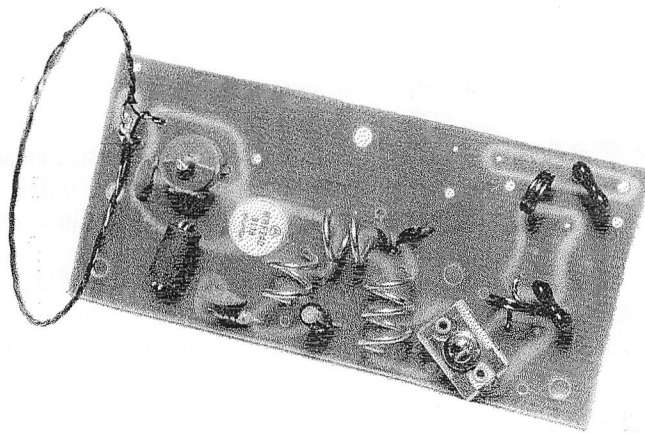


MAGGIORE ELECTRONIC LABORATORY

Hi Pro

OPERATING AND MAINTENANCE MANUAL



Hi Pro PAV-1 POWER AMPLIFIER

1. **DESCRIPTION.** The PAV-1 is an RF power amplifier which produces an nominal power output of 35 watts, minimum, 30 watts with a input drive level of 3 watts. The amplifier covers the frequency range of 132-174 MHz and designed primarily as a booster amplifier for the Hi Pro EV-1 transmitter/exciter. Any exciter with a 50 ohm output, capable of meeting the drive and emission requirements, however, may be used.

The PA operates from a nominal 13.8 VDC source. Lower voltage can be used but it will reduce the power output of the amplifier. In most cases, a DC power supply is used with a battery back up system in times of AC power failure. Due to the efficiency of these power amplifiers it is practical to use a solar power system at remote sites.

The amplifier incorporates a single power transistor, in class C. An input network, provides a 50 ohm matching load and a means of coupling the exciter output to the amplifier. The input circuit is tuned by means of capacitor C2. The output of the amplifier is fed to the antenna through a low pass filter consisting of L4, C16, L5 and C13.

2. **POWER AMPLIFIER ALIGNMENT.** Alignment requires the use of the following equipment:

1. A 50 ohm non inductive load and wattmeter. (Preferably with a 5 watt and 40 watt scale).
2. A 0-1 and 0-10 DC ampmeter connected in series with the supply line.

3. **PROCEDURE.** Be sure that the driver is operating before attempting to tune the power amplifier. Terminate the driver stage into the 50 ohm inductive load wattmeter. Adjust the drive to approximately 3 watts. This is accomplished easily with the EV-1 transmitter by adjusting the power level pot located on the EV-1 transmitter board.

Connect driver output to the power amplifier.

Adjust the power amplifier input capacitor C2 for an increase in power amplifier collector current.

Adjust C15 for maximum current. Output power on the wattmeter/load should be indicated at this time. Adjust to maximum output indication.

Alternately adjust C2 and C15 for maximum output indication on wattmeter.

4. **POWER AMPLIFIER INSTALLATION.** A heat sink of adequate size must be used with this amplifier. The stud on the power transistor must have heat sink compound applied to it and then this stud must be attached to an adequate heat sink. Severe damage to the power transistor will result if operated without proper heat sinking.

On amplifiers where a Hi Pro heat sink is provided with the amplifier, additional heat sinking is required in conjunction with the provided heat sink. This additional heat sinking is provided normally when mounted in our enclosure. If our enclosure is not used, then sandwich the amplifier and the heat sink to the chassis or panel.

5. **SUGGESTIONS ON HEAT SINK SIZES.**

INTERMITTENT SERVICE: 20% DUTY CYCLE. 3"W x 5"L x 1" FINS.

CONTINUOUS DUTY SERVICE: 100% DUTY CYCLE. 6"W x 12"L x 1" FINS.

NOTE: The PAV is the same as the PAV-1 except for the power output transistor, and capacitors, C3 and C4.

1. EQUIPMENT DESCRIPTION -The PAV-1 is an RF power amplifier which produces a minimum output of 25* watts with a nominal input drive of 3 watts. The unit covers the frequency range of 132-174 MHz and was designed primarily as a booster amplifier accessory for the Maggiore Electronic Lab. EV-1 transmitter exciter. Any exciter with a 50 ohm output, capable of meeting the drive and emission requirements, however, may be used.

The PA operates from a nominal 13.8 VDC source. In most cases, a battery is used as the main source of supply with a D.C. supply operating from the A.C. mains to provide for charging of the battery.

The amplifier incorporates a single power transistor, type MRF240, operated in Class C. An input network, with a high efficiency trifilar wound coil, T1 provides a 50 ohm matching load and a means of coupling the exciter output to the amplifier. The input circuit is tuned to resonance by means of capacitor C2. The output circuit is tuned with capacitors C6 and C7. The output of the amplifier is fed to the antenna through a low pass filter consisting of C13, L4, C14, L5 and C15.

TUNE UP PROCEDURE

Equipment - A 50 ohm non-inductive load and wattmeter (5w and 30 watt scales, preferable).

DC Ammeter, 0-2A, connected in series with the + volts lead to measure collector input current.

Procedure - Tune up driver unit first in accordance with its prescribed procedure. Terminate driver output in wattmeter/load. Adjust drive to approximately 3 watts (3.3 watts, maximum). This is accomplished with the EV-1 by tuning the output network, so as to produce the required output with the lowest exciter collector input current. Connect driver output to PA.

Adjust PA input capacitor, C2, for an increase in power amplifier collector current.

Adjust C10 for maximum current. Output power on the wattmeter/load should be indicated at this time.

Adjust C11 for maximum output power indication.

Re-adjust C2 for maximum output.

Alternately re-adjust C10 and C11 for maximum output with minimum input (lowest collector current reading).

*Note These instructions also will apply to the 15 watt amplifier.

PARTS LIST

Maggiore Electronic Laboratory

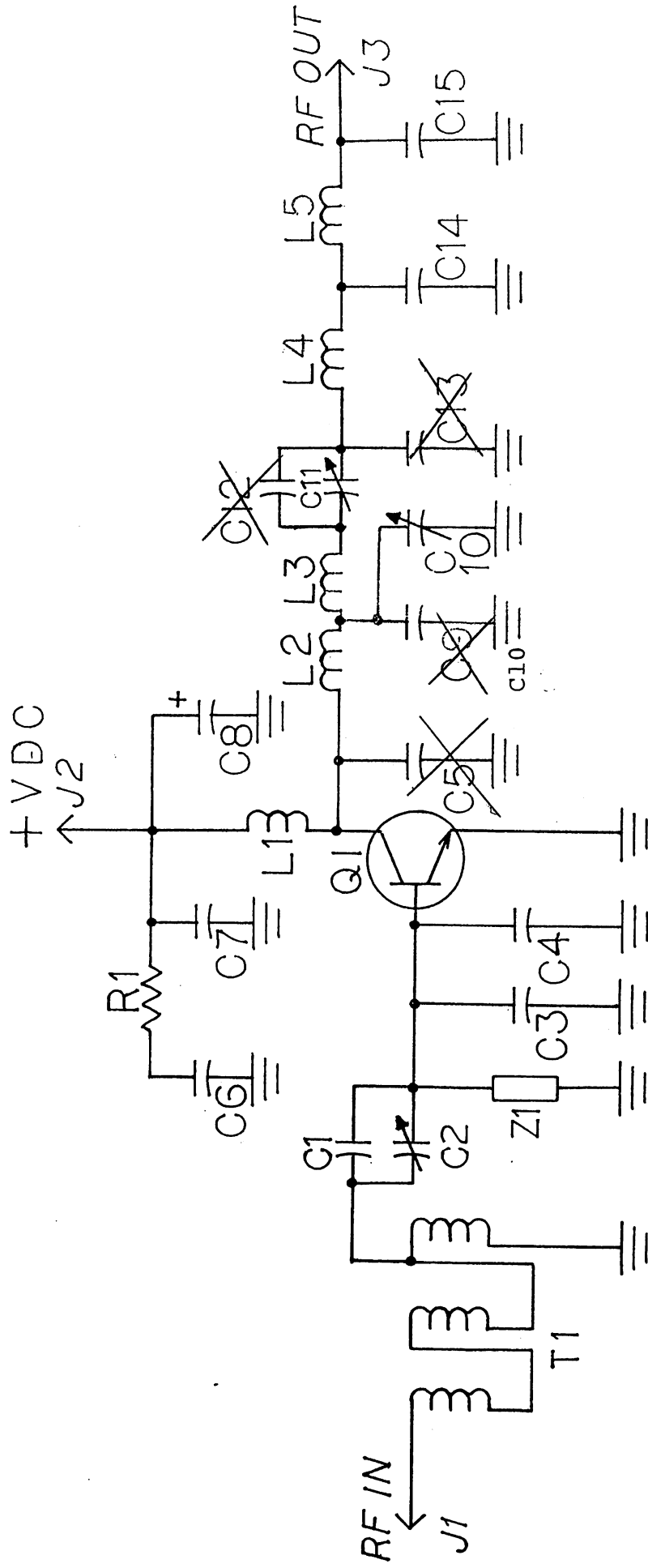
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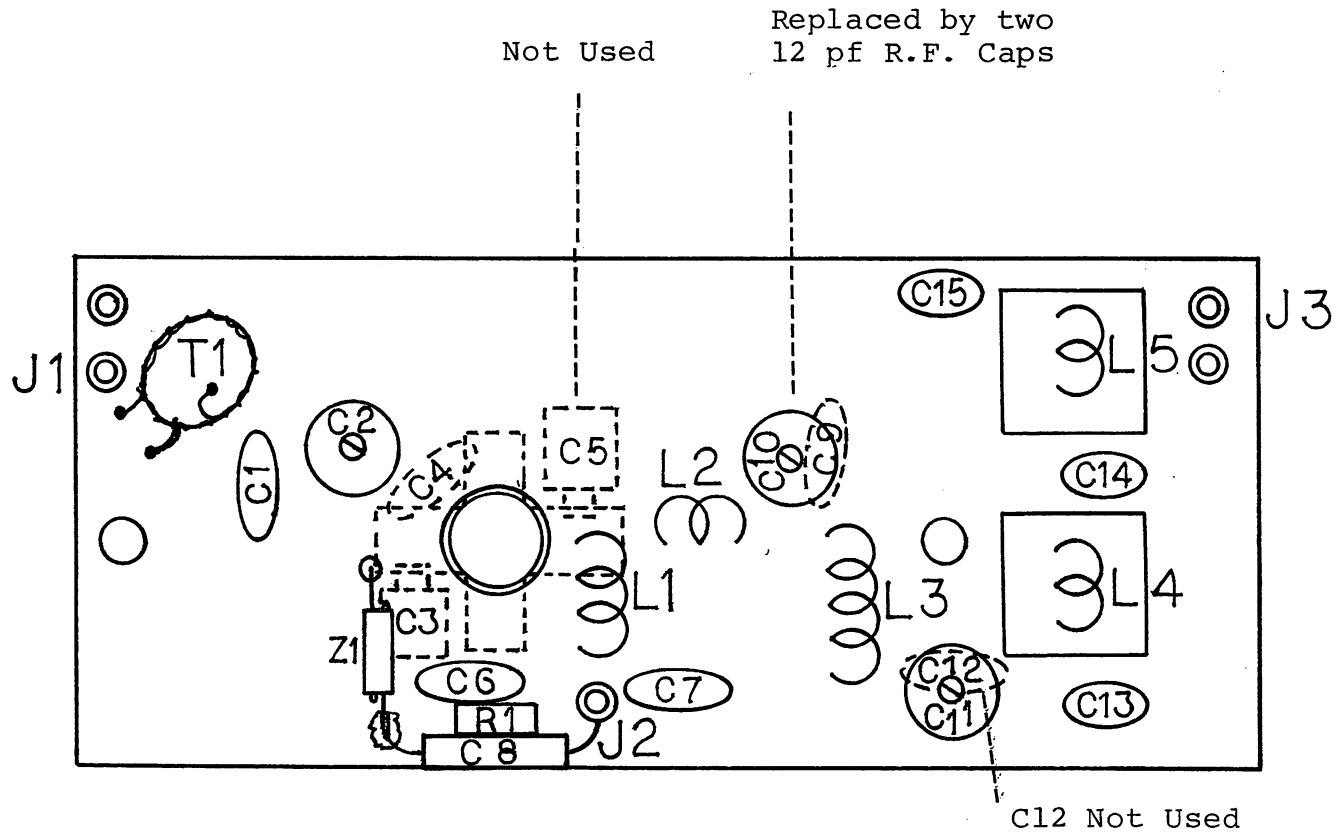
AUTHENTICATION:

DRAWING OR DOCUMENT NUMBER	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
C1		22 PF CERAMIC DISC
C2		10-40 PF TRIMMER
C3		150 PF DISC
C4		150 PF CERAMIC DISC
C6		.02 MF CERAMIC DISC
C7		.001 CERAMIC DISC
C8		10 UF ELECTROLYTIC
C10		2-12 PF R.F. CAPS
C11		2-13 PF TRIMMER
C14		22 PF S.M.
C15		22 PF S.M.
L1		P.A. COIL
L2		P.A. COIL
L3		P.A. COIL
L4		FILTER COIL
L5		FILTER COIL
Q1		MRF 238 TRANSISTOR
T1		9:1 TRANSFORMER
Z1		FERRITE CHOKE
R1		10 Ohm $\frac{1}{4}$ Watt



HI PRO V.H.F. AMPLIFIER

SIZE	CODE IDENT NO.	DRAWING NO.
	PAV-1	2D0583
SCALE	1/4" = 1"	
		SHEET 3



HI PRO V.H.F. AMPLIFIER

SIZE	CODE IDENT NO.	DRAWING NO.
	PAV-1	2E0583
SCALE	<i>f.m.</i>	SHEET 4