INSTRUCTION MANUAL

LINEAR AMPLIFIER
BR-2906

NEGATIVE GROUND ONLY

SONAR RADIO CORPORATION

73 Wortman Avenue ● Brooklyn, N.Y. 11207

44-010-068A

MODEL BR-2906

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SECTION 1 - WARRANTY AND SERVICE

1 - 1. WARRANTY

SONAR RADIO CORPORATION warrants each instrument manufactured by them to be free from defects in material and workmanship. Our liability under this warranty is limited to servicing or adjusting any instrument which is returned to the factory for that purpose and to replacing any defective parts thereof. This warranty on all parts is effective for one year after delivery to the original purchaser, and for free labor and servicing for 90 days after delivery to the original purchaser, provided that all instructions as to installation, use and operation are followed and the fault has not been caused by misuse, accidents, negligence, alteration, unauthorized repairs and the equipment has not been damaged by excessive input power, lightning or waterflooding.

1 - 2. SERVICE POLICY

If it is necessary to return any equipment to the factory, a letter should first be sent describing the basic trouble. If an authorized service and sales agency is close to the customer, the customer will be so informed; otherwise, the unit will be returned to the factory. Do not return the unit without factory authorization.

1 - 3. CHANGES

Sonar Radio Corporation reserves the right to modify or change any design or equipment, mechanically or electrically, to any degree as is necessary without Sonar Radio Corporation being liable to modify, change or exchange previously delivered equipment.

1 - 4. WARRANTY REGISTRATION

Sonar Radio Corporation is under no obligation to extend the above warranty to any unit for which a Sonar Warranty Registration card has not been completed and mailed to the Corporation within 10 days after date of delivery. Warranty is extended to the ORIGINAL PURCHASER ONLY!

SECTION 2 - FCC RULES AND REGULATIONS

The operation of the MODEL BR-2906 is governed by the FCC Rules and Regulations set forth in Parts 89, 91 and 93. A copy of these Rules is available from the Department of Commerce and should be in the possession of the operator.

Operation of this equipment requires a FCC license. Failure to comply is punishable by penalties set forth in the Rules and Regulations of the FCC.

The BR-2906 complies with FCC Regulations when shipped from the factory.

The Driver-Transmitter for the BR-2906 must be FCC Type Accepted under Parts 89, 91 and 93 in order that the system be valid.

SECTION 3 - DESCRIPTION

3 - 1. GENERAL

The Sonar BR-2906 is a R. F. Power Amplifier designed for use with a low power AM, FM or SSB Transmitter in the 25-50 MHz band. The 2906 is automatically switched into the transmit mode by a R. F. detection switching circuit.

The unit is horizontally mounted to allow convection cooling from the bottom through to the top of the cabinet. Care must be taken to keep objects clear of the unit that could obstruct the flow of air.

3 - 2. CONTROLS AND FITTINGS

A. FRONT

Panel lamp indicates R. F. output and is used to indicate proper tuning when first installing the BR-2906.

INPUT

50 Ohm input for 1 to 15 watts of power. (Do not exceed 15 watts.)

OUTPUT

50 Ohm R. F. Power Output depends on emission, power input and frequency.

B. REAR

13.8 VDC cables with an inline fuse for protection.

C. CONTROL BRACKET

Mounts under the dash to turn power "ON" and "OFF". This function is indicated by a green lamp.

3 - 3. OPERATION

The BR-2906 should not be driven by more than 15 watts. If the driver is a FM or SSB Transmitter, the amplifier is tuned for maximum output. If the driver is an AM Transmitter, the Loading Control is adjusted to reduce output (as described in the tune-up procedure) thereby allowing the reduced carrier to increase in amplitude during AM modulation peaks. The BR-2906 is rated for intermittent operation only (not continuous).

3 - 4. SPECIFICATIONS

Frequency Range	25 - 50 MHz
Emission	AM, FM or SSB
Duty	Intermittent
Drive Power	1 to 15 watts
Input and Output Impedance	50 Ohms
Noise Level	Suppressed more than 60 db
Harmonic Output	Suppressed more than 60 db
Size	2" High x 6" Wide x 8" Deep
Weight	3 lbs.
Power Requirements:	Standby: 2 Amperes Transmit 20 Amperes (Approx.)

SECTION 4 - INSTALLATION

4 - 1. INSTALLATION

The BR-2906 is usually trunk mounted in a horizontal position only using the brackets supplied. The area surrounding the unit must be kept clear to provide adequate ventilation. If the surface where the BR-2906 is carpeted, the mounting brackets should be raised with 1" blocks of wood to allow air to pass into the bottom of the cabinet.

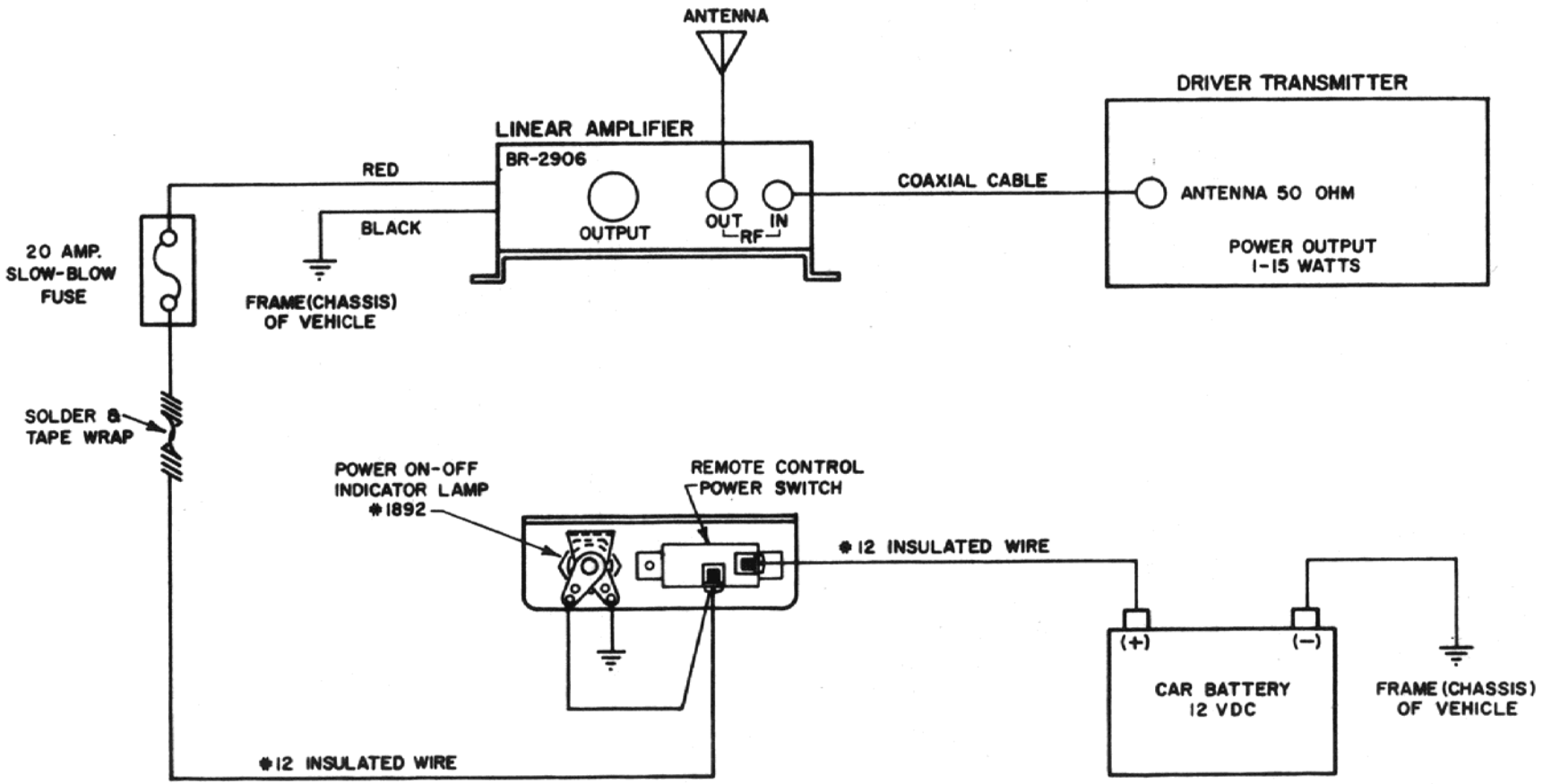

FIG.1 INSTALLATION DIAGRAM

12 VDC NEGATIVE GROUND ONLY

The Remote Control Power Switch bracket is mounted under the dash with the Positive battery lead connected to the unused terminal of the switch. The other terminal goes to the lamp and the BR-2906. No. 12 stranded wire is used throughout. The Negative power lead from the rear of the BR-2906 is connected to the vehicle chassis. See Fig. 1.

SECTION 5 - OPERATION

5 - 1. FREQUENCY RANGE ADJUSTMENT

The BR-2906 is set at the factory for the 25-32 MHz range. Operation at higher frequencies requires a change in the number of turns of L2 (R. F. output coil) according to the following schedule:

Range	Shorting Tap
25 - 32 MHz	None
32 - 42 MHz	To 3rd Turn
42 - 50 MHz	To 5th Turn

The shorting tap is placed from the end of the coil closest to the side of the unit to the 3rd or 5th turn, counting from the side.

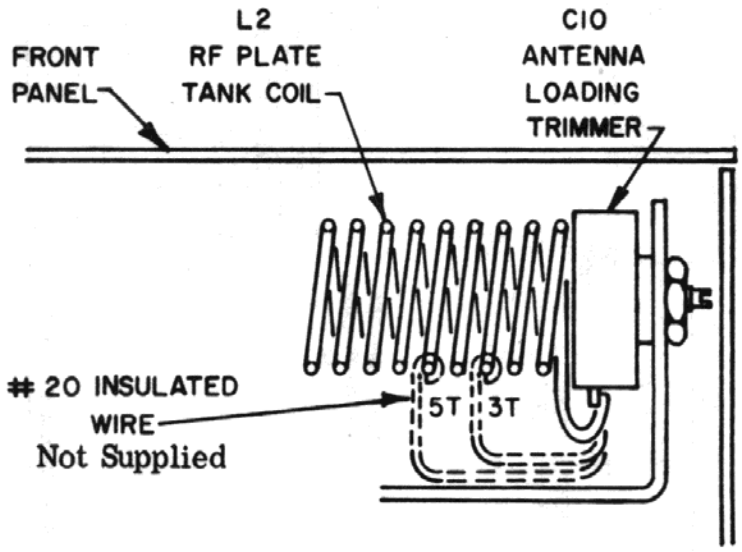

FIG. 2 TOP VIEW OF TANK COIL

5 - 2. TUNING PROCEDURE

A. FM OPERATION

(1) It shall be assumed that the driver-transmitter has been tuned into a 50 ohm load or antenna. If this is not true, then tune-up of the driver-transmitter into a 50 ohm load is necessary prior to proceeding any further.

(2) Connect the output of the driver-transmitter to the input of the BR-2906 using a 50 ohm cable and PL-259 UHF connectors.

(3) Connect the output of the BR-2906 to a 50 ohm antenna (or load) with a Bird Electronics Thruline Wattmeter (Model 43 or equivalent) in series between the BR-2906 and the antenna.

(4) Key the system for power output and adjust the Plate Tuning Control (C11) for maximum R. F. output as indicated on the Wattmeter. (Note: The lamp will indicate increased brilliance.)

The tuning controls are located on the left side. The top is the Antenna Loading Control. The bottom is the Plate Tuning Control.

(5) Adjust the Antenna Loading Control (C10) for maximum R. F. Output.

(6) Adjust C5 (on P. C. Board) for maximum R. F. Output.

(7) Repeat (4) and (5) for maximum R. F. Output.

B. AM OPERATION

(1) Perform steps A(1) to A(7).

(2) Adjust the Antenna Loading Control clockwise to reduce power output by 20%; i. e., if output is 50 watts, reduce output to 40 watts.

(3) Repeat steps A(4) and B(2).

5 - 3. TUNE-UP PROCEDURE USING INDICATOR LAMP AS POWER OUTPUT INDICATOR

This procedure can be used for Amateur service or when a Thruline Wattmeter is not immediately available.

A. FM OPERATION

Use same procedure as in 5-2 A(1) through A(7) using the brilliance of the Output indicator lamp instead of the Thruline Wattmeter.

B. AM OPERATION

(1) Perform steps indicated in 5-3A.

(2) Rotate Antenna Loading Control clockwise and speak into the microphone. Modulation peaks will cause the lamp to dim. Continue to rotate the Antenna Loading control until modulation peaks no longer dim the indicator lamp.

(3) Repeat 5-2A(4) and 5-3B(2).

C. SSB OPERATION

(1) Move the wire jumper on the P. C. Board to the SSB position. (See note 3 on the schematic diagram.)

(2) Follow steps 5-2A(1) to A(7) or 5-3A, while applying a test tone to the SSB Transmitter.

(3) Further tuning for best linearity requires a Modulation Monitor to view the R. F. Output wave form.

NOTE: To remove K1 Relay from unit, remove spacer hold-down screw from bottom of unit, lift out spacer and remove relay.

MODEL BR-2906 PARTS LIST

DIAG. NO.	DESCRIPTION	SONAR PART NO.	*LIST PRICE
R2, 3	Resistor, Fixed, Composition 2.2 K Ohms, 10%, 1/4 w	01-222-331	$0.25
R3A	Resistor, Fixed, Composition 10 Ohms, 5%, 1 w	01-100-621	0.35
R4	Resistor, Fixed, Wirewound 7 Ohms, 10%, 5 w	02-070-422	0.50
R5	Resistor, Fixed, Composition 220 Ohms, 10%, 1 w	01-221-631	0.50
R6, 7	Resistor, Fixed, Composition 100 K Ohms, 10%, 1 w	01-104-631	0.35
C1	Capacitor, Fixed, Ceramic 5.6 PF, 500 V, NPO, 5%	04-566-019	0.50
C2	Capacitor, Fixed, Ceramic .005 MF, 100 V, +80-20%	04-503-003	0.50
C3	Capacitor, Fixed, Electrolytic 16 MF, 40 V	06-530-047	1.00
C4, 7, 8, 9	Capacitor, Fixed, Ceramic .001 MF, 500 V, GMV	04-103-004A	0.50
C5	Capacitor, Variable, Compression 37-250 PF, 1 Section	09-210-038	1.50
C6	Capacitor, Fixed, Ceramic .01 MF, 100V, +80-20%	04-102-003	1.50
C10	Capacitor, Variable, Compression 100-500 PF, 1 Section	09-210-001	1.00
C11	Capacitor, Variable, Air 7.3-51 PF, 1 Section	08-150-015	3.00
C12, 15	Capacitor, Fixed, Ceramic .001 MF, 2 KV, ±20%	04-103-022	0.50
C13, 14	Capacitor, Fixed, Electrolytic 10 MF, 450 V	06-130-090	2.50
C16, 17	Capacitor, Fixed, .68 MF, 100 V, 10%	05-681-055	1.00
D1, 1A	Diode IN-295X	19-050-004	0.50
D2, 3, 4, 5	Diode CER-71	19-040-002	1.00
Q1, 2	Transistor RCA40397/S397	19-020-043A	2.00
Q3, 4	Power Transistor Motorola 2N2152	19-020-019	6.00
V1, 2	Electron Tube 6JU6	19-010-065	6.00
L1	Wire #22, 1-1/2 turns		
L2	Coil, RF Plate Tank	22-070-024	0.75
L3	Coil, Input, Matching	22-150-005	1.00
RFC1, 2	Choke, 10 UH	22-060-008	1.00
RFC3	Choke, 21 UH	22-060-005	1.00

*Minimum Order - $15.00 Prices are subject to change without notice.

MODEL BR-2906 PARTS LIST

DIAG. NO.	DESCRIPTION	SONAR PART NO.	*LIST PRICE
T1	Power Transformer, Toroid	14-120-004	$10.00
F1	Fuse, 20-A, 32 V, 3AG, Slow-Blow	42-010-001	0.35
J1, 2	RF Connector	15-120-001	1.00
B1	Pilot Lamp #47, 6 V	19-060-001	0.25
	Mini-Pin (Male) Disconnect on P. C. Board	55-020-002	0.25
	Receptacle (Female) Disconnect on P. C. Board	55-020-001	0.25
	Cabinet, Top Shell	28-020-028	3.00
	Cabinet, Bottom Shell	28-020-027	5.50
	Front Panel	11-020-103	2.50
	Unit Mounting Bracket	11-040-146	1.00
	P. C. Board Tube Hold Down Assembly	51-010-038	2.50
K1	Plug-in Relay 4 PD, 12 VDC Coil	16-010-016	12.00
K2	Relay, SPST 12VDC, 15 AMP	16-050-002	7.50
	Relay Socket, P. C. Type	13-170-005	1.00
	Heat Sink	34-170-008	3.00
	Novar Socket P. C. Type	13-020-007	0.50
	Pilot Light Socket w/Amber Jewel	13-110-018	2.00
	In Line Fuse Retainer	42-020-006	0.50
	Rubber Washer (for Toroid)	35-040-015	0.25
	Rod, Tube Hold Down	34-120-004	0.50
	Tinnerman Fastener, #6-32	34-060-010	0.10
	Remote Control Power Switch (Complete Assembly)	51-010-039	7.95
	Rocker Switch SPST	10-090-001	2.50
	Power Indicator Lamp #1892, 12V	19-060-002	0.25
	Indicator Light Assembly Green Jewel	13-110-019	2.50
	Mounting Bracket (Remote Control Power Switch)	11-040-148	1.75
	Instruction Manual	44-010-068A	2.00

*Minimum Order - $15.00 Prices are subject to change without notice.

When ordering replacement parts, it is essential to specify Model, Serial number, Part number and description as indicated in Parts List.