

Bi Ra Systems, Inc.

2404 COMANCHE NORTHEAST • ALBUQUERQUE, NEW MEXICO 87107 • (505) 881-8887

Hall A

MODEL 5408

8 CHANNEL 12-BIT DAC
MANUAL

OCTOBER 1988

CALIBRATION PROCEDURE

EQUIPMENT

DVM - Full scale ± 10 VDC, 100uV resolution.

CAMAC Extender card - BI RA Model 8201-1 or equivalent. CAMAC System to supply power and commands.

1.0 RANGE SELECT STRAPS

Remove right side cover of Model 5408 for access to OUTPUT RANGE SELECT points A, B, C, D, and E near the top edge of the component side of the PC board. Select the required scale from the enclosed Model 5408 8 Channel, 12-bit DAC DESCRIPTION sheet and strap exactly as specified for each of the eight channels. Channel strap locations are shown on the enclosed PRINTED WIRING ASSY MODEL 5408 sheet. Channel straps from BACK TO FRONT of the PC board are sequential from 0 to 7. Replace side cover.

2.0 GAIN AND OFFSET ADJUST

(a) Install the Model 5408 in the 8201-1 extender and insert extender into crate with POWER OFF. Apply Power and allow five (5) minutes warm up to stabilize.

(b) Issue CAMAC Z to clear all DAC registers to zero.

2.1 UNIPOLAR

(a) For each unipolar selected channel, issue CAMAC Z and adjust corresponding OFFSET pot as indicated on the enclosed SCHEMATIC DIAGRAM MODEL 5408 and monitor the corresponding OUTPUT according to the type of connector mounted on the front panel of the 5408. If no connector is present, the OUTPUT may be monitored at the rear auxiliary connector. The schematic indicates the auxiliary assignments; Pins 1 through 18 are sequential from top to bottom on the component side of board. A separate sheet is enclosed for a front panel Blue Ribbon Amphenol connector. Adjust to set the DVM output OFFSET to ZERO volts within 1mv.

(b) Issue the appropriate CAMAC WRITE command with W1-W12 = logical 1 and adjust corresponding R1 through R7 GAIN pot to set the output voltage for the selected Full Scale reading on the DVM. For example if Channel 0 is strapped for UNIPOLAR +10V, issue F16 AO with W1-W12=1. R9 shown on the PRINTED WIRING ASSY Model 5408 is adjusted for $+10.000V \pm 1mv$.

(c) Issue appropriate command and data to repeat steps a, b above and adjust as required for ZERO and FS output voltage.

2.2 BIPOLAR

Monitor corresponding Channel output with DVM. Repeatedly issue the write commands and data shown below. Adjust pots to obtain the corresponding voltage within 1mv.

COMMAND	DATA	DVM VOLTS	POT ADJ.
F16*	W1-W11=0, W12=1	ZERO	OFFSET
F16*	W1-W12=1	+FS	GAIN
F16*	W1-12=0	-FS	GAIN

Turn Power off and disassemble set up. Unit is ready for use.

*Channels 0-7 equal addresses A0-A7.

MODEL 5408 8 CHANNEL 12-BIT DAC

3.0 DESCRIPTION

The Model 5408 is a single-wide module that contains eight (8) independent 12-bit DAC's and storage registers. Each register can be loaded or read from the dataway. Each DAC is strap selectable for 0 to +5V, 0 to +10V, $\pm 5V$, and $\pm 10V$ ranges. Each output will drive $\pm 5ma$. on all ranges. Settling time to .01% Typ. 3 μ sec.

DAC Outputs are on the 36-pin read edge connector or optionally on 8 front panel LEMO or a single Blue Ribbon connector.

4.0 INSTALLATION

The 5408 can be installed in any slot in a CAMAC crate except N24 and N25. Before installing the 5408, check patch pin straps for proper range and coding.

OUTPUT RANGE SELECT:

OUTPUT RANGE	CONNECT PIN A TO	PIN B TO	PIN D TO
$\pm 10V$	D	E	A
$\pm 5V$	C	E	N/C
$\pm 2.5V$	C	E	E
0 to +10V	C	F	N/C
0 to +5V	C	F	E

NOTE: If range is strapped for UNIPOLAR with patch pins G and H shorted, dataway Z will set outputs to ZERO volts; G and H open sets 1/2 Full-Scale.

For BIPOLAR G and H open, dataway Z will set outputs to ZERO volts; G and H shorted sets NEG Full-Scale.

Calibration of gain and offset for each channel is possible via pots at top of unit.

COMMANDS

F0 A(n) Read register (n).
F16 A(n) Write register (n).

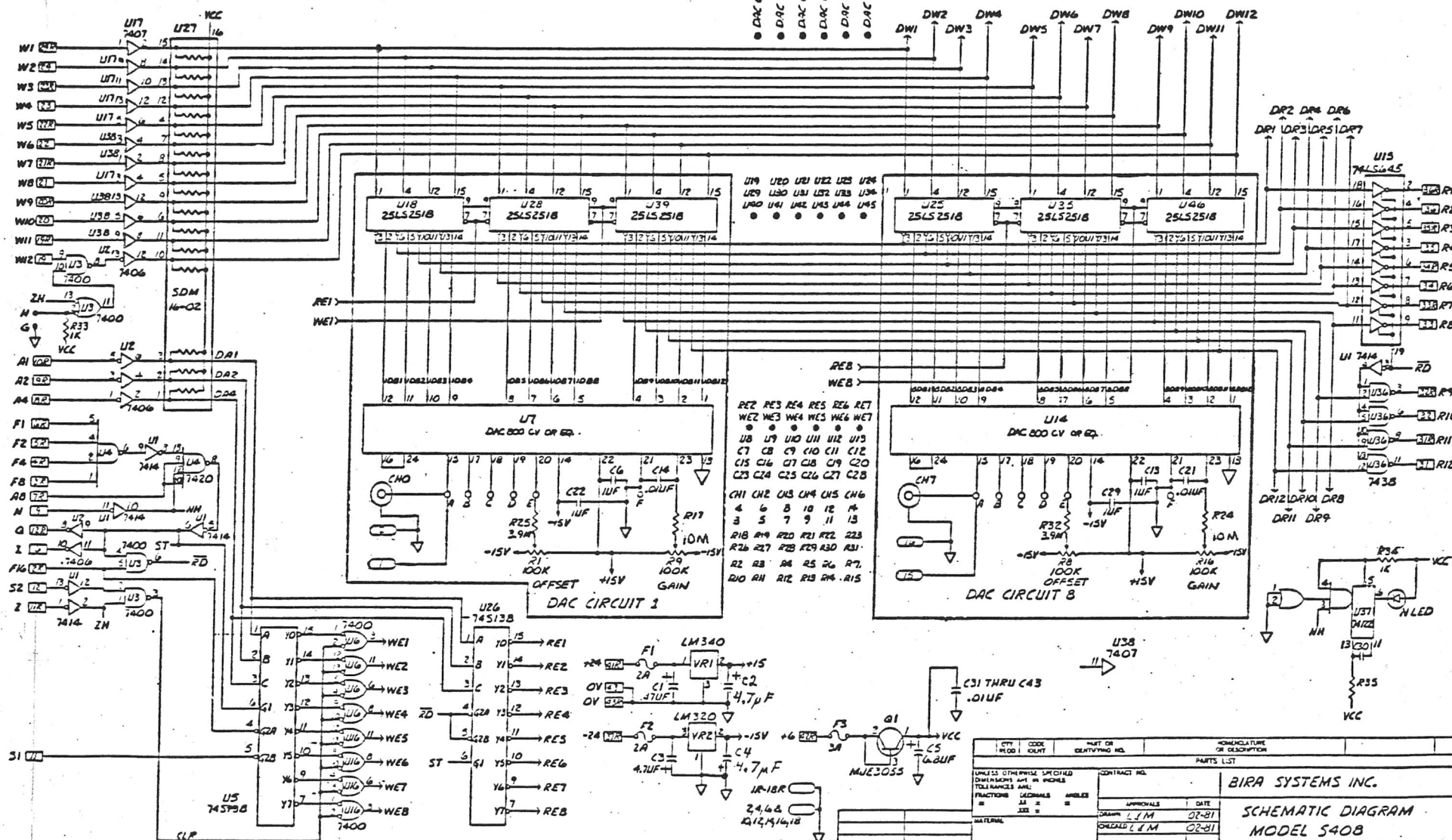
Where (n) represents DAC channel 0 thru 7, Q and X returned for each valid command.

Z.S2 Clear all registers.

 CAMAC CONNECTOR
 AUX CONNECTOR
 WIRE WRAP POST
 DAC CIRCUIT BUS LINES

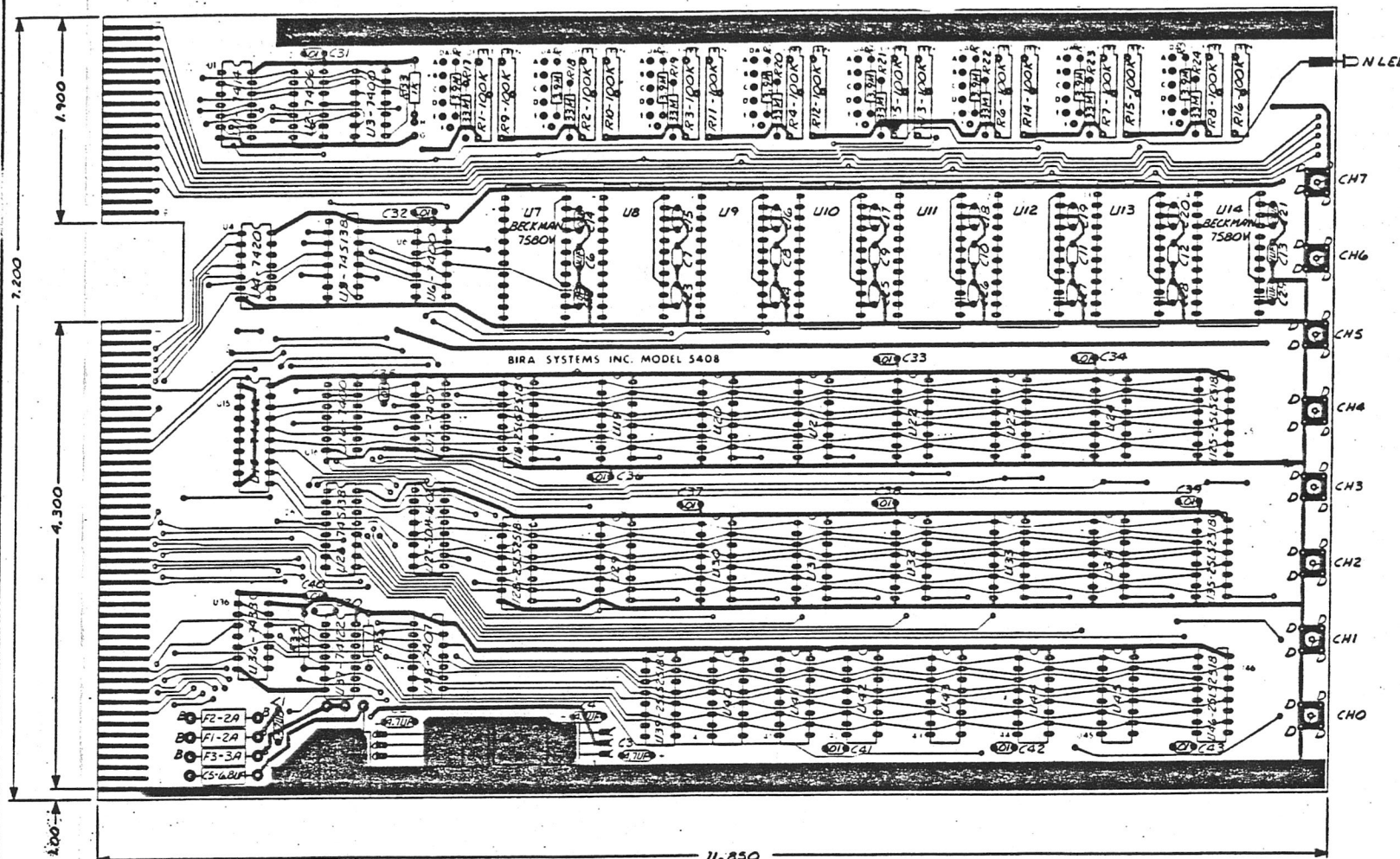
DAC CIRCUIT 2
 DAC CIRCUIT 3
 DAC CIRCUIT 4
 DAC CIRCUIT 5
 DAC CIRCUIT 6
 DAC CIRCUIT 7

*REVISIONS				
DATE	REV	DESCRIPTION	DATE	APPROVED
	1	ORIGINAL ISSUE	02-81	
	2	1/2 FROM TAKES TO TVSUSE	7-83	
	3	1/2 LHS FROM 1980-1 TO 1980-2	7-83	



ETT REQ ID		CODE EXHIBIT		PART OR IDENTIFYING NO.		NOMENCLATURE OR DESCRIPTION	
PARTS LIST						BIRA SYSTEMS INC.	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS .01 = .0005 DECIMALS .01 = .0005 ANGLES .01 = .0005				CONTRACT NO.			
MATERIAL				APPROVALS		DATE	
DRAWN L M				02-81		SCHEMATIC DIAGRAM	
CHECKED L M				02-81		MODEL 5408	
SIZE				CODE EXHIBIT NO.		DRAWING NO.	
D				0		0	
NO NOT SCALE DRAWING				SCALE		SHEET 1 OF 1	

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	ORIGINAL ISSUE	02-81	



NOTE:
KEYBOARD TO BE ALL PLATED
.00005 THICK MIN. OVER Ni.

HOLE CHART		
SYM	DESCRIPTION	QTY
A	.125/.130	14
B	.075/.080	6
C	.040/.045	14
D	.058/.062	32
ALL OTHERS	.032/.036	A/R

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
PARTS LIST			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES			
MATERIAL XXX .040			
CONTRACT NO.		DATE	
APPROVALS		02-81	
DRAWN L & M		02-81	
CHECKED L & M		02-81	
BIRA SYSTEMS INC. PRINTED WIRING ASSY MODEL 5408			
SIZE D	CODE IDENT NO.	DRAWING NO.	
SCALE 2:1		SHEET 1 OF 1	

Bi Ra Systems, Inc.

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MODEL 5408
8 CHANNEL, 12-BIT D/A CONVERTER

FEATURES

- 8 Analog Outputs to rear connector and optional front panel connectors
- Outputs are short circuit proof
- Selectable output voltage ranges, 0-5V, 0-10V, $\pm 10V$, $\pm 5V$, and $\pm 2.5V$ for each channel

APPLICATIONS

- Drive Panel Meters and X-Y Recorders
- Programmable Voltage Levels

General Description

The Model 5408 is a single-width module that contains 8 independent 12-bit DAC's and storage registers. Each register can be loaded or read from the dataway. Each DAC is strap selectable for 0V to 5V, 0V to 10V, $\pm 2.5V$, $\pm 5V$, and $\pm 10V$ ranges. Each output will drive $\pm 5ma$. on all ranges. Settling time to half LSB is within 4usec.

DAC outputs are on the 36-pin rear edge connector, and optionally on 8 front panel LEMO's (one or two pin) or a Ribbon connector.

Calibration of gain and offset for each channel is with pots mounted at the top of the module. The output impedance is less than 50 m ohms and the outputs are short circuit proof.

Optional front panel connectors are available.

Function Codes:

Command	Q	Action
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F16	An WT1 1	Writes the data register n. NOTE: n can range from 0-7.
FO	An RD1 1	Reads the data register n.
Z	CZ 0	Clears the data registers.
X		Valid for all addressed commands.

Power Requirements: +6 Volts - 400mA. +24 Volts - 100mA +load current.
-24 Volts - 200mA.

Weight: .45Kg. (1 lb.)

ORDERING INFORMATION:

Model 5408-0	8 channel, 12 Bit DAC with rear auxiliary connector
Model 5408-1	8 channel, 12 Bit DAC with front mounted 1 Pin LEMO conn.
Model 5408-2	8 channel, 12 Bit DAC with front mounted 2 Pin LEMO conn.
Model 5408-3	8 channel, 12 Bit DAC with front mounted Ribbon connector

ACCESSORIES: Mating connectors for Model 5408 are:

- 0 H42511-18/36
- 1 LEMO shell 00, one contact
- 2 LEMO shell 00, two contact
- 3 Blue Ribbon 57-30500

MODEL
5408
DAC

N

J1

OUT

BiRa

MODEL 5408

8 CHANNEL 12-BIT DAC
MANUAL

SEPTEMBER 1996

Bi Ra Systems

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OUTPUT RANGE SELECT

OUTPUT RANGE	CONNECTOR		
	PIN A TO	PIN B TO	PIN D TO
+/-10V	D	E	A
+/-5V	C	E	N/C
+/-2.5V	C	E	E
0 to +10V	C	F	N/C
0 to +5V	C	F	E

NOTE: If range is strapped for UNIPOLAR with patch pins G and H shorted, dataway Z will set outputs to ZERO volts; G and H open sets 1/2 Full-Scale.

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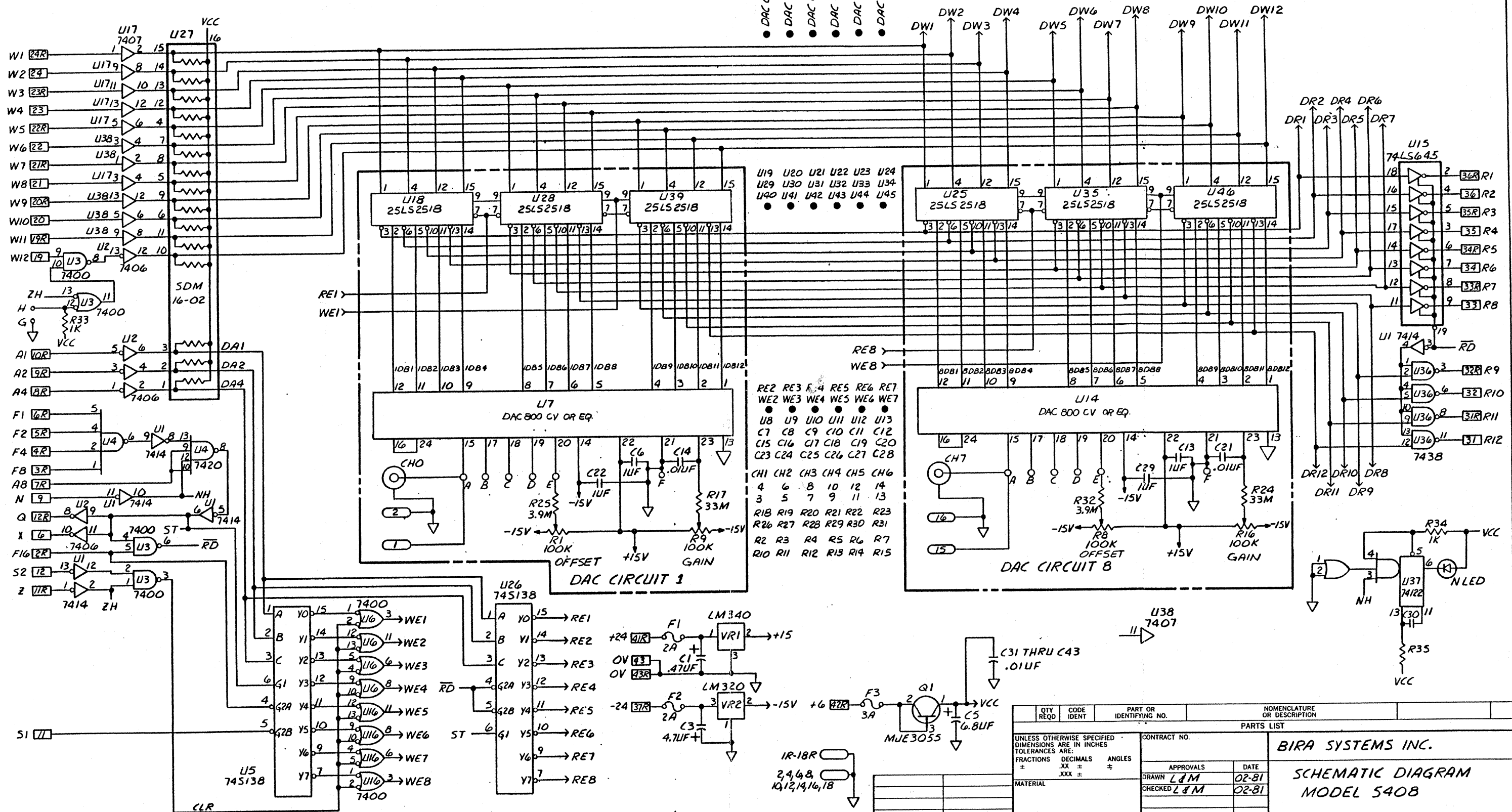
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LEGEND:
 CAMAC CONNECTOR
 AUX CONNECTOR
 WIRE WRAP POST
 DAC CIRCUIT BUS LINES

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
A	ORIGINAL	ISSUE	02-81	
B	U15 FROM 74LS42 TO 74LS45		9-83	
C	U7, U14 FROM 7580V TO DAC 800CV		7-83	



QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
PARTS LIST			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES .XX ± .XXX ± °			
MATERIAL		CONTRACT NO.	BIRA SYSTEMS INC.
FINISH		APPROVALS	DATE
NEXT ASSY		DRAWN LAM	02-81
USED ON		CHECKED LAM	02-81
APPLICATION		DO NOT SCALE DRAWING	
SCALE		SIZE	CODE IDENT NO. DRAWING NO.
		D	
		SHEET 1 OF 1	