

DSD-1

Precision Digital FM Stereo Decoder

Guide to Operations

2-03

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WARRANTY AND ASSISTANCE

All Belar products are warranted against defects in materials and workmanship. This warranty applies for one year from the date of delivery, FOB factory or, in the case of certain major components listed in the instruction manual, for the specified period. Belar will repair or replace products which prove to be defective during the warranty period provided that they are returned to Belar prepaid. No other warranty is expressed or implied. Belar is not liable for consequential damages.

For any assistance, contact your Belar Sales Representative or Customer Engineering Service at the Belar factory.

DSD-1 Digital FM Stereo Decoder

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DSD-1 Digital FM Stereo Decoder

1 General Information

1-1 General Description

The Belar DSD-1 FM Digital Stereo Decoder is a DSP based precision stereo decoder. It is designed for any application requiring the precise accurate conversion of analog baseband composite to digital AES/EBU output.

The DSD-1 digitizes the composite and decodes the stereo multiplex signal using digital signal processing techniques. Unlike an analog design, a DSP based design is not subject to variations due to temperature, component aging, or component tolerances. The resulting circuit requires virtually no adjustments, but can achieve extremely tight tolerances. In addition, the DSP design allows the use of FIR linear phase filters which eliminate phase distortion.

1-2 Specifications

Input Composite, 100 k Ω , unbalanced, BNC Connector, 1.0 - 2.0 Vrms (2.8V - 5.7V P-P).

Output Left and Right Digital, AES/EBU, 48 kHz

Separation:

Left to Right 80 dB, 10Hz to 15 kHz

Right to Left 80 dB, 10Hz to 15 kHz

Crosstalk:

L + R to L - R 80 dB

L - R to L + R 80 dB

SCA to L + R 90 dB

SCA to L - R 90 dB

SCA Interference 90 dB

2 Unpacking

2-1 Initial Inspection

Check the shipping carton for external damage. If the carton exhibits evidence of abuse in handling (holes, broken corners, etc.) ask the carrier's agent to be present when the unit is unpacked. Carefully unpack the unit and inspect all equipment for physical damage immediately after unpacking. Bent or broken parts, dents and scratches should be noted. If damage is found, refer to Paragraph 2-2 for the recommended claim procedure. Keep all packing material for proof of claim or for possible future use.

The DSD-1 is shipped with a Guide to Operations, 4 black rack-mount screws, and a three-wire line cord.

2-2 Claims

If the unit has been damaged, notify the carrier immediately. File a claim with the carrier or transportation company and advise Belar of such action to arrange the repair or replacement of the unit without waiting for a claim to be settled with the carrier.

2-3 Repacking for Shipment

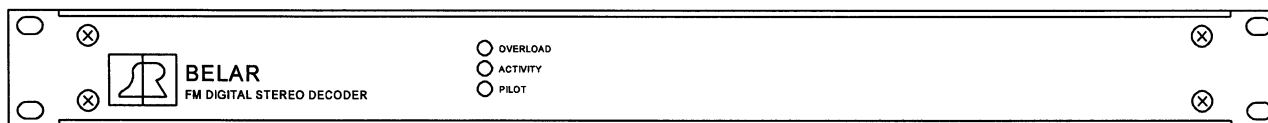
If the unit is to be returned to Belar, attach a tag to it showing owner and owner's address. A description of the service required should be included on the tag. The original shipping carton and packaging materials should be used for reshipment. If they are not available or reusable, Belar can provide a replacement box and packaging at a nominal cost. Alternatively, the unit should be repackaged in the following manner:

- a) Use a double-walled carton with a minimum test strength of 275 pounds.
- b) Use heavy paper or sheets of cardboard to protect all surfaces.
- c) Use at least 4 inches of tightly packed, industry approved, shock absorbing material such as extra firm polyurethane foam or rubberized hair. **Newspaper is not sufficient for cushioning material!**
- d) Use heavy duty shipping tape to secure the outside of the carton.
- e) Use large **FRAGILE** labels on each surface.
- f) Return the unit, freight prepaid. Be sure to insure the unit for full value.

DSD-1 Digital FM Stereo Decoder

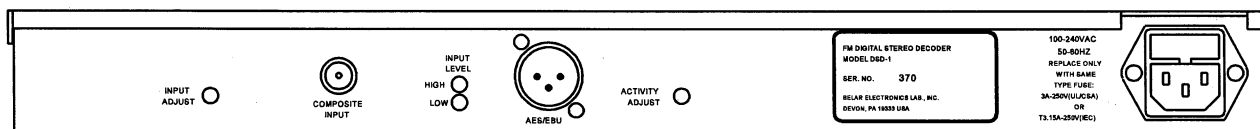
3 Operation

3-1 Front Panel



The green **PILOT** LED is illuminated when the unit detects the 19 kHz pilot. At least 6% injection is required to illuminate this light. The yellow **ACTIVITY** LED will light at 110% or other level that you have set (see the next section for adjustment instructions). Generally you will see this light flicker on and off occasionally during normal operation, depending on program peaks. The red **OVERLOAD** LED will illuminate as you get close to the maximum input level -- if this light is on, your input level is too high.

3-2 Rear Panel



Input Composite, 100 k Ω , unbalanced, BNC Connector, 1.0 - 2.0 Vrms (2.8V - 5.7V P-P).

Output Left and Right 75 μ sec de-emphasized*, AES/EBU, 48 kHz, on XLR connector

*Note: This output can be changed to Left and Right FLAT, or Pilot & Subcarrier, or Pilot & Pilot Mod by resetting internal jumpers as described in *Section 4*.

4 Installation and Setup

The DSD-1 is designed to be mounted in a standard 19-inch rack. The unit can be operated from an 100 to 240 VAC single phase, 50-60 Hz power source, with no user adjustments. The fuse should be a 3A-250V (UL/CSA) or T3.15A-250V (IEC) fuse only. A spare fuse is stored in the removable fuse compartment.

Connect the three wire grounded line cord provided, or, if a substitute line cord is used, be sure that the ground lead is connected to "G" on the line cord receptacle.

Make the rear panel connection and adjustment as follows:

COMPOSITE INPUT While applying the appropriate calibration signal to the composite input (for example, a Belar FMM-2 or FMMA-1 with the calibrator turned on), adjust the potentiometer labeled "INPUT ADJUST" located on the back panel until both the HIGH and LOW LED's on the back panel are not lit.

ACTIVITY ADJUST The potentiometer labeled "ACTIVITY ADJUST" is used to change the level at which the "ACTIVITY" LED illuminates. The light is set at the factory at 110%, but may be changed according to user preference. The "ACTIVITY" LED is provided as a front-panel indicator of program peaks -- similar to the adjustable peak light of a mod monitor. This LED should be set so that it lights occasionally, so you are assured that there is program material passing through the unit.

During normal operation both the HIGH and LOW LEDs on the rear panel may light at seemingly random and frequent intervals. This is normal and just indicates that there is program material being applied to the unit.

4-1 AES/EBU Digital Output

The digital output of the DSD-1 can be configured as different data streams, depending on the application. As shipped, the output is configured as Left and Right, 75 μ sec de-emphasized. By resetting internal jumpers (as shown on the DSD-1 A1 Board Connections and Adjustments drawing in Section 5), the digital output can be changed to Left and Right FLAT, Pilot & Stereo Subcarrier (38 kHz), or Pilot and Pilot Modulation. The table below shows the different outputs that are available and the respective jumper settings. The jumper positions are indicated as viewed from the front of the unit. An "X" in a block indicates that the position of that jumper does not affect the output.

	Left and Right FLAT	Left and Right 75 μ sec de-emphasized	Pilot, 38kHz Subcarrier	Pilot, Pilot Mod
P1	X	X		
P2				
P3			X	X

DSD-1 Digital FM Stereo Decoder

5 Diagrams, Schematics and Parts Lists

Replaceable Parts. This page contains information for ordering replaceable parts for the DSD-1. The tables that follow list the parts in alphanumeric order by reference designation and provides a description of the part with the Belar part number.

Ordering Information. To order a replacement part from Belar, address the order or inquiry to Belar and supply the following information:

- a. Model number and serial number of unit.
- b. Description of part, *including the reference designation and location.*

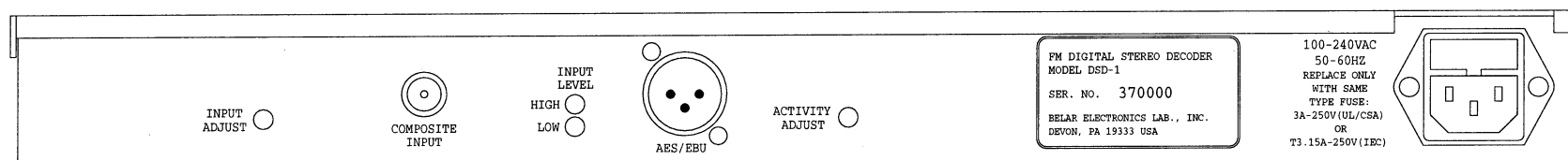
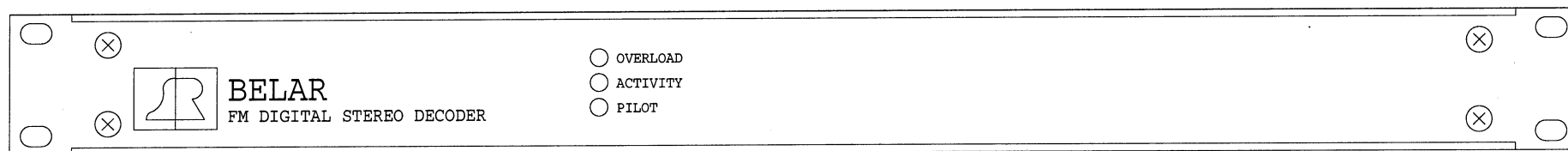
Orders may also be taken over the telephone. Parts orders can be put on your VISA, MasterCard, or American Express card, or we can ship them COD.

REFERENCE DESIGNATORS

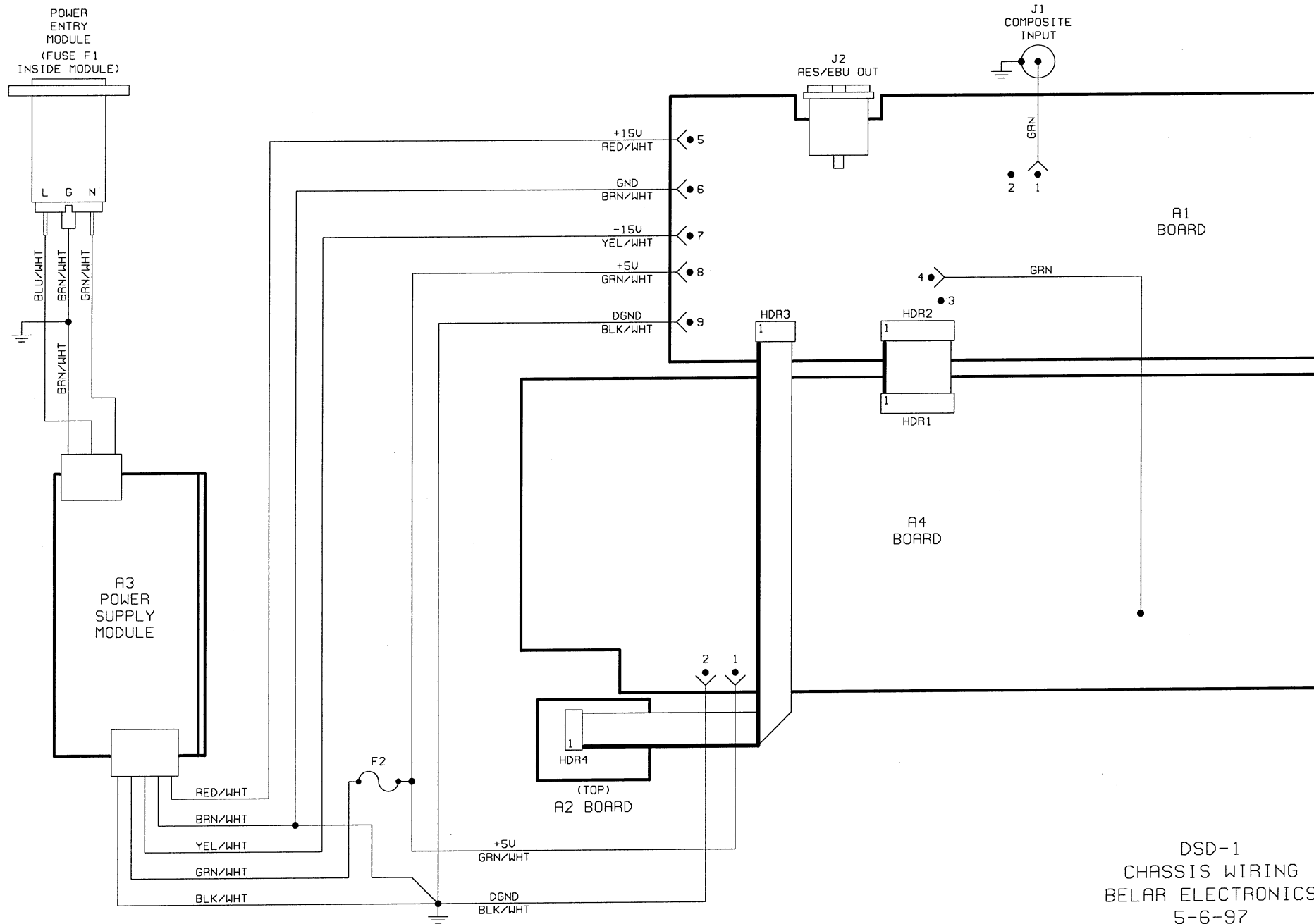
A	= assembly	J	= jack	S	= switch
BR	= diode bridge	L	= inductor	T	= transformer
C	= capacitor	M	= meter	TB	= terminal block
CR	= diode or LED	P	= plug	U	= integrated circuit
DS	= display or lamp	Q	= transistor	W	= cable
F	= fuse	R	= resistor	X	= socket
FL	= filter	RL	= relay	Y	= crystal
HDR	= header connector	RN	= resistor network		

ABBREVIATIONS

ADC	= analog-to-digital converter	PIV	= peak inverse voltage
BCD	= binary coded decimal	POLY	= polystyrene
CER	= ceramic	PORC	= porcelain
COMP	= composition	POT	= potentiometer
CONN	= connector	SEMICON	= semiconductor
DAC	= digital-to-analog convertor	SI	= silicon
DPM	= digital panel meter	TANT	= tantalum
ELEC	= electrolytic	uF	= microfarads
GE	= germanium	V	= volt
IC	= integrated circuit	VAR	= variable
k	= kilo = 1,000	VDCW	= dc working volts
M	= meg = 1,000,000	W	= watts
MOD	= modulation	WW	= wirewound
MY	= Mylar		
PC	= printed circuit		
pF	= picofarads		



DSD-1 FRONT & REAR VIEW
BELAR ELECTRONICS

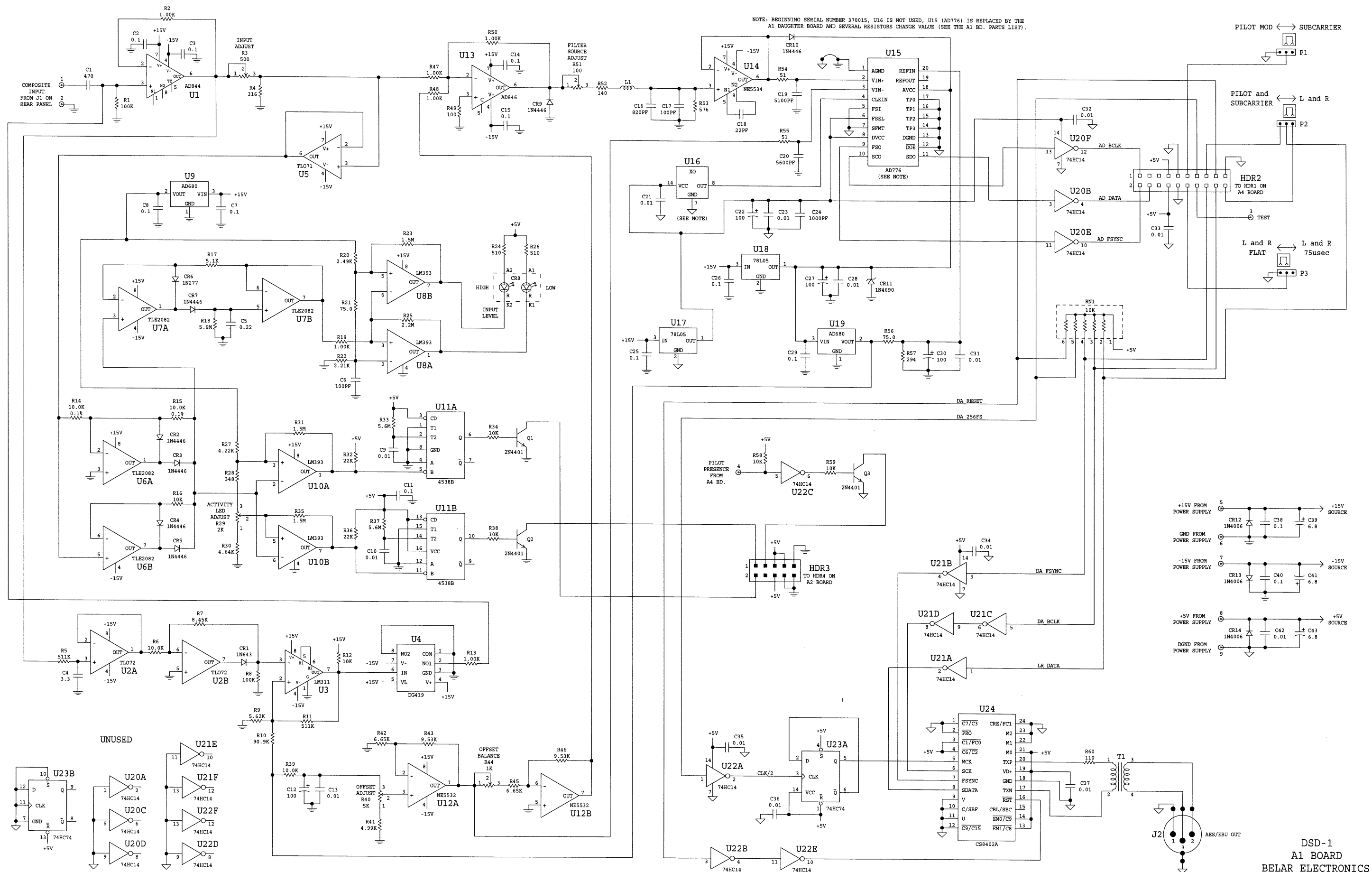


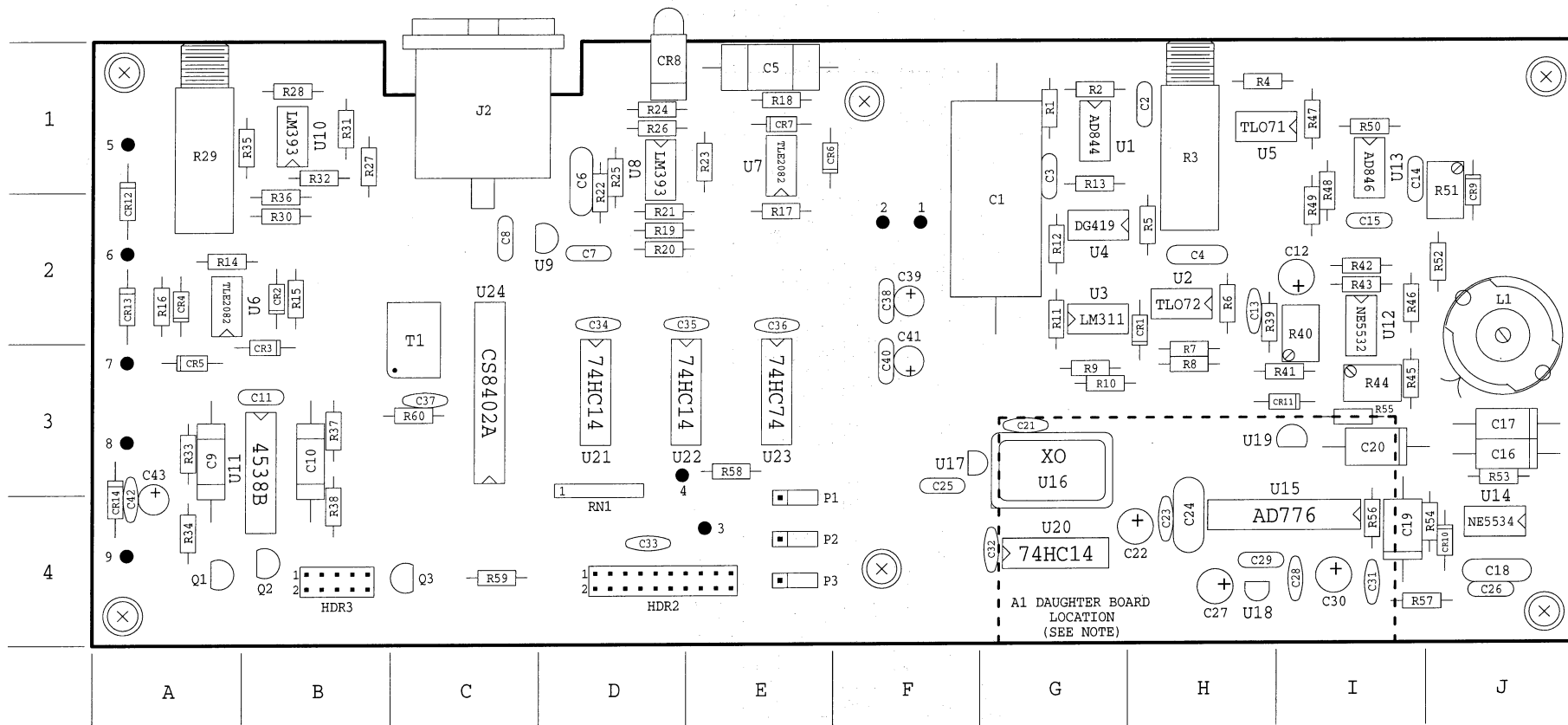
DSD-1
CHASSIS WIRING
BELAR ELECTRONICS
5-6-97

DSD-1 PARTS LISTS

MAIN CHASSIS

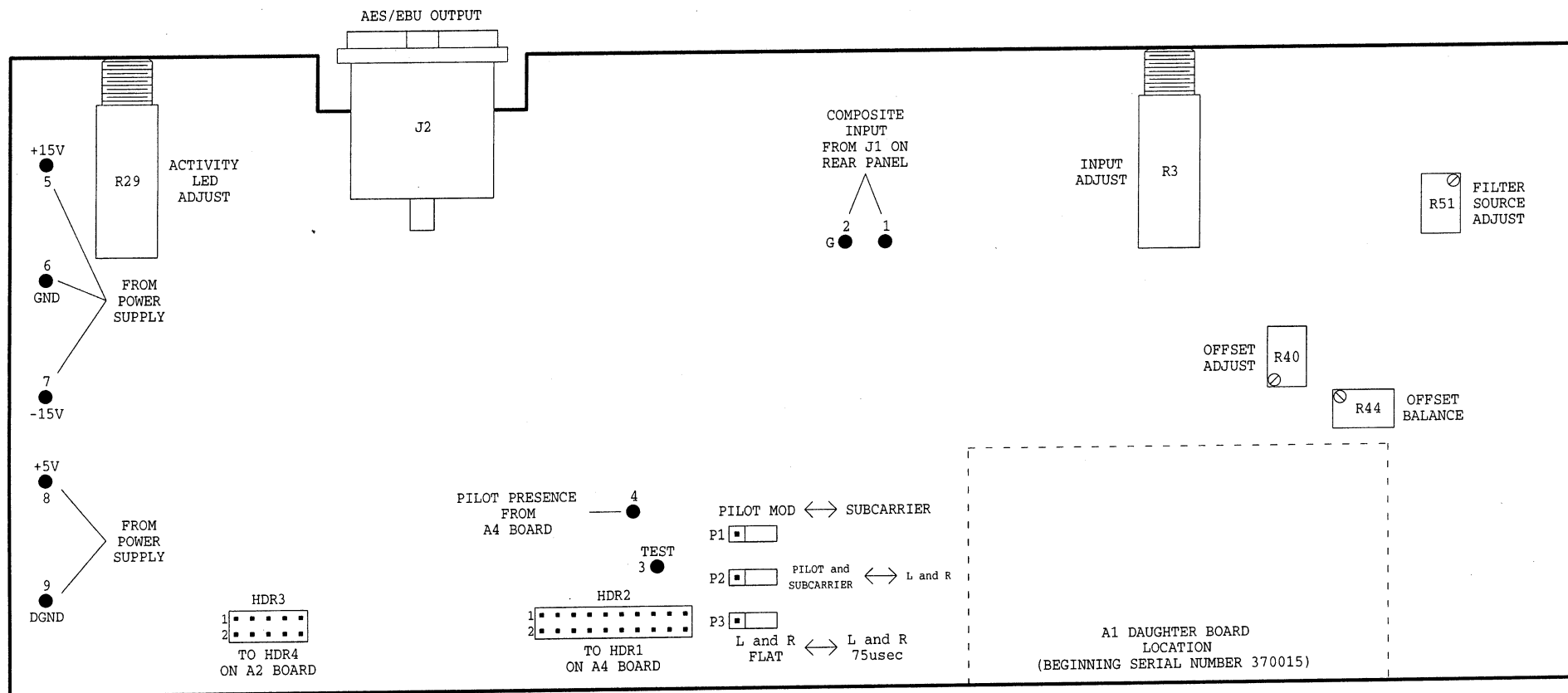
Reference Designation	Description	Part Number
A3	POWER SUPPLY MODULE: 15W	4005-0019A
--	POWER ENTRY MODULE: 6EGG1-1	0360-0021
F1	FUSE: GMA-3A 250V(UL/CSA)	2110-0009
--	or T3.15A-250V(IEC)	
--	FUSE HOLDER: CHASSIS MOUNT	2110-0010
F2	FUSE: AGC-2A 250V	2110-0006
J1	JACK: BNC	0360-0005
--	FLAT CABLE ASSEMBLY: 24 CONDUCTOR	8900-0006
--	FLAT CABLE ASSEMBLY: 10 CONDUCTOR	8900-0007
--	LINE CORD (115 Vac line voltage)	8120-0002
--	LINE CORD (230 Vac line voltage)	8120-0004





DSD-1 A1 BOARD
COMPONENT LAYOUT
BELAR ELECTRONICS

Desiq/Loc		Desiq/Loc		Desiq/Loc		Desiq/Loc		Desiq/Loc		Desiq/Loc	
C1	G2	C30	I4	HDR2	D4	R15	B2	R44	I3	U8	D1
C2	H1	C31	I4	HDR3	B4	R16	A2	R45	I3	U9	D2
C3	G1	C32	G4			R17	E2	R46	I2	U10	B1
C4	H2	C33	D4	J2	C1	R18	E1	R47	I1	U11	B3
C5	E1	C34	D2			R19	D2	R48	I1	U12	I2
C6	D1	C35	E2	L1	J2	R20	D2	R49	I2	U13	I1
C7	D2	C36	E2			R21	D2	R50	I1	U14	J4
C8	C2	C37	C3	P1	E4	R22	D1	R51	J1	U15	I4
C9	A3	C38	F2	P2	E4	R23	E1	R52	J2	U16	G3
C10	B3	C39	F2	P3	E4	R24	D1	R53	J3	U17	F3
C11	B3	C40	F3			R25	D1	R54	J4	U18	H4
C12	I2	C41	F3	Q1	A4	R26	D1	R55	I3	U19	I3
C13	H2	C42	A4	Q2	B4	R27	B1	R56	I4	U20	G4
C14	I1	C43	A4	Q3	C4	R28	B1	R57	I4	U21	D3
C15	I2					R29	A1	R58	E3	U22	D3
C16	J3	CR1	H2	R1	G1	R30	B2	R59	C4	U23	E3
C17	J3	CR2	B2	R2	G1	R31	B1	R60	C3	U24	C3
C18	J4	CR3	B3	R3	H1	R32	B1				
C19	I4	CR4	A2	R4	H1	R33	A3	RN1	D3		
C20	I3	CR5	A3	R5	H2	R34	A4				<u>pins</u>
C21	G3	CR6	E1	R6	H2	R35	B1	T1	C2	1	F2
C22	H4	CR7	E1	R7	H3	R36	B2			2	F2
C23	H4	CR8	D1	R8	H3	R37	B3	U1	G1	3	E4
C24	H4	CR9	J1	R9	G3	R38	B4	U2	H2	4	D3
C25	F3	CR10	J4	R10	G3	R39	H2	U3	G2	5	A1
C26	J4	CR11	I3	R11	G2	R40	I2	U4	G2	6	A2
C27	H4	CR12	A2	R12	G2	R41	I3	U5	H1	7	A3
C28	I4	CR13	A2	R13	G1	R42	I2	U6	A2	8	A3
C29	H4	CR14	A4	R14	A2	R43	I2	U7	E1	9	A4



DSD-1 A1 BOARD
CONNECTIONS & ADJUSTMENTS
BELAR ELECTRONICS

A1 BOARD DSD-1

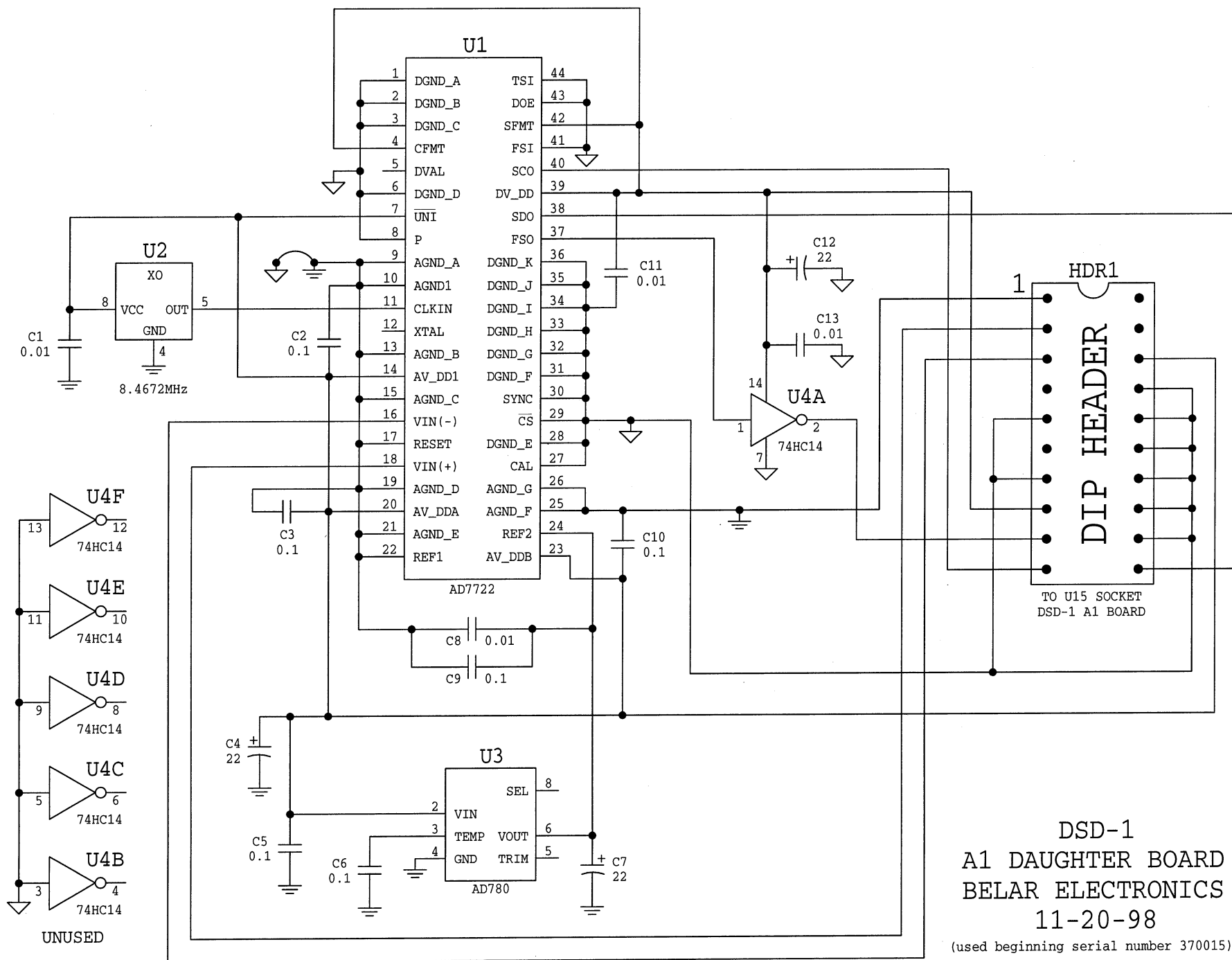
Reference Designation	Description	Part Number
C1	C: FIXED ELEC 470uF 25V NON-POLAR	0180-0037
C2,C3	C: FIXED CERAMIC 0.1uF 50V	0151-0015
C4	C: FIXED CERAMIC 3.3uF 50V	0151-0011
C5	C: FIXED FILM 0.22uF 10% 80V	0120-2241
C6	C: FIXED MICA 100pF 5%	0140-1015
C7,C8	C: FIXED CERAMIC 0.1uF 50V	0151-0015
C9,C10	C: FIXED FILM 0.01uF 10% 200V	0120-1031
C11	C: FIXED CERAMIC 0.1uF 50V	0151-0015
C12	C: FIXED TANT 100uF 6.3V	0185-0010
C13	C: FIXED CERAMIC 0.01uF 100V	0151-0003
C14,C15	C: FIXED CERAMIC 0.1uF 50V	0151-0015
C16	C: FIXED POLY 820pF 2.5% 160V	0130-8212
C17	C: FIXED POLY 100pF 2.5% 160V	0130-1012
C18	C: FIXED MICA 22pF 5%	0140-2205
C19	C: FIXED POLY 5100pF 1% 160V (C19 is selected for 1%)	0130-5122
C20	C: FIXED POLY 5600pF 2.5% 160V	0130-5622
C21	C: FIXED CERAMIC 0.01uF 100V	0151-0003
C22	C: FIXED TANT 100uF 6.3V	0185-0010
C23	C: FIXED CERAMIC 0.01uF 100V	0151-0003
C24	C: FIXED MICA 1000pF 5%	0140-1025
C25,C26	C: FIXED CERAMIC 0.1uF 50V	0151-0015
C27	C: FIXED TANT 100uF 6.3V	0185-0010
C28	C: FIXED CERAMIC 0.01uF 100V	0151-0003
C29	C: FIXED CERAMIC 0.1uF 50V	0151-0015
C30	C: FIXED TANT 100uF 6.3V	0185-0010
C31 thru C37	C: FIXED CERAMIC 0.01uF 100V	0151-0003
C38	C: FIXED CERAMIC 0.1uF 50V	0151-0015
C39	C: FIXED TANT 6.8uF 25V	0185-0002
C40	C: FIXED CERAMIC 0.1uF 50V	0151-0015
C41	C: FIXED TANT 6.8uF 25V	0185-0002
C42	C: FIXED CERAMIC 0.01uF 100V	0151-0003
C43	C: FIXED TANT 6.8uF 25V	0185-0002
CR1	DIODE: 1N643	1900-0017
CR2 thru CR5	DIODE: 1N4446	1900-0002
CR6	DIODE: 1N277 GERMANIUM	1900-0001
CR7	DIODE: 1N4446	1900-0002
CR8	LED: BI-LEVEL, RED/RED	1910-0009
CR9,CR10	DIODE: 1N4446	1900-0002
CR11	DIODE: 1N4690	1900-0031
CR12 thru CR14	DIODE: 1N4006	1900-0016
HDR2	HEADER CONNECTOR: 20 PIN	0361-0020
HDR3	HEADER CONNECTOR: 10 PIN	0361-0010
J2	CONNECTOR: "XLR" MALE	0360-0046
L1	INDUCTOR: BELAR	

A1 BOARD DSD-1 cont.

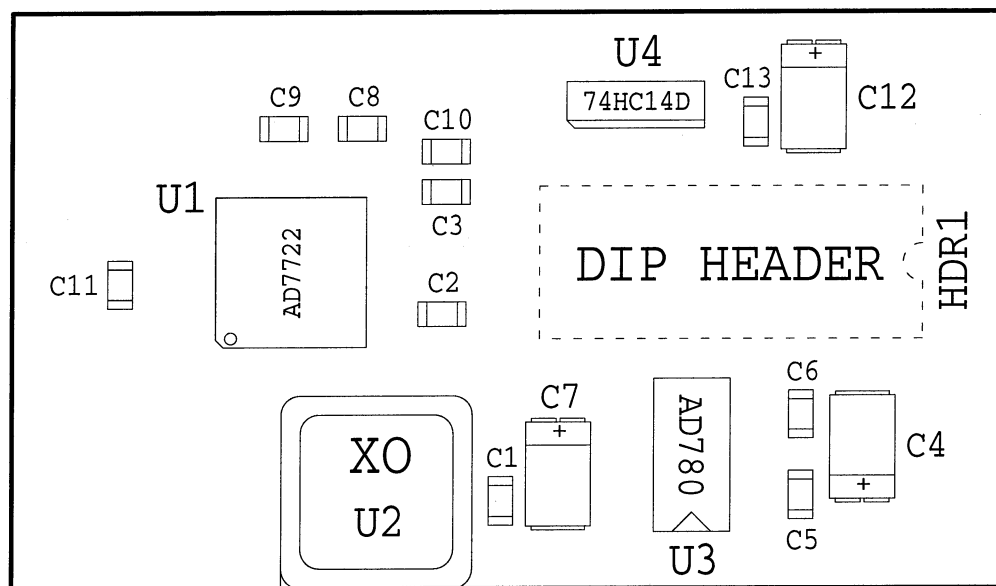
Reference Designation	Description	Part Number
P1 thru P3	PLUG: 3 PIN, PC MOUNT	0365-0030
--	JUMPER: 2 POSITION (USED WITH P1 thru P3)	0365-0028
Q1 thru Q3	TRANSISTOR: 2N4401	1850-0028
R1	R: METAL FILM 100k 1%	0721-1003
R2	R: METAL FILM 1.00k 1%	0721-1001
R3	R: VAR COMP 500, 10 TURN	2100-0028
R4*	R: METAL FILM 1.00k 1%	0721-1001
*Note: beginning serial no. 370015, R4 is 316 1%, P/N 0721-3160		
R5	R: METAL FILM 511k 1%	0721-5113
R6	R: METAL FILM 10.0k 1%	0721-1002
R7	R: METAL FILM 8.45k 1%	0721-8451
R8	R: METAL FILM 100k 1%	0721-1003
R9	R: METAL FILM 5.62k 1%	0721-5621
R10	R: METAL FILM 90.9k 1%	0721-9092
R11	R: METAL FILM 511k 1%	0721-5113
R12	R: METAL FILM 10k 2% 1/4W	0751-1032
R13	R: METAL FILM 1.00k 1%	0721-1001
R14, R15	R: METAL FILM 10.0k 0.1%	0711-1002
R16	R: METAL FILM 10k 2% 1/4W	0751-1032
R17	R: METAL FILM 5.1k 2% 1/4W	0751-5122
R18	R: FIXED CARBON 5.6M 5% 1/4W	0683-5655
R19	R: METAL FILM 1.00k 1%	0721-1001
R20*	R: METAL FILM 2.32k 1%	0721-2321
R21*	R: METAL FILM 90.9 1%	0721-90R9
R22*	R: METAL FILM 2.74k 1%	0721-2741
*Note: beginning serial no. 370015, R20 is 2.49k 1%, P/N 0721-2491, R21 is 75.0 1%, P/N 0721-75R0 and R22 is 2.21k 1%, P/N 0721-2211		
R23	R: FIXED CARBON 1.5M 5% 1/4W	0683-1555
R24	R: METAL FILM 510 2% 1/4W	0751-5112
R25	R: FIXED CARBON 2.2M 5% 1/4W	0683-2255
R26	R: METAL FILM 510 2% 1/4W	0751-5112
R27*	R: METAL FILM 3.01k 1%	0721-3011
R28*	R: METAL FILM 432 1%	0721-4320
R29	R: VAR COMP 2k, 10 TURN	2100-0032
R30*	R: METAL FILM 5.11k 1%	0721-5111
*Note: beginning serial no. 370015, R27 is 4.22k 1%, P/N 0721-4221, R28 is 348 1%, P/N 0721-3480 and R30 is 4.64k 1%, P/N 0721-4641		
R31	R: FIXED CARBON 1.5M 5% 1/4W	0683-1555
R32	R: METAL FILM 22k 2% 1/4W	0751-2232
R33	R: FIXED CARBON 5.6M 5% 1/4W	0683-5655
R34	R: METAL FILM 10k 2% 1/4W	0751-1032
R35	R: FIXED CARBON 1.5M 5% 1/4W	0683-1555
R36	R: METAL FILM 22k 2% 1/4W	0751-2232
R37	R: FIXED CARBON 5.6M 5% 1/4W	0683-5655
R38	R: METAL FILM 10k 2% 1/4W	0751-1032
R39	R: METAL FILM 10.0k 1%	0721-1002
R40	R: VAR COMP 5k, 10 TURN	2100-0020

A1 BOARD DSD-1 cont.

Reference Designation	Description	Part Number
R41	R: METAL FILM 4.99k 1%	0721-4991
R42	R: METAL FILM 6.65k 1%	0721-6651
R43	R: METAL FILM 9.53k 1%	0721-9531
R44	R: VAR COMP 1k, 10 TURN	2100-0021
R45	R: METAL FILM 6.65k 1%	0721-6651
R46	R: METAL FILM 9.53k 1%	0721-9531
R47*	R: METAL FILM 715 1%	0721-7150
*Note: beginning serial no. 370015, R47 is 1.00k 1%, P/N 0721-1001		
R48	R: METAL FILM 1.00k 1%	0721-1001
R49	R: METAL FILM 100 2% 1/4W	0751-1012
R50	R: METAL FILM 1.00k 1%	0721-1001
R51	R: VAR COMP 100, 10 TURN	2100-0022
R52	R: METAL FILM 140 1%	0721-1400
R53	R: METAL FILM 576 1%	0721-5760
R54	R: METAL FILM 51.1 1%	0721-51R1
(R54 is selected for value, nominal value shown)		
R55	R: METAL FILM 51 2% 1/4W	0751-5102
R56	R: METAL FILM 75.0 1%	0721-75R0
R57	R: METAL FILM 294 1%	0721-2940
R58, R59	R: METAL FILM 10k 2% 1/4W	0751-1032
R60	R: METAL FILM 110 2% 1/4W	0751-1112
RN1	R: NETWORK 6 PIN 10k	0906-1032
T1	TRANSFORMER: PULSE 602-12545	9100-0030
U1	IC: AD844A	1826-0052
U2	IC: TLO72	1826-0038
U3	IC: LM311	1826-0009
U4	IC: DG419	1827-0011
U5	IC: TLO71	1826-0004
U6, U7	IC: TLE2082	1826-0069
U8	IC: LM393	1826-0011
U9	IC: AD680	1826-0051
U10	IC: LM393	1826-0011
U11	IC: 4538B	1822-0023
U12	IC: NE5532	1826-0037
U13	IC: AD846A	1827-0008
U14	IC: NE5534	1826-0025
U15*	IC: AD776	1830-0005
*Note: beginning serial no. 370015, U15 is replaced by the A1 Daughter Board		
U16**	IC: XO, 12.7008MHz	0415-1270
**Note: beginning serial no. 370015, U16 is not used		
U17, U18	IC: 78L05CP	1826-0012
U19	IC: AD680	1826-0051
U20 thru U22	IC: 74HC14A	1822-0042
U23	IC: 74HC74	1822-0067
U24	IC: CS8402A	1823-0008



DSD-1
A1 DAUGHTER BOARD
BELAR ELECTRONICS
11-20-98
(used beginning serial number 370015)



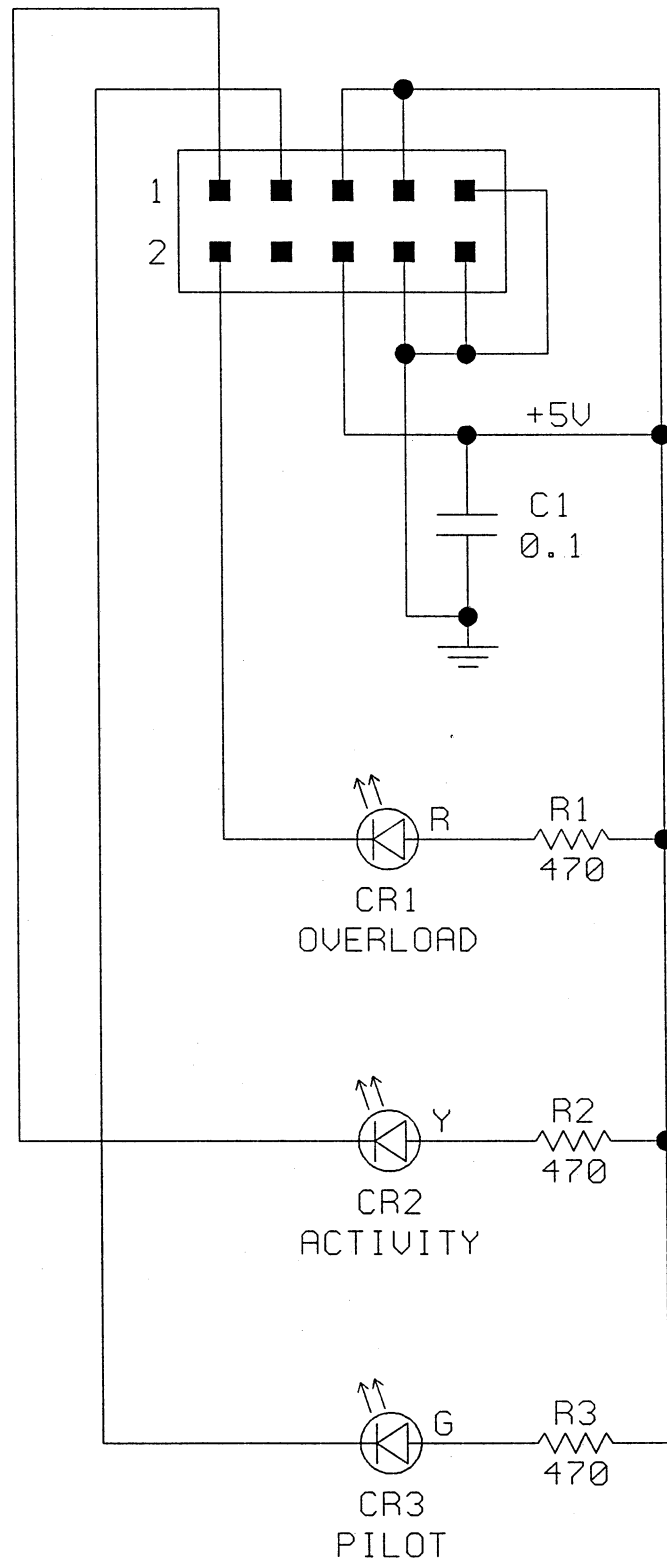
DSD-1
A1 DAUGHTER BOARD
COMPONENT LAYOUT
BELAR ELECTRONICS
(used beginning serial number 370015)

DSD-1 A1 DAUGHTER BOARD

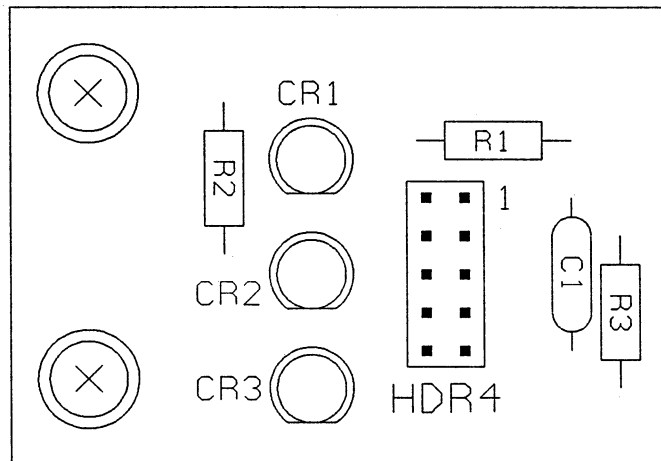
(used with the DSD-1 A1 Board beginning serial number 370015)

Reference Designation	Description	Part Number
C1	C: FIXED CERAMIC CHIP 0.01uF 50V C1206	0151-0021
C2, C3	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C4	C: FIXED TANTALUM CHIP 22uF 25V	0185-0032
C5, C6	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C7	C: FIXED TANTALUM CHIP 22uF 25V	0185-0032
C8	C: FIXED CERAMIC CHIP 0.01uF 50V C1206	0151-0021
C9, C10	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C11	C: FIXED CERAMIC CHIP 0.01uF 50V C1206	0151-0021
C12	C: FIXED TANTALUM CHIP 22uF 25V	0185-0032
C13	C: FIXED CERAMIC CHIP 0.01uF 50V C1206	0151-0021
HDR1	DIP HEADER: 20 PIN	0363-0020
U1	IC: AD7722	1880-0003
U2	IC: XO, 8.4672MHz	0416-8467
U3	IC: AD780	1826-0064
U4	IC: 74HC14D	1872-0010

HDR4
FROM HDR3
ON A1 BOARD



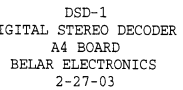
DSD-1/DSD-1A A2 BOARD
BELAR ELECTRONICS
7-5-95

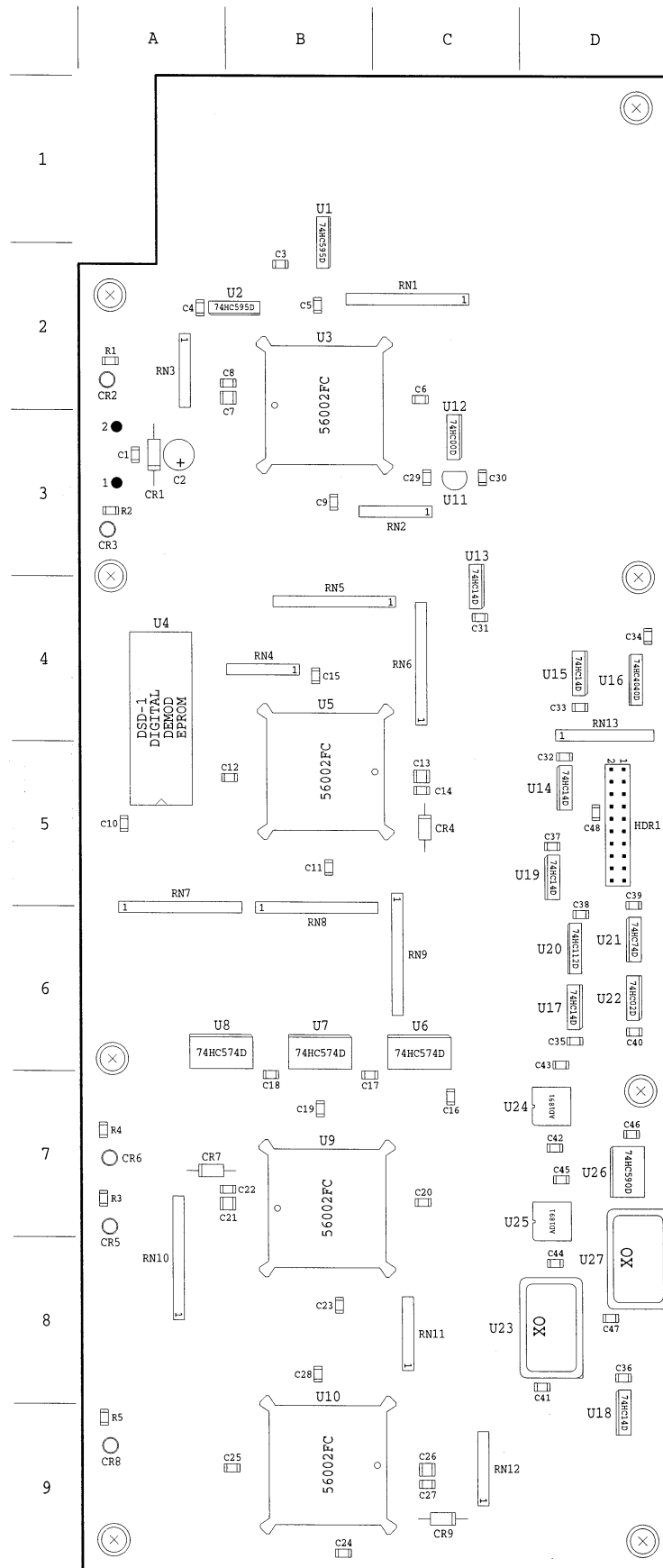


DSD-1/DSD-1A A2 BOARD
COMPONENT LAYOUT
BELAR ELECTRONICS

A2 BOARD DSD-1/DSD-1A

Reference Designation	Description	Part Number
C1	C: FIXED CERAMIC 0.1uF 50V	0151-0006
CR1	LED: RED MV5053	1910-0001
CR2	LED: YELLOW MV5353	1910-0002
CR3	LED: GREEN CMD5453	1910-0003
HDR4	HEADER CONNECTOR: 10 PIN	0361-0010
R1 thru R3	R: METAL FILM 470 2% 1/4W	0751-4712





DSD-1 A4 BOARD
COMPONENT LAYOUT
BELAR ELECTRONICS

DSD-1 A4 BOARD
PART LOCATIONS

<u>Desig/Loc</u>	<u>Desig/Loc</u>	<u>Desig/Loc</u>	<u>Desig/Loc</u>	<u>Desig/Loc</u>	<u>Desig/Loc</u>	<u>Desig/Loc</u>	<u>Desig/Loc</u>	<u>Desig/Loc</u>	<u>Desig/Loc</u>	<u>Desig/Loc</u>	<u>Desig/Loc</u>
C1 A3	C20 C7	C39 D5	CR9 C9	RN10 A8	U15 D4						
C2 A3	C21 A7	C40 D6		RN11 C8	U16 D4						
C3 B2	C22 A7	C41 D8	HDR1 D5	RN12 C9	U17 D6						
C4 A2	C23 B8	C42 D7		RN13 D4	U18 D9						
C5 B2	C24 B9	C43 D6	R1 A2		U19 D5						
C6 C2	C25 B9	C44 D8	R2 A3	U1 B1	U20 D6						
C7 B2	C26 C9	C45 D7	R3 A7	U2 B2	U21 D6						
C8 B2	C27 C9	C46 D7	R4 A7	U3 B2	U22 D6						
C9 B3	C28 B8	C47 D8	R5 A9	U4 A4	U23 D8						
C10 A5	C29 C3	C48 D5		U5 B5	U24 D7						
C11 B5	C30 C3		RN1 C2	U6 C6	U25 D7						
C12 B5	C31 C4	CR1 A3	RN2 C3	U7 B6	U26 D7						
C13 C5	C32 D5	CR2 A2	RN3 A2	U8 A6	U27 D8						
C14 C5	C33 D4	CR3 A3	RN4 B4	U9 B7							
C15 B4	C34 D4	CR4 C5	RN5 B4	U10 B9	<u>pins</u>						
C16 C7	C35 D6	CR5 A7	RN6 C4	U11 C3	1 A3						
C17 B7	C36 D8	CR6 A7	RN7 A6	U12 C3	2 A3						
C18 B7	C37 D5	CR7 A7	RN8 B6	U13 C4							
C19 B7	C38 D6	CR8 A9	RN9 C6	U14 D5							

A4 BOARD DSD-1 (Note: Board is marked "FMSA-1")

Reference Designation	Description	Part Number
C1	C: FIXED CERAMIC CHIP 0.01uF 50V C1206	0151-0021
C2	C: FIXED TANTALUM 10uF 16V	0185-0007
C3,C4	C: FIXED CERAMIC CHIP 0.01uF 50V C1206	0151-0021
C5,C6	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C7	C: FIXED CERAMIC CHIP 6800pF 50V C1210	0151-0022
C8,C9	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C10	C: FIXED CERAMIC CHIP 0.01uF 50V C1206	0151-0021
C11,C12	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C13	C: FIXED CERAMIC CHIP 6800pF 50V C1210	0151-0022
C14,C15	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C16 thru C18	C: FIXED CERAMIC CHIP 0.01uF 50V C1206	0151-0021
C19,C20	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C21	C: FIXED CERAMIC CHIP 6800pF 50V C1210	0151-0022
C22 thru C25	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C26	C: FIXED CERAMIC CHIP 6800pF 50V C1210	0151-0022
C27 thru C30	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C31 thru C47	C: FIXED CERAMIC CHIP 0.01uF 50V C1206	0151-0021
C48	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
CR1	DIODE: 1N4006	1900-0016
CR2,CR3	LED: RED T-1	1910-0004
CR4	DIODE: HP5082-2800	1900-0026
CR5	LED: RED T-1	1910-0004
CR6	LED: GREEN T-1	1910-0008
CR7	DIODE: HP5082-2800	1900-0026
CR8	LED: RED T-1	1910-0004
CR9	DIODE: HP5082-2800	1900-0026
HDR1	HEADER CONNECTOR: 20 PIN	0361-0020
R1 thru R5	R: FIXED CARBON CHIP 470 5% RC1206	0681-4715
RN1	R: NETWORK 10 PIN 10k	0910-1032
RN2 thru RN4	R: NETWORK 6 PIN 10k	0906-1032
RN5 thru RN10	R: NETWORK 10 PIN 10k	0910-1032
RN11,RN12	R: NETWORK 6 PIN 10k	0906-1032
RN13	R: NETWORK 8 PIN 10k	0908-1032
U1,U2	IC: 74HC595D	1872-0012
U3	IC: 56002FC	1890-0002
U4*	IC: DSD-1 DIGITAL DEMOD EPROM *(used beginning serial number 370017)	1840-0003J
U5	IC: 56002FC	1890-0002
U6 thru U8	IC: 74HC574D	1872-0011
U9,U10	IC: 56002FC	1890-0002
U11	IC: MC34064	1826-0048
U12	IC: 74HC00D	1872-0001

A4 BOARD DSD-1 cont.

Reference Designation	Description	Part Number
U13 thru U15	IC: 74HC14AD	1872-0010
U16	IC: 74HC4040D	1872-0013
U17 thru U19	IC: 74HC14AD	1872-0010
U20	IC: 74HC112D	1872-0004
U21	IC: 74HC74AD	1872-0003
U22	IC: 74HC02D	1872-0002
U23	IC: XO, 16.000MHz	0415-1600
U24,U25	IC: AD1891	1880-0001
U26	IC: 74HC590D	1872-0005
U27	IC: XO, 12.288MHz	0415-1228