

# Operator's Manual

## Enhanced Flight™ Model 2870A

### 28V Aviation Ground Power Unit (GPU)



**NOTE:** This manual is also applicable to the Model 2835A, which is identical in appearance and operation, except with a maximum continuous output of 35 amperes, instead of 70. If your GPU includes the optional, built-in BatteryMINDER® de-sulfating, maintenance charger, a separate operator's manual is provided for that feature.

#### IMPORTANT DISCLAIMER & OPERATING LIMITATIONS

Audio Authority authorizes this device for use ONLY by aviation professionals, such as licensed pilots and maintenance technicians, knowledgeable about their aircraft electrical system and batteries. Aircraft electrical systems vary widely. Many aircraft electrical systems have been altered in the field from the original OEM configuration and these changes are often poorly documented in the aircraft records. The operational concepts, recommendations, and instructions presented in this manual are necessarily general and make assumptions that do not apply to every aircraft, and may not be correct for your particular aircraft. Incorrect use of this device has the potential to damage the GPU and/or aircraft components. It is the operator's responsibility to read completely and fully understand this manual, plus those sections of the Aircraft Flight Manual and Maintenance Manual that pertain to their aircraft's electrical system design, in order to determine the appropriate use of this, or any, external power source. **If you cannot do this, do not use this product.** Instead, consult the airframe manufacturer or a technician familiar with your specific aircraft type and configuration before connecting the GPU to your aircraft.

Please check our website for the latest product information: <http://www.audioauthority.com/GPU>

## General Description and Application

The Model 2870A GPU is a modular switching-mode power supply designed to provide pilots and aviation maintenance professionals with a portable, affordable source of stable, high-current, noise-free DC power that replicates the in-flight electrical environment. Its rated output is 28 Volts DC, up to 70 amps continuous, from a 20A 120 VAC 60 Hz input. It will safely provide continuous power for the most delicate electronics with stable, ripple-free DC up to its full rated output. It is ideal for:

- private aircraft hangars
- portable backup power source for remote sites
- FBOs, avionics & maintenance shops
- air shows and aircraft exhibitions
- aircraft production and testing facilities

Operation of sophisticated avionics and electrical equipment by poorly regulated, noisy power sources risks costly damage. This portable GPU is designed as a practical alternative to large, expensive start carts, battery chargers, and other transformer/rectifier-based power systems designed to turn electric starter motors. It is suitable for ground operation of airframe systems such as:

- avionics for familiarization & training, database updates, testing or maintenance
- aircraft heating, air conditioning and ventilation systems
- cabin entertainment systems
- hydraulic and electric motors for actuating landing gear systems
- electrical equipment, motors, and lighting
- electronic instruments and gyros

## Operating Conditions & Limitations

The 2870A GPU is fan-cooled and relies on unobstructed access for cooling air to enter the rear vents and exit the bottom of the cabinet at the front. The GPU should operate on a clean, hard surface so that debris cannot be ingested. Its design assumes a dry operating environment. If used outdoors, it is the operator's responsibility to insure that the unit is not exposed to moisture.

At full output, the 70A GPU can draw up to 19 amperes and therefore should be connected to a dedicated 120 volt AC, 20-amp wall receptacle. Connecting the GPU to a standard 15-amp wall outlet will limit its output to about 55A, but otherwise it will function properly. If an extension cord is to be used with the GPU, a 3-pin grounded 12-gauge HD type of less than 50 feet is recommended – the shorter, the better.

## Connecting GPU to Aircraft

Consult your Aircraft Flight Manual, Pilot's Operating Handbook, or Aircraft Maintenance Manual for the correct procedures for connecting an external power source to your particular aircraft. Our general recommendation is to turn the GPU ON and observe its output voltage stabilized at approximately 28 volts before connecting its output cable to the aircraft's external power receptacle. Similarly, we recommend removing the GPU's output cable from the aircraft prior to turning its power switch OFF. This procedure will avoid any possibility of subjecting the aircraft electrical system to turn-on or power-down transients. If the GPU voltage is less than 24 volts, do not connect to aircraft, or if connected, discontinue operation and seek repair.

The GPU rear panel has a circuit breaker. If the GPU shuts down while operating, turn its power switch to the OFF position, disconnect it from the aircraft and check for any potential overload or short circuit conditions. Once resolved, reset the circuit breaker, turn power switch to the GPU position to restore GPU output, and then reconnect to the aircraft.

## Operation and Output Indication

The 2870A includes digital output indicators for both voltage and current. It is characteristic of the switching-mode power design to maintain a stable 28-volts up to its full rated output. If the output limit is exceeded, the display will flash and an alarm will sound to warn of the overload condition so the operator can reduce the circuit load to the GPU.

Under significant overload conditions, the GPU's internal protection will automatically shutdown the GPU output and display *OL*. To restore GPU operation, move the power switch to the OFF position, disconnect the external power cable from the aircraft, and disconnect the AC power line cord for 5 minutes. Adjust electrical load to within GPU output limits, then reconnect GPU, turn ON, and monitor.

## GPU / Aircraft Compatibility

The 2870A GPU is compatible with all piston and turbine aircraft with 28 VDC electrical systems (24 volt batteries) that initially draw less than 70 amperes without optional equipment turned ON. This includes most piston aircraft and a large number of turboprops and small jets. Current load on the GPU can be observed with the built-in meter on the front panel. The GPU may also be compatible with additional aircraft where the initial load to the GPU can be reduced by pulling circuit breakers (CB) for non-essential equipment such as lighting and environmental systems. This may require some experimentation to determine the configuration that fits within the output limitations of the GPU, but once identified, the configuration can be easily reproduced for subsequent ground power operation.

## Battery Use and Charging Limitations

Connecting the GPU to the aircraft will replicate the 28VDC electrical flight environment. If the aircraft's battery is in-circuit with the GPU output (by engaging the Battery Master switch in many aircraft) the battery will benefit from the GPU "topping off" the battery, just as it would in flight. Be aware that the initial load to the GPU may be temporarily higher, even with a well-charged battery, until the battery's demand on the GPU is satisfied. This can be observed as the GPU's amp meter ticks down over a period of minutes until stabilized. Operating the GPU with the battery in-circuit for a period of several hours should not cause any problems. In addition, if the GPU is used to operate devices where the inrush current is greater than 70 amps (hydraulic gear motors, electric air conditioning, etc.), supplying the surge amperage from the ship's battery is recommended and will facilitate operation of these devices, so long as the continuous load is not in excess of the GPU's output. Similarly, topping off a serviceable battery with the GPU in preparation for engine start will improve battery output and starting performance.

The 2870A GPU is NOT an automatic battery charger:

- It cannot isolate the ship's battery from the rest of the electrical system and contains no circuitry to monitor or evaluate the battery's level of charge.
- It will not automatically turn off when the battery is fully charged.
- Its output voltage is fixed at 28 volts DC and is not compensated for non-standard temperatures.
- It cannot vary the output current in response to battery temperature or charge condition, so a deeply discharged battery may recharge too rapidly, risking battery damage and electrolyte overflow.

A deeply discharged battery (less than 22 volts on the ship's volt meter) should be removed from the aircraft and serviced in accordance with the aircraft Maintenance Manual before returning to service.

## GPU Start Assist (piston engines only)

The GPU may be used for piston engine start assist with a well-charged battery. Check that the following precautions have been complied with before proceeding:

- GPU and all cables are well clear of the propeller arc and that once engine has been started, cables can be unplugged from the aircraft, the GPU removed, and the aircraft external power receptacle secured without danger to ground personnel or the aircraft. Consult your Aircraft Flight Manual for procedures for starting with external power.

- Resting battery voltage must be at least 23 volts on the ship's meter. If less, allow time to top-off battery charge, or if deeply discharged, remove the battery from the aircraft for service in accordance with the manufacturer's instructions before returning to service.

### **WARNING!**

Do not attempt flight with a battery not fully charged. In the event of an electrical system failure, the battery's capacity to operate the aircraft electrical equipment would be severely diminished, which could jeopardize safety of flight, risking property damage and lives.

### **NOTE**

The 2870A GPU is adequate for piston engine start **ASSIST ONLY**. Its capacity is inadequate for turbine engine motoring or starts and should be used for airframe systems power only. Do not attempt turbine engine motoring or starts with the GPU connected to aircraft.

### **Specifications:**

Input:	110-240 Volts AC, 50-60 Hz, up to 19 amps (9.5 amps Model 2835A)
Output:	28.0 +/- 0.3 Volts DC, 70 amps continuous (35 amps Model 2835A)
Shipping Weight:	33 lbs / 15 kg (Model 2835A 28.6 lbs / 13 kg)
Chassis Dimensions:	8.75"H x 11.38" W x 18.38"D (22.2 cm x 28.9 cm x 46.7 cm)

### **One Year Limited Warranty**

Model 2870A Ground Power Units are warranted to the original purchaser to be free of defects in materials and workmanship for a period of one year from date of shipment. If you suspect a failure please see our Service Policies online at [http://www.audioauthority.com/page/Service\\_policy](http://www.audioauthority.com/page/Service_policy), or contact our service department for instructions.

Service Department  
Audio Authority Corporation  
2048 Mercer Road, Lexington, KY 40511  
Phone: 800-322-8346 (or 859-233-4599)  
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Units received that are in-warranty will be repaired without charge. Units returned for service must be shipped freight prepaid. Units repaired under warranty will be returned freight prepaid via UPS ground or equivalent. A repair estimate will be provided for out-of-warranty repairs. This warranty is void for products that, in our opinion, have been subject to overload, moisture, accident, damage, alteration, misuse, abuse, or acts of nature.

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