

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
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Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

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Visit our website - *Click HERE*

Dear AR Customer,

Thank you for your purchase of AR equipment; we hope to keep you as a satisfied customer for years to come. Included in this Operator's Manual, are advertisements of our other offerings. If you require additional information on any of these products, please contact your AR sales associate or AR directly to provide you with your choice of the following brochures:

- RF Power Amplifier Brochure – "A" Series - 25 to 10,000 Watts, DC to 250 MHz
  "W" Series - 1 to 4000 Watts, DC to 1 GHz
- Microwave Amplifier Brochure – "S" Series – 1 to 800 Watts, 0.8 to 20 GHz
  "ST" & "T" Series – 10 to 16,000 Watts, 0.8 to 45 GHz
- "L" Series High Power Amplifier Brochure – 1200 to 10,000 Watts 10 kHz to 220 MHz
- NMR/MRI Guide to Broadband RF Amplifiers – Quiet Amps Brochure
- RF & Microwave Accessories – field monitor, field probes, EMC test software, system controllers, directional couplers and signal generators
- Antennas – 1 to 15,000 Watts, 10 kHz to 50 GHz
- AR Cell Pre-compliance Test Systems and Radiated Immunity Test Systems
- RF Conducted Immunity Generators & Automotive Transient Generator Systems
- 10, 20, 50, 100 or 200 V/m Recommended system configuration application notes
- IEC 61000-4-3 (IEC 801-3) System configuration

Again, thank you for your purchase. Your business is appreciated.

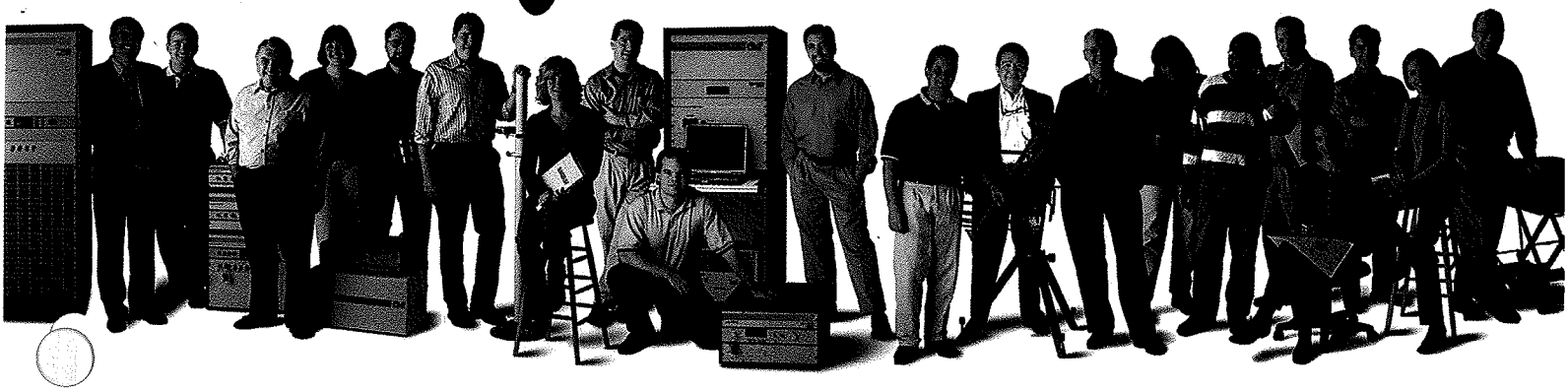
Sincerely,

Donald Shepherd
President

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The Power of One!



In the world of EMC, Wireless and beyond, one name stands out as the ultimate source for testing & communication solutions: AR. With the combined resources of all the AR companies, we simply have more options, more solutions, and more innovations. No wonder AR is recognized as the global leader.

You get the benefit of all our people, all our innovations, and all our support when you connect with any AR company. We're one company. With infinite solutions.

You work in an environment where precision and dependability are essential. A millisecond can make a critical difference. So AR products are designed and built to the toughest standards. The result is tough, durable, innovative products that you can count on to help you achieve new levels of efficiency and accuracy. Products that perform beyond expectations in even the most grueling environments. AR products work hard, they work long, and they deliver real value.

AR products not only provide solutions to current problems, they anticipate and help you prepare for the future.

Our new products give customers room to grow as frequencies move higher in Wireless and EMC. Our new transient generator systems have so much built-in flexibility that testers will no longer need to purchase multiple generators to meet constantly-changing specifications.

AR supports its products with the strongest, most comprehensive warranty in the industry. It's backed by a worldwide service and technical support network that's second to none. If anything goes wrong with your AR product - ever - we'll be there to help make it right.

The combination of great people and great products will give you the competitive edge you need to take on any problem.

www.ar-worldwide.com *or call RF/Microwave Instrumentation at 215.723.8181, Modular RF at 425.485.9000. or Receiver Systems at 800.964.1424*

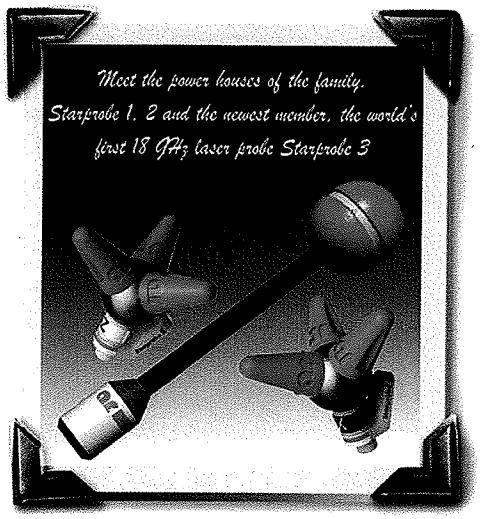
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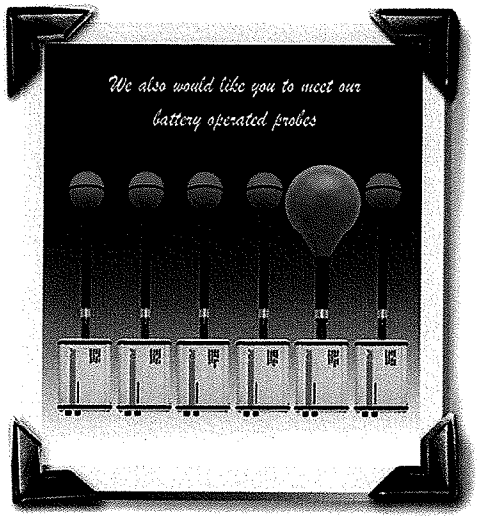
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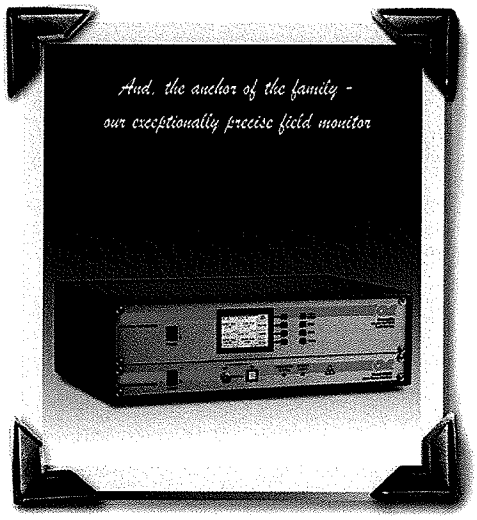
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The Bigger Picture!







World's Largest Selection Of Field Probes – 5 kHz to 60 GHz

AR's line of field monitoring equipment is not only the largest, most comprehensive in the EMC field, it's also the most technologically advanced. No other company even comes close to the performance, the reliability or the options available from AR.

The family of Starprobe™ laser powered probes covers the broadest frequency range – 5 kHz to 18 GHz! These E-field laser probes contain an internal microprocessor that enables them to "think" for themselves and adapt to their environment. This provides optimal linearization, temperature compensation, control, and communication functions. They also have three levels of safety for ultimate protection.

Starprobe™ 1 Laser Powered Probe (Model FL7030) 5 kHz - 30 MHz / 1.5 - 300 V/m
Starprobe™ 2 Laser Powered Probe (Model FL7006) 100 kHz - 6 GHz / 0.5 - 800 V/m redesigned to meet the IEC 6 GHz requirement!
Starprobe™ 3 Laser Powered Probe (Model FL7018) 3 MHz - 18 GHz / 1 - 1000 V/m the world's first 18 GHz laser probe!
Six battery-operated E&H Field Probes, 100 kHz - 60 GHz with quicker calibration turnaround, more complete data and excellent isotropic response and linearity.
Starmonitor™ Field Monitor, (FM7004) exceptionally precise with auto-recognition to adapt to laser or battery-powered probes. *Like all AR products, our probes and monitor are backed by our limitless support network and by the most comprehensive warranty in the industry.*

To learn more, visit www.ar-worldwide.com or call us at 215-723-8181.

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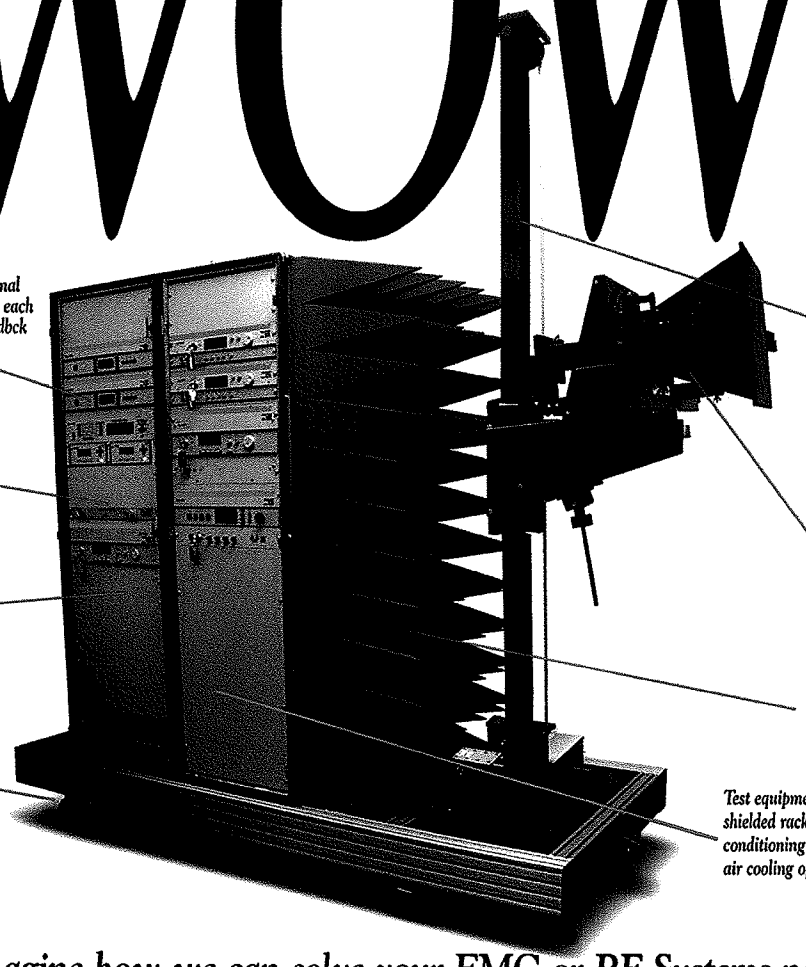
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WOW!



Imagine how we can solve your EMC or RF Systems needs!

AR people don't do anything half-way. Whether it's our legendary mismatch capability, the quality components we use, or the way we check and recheck every single detail, we always take the extra step. That's what makes an AR system so completely reliable.

It isn't just that we can put a system together to solve any EMC or RF test scenario – it's the parts that go into that system!

We have complete test systems "on the shelf" that perform entire tests with just the press of a few buttons. The AS40000 Radiated Immunity Test System (800 MHz – 40 GHz), for example, allows you to coordinate five amplifiers, a field monitor, two power meters, two system controllers, a signal generator, and a 20-foot antenna mast with five antennas.

AR can also put together a customized system to solve your test problems, with the power and frequency you need – from 10 kHz – 45 GHz. You can start with just a few essential components and then build a system around them.

Every product in your AR test system is backed by the most comprehensive warranty in the business; and a global support network that's second to none. When you have a question about any part of the system, you know exactly who to call.

We've been here for over 35 years and we'll continue to be here, serving your needs and engineering the products that meet tomorrow's challenges.

To learn more, visit www.ar-worldwide.com or call us at 215-723-8181.

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More Gigs Galore.

1S1G4A 1 Watt 0.8-4.2 GHz	35S4G8A 35 Watt 4-8 GHz	400S1G4 400 Watt 0.8-4.2 GHz	40T4G18 40 Watt 4.2-18 GHz	200T2G4 200 Watt 2-4 GHz	1000T2G8B 1000 Watt 2.5-7.5 GHz	2000TP1G2A 1700 Watt Pulse 1-2.5 GHz
1S4G11 1 Watt 4-10.6 GHz	40S4G11 40 Watt 4-10.6 GHz	450S1G3 450 Watt 0.8-3.0 GHz	40T18G26A 40 Watt 18-26.5 GHz	200T2G8A 200 Watt 2.5-7.5 GHz	1000T8G18B 1000 Watt 7.5-18 GHz	2000TP2G8B 2000 Watt Pulse 2.5-7.5 GHz
5S1G4 5 Watt 0.8-4.2 GHz	50S1G4A 50 Watt 0.8-4.2 GHz	540S1G4 540 Watt 0.8-4.2 GHz	40T26G40A 40 Watt 26.5-40 GHz	200T4G8 200 Watt 4-8 GHz	1000TP1G2 1000 Watt Pulse 1-2.5 GHz	2000TP8G12 2000 Watt Pulse 8.2-12.4 GHz
5S4G11 5 Watt 4-10.6 GHz	60S4G8 60 Watt 4-8 GHz	600S1G3 590 Watt 0.8-3.0 GHz	50T4G18 50 Watt 4.2-18 GHz	200T8G18A 200 Watt 7.5-18 GHz	1000TP2G8 1000 Watt Pulse 2.5-7.5 GHz	2000TP8G18 2000 Watt Pulse 7.5-18 GHz
5S10G20 5 Watt 10-20 GHz	60S4G11 60 Watt 4-10.6 GHz	700S1G4 700 Watt 0.8-4.2 GHz	70T26G40 70 Watt 26.5-40 GHz	250T1G3 250 Watt 1-2.5 GHz	1000TP8G18 1000 Watt Pulse 7.5-18 GHz	4000TP1G2 4000 Watt Pulse 1 - 2 GHz
10S1G4A 10 Watt 0.8-4.2 GHz	80S4G11 80 Watt 4-10.6 GHz	800S1G3 800 Watt 0.8-3.0 GHz	70T18G26 75 Watt 18-26.5 GHz	250T8G18 250 Watt 7.5-18 GHz	1000TP1G3* 1000/500 Watt Pulse 1.15-3.1 GHz	4000TP2G4 4000 Watt Pulse 2-4 GHz
10S4G11A 10 Watt 4-10.6 GHz	90S4G8 90 Watt 4-8 GHz	10ST1G18A 10 Watt 0.8-18 GHz	120T40G40 120 Watt 40-45 GHz	300T2G8 300 Watt 2.5-7.5 GHz	1500T1G3A 1500 Watt 1-2.5 GHz	4000TP4G8 4000 Watt Pulse 4-8 GHz
15S1G3 15 Watt 0.8-3.0 GHz	100S1G4 100 Watt 0.8-4.2 GHz	20ST1G18A 20 Watt 0.8-18 GHz	125T18G26 125 Watt 18-26.5 GHz	500T1G2 500 Watt 1-2.5 GHz	1500T2G8A 1500 Watt 2.5-7.5 GHz	4000TP8G12 4000 Watt Pulse 8-12 GHz
15S4G8A 15 Watt 4-8 GHz	120S1G3 120 Watt 0.8-3.0 GHz	35ST1G18 35 Watt 0.8-18 GHz	125T26G40 125 Watt 26.5-40 GHz	500T2G8 500 Watt 2.5-7.5 GHz	1500T8G18 1500 Watt 7.5-18 GHz	4000TP12G18 4000 Watt Pulse 12-18 GHz
20S4G11A 20 Watt 4-10.6 GHz	120S4G8 120 Watt 4-8 GHz	50ST1G18 50 Watt 0.8-18 GHz	125T40G45 125 Watt 40-45 GHz	500T8G18 500 Watt 7.5-18 GHz	2000T1G3 2000 Watt 1-2.5 GHz	
25S1G4A 25 Watt 0.8-4.2 GHz	200S1G4A 200 Watt 0.8-4.2 GHz	15T4G18A 15 Watt 4.2-18 GHz	200T1G2 200 Watt 1-2 GHz	750TP1G3/200T *750/500 Watt Pulse 1.15-3.1 GHz	2000T2G8 2000 Watt 2.5-7.5 GHz	
30S1G3 30 Watt 0.8-3.0 GHz	240S1G3A 240 Watt 0.8-3.0 GHz	20T4G18A 20 Watt 4.2-18 GHz	200T1G3A 200 Watt 0.8-2.8 GHz	1000T1G2B 1000 Watt 1-2.5 GHz	2000T8G18 2000 Watt 7.5-18 GHz	



From 0.8 GHz To 45 GHz, And Everything In Between For EMC & Wireless Testing.

When EMC and Wireless testing is your gig, you need choices. AR has microwave amplifiers from 0.8 - 45 GHz and everything in between. Solid State to 800 watts or TWTAs to 4000 watts. Another example of AR Infinite Solutions.

AR products supply a multitude of RF solutions to companies around the world. Our limitless support network reaches the far corners of the world. And, everything we sell is backed by the best comprehensive warranty in the industry.

So when you're looking for just the right microwave amplifier for your total testing needs, remember... AR has a wide world of gigs.

To learn more, visit www.ar-worldwide.com or call 215.723.8181.

**1.15-1.45 and 2.7-3.1 GHz for radar simulation.*

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Expandable Power.



Add Power As You Grow!

It's one of the nicest offers we've ever made. Now, you don't need to buy a new amplifier when you need more power. Simply add an amplifier module plus a combiner controller unit.

Begin with our basic "Expandable Power" "building block" – the 1000W1000C – 1000 watts from 80 to 1000 MHz. Then add power in 1000-watt increments, up to 4000 watts – as you need it – by adding more 1000W1000C's and a control unit.

It's never been easier to enjoy AR quality. "Expandable Power" is another technical innovation that gives our customers an advantage in today's tough economy to accomplish high field, large EUT testing! Our "S" Series amplifiers are designed to be expandable and upgradeable as well (200 to 800 watts and 0.8-4.2 GHz).

AR products supply a multitude of unique RF solutions to some of the finest names worldwide. From leading automotive and communications giants to the military, AR is there. Our support network reaches the far corners of the world, and our solid-state amplifiers are backed by the best comprehensive warranty in the business.

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Workhorses!



When the testing gets tough, your low-power amplifier could quickly begin folding back, losing power, and leaving you …powerless to perform your tests. You can never really be 100% sure that your RF or EMC test amplifier will hold up. Unless it's an AR amplifier.

AR amplifiers are designed and built to withstand even the harshest, most extreme test conditions. Our amplifiers have more or larger transistors than other amps, which means less stress per transistor, giving your amplifier a longer life. Plus, something no other amplifier offers: infinite VSWR tolerance.

That means that AR amplifiers continue to deliver full rated power to the load in all test circumstances. Even when the VSWR ratio is so high that other amplifiers fold back or diminish output to protect circuitry. AR amplifiers give you every watt of power you paid for. Every time.

Why take chances when AR makes it easy to get the power and frequency combination you need? AR supplies a multitude of unique RF solutions – and provides a competitive edge – to some of the best-known companies worldwide. Our products are backed by the strongest, most comprehensive warranty in the industry, and a global support network that's second to none.

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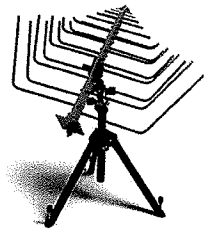
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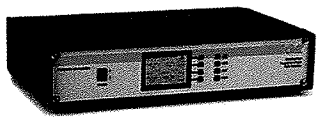
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Your Test Is Only As Good As The Sum Of Its Parts.



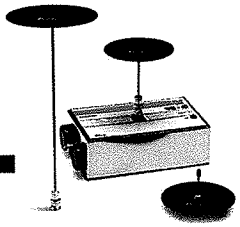
AT5080 Log Periodic Antenna
80 MHz – 5 GHz, 5,000 watt input power



Starmonitor®
Field Monitor FM7004



Starprobe® 3 Laser Powered Probe
(Model FL7018) 3 MHz – 18 GHz / 1 – 1000 V/m.



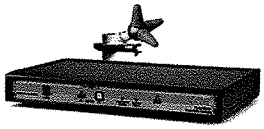
NE3000 Noise Emitter
9 kHz – 2 GHz



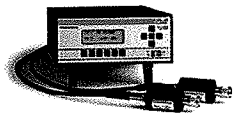
DC7350A
4 – 8 GHz, 350 Watt



Microwave Horns
0.8 – 50 GHz



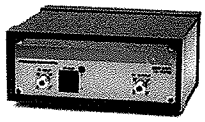
Starprobe® 1 Laser Powered Probe
(Model FL7030) 5 kHz – 30 MHz / 1.5 – 300 V/m
And FI7000 Probe Interface



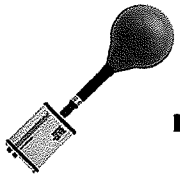
PM2002 Two-Channel Power Meter
10 kHz – 40 GHz



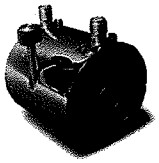
SW1006 EMC Test Software



LN1G11 Low Noise Amp
1.0 – 11.0 GHz



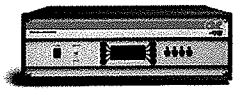
Battery-powered E&H field probes
100 kHz – 60 GHz



BI30000 Tubular Wave Couplers
150 kHz – 3 GHz



SG1200 Signal Generator
9 kHz – 1.2 GHz



SC1000 System Controller
DC – 40 GHz

Infinite Solutions for All Your Testing Needs.

If you've got AR amplifiers, you obviously recognize the importance of quality and ultimate reliability. But now that you're about to add accessories, this is no time for a weak link.

All it takes is one component in your test set-up that doesn't perform as well as it should, and all your test results become questionable. Why take chances?

AR offers a complete selection of accessory products that give you a competitive edge, the most reliable results, and complete peace of mind. Field monitors, probes, software, system controllers, couplers, signal generators, and more. All matched to our amplifiers to make your set-up as easy as possible. And all AR products are backed by the most comprehensive warranty in the business; and a global support network that's second to none. We're here to help you, today, tomorrow and always.

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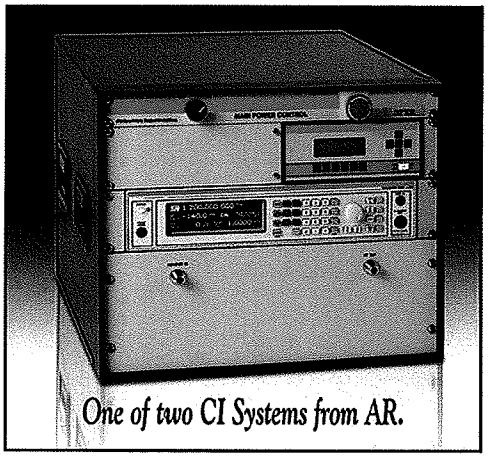
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Introducing The Conducted Immunity Test System ... And Its Closest Competition.



One of two CI Systems from AR.

All competing conducted immunity test systems that even come close.

The new CI self-contained Conducted Immunity Test Systems from AR stand alone. No competing products even come close. Not when it comes to ease of use, flexibility, reliability, or any other features that really matter. Among the features that set the CI Systems apart are a higher level of accuracy, a wider sensitivity range, excellent speed, and the ability to do accurate margin testing. The CI Systems make it easy to conduct customized tests; and reports are generated directly into Microsoft® Word or Excel.

AR Components Can Be Used Independently

Of course, it's the AR components that make these systems so accurate and reliable. The AR amplifier and signal generator are state-of-the-art equipment. And you can use them independently, apart from the system. So when you purchase a CI System you also get a stand-alone AR amplifier and signal generator! Talk about value!

Two CI Systems are currently available and more are on the way:

Model CI00250 (75 watt, 10 kHz – 250 MHz) – Provides complete testing solutions to the following standards: EN/IEC 61000-4-6, IEC 60601-1-2, EN 50130-4, EN 61000-6-1/2, and EN 55024.

The CI00400 (100 watt, 10 kHz – 400 MHz) – Designed to test to MIL-STD-461D & E CS114, DO160D & E, EN/IEC 61000-4-6, IEC 60601-1-2, EN 50130-4, EN 61000-6-1/2, and EN 55024 standards.

AR supplies a multitude of unique RF solutions to some of the best-known companies worldwide. Our products are backed by the strongest, most comprehensive warranty in the industry, and a global support network that's second to none.

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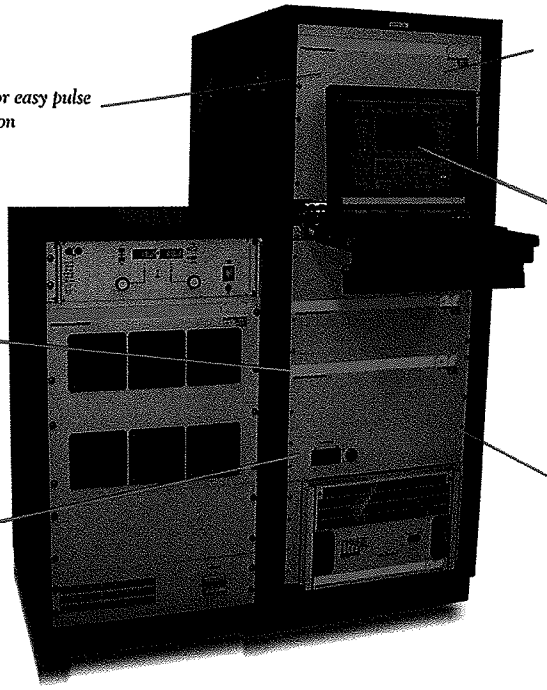
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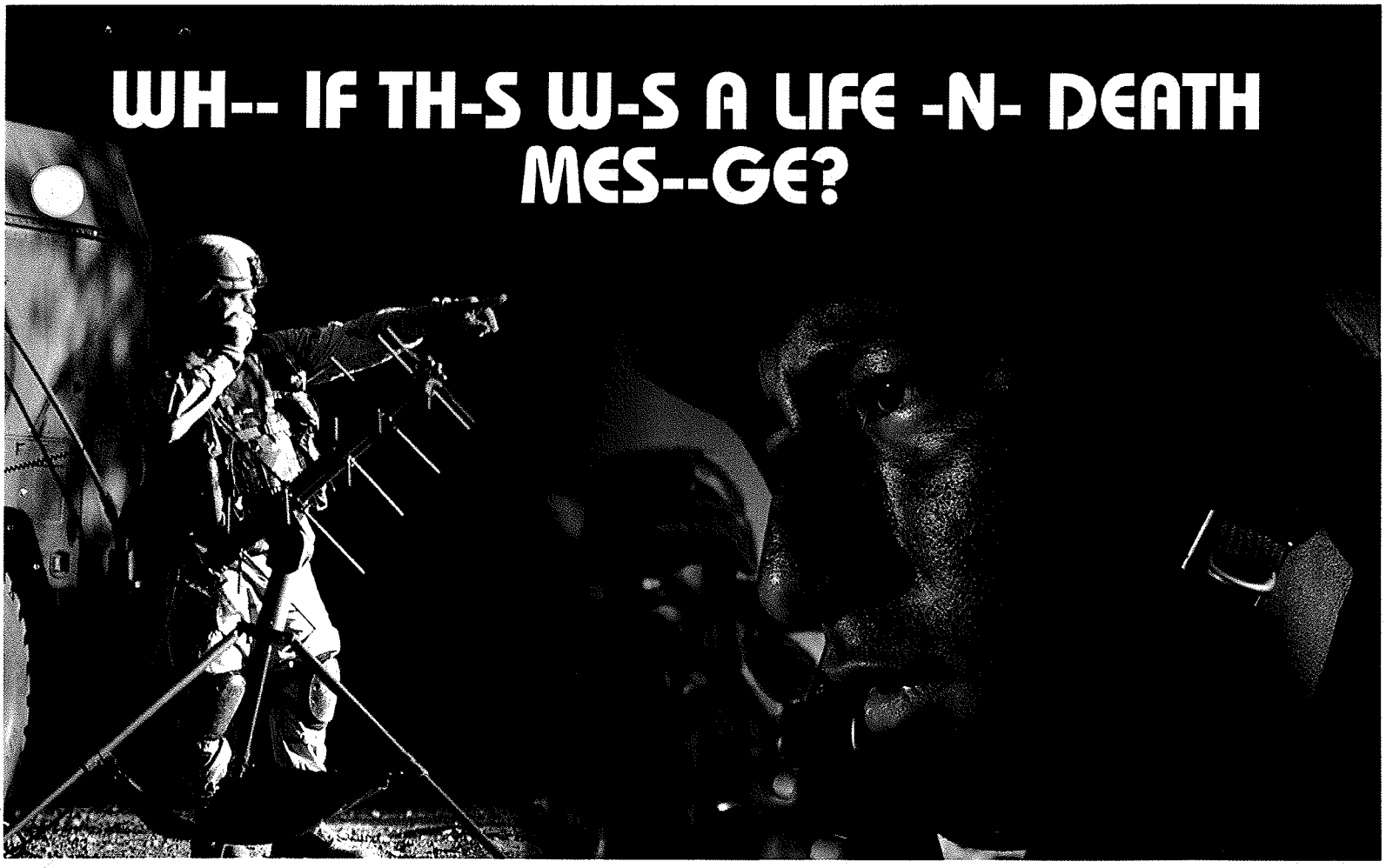
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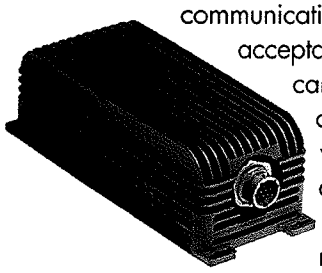
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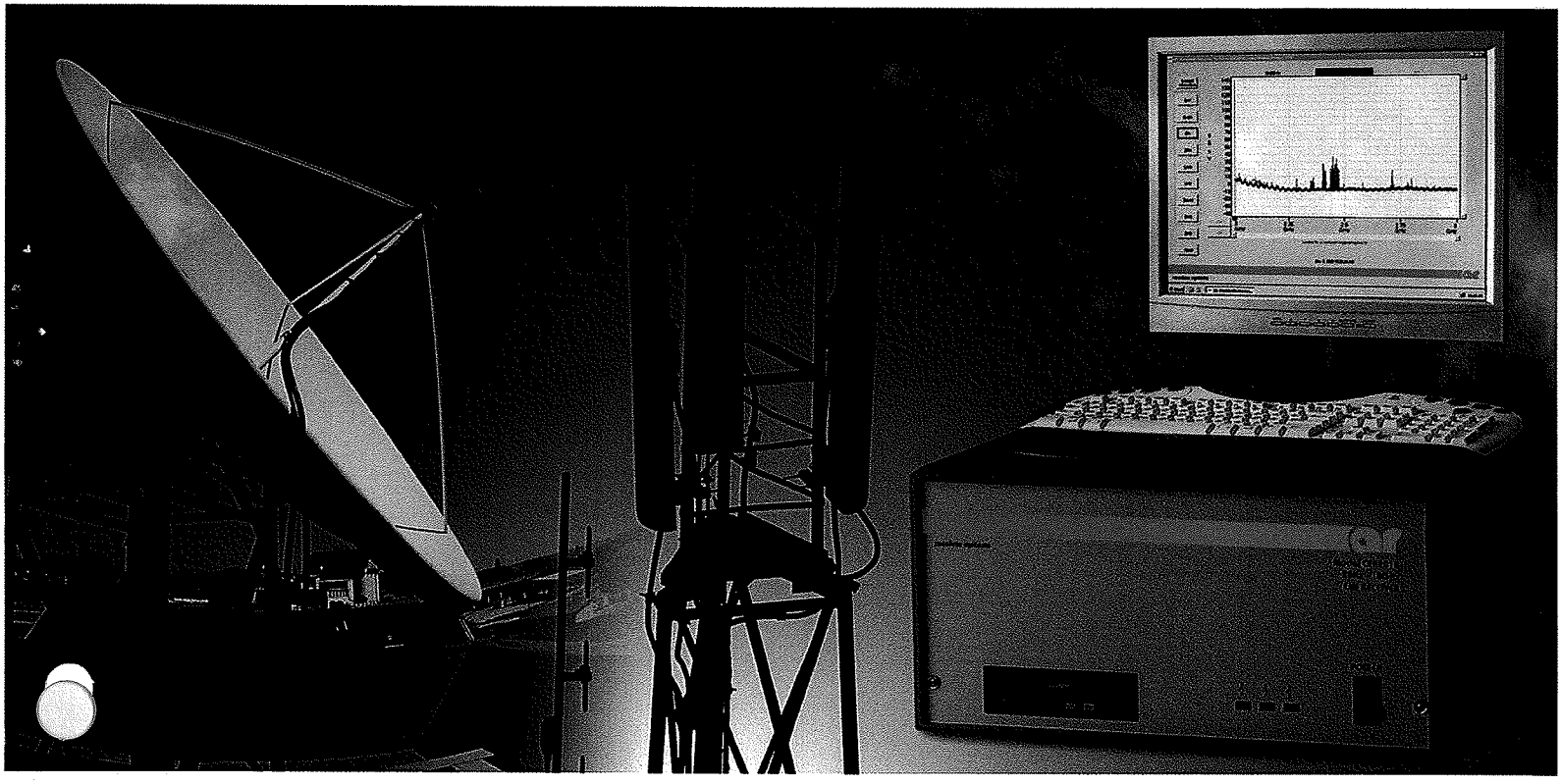
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rf/microwave instrumentation

Operating and Service Manual

25A250AM6
Model

10007635
Part Number

0328411
Serial Number

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rf/microwave instrumentation

EC Declaration of Conformity

We; AR Worldwide
160 School House Road
Souderton, Pa. 18964

declare that our product(s);

the Model 25A250A series amplifiers

to which this declaration relates is in compliance with the requirements of the EEC EMC Directive (89/336/EEC) and Low Voltage Directive (73/23/EEC) in accordance with the relative standards listed below:

EMC:

EN 50082-2 : 1995
Electromagnetic compatibility - Generic immunity standard
Part 2: Industrial environment

EN 55011 : 1991
Electromagnetic emissions requirements for Industrial, Scientific and Medical (ISM) Equipment
Group 1, Class A

Safety:

IEC 61010-1 : 2001

The CE marking is affixed on the device according to the EC Directives.

Donald R. Shepherd
President

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INSTRUCTIONS FOR SAFE OPERATION

BEFORE APPLYING POWER

Review this manual and become familiar with all safety markings and instructions.

Verify that the equipment line voltage selection is compatible with the main power source.

Protection provided by the equipment may be impaired if used in a manner not specified by Amplifier Research.

INTENDED PURPOSES

This equipment is intended for general laboratory use in a wide variety of industrial and scientific applications. It is designed to be used in the process of generating, controlling, and measuring high levels of electromagnetic Radio Frequency (RF) energy. Therefore, the output of the amplifier must be connected to an appropriate load such as an antenna or field-generating device. It is the responsibility of the user to assure that the device is operated in a location which will control the radiated energy such that it will not cause injury and will not violate regulatory levels of electromagnetic interference.

HAZARDOUS RF VOLTAGES

The RF voltages on the center pin of the RF output connector can be hazardous. The RF output connector should be connected to a load before AC power is applied to the amplifier. Do not come into contact with the center pin of the RF output connector or accessories connected to it. Place the equipment in a non-operating condition before disconnecting or connecting the load to the RF output connector.

SAFETY GROUND

This equipment is provided with a protective earth terminal. The main power source to the equipment must supply an uninterrupted safety ground of sufficient size to the input wiring terminals, power cord, or supplied power cord set. The equipment **MUST NOT BE USED** if this protection is impaired.

PHYSICAL DAMAGE

The RF amplifier should not be operated if there is physical damage, missing hardware, or missing panels.

MAINTENANCE CAUTION

Adjustment, maintenance, or repair of the equipment must be performed only by qualified personnel. Hazardous energy may be present while protective covers are removed from the equipment even if disconnected from the power source. Contact may result in personal injury. Replacement fuses are required to be of specific type and current rating.

SAFETY SYMBOLS



This symbol is marked on the equipment when it is necessary for the user to refer to the manual for important safety information.



Dangerous voltages are present. Use extreme care.

CAUTION: The caution symbol denotes a potential hazard. Attention must be given to the statement to prevent damage, destruction, or harm.



Indicates protective earth terminal.

RANGE OF ENVIRONMENTAL CONDITIONS

This equipment is designed to be safe under the following environmental conditions:

- Indoor use
- Altitude up to 2000M
- Temperature of 5°C to 40°C
- Maximum relative humidity 80% for temperatures up to 31°C. Decreasing linearly to 50% at 40°C.
- Main supply voltage fluctuations not to exceed ± 10% of the nominal voltage or minimum and maximum autoranging values.
- Pollution degree 2: Normally non-conductive with occasional condensation. While the equipment will not cause hazardous condition over this environmental range, its performance may vary.

COOLING AIR

Care should be exercised not to block the cooling air inlets or outlets. Cooling air blockage can result in damage to the RF amplifier or intermittent shut-downs.

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1. GENERAL INFORMATION

1.1 GENERAL INFORMATION

The Model 25A250A Amplifier is a self-contained broadband unit designed for laboratory applications where instantaneous bandwidth, high gain and moderate power output are required. Solid state technology is used exclusively to offer significant advantages in reliability and cost. A valuable feature is the amplifier gain over a 18 dB range to meet specific output power requirements by means of a simple front panel control.

Typical applications include antenna and component testing, wattmeter calibration, EMI susceptibility testing, use as a driver for frequency multipliers and high power amplifiers and as an RF source for nuclear magnetic resonance imaging studies.

1.2 POWER SUPPLIES

The 25A250A has a self-contained switching power supply. The input voltage range to this supply is 90-132 VAC or 180-264 VAC, 50/60 Hz, universal or selected automatically. The operator does not have to switch or change anything when changing the input line voltage.

The power consumption is a nominal 100 watts (200 watts maximum). Primary circuit fusing is provided.

1.3 SPECIFICATIONS

Refer to AR Worldwide Data Sheet at the end of this section for detailed specifications.

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MODEL 25A250AM6
25 WATTS CW
1 – 300 MHz

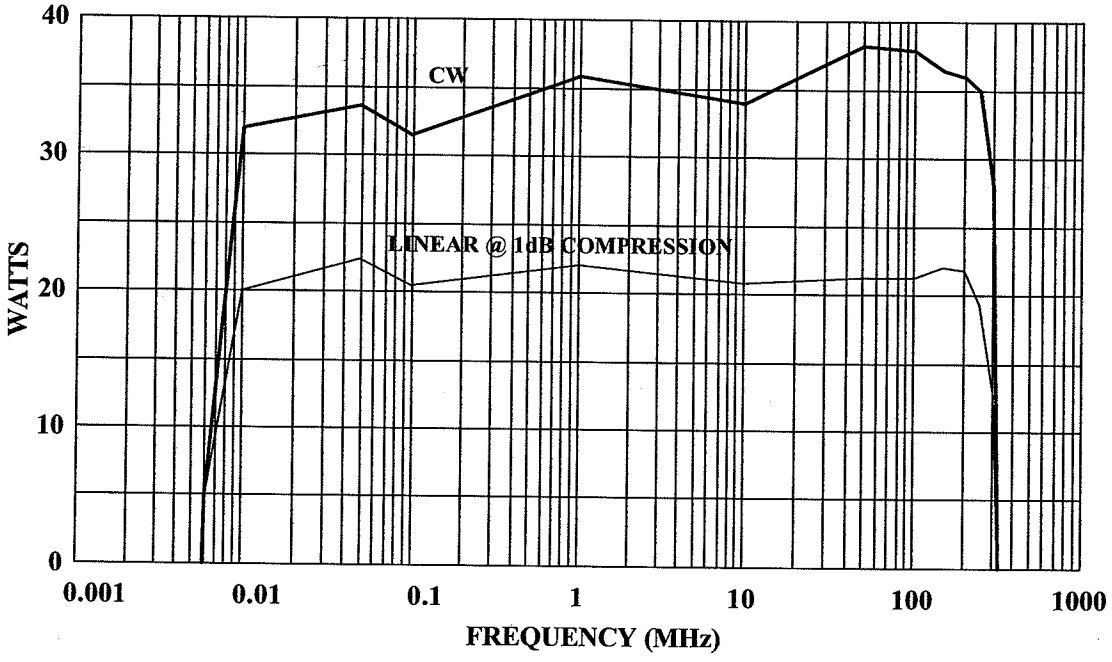
The Model 25A250AM6 amplifier is a self-contained, broadband unit designed for laboratory applications where instantaneous bandwidth, high gain and moderate power output are required. Utilization of push-pull MOSFET circuitry lowers distortion, improves stability and allows operation into any load impedance without damage. The Model 25A250AM6, when used with an RF sweep generator, will provide a minimum of 25 watts of swept power.

The Model 25A250AM6 includes a front panel control which permits the operator to conveniently set the amplifier's desired output level. Designed for rack mounting, the Model 25A250AM6 provides readily available RF power for typical applications such as RF susceptibility testing, antenna and component testing, watt meter calibration, and use as a driver for higher power amplifiers.

The 25A250AM6 utilizes a switching power supply with universal and autoranging input which will automatically accept from 90 to 135 VAC or from 180 to 270 VAC at 47 to 63 Hz.

The M6 version of the 25A250A is supplied without an instrument case and exhibits an enhanced frequency response.

25A250AM6 TYPICAL POWER OUTPUT



REV061297

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SPECIFICATIONS
Model 25A250AM6

POWER OUTPUT, CW	
Nominal	***35 watts***
Minimum	***25 watts***
Linear @ 1dB compression	***15 watts minimum (1-250 MHz)*** ***10 watts minimum (250-300 MHz)***
FLATNESS	***± 1.0 dB maximum***
FREQUENCY RESPONSE	***1-300 MHz instantaneously***
INPUT FOR RATED OUTPUT	***1.0 milliwatt maximum***
GAIN (at maximum setting)	***44 dB minimum***
GAIN ADJUSTMENT (continuous range)	***18 dB minimum***
INPUT IMPEDANCE	***50 ohms, VSWR 1.5:1 maximum***
OUTPUT IMPEDANCE	***50 ohms, VSWR 2.0:1 maximum***
MISMATCH TOLERANCE *	***100% of rated power without foldback. Will operate without damage or oscillation with any magnitude and phase of source and load impedance.***
MODULATION CAPABILITY	***Will faithfully reproduce AM, FM, or pulse modulation appearing on the input signal***
NOISE FIGURE (above 1.0 MHz)	***6 dB typical***
HARMONIC DISTORTION	***Minus 20 dBc maximum at 15 watts***
THIRD ORDER INTERCEPT POINT	***54 dBm typical***
PRIMARY POWER	***90-135/180-270 VAC*** ***47 to 63 Hz, single phase 200 watts maximum***
RF CONNECTORS	***Type N female***
COOLING	***Forced air (self contained fans)***
WEIGHT	***10.9 kg (24.0 lb)***
SIZE (WxHxD)	***48.3 x 13.2 x 28.7 cm*** ***19.0 x 5.2 x 11.3 in***

**** See Application Note #27***

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2. OPERATING INSTRUCTIONS

2.1 GENERAL

Operation of the Model 25A250A broadband amplifier is quite simple. The input signal, whether swept or fixed in frequency, is applied to the jack marked "INPUT" and the amplifier output signal is taken from the jack labeled "OUTPUT". The unit is turned on by activating the power switch marked "1" / "0". In the event of a unit malfunction, protection is provided by fusing located at the rear of the unit. A polarized, three (3) wire AC power cord is also included with the unit to provide cabinet and chassis grounding to the power mains.



CAUTION:

The Model 25A250A amplifier is not critical in regards to source and load VSWR and will remain unconditionally stable with any magnitude and phase of source and load VSWR. It also has been designed to withstand RF input power up to twenty (2) times its rated input of 1mW. However, signal levels higher then 20 mW or transients with high peak voltages can damage the amplifier. Also, accidental connection of the output to its input causes oscillations which may permanently damage the unit.



CAUTION:

While the Model 25A250A will operate at its rated output power into any load impedance, the amplifier may be damaged if it is simultaneously overdriven with an open or short circuited load. To prevent damage to the amplifier, the following practices are recommended:

- **Do not intentionally overdrive the amplifier at any time. When operating into a mismatched load, take special precautions so that the input cable cannot be inadvertently overdriven.**
- **When connecting and disconnecting cables, turn the power switch off. 25 watts of RF power is sufficient to cause serious electrical shock and/or burns.**
- **Care must be taken to prevent restrictions of the cooling fan air inlet opening on the bottom of the unit. Restriction of the opening for extended periods will cause overheating of the unit and possible premature failure.**

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2.2 AMPLIFIER OPERATION

Figure 2.1 shows the Model 25A250A Amplifier in pictorial form.

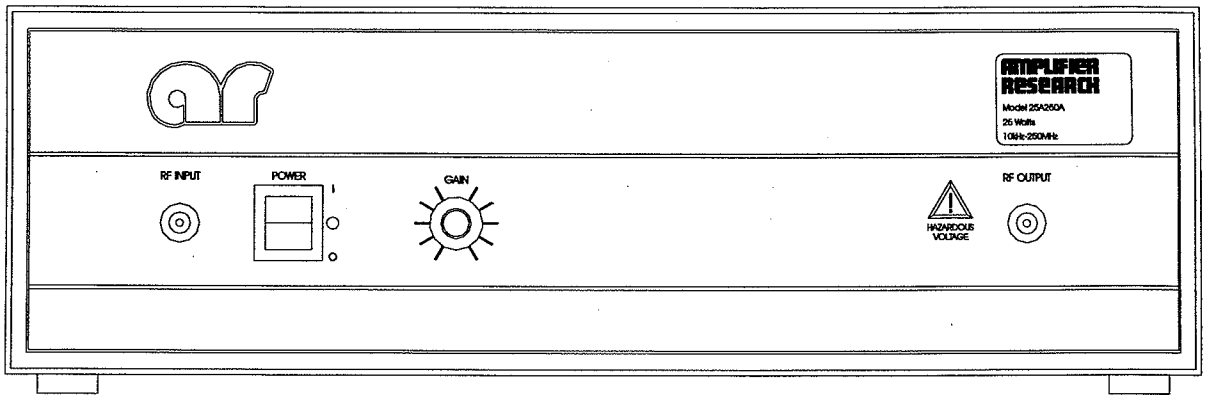


Figure 2-1. Amplifier Operation

1. Connect the AC power to the unit.
2. Connect input signal to INPUT connector.
3. Connect load to OUTPUT connector.
4. Set gain control fully counter clockwise.
5. Activate power switch to on (1) position. A GREEN indicator light mounted on the front panel will light when power is applied.
6. Adjust gain control as required.

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3. THEORY OF OPERATION

3.1 INTRODUCTION

The Model 25A250A Amplifier consists essentially of three (3) cascaded stages followed by a push-pull stage of broadband Mosfet transistor amplifiers. Total power gain of the amplifier is a minimum of 44 dB. Input and output matching networks are utilized to provide optimum power transfer of the RF signal when the amplifier is connected to a source and load impedance of 50 ohms. Inter-stage coupling is accomplished by means of capacitors between the three (3) cascaded stages and transformer coupling between these stages and the push-pull output stage. This provides an overall flat frequency response that is further enhanced by utilizing negative feedback around each transistor stage.

The self-contained power supply consists of a switching power supply, which features universal input voltage capability, followed by a current limiter circuit which provides over dissipation protection for the amplifier. Gate bias stability is provided by a three (3) terminal regulator set for 15 VDC.

3.2 AMPLIFIER SECTION

Refer to Schematic Diagram No. 10019450.

The input signal to the amplifier is fed through the front panel attenuator to the gate of Q1, which is input level limited by diodes CR2 and CR3. Biasing for Q1 is accomplished by R10 which drives the gate of Q1. Bias voltage for Q2 is adjusted via R6 through R11. Output of Q2 is coupled through C4 to the gate of Q3. Resistor R12 and capacitor C12 provide adjustments for bandpass response. The output of Q3 is coupled to transformer T1 which is utilized to drive push-pull stage Q4 and Q5. Resistor R22 sets bias voltages for both Q4 and Q5, in conjunction with R23 which is used to equalize the bias voltage on gates of Q4 and Q5.

The output of Q4 and Q5 are coupled through matching transformer T2 to coaxial connector on front panel of unit.

Power gain of each of the three (3) cascaded stages is approximately +11 dB and +13 dB for push-pull stage, giving an overall gain of better than +44 dB for the amplifier.

3.3 POWER SUPPLY

Refer to Schematic Diagrams No. 10019449 and 10019322.

The self-contained power supply employs a switching power supply with universal input line voltage capability. Input AC power is fed through RFI filter FL1 before being switched by the main power switch S1. FL1 also contains the line fuses that protect the unit against excessive line current. Power switch S1 supplies power to the switching power supply PS1. The approximately 29 VDC output of PS1 is fed to a current limiter circuit A3. A3 allows the voltage to the amplifier to be adjusted to 28 VDC and also allows the current limit to be set to approximately five (5) amps.

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4. MAINTENANCE

4.1 GENERAL MAINTENANCE INFORMATION

The Model 25A250A should require very little maintenance since it is a relatively simple instrument. It is built with etched circuit wiring and solid state devices which should ensure long, trouble-free life. However, should trouble occur special care must be taken in servicing to avoid damage to the devices or the etched circuit board.

Since the components are soldered in place, substitution of components should not be resorted to unless there is some indication that they are faulty. In addition, take care when troubleshooting not to short voltages across the amplifier. Small bias changed may ruin the amplifier due to excessive dissipation or transients.

Components with AR Worldwide instruments are conservatively operated to provide maximum instrument reliability. In spite of this, parts within an instrument may fail. Usually, the instrument must be immediately repaired with a minimum of "down time". A systematic approach can greatly simplify and thereby speed up the repair.

However, due to the importance of the amplifier's alignment, it is recommended that when failure is caused by breakdown of any of the components in the signal circuits, the amplifier be returned to the factory for part replacement and amplifier realignment. Shipping instructions are as follows:

Ship **PREPAID** via United Parcel Service to:

AR WORLDWIDE

160 SCHOOL HOUSE ROAD

SOUDERTON, PA 18964

See warranty statement at rear of manual.

4.2 COVER AND CIRCUIT BOARD REMOVAL

CAUTION:



Remove power cord from receptacle before servicing.

1. The amplifier can be removed from the housing by removing 4 screws from the front panel and 4 screws from the back panel. The amplifier can then be slid from the housing.

2. The top cover can be removed to gain access to the RF assembly. The bottom cover can be removed to gain access to the power supply assembly.

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4.3 TROUBLESHOOTING

CAUTION:



Extreme caution should be exercised when troubleshooting this unit. Hazardous voltages exist in the unit which could cause serious injury to any personnel performing internal measurements.

A good way to start troubleshooting is to check the supply voltage at the amplifier supply voltage terminal. If it is low or non-existent, check the power supply components starting with the AC line.

The power supply output voltage should be nominally +29.5 VDC. The output voltage of the current regulator assembly should be 28.0 VDC.

Assuming these voltages are correct, the problem may lie in the RF amplification chain. A re-alignment of the RF board should reveal the problem. Contact AR Worldwide for the appropriate alignment/test procedure.

CAUTION:



Beware of voltages applied to the gate of a Mosfet transistor in excess of ±20 V. This will result in transistor gate failure.

4.4 SERVICING ETCHED CIRCUIT BOARDS

When soldering leads, use a hot forty (40) watt or smaller iron. Apply heat sparingly to the leads, not to the printed wiring on the board. Before installing new parts, clean holes to receive new part without forcing. Have new leads tinned to receive solder quickly with a minimum of heat and without residue.

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WARRANTIES: LIMITATION OF LIABILITY

Seller warrants (i) that seller has title to the goods sold and (ii) that Amplifiers (all parts excluding traveling wave and vacuum tubes), Antennas, Pre-compliance Test Systems, Transient Generators, Power Meters, Directional Couplers, Field Monitoring Equipment, Conducted Immunity Generators, Signal Generators and Tripods will be free from defects in material and workmanship for a period of three (3) years from date of shipment shown on AR RF/Microwave Instrumentation invoice. Traveling Wave Tubes in the 200T1G3A, 200T2G8A, 200T8G18A, 250T1G3 and 250T8G18 will be free from defects in material and workmanship for a period of two (2) years from date of shipment. Vacuum tubes in the 'L' series amplifiers, other traveling-wave tubes in models not previously listed and power heads will be free from defects in material and workmanship for a period of one (1) year. Contact AR RF/Microwave Instrumentation for warranty information regarding items not listed. Seller's sole responsibility in fulfilling these warranties shall be to repair or replace any goods which do not conform to the foregoing warranties or, at seller's option, to give buyer credit for defective goods. The warranty is valid only when used in the country specified at time of order. Warranty service must be obtained from the repair facility designated at that time. If warranty service is not available in the country where the equipment is to be used, it must be returned to AR RF/Microwave Instrumentation. Warranty service will be provided only for defective goods which are returned within the warranty period, freight costs prepaid to AR RF/Microwave Instrumentation or its designated repair facility.

There are no other warranties, express or implied, including any warranty of merchantability or fitness. Seller shall not be responsible for any incidental or consequential damages arising from any breach of warranty.

No person other than an officer of Amplifier Research Corporation, has any authority to bind seller to any affirmation, representation or warranty except as specifically included in the preceding terms and conditions.

REV0108

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Production Test Procedure

Saturated Power

The signal generator is set to a level of 0dBm, and output power is measured by the power meter across the frequency range and recorded on the graph. Power must be above the minimum level specified on the spec sheet.

Linear Power

An automated procedure searches for the power at which a 10dB decrease in input results in a 9dB decrease in output for 1dB compression, and a 7dB decrease in output for 3dB compression. When these points are found, the output power is measured by the power meter and recorded on the graph. This procedure is repeated across the frequency range. Power must be above the level specified on the spec sheet for both 1 dB and 3dB compression. Please note that the action of the amplifier's forward power protection circuit might cause 1dB and 3dB compression to occur at the same power level, viz. the set point of the protection circuit.

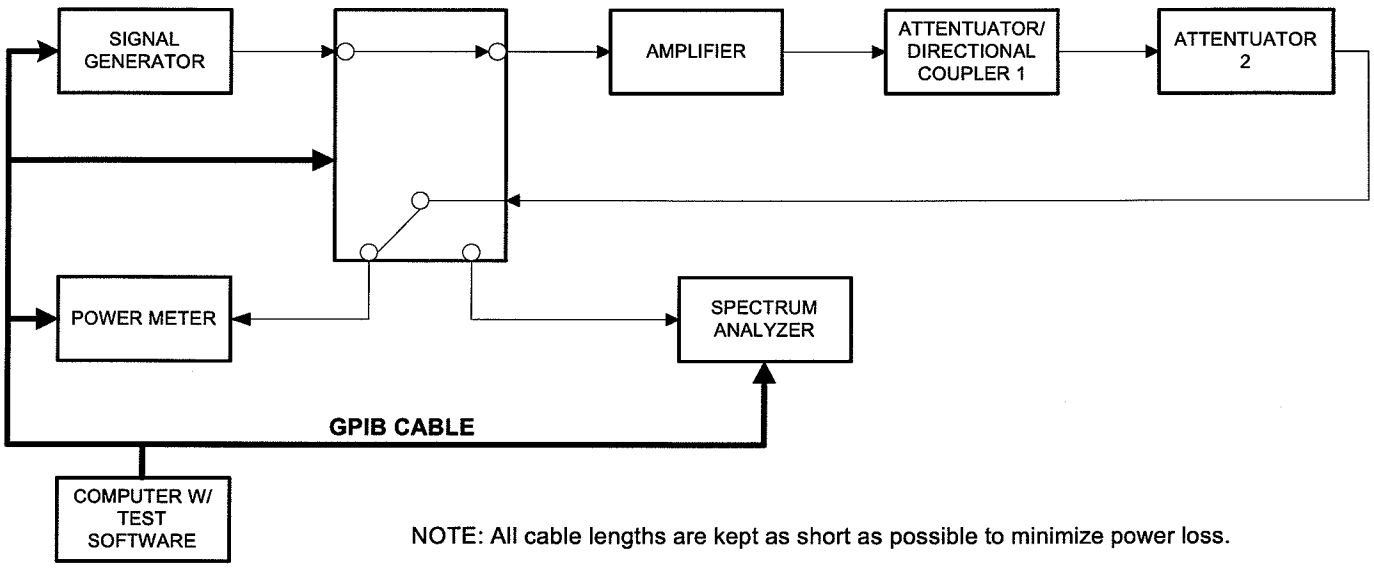
Gain Flatness

Power input level is set to -20dBm. The output power is then read across the frequency range. The results are plotted on a graph in dB. The difference between max and min gain must not exceed the value listed on the spec sheet under flatness.

Harmonics Test

Output power is set to the level listed on the spec sheet using a power meter. The amplitude of this carrier frequency is measured by the spectrum analyzer in dBm. The second and third harmonics are then measured and subtracted from the fundamental. These measurements are represented as negative numbers on the graph to show that they are below the fundamental. Both the second and third harmonic must be below the carrier as specified on the spec sheet.

DIAGRAM OF TEST SETUP



NOTE: All cable lengths are kept as short as possible to minimize power loss.

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MODEL

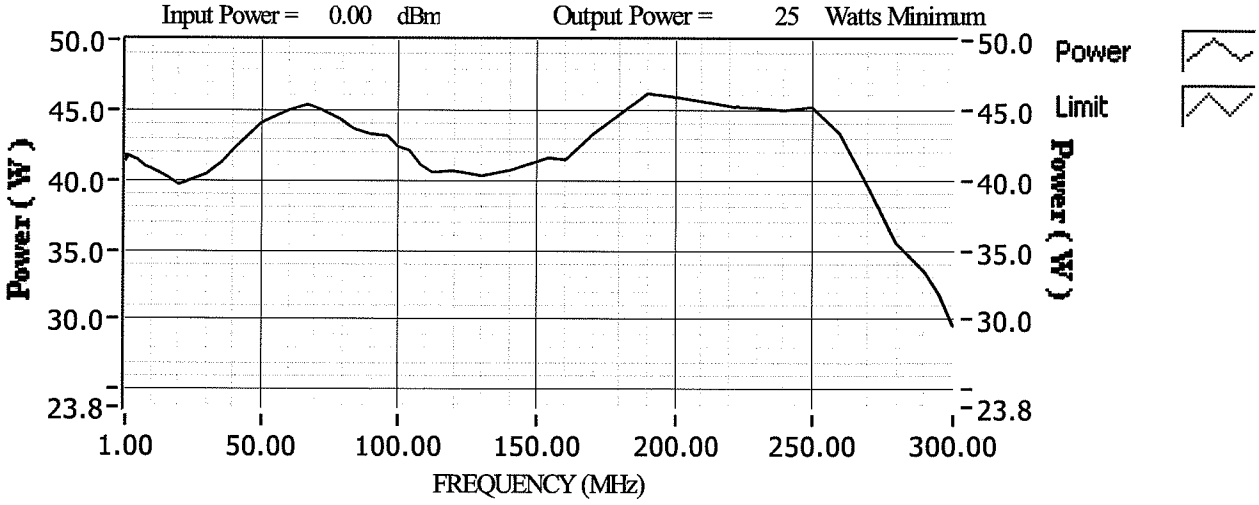
25A250AM6

FINAL DATA

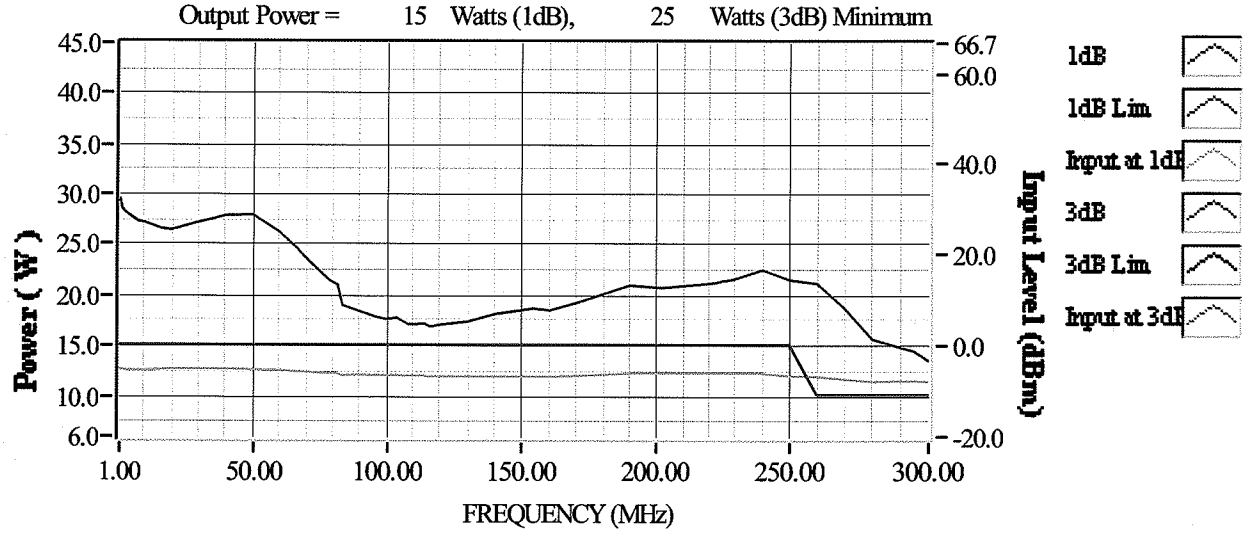
Serial Number : 328411 Test Conducted By : MJH

System ID : MOBY4 Date : Apr 04, 2008 11:52 AM

CW Power



Compressed Power



Signal Generator Serial Number : 1585

Power Meter Serial Number : 2091

Spectrum Analyzer Serial Number : 2095

Test Program Revision : 040208

Att. #1 S/N & Cal Date : AT2275-H, Fri, Feb 22, 2008

Att. #2 S/N & Cal Date :

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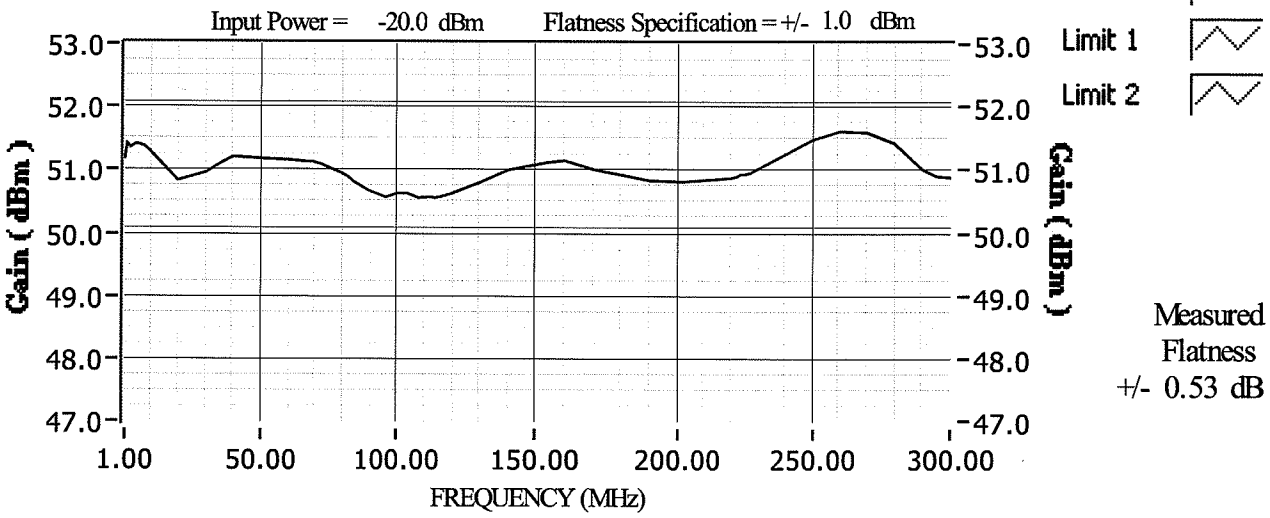
MODEL
25A250AM6

Serial Number : 328411 Test Conducted By : MJH

System ID : MOBY4 Date : Apr 04, 2008 11:52 AM

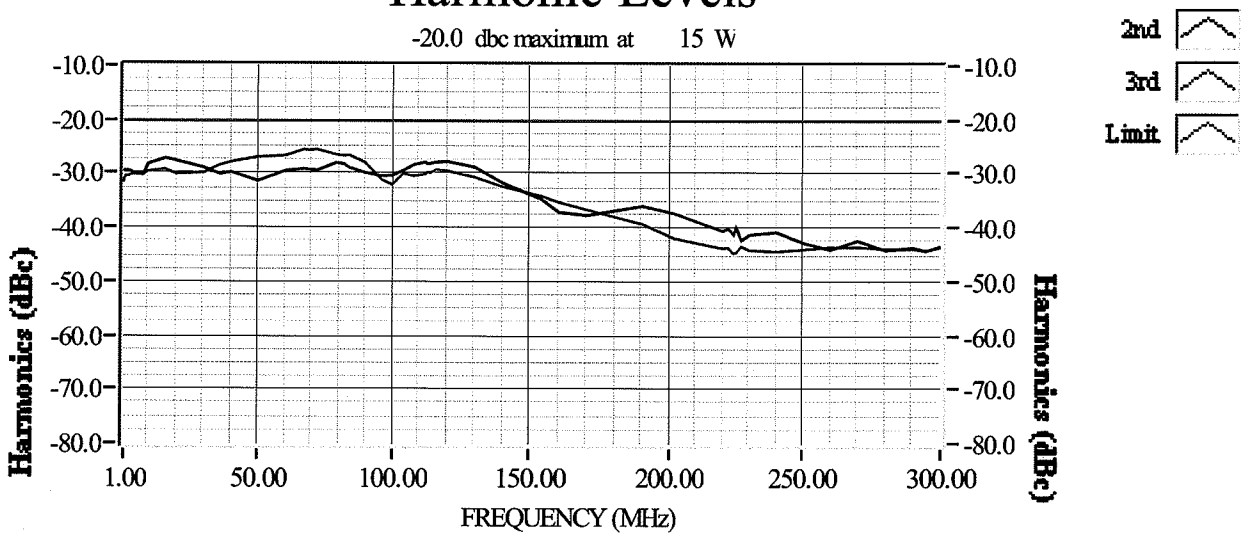
FINAL DATA

Gain Flatness



Measured Flatness +/- 0.53 dB

Harmonic Levels



OPEN TEST	■	PASSED
STABILITY TEST	■	PASSED
VSWR TEST	■	PASSED

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SELECT IN TEST INFORMATION

MODEL 25A250AM6 S/N 328411 TECH MJH DATE Apr 04, 2008 11:52 AM

Documentation Ref 1	Description of Item/Assy 1	Description of Changes 1 (Limit text to window size.)
NO CHANGES!	NO CHANGES!	NO CHANGES!
Documentation Ref 2	Description of Item/Assy 2	Description of Changes 2
Documentation Ref 3	Description of Item/Assy 3	Description of Changes 3
Documentation Ref 4	Description of Item/Assy 4	Description of Changes 4
Documentation Ref 5	Description of Item/Assy 5	Description of Changes 5

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AR RF/Microwave Instrumentation
In compliance to IEC 1010-1
Safety requirements of electrical equipment for laboratory use
Annex K

ROUTINE TESTS

Model	:	**25A250AM6**
Serial No.	:	**328411**
Date	:	**Apr 04, 2008 11:52 AM**
Inspected By	:	**MJH**

Tests: For equipment with working voltage up to 300 V

Protective earth resistance	Limit	
Apply 25 amps between protective terminal and **accessible** parts. Record resistance.	<= 0.1 ohms	**.06**

Mains circuit insulation	(Check one)	(X)
Apply voltage from the mains input to chassis for a period of time greater than two (2) seconds. No arcing or breakdown should occur.	1350 VAC	
	1900 VDC	**X**

Floating input terminals	Record Voltage	(X)
Apply 1.5 times working voltage to floating input terminals, where applicable. No arcing or breakdown should occur.	**N/A**	

Form 405 Rev0108

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