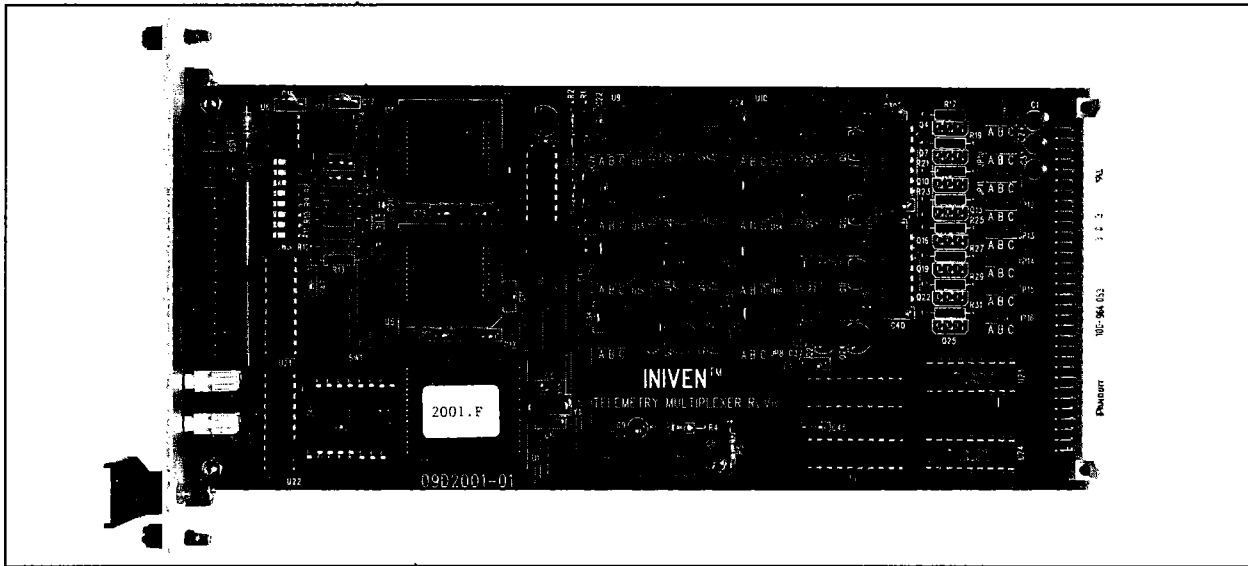


# INIVEN

## INSTRUCTION MANUAL

### IMR-98 AND IMR-98-1U

(INCLUDES IM-RELAY SCHEMATIC & I/O RELAY TERMINAL CONNECTIONS)



**Fig. 1. IMR-98MUX Demultiplexer Receiver**

**DESCRIPTION:** The IMR-98 and IMR-98-1U are programmable analog receivers when used in conjunction with the INIVEN IMT-98 and IMT-98-1U comprise a subsystem capable of receiving up to 8 analog quantities and sixteen discrete (ex. controls, status) functions. The units work in conjunction with INIVEN's Series 98 FSK receivers as well as other modems over a voice frequency communication media.

The demultiplexer receivers are switch programmable for baud rates from 50 to 600 in eight steps. Options for 1200 and 2400 baud operation and polling applications are available.

A second switch permits field programming of various standard analog output voltage and current ranges. Applications requiring other ranges are accommodated via a resistor change. Bi-polar and uni-polar are available with the highest range being +/- 10 volts.

#### **FEATURES:**

- 8 analog and 16 discrete quantity capability with added security through BCH coding.
- No CALIBRATION required. Transparent operation.
- Dip Switch Programmable for analog output ranges, baud rate, unpolar or bi-polar, status (scan) fail, 8 or 16 discrete update times and zero status or hold last status.
- Holds last data on loss of signal.

**SPECIFICATIONS:**

Analog outputs: 0, up to 4, up to 8.

Analog Resolution: 12 Bit D/A

Analog Accuracy: +/- .05% of full scale.

Analog Linearity: +/- .025%.

Output Range: Various standard voltage and current ranges. See Charts 2 & 3(pg.8 & 9).  
Maximum current output of 100mA.  
Maximum voltage output of +/- 10V.

Status Outputs: 50VDC max, 500mA max. Open collector NPN.

Digital Input: 2.5V to 30V peak.

**Environmental Requirements:**

Temperature Range: -30 to +70° C (-22 to +158° F).

Relative Humidity: 95% maximum, non condensing at 40° C (104° F).

Power Requirements: +5VDC 95 mA.  
+15VDC 63 mA.  
-15VDC 60 mA.

**Physical:**

Weight: 0.49 lbs. (22 Kg)

Dimensions: .999"(25.4mm) Wide by 5.04"(128mm) High by 9.76"(248mm) Deep.

Note: IR-98MUX-1U has a special front panel and is intended for use in the 1U chassis only.

When ordering, refer to Table 1 multiplexer receiver part numbers (See Buffer page 9).

**TABLE 1**

MODEL NUMBER	PART NUMBER	# OF ANALOGS	# OF DISCRETES
IMR-98-00	CC2001-00	8	16
IMR-98-1U-00	CC2124-00	8	16
IMR-98-01	CC2001-01	8 W/BUFFER	16
IMR-98-1U-01	CC2124-01	8 W/BUFFER	16
IMR-98-02	CC2001-02	0	16
IMR-98-1U-02	CC2124-02	0	16
IMR-98-03	CC2001-03	4	16
IMR-98-1U-03	CC2124-03	4	16
IMR-98-04	CC2001-04	4 W/BUFFER	16
IMR-98-1U-04	CC2124-04	4 W/BUFFER	16

## **SAFETY**

Standard safety precautions must be followed at all times when installing, operating, servicing, and repairing this equipment. INIVEN/CONOLOG CORP. assumes no liability for failure to observe standard or specifically noted safety requirements or to use this equipment for purposes other than intended.

### **GROUNDING:**

A suitable ground is required to reduce the hazard of shock. Refer to the enclosed module, chassis, and/or cabinet wiring diagram for ground connection locations.

### **ENVIRONMENT:**

Operation of any electrical equipment in any area containing gases, fumes, wet, or damp is a potential safety hazard. Necessary precautions should be taken.

### **MANUAL:**

Operators and maintenance personnel should read this manual before installing the equipment and placing it in service. Only properly trained personnel with proper tools and equipment should operate, maintain, repair, or service this equipment.

### **SHOCK:**

Potentially dangerous electrical shock can occur whenever working on this product. Protective measures and safety procedures should be observed at all times.

### **THEORY OF OPERATION:**

**GENERAL:** The unit accepts the digital word from the IMT-98MUX and outputs the 8 analog and 16 discrete quantities.

**DIGITAL CODE:** The code contains 5 digital words. Each word has a length of 8 bits, 1 start, 1 stop and 1 parity. The first word contains the BCH security code. The second word contains the eight (8) most significant bits of the Analog to Digital converter. The third word contains the next four (4) least significant bits of the Analog to Digital converter, 3 bits for the address code and 1 extra bit for security. The fourth word contains the first 8 status bits, while the fifth and final word contains the remaining eight (8) status bits.

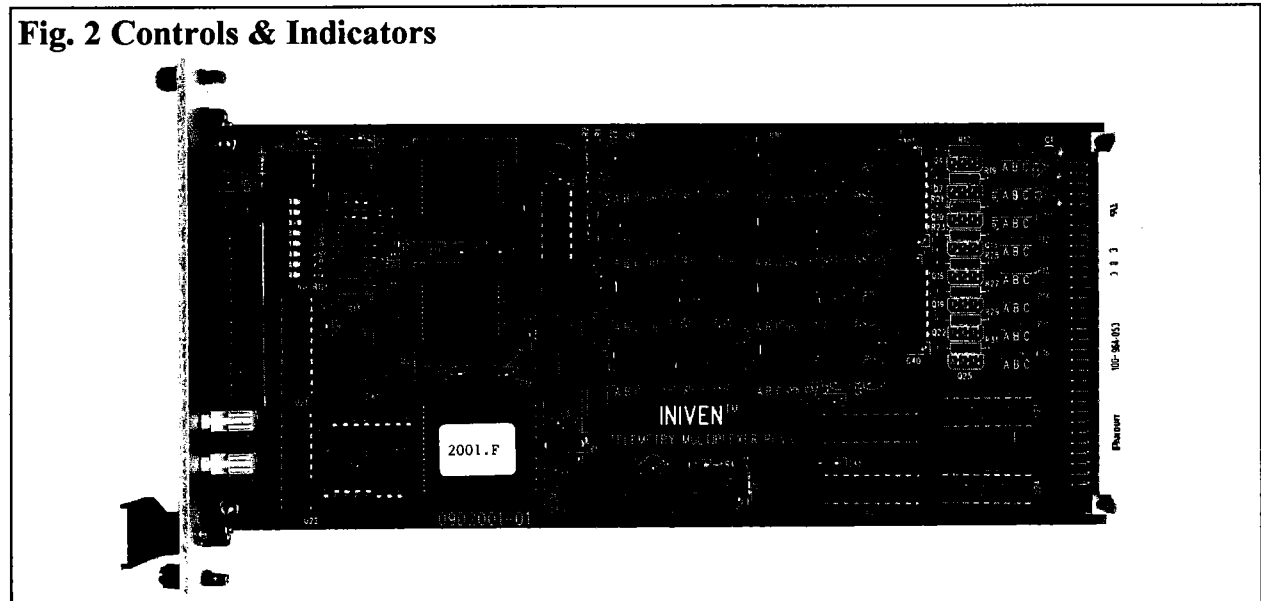
**PROGRAMMING:** Upon applying power to the unit the micro controller reviews the program information which has been set by programming switches SW1 & SW2.

**INPUT:** The unit accepts the digital serial input from the IMT-98MUX transmitter.

**MICRO CONTROLLER:** The Micro Controller (U1) accepts the serial data signal from the IR-98DSP (or other modem) and outputs the 8 analog information to the digital to analog converters (U4 & U5).

**OUTPUT:** The voltage for the Digital to Analog converters is through U6 & U7. When current output is desired, U9 through U16 convert the voltage from the Digital to Analog converters (U4 & U5) to current output. If only voltage output is desired, U12 through U16 are buffers.

When using the 16 discrete outputs, U23 and U24 drive the relay outputs.



**Table 2 Controls and Indicators**

- DS1 Indicator (**DATA IN**), lights when data is being inputted.
- DS2 Indicator (**UPDATE**), lights when a valid word has been accepted (update).
- DS3-DS10  
Indicators (**1 through 16**), light when discrete value will output.
- SW1 Switch, controls status fail light.
- SW2 Switch, programs baud rate, unipolar or bi-polar, gain, 8 or 16 status' being used, zero status or hold last status.
- SW3 Switch, selects analog output ranges.
- J1,J9 Jumpers, determines current or voltage output for Analog Channel #1.
- J2,J10 Jumpers, determines current or voltage output for Analog Channel #2.
- J3,J11 Jumpers, determines current or voltage output for Analog Channel #3.
- J4,J12 Jumpers, determines current or voltage output for Analog Channel #4.
- J5,J13 Jumpers, determines current or voltage output for Analog Channel #5.
- J6,J14 Jumpers, determines current or voltage output for Analog Channel #6.
- J7,J15 Jumpers, determines current or voltage output for Analog Channel #7.
- J8,J16 Jumpers, determines current or voltage output for Analog Channel #8.

## **INSTALLATION:**

**GENERAL:** Series 98 equipment is supplied in various forms depending on the application and system purchased. When supplied loose the module must be installed in a chassis and interwired. The method of bringing out the module inputs/outputs to the rear of the chassis is via an I/O connector (input/output). The I/O's are available in various styles, depending on application, and are purchased separate from the module. This section of the manual covers the most common supplied methods. Separate instructions will accompany equipment not covered herein.

**UNPACKING:** This equipment may be supplied loose, mounted in an individual chassis, stacked interconnected chassis, or as part of a rack or cabinet. Follow the procedure for the type of system supplied.

Loose and/or equipment mounted in an individual chassis will be packed in its own shipping carton. Inspect the carton for possible damage in transit. Open each carton carefully and remove the contents. Inspect the equipment for possible damage. Verify all items of value have been removed prior to discarding any packing material.

**NOTE:** It is suggested the carton be retained for possible onward shipment.

Interconnected chassis or equipment supplied in racks or cabinets will be supplied in special boxes, wood crates, or if shipped via air-ride van without any case. Inspect the crate or other packing for possible damage in transit. Carefully remove the equipment from the container and inspect for possible damage. Verify all items of value have been removed from the crate prior to discarding any packing material and refer to the note above.

Should transit damage be found please notify INIVEN immediately.

**MOUNTING:** After unpacking follow the appropriate mounting procedure.

Loose module: (The following is for new installations - replacement of an existing module will have the card guides already mounted, refer to **MODULE REPLACEMENT** in the maintenance section of this manual). Each I/O connector comes with two Card Guides which are to be mounted within the chassis (A one-rack unit high chassis is supplied with the card guides mounted). Locate the desired position within the chassis for which the module is to be placed. Remove blank panels if existing. Viewing the chassis from the front, the recommended arrangement is a power supply on the extreme left then followed by transmit and or receive modules working towards the right of the chassis. From the front of the chassis and with the boss side (rounded) facing to the right press the lower card guide into the holes provided for the desired location. Repeat this procedure for the upper card guide.

The I/O module, (provided separately) is installed from the rear of the chassis. Aligning the I/O with the appropriate desired location push the assembly into the chassis.

Turn the two quarter turn screws (clockwise) using a flat blade screwdriver which will secure it in place.

Install the module by sliding it into the proper slot aligning to the card guides. Once the module is firmly seated use the flat blade screwdriver to turn the two quarter turn screws on the front panel (clockwise).

**Individual Chassis:** The chassis is a 1 or 3 rack unit high frame containing two mounting ears for 19" rack mounting. Two screws appropriate for the mating hardware are required for each mounting ear (total of four per chassis) and are not supplied with the chassis. Install the chassis in the desired location and securely tighten all four screws. Spacing on the mounting ear holes are compliant with EIA and DIN standards.

Interconnected Chassis equipment mounted on shipping rails are to be mounted similar to an individual chassis. When shipping rails are provided the equipment is to be placed near the desired location. Remove the screws holding the shipping rails and then remove the rails. Slide the equipment into the rack or cabinet and secure it with proper screws for the mating hardware being used. Tighten all screws.

Systems provided in a rack or cabinet from the factory must be secured to the floor or wall as required. Mounting hardware is not supplied due to the various surfaces and mounting methods.

**CAUTION: EQUIPMENT MOUNTED IN SWING RACK TYPE CABINETS MUST BE SECURED TO THE MOUNTING SURFACE PRIOR TO OPENING THE SWING RACK TO PREVENT THE CABINET FROM FALLING.**

**VENTILATION:** Proper ventilation is required for most electronic equipment. Enclosed cabinets or rooms where this equipment is mounted should be kept at temperatures within the limits of the equipment. Operation above these limits may affect reliability.

**ELECTRICAL CONNECTIONS:** User connections are made via the I/O on the rear of the chassis. Each unit in the 98 SERIES of equipment will contain these connections in the instruction manual for the specific individual module. On equipment supplied wired from the factory or on interwired chassis and cabinets an "as supplied" drawing will be included with the equipment. External wiring should be in accordance with the "as supplied" drawing when supplied.

The IMT-98 and IMT-98-1U supplied loose may be interfaced with the I/O shown herein. External wiring is to be in accordance with the I/O used and particular interface required for your application.

**For safety reasons power on the leads to be connected to the unit are to be de-energized during installation.**

Methods of making the wiring connections to the terminal blocks vary and based on local practice. It is suggested number 20 AWG size insulated wire, stripped portion tinned, be used. Approximately 1/4" of the insulation is to be removed and inserted in the terminal strip.

Module power may be daisy chained should the application require.

Tighten all connections and insure exposed wires do not touch the chassis.

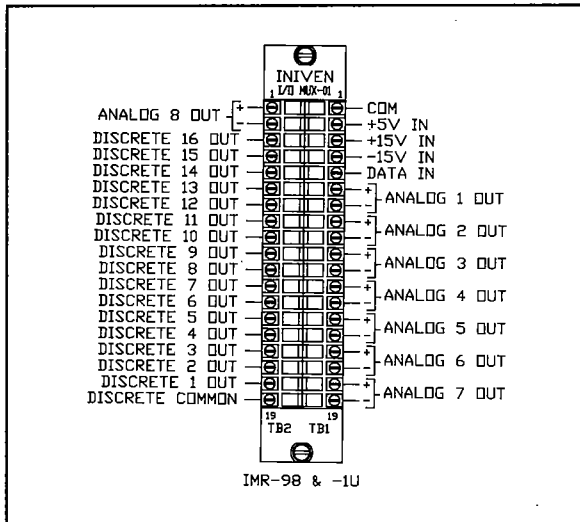


FIG. 3 Standard MUX I/O I/O MUX-01

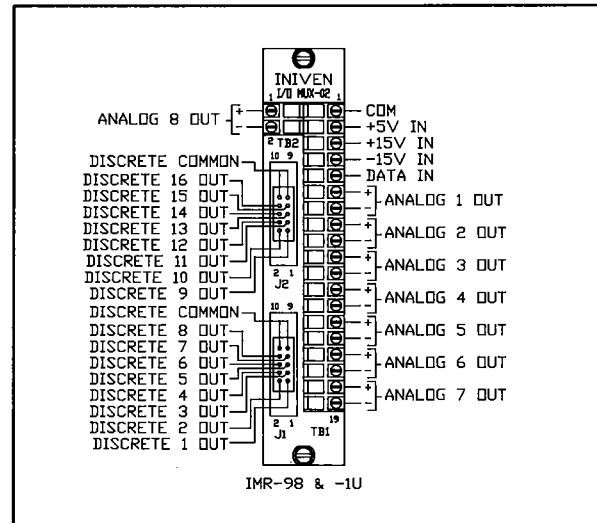


FIG. 4 Ribbon MUX I/O I/O MUX-02

### I/O MUX-01

**Description:** This I/O module is installed from the rear of the chassis. There are 38 terminal connections on the terminal block. Four connections for power, 17 connections for the discretives, 16 connections for the analogs and one for data in. The standard IMR-98 unit will permit for all inputs as shown in the programming charts.

### I/O MUX-02

**DESCRIPTION:** This I/O module is also installed from the rear of the chassis and was designed to simplify the interconnect wiring for the 16 discrete points. There are 21 terminal connections and two male ribbon connectors (for the 16 discrete outputs). These ribbon connectors are used to simplify the interconnect wiring between the I/O modules of the INIVEN IMR-98 multiplexer receiver and the IM-RLY ( 8 relay module for dry contact output ) (refer to the IM-RELAY instruction manual for schematics and I/O connections). A ribbon cable is supplied that will easily snap into the desired male ribbon connector on the I/O RIBBON and IM-RLY modules. If only 8 discrete functions are being used, the ribbon connector should be connected to J1 on the I/O RIBBON.

**CONNECTING THE RIBBON CABLE:** To connect the ribbon cable to the I/O modules please complete the following:

The ribbon cable connector can only be inserted into the male ribbon connector one way to assure proper installation. Please identify the correct direction of the cable connector first.

Once the connectors are aligned properly, firmly insert the ribbon connector into the I/O connector as straight as possible. The small levers on the top and bottom of the connector should snap into a locked position. If they do not snap into place, remove the cable, lift the before mentioned levers and retry the insertion process.

**PROGRAMMING:**

**BAUD RATE SELECTION:**

**CHART 1**

**SETTING THE BAUD RATE**

TO OBTAIN THIS BAUD RATE	SET LISTED POSITIONS OF SW2 "ON"
50	1,2,3
60	2,3
85	1,3
120	3
170	1,2
240	2
300	1
600	

NOTE: OTHER BAUD RATES AVAILABLE ON SPECIAL ORDER (EX. 1200 & 2400 BAUD)

To set the desired baud rate the user must position the switches of the Switch Bank labeled SW2 as shown in Chart 1. The multiplexer receiver (IMR-98) baud rate must correspond to that of the multiplexer transmitter on the other end of the system.

**OUTPUT VOLTAGE AND CURRENT SELECTION:**

In order to obtain the desired output range, the IMR-98 must be adjusted appropriately.

TO OBTAIN THIS RANGE	SET LISTED POSITIONS OF SW2 "ON"	SET LISTED POSITIONS OF SW3 "ON"
+/-10V		3
+/-5V	5	3
+/-2.5V	5	1,3
+/-1.25V	5	2,3
+/-1V	5	4
+/-0.5V	5	5
+/-250mV	5	1,5
+/-125mV	5	2,5
+/-100mV	5	6
+/-50mV	5	7
+/-25mV	5	1,7
+/-12.5mV	5	2,7
0-10V	4,5	3
0-5V	4,5	1,3
0-2.5V	4,5	2,3
0-2V	4,5	4
0-1V	4,5	5
0-.5V	4,5	1,5
0-250mV	4,5	2,5
0-200mV	4,5	6
0-100mV	4,5	7
0-50mV	4,5	1,7
0-25mV	4,5	2,7

NOTE: ALL JUMPERS TO BE IN POSITION "B & C"

**CHART 2  
OUTPUT VOLTAGE RANGES**



**CHART 3**  
**OUTPUT CURRENT RANGES**

TO OBTAIN THIS RANGE	SET LISTED POSITIONS OF SW2 "ON"	SET LISTED POSITIONS OF SW3 "ON"
+/-100mA		3
+/-50mA	5	3
+/-25mA	5	1,3
+/-12.5mA	5	2,3
+/-10mA	5	4
+/-5mA	5	5
+/-2.5mA	5	1,5
+/-1.25mA	5	2,5
+/-1mA	5	6
+/-0.5mA	5	7
+/-0.25mA	5	1,7
+/-0.125mA	5	2,7
0-100mA	4,5	3
0-50mA	4,5	1,3
0-25mA	4,5	2,3
0-20mA	4,5	4
0-10mA	4,5	5
0-5mA	4,5	1,5
0-2.5mA	4,5	2,5
0-2mA	4,5	6
0-1mA	4,5	7
0-.5mA	4,5	1,7
0-.250mA	4,5	2,7
4-20mA	4,5	4
10-50mA	4,5	1,3

NOTE: ALL JUMPERS TO BE IN POSITION "A & B"

**HIGH VOLTAGE/CURRENT BUFFER OPTION:**

The high voltage/current buffer option must be used only in conjunction with up to a 50V maximum loop supply and unipolar current. The following components need to be added for the buffer option:

- Channel #1 Q4 & R17
- Channel #2 Q7 & R19
- Channel #3 Q10 & R21
- Channel #4 Q13 & R13
- Channel #5 Q16 & R25
- Channel #6 Q19 & R27
- Channel #7 Q22 & R29
- Channel #8 Q25 & R31

**CHART 4**

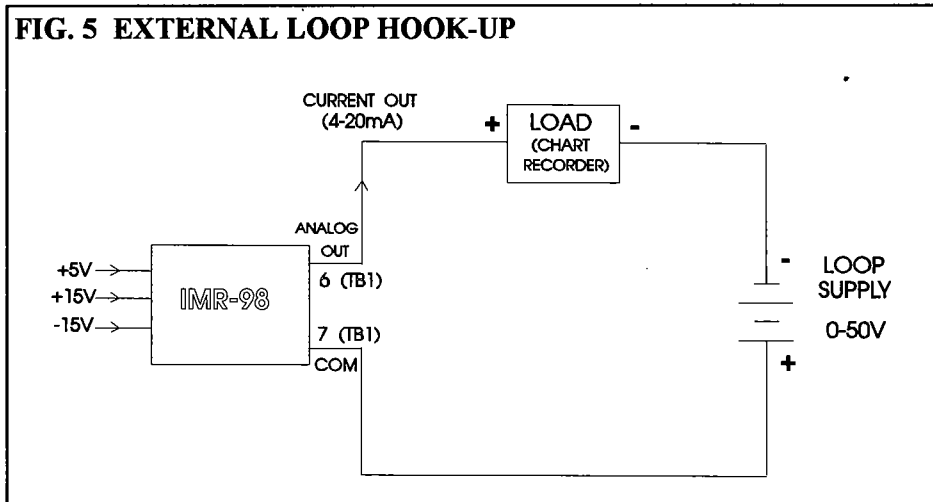
**MAXIMUM ALLOWABLE RESISTANCE:**

CURRENT OUTPUT	MAXIMUM RESISTANCE (OHMS)
100mA	20
50mA	140
20mA	500
10mA	1100
5mA	2300
2.5mA	4700
1mA	11,900

If no external loop supply is used, see chart 4 for current output and maximum allowable resistances.

**NOTE:** When an external loop supply for an unipolar output range is being used (ex. 4-20ma), the buffered output option is necessary (please refer to Figure 5 External Loop Hook-up).

**FIG. 5 EXTERNAL LOOP HOOK-UP**



**MISCELLANEOUS FUNCTIONS:  
CHART 5A**

TO OBTAIN THIS DESIRED RESULT	SET LISTED POSITIONS OF SW2
16 STATUS	6 OFF
8 STATUS	6 ON
DATA FAIL, ZERO THE STATUS	7 ON
DATA FAIL, HOLD LAST STATUS	7 OFF

**CHART 5B**

TO OBTAIN THIS DESIRED RESULT	SET LISTED POSITIONS OF SW1
FOR NORMAL 16 DISCRETE CAPABILITY	1 OFF
FOR POINT 16 TO INDICATE DATA FAIL	1 ON

Now that you have programmed the baud rate and output ranges desired, the user has a few more options available. If up to only 8 discrete functions are being utilized, the user may wish to tell the unit by the switch settings described in Chart 5A.

For DATA FAIL, there are two options. The first is to zero the status and the second is to hold last status. Refer to Chart 5A for the switch settings of the desired result.

Finally the IMR-98 can be programmed to have the last or sixteenth (16th) point to indicate data fail. Refer to Chart 5B for the switch settings.

***IMPORTANT: THE 98 SERIES EQUIPMENT ONLY READS THE DIP SWITCHES DURING POWER-UP. IF YOU MOVE ANY OF THE DIP SWITCHES, THE POWER SUPPLY WILL HAVE TO BE TURNED OFF AND THEN TURNED BACK ON AGAIN BEFORE THE UNIT WILL RESPOND TO THE NEW SWITCH SETTINGS.***

**MAINTENANCE:**

**ALL SAFETY PROCEDURES ARE TO BE STRICTLY ADHERED TO AND ONLY QUALIFIED MAINTENANCE, OPERATORS, OR SERVICE PERSONNEL ARE TO PERFORM WORK ON THIS EQUIPMENT. LIFE THREATENING VOLTAGES AND CURRENTS ARE PRESENT WITHIN THIS EQUIPMENT. OBTAIN ALL REQUIRED APPROVALS PRIOR TO PLACING THIS EQUIPMENT IN OR OUT OF SERVICE.**

PREVENTIVE MAINTENANCE is meant to reduce system downtime by locating and correcting potential problems prior to catastrophic failure. The following procedure is recommended to be performed on six month intervals. Equipment located in harsh environments may require more frequent maintenance. It is not the intent of this schedule to replace preventative maintenance procedures in place within any particular organization.

Items required to perform the following procedure:

Soft-bristled brush with non-conductive handle OR a source of low level compressed air.  
Clean dry cloth(s)  
Flat blade screwdriver with 1/8" wide tip.  
Flat blade screwdriver with 1/4" wide tip.  
Mild non-abrasive detergent solution.

1. Turn off the power switch on the power supply module and de-energize the power applied to the equipment.
2. Remove the modules from the chassis by using a flat blade screwdriver to turn the two quarter turn fasteners (counterclockwise) on the front panel of each module (note module location). Then remove each module by pulling on its handle.
3. Using a brush or low pressure compressed air remove all the dust from the module and chassis.
4. Inspect module for signs of visual damage such as overheating or corrosion. Correct the conditions prior to proceeding further.

5. Use the cloth and mild detergent to clean the front panels of each module and front of the chassis. Insure all parts are dry prior to proceeding.

6. Replace all modules in the proper location as noted in step 2 above aligning each to the card guides in the chassis. Once each card is firmly seated in its correct position use the flat blade screwdriver to turn the two quarter turn screws on the front panel of each module (clockwise).

7. Energize power to the equipment and turn "ON" the power supply.

MODULE REMOVAL is accomplished by first turning off the power switch on the power supply. Turn the two quarter turn screws (counterclockwise) on the front panel of the module to be removed. Pull out the module by the handle.

MODULE REPLACEMENT is accomplished by first turning off the power supply and then sliding the module into the proper slot aligning to the card guides. Once the module is firmly seated use the flat blade screwdriver to turn the two quarter turn screws on the front panel clockwise. Turn the power supply switch "ON".

Note: In the event a replacement module is being installed check all switch and jumper positions prior to installation. Comparison with the removed module is one convenient method.

The equipment has been designed to operating in an industrial environment and should provide years of trouble free operation. In the unlikely event a malfunction should occur standard troubleshooting techniques may be followed to resolve the problem. To assist you we have included schematics, and detailed information (including parts list) within this manual.

If factory assistance is required **INIVEN** has set up a toll free number (1-800-526-3984) for sales and service information. Should a module require repair please refer to our twelve year warranty in this manual. All returns require an INIVEN RMA # which can also be attained by calling 800-526-3984.

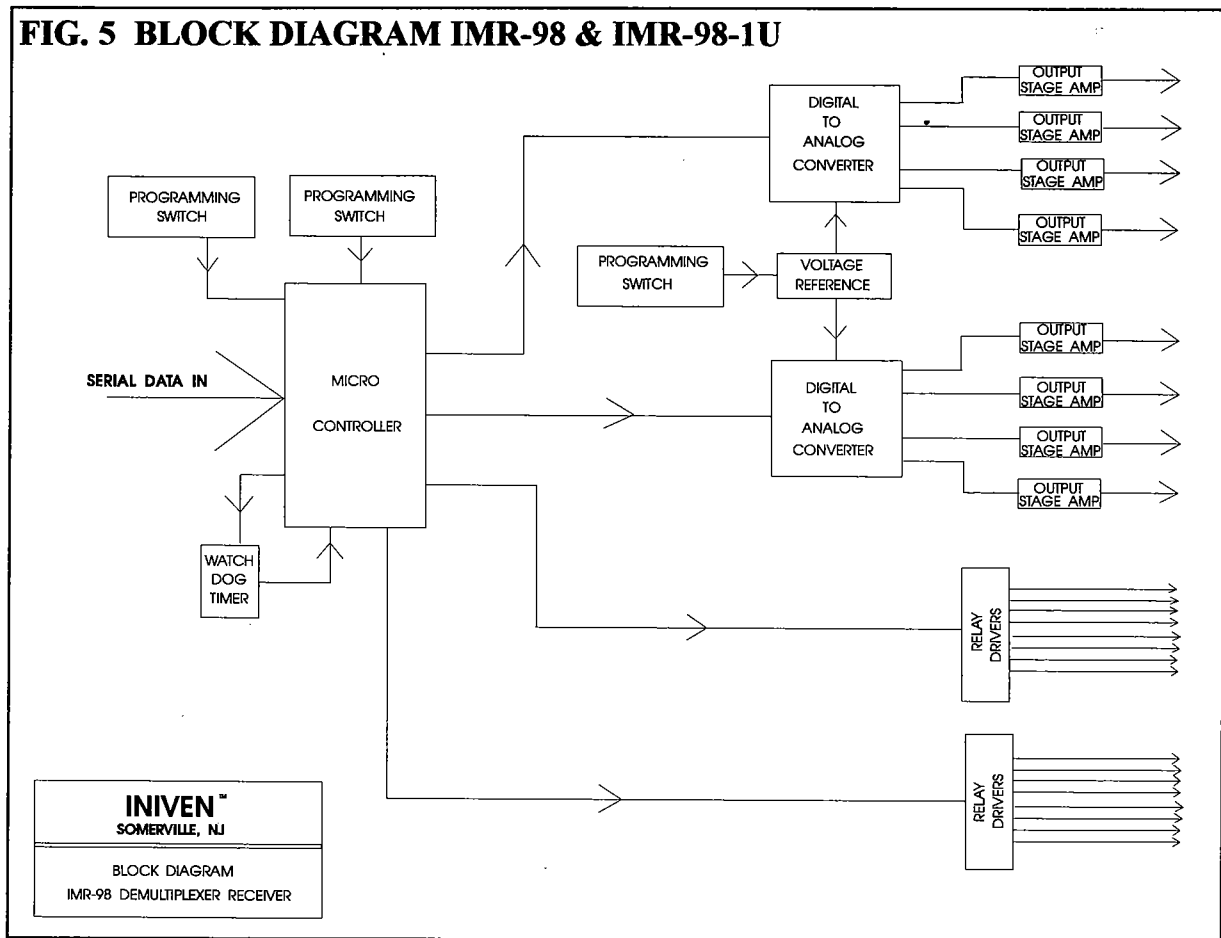
**Table 1. Replaceable Parts IMR-98 (CC2001-00) & IMR-98-1U (CC2124-00)**

<b>Circuit Symbol</b>	<b>Description</b>	<b>INIVEN Part Number</b>
<b>CAPACITORS:</b>		
C1-3,9,43	Capacitor,tantalum,1uF,35V,+/-20%,DT35V105M or equiv.	DT35V105M
C8	Capacitor,tantalum,10uF,35V,+/-20%,DT35V106M or equiv.	DT35V106M
C4,7,10-48	Capacitor,ceramic,0.1uF,50V,+/-20%,CM-Z5U-D-104-M	CM-Z5U-D104M
C5,6	Capacitor,ceramic,15pF,100V,+/-5%,CM-NPO-E-150-J or equiv.	CM-NPO-E-150J
<b>RESISTORS:</b>		
RN1,RN2	Resistor Network,SIP 9PIN 8 Resistor 1K,4309R-101-102 or equiv.	4309R-101-102
R1	Resistor,carbon,20K,1/4 watt,+/-5% or equiv.	RCF07J203
R2	Resistor,carbon,10K,1/4 watt,+/-5% or equiv.	RCF07J103
R3,6	Resistor,carbon,560 ohms,1/4 watt,+/-5% or equiv.	RCF07J561
R4,32	Resistor,carbon,100K,1/4 watt,+/-5% or equiv.	RCF07J104
R5	Resistor,carbon,330K,1/4 watt,+/-5% or equiv.	RCF07J334
R7,8,14,15	Resistor,wire wound,10K,1/4 watt,+/-0.01% or equiv.	WWR1/4T10000
R9	Resistor,wire wound,2K,1/4 watt,+/-0.01% or equiv.	WWR1/4T2000
R10	Resistor,wire wound,1K,1/4 watt,+/-0.01% or equiv.	WWR1/4T1000
R11	Resistor,wire wound,200 ohm,1/4 watt,+/-0.01% or equiv.	WWR1/4T200
R12,16,18,20,22 24,26,28,30	Resistor,wire wound,100 ohm,1/4 watt,+/-0.01% or equiv.	WWR1/4T100
<b>SEMICONDUCTORS</b>		
D1	Diode,general purpose,1N914 or equiv.	1N914
DS1-2	LED,Red,Dialight 550-1106-RED or equiv.	550-1160-RED
DS3-10	LED,Red,Bilevel T-1,3mm,RED-RED,Dialight 553-0111 or equiv.	553-0111
Q1	Transistor,NPN 2N4401 or equiv.	2N4401
Q2,5,8,11,14, 17,20,23	Transistor, ,Motorola BDB01C or equiv.	BDB01C
Q3,6,9,12,15, 18,21,24	Transistor, , Motorola BDB02C or equiv.	BDB02C
U1	Microcontroller,8-bit,4kX8 EPROM, Signetics SC87C451CCA68 or equiv.	SC87C451CCA68

**Table 1. Replaceable parts (continued)**

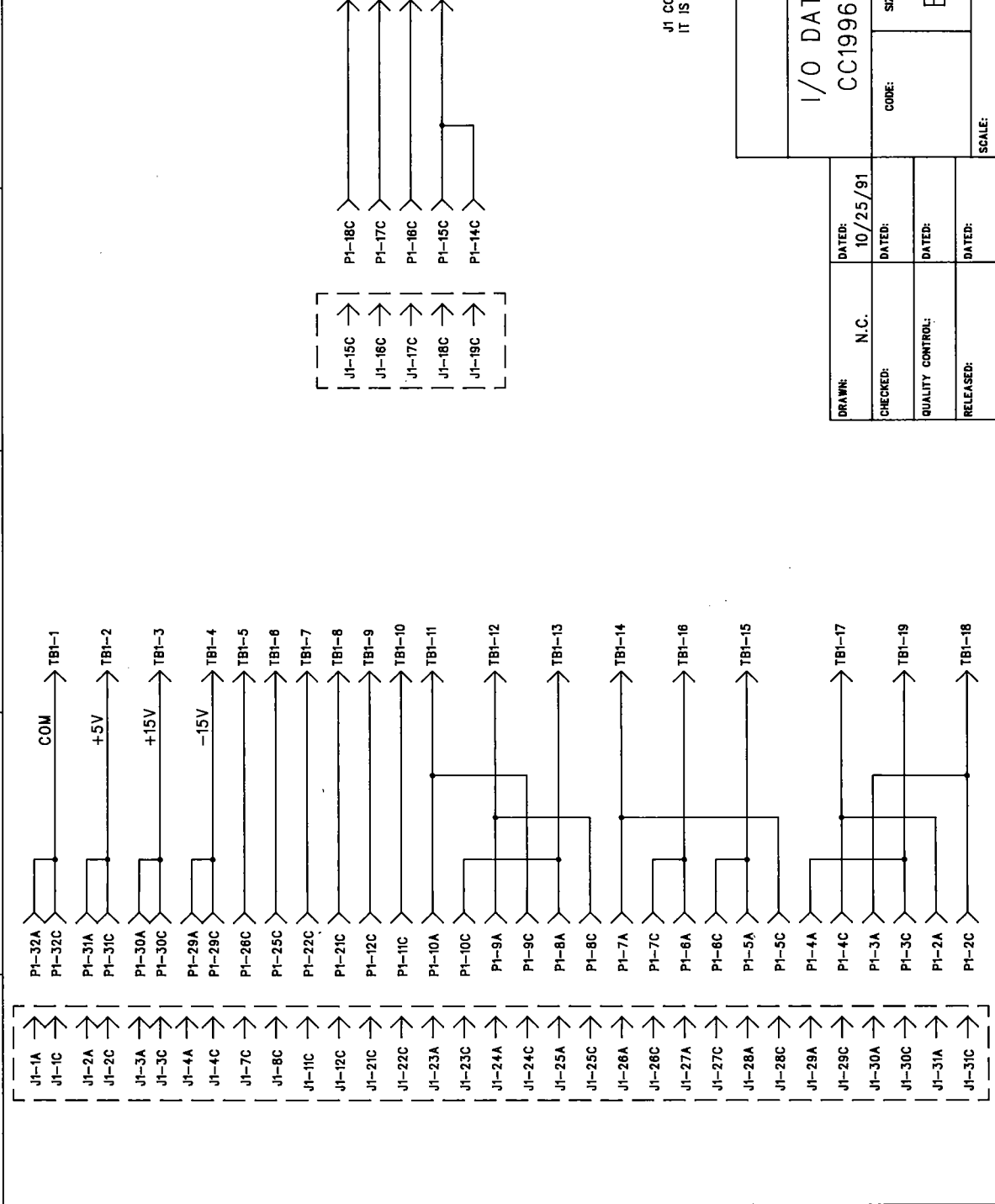
<b>Circuit Symbol</b>	<b>Description</b>	<b>INIVEN Part Number</b>
<b>SEMICONDUCTORS (continued)</b>		
U2	Watchdog Timer,Dallas Semiconductor DS1232 or equiv.	DS1232
U3	Multivibrator,Dual Retriggerable,National MM74HC123AN or equiv.	MM74HC123AN
U4,5	D/A Converter,Quad 12 bit,Analog Devices AD664JP or equiv.	AD664JP
U6	Precision Voltage Reference,Analog Devices AD584KN or equiv.	AD584KN
U7	Dual operational amplifier,very low noise,Analog Devices OP-270FZ or equiv.	OP-270FZ
U8	Hex inverter,National Semiconductor MM74HC04N or equiv.	MM74HC04N
U9-16	Differential amplifier,Precision,Analog Devices AMP-03GP or equiv.	AMP-03GP
U17,18	Bipolar Quad operational amp,pA input Current,Anal. Dev. AD704JN or equiv.	AD704JN
U19-22	Octal/bus driver,non-inverting,National Semiconductor MM74HC244N or equiv	MM74HC244N
U23,24	Driver array,octal peripheral,Motorola ULN2803A or equiv.	ULN2803A
<b>MISCELLANEOUS COMPONENTS</b>		
SW1-3	Switch,DIP 8 position,Alcoswitch ADF-08 or equiv.	ADF-08
Y1	Crystal,quartz,12 MHz or equiv.	MP120

**FIG. 5 BLOCK DIAGRAM IMR-98 & IMR-98-1U**



6 5 4 3 2 1

REVISION RECORD			
LTR	DESCRIPTION	APPROVED:	DATE:
A	REF. TO J1 ADDED	N.C.	12/13/93



J1 CONNECTOR SHOWN AS REFERENCE ONLY  
IT IS NOT PART OF I/O DATA ASSEMBLY

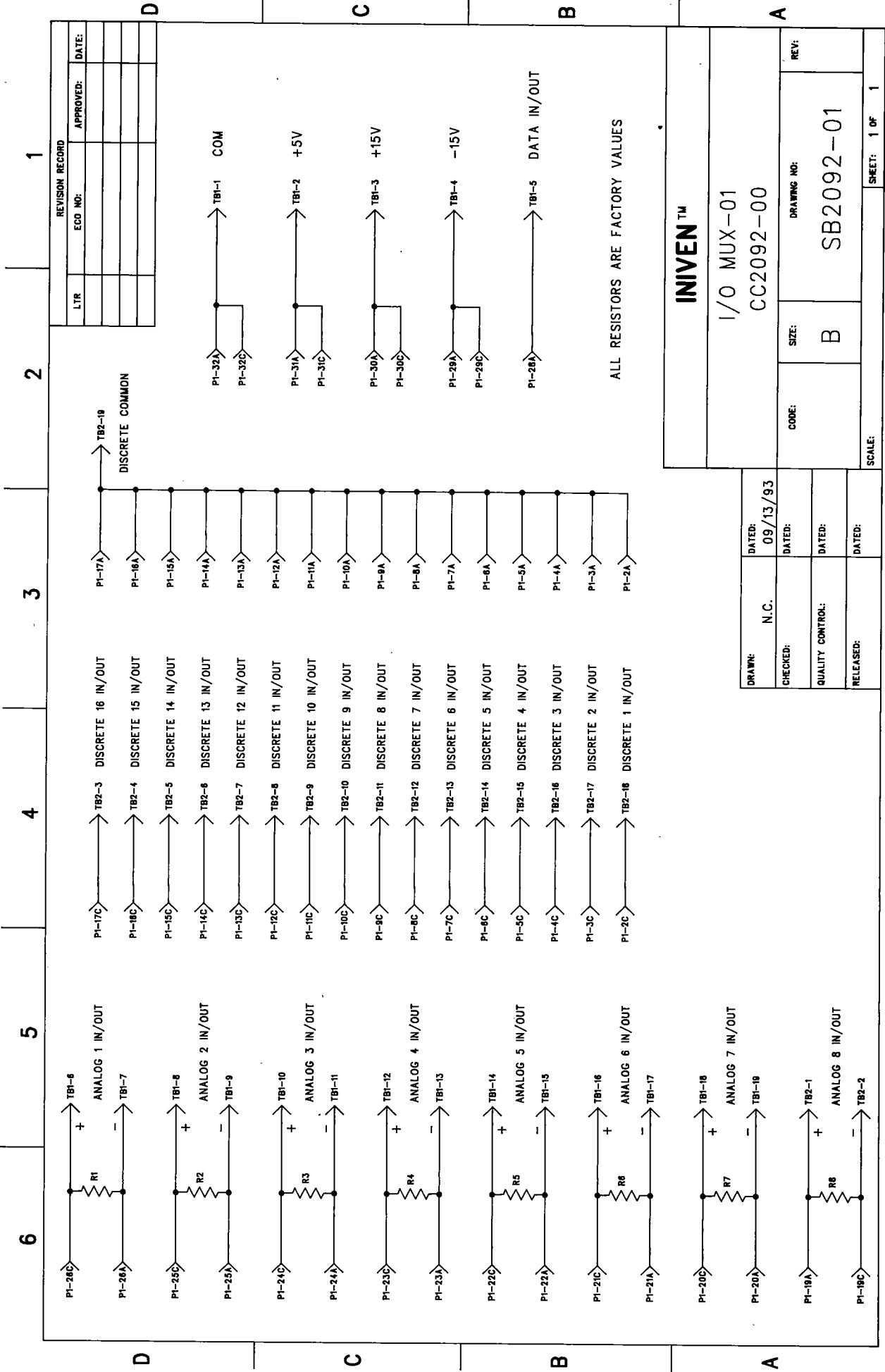
**INIVEN™**

I/O DATA AND I/O DATA-1U  
CC1996-00 AND CC2005-00

DRAWN:	N.C.	DATED:	10/25/91
CHECKED:		DATED:	
QUALITY CONTROL:		DATED:	
RELEASED:		DATED:	

CODE:		SIZE:	B	REV:	A
DRAWING NO:	SB1996-01		SCALE:	1 OF 1	





REVISION RECORD			
LTR	ECO NO.	APPROVED:	DATE:

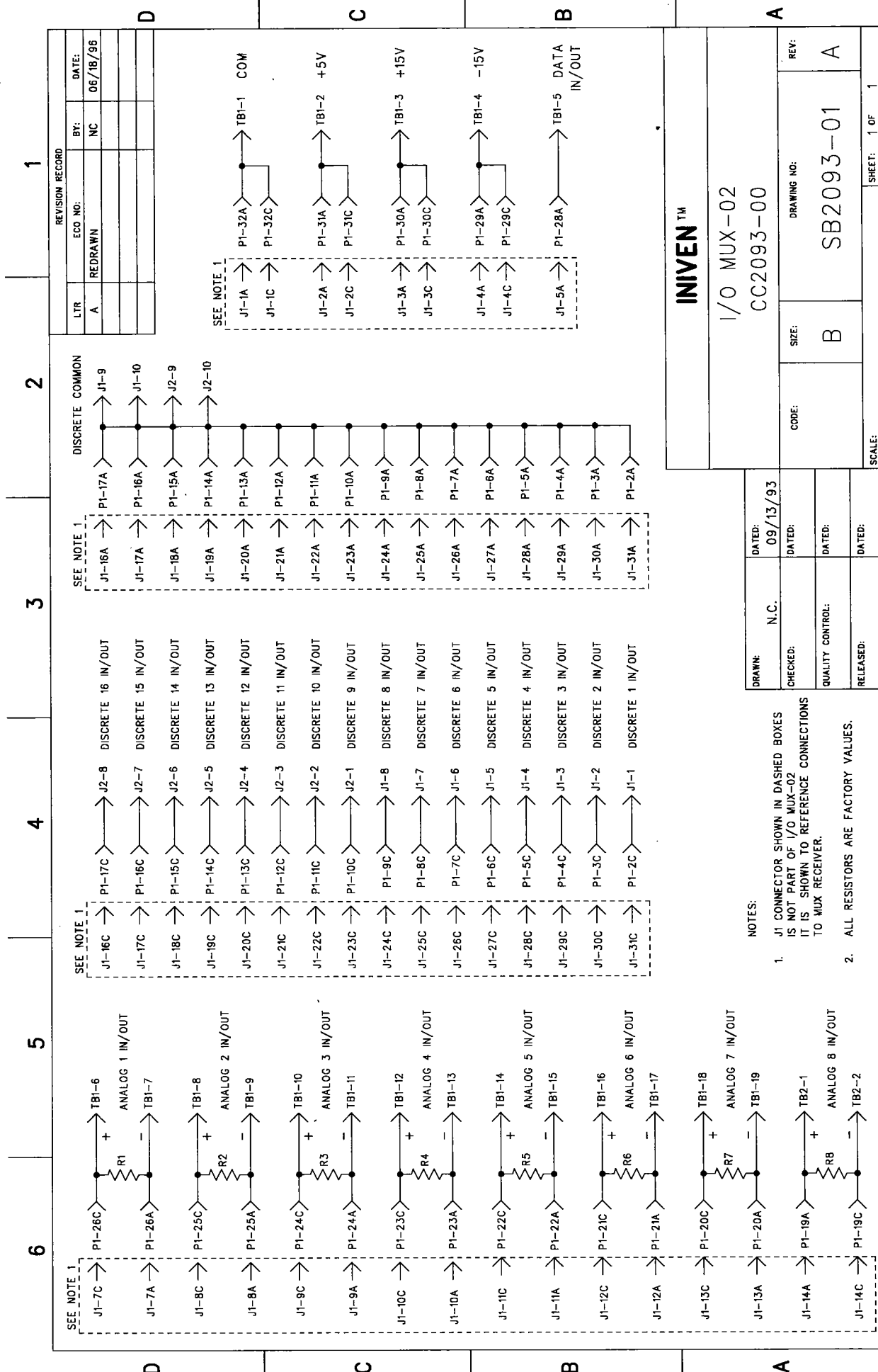
**INIVEN™**

I/O MUX-01  
CC2092-00

CODE:	SIZE:	DRAWING NO:	REV:
	B	SB2092-01	
SCALE:			SHEET: 1 OF 1

DRAWN:	DATED:
N.C.	09/13/93
CHECKED:	DATED:
QUALITY CONTROL:	DATED:
RELEASED:	DATED:

ALL RESISTORS ARE FACTORY VALUES



1

2

3

4

5

6

REVISION RECORD			
LTR	ECO NO.	BY:	DATE:
A	REDRAWN	NC	06/18/96

SEE NOTE 1

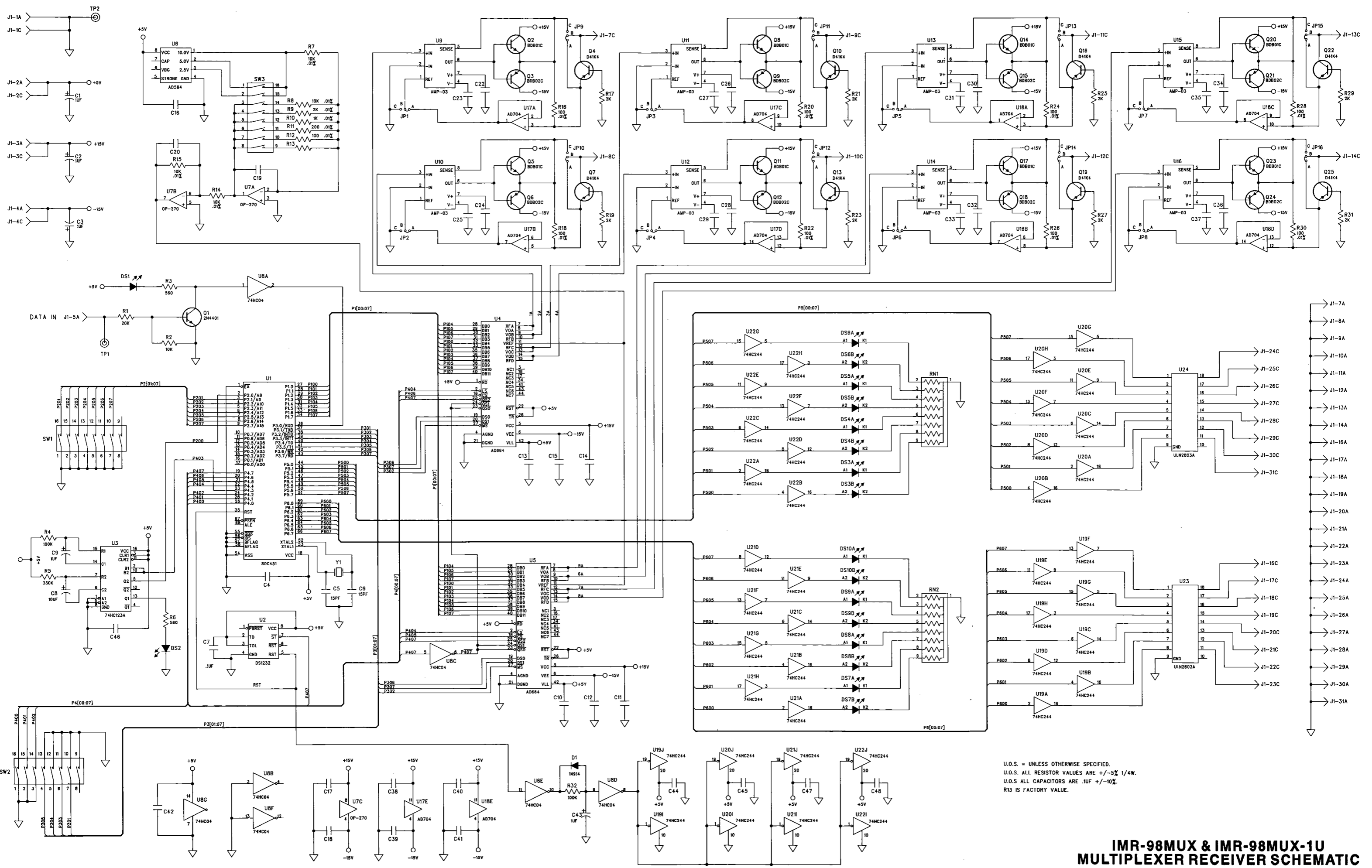
**INIVEN™**

I/O MUX-02  
CC2093-00

DRAWN:	N.C.	DATED:	09/13/93
CHECKED:		DATED:	
QUALITY CONTROL:		DATED:	
RELEASED:		DATED:	

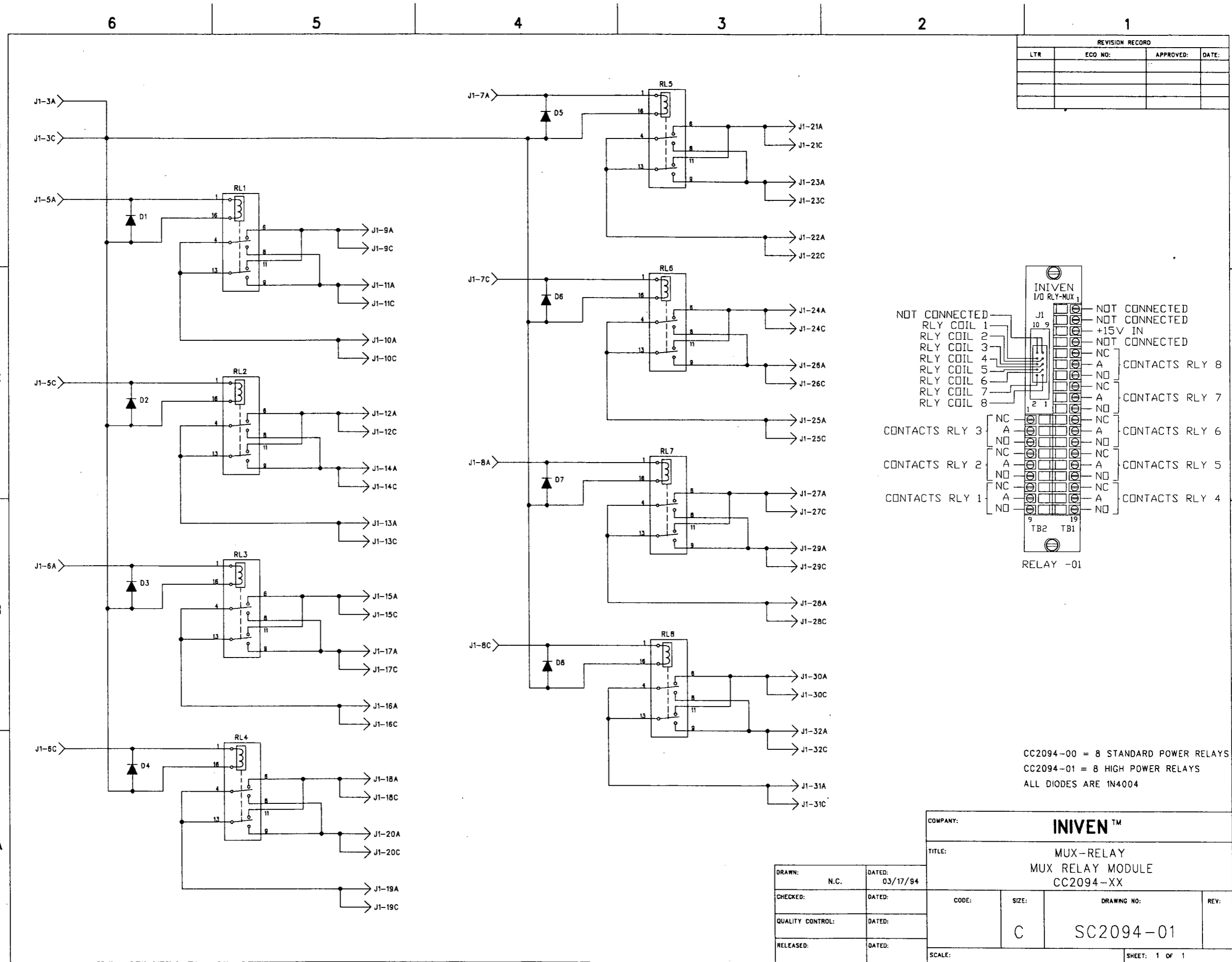
- NOTES:
- J1 CONNECTOR SHOWN IN DASHED BOXES IS NOT PART OF I/O MUX-02 IT IS SHOWN TO REFERENCE CONNECTIONS TO MUX RECEIVER.
  - ALL RESISTORS ARE FACTORY VALUES.

CODE:		DRAWING NO.:	SB2093-01	REV.:	A
SIZE:	B				
SCALE:		SHEET:	1 OF 1		

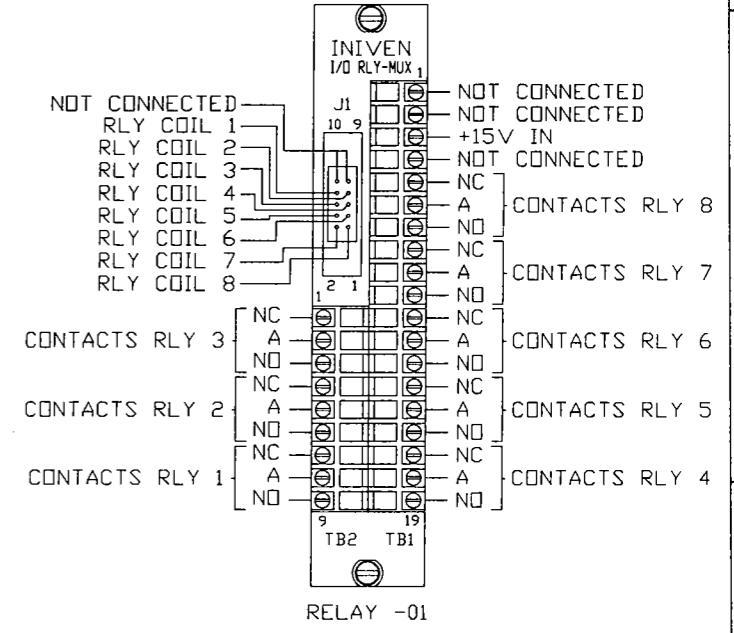


U.O.S. = UNLESS OTHERWISE SPECIFIED.  
 U.O.S. ALL RESISTOR VALUES ARE +/- 5% 1/4W.  
 U.O.S. ALL CAPACITORS ARE .1UF +/- 10%.  
 R15 IS FACTORY VALUE.

**IMR-98MUX & IMR-98MUX-1U  
 MULTIPLEXER RECEIVER SCHEMATIC**



REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:



CC2094-00 = 8 STANDARD POWER RELAYS  
 CC2094-01 = 8 HIGH POWER RELAYS  
 ALL DIODES ARE 1N4004

COMPANY: <b>INIVEN™</b>			
TITLE: <b>MUX-RELAY MUX RELAY MODULE CC2094-XX</b>			
CODE:	SIZE:	DRAWING NO:	REV:
	C	SC2094-01	
SCALE:		SHEET: 1 OF 1	

DRAWN: N.C.	DATED: 03/17/94
CHECKED:	DATED:
QUALITY CONTROL:	DATED:
RELEASED:	DATED:

\*\*\*\*\*

## WARRANTY AGREEMENT

All INIVEN product lines carry an equipment warranty for any part which fails during normal operation or service for **twelve years** from date of shipment. A defective part should be returned to the factory, shipping charges prepaid, for repair f.o.b. Somerville, New Jersey. In the event INIVEN cannot promptly return the unit to you, it will endeavor to provide a loaner until the repair or replacement is returned to you.

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