## rf/microwave instrumentation



## Model 2000W1000B, 2000 Watts CW 80-1000 MHz

The Model 2000W1000B is a self-contained, air-cooled, broadband, completely solid-state amplifier designed for applications where instantaneous bandwidth and high gain are required. Push-pull circuitry is utilized in all high power stages in the interest of lowering distortion and improving stability. The Model 2000W1000B, when used with a sweep generator, will nominally provide over 2000 watts of RF power.

The Model 2000W1000B is equipped with a Digital Control Panel (DCP) which provides both local and remote control of the amplifier. The DCP uses a graphic display, menu assigned softkeys, a single rotary knob, and four dedicated switches (POWER, STANDBY, OPERATE and FAULT/RESET) to offer extensive control and status reporting capability. The display provides operational presentation of Forward Power and Reflected Power plus control status and reports of internal amplifier status. Special features include a gain control, internal/external automatic level control (ALC) with front panel control of the ALC threshold, pulse input capability and RF output level protection. Also included is an internal RF detector which provides an output for use in self-testing or operational modes.

All amplifier control functions and status indications are available remotely in GPIB/IEEE-488.2 format, and RS-232 fiber optic. The bus interface connector is located on the back panel and positive control of local or remote operation is assured by a keylock on the front panel of the amplifier.

Housed in stylish, contemporary equipment racks, the Model 2000W1000B provides readily available RF power for typical applications such as RF susceptibility testing, antenna and component testing, watt meter calibration, and as a driver for frequency multipliers and higher power amplifiers.

The 2000W1000B consists of two 1000 watt amplifiers which can be operated as independent individual amplifiers and a controller/driver equipment rack.

By simply adding one 1000 watt amplifier and the appropriate combiner along with minor tuning, the 2000W1000B is upgraded to a 3000 watt amplifier with expandability to 4000 watts.



## 2000W1000B TYPICAL POWER OUTPUT

## SPECIFICATIONS, MODEL 2000W1000B

| INPUT FOR RATED OUTPUT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | RATED OUTPUT POWER                                                                                                                                  | 1900 watts minimum                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal   2100 watts     Minimum   1700 watts     POWER OUTPUT @ 1dB   1750 watts     Nominal   1250 watts     FLATNESS   ± 2.5 dB maximum     ± 0.8 dB with internal leveling     FREQUENCY RESPONSE   80-1000 MHz instantaneously     GAIN (at maximum setting)   .63 dB minimum     GAIN (at maximum setting)   .63 dB minimum     INPUT IMPEDANCE   .50 ohms, VSWR 2.0:1 maximum     OUTPUT IMPEDANCE   .50 ohms, vSWR 2.0:1 maximum     OUTPUT IMPEDANCE   .100% of rated power without foldback up to 6.0:1 mismatch above which may limit to 1000 watts reflected power. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.     "See Application Note #27     MODULATION CAPABILITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | INPUT FOR RATED OUTPUT                                                                                                                              | 1.0 milliwatts maximum                                                                                                                                                                                                                                                                              |
| Nominal   1750 watts     FLATNESS   ±2.5 dB maximum     ±2.5 dB maximum   ±0.8 dB with internal leveling     FREQUENCY RESPONSE   80-1000 MHz instantaneously     GAIN (at maximum setting)   63 dB minimum     GAIN ADJUSTMENT (continuous range)   18 dB minimum     INPUT IMPEDANCE   50 ohms, VSWR 2.0:1 maximum     OUTPUT IMPEDANCE   50 ohms nominal     MISMATCH TOLERANCE *   100% of rated power without foldback up to 6.0:1 mismatch above which may limit to 1000 watts reflected power. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.     *See Application Note #27     MODULATION CAPABILITY   Will faithfully reproduce AM, FM, or pulse modulation appearing on the input signal     HARMONIC DISTORTION   Minus 20 dBc maximum at 1600 watts     THIRD ORDER INTERCEPT POINT   70 dBm typical     RF POWER (specify voltage)   200-2500 watts     PRIMARY POWER (specify voltage)   200-2500 watts     RF input   Type 15/8 EIA on rear     RF input   Type 15/8 EIA on rear     RF input   Type 15/8 EIA on rear     RF input   Type BNC female on front panel     Pulse modulation input   Type BNC female on front panel     Pulse     | Nominal                                                                                                                                             |                                                                                                                                                                                                                                                                                                     |
| ±0.8 dB with internal leveling<br>FREQUENCY RESPONSE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Nominal                                                                                                                                             |                                                                                                                                                                                                                                                                                                     |
| GAIN (at maximum setting)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | FLATNESS                                                                                                                                            |                                                                                                                                                                                                                                                                                                     |
| GAIN ADJUSTMENT (continuous range)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | FREQUENCY RESPONSE                                                                                                                                  | 80-1000 MHz instantaneously                                                                                                                                                                                                                                                                         |
| INPUT IMPEDANCE   .50 ohms, VSWR 2.0:1 maximum     OUTPUT IMPEDANCE   .50 ohms nominal     MISMATCH TOLERANCE *   .100% of rated power without foldback up to 6.0:1 mismatch above which may limit to 1000 watts reflected power. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.     *See Application Note #27   MODULATION CAPABILITY     MODULATION CAPABILITY   Will faithfully reproduce AM, FM, or pulse modulation appearing on the input signal     HARMONIC DISTORTION   Minus 20 dBc maximum at 1600 watts     THIRD ORDER INTERCEPT POINT   .70 dBm typical     RF POWER IDSPLAY   .0-2500 watts     PRIMARY POWER (specify voltage)   .200-250 VAC, Delta Connected (4 wire)     .360-435 VAC, Wye Connected (5 wire)   .50/60 Hz, 3 phase     .50 kVA Maximum   .50 KVA Maximum     CONNECTORS      RF input      RF output      Type BNC female on rear panel   RF output     Puise modulation input      Type BNC female on front panel      Puise modulation input </td <td>GAIN (at maximum setting)</td> <td>63 dB minimum</td>                                                                                                             | GAIN (at maximum setting)                                                                                                                           | 63 dB minimum                                                                                                                                                                                                                                                                                       |
| OUTPUT IMPEDANCE.   .50 ohms nominal     MISMATCH TOLERANCE *   .100% of rated power without foldback up to 6.0:1 mismatch above which may limit to 1000 watts reflected power. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.     *See Application Note #27   *See Application Note #27     MODULATION CAPABILITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | GAIN ADJUSTMENT (continuous range)                                                                                                                  | 18 dB minimum                                                                                                                                                                                                                                                                                       |
| MISMATCH TOLERANCE *   100% of rated power without foldback up to 6.0:1 mismatch above which may limit to 1000 watts reflected power. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.     *See Application Note #27   *See Application Note #27     MODULATION CAPABILITY   Will faithfully reproduce AM, FM, or pulse modulation appearing on the input signal     HARMONIC DISTORTION   Minus 20 dBc maximum at 1600 watts     THIRD ORDER INTERCEPT POINT   70 dBm typical     RF POWER DISPLAY   0-2500 watts     PRIMARY POWER (specify voltage)   200-250 VAC, Delta Connected (4 wire) 360-435 VAC, Wye Connected (5 wire) 50/60 Hz, 3 phase 25 kVA Maximum     CONNECTORS   RF input   N female on rear panel     RF output   Type 15 /8 EIA on rear External leveling inputs   Type BNC female on front panel     Pulse modulation input   Type BNC female on front panel   Safety interlock.     Safety interlock.   15 pin female subminiature D on rear panel   Remote computer interface     Remote computer interface (fiber optic)   ST conn Tx and Rx RS-232   COQUING     COULING   Forced air (self contained fans) Enters front and bottom | INPUT IMPEDANCE                                                                                                                                     | 50 ohms, VSWR 2.0:1 maximum                                                                                                                                                                                                                                                                         |
| which may limit to 1000 watts reflected power. Will operate without<br>damage or oscillation with any magnitude and phase of source and<br>load impedance.<br>"See Application Note #27<br>MODULATION CAPABILITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | OUTPUT IMPEDANCE                                                                                                                                    | 50 ohms nominal                                                                                                                                                                                                                                                                                     |
| input signal<br>HARMONIC DISTORTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | MISMATCH TOLERANCE *                                                                                                                                | which may limit to 1000 watts reflected power. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.                                                                                                                                                |
| THIRD ORDER INTERCEPT POINT.   .70 dBm typical     RF POWER DISPLAY.   .0-2500 watts     PRIMARY POWER (specify voltage)   .200-250 VAC, Delta Connected (4 wire)     360-435 VAC, Wye Connected (5 wire)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | MODULATION CAPABILITY                                                                                                                               |                                                                                                                                                                                                                                                                                                     |
| RF POWER DISPLAY   .0-2500 watts     PRIMARY POWER (specify voltage)   .200-250 VAC, Delta Connected (4 wire)<br>360-435 VAC, Wye Connected (5 wire)<br>50/60 Hz, 3 phase<br>25 kVA Maximum     CONNECTORS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | HARMONIC DISTORTION                                                                                                                                 | Minus 20 dBc maximum at 1600 watts                                                                                                                                                                                                                                                                  |
| PRIMARY POWER (specify voltage)   200-250 VAC, Delta Connected (4 wire)<br>360-435 VAC, Wye Connected (5 wire)<br>50/60 Hz, 3 phase<br>25 kVA Maximum     CONNECTORS<br>RF input   N female on rear panel<br>RF output     RF output   Type 1 5/8 EIA on rear<br>External leveling inputs     Pulse modulation input   Type BNC female on front panel<br>Pulse modulation input     Detected RF output   Type BNC female on front panel<br>Safety interlock     Remote computer interface   24 Pin female IEEE-488.2 (GPIB) connector on rear panel<br>Remote computer interface (fiber optic)     ST COOLING   Forced air (self contained fans) Enters front and bottom     WEIGHT (approximate)   839 kg (1850 lb)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | THIRD ORDER INTERCEPT POINT                                                                                                                         | 70 dBm typical                                                                                                                                                                                                                                                                                      |
| 360-435 VAC, Wye Connected (5 wire)     50/60 Hz, 3 phase     25 kVA Maximum     CONNECTORS     RF input   N female on rear panel     RF output   Type 1 5/8 EIA on rear     External leveling inputs   Type BNC female on front panel     Pulse modulation input   Type BNC female on front panel     Detected RF output   Type BNC female on front panel     Safety interlock   15 pin female subminiature D on rear panel     Remote computer interface   24 Pin female IEEE-488.2 (GPIB) connector on rear panel     Remote computer interface (fiber optic)   ST Conn Tx and Rx RS-232     COOLING     WEIGHT (approximate)     WEIGHT (approximate)   839 kg (1850 lb)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | RF POWER DISPLAY                                                                                                                                    | 0-2500 watts                                                                                                                                                                                                                                                                                        |
| CONNECTORS   N female on rear panel     RF input   Type 1 5/8 EIA on rear     External leveling inputs   Type BNC female on front panel     Pulse modulation input   Type BNC female on front panel     Detected RF output   Type BNC female on front panel     Safety interlock   15 pin female subminiature D on rear panel     Remote computer interface   24 Pin female IEEE-488.2 (GPIB) connector on rear panel     Remote computer interface (fiber optic)   ST Conn Tx and Rx RS-232     COOLING   Forced air (self contained fans) Enters front and bottom     WEIGHT (approximate)   839 kg (1850 lb)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | PRIMARY POWER (specify voltage)                                                                                                                     | 360-435 VAC, Wye Connected (5 wire)<br>50/60 Hz, 3 phase                                                                                                                                                                                                                                            |
| RF output   Type 1 5/8 ElA on rear     External leveling inputs   Type BNC female on front panel     Pulse modulation input   Type BNC female on front panel     Detected RF output   Type BNC female on front panel     Safety interlock   15 pin female subminiature D on rear panel     Remote computer interface   24 Pin female IEEE-488.2 (GPIB) connector on rear panel     Remote computer interface (fiber optic)   ST Conn Tx and Rx RS-232     COOLING   Forced air (self contained fans) Enters front and bottom     WEIGHT (approximate)   839 kg (1850 lb)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                     |                                                                                                                                                                                                                                                                                                     |
| External leveling inputs   Type BNC female on front panel     Pulse modulation input   Type BNC female on front panel     Detected RF output   Type BNC female on front panel     Safety interlock   15 pin female subminiature D on rear panel     Remote computer interface   24 Pin female IEEE-488.2 (GPIB) connector on rear panel     Remote computer interface (fiber optic)   ST Conn Tx and Rx RS-232     COOLING   Forced air (self contained fans) Enters front and bottom     WEIGHT (approximate)   839 kg (1850 lb)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | •                                                                                                                                                   | •                                                                                                                                                                                                                                                                                                   |
| Detected RF output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | External leveling inputs                                                                                                                            | Type T 5/8 EIA on rear                                                                                                                                                                                                                                                                              |
| Safety interlock                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                     | Type BNC female on front panel                                                                                                                                                                                                                                                                      |
| Remote computer interface                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Pulse modulation input                                                                                                                              | Type BNC female on front panel<br>Type BNC female on front panel                                                                                                                                                                                                                                    |
| Remote computer interface (fiber optic)ST Conn Tx and Rx RS-232<br>COOLINGForced air (self contained fans) Enters front and bottom<br>WEIGHT (approximate)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Pulse modulation input<br>Detected RF output                                                                                                        | Type BNC female on front panel<br>Type BNC female on front panel<br>Type BNC female on front panel                                                                                                                                                                                                  |
| WEIGHT (approximate)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Pulse modulation input<br>Detected RF output<br>Safety interlock                                                                                    | Type BNC female on front panel<br>Type BNC female on front panel<br>Type BNC female on front panel<br>15 pin female subminiature D on rear panel                                                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Pulse modulation input<br>Detected RF output<br>Safety interlock<br>Remote computer interface                                                       | Type BNC female on front panel<br>Type BNC female on front panel<br>Type BNC female on front panel<br>15 pin female subminiature D on rear panel<br>24 Pin female IEEE-488.2 (GPIB) connector on rear panel                                                                                         |
| SIZE (WxHxD) (3 cabinets)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Pulse modulation input<br>Detected RF output<br>Safety interlock<br>Remote computer interface<br>Remote computer interface (fiber optic)            | Type BNC female on front panel<br>Type BNC female on front panel<br>Type BNC female on front panel<br>15 pin female subminiature D on rear panel<br>24 Pin female IEEE-488.2 (GPIB) connector on rear panel<br>ST Conn Tx and Rx RS-232                                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Pulse modulation input<br>Detected RF output<br>Safety interlock<br>Remote computer interface<br>Remote computer interface (fiber optic)<br>COOLING | Type BNC female on front panel<br>Type BNC female on front panel<br>Type BNC female on front panel<br>15 pin female subminiature D on rear panel<br>24 Pin female IEEE-488.2 (GPIB) connector on rear panel<br>ST Conn Tx and Rx RS-232<br>Forced air (self contained fans) Enters front and bottom |