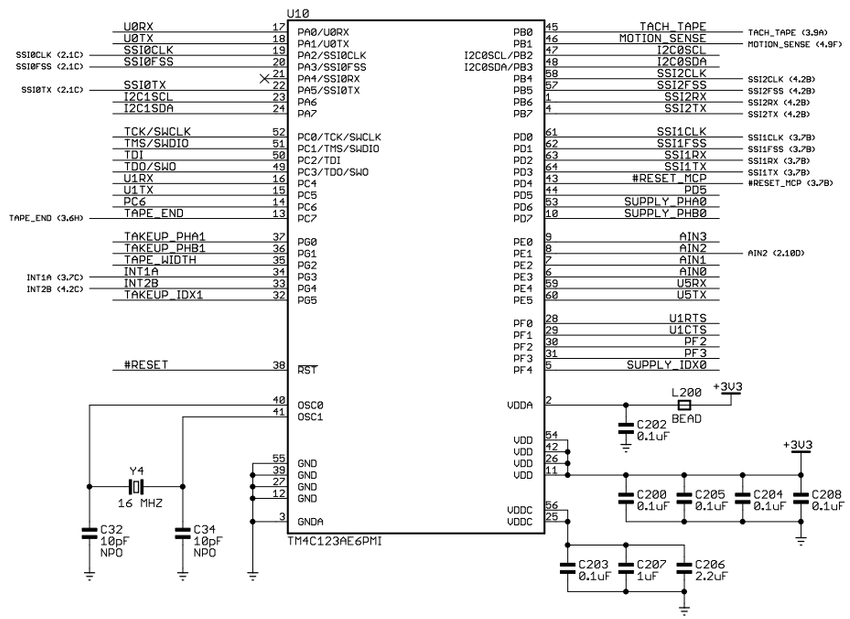
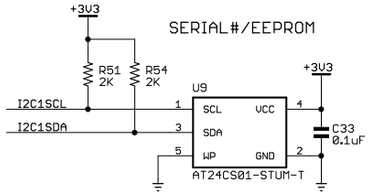
MICROCONTROLLER



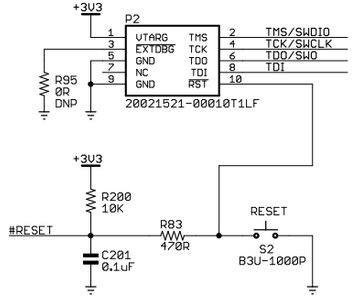
SSI-0 : SPI SUPPLY & TAKEUP SERVO DAC
SSI-1 : SPI MCP23S17SO TRANSPORT SWITCHES & LAMPS
SSI-2 : SPI MCP23S17SO SOLENOID, CONFIG DIP SWITCH & TAPE OUT

SERIAL#/EEPROM



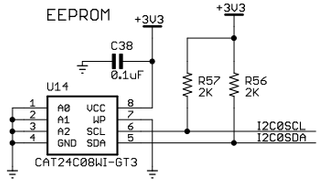
ADDR: 0x10100000 (0xA0) (EPROM)
ADDR: 0x10110000 (0xB0) (SERIAL#)

JTAG



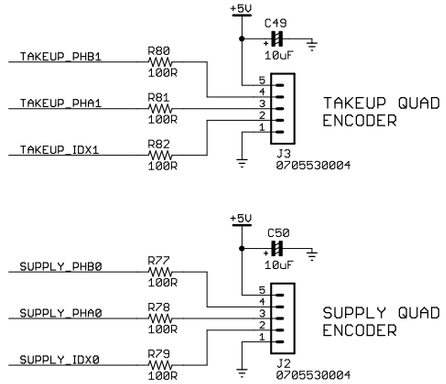
PLACE CAP AND PULLUP NEAR CPU PIN

EEPROM

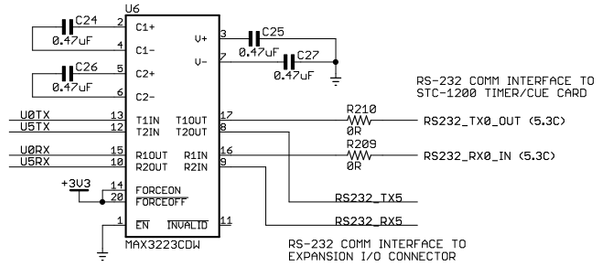


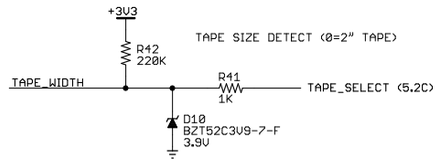
ADDR: 0x10100000 (0xA0)

QUADRATURE ENCODER INTERFACES



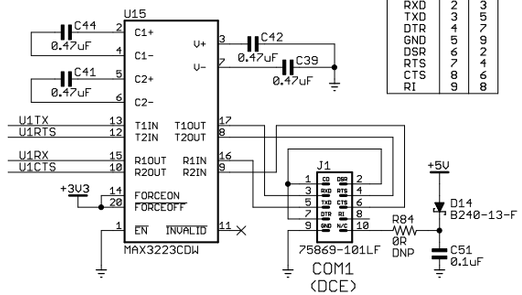
RS-232 INTER-BOARD COMM





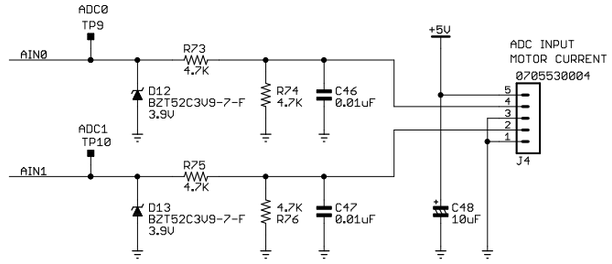
DB-9 IDC RIBBON CABLE CONNECTOR 8309-6000
IDC RIBBON CABLE CONNECTOR 71600-110LF

RS-232

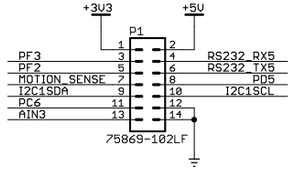


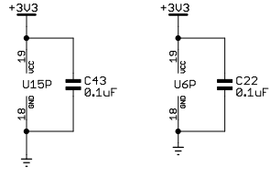
RS-232	DB9	IDC
CD	1	1
RXD	2	3
TXD	3	5
DTR	4	7
GND	5	9
DSR	6	2
RTS	7	4
CTS	8	6
RI	9	8

OPTION ADC INPUTS



EXPANSION





CONN HOUSING	IDC CONNECTOR	
BOM-ENTRY1	BOM-ENTRY3	
50-57-9405	71600-110LF	
QTY = 3	QTY = 2	
CONN PINS	IDC CONNECTOR	
BOM-ENTRY2	BOM-ENTRY4	
16-02-0097	8309-6000	
QTY = 15	QTY = 2	

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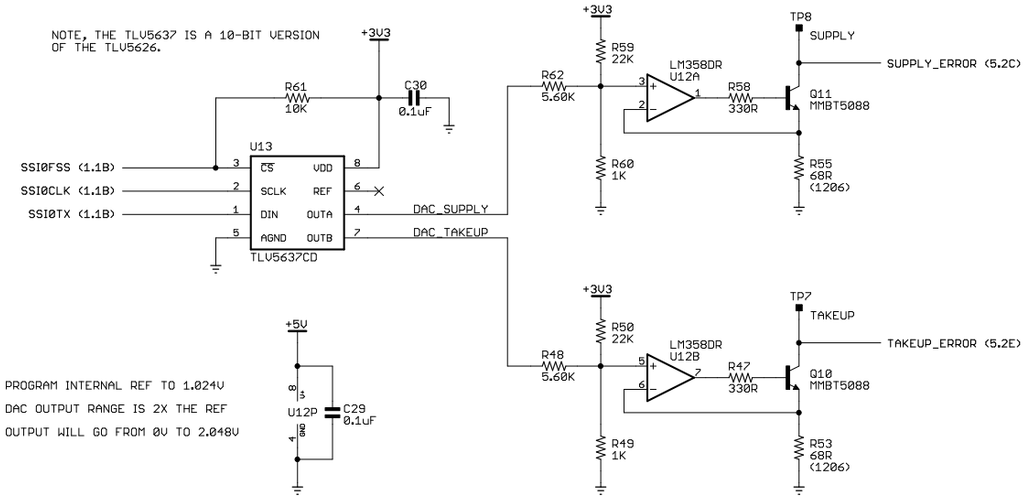
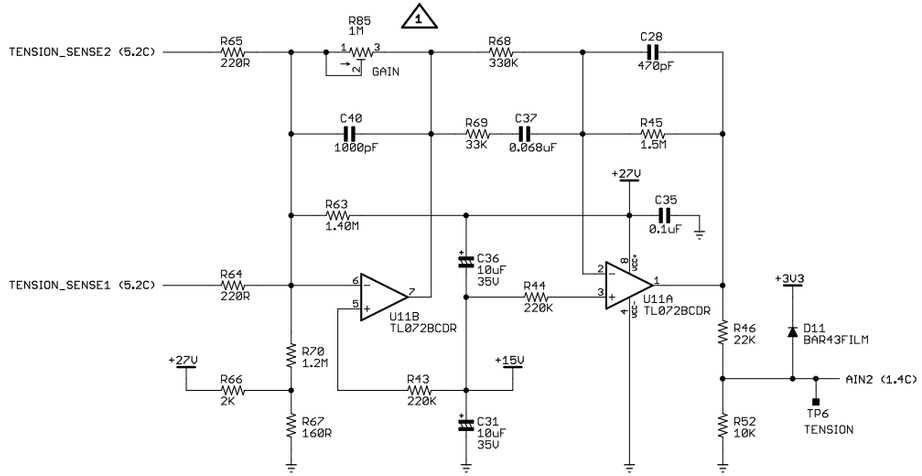
DATE XX/XX/XX	FILE: DTC-1200-C		PAGE: 1/6

MOTOR DRIVE AMP DRIVERS
5.5 mA = NO TORQUE
1.1 mA = FULL TORQUE

MOTOR DRIVE AMP CURRENT DAC



TENSION SENSOR PHOTOCELL AMP



When the DAC outputs 2.05V (the max value for code 255), U12A-3 should be 0.387V.

When the DAC outputs 0V (the value for code 0), U12A-3 should be 0.123V.

The math problem is 2 equations in 2 unknowns. The method I used is plain-old DC circuit analysis, sum of currents at U12A-3 = 0:

#1

Sum of currents through Rpu and R53 into node at U12A-2 = Current out of node U12A-2 through R55 to 0V.

(3.3V - 0.387V) / Rpu + (2.05V - 0.387V) / R53 = 0.387V / 1K

#2

Current through Rpu into node at U12A-2 = sum of currents out of node U12A-2 through R53 and R31 to 0V.

(3.3V - 0.123V) / Rpu = 0.123V / R53 + 0.123V / 1K

Rearrange both equations to isolate Rpu:

#1b

Rpu = 3.177 / [0.000123 + (0.123 / R53)]

#2b

Rpu = 2.913 / [0.000387 - (1.663 / R53)]

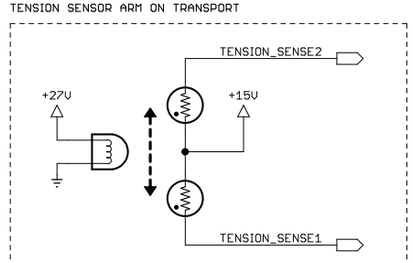
Now, the right sides of the 2 equations are equal to each other, since they're both = Rpu. Solve for R53 and you get 5.65K.

Then, plug 5.65K into 1b and Rpu = 21.947K.

Since we use standard values 22K & 5.6K, the DAC range 0 - 255 will give you a little more than 0.123V to 0.387V, but it will be very close.

This will result in a DAC range of about 5 - 250, or about 0.4% steps.

TENSION SENSOR ARM ON TRANSPORT



1

ADJUST TRIMMER R85 FOR MID SCALE
DAC READING OF XXXX WITH NO PRESSURE
ON THE TENSION SENSOR ARM.

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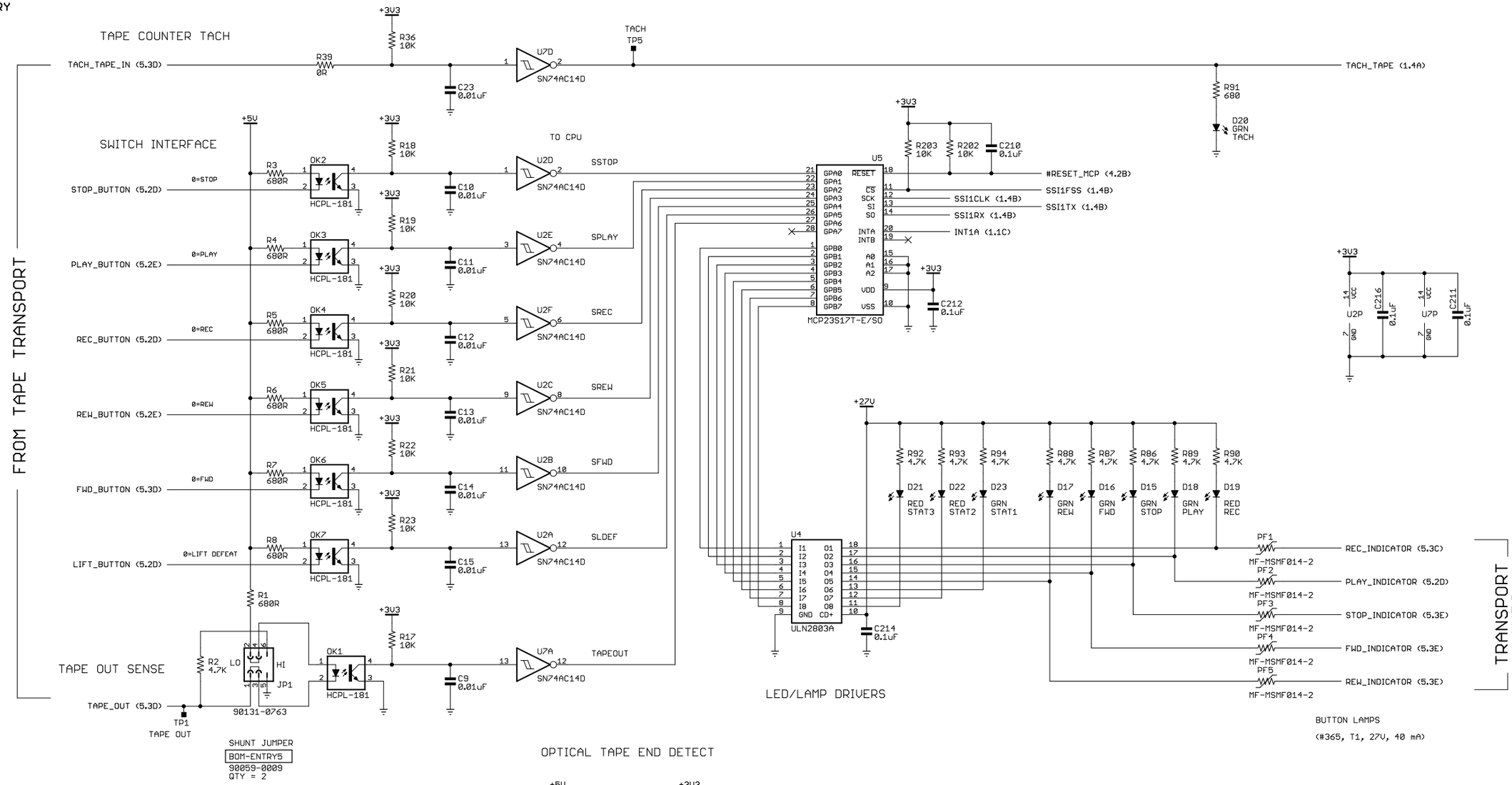

A DEFAULT ACTIVE LOW = TAPE OUT.

TAPE OUT ARM SENSE OPTION	
ACTIVE	JP1 JUMPER SETTINGS
HIGH (+27V)	JUMPER PINS 3+5 AND 4+6.
LOW (0V)	JUMPER PINS 1+3 AND 2+4.

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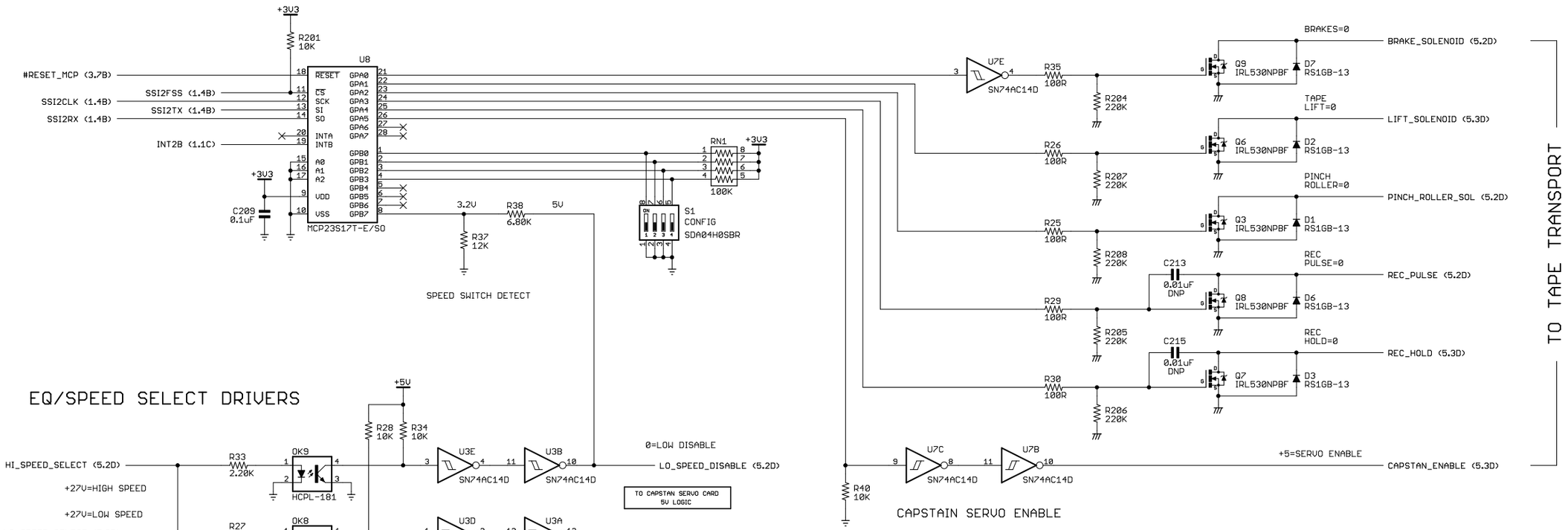
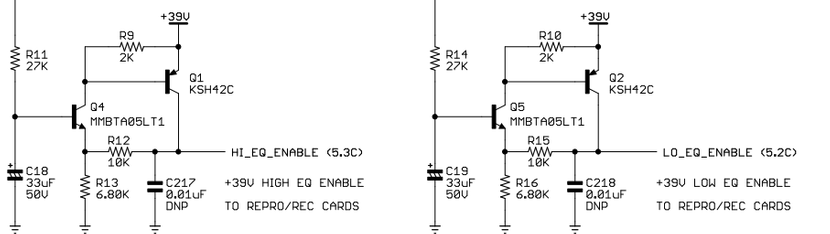
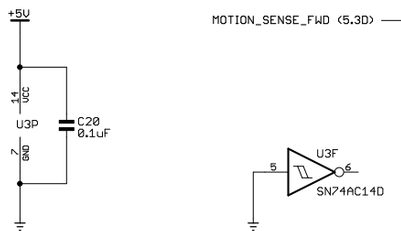
DATE XX/XX/XX	FILE: DTC-1200-C		PAGE: 3/6

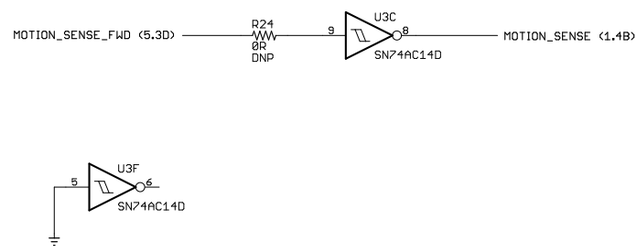
SOLENOID & RECORD LOGIC DRIVERS



EQ/SPEED SELECT DRIVERS







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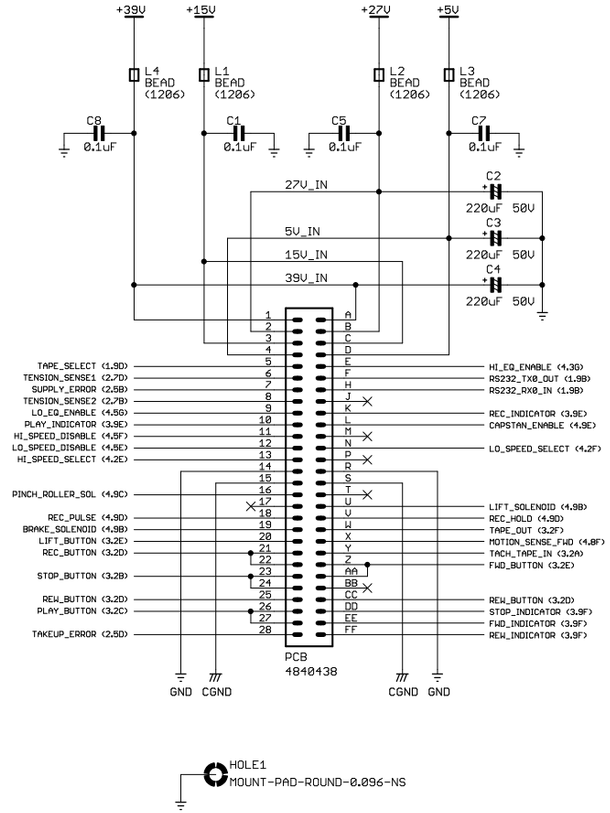


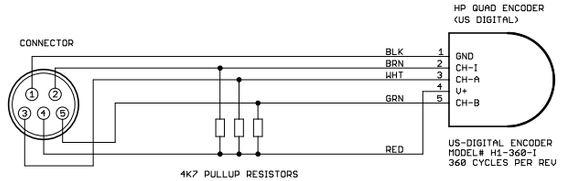
PCB 4840438 EDGE CARD SIGNALS

PIN	DESCRIPTION	PIN	DESCRIPTION
1	+39V	A	+39V
2	+27V	B	+27V
3	+15V	C	+15V
4	+5V	D	+5V
5	TAPE SELECT (0=2")	E	HI EQ ENABLE
6	TENSION SENSOR	F	(RS232 TX TO STC-1200)
7	SUPPLY ERROR SIGNAL	H	(RS232 RX FROM STC-1200)
8	TENSION SENSOR	J	---
9	LOW EQ ENABLE	K	REC INDICATOR
10	PLAY INDICATOR	L	CAPSTAN SERVO ENABLE
11	HI SPEED DISABLE	M	---
12	LO SPEED DISABLE	N	LO SPEED SELECT
13	HI SPEED SELECT	P	---
14	GND	R	GND
15	GND	S	GND
16	PINCH ROLLER SOLENOID	T	---
17	---	U	TAPE LIFTER SOLENOID
18	REC PULSE	V	REC HOLD
19	BRAKE SOLENOID	W	TAPE OUT SWITCH
20	LIFT DEFEAT BUTTON	X	MOTION SENSE (0=FWD)
21	REC BUTTON	Y	(TACH INPUT FROM STC/CTR)
22	REC BUTTON	Z	FWD BUTTON
23	STOP BUTTON	AA	FWD BUTTON
24	STOP BUTTON	BB	MOTION SENSE (0=REW)
25	REW BUTTON	CC	REW BUTTON
26	PLAY BUTTON	DD	STOP INDICATOR
27	PLAY BUTTON	EE	FWD INDICATOR
28	TAKEUP ERROR SIGNAL	FF	REW INDICATOR

NOTE: Unused pin Y on MM1200 chassis edge connector J1 must be wired to connector J4 pin 22 (tach out) from the timer/counter card to pickup tach pulses from the tape counter wheel.

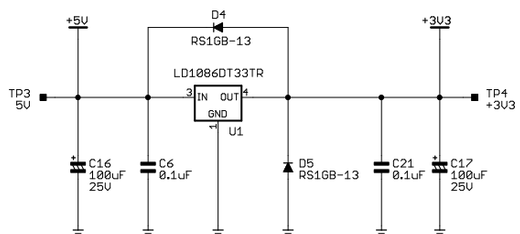
ENCODER ASSY WIRING DIAGRAM

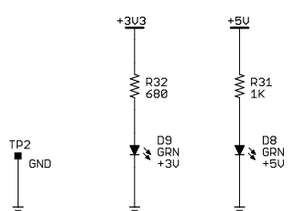
TWO REQUIRED, ONE ON EACH MOTOR



ENCODER/CONNECTOR WIRING

CONNECTOR PIN	WIRE COLOR	ENCODER DESIGNATION
1	BLACK	GND
2	BROWN	CH-I
3	WHITE	CH-A
4	RED	V+
5	GREEN	CH-B





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DATE XX/XX/XX	FILE: DTC-1200-C		PAGE: 5/6

REQUIRED WIRING MODIFICATIONS TO THE MM1200

1. THE SEARCH-TO-CUE/COUNTER CARD GENERATES TACH PULSES ON J4 PIN-22. THESE PULSES ARE DERIVED FROM THE TAPE ROLLER/COUNTER QUADRATURE ENCODER TO PROVIDE TAPE SPEED FEEDBACK. THESE TACH PULSES MUST BE ROUTED TO J1 PIN-Y ON THE NEW TRANSPORT CONTROLLER CARD FOR PROPER PLAY MODE OPERATION.

   THIS REQUIRES REMOVING THE CONTROL ELECTRONICS CARD CAGE FROM THE MM1200 AND ADDING A JUMPER WIRE FROM EDGE CONNECTOR J4 PIN-22 (STC/COUNTER CARD) AND RUNNING A WIRE OVER TO EDGE CONNECTOR J1 PIN-Y (TRANSPORT CTL CARD) ON THE CARD CAGE CONNECTORS.

   NOTE THAT THERE IS ALREADY A WIRE ON J4 PIN-22 WHICH FEEDS THE TACH OUTPUT TO J13 ACCESSORY CONNECTOR PIN AA. THIS WIRE SHOULD REMAIN AND THE JUMPER WIRE SHOULD CONNECT TO THIS SAME WIRE ON PIN-22 OF J4. THEN, ROUTE THE NEW WIRE FROM HERE TO J1 PIN-Y ON THE TRANSPORT CONTROL CARD SLOT. NOW THE TACH PULSES WILL BE AVIALABLE ON J1 PIN-Y FOR THE DTC-1200.

2. THE 5V POWER FOR THE TRANSPORT CONTROL CARD SLOT COMES FROM THE CAPSTAN SERVO CARD IN THE ORIGINAL AMPEX DESIGN. THE ZENER REGULATOR ON THE CAPSTAN DOES NOT HAVE ENOUGH CURRENT CAPABILITY TO POWER THE NEW DTC-1200 DIGITAL TRANSPORT CONTROLLER CARD.

   THEREFORE, J1 WIRING MUST BE CHANGED TO DRAW 5V POWER FROM THE MAIN SYSTEM 5V REGULATOR INSTEAD. THE MAIN SYSTEM +5V RAIL IS AVAILABLE AT J4 (SEARCH-TO-CUE) PINS 1/FF & A/28. THE NEW CONTROLLER CARD DRAWS ABOUT 220MA TOTAL CURRENT IN NORMAL OPERATION AND MUST NOW RUN FROM THE SYSTEM +5V RAIL.

   DISCONNECT THE +5V OUTPUT WIRE FROM J2 (CAPSTAN SERVO CARD) PINS 4 & D AND MOVE THIS TO PINS FF & 28 ON J4 (SEARCH-TO-CUE CARD) INSTEAD. THIS WILL POWER THE NEW TRANSPORT CONTROLLER FROM THE MAIN SYSTEM 5V SUPPLY WITH 2A TOTAL MAX CURRENT.

3. JUMPERS WIRES ARE REQUIRED FOR RS-232 COMMUNICATIONS BETWEEN THE STC-1200 CUE/TIMER CARD AND THE DTC-1200 TRANSPORT CONTROL CARD ON EDGE CONNECTOR PINS F & H OF BOTH CARDS.

   JUMPER A WIRE BETWEEN J1 PIN-F (TRANSPORT CTRL CARD) TO J4 PIN-F (STC/COUNTER CARD). ADDITIONALLY, JUMPER A WIRE BETWEEN J1 PIN-H TO J4 PIN-H.

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