

AN/ARN-21B Power Supply and interface
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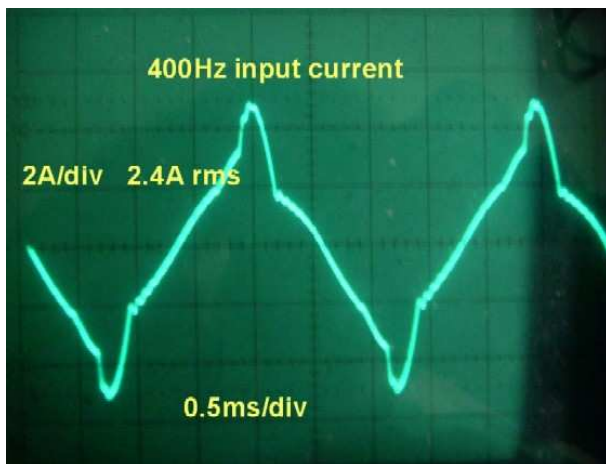
RT220B Power Supply

The RT220 receives power from 3 different sources:

- 102-124 Volts ac , 320-1000 Hz, 370VA max;
- 102-124 Volts ac , 380-420Hz, 75 VA max;
- 24-29Vdc, 50W max

In the aircraft, source a) is the jet driven alternator, source b) is a DC powered, speed stabilized motor/alternator set, and source c) is the on board dc bus. The "wild" source is used for heaters and plate voltages; the near 400Hz source is used for the servo systems and the fan. The dc bus is only used for a few relays and the channel select motor.

For service and test, inputs a) and b) are supplied from a common 400Hz source. In my set, I have never seen more than 2.8 Arms, with waveform as shown below. The power factor is compensated to 0.95 by the 1 μ F capacitor in the rack mount.



Start up

With the cockpit mode switch at "OFF", all power is cut from the RT220. When switched to REC or T/R, initially only the heater transformer is powered, and a thermal relay heats up. The preheating takes 80 seconds, mainly to condition the 2C39A cathodes. After this time, the plate transformer comes in, and -100V is produced immediately, and Ry1 turns on. The +350V rectifier heater is now powered as well, and after 8 more seconds the +350V builds up. This gives g1 and g2 voltage to the PL21's, and the 120V circuits start as well. In approx. 105 sec, all supply voltages are there, and the RT220 starts to function. It takes another minute before the mixer diode current comes up.

During the whole process, there are no inrush currents, not from cold heaters, not from transformers, not from charging capacitors.

Servo supply

The servo motor/tacho combinations are supplied by 24V from a transformer on the power supply module. This transformer also provides the floating 20V sources for the channel selection potmeters.

Fan

There is one fan in the middle of the RT220, sucking air through an air filter in the rack mount directly below the fan. The exhaust of hot air is on all four sides of the case, not on the top.

The fan is switched off when the air temperature is below 5 °C (20F), or when the case is removed to prevent injury to service personnel.

Interface

Except for the antenna, all connections are made by a 45-pin connector on the rear of the chassis. The 35 lines from this plug are routed in the rack mount to the bearing indicator, range indicator, cockpit control panel, and power supplies.

The rack mount has two relays, both controlled with the mode switch in the control panel.

One relay cuts all power to the RT220B in the "OFF" mode. The other relay applies power to the modulator in the Transmit/Receive (T/R) mode, and supplies 24V ac to the range indicator motor. Otherwise, the range indicator would rotate continuously at top speed in REC mode.

Connectors

The connectors for the instruments, cockpit panel and power supply are MIL-C-5015 style plugs like [the DS5015 series](#) from Amphenol-Socapex. The power supply connector is real hard to find. I replaced it by a 3-terminal strip.

The antenna connector is a HN connector.

Suitable plugs are Radiall UG59 or UG1213 with RG-8 cable

The blanking output connector on the front is BNC.