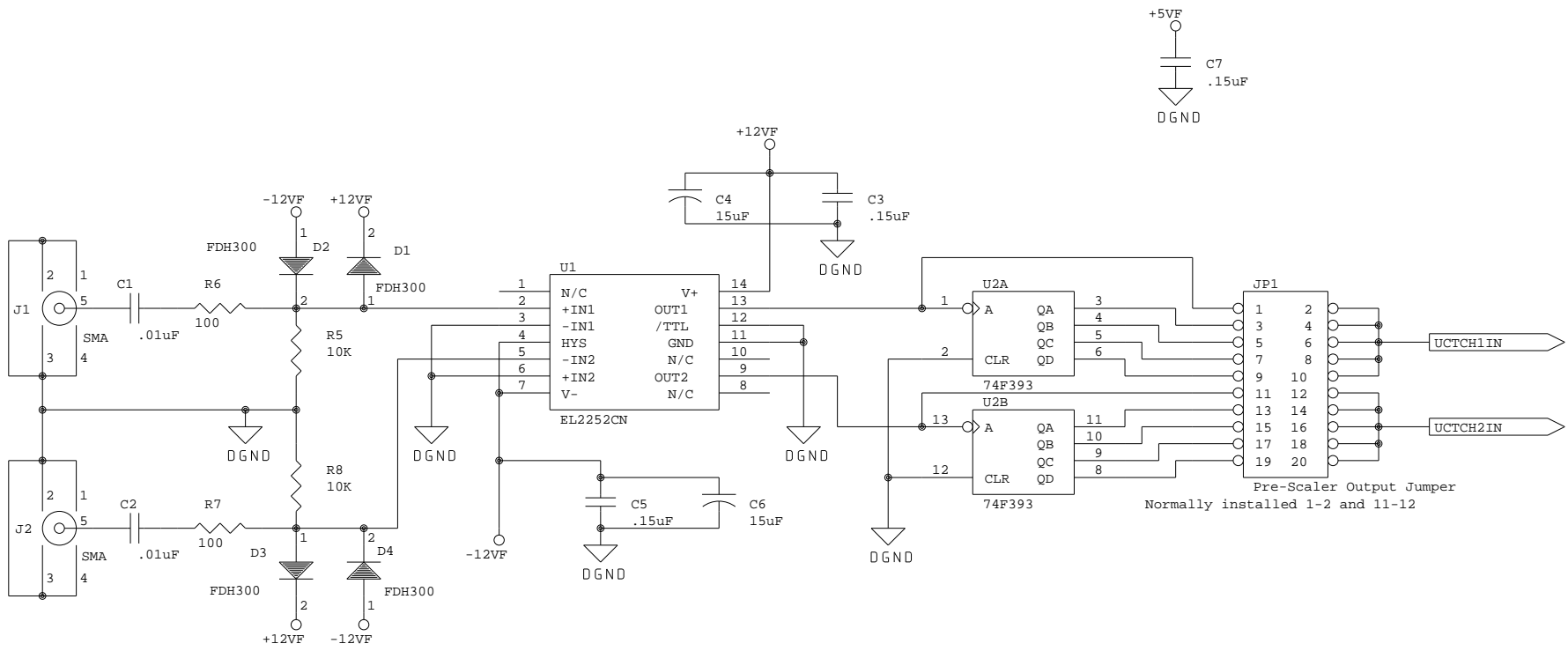
- Number of Channels 2
- Input Frequency 10KHz to 50MHz
- Coupling AC only
- Input Impedance 50 pF in parallel with 10 K Ω
- Sensitivity 200mV RMS
- Maximum input $\pm 5V$
- Hysteresis 60mV
- Division 1, 2, 4, 8 or 16
- Output TTL levels

Model TR-6-2-DMM Signal Conditioner Kit

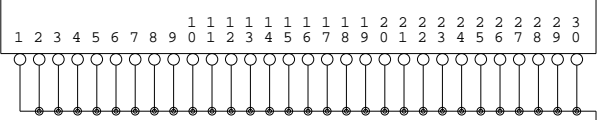
The Model TR-6-2-DMM is a high impedance differential buffer/amplifier suitable for preconditioning signals feeding the DMM function of the Model TR-6 System Module. Two of the kits may be installed in the Model TR-6-2 Assembly. The kit includes the following:

U3 or U4	AD620AN	Instrumentation	Amplifier
R8 or R9	5.49K and 499 Ω		

Schematics

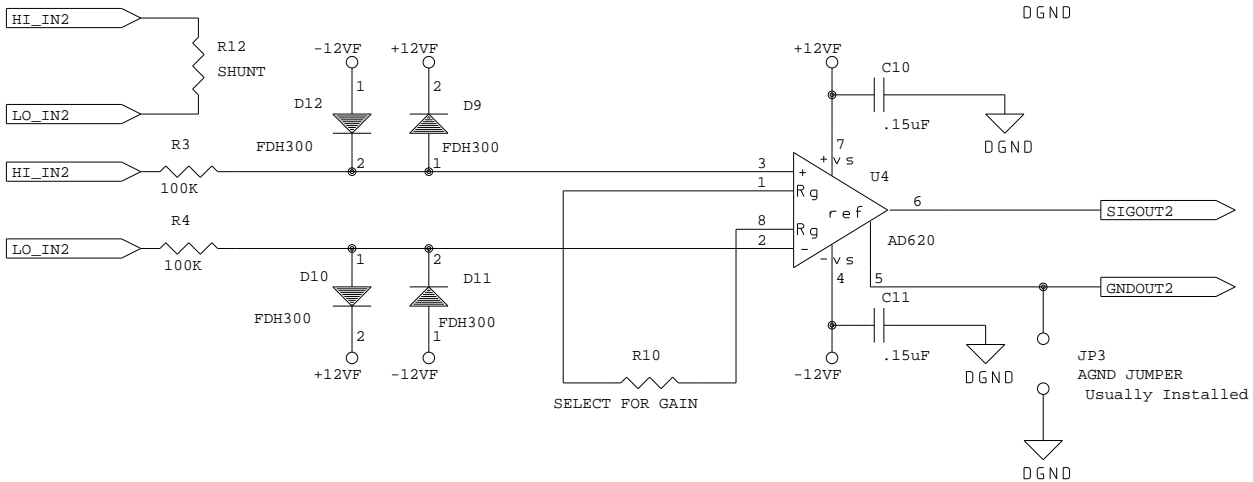
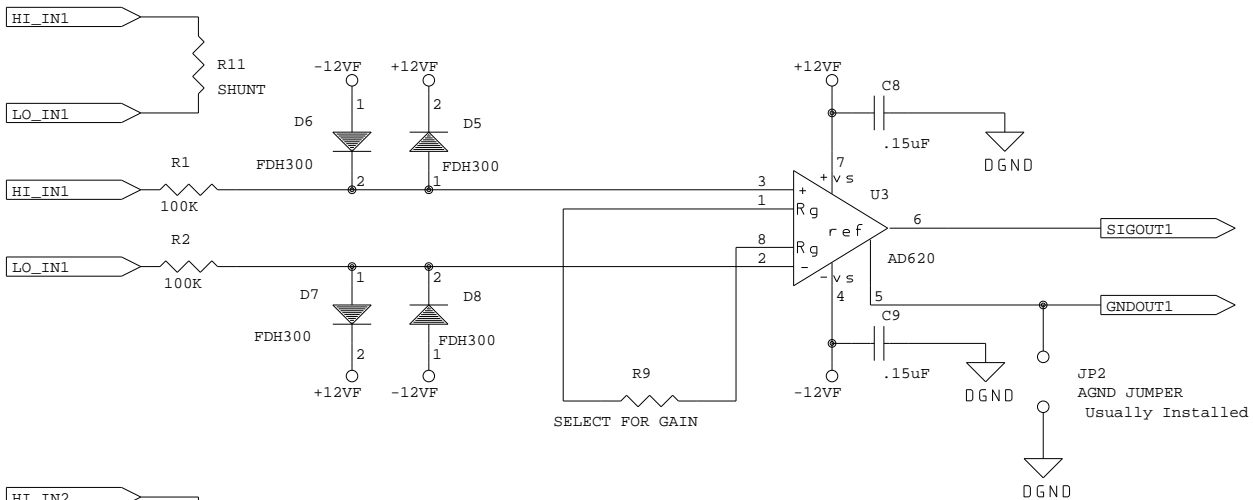


lower holes of breadboard area

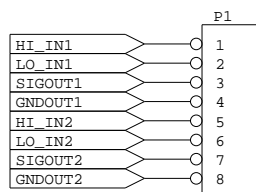


countpre

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Date:	December 28, 1992	Sheet 1 of 4

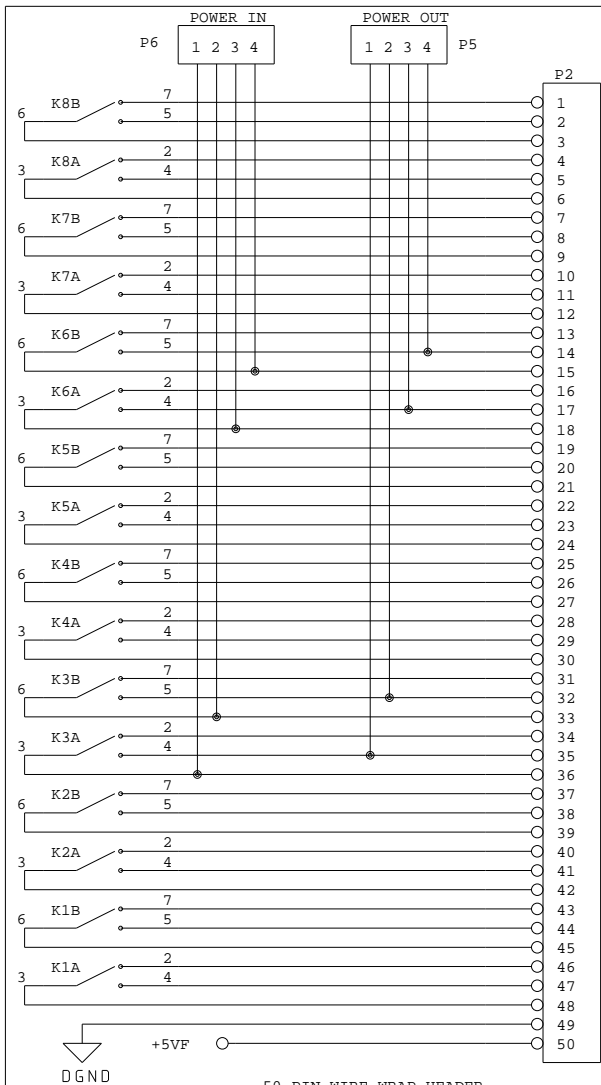


GAIN	R9/R10
1	open
10	5.49K
100	499
1000	49.4

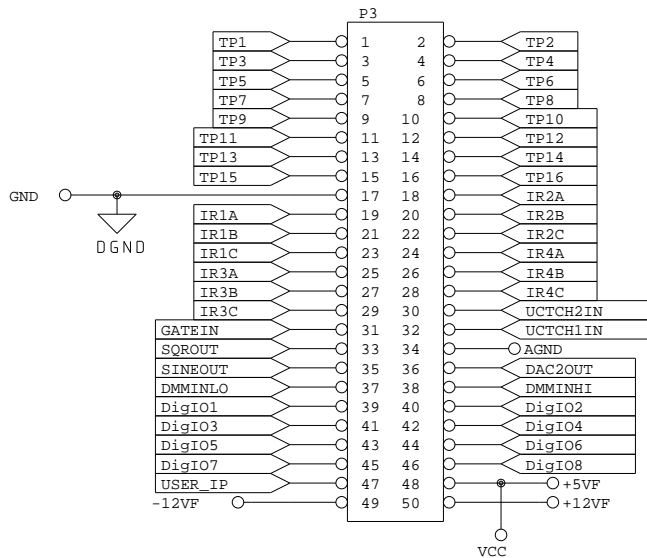


Wire Wrap Header for Sig Cond.

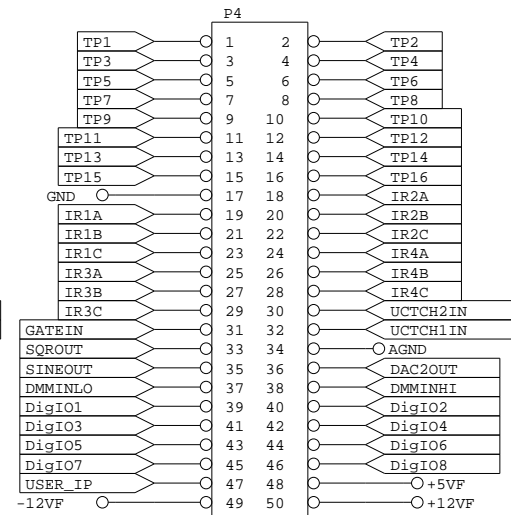
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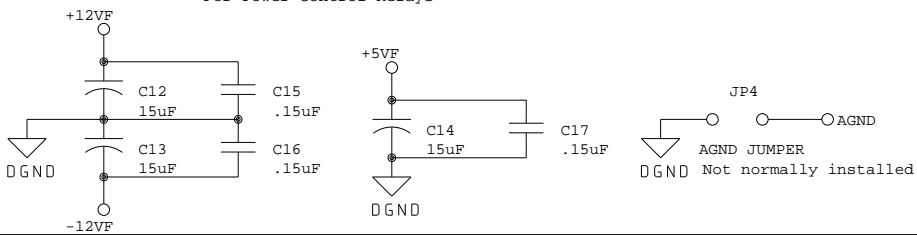
50 PIN WIRE WRAP HEADER
For Power Control Relays



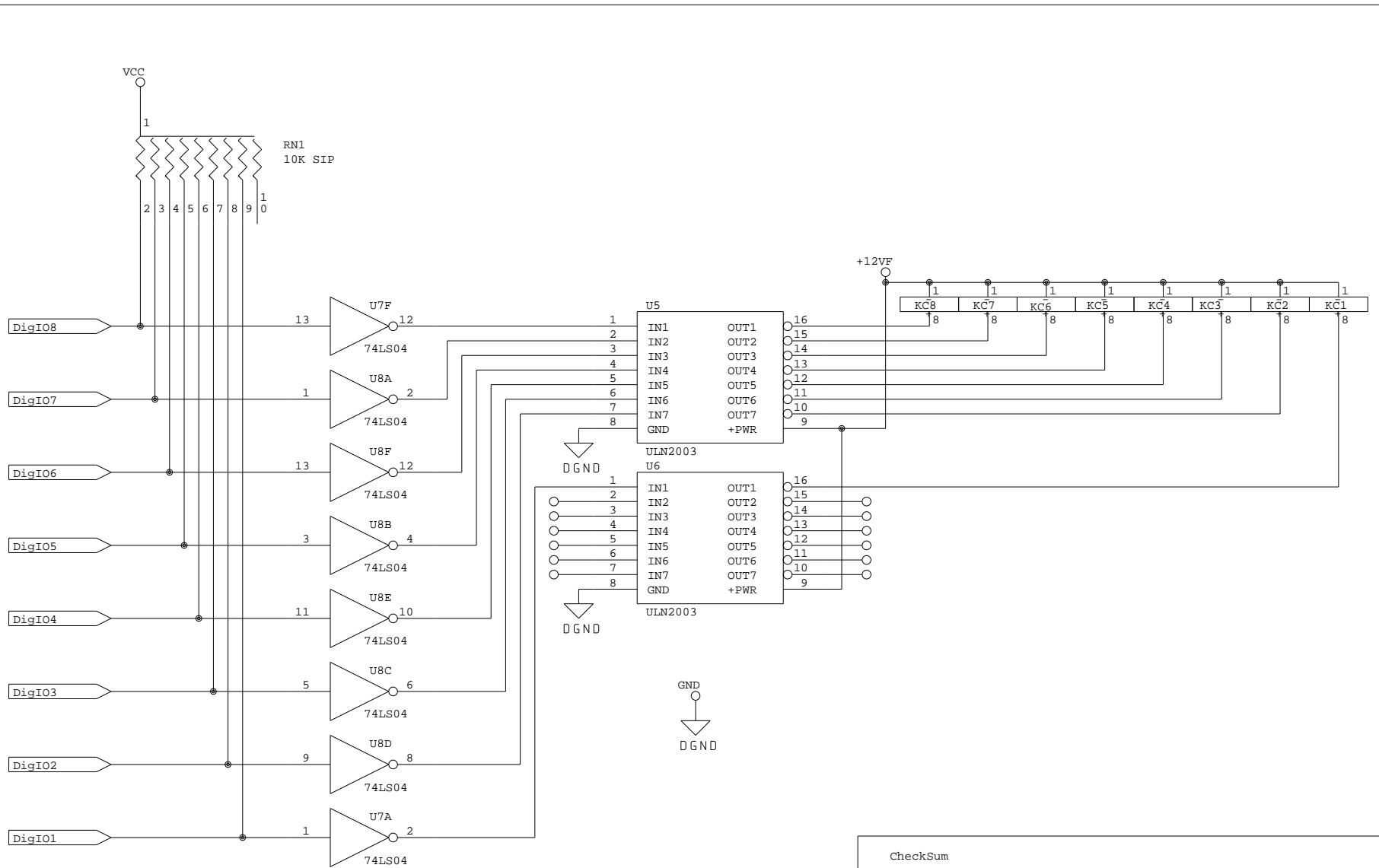
Wire Wrap Header for TR6
In Parallel with TR6 inputs



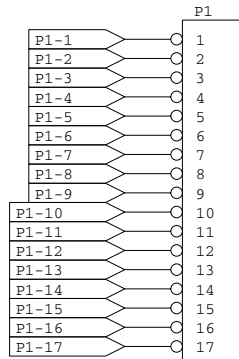
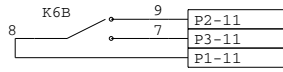
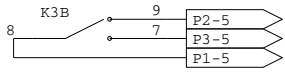
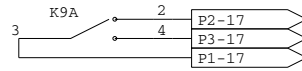
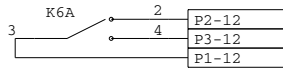
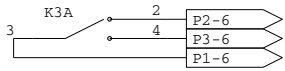
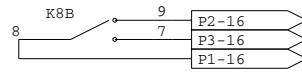
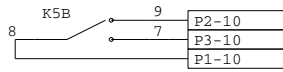
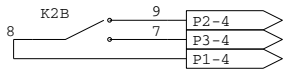
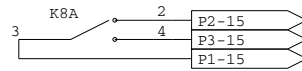
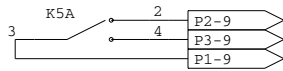
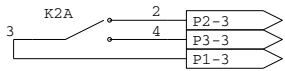
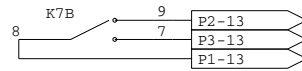
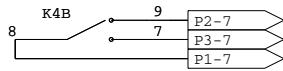
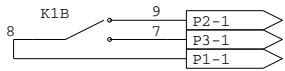
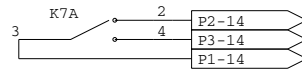
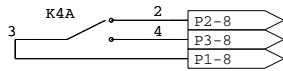
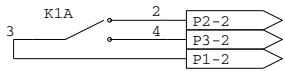
ON BOARD CONNECTOR TO TR6
50 Pin Protected Header



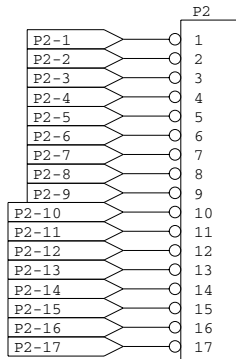
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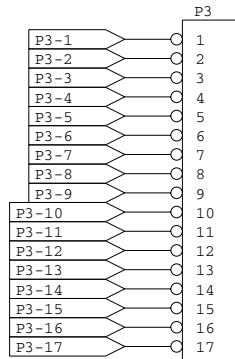
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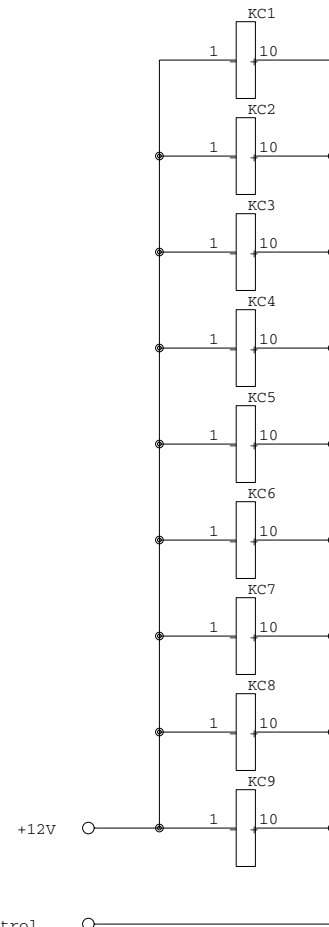
INPUT



NORMALLY
CLOSED



NORMALLY
OPEN



Control
using lower relay
socket

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