

**OWNER'S MANUAL  
MTX-DE AMX/DMX DECODER  
DECODMAN Rev. 2.1 - 4/11/94**

Dove Systems  
3563 Sueldo Unit E  
San Luis Obispo, CA 93401  
805-541-8292

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## 1. INTRODUCTION

The MTX-DE decodes a multiplexed control signal into a DC voltage to drive standard analog dimmers from any controller which is compatible with DMX-512, AMX-192, or C152 (Colortran) control. Each unit decodes 48 channels and the starting channel may be set to be any dimmer, 1 to 512 (1 to 192 for AMX). The MTX-DE is factory set to start on dimmer #1 and the control output voltage is 0 to +10V. Other settings may be made for the dimmer start channel.

## 2. SET UP AND CONNECTION

The MTX-DE is usually located close to the dimmer packs it controls. The input and output connections should be made before the decoder is plugged into power and energized. Output connections are made on the PC terminal strip at the back of the circuit board. There are 48 positions and two common terminals. There should be a common wire for each dimmer pack. The common of the dimmer should not be tied to earth ground. The MTX-DE is factory set for 0 to +10 volts output and to start on channel #1. It is possible to parallel an analog controller as a backup control on the outputs, but only if it has diode protection. Higher output voltages are possible: adjust R90 (see page 7) clockwise for voltage ranges up to 0 to +28V.

The multiplex input can be made at either XLR connector. It is important that the proper pin designation is followed on the multiplex connector. Connector pin designations are as follows:

PIN 1 Signal Common  
PIN 2 Dimmer Drive Complement (Clock-)  
PIN 3 Dimmer Drive True (Clock+)  
PIN 4 Analog Level (AMX Only)  
PIN 5 N/C Spare

### PROTOCOL SELECTION

JUMPER	AMX	DMX	C152
JP52	1-2	2-3	2-3
JP53	N/A	1-2	2-3
JP54	2-3	1-2	1-2
JP55	2-3	1-2	1-2

JP51	ON	NO PARITY (Factory Set)
	OFF	PARITY Colortran 192

The Start Code is changed through Switch SW1. Sum the binary values of the switches set to derive the Start Code or just follow the chart. (Note: the DMX standard requires a start code of 0 for dimmers.)

	SW - 1	Start	(X=ON, 0=OFF)
	1 2 3 4 5 6 7 8	Code	
Factory Set	0 0 0 0 0 0 0	0	
	X 0 0 0 0 0 0	1	
	0 X 0 0 0 0 0	2	
	X X 0 0 0 0 0	3	

# CHANNEL SELECTION

The Starting Channel is changed through Switch SW2. Starting channels above 255 are achieved through the removal of jumper JP57.

(X=ON, 0=OFF)

SW - 2								JP57	Starting Channel		
1	2	3	4	5	6	7	8	X	1	<- Factory Set	
X	0	0	0	0	0	0	0	X	2		
0	X	0	0	0	0	0	0	X	3		
X	X	0	0	0	0	0	0	X	4		
0	0	X	0	0	0	0	0	X	5		
X	0	X	0	0	0	0	0	X	6		
0	X	X	0	0	0	0	0	X	7		
X	X	X	0	0	0	0	0	X	8		*
0	0	0	X	0	0	0	0	X	9		*
X	0	0	X	0	0	0	0	X	10		*
0	X	0	X	0	0	0	0	X	11		*
X	X	0	X	0	0	0	0	X	12		*
0	0	X	X	0	0	0	0	X	13		*
X	0	X	X	0	0	0	0	X	14		*
X	0	0	0	X	X	0	0	X	49		
X	0	0	0	0	X	X	0	X	97		
X	0	0	0	X	0	0	X	X	145		
X	0	0	0	0	0	X	X	X	193	(Channels 193-512 unavailable for AMX)	
X	0	0	0	X	X	X	X	X	241		
0	X	X	X	X	X	X	X	X	254		
X	X	X	X	X	X	X	X	X	255	<- All on, JP57 CLOSED	
0	0	0	0	0	0	0	0	0	256	<- All off, JP57 OPEN	
X	0	0	0	0	0	0	0	0	257		
0	X	0	0	0	0	0	0	0	258		
X	X	0	0	0	0	0	0	0	259		
X	0	0	0	0	X	0	0	0	289		
X	0	0	0	X	0	X	0	0	337		
X	0	0	0	0	0	0	X	0	385		
X	0	0	0	0	X	X	X	0	433		
X	0	0	0	X	X	X	X	0	481		
X	X	X	X	X	X	X	X	0	511	<- Last Starting Channel	

When the input and output connections are made the unit may be energized by plugging into a power source which can be turned on and off with the dimmer packs. The controller may now be energized and the system tested. The LED on the front panel will glow green and red upon power-up. When a valid multiplex signal is present it will glow green only.

The MTX-DE may be modified to drive solid state relays directly, and thus become a 48 channel dimmer. This is a factory only modification. Call the factory if you think you need this feature.

### 3. THEORY OF OPERATION

Multiplexing is a way of combining several control signals into one wire. This allows a savings of wire, connectors and hardware at the sending and receiving end of a communications system and is particularly convenient for computer control. The USITT DMX-512 protocol specifies that up to 512 dimmer channels may be carried on three conductors. The three conductors are: signal common; data plus; and data minus. The USITT AMX192 protocol specifies that up to 192 dimmer channels may be carried on four conductors. The four conductors are: analog level; signal common; clock plus; and clock minus.

From a DMX output the dimmer levels are sent digitally, one channel at a time in much the same way as a computer sends characters to a printer. After a reset, called a break, the first character is a zero, which indicates that all the following data is for dimmers. Then one channel at a time starting with channel 1 and going up to as high as channel 512 is sent. The dimmer levels are actually numbers from 0 (for off) to 255 (on full). 128 would be half power.

From an AMX output the dimmer levels are sent on the analog level conductor with respect to the analog common, one channel at a time starting with dimmer #1 and going as high as #192. The voltage on this wire is 0 (for off) to +5 volts (for 100%). The differential clock lines determine when the signal changes from one dimmer to the next and when to start all over with dimmer #1 (reset).

The MTX-DE decodes these signals by sampling each channel and changing them to a voltage. This voltage is amplified to the required level and fed through a diode to a terminal for each of 48 channels. The maximum current that can be source for each channel is 10 milliampere. This is more than enough power for most dimmers but may not be enough for driving relays or light indicators directly. Consult the factory for special applications interface.

Copies of the USITT AMX and DMX standards may be obtained through:

United States Institute for Theatre Technology  
10 West 19th Street, Suite 5A  
New York, NY 10011-4206  
Phone: 212-924-9088

### 4. IN CASE OF TROUBLE

The most common cause of trouble is a miswired connector. Be sure you have all the connections made correctly. The pin configuration for the multiplex connector is most important. The board will not work at all if any of the wires are not on the correct pin, and the signal present LED will glow red only. The dimmer control common must be connected. The common of the dimmer should not be tied to earth ground. Check the control connection diagram to be sure of your connections. Check the MTX-DE with a DC voltmeter. Connect the common to Test Point 3 (TD3).

If, after performing these tests, you still cannot get proper operation, you may call the factory for technical assistance at (805)541-8292. To obtain service send your unit to the factory, freight prepaid, with a note describing the specific complaint and a return shipping address.

Send To:  
Service Department  
Dove Systems  
3563 Sueldo St. Unit E  
San Luis Obispo, CA 93401

#### LIMITED WARRANTY

The manufacturer agrees that its products shall be free from defects in material or workmanship over a period of one year from date of shipment from the factory. Said warranty will not apply if equipment is used under conditions of service for which it is not specifically intended. The manufacturer is not responsible for damage to its apparatus through improper installation, physical damage, or poor operating practice.

If any device is found unsatisfactory under the warranty, the buyer should notify the manufacturer, and after receipt of shipping advice, buyer may return it directly to Dove Systems, San Luis Obispo, CA, shipping prepaid. Such equipment will be replaced or put in proper operating condition, free of all charges except transportation. The correction of any defects by repair or replacement by the manufacturer shall constitute fulfillment of all obligations to the purchaser. Manufacturer does not assume responsibility for unauthorized repairs to its apparatus, even though defective.

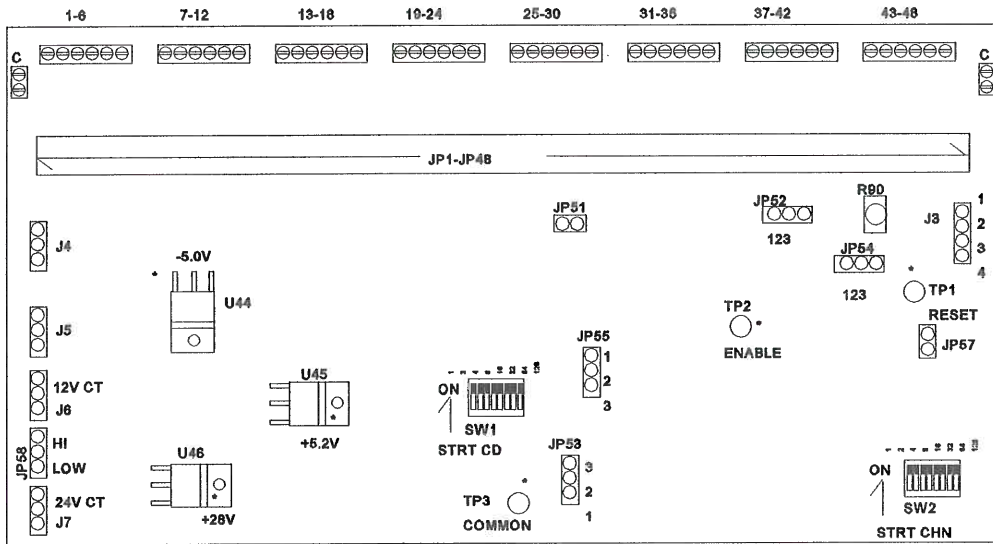
Manufacturer shall not be liable for any consequential damage in case of any failure to meet the conditions of any warranty of shipping schedule, nor will claims for labor, loss of profits, repairs, or other expenses incidental to replacement be allowed.

No other representation, guarantees or warranties, expressed or implied, are made by the manufacturer in connections with the manufacture and sale of its equipment. This warranty is non-transferable and applies to the original buyer only.

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**DOVE SYSTEMS**  
**MTX-DE**  
**CONTROL INPUT**  
**SELECTION CHART**

\* TEST POINTS ARE MARKED  
 WITH ASTERISKS



JP58  
 HIGH: OUTPUT VOLTAGES ABOVE 15V  
 LOW: OUTPUT VOLTAGES UNDER 15V

J3 (CONTROL IN) PIN 1 COMMON  
 PIN 2 ANALOG  
 PIN 3 +CLOCK  
 PIN 4 -CLOCK

JUMPER	AMX	DMX	C152
JP51	ON	ON	OFF
JP52	1-2	2-3	2-3
JP53	N/A	1-2	2-3
JP54	2-3	1-2	1-2
JP55	2-3	1-2	1-2
JP57	ON FOR 1-255, OFF FOR 256-512		

1 2 4 8 16 32 64 128  
 ON  
 SW2

THE STARTING CHANNEL IS FACTORY SET FOR #1. SUM THE VALUES OF THE SWITCHES SET TO DERIVE THE STARTING CHANNEL. REMOVE JUMPER ON JP57 TO SET A STARTING CHN ABOVE 255 (DMX ONLY). SEE PAGE 4.

