1 SC1000 Introduction

1.1 General Description: SC1000

The SC1000 is a differential Global Positioning System (DGPS) transmitter with carrier power adjustable from 100 - 1000 W (max). The transmitter uses switching technology in the power amplifiers and modulator/regulator modules resulting in a highly efficient system, in a small package. The exciter portion consists of an interface for a 283.5 to 325 kHz 5mW MSK sinewave signal. Each system has output filters, switching power amplifiers, and switching modulator/ regulators. The RF output of each system provides the 1000W signal to the Antenna Tuning Unit (ATU). The SC1000 Dual consists of two independent SC1000 transmitters, and an Automatic Transfer Unit/RSIM Controller housed in a single cabinet.

1.2 Specifications: SC1000

QUALIFICATIONS: Meets applicable requirements of the FCC.

FREQUENCY: 283.5 to 325 kHz

POWER OUTPUT: Carrier power into 50 Ohms continuously adjustable from 100 to 1000 W (max).

SPURIOUS EMISSION: Spurious emissions (measured at a dummy antenna) are less than -70dBc.

RADIATED HARMONICS: Radiated harmonics (measured at a dummy antenna) are less than -60dBc.

TYPE OF EMISSION: NON, G1D

NOISE AND HUM LEVEL: Less than -40dB

INPUT POWER: 144VDC, 190-260VAC

POWER CONSUMPTION: 1200 Watts for 1000 Watt RF Output

METERING: Forward power output, Reflected power output, PA voltage and PA current

CIRCUIT PROTECTION:

- The DC circuits are protected by individual fuses.
- If desired, a VSWR circuit shuts down the transmitter when VSWR exceeds an adjustable value.
- Individual RF Power Amplifiers have a special over-current protection circuitry with transient recovery capability.
- MSK signal conditioning protects the Power Amplifiers from signal loss.
- In-rush circuitry protects power supplies from premature failure.

Monitoring: Radio Technical Commission for Maritime Services (RTCM) Standard Integrity Monitor with RS232, RS422, RS485 or Ethernet communications is available. A membrane keypad provides user controls for the Remote Station Integrity Monitor (RSIM) panel. An LCD displays either the last RSIM command completed or test point data within the transmitters. A powerful microcontroller within the RSIM controller monitors critical parameters and provides control for abnormal conditions. A low power condition will cause the primary transmitter to shutdown and the system to transfer to the secondary transmitter. A secondary low power shutdown causes the system to fail.

The RSIM monitor shuts down the transmitter if VSWR exceeds 2.62.

A shutdown override can be implemented either at the transmitter or by remote access. A master reset can also be implemented remotely.

Working Conditions: Continuous unattended operation in the following environments:

- ambient temperature: -15 to +55 Degrees Centigrade
- relative humidity: 0 to 95%

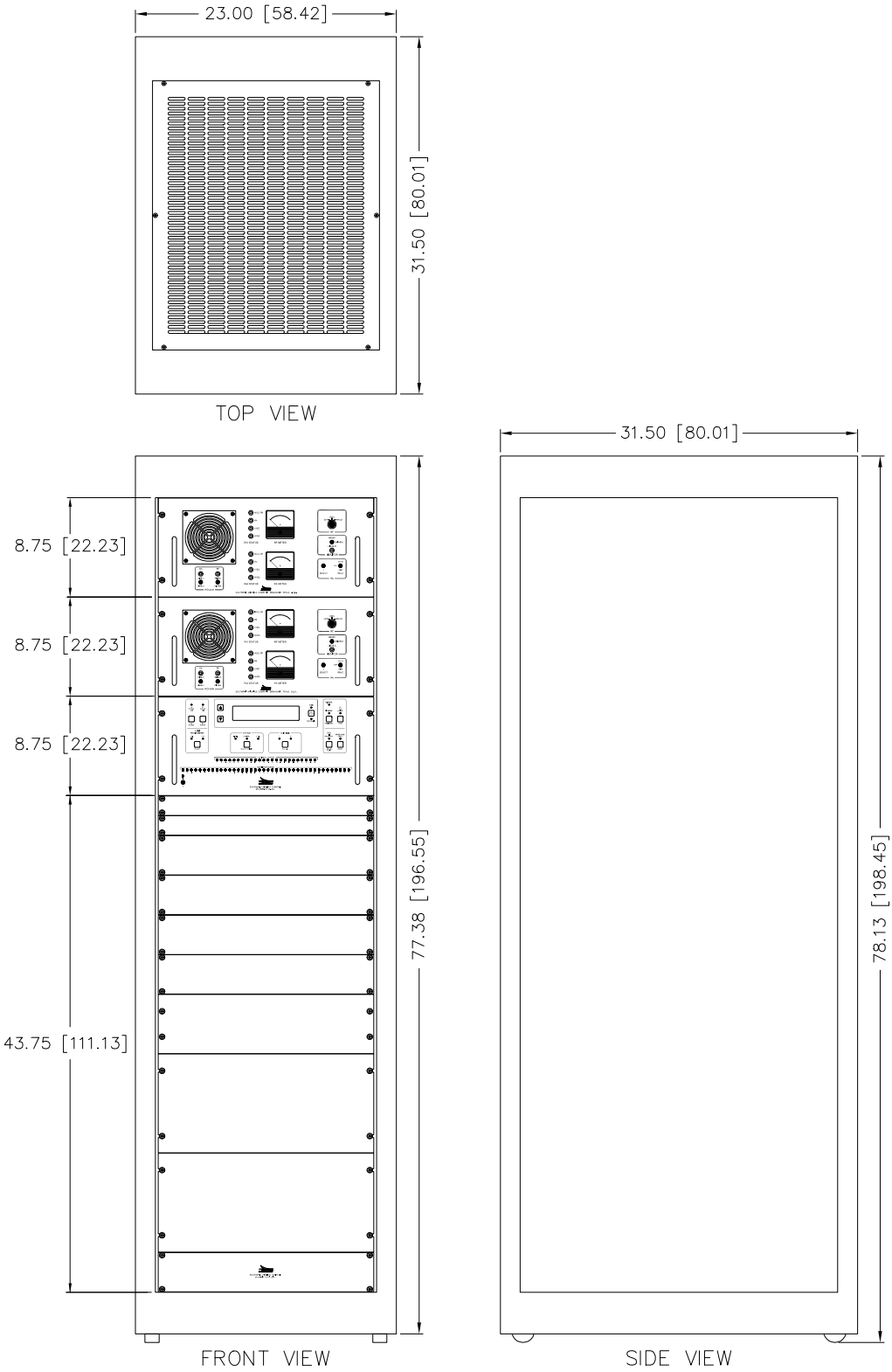


Figure 1-1. SDF30601 - SC1000 Transmitter Enclosure Dimensions

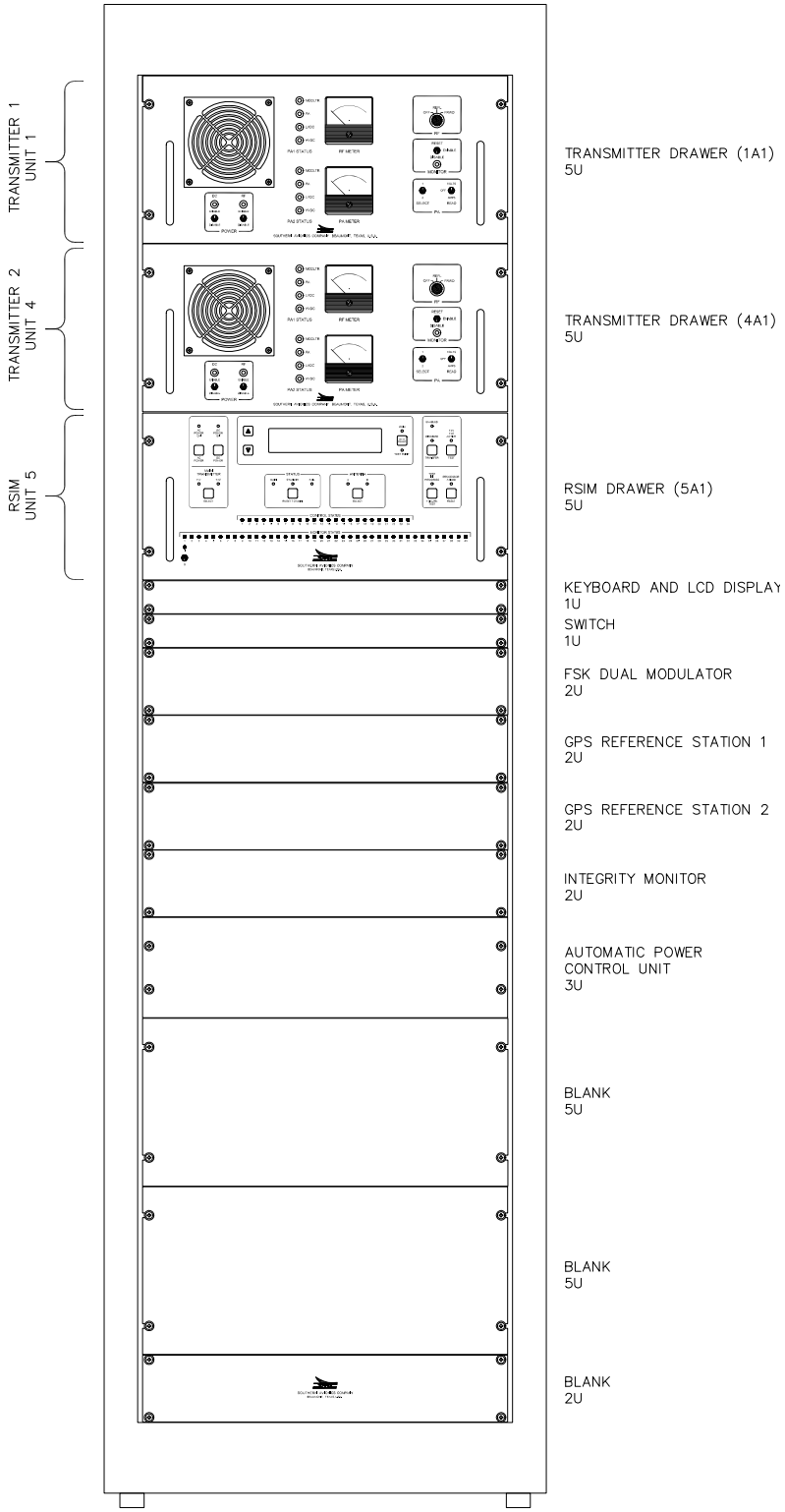


Figure 1-2. SDF30601 - SC1000 DC Transmitter Portrait (Front view)

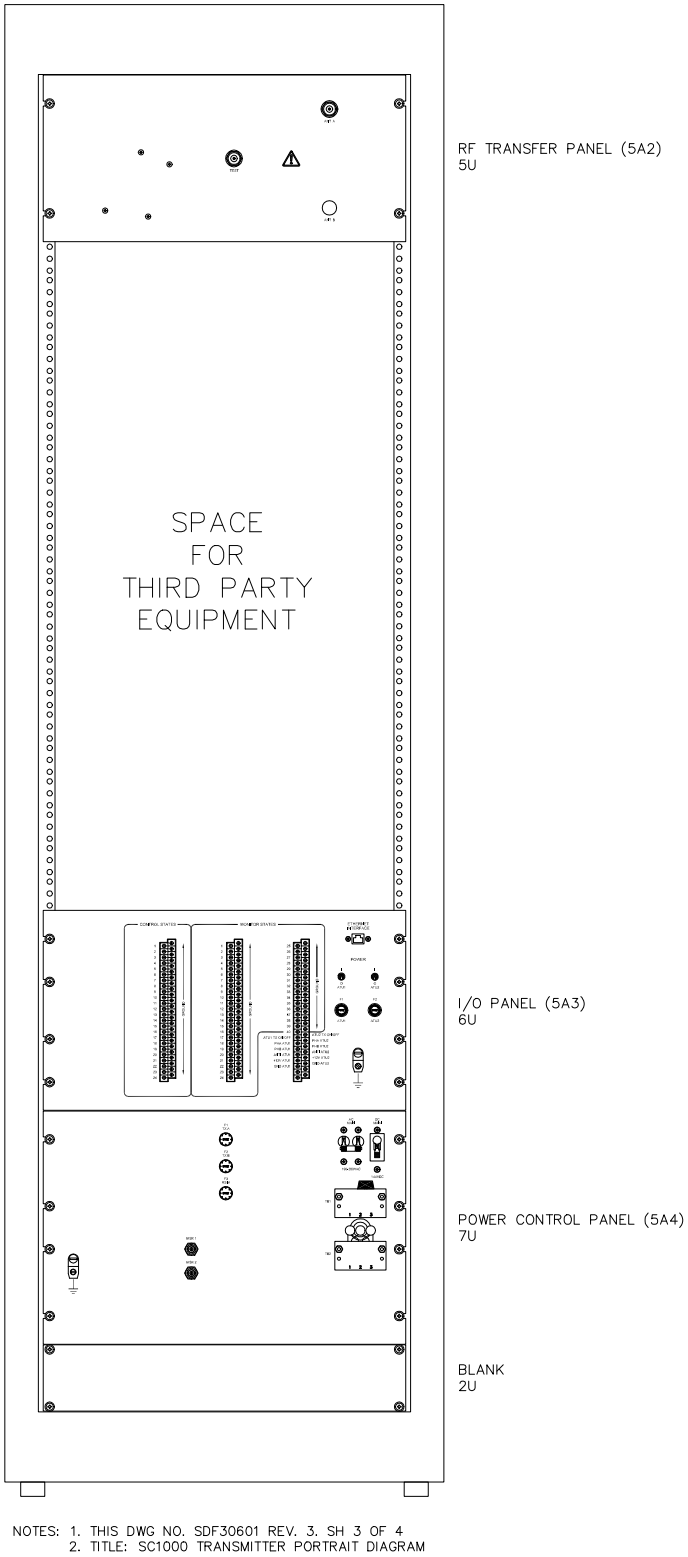
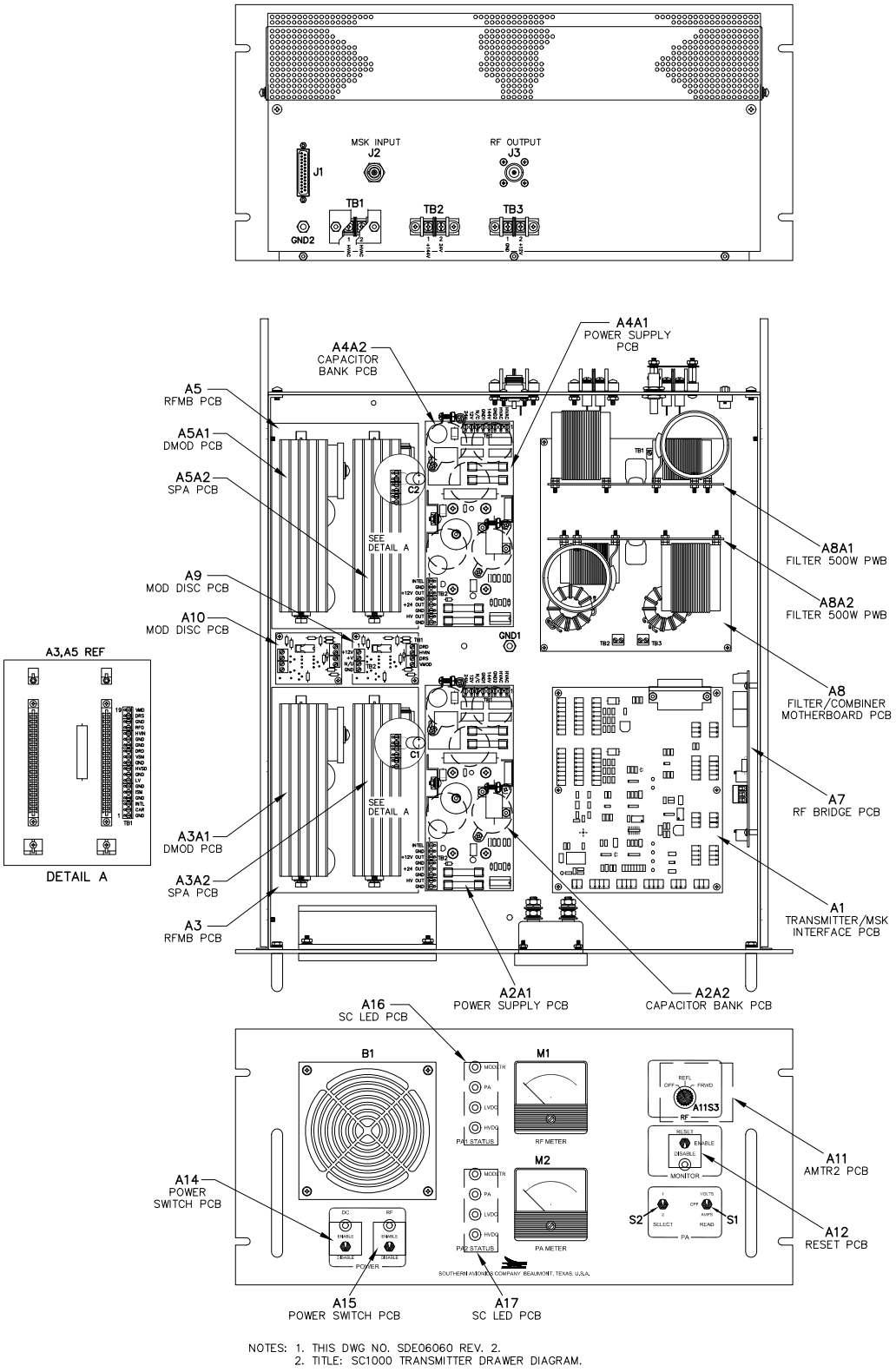


Figure 1-3. SDF30601 - SC1000 DC Transmitter Portrait (Rear view)



NOTES: 1. THIS DWG NO. SDE06060 REV. 2.
2. TITLE: SC1000 TRANSMITTER DRAWER DIAGRAM.

Figure 1-4. SDE06060 - SC1000 Transmitter Drawer Diagram

1.3 General Description: Automatic Transfer Unit / RSIM Controller

The automatic transfer unit autommatically switches from the primary to the secondary transmitter if RF power falls below an adjustable value, reflected power increases above a set value, or in the event the transmitter signals the RSIM monitor that a fault has been detected.

The transfer system allows the secondary transmitter to be tested into an external dummy load without interruption to the primary transmitter allowing it to remain "on the air."

1.4 Specifications: Automatic Transfer Unit / RSIM Controller

INPUT/OUTPUT PORTS: An ethernet port located on the rear panel allows the user to remotely control and monitor the system using RSIM standards as described in RTCM PAPER 88-96/ SC104-STD. A 24 position barrier terminal block is provided for connecting 24 binary control states, (0 volts, +12 volts 500mA per contact, 3A max). A 40 position barrier terminal block is provided for connecting 40 binary control states, (open circuit, short circuit).

24 BINARY CONTROL STATES: When the control state is 0, the transmitter will provide 0 Volts. When the control state is 1, the transmitter will provide +12 Volts. The binary control states are controlled by the microprocessor. The states are latched and maintained until changed by the microprocessor.

40 BINARY MONITOR STATES: When the input is an open circuit, the monitored state is 0. When the input is a short circuit, the monitored states is 1. The binary monitor states are read and monitored by the microprocessor.

DISPLAYS LOCALLY: Forward 24 binary control states LEDs, 40 binary monitor states LEDs, Transfer Power, AC Power, DC Power, Select Main, Status (Main, Standby, Fail), Transfer Function, Remote Control, and Standby Test.

DISPLAYS REMOTELY: Output Power, Reflected Power, DC Supply Voltage, Antenna A/B, Side A/ Side B, DC Unit Power Source, Failed Modules, 24 Binary Control States, and 40 Binary Monitor States using RSIM messages.

REMOTE CONTROLS: The ethernet port provides remote control and monitoring of the Side A/ Side B, DC Supply Power Source, Automatic Switch-over, ENABLE/DISABLE, Reset, and 24 Binary Control States (0 or 12 Volts).

LOCAL CONTROLS: Transfer Power (ON-OFF), AC Power (ON-OFF), DC Power (ON-OFF), Select Main (Side A - Side B), Reset To Main, Transfer Function (Disable - Enable), Remote Control (Disable - Enable), and Standby Test (Test - Normal).

WORKING CONDITIONS: Continuous unattended operation in the following environments:

- ambient temperature -15°C to +55
- relative humidity 0 to 95%.

CIRCUIT PROTECTION: Fuses are furnished in DC power lines. Logic line inputs are isolated by series impedances and diode clamps.

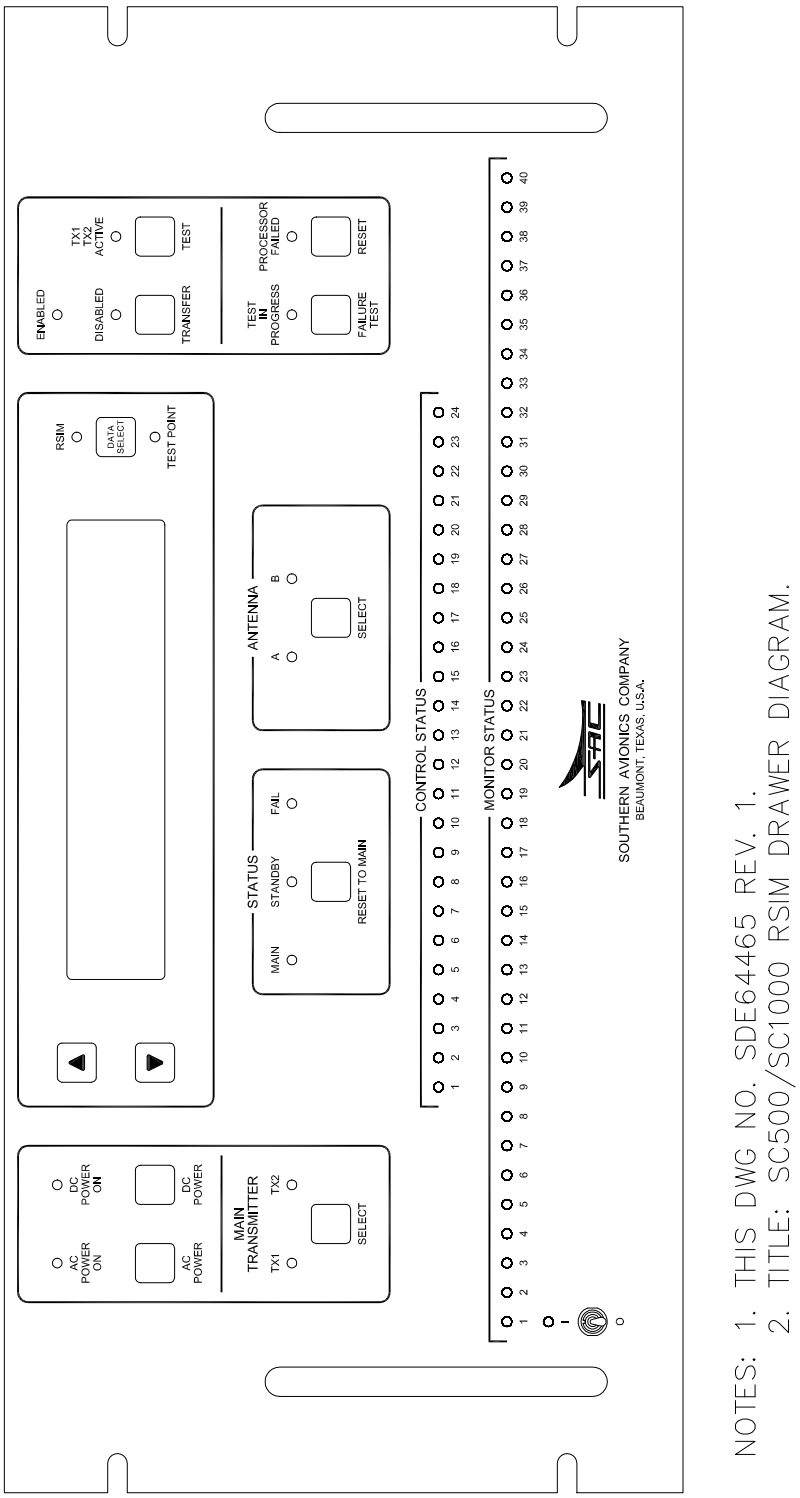
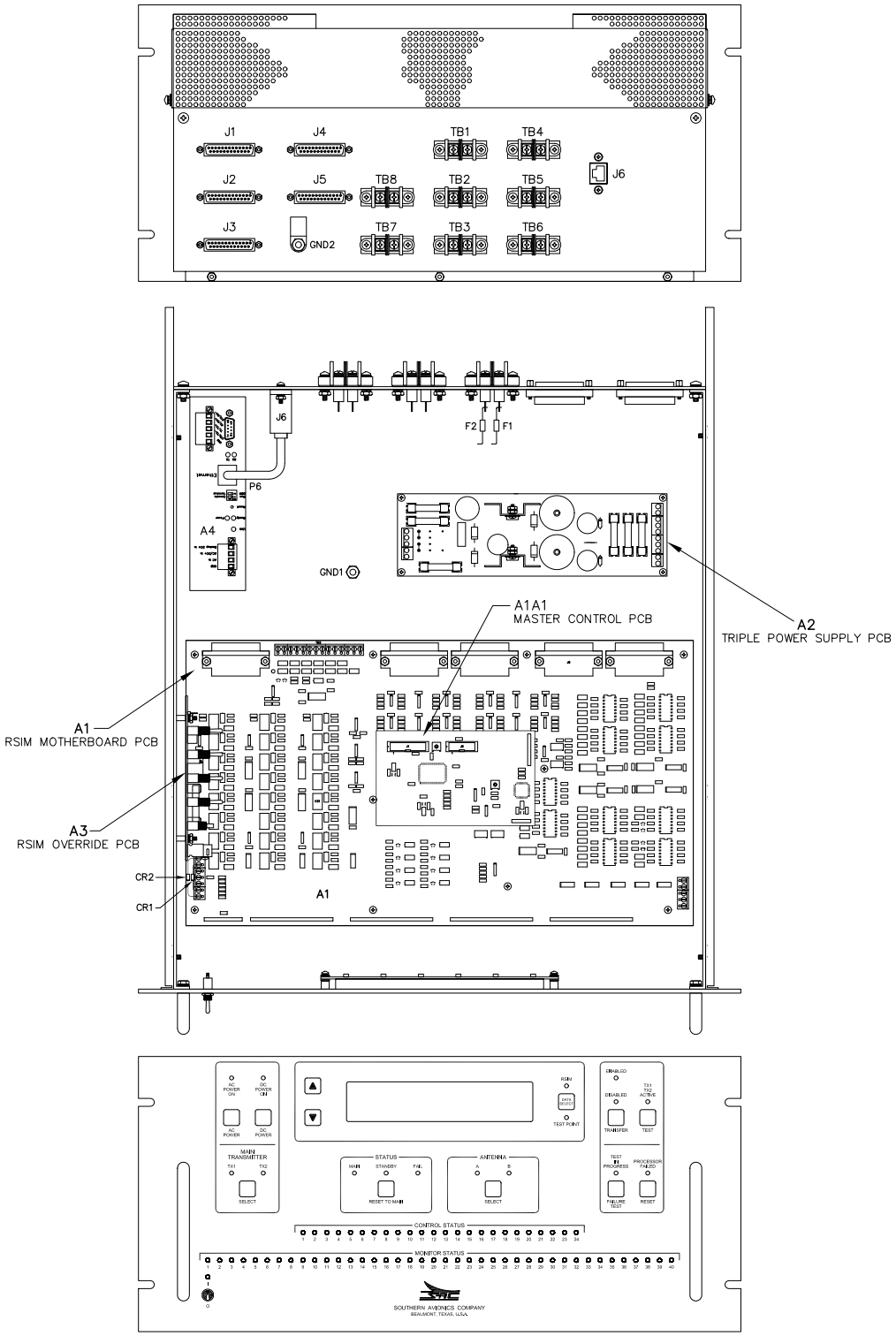


Figure 1-5. SDE64465 - SC1000 Automatic Transfer Unit/RSIM Controller Diagram



NOTES: 1. THIS DWG NO. SDE64465 REV. 1.
2. TITLE: SC500/SC1000 RSIM DRAWER DIAGRAM.

Figure 1-6. SDE64465 - SC1000 RSIM Drawer Diagram