

Model RFA-1A FM RF AMPLIFIER

Guide to Operations

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BELAR ELECTRONICS LABORATORY, INC.

119 LANCASTER AVENUE • P.O. BOX 76 • DEVON, PA 19333-0076 USA

VOICE (610) 687-5550 • FAX (610) 687-2686

WEB: <http://www.belar.com/> • E-mail: sales@belar.com • service@belar.com • parts@belar.com

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.

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1 General Information

1-1 General Description

The Belar RFA-1A FM RF Amplifier is a crystal controlled, fixed frequency RF amplifier designed for use with Belar's complete line of FM monitors, including the FMM-1 series, the FMM-2 series, and The Wizard.

Local Oscillator and 10.7 MHz outputs are provided for use with the Belar FMM-4A Frequency Monitor for continuous off-air frequency measurement.

1-2 Physical Description

The RFA-1A is constructed on a standard EIA 1 $\frac{3}{4}$ x 19 inch rack mount panel (one EIA rack unit). Factory adjustments are located within the unit. The RF input, IF (650 kHz) output, L.O. output, and 10.7 MHz output are BNC connectors located on the rear of the unit. Two input attenuator switches and a crystal oscillator power switch are also located on the rear of the unit.

1-3 Electrical Description

The RFA-1A is a solid state superheterodyne type RF amplifier designed to accurately receive FM signals for measurement and monitoring purposes. It features a proprietary multi-stage IF filter and crystal-controlled pre-selector for maximum performance.

1-4 Electrical and Mechanical Specifications

RF Input Sensitivity	100 μ v
Signal-to-Noise Ratio:	
100 μ v input	75 dB
500 μ v input	85 dB
RF Input Impedance	75 Ω , BNC Connector
Input Attenuator	0, 6, 12, 18 dB
RF Frequency Range	87.75 - 107.95 MHz (specify frequency)
Outputs	650 kHz IF 10.7 MHz IF (input frequency + 10.7 MHz) LO
Capture Ratio	1.5 dB
Selectivity:	
Alternate Channel	27 dB
3rd Adjacent Channel	46 dB
Harmonic Distortion	< 0.03%
@ 1 kHz, 75 kHz deviation	
Separation with FMM-2 or Wizard Demod	
1 kHz	65 dB
15 kHz	55 dB
Dimensions	1 EIA Rack Unit 1.75"H x 10.5"D x 19"W
Power Requirements	100–240 Vac, 50–60 Hz, IEC-320 AC line inlet
Power Consumption	10 Watts
Shipping Weight	8 lbs (3.6 kgs)

2 Installation

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 to avoid damaging the equipment through use of careless procedures. 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 damage claim or for possible future use.

The RFA-1A is shipped with an instruction book, three wire line cord, four black rack mount screws, and a coaxial cable patch 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, 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.

2-4 Preparation for Use

The RFA-1A FM RF Amplifier is designed to be mounted in a standard 19-inch rack. When the amplifier is mounted above high heat generation equipment such as power amplifiers, consideration should be given to cooling requirements which allow a free movement of cooler air around the RFA-1A. In no instance should the ambient chassis temperature be allowed to rise above 45°C (113°F).

Units beginning with serial number 410215:

These units can be operated from a 100 to 240 Vac, single phase, 50-60 Hz power source with no user adjustments. The fuse should be a 5mm x 20mm type GMA-3, 3AMP-250V (UL/CSA) or T3.15A-250V (IEC) fuse only. A spare fuse is stored in the removable fuse compartment.

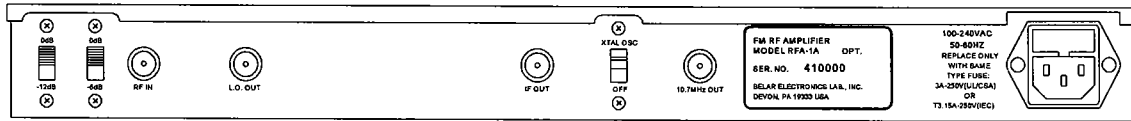
Units prior to serial number 410215:

These units can be operated from either a 105 to 125 Vac or 210 to 250 Vac single phase, 50 to 60 Hz power source. Make sure the unit is set for the proper voltage as follows:

Unplug the line cord. Open the fuse compartment door and pull lever to remove fuse. Using needlenose pliers, pull the voltage select board straight out of the power entry module. While facing the rear of the unit, orient the voltage select board so the desired line voltage is face up and reads correctly ("120" for 115 Vac operation, "240" for 230 Vac operation. The "100" and "220" positions on the bottom of the board are not used.) Reinsert the board into the power entry module, install the proper fuse (½A 250V for 115 Vac, ¼A 250V for 230 Vac), close the fuse door, and plug the line cord back in.

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

2-5 Interconnections & Controls



RFA-1A Rear Panel Jacks and Switches

RF IN RF Input: connect your receiving antenna to this input.

0dB-6dB These attenuation switches reduce the RF input level by 6 dB, 12 dB, or 18 dB. These switches may be used in high signal strength areas to prevent overload and for optimum signal-to-noise ratio.

IF Out IF output (650 kHz) for connection to the IF Input jack of Belar FMM-2 FM Modulation Monitor, or IF Input jack of The Wizard (with demod). Note that when operating the Belar FMM-2 with the RFA-1A, the IF Jack on the FMM-2 must be used and the RF/IF slide switch on the back of the FMM-2 must be set in the IF position.

L.O. Out Local Oscillator and 10.7 MHz outputs for connection to the Belar FMM-4A FM Frequency Monitor for measuring incoming frequency off-air.

3 Operation

3-1 Initial Operation

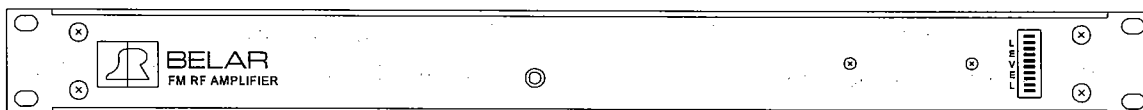
1. Connect your receiving antenna cable to the RF Input Jack on the back of the unit.
2. Connect the IF Output jack (650 kHz output) to the Belar FMM-2 FM Modulation Monitor IF Input jack, or The Wizard (with demod) IF Input jack.

Note: If you are using the Belar FMM-2, also move the RF/IF slide switch on the back of the FMM-2 to the IF position.

Note: If you are using the Belar FMM-1 (or RCA BW-75A), your FMM-1 will need modifications to accept IF input. See *Section 4*.

3. If using the RFA-1A with the Belar FMM-4A Digital Frequency Monitor, connect the L.O. and 10.7 MHz output jacks to the respective input jacks of the FMM-4A.
4. Ensure that units prior to serial number 410215 are set for the proper line voltage (see *Section 2-4*) and plug in the line cord.

3-2 Front Panel Indicators and Controls



The RF Level indicator shows the relative strength of the RF Input. At least 1 indicator bar should be lit in order to make most accurate modulation measurements.

4 Use with the Belar FMM-1 or RCA BW-75A

In order to use the Belar RFA-1A with the Belar FMM-1 (or RCA BW-75A), the RF input of the monitor must be modified to accept the 650 kHz output of the RFA-1A.

The purpose of this modification is to provide a direct connection to the IF input on the A2 card of the monitor.

Note: This modification disables the AM and incidental AM noise functions as well as the direct RF input function. No RF or OSCillator levels will be indicated on the modulation meter. No frequency deviation will be indicated.

1. Remove bottom cover.
2. Remove power to A1 card by unplugging the red lead to pin 1 on A1 and taping the end of the red lead to prevent shorts.
3. Remove the two orange leads from the INC. AM Noise Jack J5 and tape the ends.
4. Unplug the coax lead from pin 2 on A1 card and solder the lead to the center of J5. Do not solder the end of the clip, so you can restore original operation.
5. Remove one lead from the frequency meter M1 to make it inoperative. Tape the lead.
6. Replace bottom cover.
7. Remove the oven fuse F2 to disable the crystal oven.
8. Label J5 **650 kHz IF Input**.
9. Label the frequency meter M1 **NOT OPERATING**.

Reverse the steps to restore original operation.

5 Diagrams, Schematics and Parts Lists

Replaceable Parts. This page contains information for ordering replaceable parts for the unit. 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:

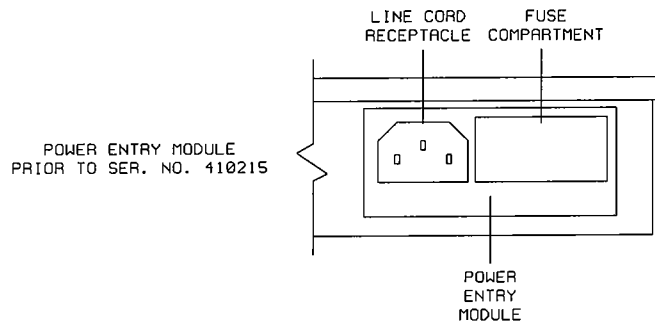
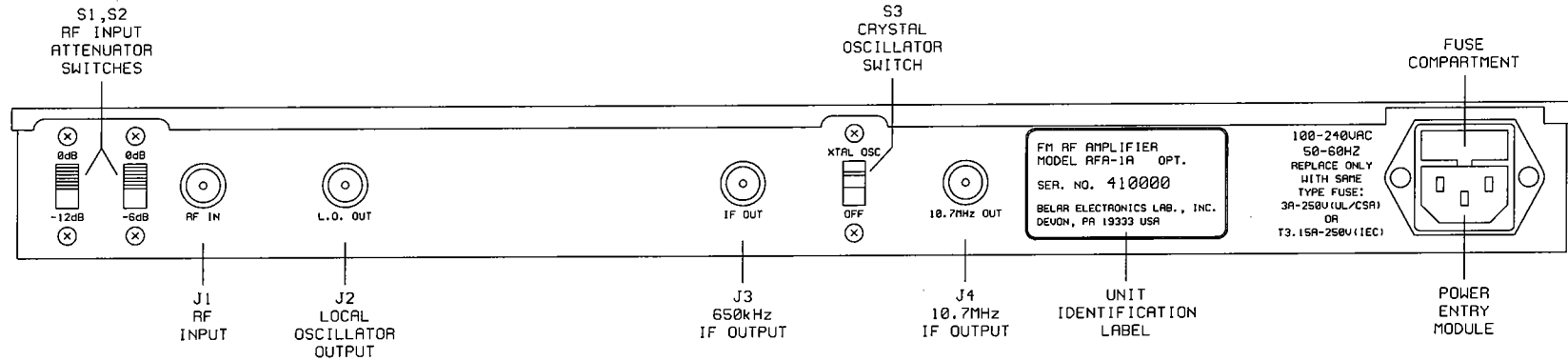
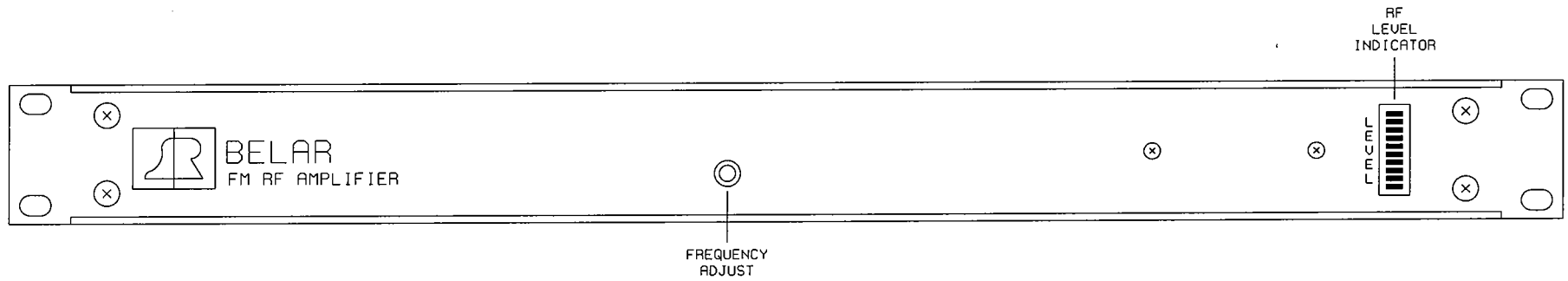
- a. Model number and serial number of unit.
- b. Description of part, *including the reference designation and location.*

REFERENCE DESIGNATORS

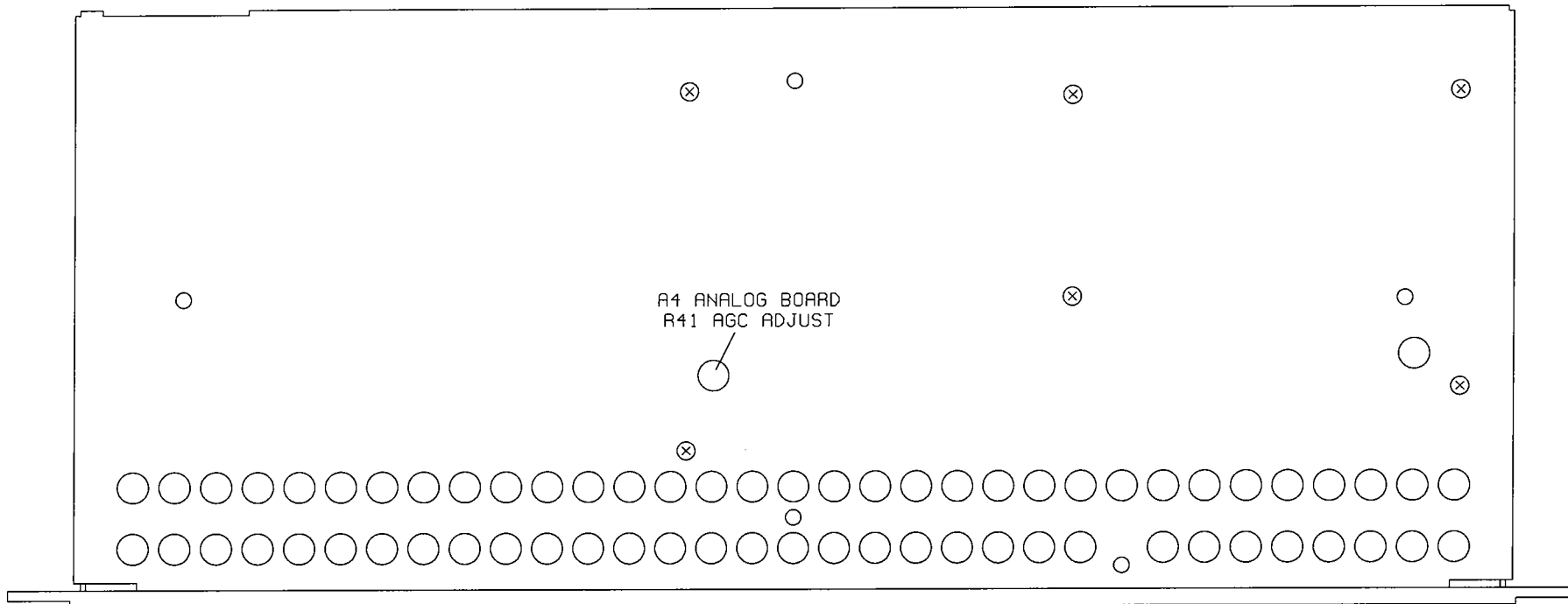
A	= assembly	J	= jack	S	= switch
BR	= diode bridge	L	= inductor	T	= transformer
C	= capacitor	M	= meter	TB	= terminal block
CR	= diode or LED	P	= plug	U	= integrated circuit
DS	= display or lamp	Q	= transistor	W	= cable
F	= fuse	R	= resistor	X	= socket
FL	= filter	RL	= relay	Y	= crystal
HDR	= header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

ABBREVIATIONS

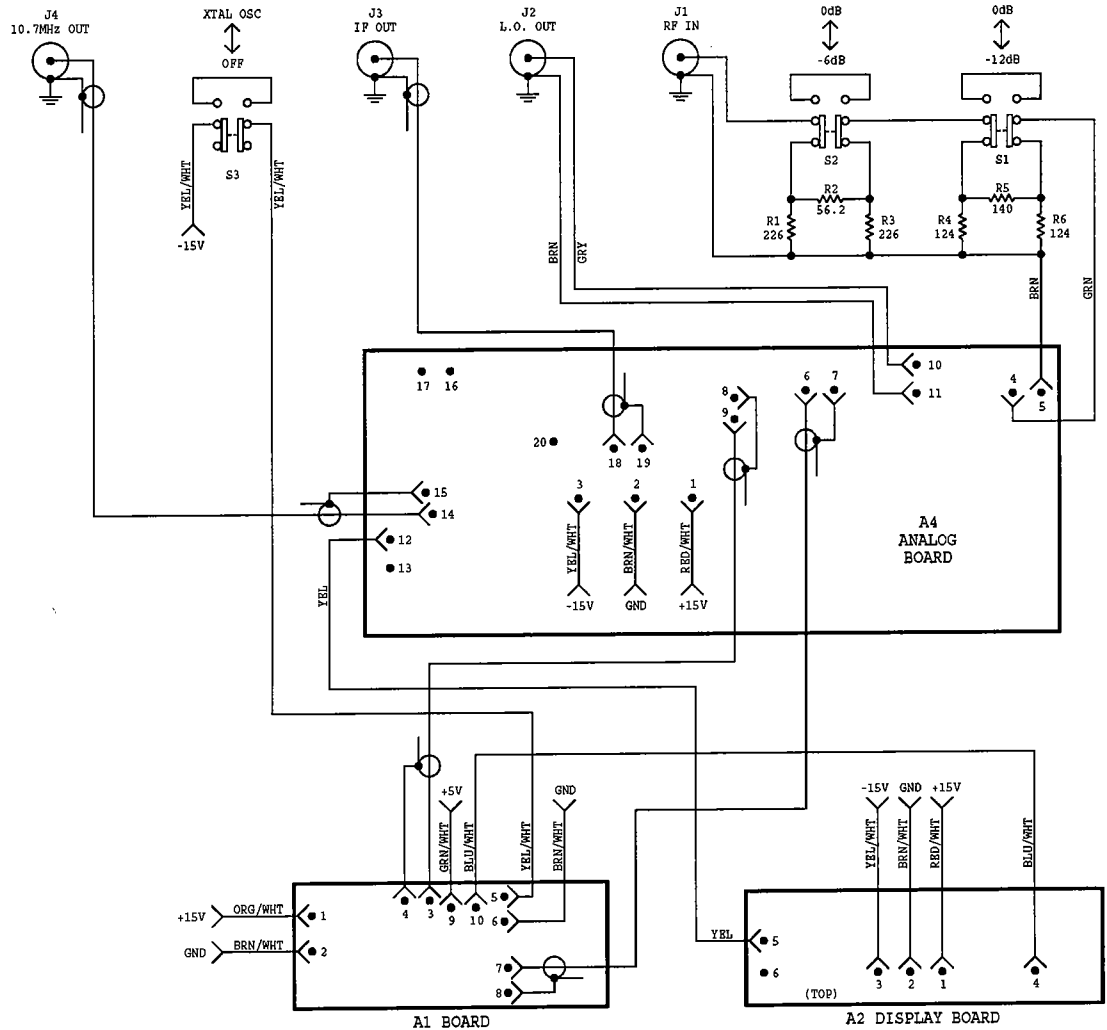
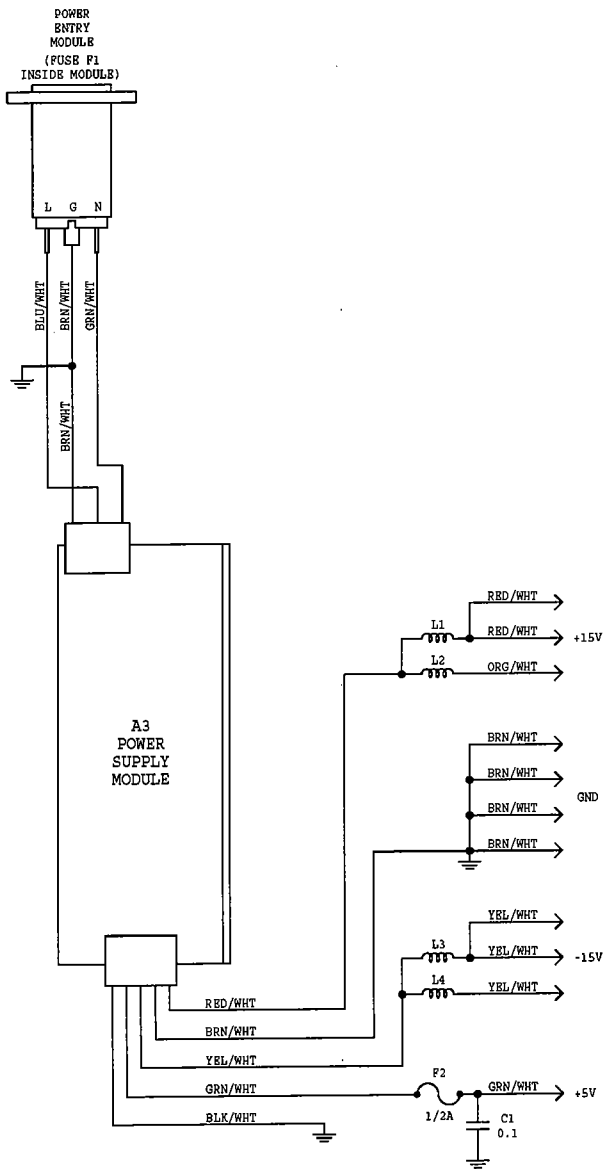
BCD	= binary coded decimal	PIV	= peak inverse voltage
CER	= ceramic	POLY	= polystyrene
COMP	= composition	PORC	= porcelain
CONN	= connector	POT	= potentiometer
DPM	= digital panel meter	SEMICON	= semiconductor
ELEC	= electrolytic	SI	= silicon
GE	= germanium	TANT	= tantalum
IC	= integrated circuit	uF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



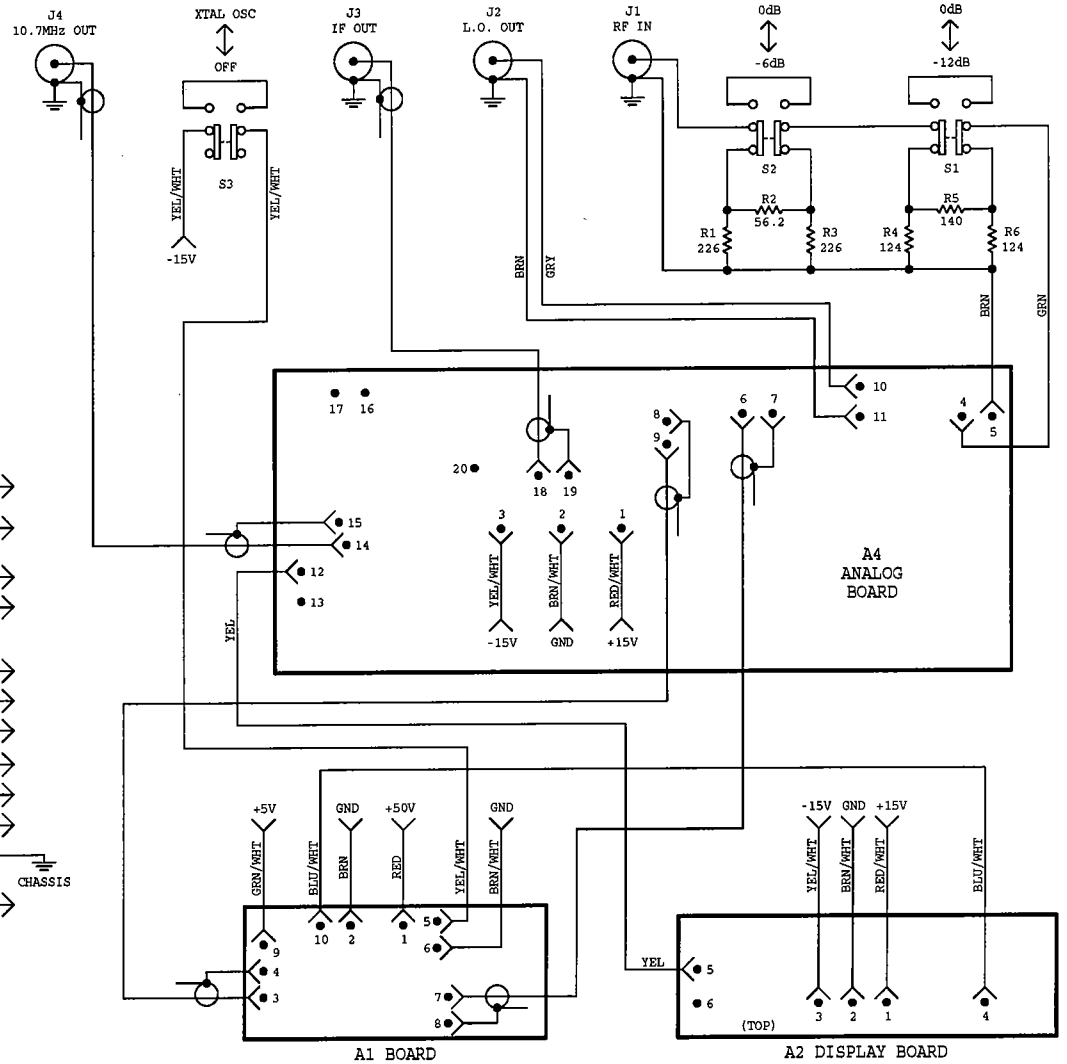
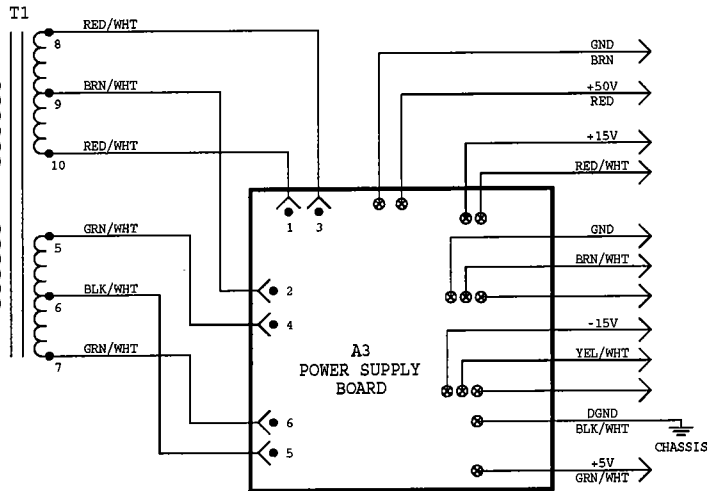
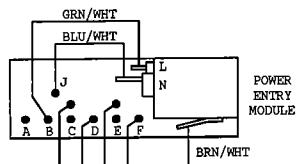
RFA-1A FRONT & REAR VIEW
BELAR ELECTRONICS



RFA-1A
TOP COVER ADJUSTMENT HOLE LOCATIONS
BELAR ELECTRONICS



RFA-1A
 CHASSIS WIRING
 BELAR ELECTRONICS
 12-15-98
 (EFFECTIVE S/N 410215)



RFA-1A
 CHASSIS WIRING
 BELAR ELECTRONICS
 10-4-94
 (USED PRIOR TO S/N 410215)

RFA-1A PARTS LISTS

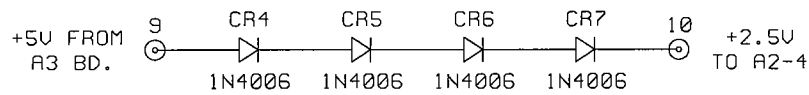
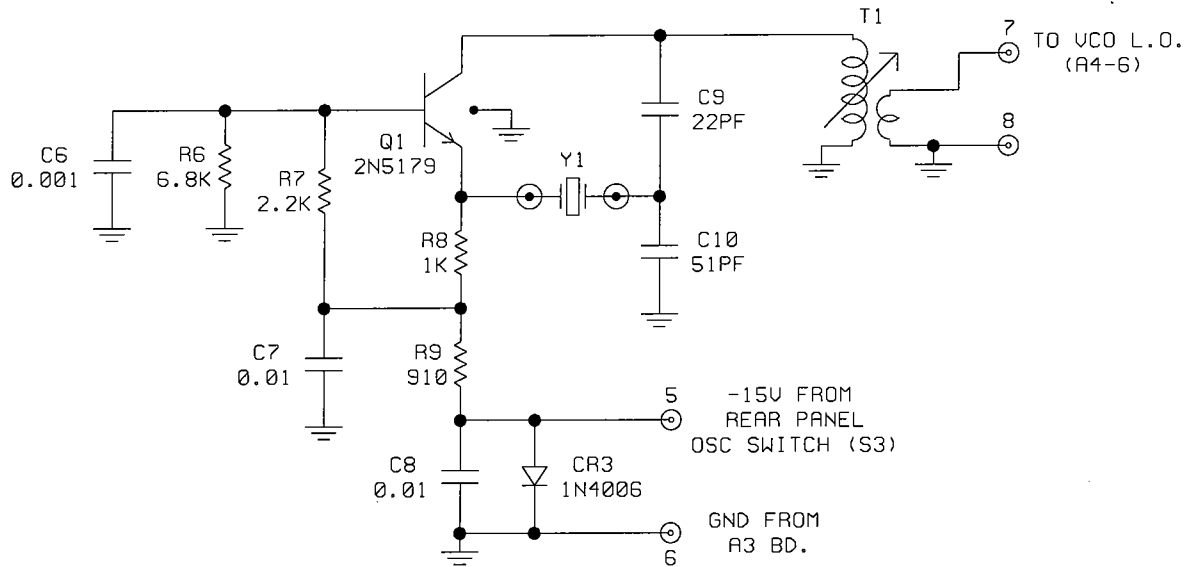
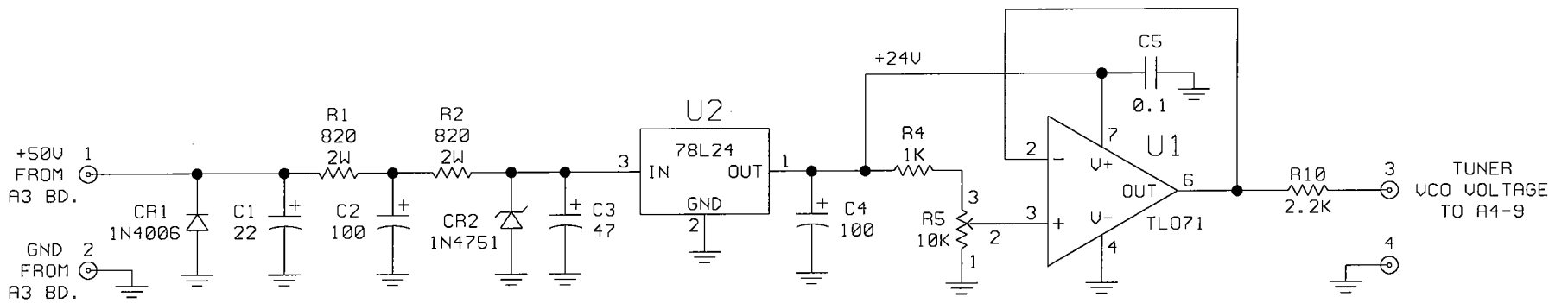
MAIN CHASSIS

Reference Designation	Description		Part Number
A3	POWER SUPPLY MODULE: 15V, 15W	(note 2)	4005-0019A
--	POWER ENTRY MODULE: 6EGG1-1	(note 2)	0360-0021
F1	FUSE: GMA-3A 250V (UL/CSA) or T3.15A-250V (IEC)	(note 2)	2110-0009
--	FUSE HOLDER: CHASSIS MOUNT	(note 2)	2110-0010
F2	FUSE: AGC-1/2A 250V	(note 2)	2110-0001
--	POWER ENTRY MODULE: 6J4	(note 1)	0360-0020
	FUSE: AGC 1/2A 250V (115 Vac)	(note 1)	2110-0001
	AGC 1/4A 250V (230 Vac)	(note 1)	2110-0002
C1	C: FIXED CERAMIC 0.1uF 50V	(note 3)	0151-0006
J1 thru J4	JACK: BNC		0360-0005
L1 thru L4	CHOKE: RF	(note 2)	9140-0011
R1	R: METAL FILM 226 1%		0721-2260
R2	R: METAL FILM 56.2 1%		0721-56R2
R3	R: METAL FILM 226 1%		0721-2260
R4	R: METAL FILM 124 1%		0721-1240
R5	R: METAL FILM 140 1%		0721-1400
R6	R: METAL FILM 124 1%		0721-1240
S1, S2	SWITCH: SLIDE, DPDT		3102-0003
S3	SWITCH: SLIDE, DPDT		3102-0001
T1	TRANSFORMER: POWER, DMPC-Y-15	(note 1)	9100-0019
--	LINE CORD (115 Vac line voltage)		8120-0002
--	LINE CORD (230 Vac line voltage)		8120-0004

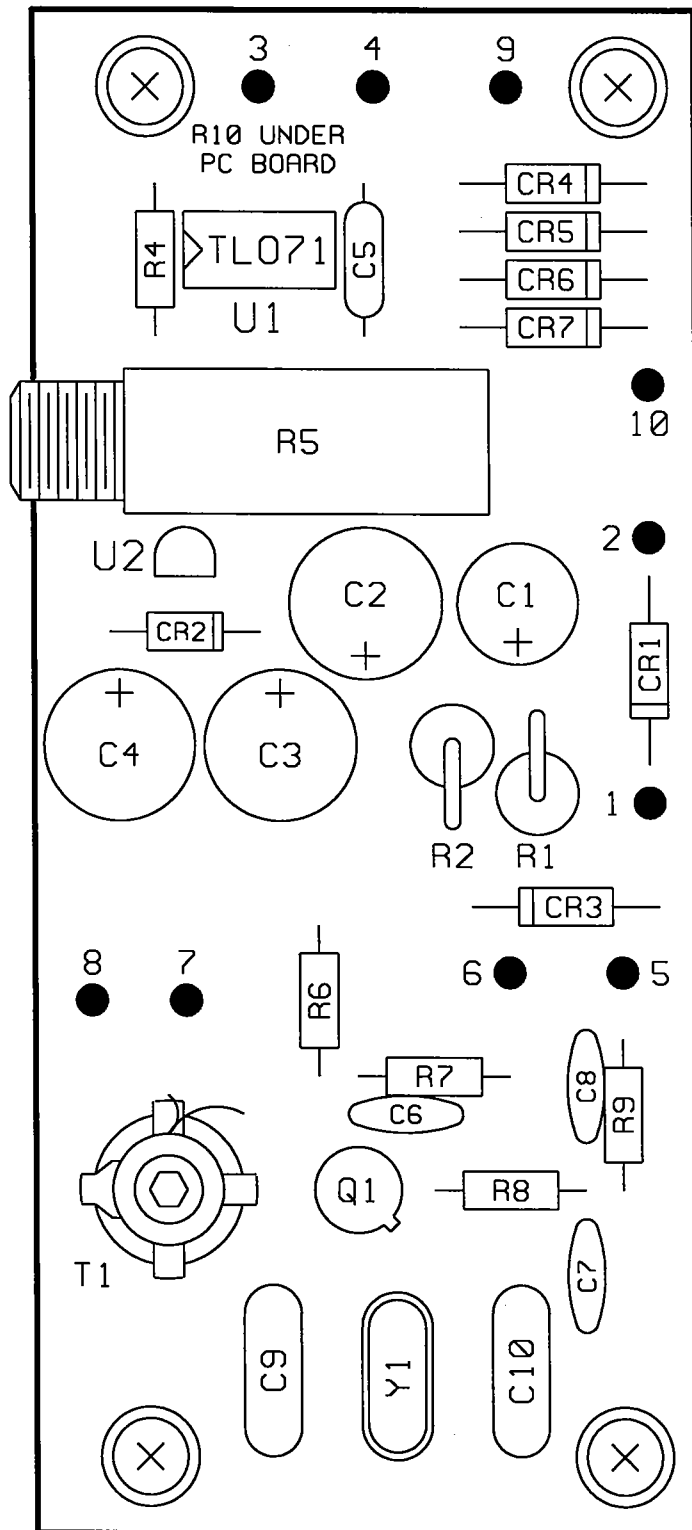
note 1: USED PRIOR TO SERIAL NUMBER 410215.

note 2: USED BEGINNING SERIAL NUMBER 410215.

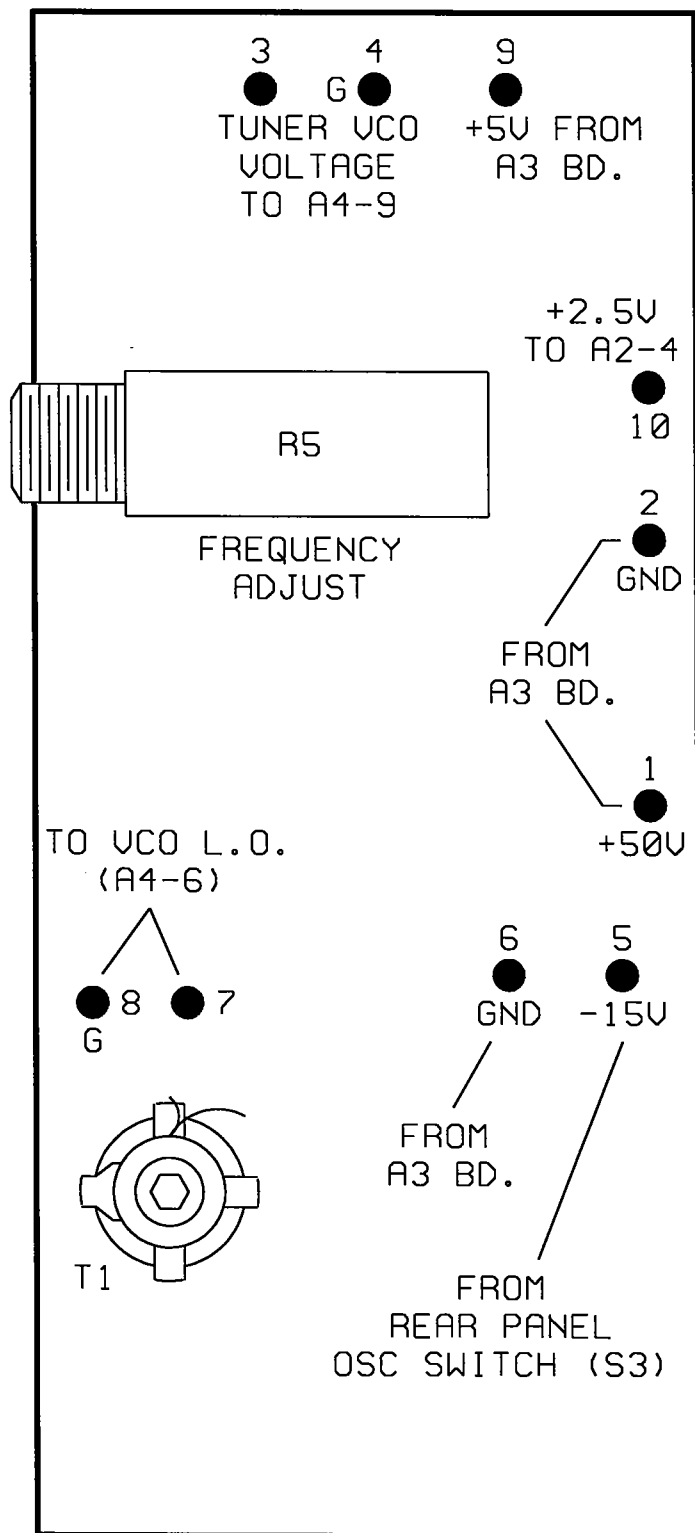
note 3: USED BEGINNING SERIAL NUMBER 410229.



RFA-1A A1 BOARD
 REV. A
 BELAR ELECTRONICS
 4-23-94
 (USED PRIOR TO S/N 410215)



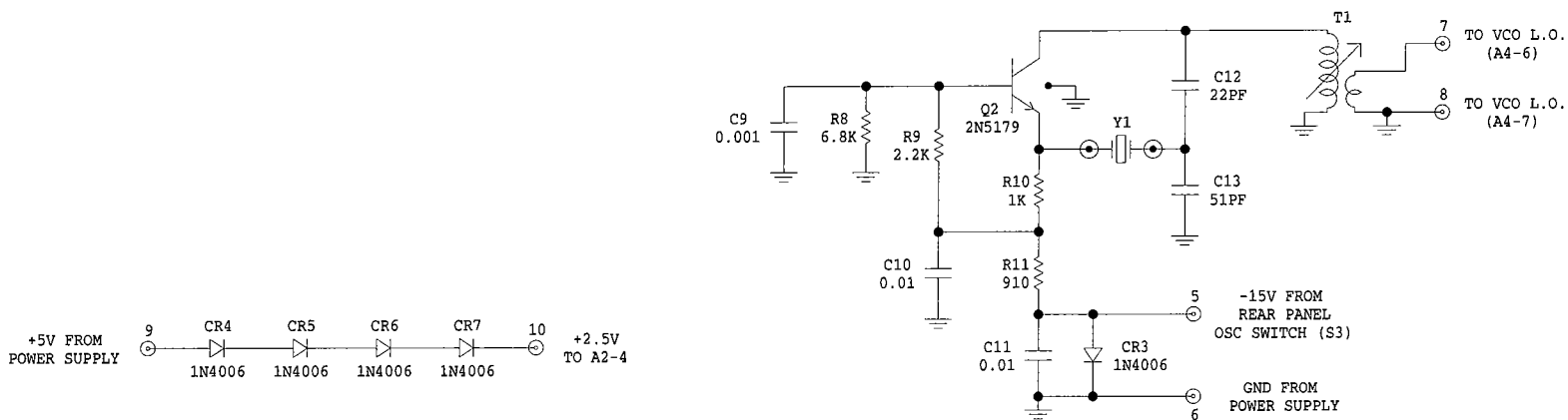
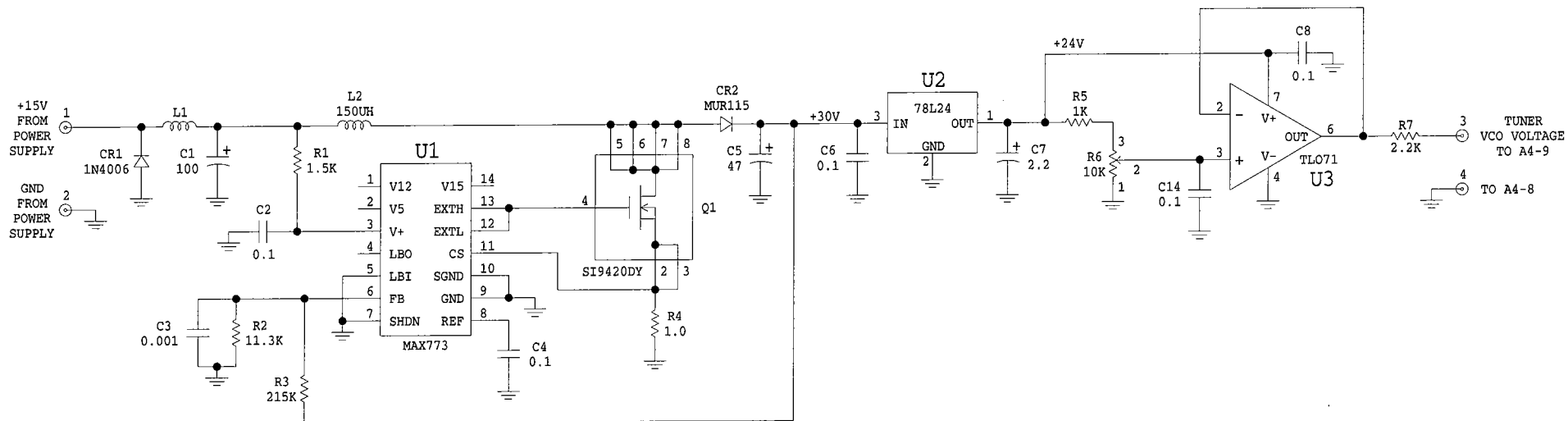
RFA-1A A1 BOARD
 REV. A
 COMPONENT LAYOUT
 BELAR ELECTRONICS
 (USED PRIOR TO S/N 410215)



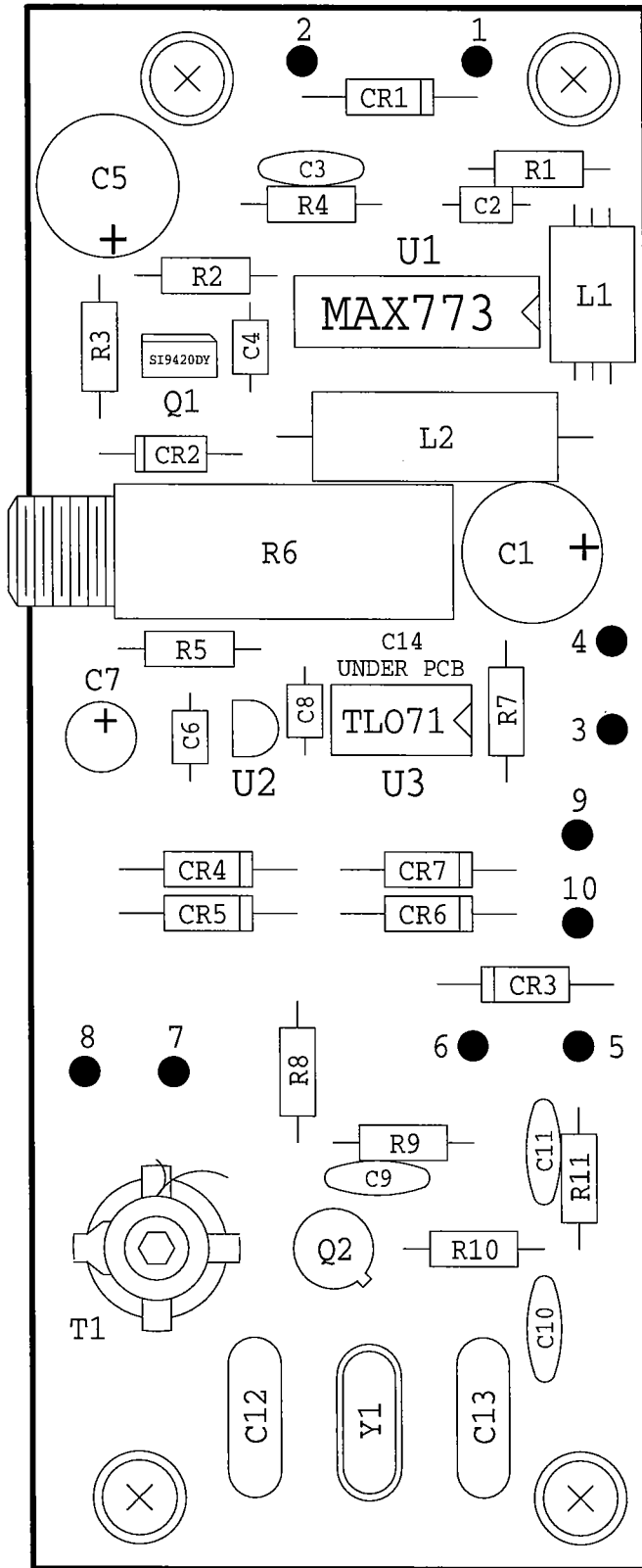
RFA-1A A1 BOARD
 REV. A
 CONNECTIONS & ADJUSTMENTS
 BELAR ELECTRONICS
 (USED PRIOR TO S/N 410215)

A1 BOARD RFA-1A, Rev. A
 (used prior to S/N 410215)

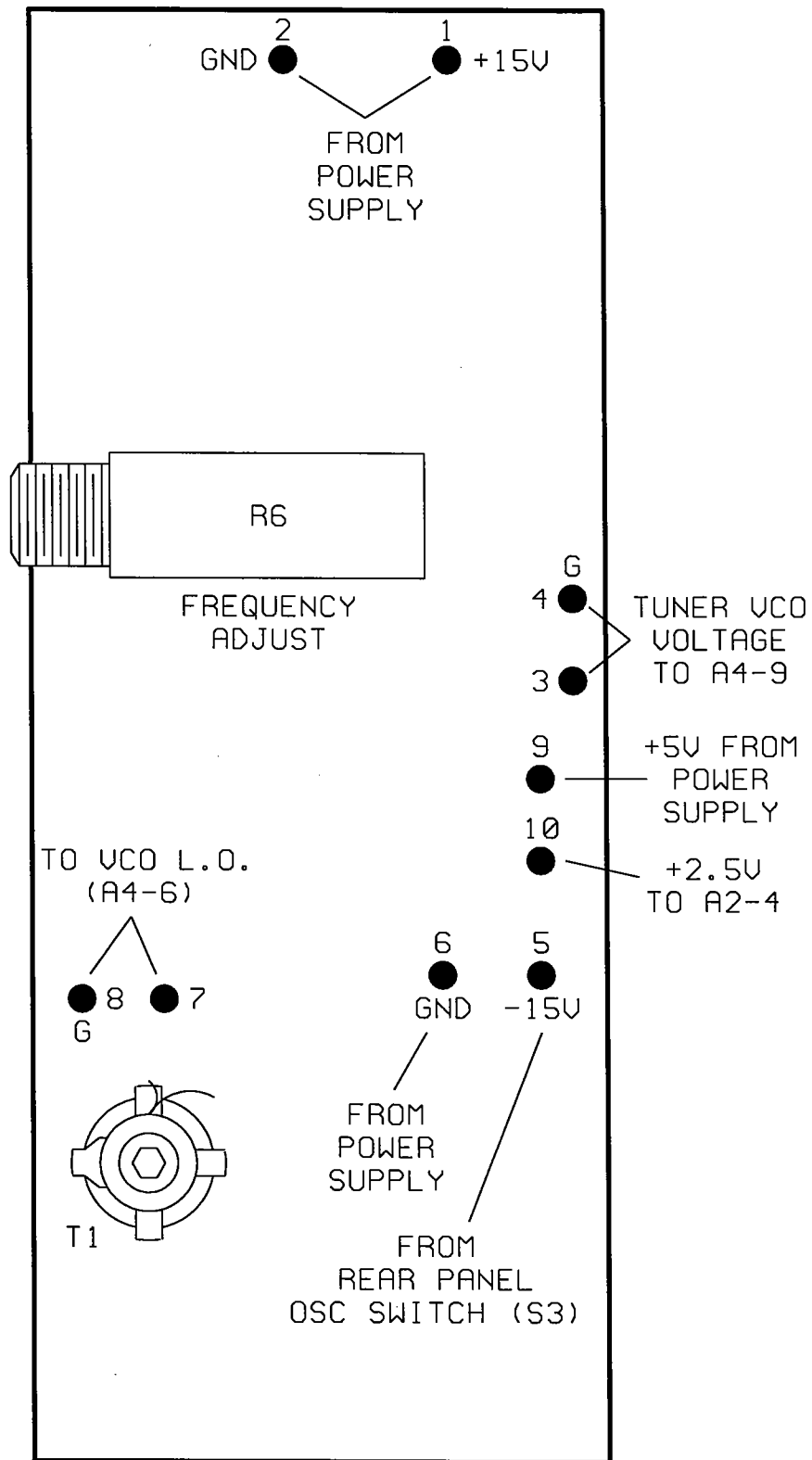
Reference Designation	Description	Part Number
C1	C: FIXED ELEC 22uF 100V	0180-0031
C2	C: FIXED ELEC 100uF 63V	0180-0032
C3	C: FIXED ELEC 47uF 63V	0180-0017
C4	C: FIXED ELEC 100uF 35V	0180-0018
C5	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C6	C: FIXED CERAMIC 0.001uF 1kV	0151-0002
C7, C8	C: FIXED CERAMIC 0.01uF 100V	0151-0003
C9	C: FIXED MICA 22pF 5%	0140-2205
C10	C: FIXED MICA 51pF 5%	0140-5105
CR1	DIODE: 1N4006	1900-0016
CR2	DIODE: 1N4751	1900-0030
CR3 thru CR7	DIODE: 1N4006	1900-0016
Q1	TRANSISTOR: 2N5179	1850-0023
R1, R2	R: WIREWOUND 820 5% 2W	0811-0020
R3	(not used)	
R4	R: METAL FILM 1k 2% 1/4W	0751-1022
R5	R: VAR COMP 10k, 10 TURN	2100-0018
R6	R: METAL FILM 6.8k 2% 1/4W	0751-6822
R7	R: METAL FILM 2.2k 2% 1/4W	0751-2222
R8	R: METAL FILM 1k 2% 1/4W	0751-1022
R9	R: METAL FILM 910 2% 1/4W	0751-9112
R10	R: METAL FILM 2.2k 2% 1/4W (R10 is under pc board.)	0751-2222
T1	TRANSFORMER: VARIABLE	Belar
U1	IC: TLO71	1826-0004
U2	IC: 78L24CP	1826-0016
Y1	XTAL: 10.7MHZ ABOVE CHANNEL FREQUENCY	



RFA-1A A1 BOARD
 REV. B
 BELAR ELECTRONICS
 10-17-01
 (EFFECTIVE S/N 410215)



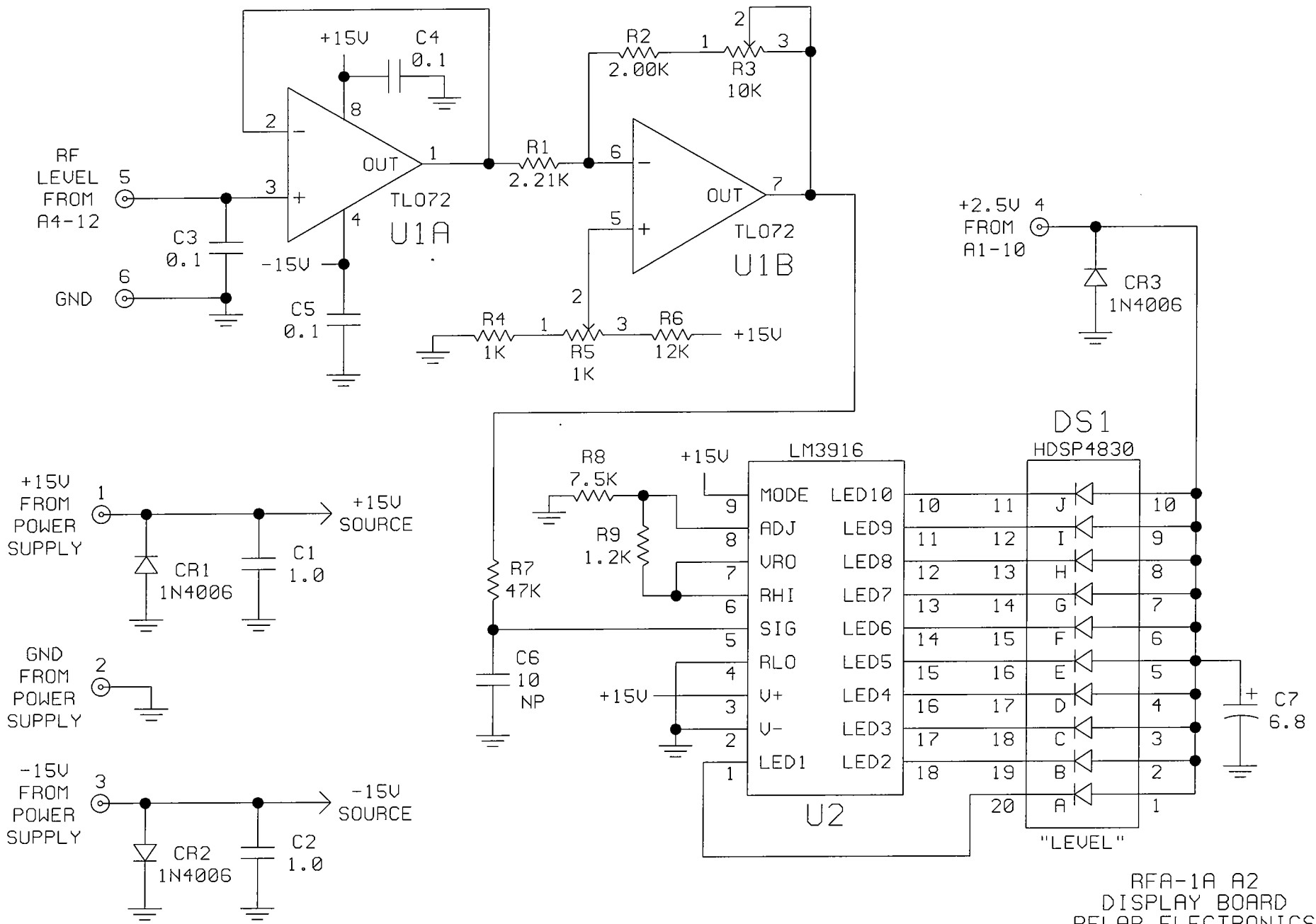
RFA-1A A1 BOARD
 REV. B
 COMPONENT LAYOUT
 BELAR ELECTRONICS
 (EFFECTIVE S/N 410215)



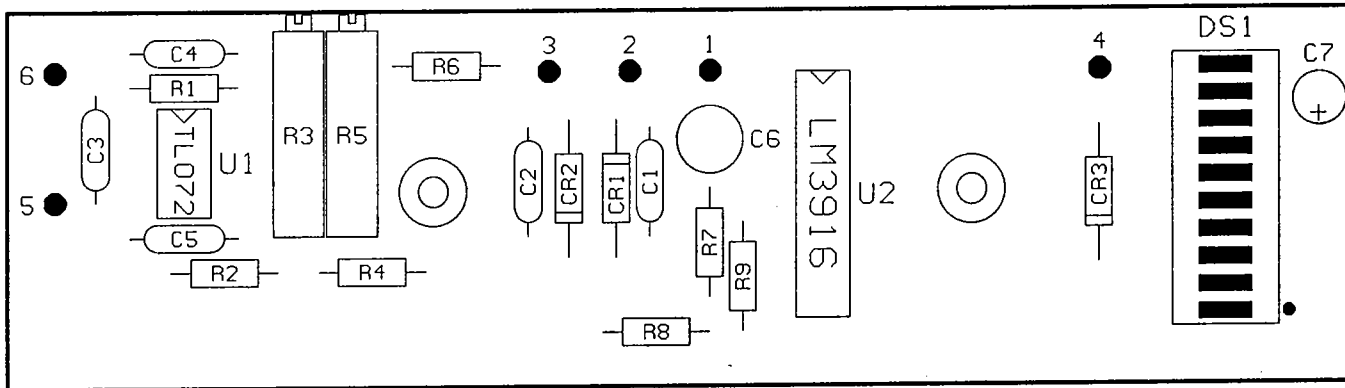
RFA-1A A1 BOARD
 REV. B
 CONNECTIONS & ADJUSTMENTS
 BELAR ELECTRONICS
 (EFFECTIVE S/N 410215)

A1 BOARD RFA-1A, Rev. B
(used beginning S/N 410215)

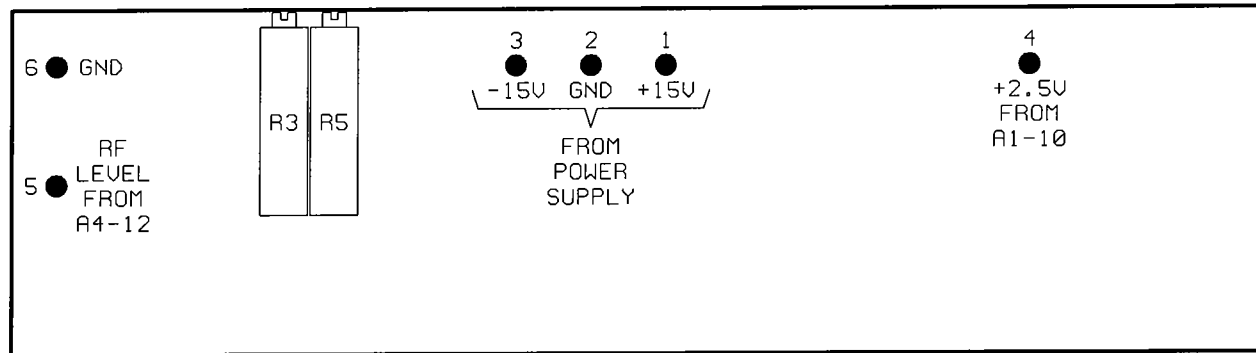
Reference Designation	Description	Part Number
C1	C: FIXED ELEC 100uF 35V	0180-0018
C2	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C3	C: FIXED CERAMIC 0.001uF 1kV	0151-0002
C4	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C5	C: FIXED ELEC 47uF 63V	0180-0017
C6	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C7	C: FIXED TANT 2.2uF 35V	0185-0009
C8	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C9	C: FIXED CERAMIC 0.001uF 1kV	0151-0002
C10,C11	C: FIXED CERAMIC 0.01uF 100V	0151-0003
C12	C: FIXED MICA 22pF 5%	0140-2205
C13	C: FIXED MICA 51pF 5%	0140-5105
C14	C: FIXED CERAMIC 0.1uF 50V	0151-0006
CR1	DIODE: 1N4006	1900-0016
CR2	DIODE: MUR115	1900-0034
CR3 thru CR7	DIODE: 1N4006	1900-0016
Q1	TRANSISTOR: SI9420DY	1850-0035
Q2	TRANSISTOR: 2N5179	1850-0023
R1	R: METAL FILM 1.5k 2% 1/4W	0751-1522
R2	R: METAL FILM 11.3k 1%	0721-1132
R3	R: METAL FILM 215k 1%	0721-2153
R4	R: METAL FILM 1.0 2% 1/4W	0751-1R02
R5	R: METAL FILM 1k 2% 1/4W	0751-1022
R6	R: VAR COMP 10k, 10 TURN	2100-0018
R7	R: METAL FILM 2.2k 2% 1/4W	0751-2222
R8	R: METAL FILM 6.8k 2% 1/4W	0751-6822
R9	R: METAL FILM 2.2k 2% 1/4W	0751-2222
R10	R: METAL FILM 1k 2% 1/4W	0751-1022
R11	R: METAL FILM 910 2% 1/4W	0751-9112
L1	CHOKE: RF	9140-0011
L2	CHOKE: 150 uH	9140-0150
T1	TRANSFORMER: VARIABLE	Belar
U1	IC: MAX773	1826-0059
U2	IC: 78L24CP	1826-0016
U3	IC: TLO71	1826-0004
Y1	XTAL: 10.7MHZ ABOVE CHANNEL FREQUENCY	



RFA-1A A2
 DISPLAY BOARD
 BELAR ELECTRONICS
 5-11-92



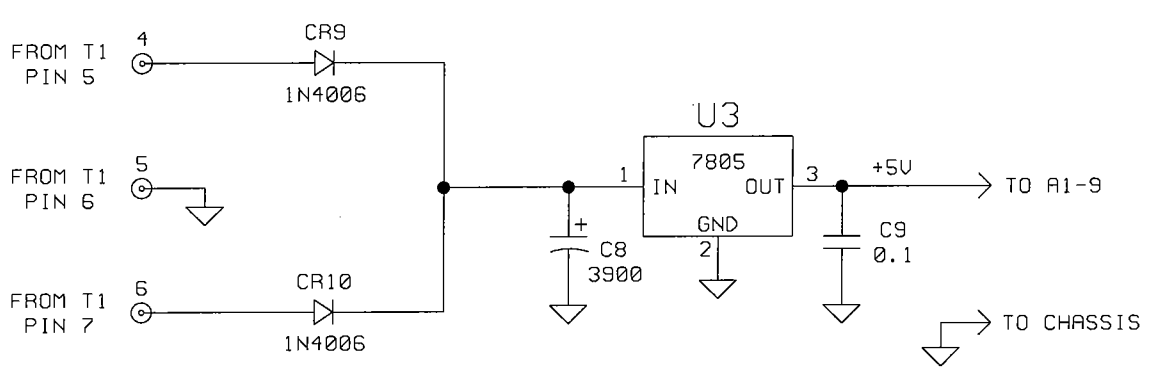
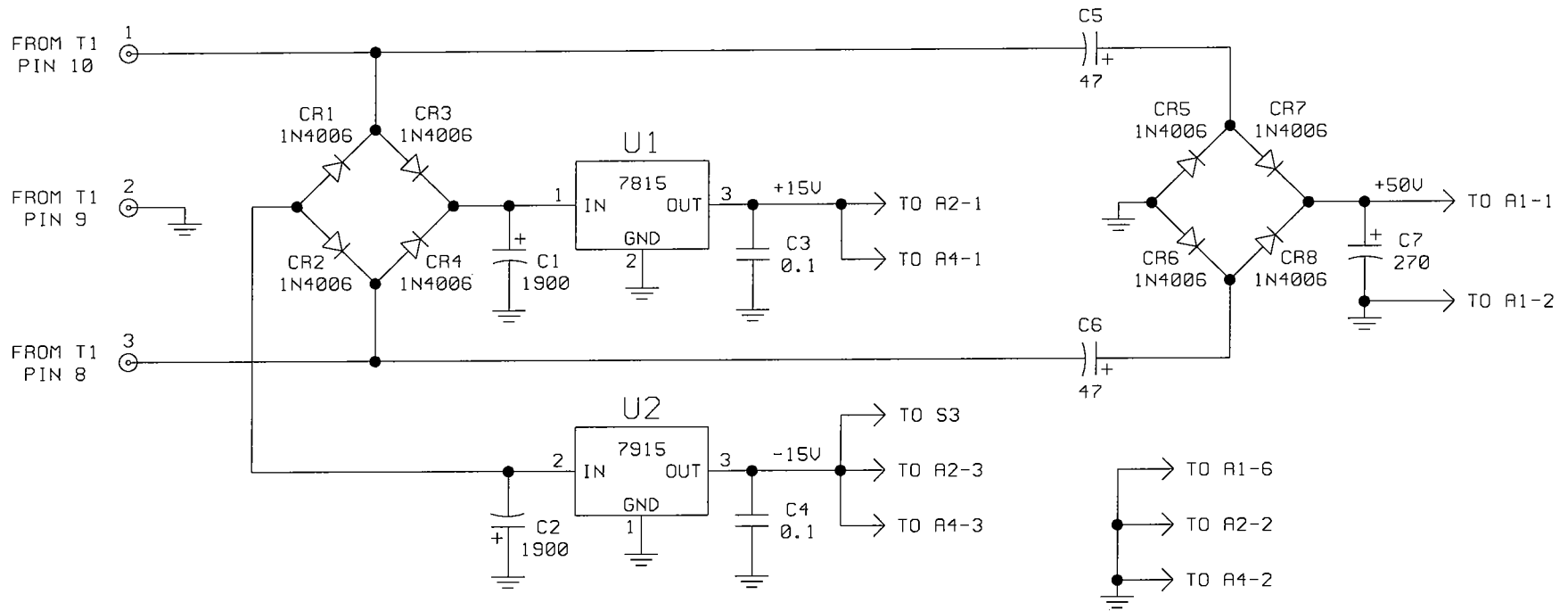
RFA-1A A2
 DISPLAY BOARD
 COMPONENT LAYOUT
 BELAR ELECTRONICS



RFA-1A A2 BOARD
CONNECTIONS & ADJUSTMENTS
BELAR ELECTRONICS

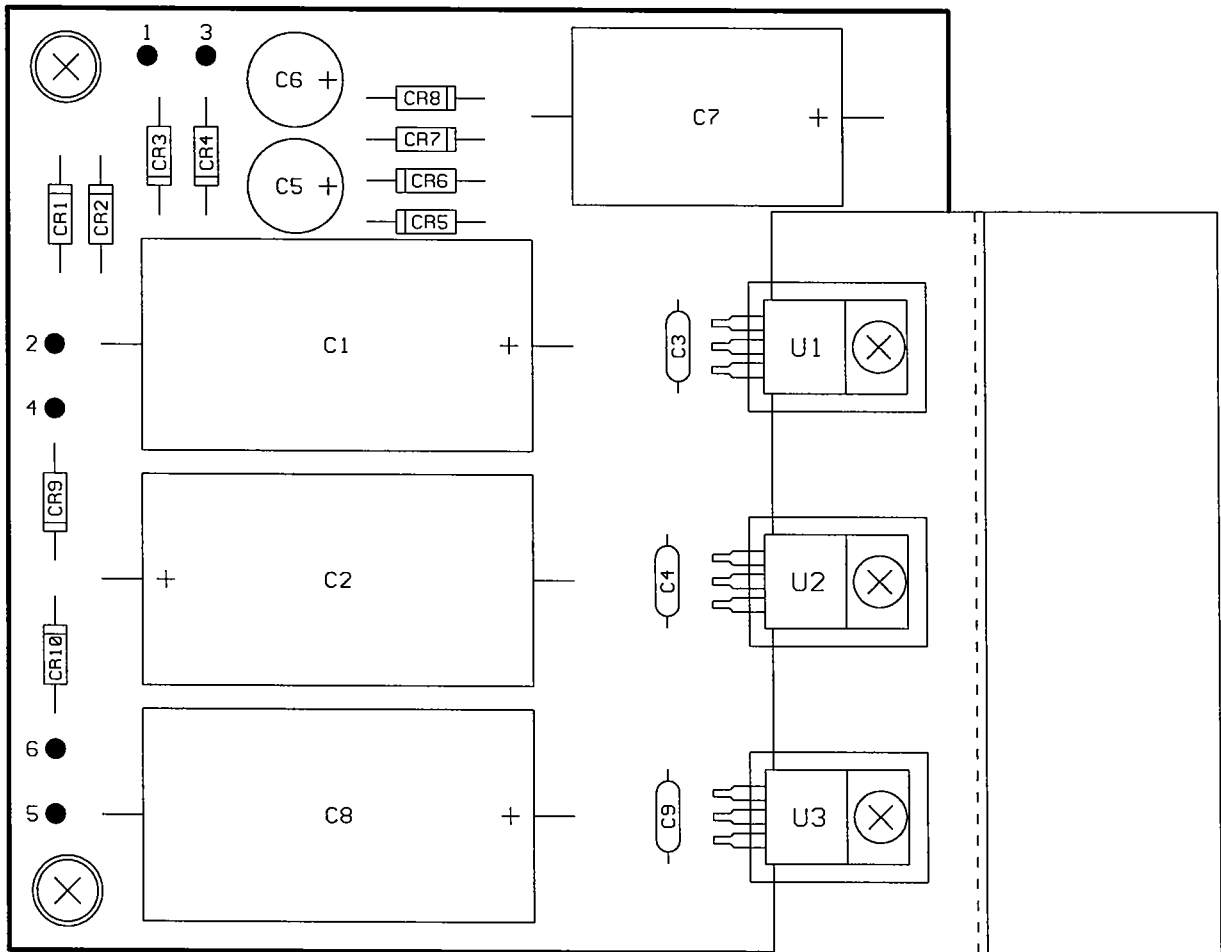
A2 BOARD RFA-1A

Reference Designation	Description	Part Number
C1,C2	C: FIXED CERAMIC 1.0uF 50V	0151-0008
C3 thru C5	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C6	C: FIXED ELEC 10uF 35V NON-POLAR	0180-0029
C7	C: FIXED TANT 6.8uF 25V	0185-0002
CR1 thru CR3	DIODE: 1N4006	1900-0016
DS1	DISPLAY: HDSP-4830	1930-0006
R1	R: METAL FILM 2.21k 1%	0721-2211
R2	R: METAL FILM 2.00k 1%	0721-2001
R3	R: VAR COMP 10k, 10 TURN	2100-0018
R4	R: METAL FILM 1k 2% 1/4W	0751-1022
R5	R: VAR COMP 1k, 10 TURN	2100-0023
R6	R: METAL FILM 12k 2% 1/4W	0751-1232
R7	R: METAL FILM 47k 2% 1/4W	0751-4732
R8	R: METAL FILM 7.5k 2% 1/4W	0751-7522
R9	R: METAL FILM 1.2k 2% 1/4W	0751-1222
U1	IC: TLO72	1826-0038
U2	IC: LM3916	1826-0049



(ONLY USED PRIOR TO SERIAL NUMBER 410215)

RFA-1A A3
 POWER SUPPLY BOARD
 BELAR ELECTRONICS
 5-12-92

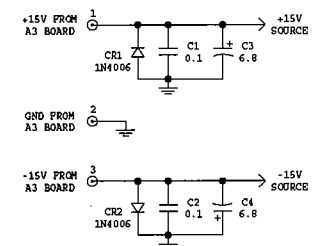
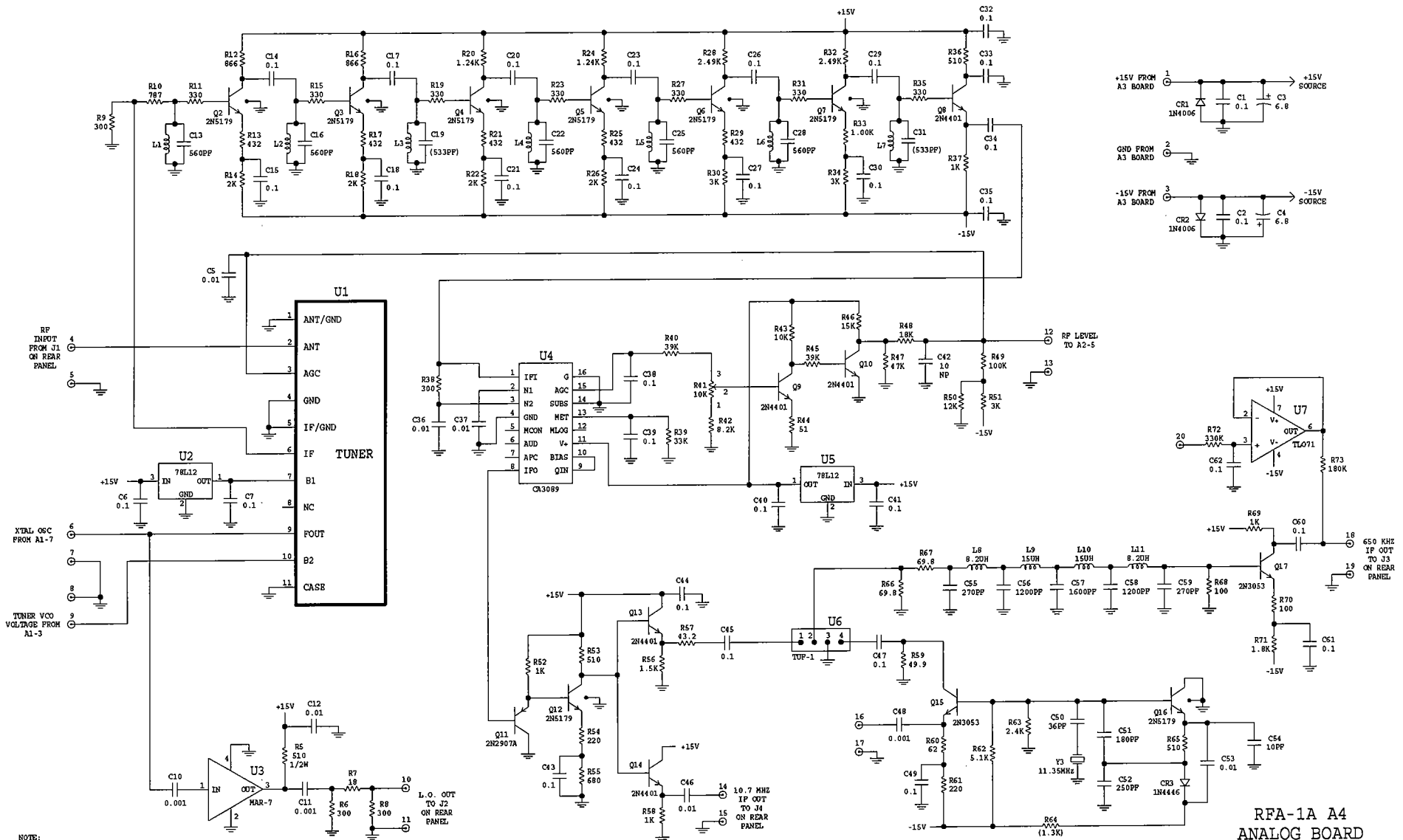


(ONLY USED PRIOR TO SERIAL NUMBER 410215)

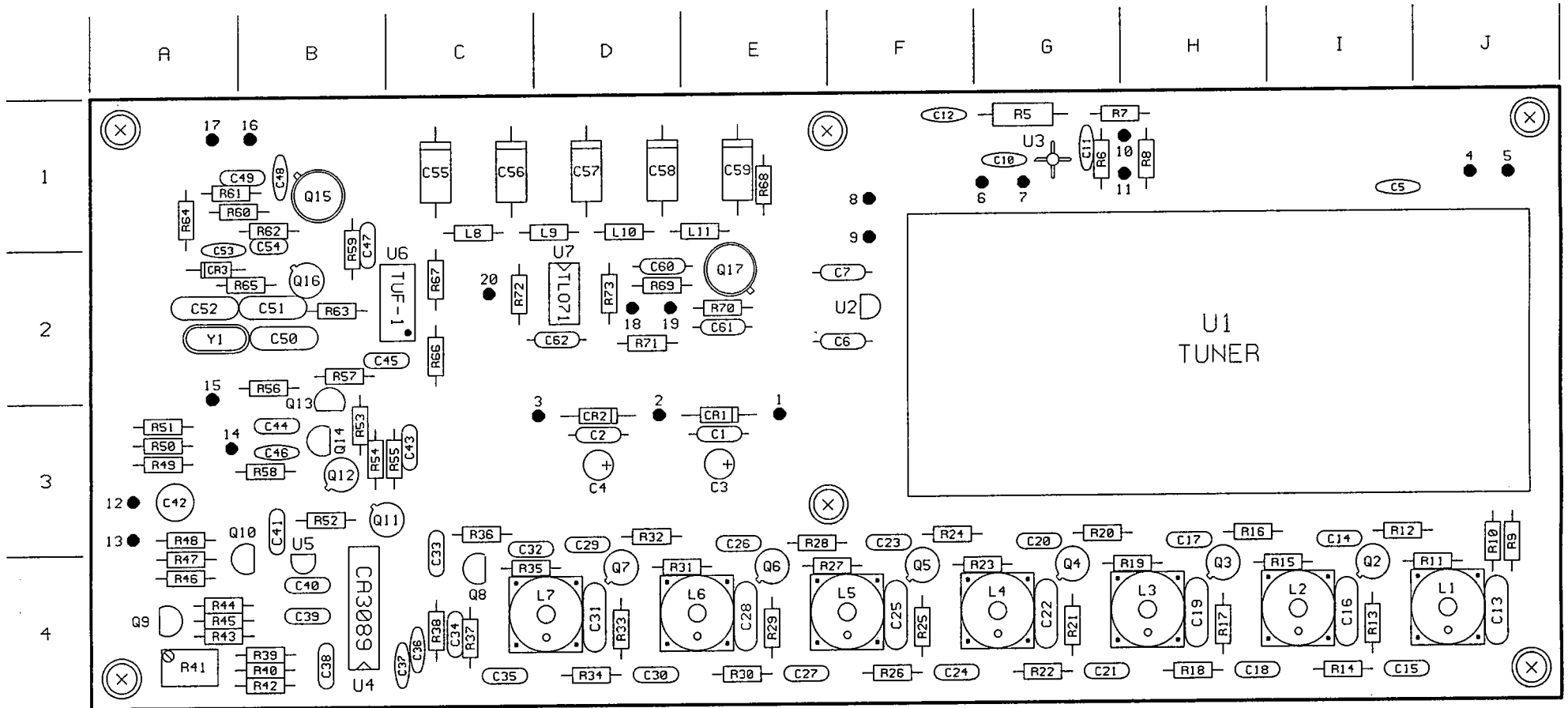
RFA-1A A3 BOARD
 COMPONENT LAYOUT
 BELAR ELECTRONICS

A3 BOARD RFA-1A
(Only used prior to serial number 410215)

Reference Designation	Description	Part Number
C1,C2	C: FIXED ELEC 1900uF 50V	0180-0027
C3,C4	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C5,C6	C: FIXED ELEC 47uF 63V	0180-0017
C7	C: FIXED ELEC 270uF 100V	0180-0034
C8	C: FIXED ELEC 3900uF 25V	0180-0035
C9	C: FIXED CERAMIC 0.1uF 50V	0151-0006
CR1 thru CR10	DIODE: 1N4006	1900-0016
U1	IC: 7815C	1826-0031
U2	IC: 7915C	1826-0033
U3	IC: 7805C	1826-0014



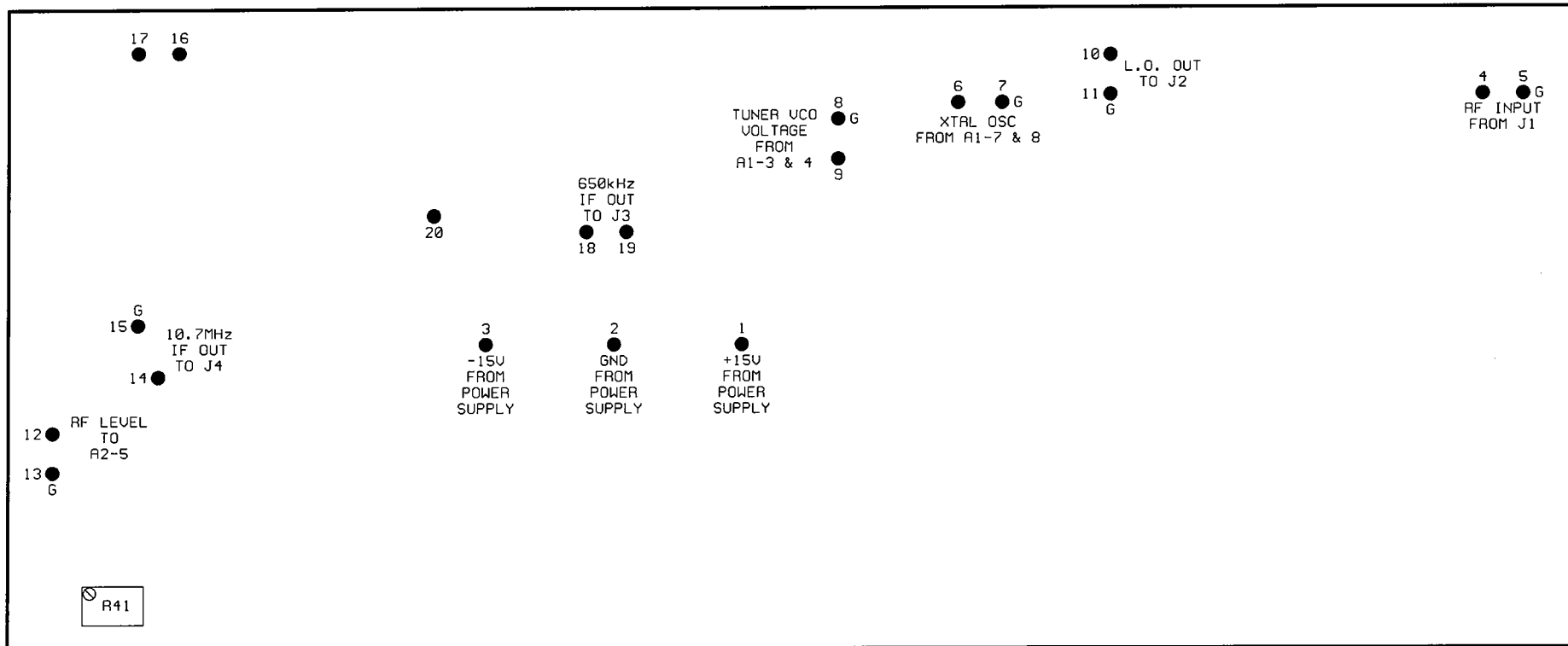
RFA-1A A4
ANALOG BOARD
BELAR ELECTRONICS
12-19-97



RFA-1A A4 BOARD
 COMPONENT LAYOUT
 BELAR ELECTRONICS

RFA-1A 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>
C1	E3	C44	B3	Q7	D4	R34	D4	U1	H2
C2	D3	C45	B2	Q8	C4	R35	C4	U2	F2
C3	E3	C46	B3	Q9	A4	R36	C3	U3	G1
C4	D3	C47	B1	Q10	B4	R37	C4	U4	B4
C5	I1	C48	B1	Q11	B3	R38	C4	U5	B4
C6	F2	C49	B1	Q12	B3	R39	B4	U6	C2
C7	F2	C50	B2	Q13	B2	R40	B4	U7	D2
C10	G1	C51	B2	Q14	B3	R41	A4		
C11	G1	C52	A2	Q15	B1	R42	B4	Y1	A2
C12	F1	C53	A1	Q16	B2	R43	A4		
C13	J4	C54	B1	Q17	E2	R44	A4		<u>pins</u>
C14	I3	C55	C1			R45	A4	1	E3
C15	I4	C56	C1	R5	G1	R46	A4	2	D3
C16	I4	C57	D1	R6	G1	R47	A4	3	D3
C17	H3	C58	D1	R7	G1	R48	A3	4	J1
C18	H4	C59	E1	R8	H1	R49	A3	5	J1
C19	H4	C60	D2	R9	J3	R50	A3	6	G1
C20	G3	C61	E2	R10	J3	R51	A3	7	G1
C21	G4	C62	D2	R11	J4	R52	B3	8	F1
C22	G4			R12	I3	R53	B3	9	F1
C23	F3	CR1	E3	R13	I4	R54	B3	10	H1
C24	F4	CR2	D3	R14	I4	R55	C3	11	H1
C25	F4	CR3	A2	R15	I4	R56	B2	12	A3
C26	E3			R16	H3	R57	B2	13	A3
C27	E4	L1	J4	R17	H4	R58	B3	14	A3
C28	E4	L2	I4	R18	H4	R59	B1	15	A2
C29	D3	L3	H4	R19	H4	R60	A1	16	B1
C30	D4	L4	G4	R20	G3	R61	A1	17	A1
C31	D4	L5	F4	R21	G4	R62	B1	18	D2
C32	C3	L6	E4	R22	G4	R63	B2	19	D2
C33	C3	L7	D4	R23	G4	R64	A1	20	C2
C34	C4	L8	C1	R24	F3	R65	B2		
C35	C4	L9	D1	R25	F4	R66	C2		
C36	C4	L10	D1	R26	F4	R67	C2		
C37	C4	L11	E1	R27	F4	R68	E1		
C38	B4			R28	E3	R69	D2		
C39	B4	Q2	I4	R29	E4	R70	E2		
C40	B4	Q3	H4	R30	E4	R71	D2		
C41	B3	Q4	G4	R31	D4	R72	C2		
C42	A3	Q5	F4	R32	D3	R73	D2		
C43	C3	Q6	E4	R33	D4				



RFA-1A A4 BOARD
 CONNECTIONS & ADJUSTMENTS
 BELAR ELECTRONICS

A4 BOARD RFA-1A

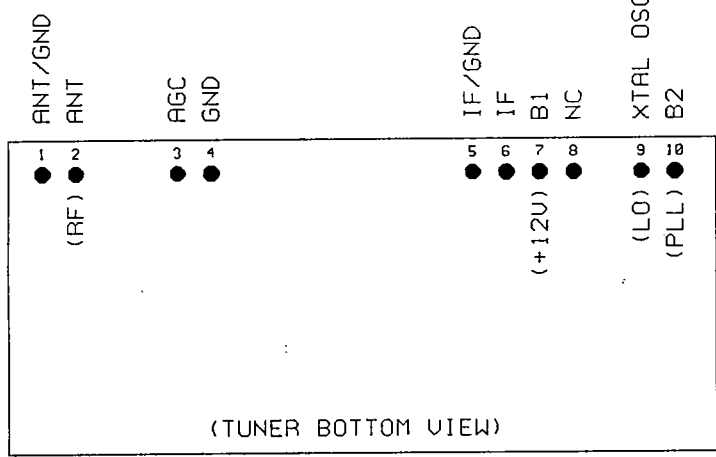
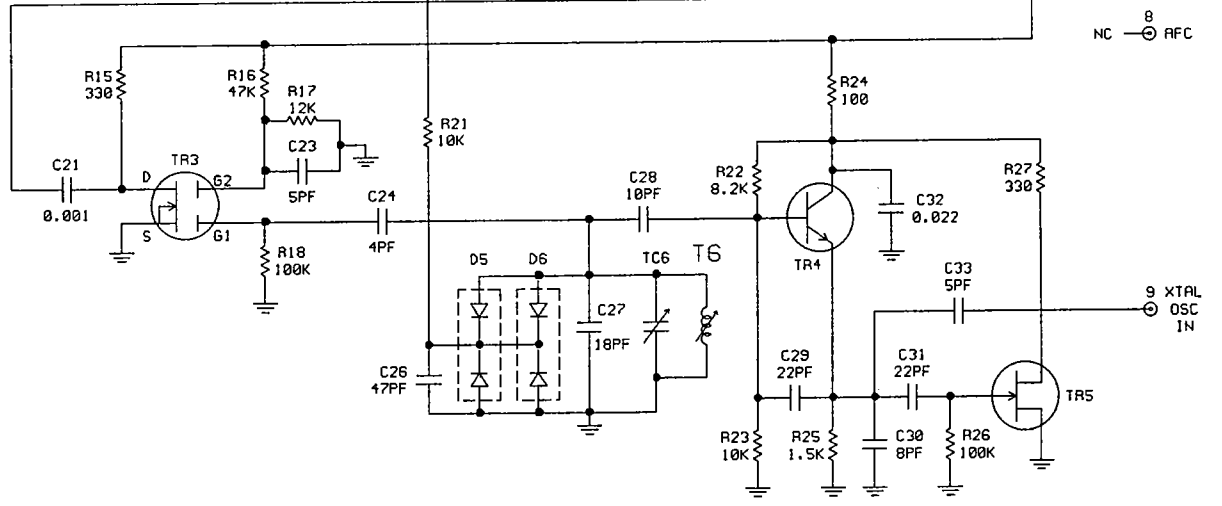
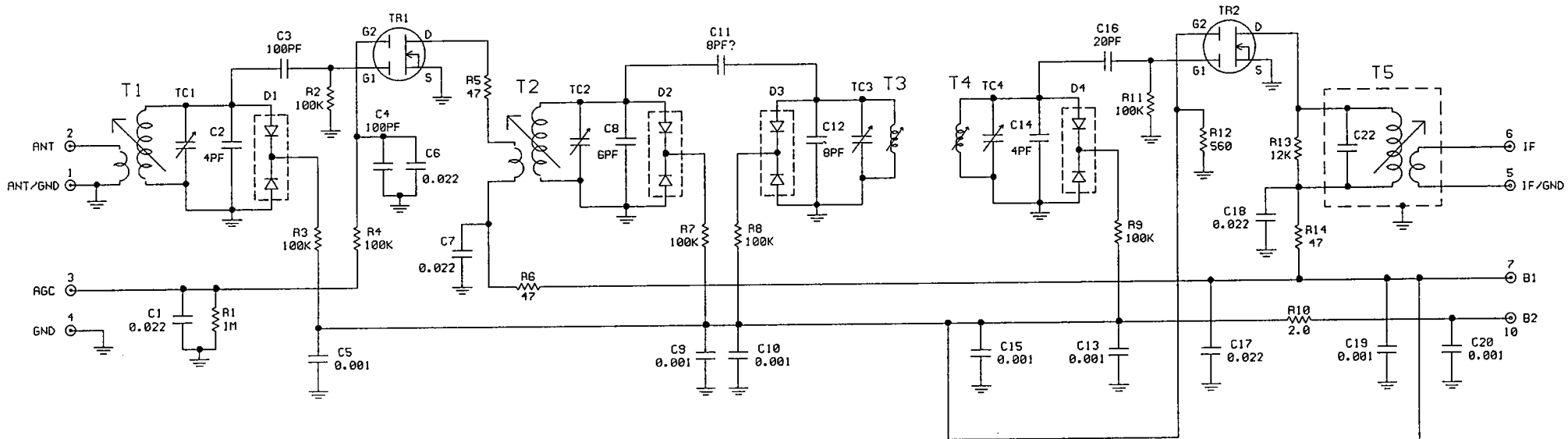
Reference Designation	Description	Part Number
C1,C2	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C3,C4	C: FIXED TANT 6.8uF 25V	0185-0002
C5	C: FIXED CERAMIC 0.01uF 100V	0151-0003
C6,C7	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C8,C9	not used	
C10,C11	C: FIXED CERAMIC 0.001uF 1kV	0151-0002
C12	C: FIXED CERAMIC 0.01uF 100V	0151-0003
C13	C: FIXED MICA 560pF 2%	0140-5612
C14,C15	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C16	C: FIXED MICA 560pF 2%	0140-5612
C17,C18	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C19	C: FIXED MICA 500pF 2%	0140-5012
	(C19 selected for value, nominal value shown)	
C20,C21	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C22	C: FIXED MICA 560pF 2%	0140-5612
C23,C24	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C25	C: FIXED MICA 560pF 2%	0140-5612
C26,C27	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C28	C: FIXED MICA 560pF 2%	0140-5612
C29,C30	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C31	C: FIXED MICA 500pF 2%	0140-5012
	(C31 selected for value, nominal value shown)	
C32 thru C35	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C36,C37	C: FIXED CERAMIC 0.01uF 100V	0151-0003
C38 thru C41	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C42	C: FIXED ELEC 10uF 35V NON-POLAR	0180-0029
C43 thru C45	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C46	C: FIXED CERAMIC 0.01uF 100V	0151-0003
C47	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C48	C: FIXED CERAMIC 0.001uF 1kV	0151-0002
C49	C: FIXED CERAMIC 0.1uF 50V	0151-0006
C50	C: FIXED MICA 36pF 5%	0140-3605
C51	C: FIXED MICA 180pF 5%	0140-1815
C52	C: FIXED MICA 250pF 5%	0140-2515
C53	C: FIXED CERAMIC 0.01uF 100V	0151-0003
C54	C: FIXED MICA 10pF 5%	0142-1005
C55	C: FIXED POLY 270pF 2.5% 160V	0130-2712
C56	C: FIXED POLY 1200pF 2.5% 160V	0130-1222
C57	C: FIXED POLY 1600pF 2.5% 160V	0130-1622
C58	C: FIXED POLY 1200pF 2.5% 160V	0130-1222
C59	C: FIXED POLY 270pF 2.5% 160V	0130-2712
C60 thru C62	C: FIXED CERAMIC 0.1uF 50V	0151-0006
CR1,CR2	DIODE: 1N4006	1900-0016
CR3	DIODE: 1N4446	1900-0002
L1 thru L7	COIL:	Belar
L8	CHOKE: 8.2uH	9141-0015
L9,L10	CHOKE: 15uH	9141-0025
L11	CHOKE: 8.2uH	9141-0015

A4 BOARD RFA-1A CONT.

Reference Designation	Description	Part Number
Q1	not used	
Q2 thru Q7	TRANSISTOR: 2N5179	1850-0023
Q8 thru Q10	TRANSISTOR: 2N4401	1850-0028
Q11	TRANSISTOR: 2N2907A	1850-0027
Q12	TRANSISTOR: 2N5179	1850-0023
Q13, Q14	TRANSISTOR: 2N4401	1850-0028
Q15	TRANSISTOR: 2N3053	1850-0008
Q16	TRANSISTOR: 2N5179	1850-0023
Q17	TRANSISTOR: 2N3053	1850-0008
R1 thru R4	not used	
R5	R: METAL FILM 510 2% 1/2W	0771-5112
R6	R: METAL FILM 300 2% 1/4W	0751-3012
R7	R: METAL FILM 18 2% 1/4W	0751-1802
R8, R9	R: METAL FILM 300 2% 1/4W	0751-3012
R10	R: METAL FILM 787 1%	0721-7870
R11	R: METAL FILM 330 2% 1/4W	0751-3312
R12	R: METAL FILM 866 1%	0721-8660
R13	R: METAL FILM 432 1%	0721-4320
R14	R: METAL FILM 2k 2% 1/4W	0751-2022
R15	R: METAL FILM 330 2% 1/4W	0751-3312
R16	R: METAL FILM 866 1%	0721-8660
R17	R: METAL FILM 432 1%	0721-4320
R18	R: METAL FILM 2k 2% 1/4W	0751-2022
R19	R: METAL FILM 330 2% 1/4W	0751-3312
R20	R: METAL FILM 1.24k 1%	0721-1241
R21	R: METAL FILM 432 1%	0721-4320
R22	R: METAL FILM 2k 2% 1/4W	0751-2022
R23	R: METAL FILM 330 2% 1/4W	0751-3312
R24	R: METAL FILM 1.24k 1%	0721-1241
R25	R: METAL FILM 432 1%	0721-4320
R26	R: METAL FILM 2k 2% 1/4W	0751-2022
R27	R: METAL FILM 330 2% 1/4W	0751-3312
R28	R: METAL FILM 2.49k 1%	0721-2491
R29	R: METAL FILM 432 1%	0721-4320
R30	R: METAL FILM 3k 2% 1/4W	0751-3022
R31	R: METAL FILM 330 2% 1/4W	0751-3312
R32	R: METAL FILM 2.49k 1%	0721-2491
R33	R: METAL FILM 1.00k 1%	0721-1001
R34	R: METAL FILM 3k 2% 1/4W	0751-3022
R35	R: METAL FILM 330 2% 1/4W	0751-3312
R36	R: METAL FILM 510 2% 1/4W	0751-5112
R37	R: METAL FILM 1k 2% 1/4W	0751-1022
R38	R: METAL FILM 300 2% 1/4W	0751-3012
R39	R: METAL FILM 33k 2% 1/4W	0751-3332
R40	R: METAL FILM 39k 2% 1/4W	0751-3932
R41	R: VAR COMP 10k, 10 TURN	2100-0024
R42	R: METAL FILM 8.2k 2% 1/4W	0751-8222

A4 BOARD RFA-1A CONT.

Reference Designation	Description	Part Number
R43	R: METAL FILM 10k 2% 1/4W	0751-1032
R44	R: METAL FILM 51 2% 1/4W	0751-5102
R45	R: METAL FILM 39k 2% 1/4W	0751-3932
R46	R: METAL FILM 15k 2% 1/4W	0751-1532
R47	R: METAL FILM 47k 2% 1/4W	0751-4732
R48	R: METAL FILM 18k 2% 1/4W	0751-1832
R49	R: METAL FILM 100k 2% 1/4W	0751-1042
R50	R: METAL FILM 12k 2% 1/4W	0751-1232
R51	R: METAL FILM 3k 2% 1/4W	0751-3022
R52	R: METAL FILM 1k 2% 1/4W	0751-1022
R53	R: METAL FILM 510 2% 1/4W	0751-5112
R54	R: METAL FILM 220 2% 1/4W	0751-2212
R55	R: METAL FILM 680 2% 1/4W	0751-6812
R56	R: METAL FILM 1.5k 2% 1/4W	0751-1522
R57	R: METAL FILM 43.2 1%	0721-43R2
R58	R: METAL FILM 1k 2% 1/4W	0751-1022
R59	R: METAL FILM 49.9 1%	0721-49R9
R60	R: METAL FILM 62 2% 1/4W	0751-6202
R61	R: METAL FILM 220 2% 1/4W	0751-2212
R62	R: METAL FILM 5.1k 2% 1/4W	0751-5122
R63	R: METAL FILM 2.4k 2% 1/4W	0751-2422
R64	R: METAL FILM 1.3k 2% 1/4W	0751-1322
	(R64 selected for value, nominal value shown)	
R65	R: METAL FILM 510 2% 1/4W	0751-5112
R66, R67	R: METAL FILM 69.8 1%	0721-69R8
R68	R: METAL FILM 100 1%	0721-1000
R69	R: METAL FILM 1k 2% 1/4W	0751-1022
R70	R: METAL FILM 100 2% 1/4W	0751-1012
R71	R: METAL FILM 1.8k 2% 1/4W	0751-1822
R72	R: METAL FILM 330k 2% 1/4W	0751-3342
R73	R: METAL FILM 180k 2% 1/4W	0751-1842
U1	TUNER ASSEMBLY (RFA-1A)	0412-0001
U2	IC: 78L12CP	1826-0015
U3	IC: MAR-7	1845-0027
U4	IC: CA3089	1826-0046
U5	IC: 78L12CP	1826-0015
U6	IC: TUF-1	1845-0011
U7	IC: TLO71	1826-0004
Y1	XTAL: 11.35MHz	0413-1135



RFA-1A TUNER
 BELAR ELECTRONICS
 5-11-92