

**JASPER  
ELECTRONICS**

*Innovative Specialty  
DC Power Systems*



## CONTACT

1580 No. Kellogg Dr.  
Anaheim, California, 92807

(714) 917-0749

[www.jasperelectronics.com](http://www.jasperelectronics.com)  
[sales@jasperelectronics.com](mailto:sales@jasperelectronics.com)

# HAL1500 Series Power Supplies

**1200 - 1500 Watts, Single Output with Standby**



**HAL1500 FRONT VIEW**

## GENERAL OVERVIEW

Jasper's ultra-reliable HAL-Series Power Supplies are most commonly used in redundant systems in applications such as nuclear plants, server rooms, security systems, and communication systems.

## FEATURES ON SELECT MODELS INCLUDE:

- 90-264VAC Universal Input
- 0.99 Line Power Factor
- High Density, 16 W/cu in.
- High Efficiency
- Hot Swap-Redundancy.
- Internal Oring Diodes
- I<sup>2</sup>C Interface Status & Control
- Extended Operating Temperature Range
- Status LEDs
- Choice of 3.3V, 5.0V or 12.0V Standby Voltage
- Single Wire Current Share
- Custom Performance & Mechanical Modifications Readily Available
- Models can be ruggedized against high shock, vibration, and humidity to meet MIL-STD-810 requirements



ISO9001:2015

Rev A-January-13-2023

## TECHNICAL SPECIFICATIONS

INPUT		
Voltage/ Current	AC 90-264V, 13.6A/8.4Arms max, 47-63Hz, 1 Phase	
Power Factor	>0.99 line PFC typical at 115VAC, full load	
Fusing	AC 15.0A, 250V NB internal line fuse provided, non-user serviceable	
Inrush Current	Thermistor soft start (~25°C cold start). 35 Apk @ 115VAC, 70 Apk @ 230VAC	
Efficiency	90% typical at 230VAC, full load	
Under Voltage Protection	Auto DC output shutdown when AC input falls below safe operating limits (≈ 80V or 150V AC). Automatic recovery when input rises to within normal operating range	
OUTPUT		
Voltage/Current (V/A)	V1 <sup>(1)</sup>	V2 Standby <sup>(2)</sup>
HAL1201-2*	12.0V @ 100.0A	5.0V @ 2.0A
HAL1501-5	24.0V @ 62.5A/50.0A	5.0V @ 2.0A
HAL1501-6	28.0V @ 53.6A/42.8A	5.0V @ 2.0A
HAL1501-8	48.0V @ 31.2A/25.0A	5.0V @ 2.0A
HAL1501-9	54.0V @ 27.7A/22.2A	5.0V @ 2.0A
1) Total loading not to exceed 1500 Watts at high line (180V-264V), and 1200 Watts at low line (90V-132V). *1200 Watts max for 12.0V output. For all configurations, outputs also derate linearly above 50°C ambient. See Operating Temperature specification. 2) Optional 3.3V/2.0A or 12.0V/1.0A standby output available.		
Output Voltage Setpoint	Factory preset within ±0.2% of nominal voltage	
Line/ Load Regulation	±1.0% at the sense point over full AC input range and 0 – 100% output loading, with sense leads connected	
Remote Sense	V1 output compensates for up to the lessor of 5.0% or 1.0V total line drop in the load cables. Output is internally sensed if leads are opened. ΔVo ≤ 1.0V	
Minimum Loading	None required	
Output Turn-on Delay	<1.0 second from AC turn-on	
Over/ Under Shoot	None at turn-on or turn-off	
Stability	Output drift <±0.2% after 20 minute warm-up	
Temperature Coefficient	<±0.02%/°C, 0° - 70°C, after 20 minute warm-up	
Dynamic Response	<5.0% deviation with a 25% load change at a slew rate of 1A/μsec, locally sensed. Output recovery time to within 1% less than 500μsec	
Ripple and Noise (PARD)	<1% p-p nominal at a 20 MHz bandwidth limit, measured with a 1.0μF ceramic capacitor in parallel with a 20μF tantalum capacitor connected between the measured output and its return at the connector	
Current Sharing/ Parallel N+1 Operation	Single wire connection. CS Accuracy is ±10% of rated current between any number of units	
Redundant/ Hot Swap	Full power N+1 redundant, hot swap capable	
Output Turn-on Delay	<1.0sec from AC turn-on. <100msec from remote enable	
Hold-Up Time	Output remains in regulation 16mSec minimum following loss of AC power at low line, full load	
Over/ Under Shoot	<1% at turn-on or turn-off	
Over Current/ Short Circuit Protection	Standard hiccup mode (cycles on/ off) current limit when V1 output current is 110% to 130% of full load. Automatic recovery when fault is removed	
Over Voltage Protection	Non-crowbar type. V1_out exceeding 115% of nominal will cause output to latch off. Remote enable or AC input recycle required to reset	
Over Temperature Protection	Internal temperature sensing. Causes all outputs to shut down. Automatic recovery	

\*Specifications subject to change without notice.

SIGNALS, INDICATORS AND CONTROLS	
Remote Enable	Enabled by closed circuit or TTL logic 0. Disabled by open circuit or TTL logic 1
Remote Inhibit	Enabled by open circuit or TTL logic 1. Disabled by closed circuit or TTL logic 0. Standby output remains active
Remote Adjust	External 0-5V DC on remote adjust pin refer- enced to negative sense equals -5% to +5% change of nominal output voltage
Power Good (DC-OK) Signal	High signal when V-out is above 95% of nominal voltage. Signal goes low when V-out drops below 90% of nominal
Power Fail Warning	Loss of input AC causes a TTL compatible signal to go high >4msec prior to any output dropping out of regulation. At AC turn-on, signal stays high until outputs are in regulation
Fan Fail Warning	High TTL compatible signal goes low on fan failure
Input Power Indicator LED	Front mounted, single-color: Green indicates power ON and within tolerance
Output Power Indicator LED	Front mounted, single-color: Green indicates the output is within tolerance
Hot Swap Indicator LED	Single-color Blue front mounted LED illuminates per ATCA standard to indicate Hot Swap condition. <b>Steady State:</b> module powering up or ready for extraction. <b>Blinking:</b> hot swap configuration set-up in process. <b>Off:</b> module functioning normally.
MECHANICAL	
Size	1U high x 114[4.49"] wide x 278[10.95"] deep. Refer to JE Outline Dwg 03586-000 or the Mechanical Outline in this data sheet
Weight	1.6Kg. [3.52 lbs]
Retaining Fastener	Supplied with a single Southco #P7-A-503-11 front mounted lever type latch and dual M3 captive panel fasteners
OPERATING ENVIRONMENT	
Operating Temperature	-10°C - 50°C ambient at full load. V1 output derates linearly to 50% of full load at 70°C
Cooling	Dual internal, front end mounted DC ball bearing fans provided. CFM rating TBD. Forward airflow direction is front to rear (connector end)
Audible Noise	45dba at 25°C, 110/220VAC operation. Fan speed adjusts as a function of load and ambient temperature
Relative Humidity	Up to 90% RH, non-condensing
Operational Vibration	0.75G peak, 5 – 500Hz along three orthogonal axis at 1 octave/min
Storage Temperature	-.40° to 85°C
Altitude	Operating to 10,000 ft. Storage to 40,000 ft.
MTBF	Designed for 300,000 hrs minimum at 30°C
INTERCONNECT	
Output Connector	47 circuit sequential contact, hot pluggable type. 2 AC input, 1 PE contact rated 40.0A. 20 DC output power contacts rated 28.0A each, 24 signal contacts rated 3.0A each. Ratings continuous, all contacts under load. UL94V-0 glass filled thermoplastic material, secured to the main circuit board assembly in the rear of the unit. Positronic Ind. P/N PCIH47M400A1 Mates with PI P/N PCIH47F300A1.
Note: Use of the specified mating connector is required to insure proper "make/break" sequential contact sequence	
I <sup>2</sup> C SERIAL COMMUNICATION	
<i>Optional: This power supply can be operated as an I2C slave device capable of operating up to 100kHz.</i>	
SCL	Driven by the system interface controller and defines the clock interface protocol
SDA	Single wire data path
A0	Module address selection. Pulled high or low (GND) dependent on system slot used
A1	Module address selection. Pulled high or low (GND) dependent on system slot used
A2	Module address selection. Pulled high or low (GND) 2 dependent on system slot used

\*Specifications subject to change without notice.

I <sup>2</sup> C Monitoring Logic	
DC-OK	Output voltage within regulation
AC-OK	AC input within safe operating limits
Fan Fail	Monitors fan RPM. Signal goes low if fan speed drops below 35%-55% of nominal
Over Temperature	Early warning signal. Trigger point approximately 10% lower than output shutdown thermal switch
Over Cur	Early warning signal. Trigger point approximately 10% lower than I-Lim trip point
PS Pres	Signal indicates power supply installed
I <sup>2</sup> C Command Logic	
REM ON/ OFF	Enable or disable DC output. 2 second disable delay
REM Cycle	Cycles output OFF/ON. Output OFF 2.0-2.5 seconds
<p>The EEPROM is programmed to supply the users system with the following information:</p> <ul style="list-style-type: none"> <li>• Manufacturers name</li> <li>• Manufacturers model description</li> <li>• Manufacturers internal part number</li> <li>• Construction configuration revision letter code. - Unit serial number</li> <li>• Date code WWYY (shipment week/year)</li> <li>• Identifies the power supply type as AC</li> </ul>	
SAFETY, REGULATORY AND EMC	
<b>Designed to comply with the relevant industry standards of the authorities having jurisdiction. Pending JE engineering evaluation of the final design configuration, this model series may be submitted for certification to U.S. and Canadian Bi-National Standards; and for approval to IEC Standards. CE Mark pending final configuration acceptance</b>	
EMI Filtering	Meets FCC Level A, and EN 55022 Level A, radiated and conducted
EN 61000-3-2	Meets limits for harmonic current emissions
EN 61000-3-3	Meets limits for voltage changes, fluctuations and flicker
EN 61000-4-2	ESD immunity: +8KV air, +4KV contact discharge, performance criteria B
EN 61000-4-3	Radiated, radio-frequency and electromagnetic field immunity: 80-1000Mhz 3V/m, AM 80% (1KHz), criteria A
EN 61000-4-4	Fast transient/burst immunity: 1KV for AC power port, 0.5KV for DC power I/O and signals port, performance criteria B
EN 61000-4-5	Surge immunity: 2KV common mode and 1KV differential mode
EN 61000-4-6	Conducted disturbance immunity: 3Vrms, 80% A.M. by 1KHz
EN 61000-4-8	Power frequency magnetic field immunity: 3A/m at 50Hz, performance criteria A
EN 61000-4-11	Voltage dips, interruption and variation immunity: 30% reduction for 10mSec, criteria B; 60% for 100mSec, criteria C; 95% for 5000mSec, criteria C
Touch Current	2.0mA max @ 50/60Hz, 264V AC per UL 60950 test procedures (Sec. 5.0)
Routine Factory Tests	Di-electric strength (hi-pot) to 2121V DC input-to- chassis and input-to-outputs; MegOhm to 500V output-to-chassis

*\*Specifications subject to change without notice.*

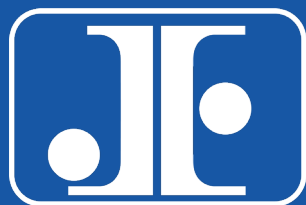
## INPUT/ OUTPUT AND SIGNAL CONNECTOR TYPE AND PIN FUNCTIONS

PIN#	SEQ <sup>(1)</sup>	FUNCTION	
01-06	2	-V1	-V1 Output (Floating)
07-12	2	-V1 Rtn	-V1 Return (Floating)
13	2	HA-0	For 13-20, pull-up resistors will be located in the PS card
14	2	HA-1	
15	2	HA-2	
16	2	HA-3	
17	2	HA-4	
18	2	HA-5	

PIN#	SEQ <sup>(1)</sup>	FUNCTION	
19	2	HA-6	
20	2	HA-7	
21	2	Stby Rtn	Standby Return (3.3V, 5V or 12V)
22	2	SCL_A	I <sup>2</sup> C Bus A
23	2	SDA_A	I <sup>2</sup> C Bus A
24	2	SCL_B	I <sup>2</sup> C Bus B
25	2	SDA_B	I <sup>2</sup> C Bus B
26	2	Stby Rtn	Standby Return (3.3V, 5V or 12V)
27	3	R/EN	Remote Enable. Close circuit to GND
28	2	Stby Rtn	Standby Return (3.3V, 5V or 12V)
29	2	GA-0	Geographic Address Bit 0
30	2	GA-1	Geographic Address Bit 1
31	2	GA-2	Geographic Address Bit 2
32	2	+VSB	Standby Output (+3.3V, +5V or +12V)
33	2	FAN	Fan Fail Signal, High/ Open
34	2	P/S	Power Supply Present
35	2	Alarm	Alarm, Hot Swap Switch. High/ Open
36	2	AC-OK	Input Power Good. High/ Open
37	2	R/INH	Remote Inhibit. Close circuit to GND
38	2	ISHR-1	V1 Current Share
39	2	N-S	-V1 Remote Sense
40	2	P-S	-V1 Remote Sense Return
41	2	3.3V	.
42	2	Stby Rtn	Standby Return (3.3V, 5V or 12V)
43	2	PTC-ADJ	Optional External Temperature Sensor
44	2	5V-PTC	Optional External Temperature Sensor
45	1	PE	Protective Earth (chassis) Ground
46	2	Input Pwr	Line (L) AC Power Input
47	2	Input Pwr	Neutral (N) ACC Power Input

## CONFIGURATION OPTIONS

OPTION	CODE
Base Model and V1 Output	HAL1201-2 = 12.0V HAL1501-5 = 24.0V HAL1501-6 = 28.0V HAL1501-8 = 48.0V HAL1501-9 = 54.0V
Standby Voltage	0 = 3.3V, Optional 1 = 5.0V, Standard 2 = 12.0V, Optional
I <sup>2</sup> C Serial Comm	Blank = Not required (standard) I = Included (optional)
Custom Configuration	MXXXX: Modified, where XXXX is a factory assigned 4-digit number to identify a user specified configuration. Such models may include special or non-standard features and/or options, or be in a configuration differing sufficiently from the design of the approved similar standard model from which it is derived to require re-evaluation of all or part of the design to insure continuing compliance with all safety requirements. The output voltage code and option codes 2,3 may not be present in the model description as this requirement is generally defined in the user specification documentation on file with the factory. Consult the factory for exact requirements



## JASPER ELECTRONICS

*Innovative Specialty  
DC Power Systems*

OPTION	CODE						
RoHS 6 Compliant	<p>G: Jasper products that are fully compliant with the requirements of Directive 2002/95/EC Restrictions of Hazardous Substances (RoHS) are identified with the letter code "G" included in the model description on the unit labels and related documents (sales orders, etc). All materials, processes and packaging used in the assembly and shipping of this product comply.</p> <p>G5: For user determined applications that require the use of lead based solder for component connections to printed circuit boards, specify "G5" for RoHS 5 compliance.</p> <p><b>Examples:</b></p> <table><tr><td>HAL1201-21-G</td><td>1200W, 12V o/p, 5V standby, RoHS</td></tr><tr><td>HAL1501-82-IG5</td><td>1500W, 48V o/p, 12V standby, w/I2C option, RoHS5</td></tr><tr><td>HAL1501-6-M6341G</td><td>1500W, 28V o/p, user specified configuration.</td></tr></table>	HAL1201-21-G	1200W, 12V o/p, 5V standby, RoHS	HAL1501-82-IG5	1500W, 48V o/p, 12V standby, w/I2C option, RoHS5	HAL1501-6-M6341G	1500W, 28V o/p, user specified configuration.
HAL1201-21-G	1200W, 12V o/p, 5V standby, RoHS						
HAL1501-82-IG5	1500W, 48V o/p, 12V standby, w/I2C option, RoHS5						
HAL1501-6-M6341G	1500W, 28V o/p, user specified configuration.						

### LIMITED WARRANTY POLICY

All Jasper Electronics (JE) standard model power supplies and products are guaranteed to be free of defects in workmanship and materials for a minimum of two (2) years from the date of original shipment, when operated within specification. Non-standard (custom) power supplies and products may be warranted on an individual basis. The unused portion of this warranty is fully transferable with the original equipment in which the power supply is installed. Please see our website for full warranty statement.



### CONTACT

1580 No. Kellogg Dr.  
Anaheim, California, 92807

(714) 917-0749

[www.jasperelectronics.com](http://www.jasperelectronics.com)  
[sales@jasperelectronics.com](mailto:sales@jasperelectronics.com)



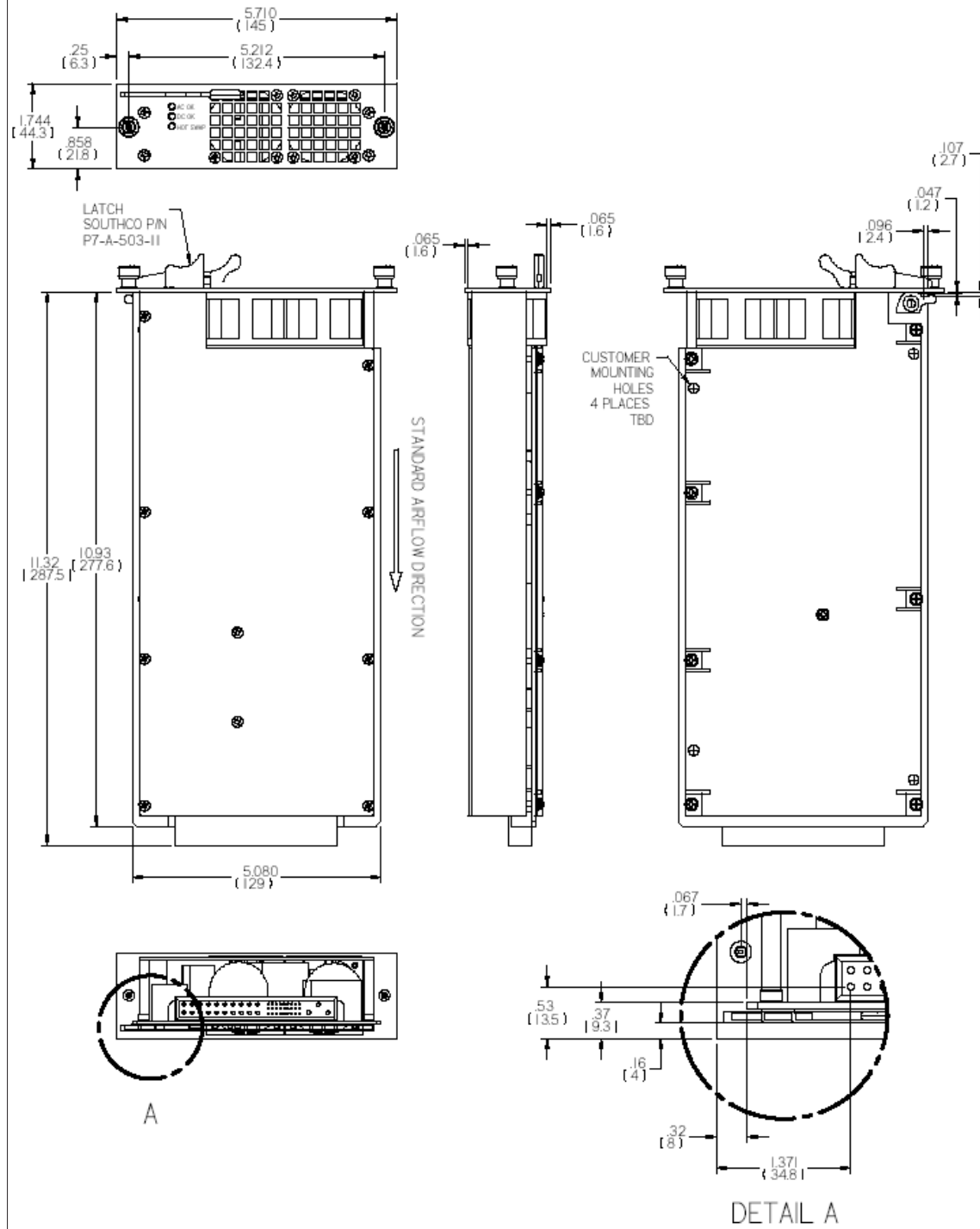
ISO9001:2015



## HAL1500 OUTLINE DRAWING

### *Mechanical Outline*

(Dimensions in millimeters [inches])



# INNOVATIVE SPECIALTY DC POWER SYSTEMS

*Standard and Custom Power Supplies from 5W to 10KW*

## TRAFFIC CONTROL POWER SUPPLIES



- 70-400+ Watts / 120 and 220 VAC Models Available
- CALTRANS TEES, NYSDOT, CDOT, GDOT Compliant for 332, 334, 336, 342, 344, and 346 Series cabinets
- RoHS and NEMA Compliant
- Custom labeling and barcoding available
- Ruggedization against shock / vibration / humidity available

## CUSTOM POWER DISTRIBUTION ASSEMBLIES (PDAs)



- Compliant with TEES 2020
- 1U smaller than the PDA2-LX and PDA3-LX
- User accessible slots as specified
- Custom labeling and barcoding available
- Ruggedization against shock / vibration / humidity available

## COMPACT PCI



- AC or DC input, 175W - 500W DC output, active PFC
- 3U x 8HP, 6U x 8HP sizes
- PICMG 2.11 compliant, UL/CSA, NEMKO/TUV/CE certified, ROHS compliant
- Ruggedization against shock/ vibration/ humidity optional

**Primary Applications: Industrial Computing, Military, Satellite Comm, Test, Transportation, Telecom, Aerospace**

## SPECIALTY HOT-SWAPPABLE POWER SUPPLIES



- 200-1500W, Universal Input, 5-54VDC Output
- Hot Swap. N+1, 90+% Efficiency
- 1U Form Factors
- 30+ Variations for Various Applications Including Nuclear
- Ruggedization against shock/ vibration/ humidity optional

**Primary Applications: Medical Equipment, Military, Test, Automotive, Computing, Audio, Sensitive Electronics**

## RACK POWER SYSTEMS



- 200W-1500W, 2-8 slots, single or mixed output voltages, up to 10KW total
- Single, dual, or individual unit AC or DC input
- Internally or externally redundant DC outputs
- Standard 19" and 23" size or user-specified configurations also available
- Ruggedization against shock/ vibration/ humidity optional

**Primary Applications: Medical Equipment, Military, Test, Automotive, Computing, Audio, Sensitive Electronics**

## CUSTOMS & MODIFIED STANDARDS



- 75W-2KW
- Single to 7 outputs
- Designed and built to custom or semi-custom specifications
- Ruggedization against shock/ vibration/ humidity optional
- Custom electrical specs, chassis, paint, labeling, connectors, interface all available

**Primary Applications: Medical Equipment, Military, Test, Automotive, Computing, Audio, Sensitive Electronics**

## LOW NOISE CONVECTION / CONDUCTION COOLED POWER SUPPLIES



- 200W-500W, 90—264VAC full range input with 12-54 VDC Output
- Wide operating temperature range / high efficiency
- Small form factors
- Ruggedization against shock/ vibration/ humidity optional

**Primary Applications: Medical Equipment, Military, IT, Sensitive Electronics**

## MEDICAL ADAPTERS



- 6W-250W, Efficiency levels V & VI
- Desktop, Wall-mount, and Interchangeable AC plug types
- Large selection of output connectors – additional cable lengths available
- UL60601 (medical) approved adapters available
- Ruggedization against shock/ vibration/ humidity optional

