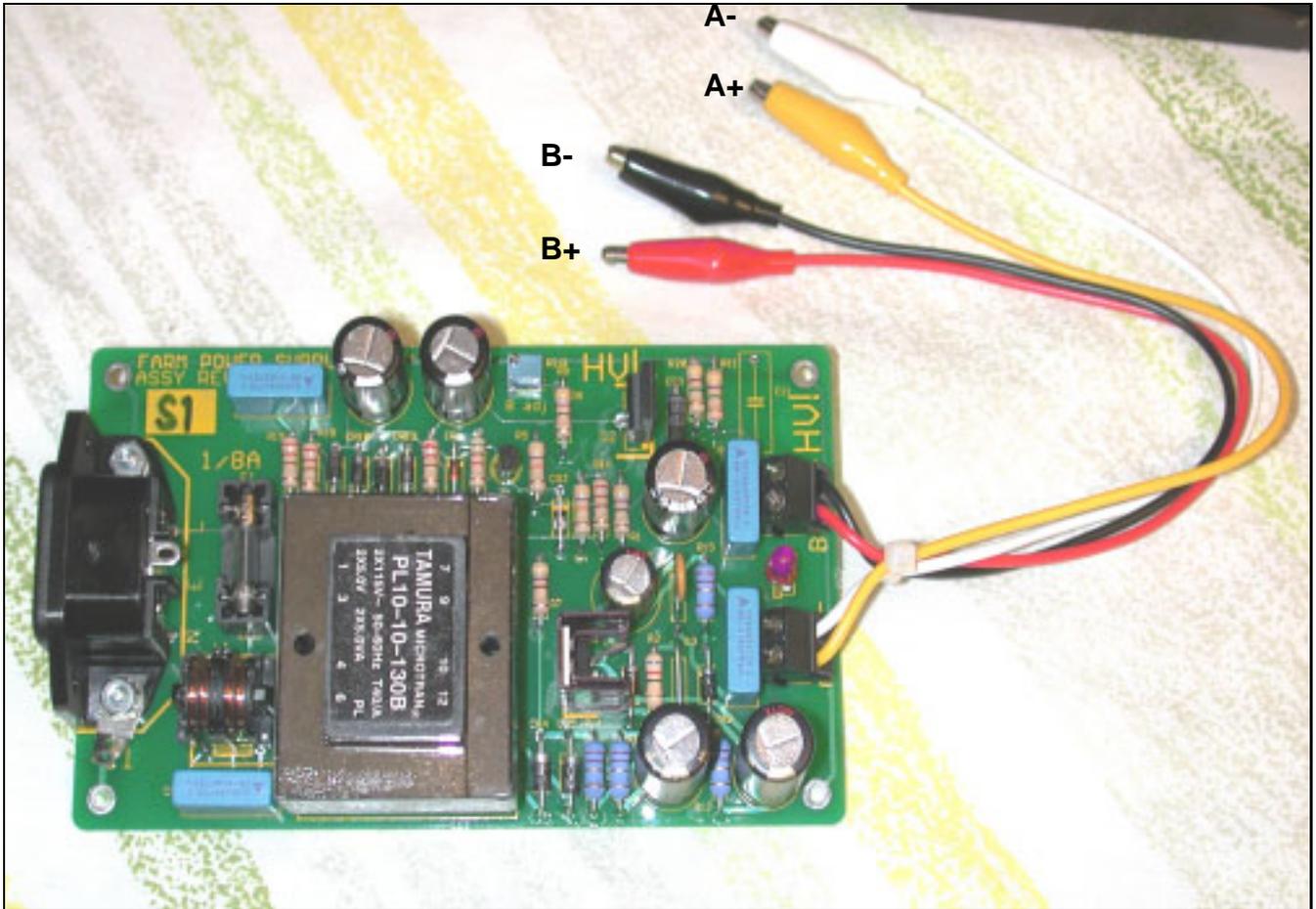


INSTRUCTION MANUAL

Model FarmPS-1, 1.5V/90V Farm Radio Power Supply



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0.0 DEFININITIONS

0.1 The term “**WARNING**” will mean that a failure to follow the direction may result in personal harm. “**CAUTION**” means that damage to the product or your radio may occur. “**NOTE**” denotes something of more importance than standard text and is meant to illustrate a key point.

1.0 INTRODUCTION

1.1 The Model FarmPS-1 supplies well regulated and filtered “A” (filament) and “B” (plate) DC voltages for use with “1.5volt” Battery Operated Vacuum Tube Farm Radios.

1.2 In mid-1938, Sylvania introduced a new octal-based tube line-up featuring low current (typically 50mA) 1.4V filaments designed for direct connection to dry cell batteries. The initial tube line-up consisted of the 1A5 (power pentode), the 1A7 (pentagrid converter), the 1H5 (diode-triode), the 1N5 (RF pentode) and the 1C5 (another power pentode).

1.3 This line was intended to supplant the then current 2-volt farm radio design, which was optimized for lead-acid storage battery operation. The term “farm” derives from the fact that, even by the late 1930s, the Rural Electrification Authority had only partially succeeded in bringing commercial power to rural America. It was still quite common for a farmer to have “wind-charger” (typically 32V) or battery power only.

1.4 The 1939 Sylvania Tube Manual shows a reference design using the 1A7-1N5-1H5-1A5 line up, along with the existing 2 volt and 32 volt farm radios. This line-up, often with a different power pentode (1C5, 1Q5, etc.), was quickly adopted by most radio manufacturers. A count of this line up in *Beitman's Most Often Needed Radio Diagrams*, shows two radios in the 1926-1938 issue, increasing to 35 in the 1940 issue.

1.5 Manufacturers varied the designs to obtain specific operating characteristics. It was not uncommon to find two output tubes operating in parallel or push-pull, as 100mW of output from a single tube is

hardly suitable to living room listening of a “fireside chat.” Other radios had extra amplification stages to pick up weak signals from the distant city stations. Besides the basic four tube line-up, 5 and 6 tube radios were common.

1.6 Three way radios (those with the same line-up for battery operation, but with an addition of a line powered rectifier tube) became more common just before World War II. Batteries were in scarce supply during the war, so after the battery went dead many of these radios were no longer used. Production of civilian radios halted in 1942.

1.7 Few manufacturers produced new farm radio designs after the war, with notable exceptions of Sears, Montgomery-Ward and Sentinel, who had significant markets in rural areas (mostly through catalog mail-order sales).

1.8 This left the true farm radio with a nominal “A” supply of 1.5V and a nominal “B” supply of 90V as an “orphaned” product line. Many were simply put away in attics and barn lofts when post-war commercial radio production was resumed.

1.9 The FarmPS-1 is designed specifically for these radios. It has enough “A” and “B” power to supply 4, 5, or 6 tube radios with the same operation characteristics that would have been obtained from the commonly available dry cell batteries when the radios were new. The actual output voltages are set to simulate “design-center” values for Carbon-Zinc (dry cell) radio batteries of the late 1930's (nominally 1.4Volts per cell).

2.0 SPECIFICATIONS

2.1 OUTPUTS

“A” supply: 1.4Volts nominal Regulated DC, 150-350mA. Less than 10mVrms ripple. Over-voltage and over-current protected. Supplies enough filament current for up to 6-tube radios.

“B” supply: 84Volts nominal regulated DC at 12mA load. Maximum load 20mA (6-tube radios). Over-voltage and over-current protected. Less than 100mVrms ripple.

The “A” supply and “B” supply are isolated from each other with less than 50pF of A- to B- coupling and more than 1MΩ of galvanic isolation. Both are RF filtered to prevent feedback and microphonic coupling.

2.2 POWER REQUIREMENTS

108-132VAC, 50-60Hz, typically 10Watts, depending upon radio being powered. Requires grounded line cord (supplied). Input is fused (1/8A SB) and RF filtered.

2.3 SIZE

3.25 inch by 5.5 inch printed circuit board, approximately 1.25 inch high. Rubber feet and mounting holes provided. The width allows convenient mounting to standard “1x4” pieces of wood, such as pine.

2.4 CONNECTORS

Factory wired with color-coded alligator clips for connection to almost any type of radio. The alligator clips can be removed from the screw terminal blocks to allow for customer desired connections.

3.0 INSTALLATION

WARNING:

The FarmPS-1 operates with dangerous live voltages. Follow the connection instructions, cautions and warnings carefully to avoid hazards.

CAUTION:

The FarmPS-1 is intended only for radios rated for 1.5V “A” batteries (4, 5, or 6 tubes) and 90V “B” batteries. If you are unsure of the correct connections for your radio, do not connect the FarmPS-1 without consulting the documentation for your radio.

3.1 Preparation. Before connecting the FarmPS-1, make sure your radio is OFF and that the FarmPS-1 is unplugged from the power line.

3.2 Power Connection. The FarmPS-1 comes factory configured with color-coded alligator leads. These are (see front cover photo):

RED	+85V (B+)
BLACK	85V Return (B-)

YELLOW	+1.4V (A+)
WHITE	1.4V Return (A-)

3.3 The most common battery connectors used with these types of farm radios are shown in Figure 1. If your radio differs from these, do not proceed without consulting further documentation.

3.4 The alligator clips are slipped over the pins with the insulator is slid down as far as possible to isolate pin from pin.

NOTE:

Manufacturers used many different color codes for their wires that age will have faded. Do not rely solely on color identification for connection to your radio.

CAUTION:

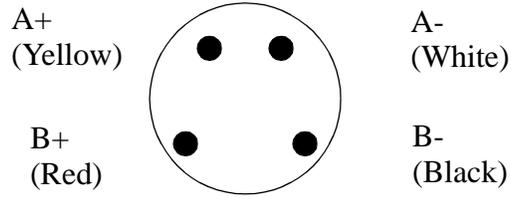
Even though the B+ is rated only for a nominal 15mA, it can momentarily provide sufficient current to destroy the fragile filaments on these radios. Check and double check your connections.

3.5 If your radio has damaged or missing connectors, direct connection can be made to the wires by stripping the wires approximately 1/4 inch and connecting the alligator clips to the correct wires. If the wires are frayed or otherwise damaged, they must be replaced before connecting the FarmPS-1. You may also use the small screws on the terminal blocks to remove the factory installed leads and directly connect your radio wires to the terminal blocks.

3.6 Verify that the line cord is unplugged from the AC outlet. Insert the cord into the receptacle on the FarmPS-1. Position the supply in a convenient position inside the radio cabinet, being careful not to short the wires or any components on the FarmPS-1. If your radio was designed for internally stored batteries there should be plenty of open space.

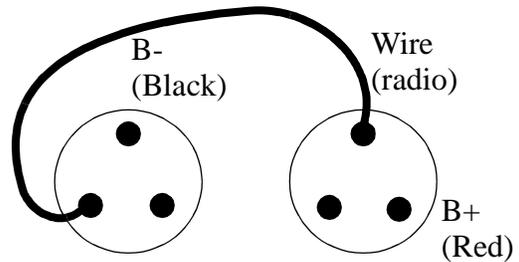
3.7 Again verify that your radio switched to OFF. Now plug the line cord into your AC outlet. The Red LED on the power supply near the output terminals will now begin flashing. The flashing indicates that power is applied and hazardous voltages are present on the power supply and should not be disabled.

Combined A/B Pack:

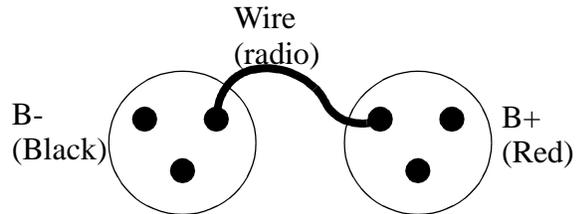


PIN-END VIEW

Separate A and B batteries:



OR:



PIN-END VIEW

FIGURE 1: Common Battery Terminals.

(colors refer to FarmPS-1 leads, not radio wires)

3.8 Your radio is now usable as if it was equipped with a 1930's battery pack. Simply use the radio controls as normal. The FarmPS-1 can safely be left on at all times, so that the radio can be used without regard to line power.

NOTE:

Some of the components on the power supply will be warm during operation. This is a normal part of the regulation process.

CAUTION:

Most farm radios use a self-bias voltage derived from the "B" supply return current, so that the B- and A- terminal will not be at the same voltage potential. Because of this, you cannot use one FarmPS-1 to power multiple radios simultaneously.

3.9 If your radio requires a ground connection, you may use the solder lug provided near the AC input receptacle. Do not use this ground if you are unsure of its need. Note also that this ground comes from your house wiring and will not provide the best performance due to household noise sources, such as computers and appliances. Best performance is obtained with a good outside antenna and a good ground.

WARNING:

If you wish to move your radio or change the connections, always remove the plug from the AC wall outlet first. Wait a few seconds for the voltages to discharge on the power supply, then remove the cord and the output wiring.

3.10 **Mounting.** Four mounting holes are provided on the board. These holes are electrically connected to ground and isolated from the supply outputs. These holes may be used to permanently attached to board to the radio. Do not tighten your screws beyond the amount necessary to hold the unit in place. The rubber feet may be compressed somewhat, but not so much that the circuit leads are contacting the chassis or case.

WARNING:

If your radio case is metal or other conductive material, you will have to use an alternative mounting method or install the power supply in an external case. The power supply must have at least 3mm clearance from the longest leads. The power supply is sized to fit on a "1x4" pine or similar board.

NOTE:

The FarmPS-1 is cooled by convection. Verify that there is adequate free air flow around the board when mounting in an enclosure.

WARRANTY

GRANDAD'S ELECTRONICS warrants that all instruments it manufactures are free from defects in material and workmanship and agrees to replace or repair any instrument found defective during a period of ninety (90) days from date of shipment to original purchaser.

This warranty is limited to replacing or repairing defective instruments that have been returned by purchaser, at the purchaser's expense, to GRANDAD'S ELECTRONICS and that have not been subjected to misuse, neglect, improper installation, repair alteration or accident. GRANDAD'S ELECTRONICS shall have the sole right to final determination regarding the existence and cause of a defect.

This warranty is in lieu of any other warranty, either expressed or implied, including but not limited to any warranty of merchantability or fitness for a particular purpose. In no event shall seller be liable for collateral or consequential damages. Some states do not allow limitations or exclusion of consequential damages so this limitation may not apply to you.

All instruments manufactured by GRANDAD'S ELECTRONICS should be inspected as soon as they are received by the purchaser. If an instrument is damaged in shipment the purchaser should immediately file a claim with the transportation company. Any instrument returned to GRANDAD'S ELECTRONICS should be shipped in its original shipping container or other rigid container and supported with adequate shock absorbing material.

This warranty constitutes the full understanding between GRANDAD'S ELECTRONICS and the purchaser and no agreement extending or modifying it will be binding on GRANDAD'S ELECTRONICS unless made in writing and signed by an authorized official of GRANDAD'S ELECTRONICS.

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