

# Operating and Service Manual

5S1G4

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Model

1007385-501

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Part Number

25110

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Serial Number



# *EC Declaration of Conformity*

We; Amplifier Research  
160 School House Road  
Souderton, Pa. 18964

declare that as of 1997, our product(s);

the Model 5S1G4 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 1010-1 : 1990 + A1, A2

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



Donald R. Shepherd  
President



# Instructions for European EMC Conformity



It is the responsibility of the user of this equipment to provide electromagnetic shielding, filtering and isolation which is necessary for EMC compliance to Directive 89/336/EEC. The equipment must therefore be operated in a shielded area which provides a sufficient level of attenuation to meet the radiated emissions and immunity specifications. All AC, DC and Control lines connected to the equipment and entering or exiting the shielded area must have sufficient isolation to meet the conducted emissions and immunity specifications. The following minimum levels are suggested for use in accordance with the rated power of the equipment.

Rated Power	Minimum shielding attenuation	Minimum line isolation
100 watts	50 dB	50 dB
101 - 1000 watts	60 dB	60 dB
1001 - 10,000 watts	70 dB	70 dB

Since this equipment is designed to generate high levels of Radio Frequency energy, it is also essential that the user read and follow the Instructions for Safe Operation in this manual. If other equipment is operated in the shielded room it may be disturbed by the amplifier.



Der Benutzer dieses Gerätes ist dafür verantwortlich, daß die elektromagnetische Abschirmung und Filterung gewährleistet ist, welche gemäß Richtlinie 89/336/EEC notwendig ist. Das Gerät muß deshalb in einem geschirmten Raum betrieben werden, welcher eine ausreichenden Schirmung bietet, um die Emissions- und Störfestigkeitsspezifikation einzuhalten. Alle Wechsel- und Gleichspannungsleitungen sowie Steuerleitungen, die mit dem Gerät verbunden sind und in den geschirmten Raum von außen hereingeführt werden, müssen ausreichend gefiltert sein, um die Emissionsspezifikation einzuhalten. Es werden folgenden Minimalwerte der Schirmdämpfung und Filterung in den unterschiedlichen Leistungsklassen empfohlen.

Hochfrequenzleistung	min. Schirmdämpfung	min Filterdämpfung
100 Watt	50 dB	50 dB
101-1000 Watt	60 dB	60 dB
1001-10.000 Watt	70 dB	70 dB

Falls andere elektrische oder elektronische Geräte gleichzeitig mit dem Gerät betrieben werden, kann es zu Beeinflussungen kommen. Da das Gerät zur Erzeugung von Hochfrequenzenergie dient ist es daher auch unbedingt notwendig, daß der Benutzer die Sicherheitsvorschriften in der Bedienungsanleitung liest und einhält.



Il est de la responsabilité de l'utilisateur de cet équipement d'assurer la protection électromagnétique, le filtrage et l'isolation nécessaires, afin de se conformer à la directive 89/336/EEC concernant la C.E.M. Par conséquent, cet équipement doit être mis en fonctionnement dans une enceinte d'atténuation suffisante pour satisfaire aux spécifications d'émissivité et de susceptibilité. Toutes les alimentations alternatives, continues ainsi que les liaisons de contrôle connectées à cet équipement, qui entrent ou sortent de cette enceinte doivent avoir une isolation suffisante pour satisfaire aux spécifications concernant les émissions conduites et d'immunité. Pour une utilisation conforme, les niveaux d'atténuation minimums suivants sont suggérés en fonction de la puissance de sortie de l'équipement:

Puissance de sortie	Atténuation minimum de l'enceinte	Isolation minimum de la ligne
100 Watts	50 dB	50 dB
101 à 1.000 Watts	60 dB	60 dB
1.001 à 10.000 Watts	70 dB	70 dB

Puisque cet équipement est destiné à générer de forts niveaux R.F., il est essentiel que l'utilisateur se conforme aux instructions de sécurité indiquées dans ce manuel. Tout autre équipement en fonctionnement dans la cage de Faraday peut-être perturbé par l'amplificateur.





# 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  $\pm 10\%$  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**

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## **1.1 GENERAL DESCRIPTION**

The Model 5S1G4 is a self-contained, broadband Amplifier designed for laboratory applications where instantaneous bandwidth, high gain and moderate power output are required. A gain control, located on the front panel, can be used to decrease the amplifier gain by 10dB or more. Solid state technology is used exclusively to offer significant advantages in reliability and cost. A Model 5S1G4, used with a frequency swept signal source, will provide 5 watts of swept power output from 0.8 to 4.2GHz. Typical applications include antenna and component testing, wattmeter calibration, EMI susceptibility testing, use as a driver for frequency multipliers and high power amplifiers.

## **1.2 POWER SUPPLIES**

The 5S1G4 contains a switching Power Supply. The input voltage range to the supply is 90-132 or 180-264 VAC, 50/60Hz, selected automatically. The operator does not have to switch or change anything on the 5S1G4 when changing the AC input voltage. The AC power consumption is 150 watts nominal. Primary AC circuit fusing is provided.

## **1.3 SPECIFICATIONS**

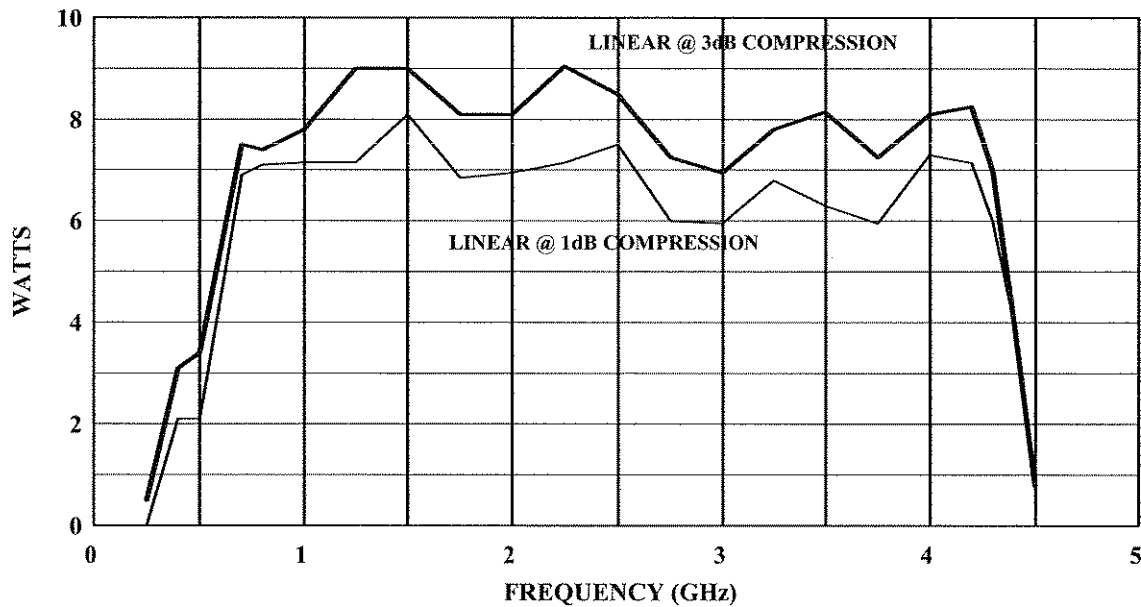
Refer to the Amplifier Research Data Sheet at the end of this section for detailed specifications.



**MODEL 5S1G4**  
**M1, M2, M3, M4, M5**  
**5 WATTS CW**  
**0.8 – 4.2GHZ**

The Model 5S1G4 is a solid state, self-contained, air-cooled, broadband amplifier designed for applications where instantaneous bandwidth and high gain are required. Housed in a stylish contemporary cabinet, the unit is designed for benchtop use, but can be removed from the cabinet for immediate equipment rack mounting. The 5S1G4, when used with a sweep generator, will provide a minimum of 5 watts of RF power. Included is a front panel gain control which permits the operator to conveniently set the desired output level. The 5S1G4 is protected from RF input overdrive by an RF input leveling circuit which controls the RF input level to the RF amplifier first stage when the RF input level is increased above 0 dBm. The RF Amplifier stages are protected from over temperature by removing the DC voltage to them if an over temperature condition occurs due to cooling blockage or fan failure. There is a fault lamp on the rear panel to indicate an over temperature or power supply fault condition. The unit can be returned to operate when the condition has been cleared.

**5S1G4 TYPICAL POWER OUTPUT**



**SPECIFICATIONS**  
**Model 5S1G4**

RATED POWER OUTPUT .....	6.5 watts minimum
INPUT FOR RATED OUTPUT .....	1.0 milliwatt maximum
POWER OUTPUT @ 3 dB COMPRESSION	
Nominal .....	8 watts
Minimum .....	6.5 watts
POWER OUTPUT @ 1 dB COMPRESSION	
Nominal .....	7 watts
Minimum .....	5 watts
FLATNESS .....	±1.5 dB typical ±2.0 dB maximum
FREQUENCY RESPONSE .....	0.8 -4.2 GHz instantaneously
INPUT FOR RATED OUTPUT .....	1.0 milliwatt maximum
GAIN (at maximum setting) .....	37 dB minimum
GAIN ADJUSTMENT (Continuous Range) .....	10 dB minimum
INPUT IMPEDANCE .....	50 ohms, VSWR 2.0:1 maximum
OUTPUT IMPEDANCE .....	50 ohms, nominal
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
HARMONIC DISTORTION .....	Minus 20 dBc maximum at 5 watts
THIRD ORDER INTERCEPT POINT .....	49 dBm typical
PRIMARY POWER (Selected Automatically) .....	90-132, 180-264 VAC 50/60 Hz, single phase 150 watts maximum
COOLING .....	Forced air (self contained fans)

\* See Application Note #27

**MODEL CONFIGURATIONS**

Model Number	RF Input	RF Output	Weight	Size (W x H x D)
5S1G4	Type N female Front Panel	Type N female Front Panel	17.2 Kg (38.0 lb)	50.3 x 15.5 x 30 cm 19.8 x 6.1 x 11.8 in
5S1G4M1	See Individual Specification Sheet			
5S1G4M2	Same as 5S1G4 with enclosure removed for rack mounting		12.2 Kg (27.0 lb)	48.3 x 13.3 x 28.7 cm 19.0 x 5.25 x 11.3 cm
5S1G4M3	Same as 5S1G4M4 with enclosure removed for rack mounting		12.2 Kg (27.0 lb)	48.3 x 13.3 x 28.7 cm 19.0 x 5.25 x 11.3 in
5S1G4M4	Type N female Rear Panel	Type N female Rear Panel	17.2 Kg (38.0 lb)	50.3 x 15.5 x 30 cm 19.8 x 6.1 x 11.8 in
5S1G4M5	Includes IEEE-488 and RS-232 Interface (see individual specification sheet).			

## 2. OPERATING INSTRUCTIONS

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### 2.1 GENERAL

Operation of the Model 5S1G4 broadband amplifier is simple. The input signal, whether swept or fixed in frequency, is fed into 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. In the event of a unit malfunction, protection is provided by fusing located in the AC input receptacle. 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 5S1G4 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, without damage, RF input power up to twenty (20) times its rated input of 1mW. However, signal levels higher than 20mW or transients with high peak voltages can damage the amplifier. Also, accidental connection of the 5S1G4 output to the input causes oscillations which will permanently damage the input circuitry.**

**CAUTION:**



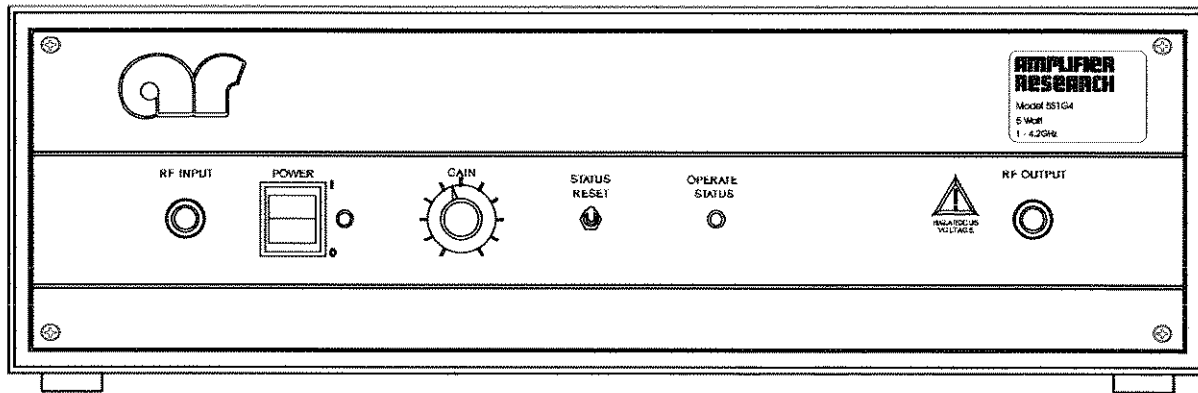
**Although designed for overdrive and load tolerance described above, subjecting the amplifier to these conditions simultaneously can cause failure of the output transistor. Repeated failures of this nature will not be covered under warranty.**

The 5S1G4 Amplifier is protected from input overdrive by an automatic level control circuit that will limit the maximum RF level to the first gain stage (Q1) of the RF Amplifier to approximately 0dBm. The 5S1G4 RF power transistors are protected from over temperature, by sensing the heat sink temperature near the RF output transistors. In the event of a cooling fan failure or an airflow blockage the DC voltage will be removed from the RF stages, when the heat sink temperature reaches approximately 70°C.

The operate LED, located on the front panel will change in color from Green (normal) to Red (fault) and the temperature fault LED located on the rear panel will light when the heat sink temperature is above 70°C. Normal operation can be resumed after the heat sink temperature drops below 70° C by resetting the 5S1G4.

## 2.2 AMPLIFIER OPERATION

The following figure shows the Model 5S1G4 Amplifier in pictorial form.



Turn On Sequence:

1. Connect input signal to **INPUT** connector. The input signal level should be 0dBm maximum.
2. Connect load to **OUTPUT** connector.
3. Activate power switch to ON (1) position. A green indicator light located next to the power switch will light when power is applied.



## **3. THEORY OF OPERATION**

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### **3.1 INTRODUCTION**

The Model 5S1G4 RF amplifier consists of a 0.8-4.2GHz RF amplifier located on the heat sink and a Power Supply/Fault circuit on a chassis assembly located on a chassis opposite the heat sink. The RF assembly is accessible thru the top of the unit. The Power Supply and Fault Detect are accessible thru the bottom of the unit.

The RF section consists of a variable gain amp/detector, a linearizer/control circuit, a one (1) watt amplifier, a bias control circuit, and a quadrature-coupled amplifier.

The Power Supply section consists of an AC input filter with fusing, AC Power Switch, a plus and minus 24V power Supply and a Regulator/Fault detect circuit.

### **3.2 RF AMPLIFIER OPERATION**

#### **3.2.1 A1 Variable Gain Amp (Schematic No. 1012338 Part of Schematic 1012408)**

The RF input signal is fed to the variable gain amplifier RF attenuator U1. U1 is a GaAs FET attenuator. DC signals between approximately 0.5 to -2.0V are used to control the shunt and series legs of the attenuator. This attenuator is used for manual gain control using the Front Panel Gain Control and to attenuate RF input signals above 0dBm, using internal voltages.

LC networks C2, L1, C3 and L2 form high pass filters used to attenuate low frequency signals.

Transistor Q1 is a GaAs FET and is the first stage of gain in the amplifier. Transistor A3Q1 in the A3 Linearizer Control Circuit controls the drain current thru FET Q1. The output of the A1 is fed to the input of the Wilkinson Two-Way Splitter.

The Wilkinson Two-Way Splitter splits the signal into two paths. One output is fed to the input of the A4 One (1)-Watt Amplifier. The other output is fed to a detector that is terminated in 50Ω. The detected output is fed to the A3 Linearizer Control Circuit.

#### **3.2.2 A3 Linearizer Control Circuit (Schematic 1012335 Part of Schematic 1012408)**

IC U1A provides a DC signal to the series element of the A1U1 attenuator. The A1U1 has minimum attenuation when the control signal is at approximately -12.5VDC with maximum attenuation (minimum gain) occurring with 0VDC on the control input.

NPN transistors Q2, Q3 and Q4 are used to provide break points in the series control voltage to the A1U1 RF attenuator, providing a more linear gain control/attenuation characteristic.

PNP transistor Q1 is used to control the drain current of GaAs FET A1Q1 by varying the A1Q1 gate voltage. A reference voltage is provided at the base of Q1 by voltage dividers R25 and R26. The drain current of the RF FET (A1Q1) flows thru R27 (220Ω 1 watt). PNP transistor Q1 varies the gate voltage to the RF FET A1Q1 to maintain the correct drain current.

IC U2A amplifies the detected signal from A2CR1. I.C. U2B is a comparator, its normal output is approximately -12.5 VDC. When the RF input signal to the A1 variable gain amplifier is increased above approximately 1mw (0dBm), the voltage output from U2B will become less negative. This voltage is fed to the gain control on the front panel of the amplifier. The wiper of the gain control is connected to the control input of U1A of the Linearizer/Control Circuit. The amplifier has maximum gain at approximately -12.5 VDC control input. Minimum gain occurs at 0 VDC. The attenuation of A1U1 will increase as the output of A3U2B varies from -12.5V toward 0 volts. This will help to protect the unit in the event of input overdrive.

### **3.2.3 A4 One (1) Watt Amplifier (Schematic 1010591 Part of Schematic 1012011)**

The one (1) watt amplifier is assembled on a teflon/glass P.C. board using microstrip techniques. The one (1) watt amp has three (3) GaAs FET gain stages. Each stage is input and output DC isolated from the other stage with coupling capacitors. Resistive feedback is used from the drain to the gate of the GaAs FET to decrease the low frequency gain. Shunt capacitive stubs are used to tune the amplifier. The drain of Q4 is matched to the output using a tapered transformer.

The GaAs FET transistors are operated in a depletion mode. They will conduct the maximum DC current with 0VDC bias on their gates and are normally operated with between approximately -1 to -4 VDC on their gates.

### **3.2.4 A5 Bias Control (Schematic 1011214 Part of Schematic 1012011)**

The bias control circuit controls the DC drain current of the three (3) FET stages in the A4 one (1) watt amplifier by varying the gate voltage of the RF stages.

The bias control has a -5 VDC input and a +20 VDC input from the power supply.

All of the bias control stages operate in a similar manner therefore only the operation of Q4 will be described.

PNP transistor Q4 (2N3906) is used to control the DC current thru A4Q3 FET in the one (1) watt amplifier. A reference voltage of 8.2 VDC is established on the base of Q4 with the voltage divider network R7 (4.7K) and R12 (3.3K). There is a 25Ω resistor from the 20VDC line to the emitter of Q4 and also to the drain of A4Q4 in the one (1) watt amplifier. Q4 will operate normally with approximately 8.8V on the emitter, this will occur with approximately 440ma thru the 25Ω resistor R8. If the current thru A4Q4 decreases the drop across R8 will decrease increasing the emitter voltage of Q4, this will cause Q4 to conduct more which will cause the gate voltage of A4Q4 to go more positive, which will cause A4Q4 to conduct more returning the voltage at the emitter of Q4 to 8.8V.

### **3.2.5 Quadrature-Coupled Amplifiers (“Quad Amps”) (Schematic No. 1011064)**

IC U1 is a voltage regulator set to 13.5V output with a current limit of approximately 2.2 amps. Q1 turns off the voltage regulator when the -5V supply voltage falls below approximately -3.5V. PNP transistors Q2 and Q5 regulate the DC current through Q3 and Q4, respectively, by sensing the voltage drop across 2.7Ω resistors R5 and R16 and varying the negative voltage on the gates of Q3 and Q4, thereby maintaining the drain current at approximately 1 amp. The DC operation of Q3 and Q4 can be checked on test points TP1 and TP2 without removing the unit's lid. The normal voltage on TP1 and TP2 without RF drive is 10.9 ±0.4V.

U2 and U3 are 90° quadrature couplers. U2 splits the input signal into two signals with a phase difference of 90°. U3 combines the RF outputs from Q3 and Q4 and is connected to the output connector J2. 50Ω termination resistors R17 and R18 absorb any difference signals and help to improve the input and output VSWR of the module. The module has a gain of 7.5dB or greater and delivers 5 watts or greater of RF power.

### **3.3 POWER SUPPLY (SCHEMATIC 1007413)**

Power supply PS1 supplies +24VDC and -24VDC to the A7 Regulator/Fault board. PS1 is a switching regulator with auto-ranging to select the correct connections for the line voltage in use either the 90-132 or the 180-264 VAC input ranges, 50 to 60Hz.

#### **3.3.1 A7 Regulator/Fault Board (Schematic 1007397)**

IC U1 is a variable voltage regulator normally set to 20 VDC output voltage. This regulator supplies drain current to the one (1) watt and 5 watt amplifiers. Transistor Q2 is used to inhibit the output of U1 if either the negative 5V is absent or there is an over temperature condition on the RF heat sink. U1 is turned off when Q2 is conducting. Transistor Q1 is a boost transistor which supplies load current from the 20V supply in excess of approximately 1.5 amps.

IC U2 is a 15V fixed regulator which supplies voltage to power the logic, on the Regulator/Fault board, and also the Linearizer/Control Circuit.

IC U6 is a fixed negative 5 volt regulator. The negative 5 volts is used to bias the RF GaAs FET's in the one (1) watt amplifier, and the 5 watt amplifier.

IC U7 is a fixed negative 15V regulator. The negative 15V is used in the Linearizer/Control Circuit.

IC U5 is used as a voltage comparator. It will provide a high signal if the output of the negative 5 volt supply is low or absent.

IC U3A, B and D form a latch and hold circuit used to sense a Thermal Fault on the RF heat sink. A Thermal Fault will cause the 20V supply to turn off, and will light the Red Thermal LED on the rear panel and cause the operate status lamp to turn from Green to Red. This circuit can be reset when the Thermal fault has been cleared.

IC U4 A, B and D form a latch and hold circuit which will hold a 5 volt supply fault, causing the 20 V supply to turn off, lighting the Red Voltage Fault LED on the rear panel, and cause the Operate status LED to turn from Green to Red. The latch and hold circuit can be reset if the negative 5 volt fault is corrected.

Transistor Q3 turns on momentarily resetting the latch and hold circuits at unit power up.



## 4. MAINTENANCE

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### 4.1 GENERAL MAINTENANCE INFORMATION

The Model 5S1G4 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 changes may ruin the amplifier due to excessive dissipation or transients.

Components in Amplifier Research 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:

Amplifier Research Corporation  
160 School House Road  
Souderton, PA 18964

### 4.2 DISASSEMBLY PROCEDURE



#### CAUTION:

**Extreme caution should be exercised when troubleshooting this unit. Particularly when measuring voltages in the power supply section of the unit as hazardous voltages do exist in the unit which could cause serious injury to any personnel performing the measurements.**

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. The top cover can be removed to gain access to the RF assemblies. The bottom cover can be removed to gain access to the power supplies.

## 4.3 TROUBLESHOOTING



### CAUTION:

The RF transistors used in the 5S1G4 amplifier are GaAs FET's. These devices are very reliable when installed in a suitable circuit but can be easily damaged with improper troubleshooting or handling techniques. The gate junctions of the GaAs FET's have a high input impedance and are susceptible to static damage or damage due to an ungrounded soldering iron. Do not try to check FETS with an ohmmeter. Use caution when troubleshooting. Do not short the gate to ground or to the drains.



### CAUTION:

Use care when unpacking new FETs. The FET packaging should only be opened at static approved work stations, by individuals familiar with the handling of static sensitive RF GaAs FET's.

Troubleshooting the 5S1G4 in a logical manner can speed the problem to a solution. The settings of pots, capacitors or other variables should not be disturbed until other problems have been eliminated. Many problems can be solved by comparing the measured DC voltage to those shown on the schematics. Before measuring circuit voltages, first verify that the voltage to the circuits are correct.

Model 5S1G4 troubleshooting symptoms and remedies are described in the sections that follow:

- Section 4.4-Power Indicator LED Doesn't Light
- Section 4.5-Thermal Fault
- Section 4.6-Voltage Fault
- Section 4.7-Fault Indications Normal - Low or No RF Power Output

## 4.4 GREEN POWER INDICATOR LED DOESN'T LIGHT

Refer to Schematic Number 1007413

1. If the cooling fan is running the power on indicator LED is defective or there is a wiring problem.
2. If the fan is not running, check to see that the 5S1G4 is plugged into a live outlet. Check the line cord, is the line cord plugged into the 5S1G4 completely?
3. Check the AC fuse located in the AC receptacle on the rear panel.
4. Check the output voltage from PS1, it should be 24 VDC

No output, check:

- Check the AC input to PS1. The AC input should be equal to the AC Line Voltage. If there isn't any AC input, the power switch could be defective or there could be an open in the wiring or other component.
- Remove the output connector from PS1, recheck the D.C. output voltage, if voltage is present without load, there may be a short on the output of PS1

## 4.5 THERMAL FAULT

The Operate Status LED on the front panel is Red and the Thermal Fault LED on the rear panel is lit. Try to reset the 5S1G4. If the unit does not reset check:

1. Check for blockage of the air inlets on the bottom of the unit.
2. Check for blockage of the air outlets on the rear of the unit.
3. Is the fan running? There should be airflow from the rear panel.
4. If the above are okay and the unit is not overheated, check the Thermal switch on the RF heat sink. The Thermal switch should be closed below 70°C.
5. Check for continuity from J1 Pin 5 on the Regulator/Fault board to GND, if okay, check the Thermal Fault circuit on the Regulator/Fault board.

## 4.6 VOLTAGE FAULT

The Operate Status LED on the front panel is Red and the Voltage Fault LED on the rear panel is lit. Try to reset the 5S1G4. If the unit does not reset check:

1. Check for -5V on TP3 (Pin J2-8) of the Regulator/Fault board.
2. If the -5V output is normal, check the operation of the voltage comparator (I.C. U5) and the latch and hold circuit (I.C. U4A, Band C) on the Regulator/Fault board.
3. If the -5V and the -15V are both low, check the operation of the -24V supply PS2.
4. If the -15V is okay but the -5V is low, check the -5V line for shorts to GND and the -5V regulator (I.C. U6) for proper operation.

## 4.7 LOW OR NO RF POWER OUTPUT

All indicators on the 5S1G4 are normal the power indicator is lit and the Operate Status is lit Green.

1. Check the position of the RF gain control.
2. Check the RF input power to the 5S1G4, is it the correct frequency range and amplitude.
3. Check the RF output connections, is it correctly connected to the load? Is the coax cable defective?
4. Check the following voltages on the Regulator/Fault board. If any of the voltages are out of tolerance, correct the problem before further troubleshooting.

TP1	+20V	±0.5V
TP2	+15V	±0.4V
TP3	-5V	±0.2V
TP4	-15V	±0.4V

5. If the voltages in Step 4.7.4 are correct, check the voltage to the Linearizer/Control Circuit (A1A3). Troubleshoot any incorrect voltages

J1 Pin 4	-15V	$\pm 0.4V$
J1 Pin 5	+15V	$\pm 0.4V$
J1 Pin 6	-12.5V	$\pm 1.5V$ (Gain control at maximum gain. Input signal less than -5dBm)

6. Check the voltage supplied to the A1A5 Bias Control Circuit. Troubleshoot any incorrect voltage.

J1 Pin 1	-5V	$\pm 0.2V$
J1 Pin 3	+20V	$\pm 0.5V$

7. Check the voltage on the feedthru caps of the A4 one (1) watt amplifier. Troubleshoot any incorrect voltage.

C3, C5 C7	-0.7V to -3.5V	
C4	+7.6V	$\pm 0.5V$
C6	+10.2	$\pm 0.5V$
C8	+10.2V	$\pm 0.5V$

8. Check the voltage on the feedthru caps of the A1A1 variable gain amplifier with the RF gain control at maximum gain. Troubleshoot any incorrect voltages.

C12	-0.7V to -3.5V	
C13	+4.3V	$\pm 0.5V$
C11	-0.1V	
C10	-1.5V	$\pm 0.5V$
C9	-4.0V	$\pm 1.0V$

9. Check the DC voltage on the feed thru caps on the A6 Quadrature Coupled Amplifier.

C1	$+20.0 \pm 0.3V$
C4	$-5.0 \pm 0.3V$

10. Check the voltages on TP1 (C21) and TP2 (C22) on the A6 Quadrature-Coupled Amplifier (Quad Amp). The voltage should be  $10.4 \pm 0.3V$ . If any of the voltages on TP1 and TP2 are low, check the voltages on C1 and C4 of that amplifier.

TP1, TP2	$10.9 \pm 0.3V$
----------	-----------------

11. If the overall gain is low the gain of the individual stages can be checked/ the gain of the A1 variable gain amp/detector should be approximately unity gain.

12. The gain of the A4 1 watt Amplifier should be 27dB or more.

13. The gain from the input of the A6 Quadrature Coupled Amplifier to the output connector on the front panel should be 7 dB or more.



## **WARRANTIES: LIMITATION OF LIABILITY**

Seller warrants (i) that seller has title to the goods sold and (ii) that Amplifiers, Antennas, Pre-compliance Test Systems, Transient Generators, Power Meters, Directional Couplers and Tripods will be free from defects in material and workmanship for a period of three (3) years from date of shipment shown on Amplifier Research invoice. Field Monitoring Equipment, Teseo Fiberoptic Systems and Traveling Wave Tubes in the 200T1G3A, 200T2G8A and 200T8G18A will be free from defects in material and workmanship for a period of two (2) years from date of shipment. Vacuum tubes, 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 Amplifier Research 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 Amplifier Research. Warranty service will be provided only for defective goods which are returned within the warranty period, freight costs prepaid to Amplifier Research 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.



## AMPLIFIER RESEARCH (AR)

12:49:53 29 NOV 2005

\* \* \* SINGLE LEVEL BILL OF MATERIAL LISTING \* \* \*

REPORT: E0056

PAGE: 1

BILL NO: 1007526-501M  
MDL,MODEL 5S1G4

REV: G U/M: EA DRAWING NO:

PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010 1007413	K	SCHEM DIAG,5S1G4	EA	REF	ARC-B\1007413	B
0020 1007385	-	ASSY DWG,MODEL 5S1G4,5 WATTS CW,800MHZ-4.2GHz	EA	REF	ARC-D\1007385	R(B)
0030 1007385-501	A	MODEL 5S1G4,5 WATTS CW,800MHZ-4.2GHz	EA	REF	ARC-D\1007385	BOM
0040 1007437	F	ASSY DWG,AMP ASSY	EA	REF	ARC-D\1007437	R(B)
0050 1007437-501	C	AMP ASSY	EA	REF	ARC-D\1007437	BOM
0060 1007438	F	ASSY DWG,PS ASSY	EA	REF	ARC-D\1007438	R(B)
0070 1007438-501	D	PS ASSY	EA	REF	ARC-D\1007438	BOM
0080 1007539	B	ASSY DWG,CTRL PNL ASSY	EA	REF	ARC-D\1007539	R(B)
0090 1007539-501	D	CTRL PNL ASSY	EA	REF	ARC-D\1007539	BOM
0100 1007397	-	SCHEM DIAG,REG/FAULT	EA	REF	ARC-B\1007397	B
0110 1007396	-	ASSY DWG,PWB ASSY,REG/FAULT	EA	REF	ARC-B\1007396	B
0120 1007396-501	A	PWB ASSY,REG/FAULT	EA	REF	ARC-B\1007396	BOM
1007743-501	A	HARNESS ASSY,MODEL 5S1G4	EA	REF		BOM
0140 1007672	F	SCHEM DIAG,RF AMP	EA	REF	ARC-B\1007672	B
0150 1007447	H	ASSY DWG,RF ASSY	EA	REF	ARC-D\1007447	R(B)
0160 1007447-501	P	RF ASSY	EA	REF	ARC-D\1007447	BOM
0170 1012408	B	SCHEM DIAG,VAR GAIN/PROT CIR	EA	REF	ARC-D\1012408	R(B)
0175 1012338	B	SCHEM DIAG,VARIABLE GAIN AMP/DET	EA	REF	ARC-D\1012338	R(B)
0180 1012337	E	ASSY DWG,VARIABLE GAIN/DET	EA	REF	ARC-D\1012337	R(B)
0190 1012337-501	C	PWB ASSY,VARIABLE GAIN AMP/DET	EA	REF	ARC-D\1012337	BOM
0200 1012335	C	SCHEM DIAG,LINERIZER/CTRL	EA	REF	ARC-D\1012335	R(B)
0220 1012334	-	ASSY DWG,LINERIZER/CTRL BD	EA	REF	ARC-B\1012334	B
0230 1012334-501	D	PWB ASSY,LINERIZER/CTRL BD	EA	REF	ARC-B\1012334	BOM
0235 1012011	-	SCHEM DIAG,BIAS CTRL	EA	REF	ARC-D\1012011	R(B)



BILL NO: 1007526-501M  
MDL,MODEL 5S1G4

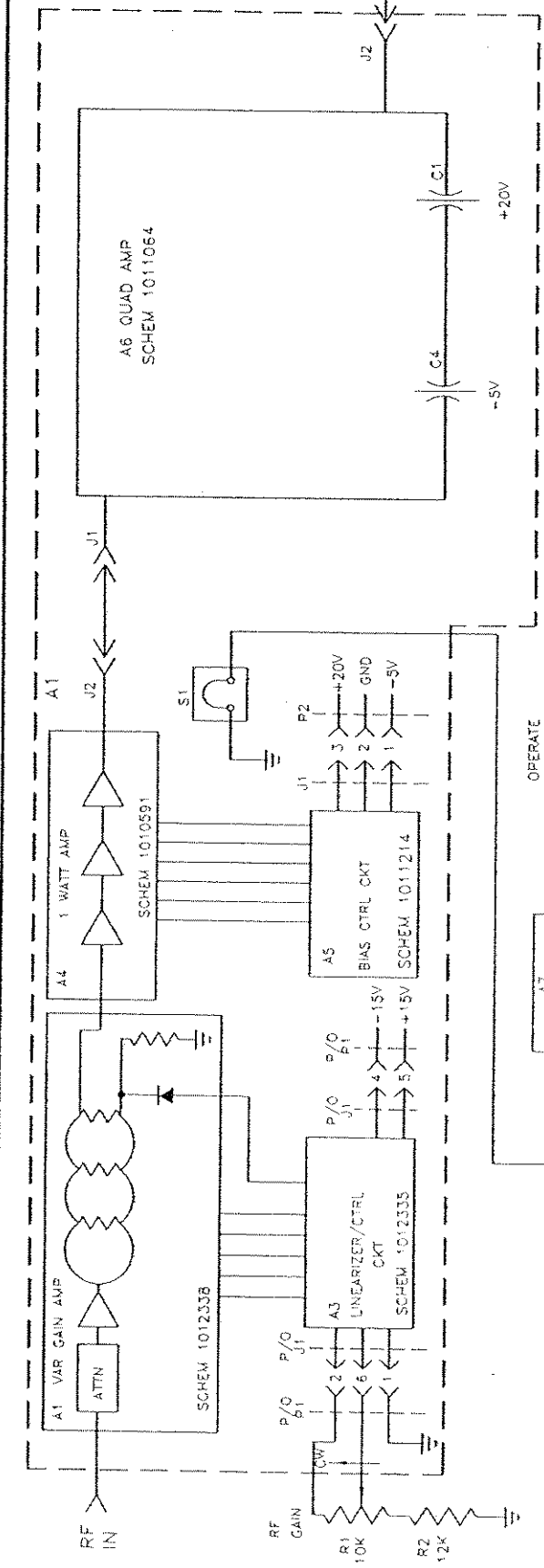
REV: G U/M: EA DRAWING NO:

PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0240 1010591	A	SCHEM DIAG,LOW LEVEL "S" MODULE	EA	REF	ARC-B\1010591	B
0250 1010589	F	ASSY DWG,LOW LEVEL "S" MODULE	EA	REF	ARC-C\1010589	R(A)
0260 1010589-501	C	PWB ASSY,LOW LEVEL "S" MODULE	EA	REF	ARC-C\1010589	BOM
0265 1011214	B	SCHEM DIAG,BIAS CONTROL,5S1G4	EA	REF	ARC-B\1011214	B
0270 1011248	-	ASSY DWG,BIAS CONTROL,1W S MODULE	EA	REF	ARC-B\1011248	B
0280 1011248-501	-	PWB ASSY,BIAS CONTROL,1W S MODULE	EA	REF	ARC-B\1011248	BOM
0290 1011064	A	SCHEM DIAG,QUAD AMP,200S1G4	EA	REF	ARC-D\1011064	R(B)
0310 1014377	-	ASSY DWG,PWB,QUAD AMP,4.2GHz	EA	REF	ARC-B\1014377	B
0320 1014377-501	-	PWB ASSY,QUAD COUPLED,AMP,0.8-4.2GHz	EA	REF	ARC-B\1014377	BOM

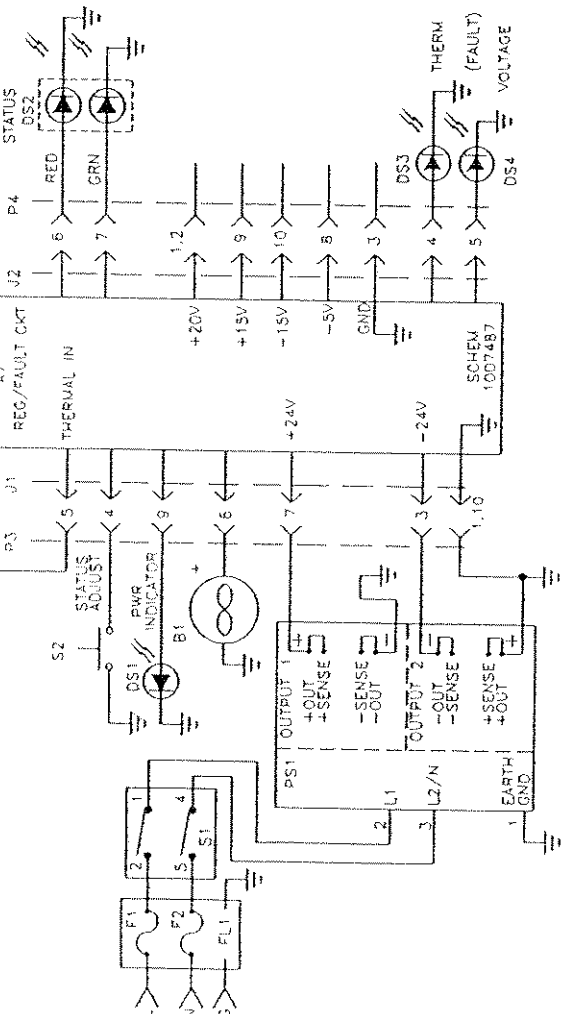




REV	DATE	BY
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2	18 MAR 95	A
3	18 MAR 95	B
4	18 MAR 95	C
5	18 MAR 95	D
6	18 MAR 95	E
7	18 MAR 95	F
8	18 MAR 95	G
9	18 MAR 95	H
10	18 MAR 95	I
11	18 MAR 95	J
12	18 MAR 95	K



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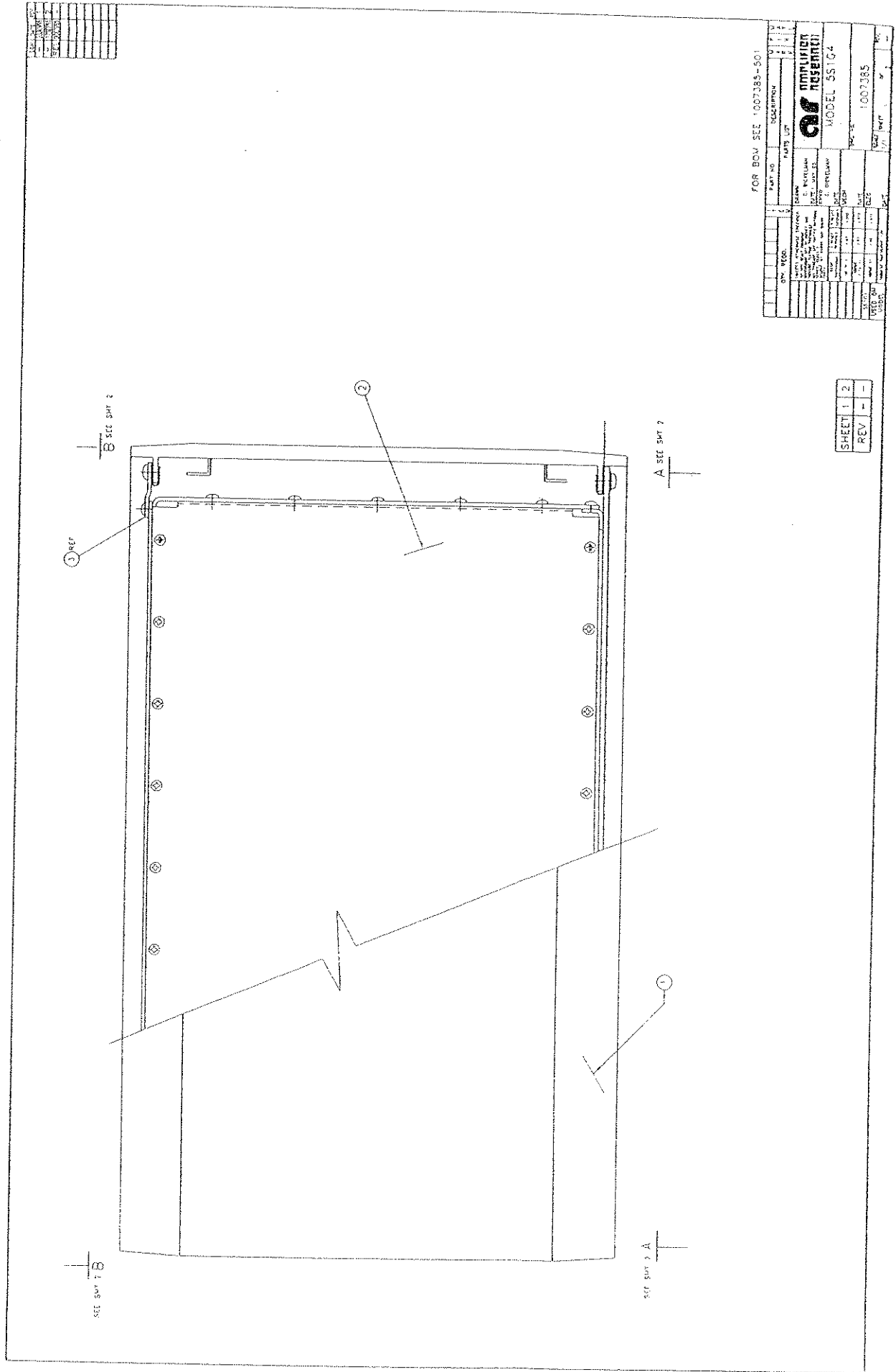
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PARTS LIST				
DRAWN C. BICKELMAN DATE 17 MAR 95				
CHKD C. BICKELMAN DATE 17 MAR 95				
MECH J. MAGNIN DATE 18 MAR 95				
ELEC F. SCHIRK DATE 18 MAR 95				
USED ON MODEL 5S1G4				
ANGULAR DIMENSIONS 1/2				
SCALE 1/1				
SHEET 1 OF 1				
REV. K				



**AMPLIFIER RESEARCH**  
 SCHEM DIAG  
 5S1G4  
 DWG. NO. 1007413







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QTY	RECD	DATE	BY	REASON	APPROVED

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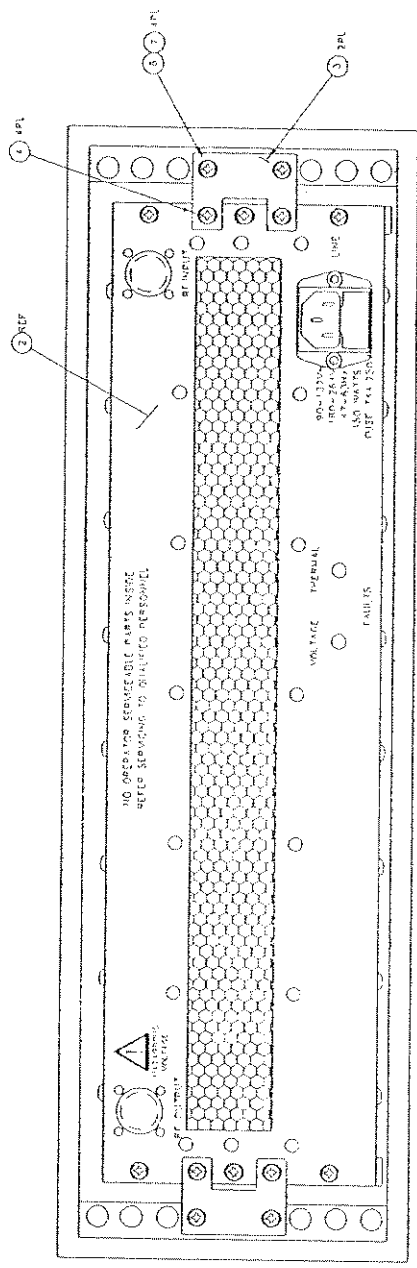
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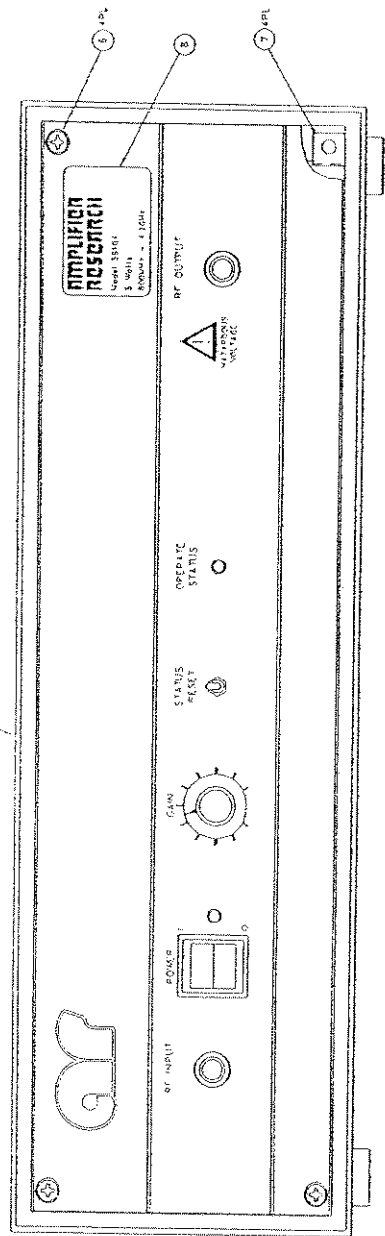
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FIG. NO.	REV.
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SECTION B-B



SECTION A-A



BILL NO: 1007385-501

REV: A

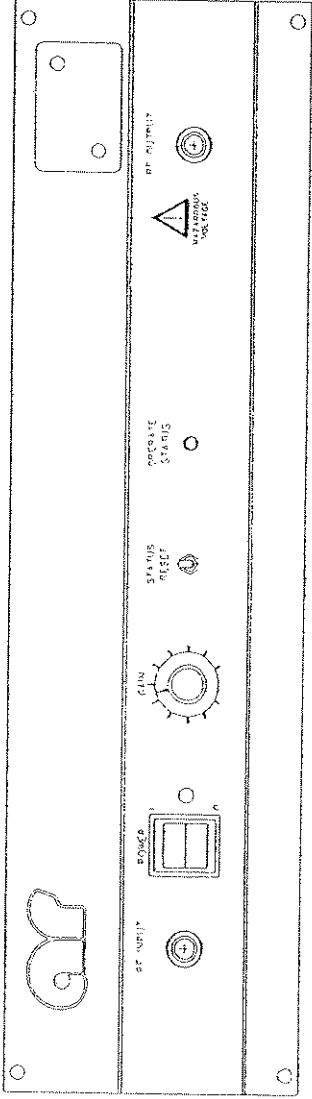
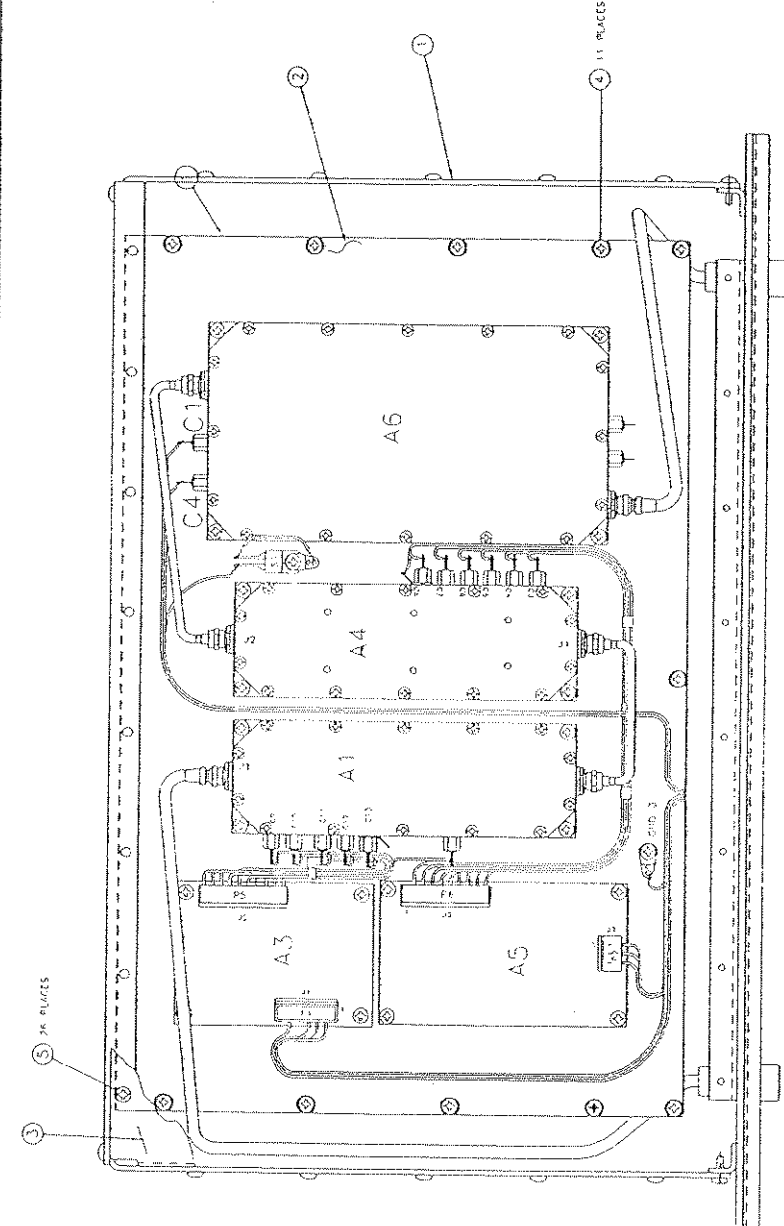
U/M: EA

DRAWING NO: ARC-D\1007385

MODEL 5S1G4,5 WATTS CW,800MHz-4.2GHz

SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1007413	K	SCHEM DIAG,5S1G4	EA	REF	ARC-B\1007413	
0020	1007385	-	ASSY DWG,MODEL 5S1G4,5 WATTS CW,800MHz-4.2GHz	EA	REF	ARC-D\1007385	
5000	1001576-311	M	CABINET,INST CASE,PERF BOT PNL,5.25 H,10.8 D	EA	1.000	ARC-B\1001576	1
5010	1007437-501	C	AMP ASSY	EA	1.000	ARC-D\1007437	2
5020	1007220-101	C	BRKT,MTG	EA	2.000	ARC-B\1007220	3
5030	11019		SCREW,MACH,PAN HD,CROSS-REC,S/ZN,6-32X.50,TYPE SW	EA	4.000		4
5050	94027		SCREW,PNL,DECORATIVE,WITH NYLON WASH	EA	8.000	OPM\HW-1	6
5060	14043		FASTENER,"U" TYPE,10B SCREW,PNL RANGE .125-.160	EA	8.000	ECON\C14810-102	7
5070	1007226-101-F1-M4	M	PL,MODEL NO,5S1G4	EA	1.000	ARC-A\1007226	8
5080	66147		PWR CORD,3 COND,18AWG,UNIV DTCH	EA	1.000	PAE\C3120-008-BL	
5090	1007526-501	-	MANUAL,MODEL 5S1G4	EA	4.000		
5100	1007747-501	-	SPARE PARTS KIT	EA	1.000		





FOR BOM SEE 1007437-501

ITEM	QTY	REQD	DESCRIPTION
1	1		AMPLIFIER ASSEMBLY
2	1		AMP ASSY

REV	DESCRIPTION	DATE	BY
1	INITIAL DESIGN		
2	REVISED		
3	REVISED		

REV	DESCRIPTION	DATE	BY
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2	REVISED		
3	REVISED		





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AMPLIFIER RESEARCH (AR)  
\*\*\* SINGLE LEVEL BILL OF MATERIAL LISTING \*\*\*

REPORT: E0056 PAGE: 1

BILL NO: 1007437-501  
AMP ASSY

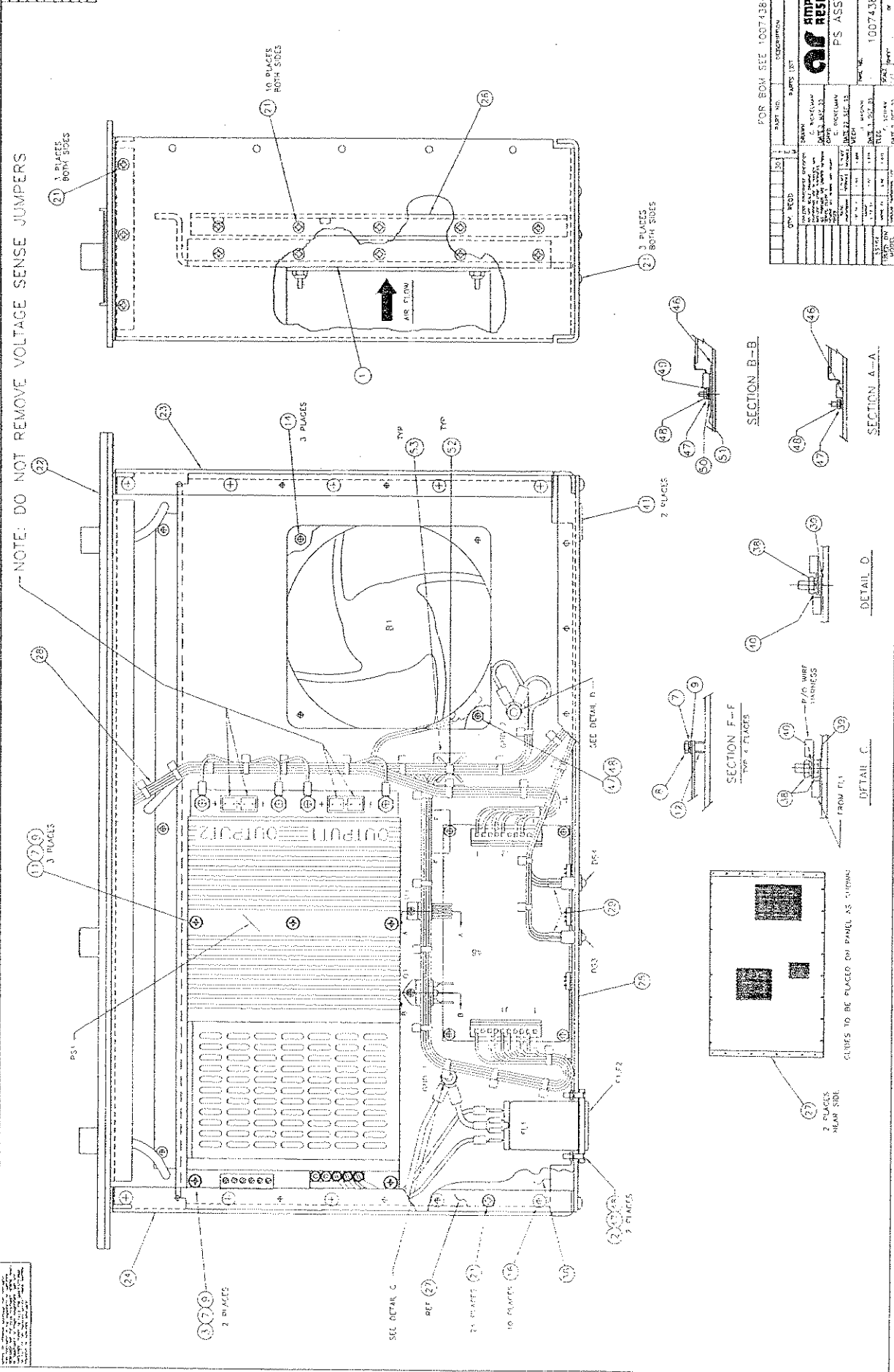
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SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1007739	K	WIRE LIST,MODEL 5S164	EA REF		ARC-A\1007739	
0020	1007437	F	ASSY DWG,AMP ASSY	EA REF		ARC-D\1007437	
5000	1007438-501	D	PS ASSY	EA	1.000	ARC-D\1007438	1
5010	1007447-501	N	RF ASSY	EA	1.000	ARC-D\1007447	2
5020	1007216-101	A	COVER, TOP	EA	1.000	ARC-D\1007216	3
5030	11021		SCREW, MACH, PAN HD, CROSS-REC, S/S, 6-32 X .62	EA	11.000	MS51957-31	4
5040	11137		SCREW, MACH, PAN HD, CROSS-REC, S/ZN, 6-32X.31, TYPE SW	EA	26.000		5
5050	69238		BASE, MTG, CABLE TIE, ADH BACK, 3/4 X 3/4	EA A/R		TAB\TC-344A	6
5080	69161		CABLE TIES, 1 3/8 MAX BUNDLE DIA, 5 5/8 L	EA A/R		PNT\PLT1.5MP	10



NOTE: DO NOT REMOVE VOLTAGE SENSE JUMPERS

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AMPLIFIER RESEARCH  
PS ASSY  
1007438



BILL NO: 1007438-501  
 PS ASSY

REV: D U/M: EA DRAWING NO: ARC-D\1007438

SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY-PER DRAWING NUMBER	REF-DSGN
0010	1007413	K	SCHEM DIAG,5S1G4	EA REF	ARC-B\1007413	
0020	1007438	F	ASSY DWG,PS ASSY	EA REF	ARC-D\1007438	
0100	1007396-501	A	PWB ASSY,REG/FAULT	EA	1.000 ARC-B\1007396	A6
0200	37020	-	FAN,AXIAL,24 VDC,106 CFM,	EA	1.000 PAM\4124KX	B1
1000	33003		LED,RED,T1 3/4(5mm)	EA	2.000 H-P\HLMP-3001-009	DS3 ,DS4
1300	35025		FUSE,SLO BLO,TYPE T,METRIC,4A,250V	EA	2.000 LIF\218004	F1 ,F2
1400	35083		FILT,LINE,6A,VDE,FUSED	EA	1.000 COR\EGG1-2	FL1
2400	25052	-	PS,SWNG,115/230VAC,AUTO,24VDC,6A,24VDC,2A	EA	1.000 V-C\VI-PU33-EVY	PS1
2500	54512		XSTR,SWNG,PNP,100V,25A,125W	EA	1.000 TIT\TIP-36C	Q1
3700	60033		INTEGRATED CKT,LINER,POS,ADJ,V,2A	EA	1.000 SGS\200CV	U1
5000	1007367-301	B	CHASSIS	EA	1.000 ARC-D\1007367	1
5010	11103		SCREW,MACH,FLT HD,100 DEG,CROSS-REC,S/S,4-40X.50	EA	2.000 \MS24693-C6	2
5020	11133		SCREW,MACH,PAN HD,CROSS-REC,S/S,6-32X.875	EA	3.000 \MS51957-33	3
5060	12048		WASH,LOCK,SPLIT,S/S,#6	EA	9.000 \MS35338-136	7
5070	13004		NUT,HEX,S/S,6-32,.250AF	EA	4.000	8
5080	12011		WASH,FLAT,S/S,#6,.312 OD X .156 ID X .035 THK	EA	9.000 \MS15795-805	9
5100	11025		SCREW,MACH,PAN HD,CROSS-REC,S/S,6-32 X 1.50	EA	3.000 \MS51957-36	11
5110	14018		SPACER,HEX,THD,F,B W/NI,1/4 HEX X 1/4 LG X 6-32	EA	4.000 KEY\I451A	12
5130	13024		NUT,SELF-LOCK,HEX,REG HT,NYLON INSERT,S/S,4-40	EA	3.000 \MS21044C04	14
5150	69119		RIVET,GRIP-TITE,A,1/8"DIA,1/8"MAT'L THK	EA	10.000 GRA\4X641	16
5200	11137		SCREW,MACH,PAN HD,CROSS-REC,S/ZN,6-32X.31,TYPE SW	EA	36.000	21
5210	1007539-501	D	CTRL PNL ASSY	EA	1.000 ARC-D\1007539	22
5220	1007212-101	B	PNL,SIDE,RT	EA	1.000 ARC-D\1007212	23
5230	1007213-101	B	PNL,SIDE,LEFT	EA	1.000 ARC-D\1007213	24



07:14:13 13 APR 2005

AMPLIFIER RESEARCH (AR)  
 \*\*\* SINGLE LEVEL BILL OF MATERIAL LISTING \*\*\*

REPORT: E0056 PAGE: 2

BILL NO: 1007438-501  
 PS ASSY

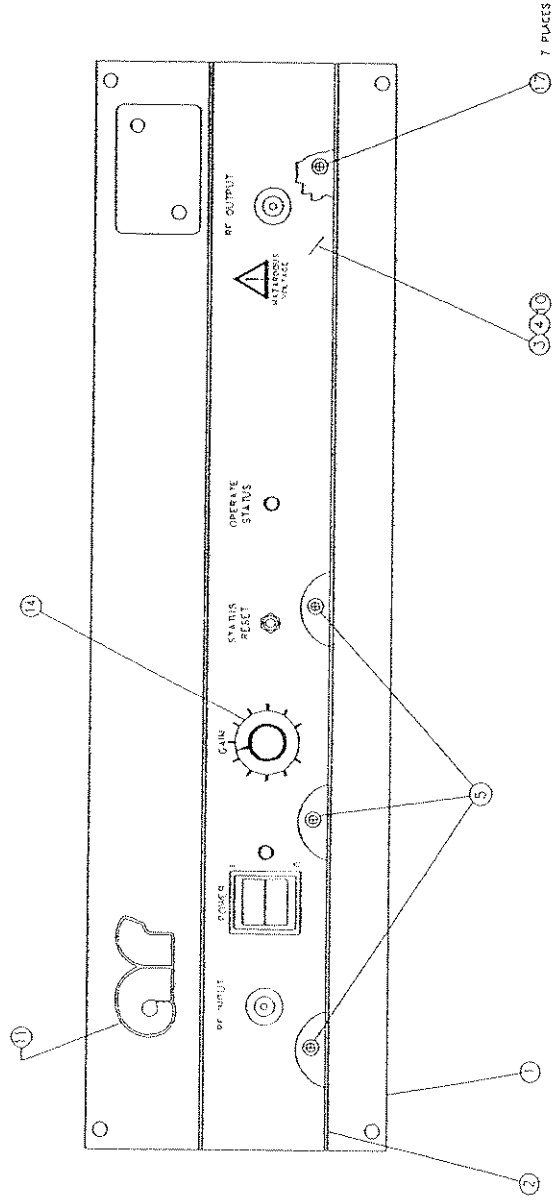
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SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY-PER DRAWING NUMBER	REF-DSGN
5240	1007402-301-M1	D	PNL ASSY, REAR	EA	1.000 ARC-D\1007402	25
5250	1007209-301	-	BRKT, SIDE	EA	2.000 ARC-C\1007209	26
5260	1007214-101	A	GLIDE, CABINET	EA	2.000 ARC-B\1007214	27
5270	1007743-501	A	HARNESS ASSY, MODEL 5S164	EA	1.000	28
5280	66116		TUBING, SHRINK, BLK, .093 EXP, .046 REC	IN A/R	REMF-P301	29
5350	1007327-101	B	COVER, BOT	EA	1.000 ARC-D\1007327	36
5360	13007		NUT, HEX, S/S, 10-32, .343AF	EA	3.000	38
5370	12059		WASH, LOCK, EXT TOOTH, S/S, #10	EA	2.000 VMS35335-60	39
5380	12050		WASH, LOCK, SPLIT, S/S, #10	EA	2.000 VMS35338-138	40
5390	69111		PLUG, HOLE, METAL, 5/8" DIA HOLE, 13/16" O/A DIA	EA	2.000 HHS\654	41
5440	77064		COMPOUND, THERMAL JOINT, TYPE 120	EA A/R	WAK\120-S	46
5450	12047		WASH, LOCK, SPLIT, S/S, #4	EA	3.000 VMS35338-135	47
5460	13003		NUT, HEX, S/S, 4-40, .187AF	EA	3.000	48
5470	12010		WASH, FLAT, S/S, #4, .250 OD X .125 ID X .022 THK	EA	1.000 VMS15795-803	49
5480	12037		WASH, SHLDR, N, .232 OD X .115 ID X .047 SHLD. THK.	EA	1.000 REL\NY-04-040	50
5490	69090		INSUL, HD ANODIZED, TYPE TO-220, .950 L, .500 W	EA	1.000 THM\4777A	51
5500	69161		CABLE TIES, 1 3/8 MAX BUNDLE DIA, 5 5/8 L	EA A/R	PNT\PLT1.5MP	52
5510	69238		BASE, MTG, CABLE TIE, ADH BACK, 3/4 X 3/4	EA A/R	TAB\TC-344A	53





REV	DATE	BY	CHKD



FOR BOM SEE 1007539-S01

REV	DATE	BY	CHKD

DATE	REV	BY	CHKD

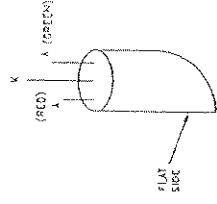
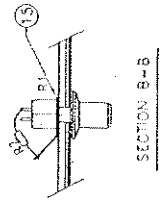
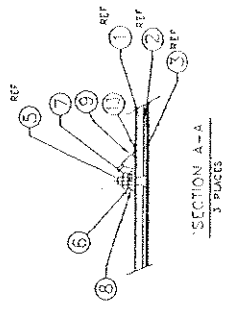
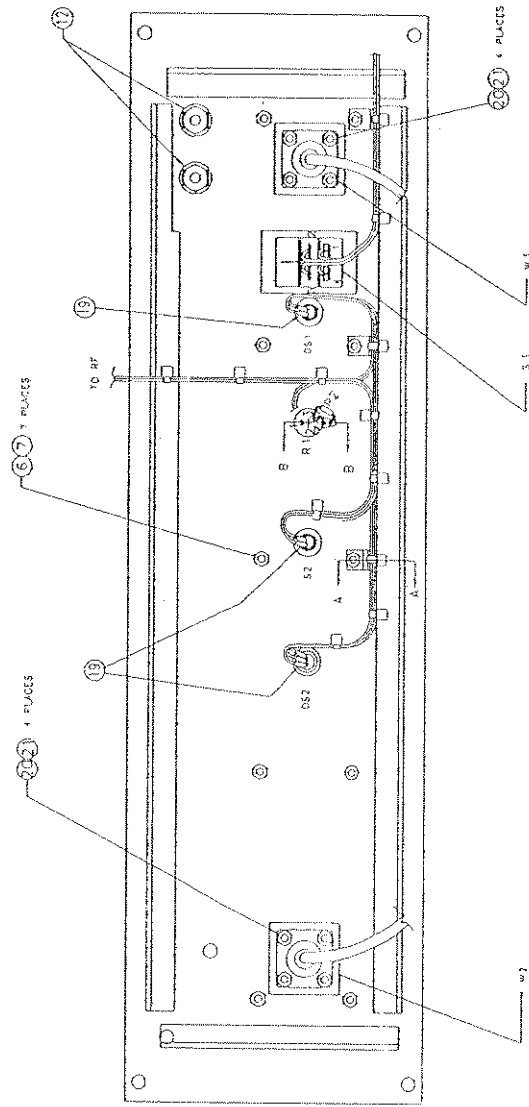
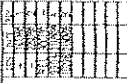
C. ROYAL  
 WILLIAMS II  
 & COMPANY  
 WILLIAMS II  
 WED  
 1007539  
 TEL. 504-581-1111  
 1111 S. 11th St.

**AMPLIFIER RESEARCH**  
 CTRL PNL ASSY

1007539  
 1007539

SHEET	1	2
REV	B	6





OS1, K, OS2



BILL NO: 1007539-501  
 CTRL PNL ASSY

REV: D U/M: EA DRAWING NO: ARC-D\1007539

SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY	PER DRAWING NUMBER	REF-DSGN
0010	1007539	B	ASSY DWG, CTRL PNL ASSY	EA REF		ARC-D\1007539	
1000	33010		LED, RED/GRN, T13/4(5MM)	EA	2.000	H-P\HMP4000-009	DS1 DS2
2700	55901		RES, VAR, CP, 10K, 10%, 1/2W	EA	1.000	CLA\RV6NAYS103A	R1
2710	55612-1212F		RES, FXD, METAL FILM, 12.1K, 1%, 1/4-1/2W	EA	1.000		R2
3100	57085		SW, ROCKER, NON-LIGHTED, DPST, BLK	EA	1.000	ESW\R5ABLKBLKEF0	S1
3110	57029		SW, PB, MOM, SPST(N.O.)	EA	1.000	A-S\MSPS-103C-2	S2
4200	20368	A	CABLE ASSY, COAX, RG-142B/U, N-BLKD, SMA R.A., 17.0	EA	1.000	ARC-A\1002494	W1
4210	20381	B	CABLE ASSY, COAX, SEMI-RIGID, N PNL, SMA ST. 7.40"	EA	1.000	ARC-A\1002494	W2
5000	1007235-301-F1	D	PNL, CTRL	EA	1.000	ARC-D\1007235	1
5010	1007236-101-F2	B	CHANNEL, TRIM	EA	1.000	ARC-D\1007236	2
5020	1007384-101-F6-M1	A	PNL, TRIM	EA	1.000	ARC-D\1007384	3
5030	69241		TAPE, TRANSPARENT, ACRYLIC ADH, 2 SIDES, .004 THK	IN A/R		CMP\H69	4
5040	11065		SCREW, MACH, FLT HD, 100 DEG, CROSS-REC, S/S, 6-32 X .50	EA	3.000	\MS24693-C28	5
5050	12048		WASH, LOCK, SPLIT, S/S, #6	EA	10.000	\MS35338-136	6
5060	13004		NUT, HEX, S/S, 6-32, .250AF	EA	10.000		7
5070	12011		WASH, FLAT, S/S, #6, .312 OD X .156 ID X .035 THK	EA	2.000	\MS15795-805	8
5080	69175		MTG TAB, NAT'L COLOR NYLON, 21/32 O/A, 3/8 W	EA	3.000	PLMA-30-167	9
5090	77067		ADH, CLEAR, RTV, 1 TOUCH	OZ A/R		6-ENG108	10
5100	1006658-101	A	LOGO, DIECAST, 1.00	EA	1.000	ARC-B\1006658	11
5110	14048		FASTENER, PALNUT, WASH TYPE, SELF THDG, .125 DIA	EA	2.000	MCS\90533A131	12
5120	69161		CABLE TIES, 1 3/8 MAX BUNDLE DIA, 5 5/8 L	EA A/R		PNT\PLT1.5MP	13
5130	69018		KNOB, SKIRTED, 1/8" SHAFT, MATTE FINISH	EA	1.000	ROG\MF-RB-67-OSK7M	14
5140	69242		LUG, SHAKEPROOF, 13/16 L, #1/4 STUD, DUAL HOLE	EA	1.000	HHS\J410-14	15
5160	11064		SCREW, MACH, FLT HD, 100 DEG, CROSS-REC, S/S, 6-32 X .38	EA	7.000	\MS24693-C26	17



07:14:14 13 APR 2005

AMPLIFIER RESEARCH (AR)  
\*\*\* SINGLE LEVEL BILL OF MATERIAL LISTING \*\*\*

REPORT: E0056 PAGE: 2

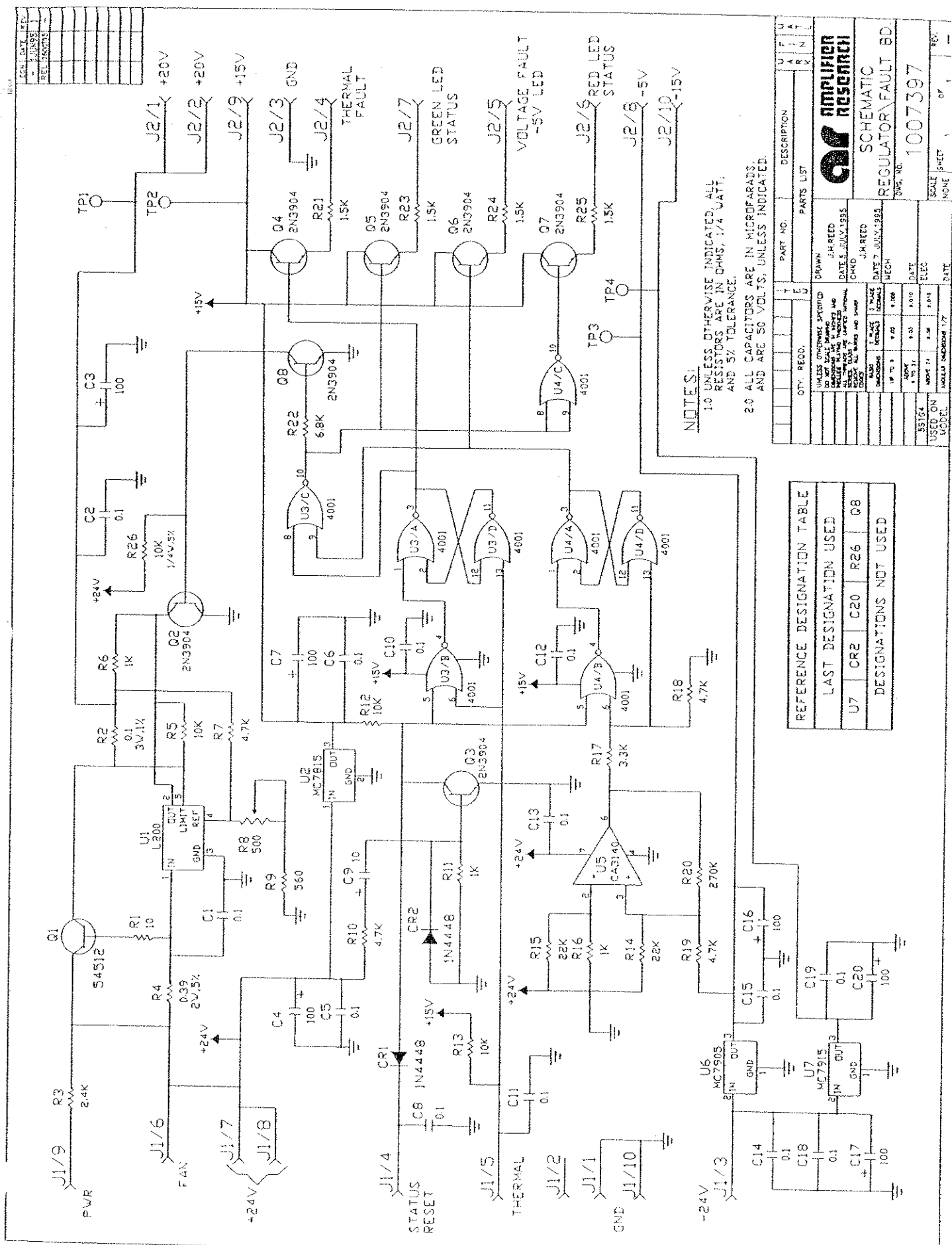
BILL NO: 1007539-501  
CTRL PNL ASSY

REV: D U/M: EA DRAWING NO: ARC-DA1007539

SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY	PER DRAWING NUMBER	REF-DSGN
5180	66116		TUBING,SHRINK,BLK,.093 EXP,.046 REC	IN A/R		REMF-P301	19
5190	12047		WASH,LOCK,SPLIT,S/S,#4	EA	8.000	MS35338-135	20
5200	13003		NUT,HEX,S/S,4-40,.187AF	EA	8.000		21







NOTES:  
 1.0 UNLESS OTHERWISE INDICATED, ALL RESISTORS ARE IN OHMS, 1/4 WATT, AND 5% TOLERANCE.  
 2.0 ALL CAPACITORS ARE IN MICROFARADS AND ARE 50 VOLTS, UNLESS INDICATED.

REFERENCE DESIGNATION TABLE

LAST DESIGNATION USED			
U7	CR2	C20	R26
DESIGNATIONS NOT USED			
U8	CR1	C19	R25

QTY.	RECD.	Y	E	L	U	V	F	A	R	K
PARTS LIST										
DRAWN: J.M. REED										
DATE: 6 JULY 1985										
CHECKED: J.M. REED										
DATE: 7 JULY 1985										
MECH: J.M. REED										
DATE: 7 JULY 1985										
SCALE: NONE										
SHEET: 1 OF 1										
REV: -										
MODEL: U5164										
USED ON: 1007397										
SCHEMATIC: REGULATOR FAULT BD										
PART NO.: 1007397										
DRAWN: J.M. REED										
DATE: 6 JULY 1985										
CHECKED: J.M. REED										
DATE: 7 JULY 1985										
MECH: J.M. REED										
DATE: 7 JULY 1985										
SCALE: NONE										
SHEET: 1 OF 1										
REV: -										
MODEL: U5164										
USED ON: 1007397										
SCHEMATIC: REGULATOR FAULT BD										
PART NO.: 1007397										







BILL NO: 1007396-501

REV: A

U/M: EA

DRAWING NO: ARC-B\1007396

PWB ASSY,REG/FAULT

SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY-PER DRAWING NUMBER	REF-DSGN
0010	1007397	.	SCHEM DIAG,REG/FAULT	EA REF	ARC-B\1007397	
0020	1007396	.	ASSY DWG,PWB ASSY,REG/FAULT	EA REF	ARC-B\1007396	
0400	27236		CAPR,FXD,DIP SPACED CER.,.1UF,50VDC	EA	13.000 AVX\M0015C104MAA	C1 .C2 C5 .C6 C8 .C10 C11 .C12 C13 .C14 C15 .C18 C19
0410	27068		CAPR,ELECT,100uF,50VDC,AXIAL	EA	6.000 IC1\107TTA050M	C3 .C4 C7 .C16 C17 .C20
0420	27059		CAPR,ELECT,10uF,50V,+/-20%,RADIAL	EA	1.000 PAN\ECEA1HU100	C9
0700	1N4448		DIODE,SIGNAL,75V PIV	EA	2.000 FCH\1N4448	CR1 .CR2
1500	41084		CONN,LOCKING HEADER,STR,10 PIN,SQR POSTS	EA	2.000 PNT\MLSS156-10-L	J1 .J2
2500	54512		XSTR,SWNG,PNP,100V,25A,125W	EA REF	TIJ\TIP-36C	Q1
2510	2N3904		XSTR,SWNG,NPN,40V,0.2A,1W	EA	7.000	Q2 .Q3 Q4 .Q5 Q6 .Q7 Q8
2700	55512-10R0J		RES,FXD,CARBON COMP,10.5%,1/4W	EA	1.000 A-BVCBI005	R1
2710	55616-R100F		RES,FXD,PRECISION,.1,1%,3W	EA	1.000 RCL\10-3-0-10-1BD	R2
2720	55612-2401J		RES,FXD,METAL FILM,2.4K,5%,1/4-1/2W	EA	1.000 TRW\GP55-2401+/-5%	R3
2730	55715-R390J		RES,FXD,WW,0.39,5%,2W,TYPE SPH	EA	1.000	R4
2740	55612-1002J		RES,FXD,METAL FILM,10K,5%,1/4-1/2W	EA	4.000 TRW\GP55-1002+/-5%	R5 .R12 R13 .R26
2750	55612-1001J		RES,FXD,METAL FILM,1K,5%,1/4-1/2W	EA	3.000 TRW\GP55-1001+/-5%	R6 .R11 R16
2760	55612-4701J		RES,FXD,METAL FILM,4.7K,5%,1/4-1/2W	EA	4.000 TRW\GP55-4701+/-5%	R7 .R10 R18 .R19
2770	55916		RES,VAR,CERMET,MULTITURN, TOP ADJ,500,10%,1W	EA	1.000 MEP\8024EKW-501	R8



BILL NO: 1007396-501  
PWB ASSY,REG/FAULT

REV: A U/M: EA DRAWING NO: ARC-B\1007396

SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY PER DRAWING NUMBER	REF-DSGN
2780	55612-5600J		RES,FXD,METAL FILM,560,5%,1/4-1/2W	EA	1.000 TRW\GP55-5600+/-5% R9	
2790	55612-2202J		RES,FXD,METAL FILM,22K,5%,1/4-1/2W	EA	2.000 TRW\GP55-2202+/-5% R14	,R15
2795	55612-3301J		RES,FXD,METAL FILM,3.3K,5%,1/4-1/2W	EA	1.000 TRW\GP55-3301+/-5% R17	
2800	55612-2703J		RES,FXD,METAL FILM,270K,5%,1/4-1/2W	EA	1.000 TRW\GP55-2703+/-5% R20	
2810	55612-1501J		RES,FXD,METAL FILM,1.5K,5%,1/4-1/2W	EA	4.000 TRW\GP55-1501+/-5% R21	,R23 R24 ,R25
2820	55612-6801J		RES,FXD,METAL FILM,6.8K,5%,1/4-1/2W	EA	1.000 TRW\GP55-6801+/-5% R22	
3700	60033		INTEGRATED CKT,LINER,POS.,ADJ.V.2A	EA REF	SGS\L200CV	U1
3710	60046		INTEGRATED CKT,3 TERM,POS REG.	EA	1.000 MOT\MC7815CT	U2
3720	60052		INTEGRATED CKT,QUAD 2-INPUT NOR GATE	EA	2.000 MOT\MC14001BCP	U3 ,U4
3730	60009		INTEGRATED CKT,LINER,OP.AMP.	EA	1.000 RCA\CA3140AE	U5
3740	60066		IC,3 TERM,NEG REG	EA	1.000 MOT\MC7905CT	U6
3750	60048		INTEGRATED CKT,3 TERM,NEG REG.	EA	1.000 MOT\MC7915CT	U7
4500	73013		SOCKET,I.C.,14 PIN	EA	2.000 TII\NC93-14-02	XU3 ,XU4
4510	73010		SOCKET,I.C.,8 PIN,DIP	EA	1.000 TII\NC93-08-02	XU5
5000	1007459-101	C	PWB,REG/FAULT BD	EA	1.000 ARC-B\1007459	1





BILL NO: 1007743-501      REV: A      U/M: EA      DRAWING NO:  
 HARNESS ASSY,MODEL 5S1G4

SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY-PER DRAWING NUMBER	REF-DSGN
0010	1007739	K	WIRE LIST,MODEL 5S1G4	EA REF	ARC-A\1007739	
0020	1007744-101		HARNESS BD,MODEL 5S1G4	EA REF		
2200	41075		CONN,PLUG,6 PIN,(F)	EA	1.000 PNT\CT156F22-6-C	P1
2210	41060		CONN,THRU COVER,6 PIN	EA	1.000 PNT\TC156F-6-C	P1
2220	41074		CONN,PLUG,3 PIN(F)	EA	1.000 PNT\CT156F22-3-C	P2
2230	41059		CONN,THRU COVER,3 PIN	EA	1.000 PNT\TC156F-3-C	P2
2240	41076		CONN,PLUG,10 PIN,(F)	EA	2.000 PNT\CT156F22-10-T	P3 ,P4
2250	41061		CONN,THRU COVER,10 PIN	EA	2.000 PNT\TC156F-10-L	P3 ,P4
5000	69323		TERM,INSUL,PUSH-ON,F,22-18 AWG,.020 X .110 TAB	EA	2.000 TAB\RA18-111F	
5010	69136		TERM,INSUL,PUSH-ON,F,16-14 AWG,.032 X .250 TAB	EA	7.000 TAB\RB-257	
5020	69137		TERM,INSUL,PUSH-ON,F,22-18 AWG,.032 X .250 TAB	EA	4.000 TAB\RA-257	
5030	69142		TERM.RING,INSUL.#10 STUD,22-16 AWG	EA	9.000 TAB\RA-877	
5040	69145		TERM.RING,INSUL.#10 STUD,16-14 AWG	EA	3.000 TAB\RB-877	
5050	66127		TUBING,PVC,BLK,.263 ID,.020 WALL THK	IN	16.000	#2
5060	69162		CABLE TIES,7/8 MAX BUNDLE DIA,4 L	EA A/R	DEN\08432	
5070	66014		WIRE,TFE,16 AWG,STRANDED,TYPE E,GRY	IN A/R		
5080	66015		WIRE,TFE,16 AWG,STRANDED,TYPE E,WHT	IN A/R		
5090	66025		WIRE,TFE,22 AWG,STRANDED,TYPE E,BLK	IN A/R		
5100	66082		WIRE,TFE,22 AWG,STRANDED,TYPE E,WHT/GRN	IN A/R		
5110	66029		WIRE,TFE,22 AWG,STRANDED,TYPE E,YEL	IN A/R		
5120	66032		WIRE,TFE,22 AWG,STRANDED,TYPE E,VIO	IN A/R		
5130	66081		WIRE,TFE,22 AWG,STRANDED,TYPE E,WHT/YEL	IN A/R		
5140	66031		WIRE,TFE,22 AWG,STRANDED,TYPE E,BLU	IN A/R		
5150	66030		WIRE,TFE,22 AWG,STRANDED,TYPE E,GRN	IN A/R		



07:14:17 13 APR 2005

AMPLIFIER RESEARCH (AR)  
\*\*\* SINGLE LEVEL BILL OF MATERIAL LISTING \*\*\*

REPORT: E0056 PAGE: 2

BILL NO: 1007743-501

REV: A

U/M: EA

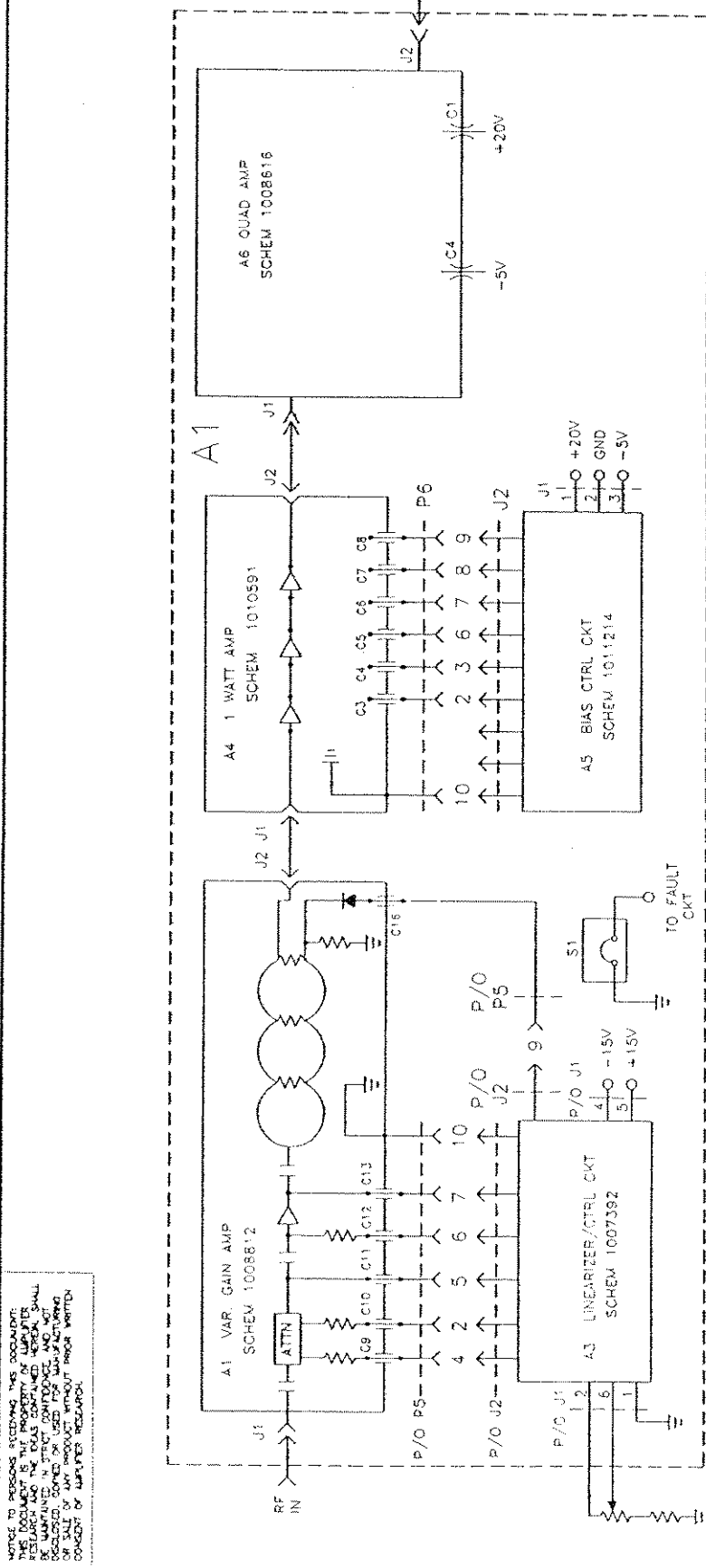
DRAWING NO:

HARNESS ASSY, MODEL 5S1G4

SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY-PER DRAWING NUMBER	REF-DSGN
5160	66027		WIRE, TFE, 22 AWG, STRANDED, TYPE E, RED	IN	A/R	
5170	66080		WIRE, TFE, 22 AWG, STRANDED, TYPE E, WHT/ORG	IN	A/R	
5180	66079		WIRE, TFE, 22 AWG, STRANDED, TYPE E, WHT/RED	IN	A/R	
5190	66083		WIRE, TFE, 22 AWG, STRANDED, TYPE E, WHT/VIO	IN	A/R	
5200	66186		WIRE, PVC, 14 AWG, STRANDED (50/30), GRN/YEL	IN	A/R	



IGN	DATE	REV
REF	6/10/95	-
8114	6/10/95	A
8185	7/4/95	B
9020	8/29/97	C
10152	1/4/00	D
05372	12/18/01	E



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QTY.	REQD.	DESCRIPTION	PART NO.	PARTS LIST	MARK
		UNLESS OTHERWISE SPECIFIED			
		DO NOT SCALE DRAWING			
		DIMENSIONS ARE IN INCHES AND			
		INCLUDE FILING THICKNESS			
		FOR ALL DIMENSIONS UNLESS			
		OTHERWISE SPECIFIED			
		REMOVE ALL BURRS AND SHARP			
		EDGES			
		BASIC DIMENSIONS			
		2 PLACE DECIMALS			
		UP TO 6			
		±.02			
		±.005			
		ADJUST			
		5 TO 24			
		±.03			
		±.010			
		ABOVE 24			
		±.06			
		±.015			
		ANGULAR DIMENSIONS 1/2			
		USED ON MODEL			
		55104			
		DATE 9 OCT 95			
		ELEC			
		F. SCHIRK			
		DATE 9 OCT 95			
		SCALE			
		NONE			
		SHEET			
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		OF			
		1			
		REV.			
		F			



SCHMATIC DIAG  
RF AMPLIFIER

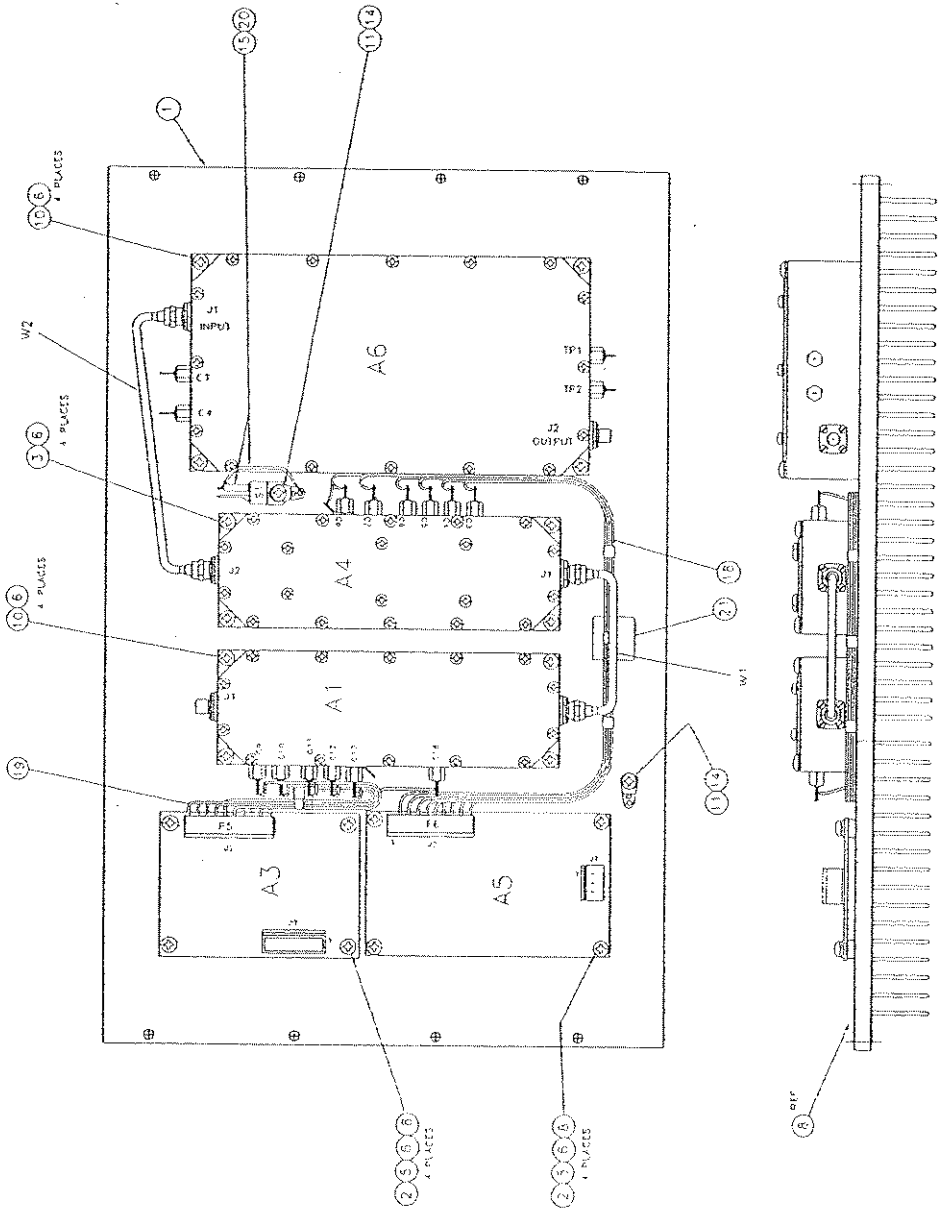
DWG. NO. 1007672

Y	E	M	DESCRIPTION	PART NO.	PARTS LIST	MARK
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			M. BICKELMAN			
			DATE 29 JUN 95			
			CHKD			
			C. BICKELMAN			
			DATE 29 JUN 95			
			MECH			
			J. MAGINN			
			DATE 9 OCT 95			
			ELEC			
			F. SCHIRK			
			DATE 9 OCT 95			



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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FOR BOM SEE 1007447-501

REV	1	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	2	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	3	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	4	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	5	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	6	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	7	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	8	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	9	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	10	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	11	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	12	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	13	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	14	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	15	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	16	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	17	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	18	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	19	DATE	10/1/88	BY	WJ	CHKD	WJ
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REV	21	DATE	10/1/88	BY	WJ	CHKD	WJ
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REV	42	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	43	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	44	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	45	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	46	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	47	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	48	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	49	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	50	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	51	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	52	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	53	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	54	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	55	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	56	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	57	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	58	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	59	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	60	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	61	DATE	10/1/88	BY	WJ	CHKD	WJ
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REV	71	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	72	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	73	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	74	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	75	DATE	10/1/88	BY	WJ	CHKD	WJ
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REV	77	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	78	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	79	DATE	10/1/88	BY	WJ	CHKD	WJ
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REV	81	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	82	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	83	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	84	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	85	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	86	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	87	DATE	10/1/88	BY	WJ	CHKD	WJ
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REV	91	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	92	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	93	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	94	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	95	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	96	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	97	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	98	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	99	DATE	10/1/88	BY	WJ	CHKD	WJ
REV	100	DATE	10/1/88	BY	WJ	CHKD	WJ

1007447-501

1007447

RF ASSY

SIMULTECH RESEARCH





BILL NO: 1007447-501  
RF ASSY

REV: P

U/M: EA

DRAWING NO: ARC-D\1007447

SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1011050	B	WIRE LIST, 1W AMP/BIAS CTRL	EA	REF	ARC-A\1011050	
0020	1008323	A	WIRE LIST, PREAMP LEVELER HARNESS	EA	REF	ARC-A\1008323	
0030	1007447	H	ASSY DWG, RF ASSY	EA	REF	ARC-D\1007447	
0100	1012337-501	C	PWB ASSY, VARIABLE GAIN AMP/DET	EA	1.000	ARC-D\1012337	A1
0120	1012334-501	D	PWB ASSY, LINEARIZER/CTRL BD	EA	1.000	ARC-B\1012334	A3
0130	1010589-501	C	PWB ASSY, LOW LEVEL "S" MODULE	EA	1.000	ARC-C\1010589	A4
0140	1011248-501	-	PWB ASSY, BIAS CONTROL, 1W S MODULE	EA	1.000	ARC-B\1011248	A5
0150	1014377-501	-	PWB ASSY, QUAD COUPLED, AMP, 0.8-4.2GHZ	EA	1.000	ARC-B\1014377	A6
3100	57062		SW, TEMP SENSING, N.C., OPEN AT 70C	EA	1.000	AIR\67L070	S1
4200	20382	B	CABLE ASSY, COAX, SEMI-RIGID, SMA, SMA, 3.5	EA	1.000	ARC-A\1002494	W1
4210	20494	B	CABLE ASSY, COAX, SEMI-RIGID, SMA, SMA, 5.8	EA	1.000	ARC-A\1002494	W2
5000	1007439-301	E	HEATSINK ASSY, 5 WATT AMP	EA	1.000	ARC-D\1007439	1
5010	11020		SCREW, MACH, PAN HD, CROSS-REC, S/S, 6-32 X .50	EA	8.000	VMS51957-30	2
5020	11024		SCREW, MACH, PAN HD, CROSS-REC, S/S, 6-32 X 1.25	EA	4.000	VMS51957-35	3
5040	12011		WASH, FLAT, S/S, #6, .312 OD X .156 ID X .035 THK	EA	8.000	VMS15795-805	5
5050	12048		WASH, LOCK, SPLIT, S/S, #6	EA	20.000	VMS35338-136	6
5070	12024		WASH, FLAT, B/ZN PLTG, .312 OD X .164 ID X .125 THK	EA	8.000	V5785-M01-F21-.164	8
5090	11025		SCREW, MACH, PAN HD, CROSS-REC, S/S, 6-32 X 1.50	EA	8.000	VMS51957-36	10
5100	11010		SCREW, MACH, PAN HD, CROSS-REC, S/S, 4-40 X .25	EA	2.000	VMS51957-13	11
5130	69099		LUG, SHAKEPROOF, BENT, 41/64 L, #4 STUD, DUAL HOLE	EA	2.000	HHS\1416-4	14
5140	66025		WIRE, TFE, 22 AWG, STRANDED, TYPE E, BLK	IN	A/R		15
5170	1007938-501	C	HARNESS ASSY, 1W AMP/BIAS CTRL	EA	1.000		18
5180	1007940-501	A	HARNESS ASSY, PRE-AMP/LEVELER	EA	1.000		19
5190	66116		TUBING, SHRINK, BLK, .093 EXP, .046 REC	EA	1.000	REMYF-P301	20



08:27:05 17 JUN 2005

AMPLIFIER RESEARCH (AR)  
\*\*\* SINGLE LEVEL BILL OF MATERIAL LISTING \*\*\*

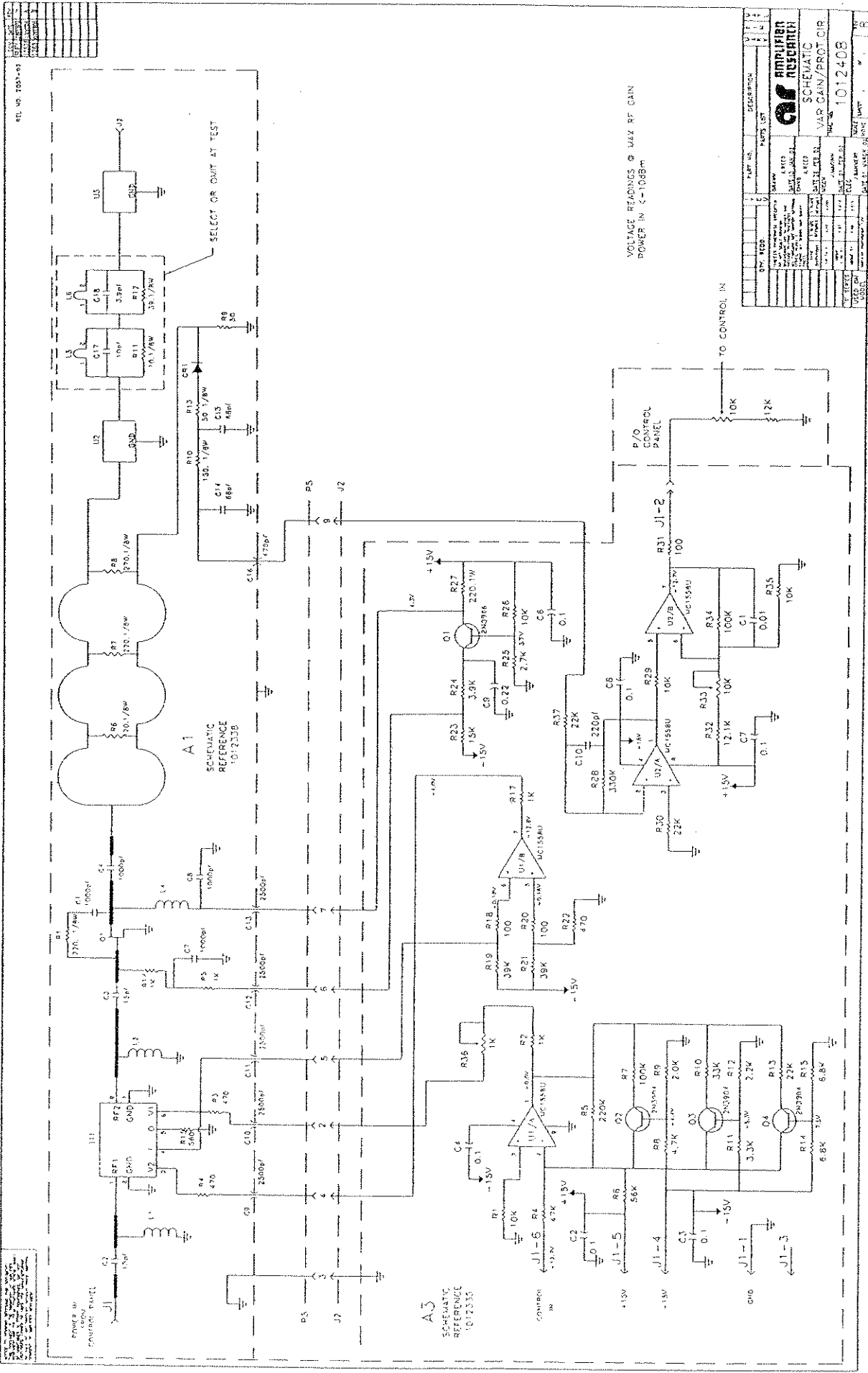
REPORT: E0056 PAGE: 2

BILL NO: 1007447-501  
RF ASSY

REV: P U/M: EA DRAWING NO: ARC-D\1007447

SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY PER DRAWING NUMBER	REF-DSGN
5200	69238		BASE, MTG, CABLE TIE, ADH BACK, 3/4 X 3/4	EA	1.000 TAB\TC-344A	21





REV	DATE	BY	CHKD	DESCRIPTION
1				SCHEMATIC
2				VAR GAIN/PROT CIR
3				1012408

REL NO. 1003-03

Power in Control Panel

Control In

P/O Control Panel





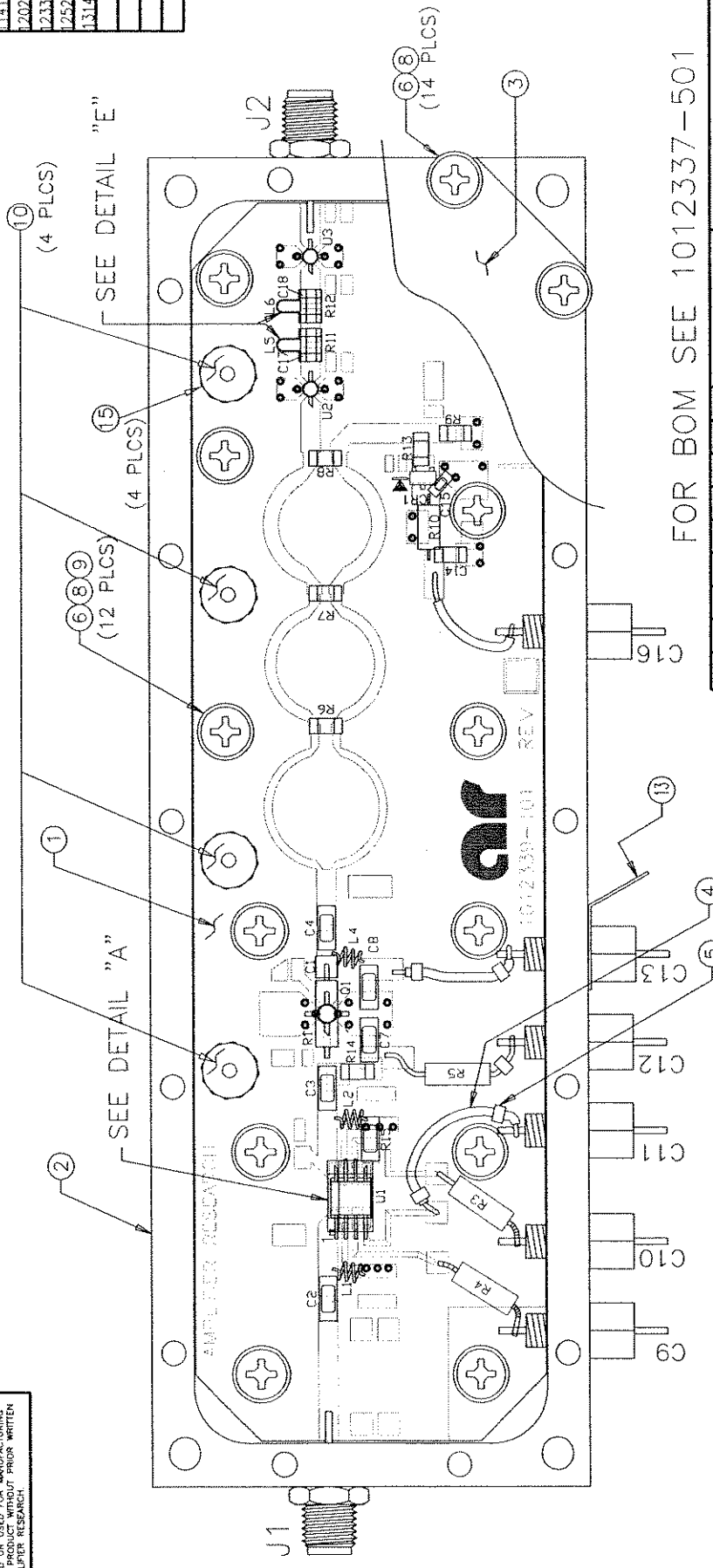




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 WITHOUT THE WRITTEN CONSENT OF AMPLIFIER RESEARCH.

REL NO. 2057-02

ECN	DATE	REV.
XXXXX	28FEB02	--
14131	18SEP02	A
20222	24JAN04	B
12337	30AUG04	C
25261	30SEP04	D
13143	21NOV05	E



FOR BOM SEE 1012337-501

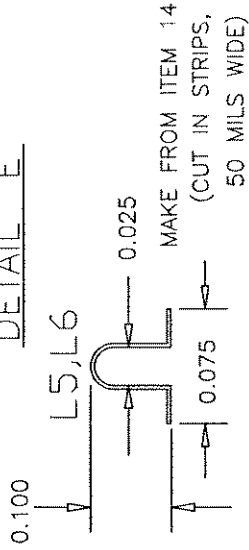
QTY. REQD.		PART NO.		DESCRIPTION	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND DECIMALS ARE UNFRACTIONAL ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 2 REMOVE ALL BURRS AND SHARP EDGES					
BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS	DECIMALS		
UP TO 6	±.02	±.005			
ABOVE 6 TO 24	±.03	±.010			
ABOVE 24	±.08	±.015			
"S" SERIES USED ON MODEL			ANGULAR DIMENSIONS 1/2		
DRAWN		PARTS LIST		SCALE	
J.H. REED				2/1	
DATE 13 FEB 02				SHEET	
CHKD				1	
A. REED				OF	
DATE 28 FEB 02				2	
MECH				REV.	
J. MAGINN				E	
DATE 01 MAR 02				1012337	
ELEC				DWG. NO.	
J. BANKERT				ASSEMBLY DRAWING	
DATE 01 MAR 02				VARIABLE GAIN AMP/DET.	
				AMPLIFIER RESEARCH	



ECN	DATE	REV
XXXX	28FEB02	---
11413	18SEP02	A
12022	22JAN04	B
12317	30JUN04	C
12526	13OCT04	D
13143	21NOV05	E

REL NO. 2057-02

DETAIL "E"



NOTES:

1.0 ASSEMBLY PROCEDURE:

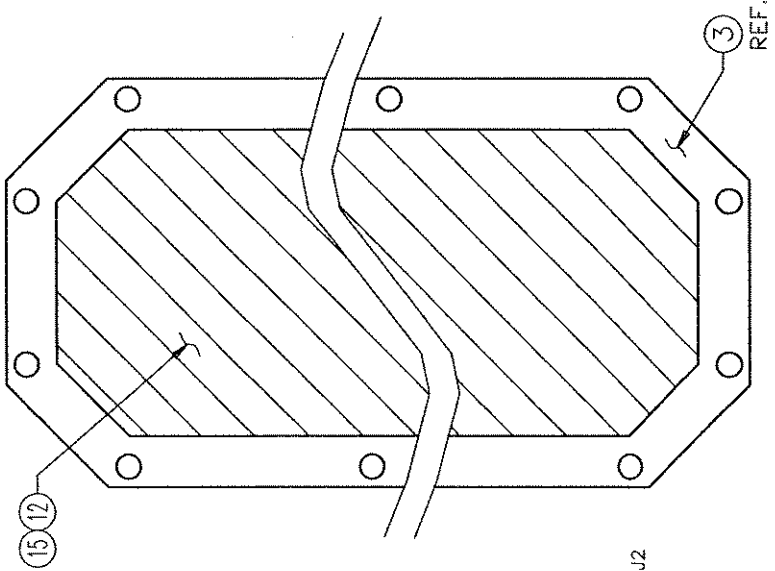
- A.) INSTALL U1 TO PC BOARD (ITEM 1), SOLDER 3 MIL THICK TINNED BRASS FROM BOTTOM OF U1 TO GROUND PLANE. U1 INSTALLATION MUST BE COMPLETED AT A STATIC APPROVED WORK STATION, SEE DETAIL "A".
- B.) INSTALL PC BOARD INTO HOUSING (ITEM 2).
- C.) INSTALL J1 AND J2, AS SHOWN IN DETAIL "B".
- D.) INSTALL FEEDTHRU CAPACITORS C9 THRU C13 INTO HOUSING.
- E.) INSTALL ALL CERAMIC CHIP CAPS, EXCEPT FOR C1, C17, AND C18.
- F.) INSTALL L1 THRU L4.
- H.) INSTALL R3 THRU R5 AND WHITE WIRE (ITEM 4) BETWEEN FEEDTHRUS AND PC BOARD. CUT LEADS AS SHORT AS POSSIBLE.
- I.) INSTALL CORES (ITEM 10) AS SHOWN ON ASSEMBLY DRAWING. SECURE IN PLACE USING RTV (ITEM 15), APPLY RTV TO BASE AND SIDES OF CORES.

2.0 FET INSTALLATION:

- WORK MUST BE COMPLETED AT A STATIC APPROVED WORK STATION. PERSONS MUST BE FAMILIAR WITH THE PROCEDURES. THE FET CAN BE DESTROYED ELECTRONICALLY AND MECHANICALLY.
- A.) CUT Q1 GATE LEAD TO APPROXIMATELY .075" LONG. THE LEAD MUST BE CUT AT AN ANGLE TO MAINTAIN LEAD IDENTIFICATION.
- B.) CUT THE SOURCE LEADS AND THE DRAIN LEADS AT APPROXIMATELY .075" LONG.
- C.) WITH A GROUNDED SOLDERING IRON, SOLDER Q1 INTO THE CIRCUIT.
- D.) INSTALL CHIP CAP C1 AS SHOWN IN DETAIL "C".
- E.) INSTALL RESISTOR R1 AS SHOWN IN DETAIL "C".
- F.) ITEMS C17, C18, R11, R12, L5, L6, U2, AND U3 WILL BE INSTALLED OR OMITTED AT TEST.

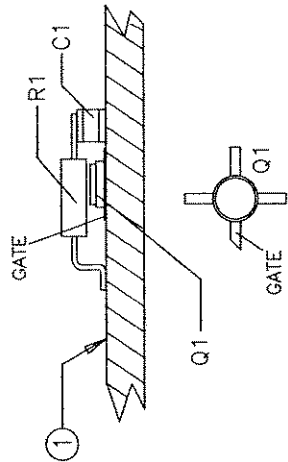
BOTTOM VIEW - COVER

(NOT TO SCALE)

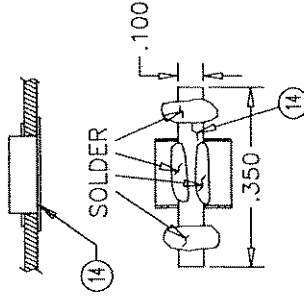


DETAIL "C"

Q1, C1, R1 INSTALLATION



DETAIL "A"

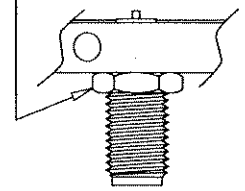


SIDE VIEW  
U1, U2

BOTTOM VIEW  
U1, U2

DETAIL "B"

"A"



TRIM TEFLON OF PARTS J1, AND J2 FLUSH WITH CONNECTOR BODY. CUT CENTER PIN TO 0.075"(IN) INSTALL CONNECTOR FLUSH WITH INNER HOUSING WALL. TIGHTEN LOCKING NUT "A" SECURELY. (DO NOT USE SUPPLIED WASHER)

DWG. NO.

1012337

SCALE	SHEET	OF	REV.
2/1	2	2	E



BILL NO: 1012337-501

REV: C

U/M: EA

DRAWING NO: ARC-DV1012337

PWB ASSY, VARIABLE GAIN AMP/DET

SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY-PER	DRAWING NUMBER	REF	DSGN
0010	1012338	B	SCHEM DIAG, VARIABLE GAIN AMP/DET	EA	REF	ARC-DV1012338		
0020	1012337	D	ASSY DWG, VARIABLE GAIN/DET	EA	REF	ARC-DV1012337		
0400	27039		CAPR, CHIP, CER, 1000pF, 10%, 50V	EA	4.000	ATC\700B102MCA50X	C1	.C4 .C7 .C8
0410	27031		CAPR, CHIP, 15pF, 20%, 500V	EA	2.000	DIL\C17AH150MATXL	C2	.C3
0420	27099		CAPR, FEED-THRU, FILT, 2500PF, 500V	EA	5.000	MET\51-719-011	C9	.C10 .C11 .C12 .C13
0430	27261		CAPR, CHIP, 68pF, 10%, 150V	EA	2.000	ATC\100A680KCA150X	C14	.C15
0440	27098		CAPR, FEED-THRU, FILT, 470PF, 10%	EA	1.000	MET\FB2B-471GMV	C16	
0450	27029		CAPR, CHIP, 10pF, 10%, 500V	EA	REF	DIL\C17AH100K4TXL	C17	
0460	1013848-107		CAPR, FXD, CHIP, 3.9pf, +/-0.1pf, 500V, (SM) 1210 PKG	EA	REF	ARC-AV1013848	C18	
0700	30042		DIODE, SCHOTTKY, DET, MICROWAVE	EA	1.000	H-PAVSHS-2850	CR1	
1500	41243		CONN, COAX, BULKHD JACK, SMA, (F)	EA	2.000	DTAV1321000K82165	J1	.J2
1800	1007507-101	-	INDUCTOR, AIR WOUND, .0501D, 34GA, 4T	EA	2.000	ARC-AV1007507	L1	.L4
1810	1007507-103	-	INDUCTOR, AIR WOUND, .0501D, 34GA, 7T	EA	1.000	ARC-AV1007507	L2	
2500	1000034-176	BG	XSTR, RF, LOW NOISE, 6aAsFET	EA	1.000	ARC-AV1000034	Q1	
2700	55511-2200J		RES, FXD, CARBON COMP, 220, 5%, 1/8W	EA	1.000	A-B\BB2215	R1	
2720	55612-4700J		RES, FXD, METAL FILM, 470, 5%, 1/4-1/2W	EA	2.000	TRWGP55-4700+/-5%	R3	.R4
2730	55612-1001J		RES, FXD, METAL FILM, 1K, 5%, 1/4-1/2W	EA	1.000	TRWGP55-1001+/-5%	R5	
2740	1013142-1200J	-	RES, FXD, CHIP, 120, 5%, 1/8W, (SM), 1206 PKG	EA	1.000	ARC-AV1013142	R6	
2750	1013142-2200J	A	RES, FXD, CHIP, 220 OHM, 5%, 1/8W, (SM) 1206 PKG	EA	1.000	ARC-AV1013142	R7	
2760	1013142-2700J	-	RES, FXD, CHIP, 270 OHM, 5%, 1/8W, (SM) 1206 PKG	EA	1.000	ARC-AV1013142	R8	
2770	1013142-6800J	A	RES, FXD, CHIP, 68 OHM, 5%, 1/8W, (SM) 1206 PKG	EA	1.000	ARC-AV1013142	R9	
2780	55511-1500J		RES, FXD, CARBON COMP, 150, 5%, 1/8W	EA	1.000	A-B\BB1515	R10	
2790	1013142-10R0J	A	RES, FXD, CHIP, 10 OHM, 5%, 1/8W, (SM) 1206 PKG	EA	REF	ARC-AV1013142	R11	



BILL NO: 1012337-501

REV: C

U/M: EA

DRAWING NO: ARC-DA1012337

PWB ASSY, VARIABLE GAIN AMP/DET

SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY-PER DRAWING NUMBER	REF-DSGN
2800	1013142-39R0J	-	RES,FXD,CHIP,39 OHM,5%,1/8W,(SM) 1206 PKG	EA	1.000 ARC-VA1013142	R12 ,R13
2810	1013142-1001J	-	RES,FXD,CHIP,1K,5%,1/8W,(SM) 1206 PKG	EA	1.000 ARC-VA1013142	R14
2820	1013142-5600J	A	RES,FXD,CHIP,560 OHM,5%,1/8W,(SM) 1206 PKG	EA	1.000 ARC-VA1013142	R15
3700	25099		ATTEN,V-VAR,DC-8 GHz	EA	1.000 HITVHMC346G8	U1
3710	25054	-	ATTEN,FXD,3dB,1W,70 MIL PKG	EA REF	MIN\PAT-3	U2
3720	25069		ATTEN,FXD,2dB,1W,70 MIL PKG	EA REF	MIN\PAT-2	U3
5000	1012339-101	A	PWB,VARIABLE GAIN AMP/DET	EA	1.000 ARC-BA1012339	1
5010	1008813-101	A	HSG,VARIABLE GAIN AMP/DET	EA	1.000 ARC-DA1008813	2
5020	1007432-101	-	COVER,1 WATT AMP	EA	1.000 ARC-BA1007432	3
5030	66035		WIRE,TFE,.22 AWG,SOLID WHT	IN A/R	WEI\2822	4
5040	1000643-401	C	CORE,FERRITE,BEAD	EA	5.000 ARC\1000643	5
5050	11010		SCREW,MACH,PAN HD,CROSS-REC,S/S,4-40 X .25	EA	26.000 \MS51957-13	6
5070	12047		WASH,LOCK,SPLIT,S/S,#4	EA	26.000 \MS35338-135	8
5080	12010		WASH,FLAT,S/S,#4,.250 OD X .125 ID X .022 THK	EA	12.000 \MS15795-803	9
5090	1000643-402	C	CORE,FERRITE,BEAD,CMD5005	EA	4.000 ARC\1000643	10
5110	69332		ABSORBER,800MHz-18GHz,1/8",ADHESIVE BACK	IN A/R	E-C\LS-26/SS-3	12
5120	69101		LUG,SOLDER,BENT TONGUE,3/4 L,3/8 OD,1/4 STUD	EA	1.000 HHS\1496	13
5130	77144		SHIM,BRASS,6.00X.003 THK (ROLL 100")	IN	2.000 MSS\00051037	14
5140	77066		ADH,RTV,SELF-LVL,CLEAR	OZ A/R	G-ENGE118	15



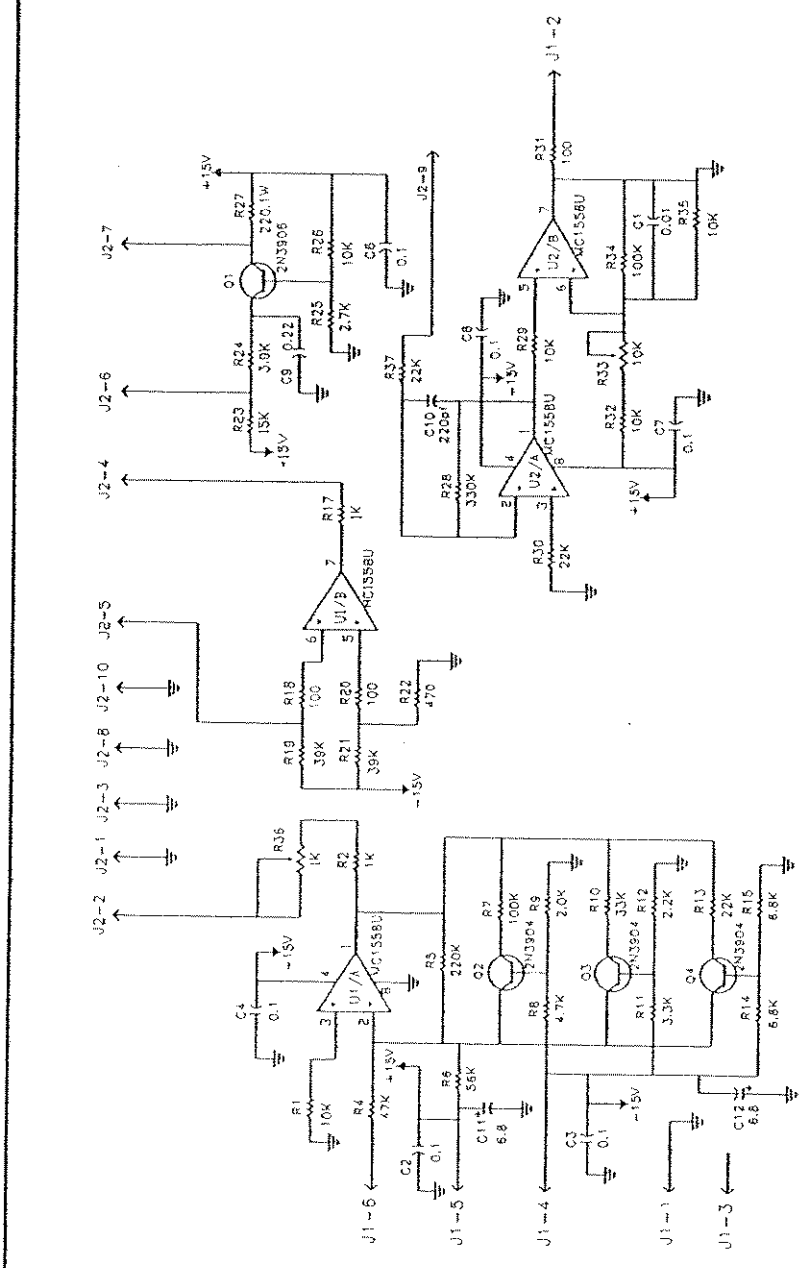






ECN	DATE	REV
REL 02FEB02		
23378UND04	A	
2338015ULV04	B	
25261000T04	C	

REL NO. 2057-02



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PART NO.		DESCRIPTION	PARTS LIST	
QTY.	RECD.			
UNLESS OTHERWISE SPECIFIED DO NOT SCALE DRAWINGS AND INCLUDE PLATING THICKNESS ALL DIMENSIONS ARE UNLESS NOTED REMOVE CLASS SURFACES AND SHARP EDGES				
DRAWN A. REED DATE 07 JAN 02 CHKD		DATE 28 FEB 02		
DATE 01 MAR 02		DATE 01 MAR 02		
MECH		ELEC		
DATE 01 MAR 02		DATE 01 MAR 02		
J. MAGINN		J. BANKERT		
SCALE 1/2		SHEET 1 OF 1		
DATE 01 MAR 02		REV. C		



SCHEMATIC  
LINEARIZER CONTROL  
DWG. NO. 1012335

REFERENCE DESIGNATION TABLE

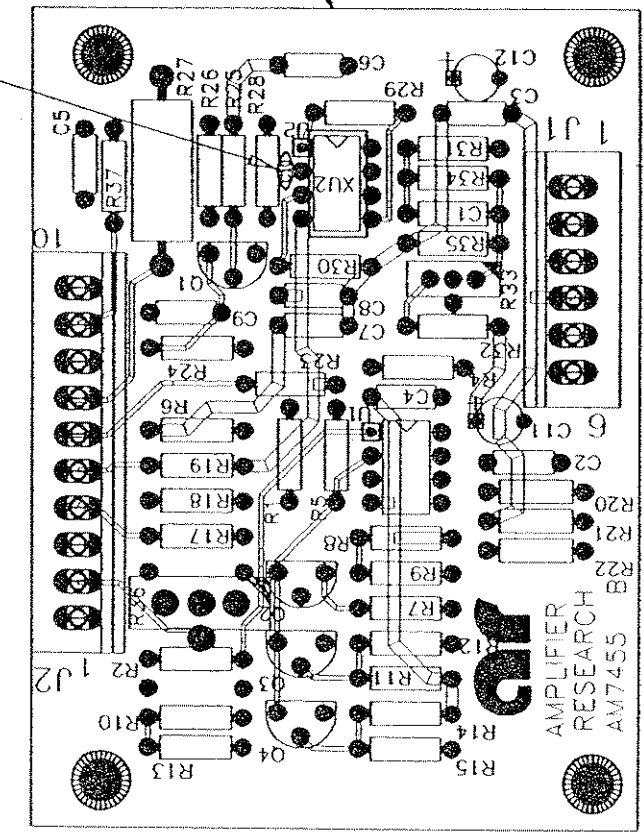
LAST DESIGNATION USED		DESIGNATIONS NOT USED	
R37	C12	Q4	U2
	C5		



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SPECIFICALLY IDENTIFY THE PRODUCT AND  
ORIGIN OF THE PRODUCT WITHOUT PROBABLY  
CONSENT OF AMPHIBER RESEARCH.

REL NO 2057-02  
ESN DATE REV  
XXX XXXX


SEE NOTE 1.0



**NOTES:**  
1.0 SOLDER C10 ACROSS R28.  
2.0 TRIM LEADS ON J1 AND J2.

FOR BOM SEE 1012334-501

QTY.	RECD.	T	M	DESCRIPTION	PARTS LIST	M	F	A	M	L

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MILLIMETERS AND DECIMALS THEREOF ALL DIMENSIONS ARE UNLESS NOTED OTHERWISE CHECK ALL DIMENSIONS AND SHARP EDGES	BASE DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS	DATE A.REED DATE: 07 JAN 02	DATE A.REED DATE: 28 FEB 02	DATE A.REED DATE: 07 JAN 02	DATE A.REED DATE: 07 JAN 02	<b>AMPLIFIER RESEARCH</b>	<b>PWB ASSY LINEARIZER/CONTROL</b>	<b>1012334</b>	ESN NONE	DATE 
BASE DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS	DATE A.REED DATE: 07 JAN 02	DATE A.REED DATE: 28 FEB 02	DATE A.REED DATE: 07 JAN 02	DATE A.REED DATE: 07 JAN 02	<b>AMPLIFIER RESEARCH</b>	<b>PWB ASSY LINEARIZER/CONTROL</b>	<b>1012334</b>	ESN NONE	DATE 	
UP TO 8	±.02	±.005	DATE A.REED DATE: 07 JAN 02	DATE A.REED DATE: 28 FEB 02	DATE A.REED DATE: 07 JAN 02	DATE A.REED DATE: 07 JAN 02	<b>AMPLIFIER RESEARCH</b>	<b>PWB ASSY LINEARIZER/CONTROL</b>	<b>1012334</b>	ESN NONE	DATE 	
8 TO 14	±.03	±.010	DATE A.REED DATE: 07 JAN 02	DATE A.REED DATE: 28 FEB 02	DATE A.REED DATE: 07 JAN 02	DATE A.REED DATE: 07 JAN 02	<b>AMPLIFIER RESEARCH</b>	<b>PWB ASSY LINEARIZER/CONTROL</b>	<b>1012334</b>	ESN NONE	DATE 	
ABOVE 14	±.06	±.015	DATE A.REED DATE: 07 JAN 02	DATE A.REED DATE: 28 FEB 02	DATE A.REED DATE: 07 JAN 02	DATE A.REED DATE: 07 JAN 02	<b>AMPLIFIER RESEARCH</b>	<b>PWB ASSY LINEARIZER/CONTROL</b>	<b>1012334</b>	ESN NONE	DATE 	
ANGULAR DIMENSIONS 1/2			DATE A.REED DATE: 07 JAN 02	DATE A.REED DATE: 28 FEB 02	DATE A.REED DATE: 07 JAN 02	DATE A.REED DATE: 07 JAN 02	<b>AMPLIFIER RESEARCH</b>	<b>PWB ASSY LINEARIZER/CONTROL</b>	<b>1012334</b>	ESN NONE	DATE 	



BILL NO: 1012334-501

REV: D

U/M: EA

DRAWING NO: ARC-B\1012334

PWB ASSY, LINEARIZER/CTRL BD

SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY-PER DRAWING NUMBER	REF-DSGN
0010	1012335	C	SCHEM DIAG, LINEARIZER/CTRL	EA	REF	ARC-D\1012335
0020	1012334	-	ASSY DWG, LINEARIZER/CTRL BD	EA	REF	ARC-B\1012334
0400	27189		CAPR, CER, 0.01uF, 20%, 500V	EA	1.000	SPR\5GAS-S10 C1
0410	27236		CAPR, FXD, DIP SPACED CER, .1uF, 50VDC	EA	6.000	AVX\MD015C104MAA C2, C3, C4, C6, C7, C8
0420	27210		CAPR, CER, 0.22uF, 50V	EA	1.000	CRL\CW30C224K C9
0430	27183		CAPR, CER, 220pF, 10%, 500/1000V	EA	1.000	CRL\DD221 C10
0440	27055		CAPR, TANT, 6.8uF, 50V	EA	2.000	MAL\TDC685K050NLF C11, C12
1500	41083		CONN, LOCKING HEADER, STR, 6 PIN	EA	1.000	PNT\MLSS156-6-C J1
1510	41084		CONN, LOCKING HEADER, STR, 10 PIN, SQR POSTS	EA	1.000	PNT\MLSS156-10-L J2
2500	2N3906		XSTR, SWNG, PNP, 40V, 0.2A, 1W	EA	1.000	ARE\2N3906 Q1
2510	2N3904		XSTR, SWNG, NPN, 40V, 0.2A, 1W	EA	3.000	Q2, Q3, Q4
2700	55612-1002J		RES, FXD, METAL FILM, 10K, 5%, 1/4-1/2W	EA	5.000	TRW\GP55-1002+/-5% R1, R26, R29, R32, R35
2710	55612-1001J		RES, FXD, METAL FILM, 1K, 5%, 1/4-1/2W	EA	2.000	TRW\GP55-1001+/-5% R2, R17
2720	55612-4702J		RES, FXD, METAL FILM, 47K, 5%, 1/4-1/2W	EA	1.000	TRW\GP55-4702+/-5% R4
2730	55612-2203J		RES, FXD, METAL FILM, 220K, 1%, 1/4-1/2W	EA	1.000	TRW\GP55-2203+1-5% R5
2740	55612-5602J		RES, FXD, METAL FILM, 56K, 5%, 1/4-1/2W	EA	1.000	TRW\GP55-5602+/-5% R6
2745	55612-1003J		RES, FXD, METAL FILM, 100K, 5%, 1/4-1/2W	EA	2.000	TRW\GP55-1003+/-5% R7, R34
2750	55612-4701J		RES, FXD, METAL FILM, 4.7K, 5%, 1/4-1/2W	EA	1.000	TRW\GP55-4701+/-5% R8
2760	55612-2001J		RES, FXD, METAL FILM, 2.0K, 5%, 1/4-1/2W	EA	1.000	TRW\GP55-2001+/-5% R9
2770	55612-3302J		RES, FXD, METAL FILM, 33K, 5%, 1/4-1/2W	EA	1.000	TRW\GP55-3302+/-5% R10
2780	55612-3301J		RES, FXD, METAL FILM, 3.3K, 5%, 1/4-1/2W	EA	1.000	TRW\GP55-3301+/-5% R11
2790	55612-2201J		RES, FXD, METAL FILM, 2.2K, 5%, 1/4-1/2W	EA	1.000	TRW\GP55-2201+/-5% R12





BILL NO: 1012334-501

REV: D

U/M: EA

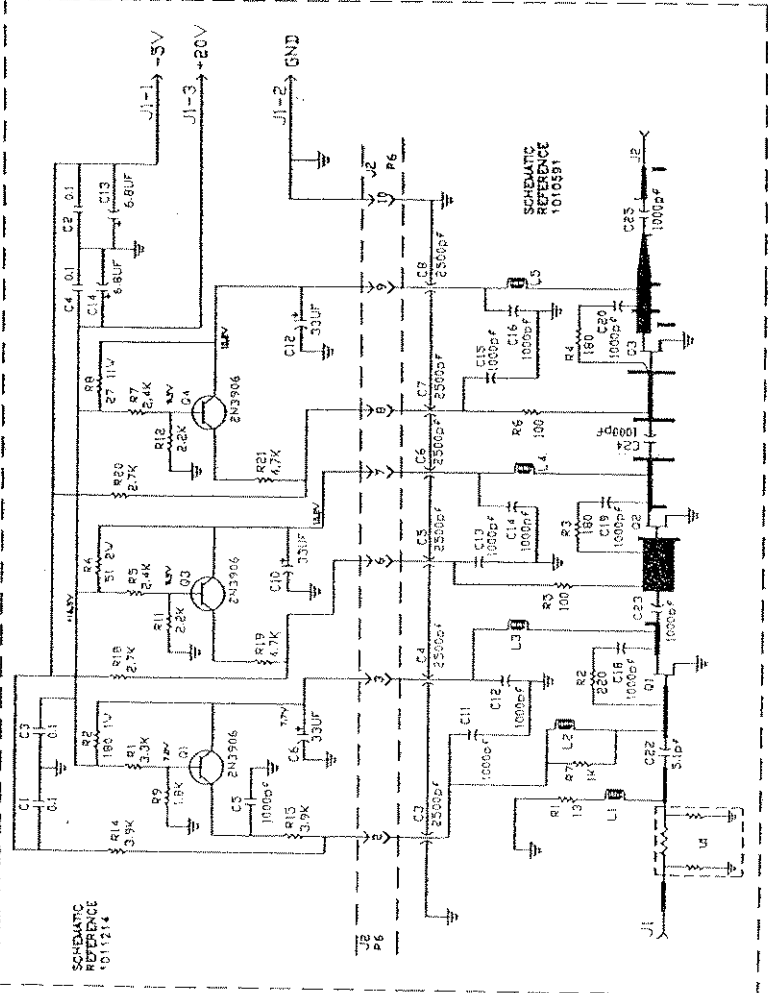
DRAWING NO: ARC-B\1012334

PWB ASSY, LINEARIZER/CTRL BD

SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
2800	55612-2202J		RES,FXD,METAL FILM,22K,5%,1/4-1/2W	EA	3.000	TRW\GP55-2202+/-5%	R13 ,R30 R37
2810	55612-6801J		RES,FXD,METAL FILM,6.8K,5%,1/4-1/2W	EA	2.000	TRW\GP55-6801+/-5%	R14 ,R15
2820	55612-1000J		RES,FXD,METAL FILM,100,5%,1/4-1/2	EA	3.000	TRW\GP55-1000+/-5%	R18 ,R20 R31
2830	55612-3902J		RES,FXD,METAL FILM,39K,5%,1/4-1/2W	EA	2.000	TRW\GP55-3902+/-5%	R19 ,R21
2835	55612-4700J		RES,FXD,METAL FILM,470,5%,1/4-1/2W	EA	1.000	TRW\GP55-4700+/-5%	R22
2840	55612-1502J		RES,FXD,METAL FILM,15K,5%,1/4-1/2W	EA	1.000	TRW\GP55-1502+/-5%	R23
2850	55612-3901J		RES,FXD,METAL FILM,3.9K,5%,1/4-1/2W	EA	1.000	TRW\GP55-3901+/-5%	R24
2855	55612-2701J		RES,FXD,METAL FILM,2.7K,5%,1/4-1/2W	EA	1.000	TRW\GP55-2701+/-5%	R25
2860	55514-2200J		RES,FXD,CARBON COMP,220,5%,1W	EA	1.000	A-B\GB2215	R27
2870	55612-3303J		RES,FXD,METAL FILM,330K,5%,1/4-1/2W	EA	1.000	TRW\GP55-3303+/-5%	R28
2900	55919		RES,VAR,CERMET,MULTITURN, TOP ADJ,10K,10%,1/2W	EA	1.000	BOR\3299Y-1-103	R33
2910	55917		RES,VAR,CERMET,MULTITURN, TOP ADJ,1K,10%,1W	EA	1.000	MEP\RJ24FW102	R36
3700	60039		INTEGRATED CKT,DUAL OP AMP	EA	2.000	MOT\MC1558U	U1 ,U2
4500	73010		SOCKET,I.C.,8 PIN,DIP	EA	2.000	TII\C93-08-02	XU1 ,XU2
5000	1007455-101	D	PWB,LINEARIZER/CTRL BD	EA	1.000	ARC-B\1007455	1
5010	66041		WIRE,TFE,26 AWG,STRANDED,TYPE E,WHT	IN A/R			2



REV	NO	DATE	BY
104-19			



REV	NO	DATE	BY
104-19			

W. A. L. P. V. BIAS CONTROL	1012011
SCHEMATIC REFERENCE 1010391	
W. A. L. P. V. BIAS CONTROL	
1012011	

104-19

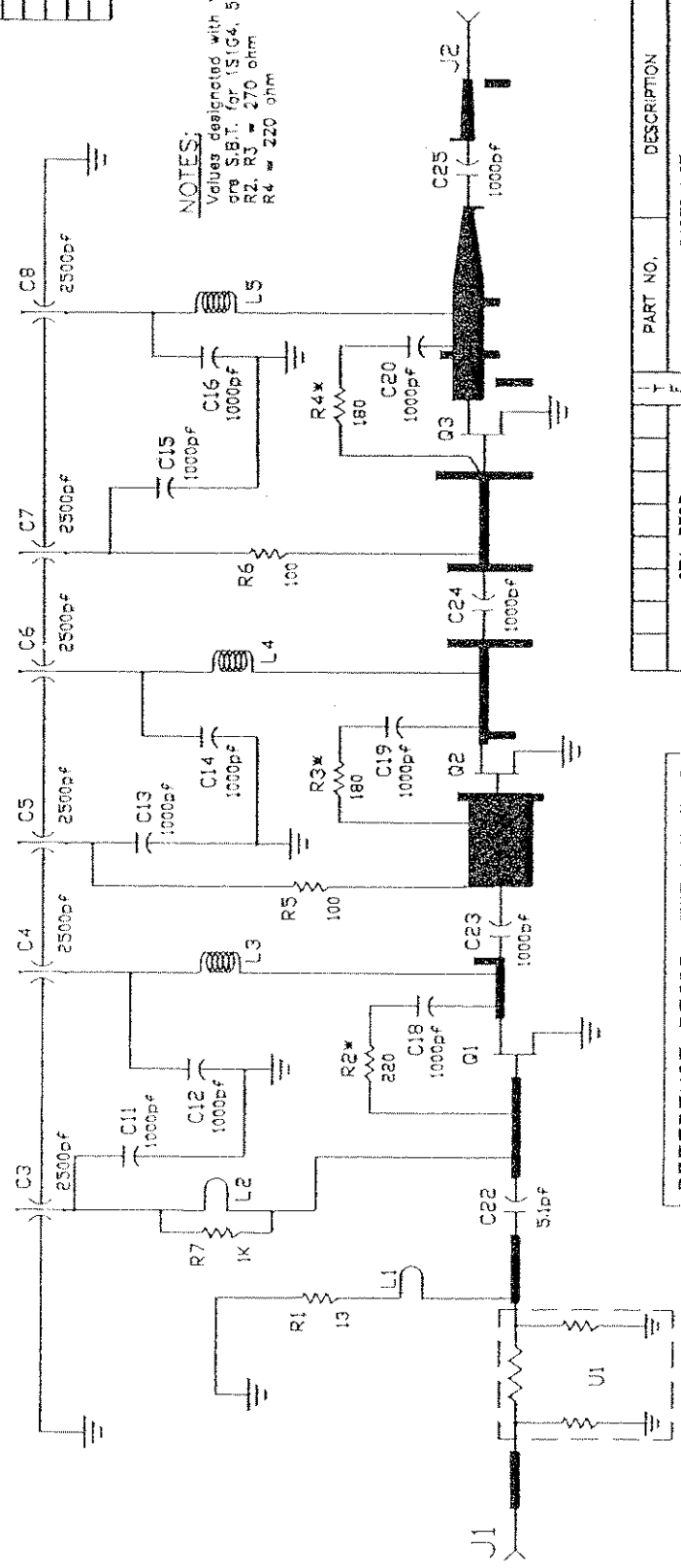




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ECN	DATE	REV.
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XXXX	15SEP99	2
XXXX	15SEP99	
XXXX	15SEP99	
XXXX	15SEP99	
XXXX	15SEP99	
XXXX	15SEP99	
XXXX	15SEP99	
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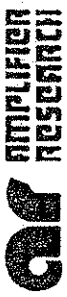
REL. NO. 1104-10



NOTES:  
 Values designated with \* are S.B.T. for 1S1G4. 5S1G4.  
 R2, R3 = 270 ohm  
 R4 = 220 ohm

REFERENCE DESIGNATION TABLE	
LAST DESIGNATION USED	
Q3	C25 L6 R7
DESIGNATIONS NOT USED	
C152,C9,C10	
C17,C21	

PART NO.		DESCRIPTION	
DRAWN		PARTS LIST	
DATE 18 JULY 99			
CHKD			
DATE 18 DEC 99			
MECH			
DATE 17 DEC 99			
ELEC			
DATE 16 DEC 99			
J. ALDERFER			
SCALE		SHEET	
NONE		1 OF 1	
		REV. A	

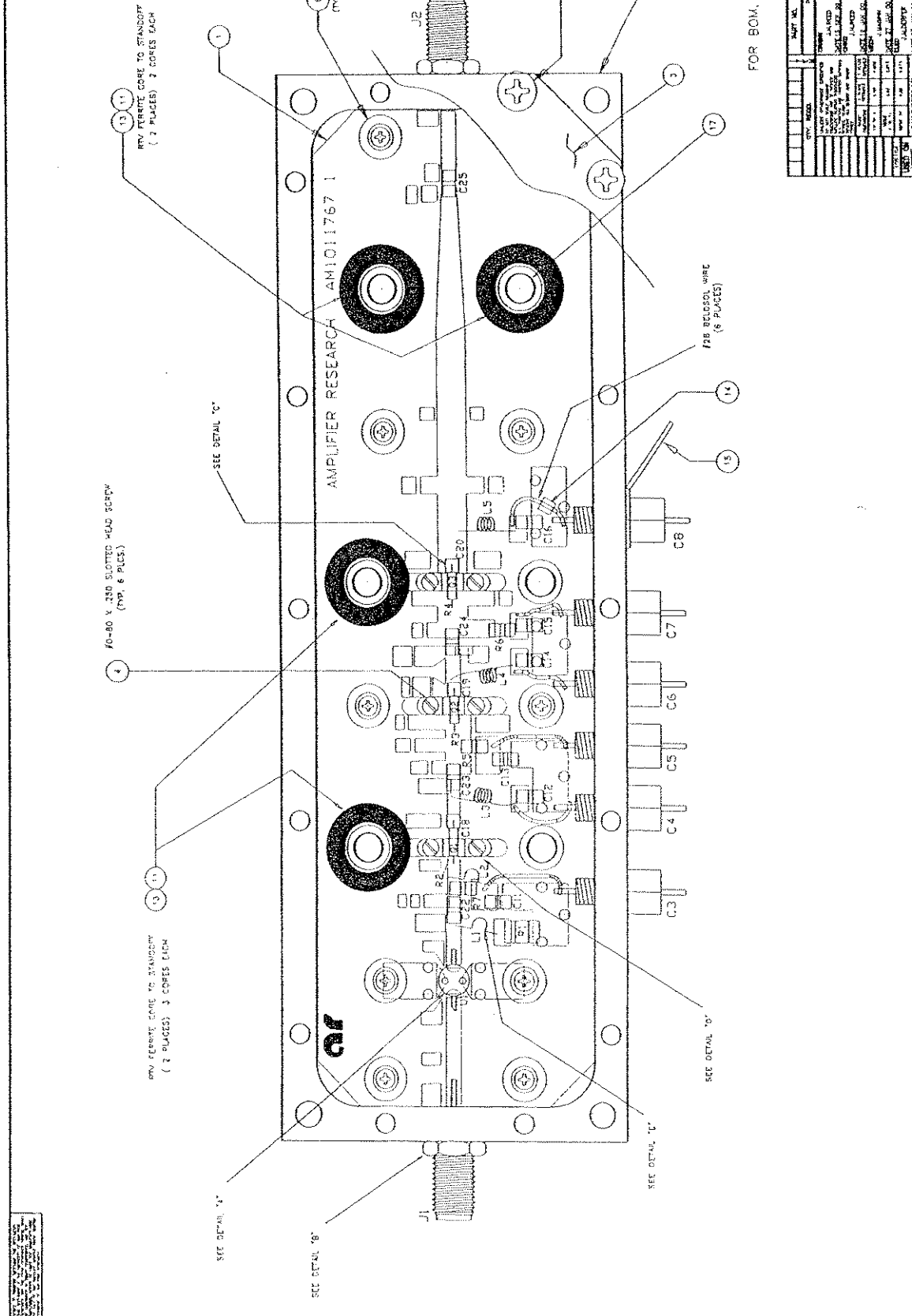


AMPLIFIER RESEARCH  
 SCHEMATIC  
 LOW LEVEL "S" MODULE  
 DWG. NO. 1010591



REV.	DATE	BY	CHKD.
1			
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REV. 10-58



FOR BOM, SEE 1010589-501

REV.	DATE	BY	CHKD.
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REV. 10-58

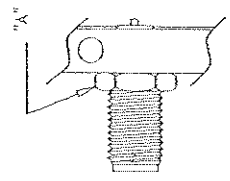
REV.	DATE	BY	CHKD.
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REV. 10-58

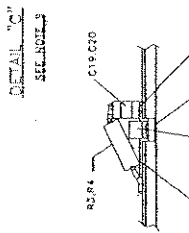




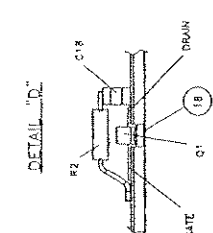
ASSEMBLY PROCEDURE - WATT AMP  
 1) INSTALL P.C. BOARD INTO HOUSING - CENTER HOUSING SCREW HOLES  
 IN SLOTS FOR Q1, Q2 AND Q3  
 2) TEMPORARILY USE MOUNTING HARDWARE TO HOLD BOARD IN PLACE  
 PRIOR TO INSTALLING STANDOFFS. TIGHTEN AT COMPLETION.  
 3) INSTALL FEEDBACK Q1 AND Q2 INTO HOUSING. NOTE: SEE DETAIL "A".  
 4) INSTALL FEEDBACK Q3 THRU Q8 INTO HOUSING.  
 5) INSTALL R1, R2, R3 (WITH FACE VALUE DOWN).  
 6) INSTALL ALL OF THE CERAMIC CHIP CAPS (Q101, Q18, Q19, AND Q20)  
 7) INSTALL Q1 THRU Q8. INSTALL Q1 AS SHOWN (CLOSE TO Q2).  
 8) INSTALL P28 DELTA-DIODE. SOLDER WIRES BETWEEN FEEDTHRU AND P.C. BOARD  
 TO BOARD SURFACE WITH NO SEPARATE LOOP. WIRE SHOULD RUN FLUSH  
 WITH THE BOARD SURFACE TO APPROPRIATE PIN WITHOUT TOUCHING ANY  
 OTHER PAD OR COMPONENTS. WIRE LENGTHS SHOULD BE AS SHORT AS  
 POSSIBLE WITH THE ABOVE MENTIONED COMPONENTS.



TRIM TAIL OF PARTS Q1 & Q2 FLUSH WITH  
 CONNECTOR BODY. CUT CENTER PIN TO 0.075"(H)  
 INSTALL CONNECTOR FLUSH WITH INNER HOUSING  
 WALL. TIGHTEN LOCKING NUT "X" SECURELY. (DO  
 NOT USE SUPPLIED WASHERS)



0-80 X 0.250 SCREW REF.

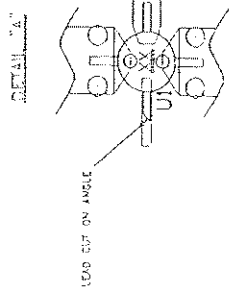


DETAIL "E"  
 (8 PUCKS)  
 28 GAUGE  
 RECESSED WIRE

9) FEET PREPARATION:  
 NOTE: THE FOLLOWING FEET INSTALLATION MUST BE DONE AT A  
 STATIC APPROVED WORK STATION. PERSONS HANDLING AND  
 INSTALLING THE FEET'S MUST BE FAMILIAR WITH THE PROCEDURE. THE  
 FEET CAN BE DESTROYED BOTH ELECTRICALLY AND MECHANICALLY.

- 1) CUT THE GATE LEADS TO APPROXIMATELY 0.075" LONG. (3 TIMES LEAD WIDTH) CLIP  
 AT 90 DEGREE TO MAXIMUM LEAD INTERSECTION.
- 2) CUT THE DRAIN LEAD AT A 90 DEGREE ANGLE TO APPROXIMATELY 0.075" LONG.  
 (GATE LEADS OF Q1-Q3 MUST FACE FORWARD.)
- NOTE: STEPS 1) THRU 3) ABOVE MUST BE COMPLETED BEFORE INSTALLING FEET'S.
- a) INSTALL SHU 9/16" DIA 101A381-101 UNDER Q1, Q2, AND Q3.
- b) INSTALL 0-80 SCREWS TO HOLD Q1-Q3. SECURELY TIGHTEN BACK OFF 1/8 TURN.  
 SOLDER THE DRAIN SIDE FIRST WITH UNIMMUN SOLDERING IRON SHELL THAT BE  
 SURE TO CONTACT BOTH THE PWB AND THE TRANSISTOR LEAD AT THE SAME  
 TIME WHILE SOLDERING.
- c) PRE-TIN Q18, Q19, Q20, BOTH ENDS AND INSTALL CAPS ON DRAIN LEADS  
 WITH UNIMMUN SHELL TUBE.
- d) RE-TIGHTEN MOUNTING SCREWS.
- e) SOLDER GATE LEADS WITH UNIMMUN SHELL TUBE

- 11) INSTALL FEEDBACK RESISTORS R1 AND R4 TO Q1 PER DETAIL "A".
- 12) INSTALL FEEDBACK RESISTORS R2 AND R3 TO Q2 AND Q3 PER DETAIL "C".



LEAD CUT ON ANGLE



BILL NO: 1010589-501

REV: C

U/M: EA

DRAWING NO: ARC-CV1010589

PWB ASSY, LOW LEVEL "S" MODULE

SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY-PER	DRAWING NUMBER	REF-DSGN
0010	1010591	A	SCHEM DIAG, LOW LEVEL "S" MODULE	EA	REF	ARC-BV1010591	
0020	1010589	E	ASSY DWG, LOW LEVEL "S" MODULE	EA	REF	ARC-CV1010589	
0400	27099		CAPR, FEED-THRU, FILT, 2500PF, 500V	EA	6.000	METV51-719-011	C3 C4 C5 C6 C7 C8
0410	27039		CAPR, CHIP, CER, 1000pF, 10%, 50V	EA	12.000	ATC\700B102MCA50X	C11 C12 C13 C14 C15 C16 C18 C19 C20 C23 C24 C25
0420	27024		CAPR, CHIP, 5.1pF, 0.5%, 500V	EA	1.000	DIL\C17AH5R1D500NT	C22
1500	41243		CONN, COAX, BULKHD JACK, SMA, (F)	EA	2.000	DTA\1321000K82165	J1 .J2
1800	66052		WIRE, MAGNET, SOLDERABLE, 28 AWG, GRN	EA	2.000		L1 .L2
1810	1007507-102		INDUCTOR, AIR WOUND, .050ID, 34GA, 5T	EA	3.000	ARC-AV1007507	L3 L4 L5
2500	1000034-183	BJ	XSTR, RF, LOW NOISE, GaAsFET	EA	1.000	ARC-AV1000034	Q1
2510	1000034-184	BJ	XSTR, RF, MED PWR, GaAsFET	EA	1.000	ARC-AV1000034	Q2
2520	1000034-185	BJ	XSTR, RF, MED PWR, GaAsFET	EA	1.000	ARC-AV1000034	Q3
2700	55649-13R0J		RES, FXD, CHIP, 13.5%, 1W	EA	1.000	D-KVP13XCT-ND	R1
2710	55511-2200J		RES, FXD, CARBON COMP, 220.5%, 1/8W	EA	1.000	A-B\BB2215	R2
2720	55511-1800J		RES, FXD, CARBON COMP, 180.5%, 1/8W	EA	2.000	A-B\BB1815	R3 .R4
2730	55647-1000J		RES, FXD, CHIP, 100 OHM, 5%, 1/8W, (SM) 1206 PKG	EA	2.000	PANVERJ-86EYJ101V	R5 .R6
2740	55647-1001J		RES, FXD, CHIP, 1K, 1/8, 5%	EA	1.000	D-KVP1.0K-ECT-ND	R7
3700	25069		ATTEN, FXD, 2dB, 1W, 70 MIL PKG	EA	1.000	MINVPAT-2	U1
5000	1011767-101	A	PWB, 1 WATT AMP	EA	1.000	ARC-BV1011767	1
5010	1010548-101		HSG, LOW LEVEL "S" MODULE	EA	1.000	ARC-DV1010548	2
5020	1010757-101		COVER, LOW LEVEL 1W AMP, S MODULE	EA	1.000	ARC-BV1010757	3



07:14:24 13 APR 2005

AMPLIFIER RESEARCH (AR)  
\*\*\* SINGLE LEVEL BILL OF MATERIAL LISTING \*\*\*

REPORT: E0056 PAGE: 2

BILL NO: 1010589-501

REV: C

U/M: EA

DRAWING NO: ARC-C\1010589

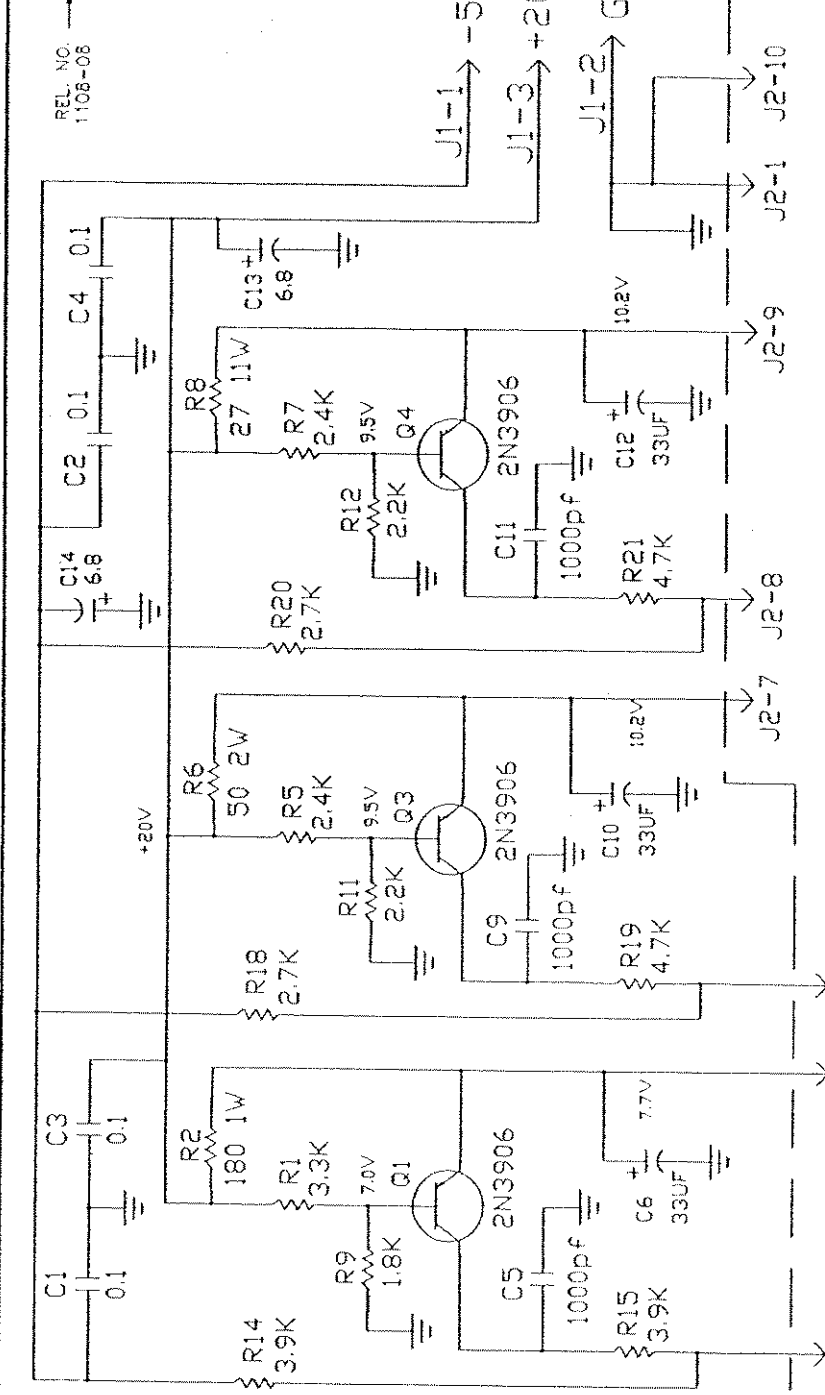
PWB ASSY, LOW LEVEL "S" MODULE

SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY PER DRAWING NUMBER	REF-DSGN
5030	11145		SCREW, MACH, FIL HD, SLOTTED, 0-80 X .25	EA	6.000	4
5050	11010		SCREW, MACH, PAN HD, CROSS-REC, S/S, 4-40 X .25	EA	24.000	\MS51957-13 6
5060	12047		WASH, LOCK, SPLIT, S/S, #4	EA	24.000	\MS35338-135 7
5070	12010		WASH, FLAT, S/S, #4, .250 OD X .125 ID X .022 THK	EA	10.000	\MS15795-803 8
5090	66054		WIRE, MAGNET, SOLDERABLE, 28 AWG, RED	IN A/R		10
5100	1000643-612	C	CORE, FERRITE, TOROID, 3E2A	EA	10.000	ARC\1000643 11
5120	77066		ADH, RTV, SELF-LVL, CLEAR	EA A/R		G-ENGE118 13
5130	1000643-401	C	CORE, FERRITE, BEAD	EA	1.000	ARC\1000643 14
5140	69101		LUG, SOLDER, BENT TONGUE, 3/4 L, 3/8 OD, 1/4 STUD	EA	1.000	HHS\1496 15
5160	69429		SPACER, RND, M-F, A, 1/4 OD x .625 L x 4-40	EA	6.000	RAF\4036-440-A 17
5170	1011381-101	A	SPACER, PWB	EA	3.000	ARC-B\1011381 18



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EDN	DATE	REV.
XXXX	AS0200	1
10541	12/14/00	A
10572	08/10/00	B



QTY.	RECD.	Y	U	F	A	R	I	N	U	REV.
		PART NO.		DESCRIPTION						
		PARTS LIST								
		DRAWN		AMPLIFIER RESEARCH						
		DATE		SCHEMATIC						
		CHKD		BIAS CONTROL						
		DATE		DWG. NO. 1011214						
		MECH		SCALE SHEET 1 OF 1						
		DATE		REV. B						
		ELEC								
		DATE								
		USED ON MODEL								
		ANGULAR DIMENSIONS 1/2								

REFERENCE DESIGNATION TABLE	
LAST DESIGNATION USED	
C15	Q4
C7,C8	R3,R4,R10, R13,R16,R17
R21	
DESIGNATIONS NOT USED	

NOTES:  
 1.0 UNLESS OTHERWISE INDICATED, ALL RESISTORS ARE IN OHMS, 1/4 WATT, AND 5% TOLERANCE.  
 2.0 ALL CAPACITORS ARE IN MICROFARADS, AND ARE 50 VOLTS, UNLESS INDICATED.

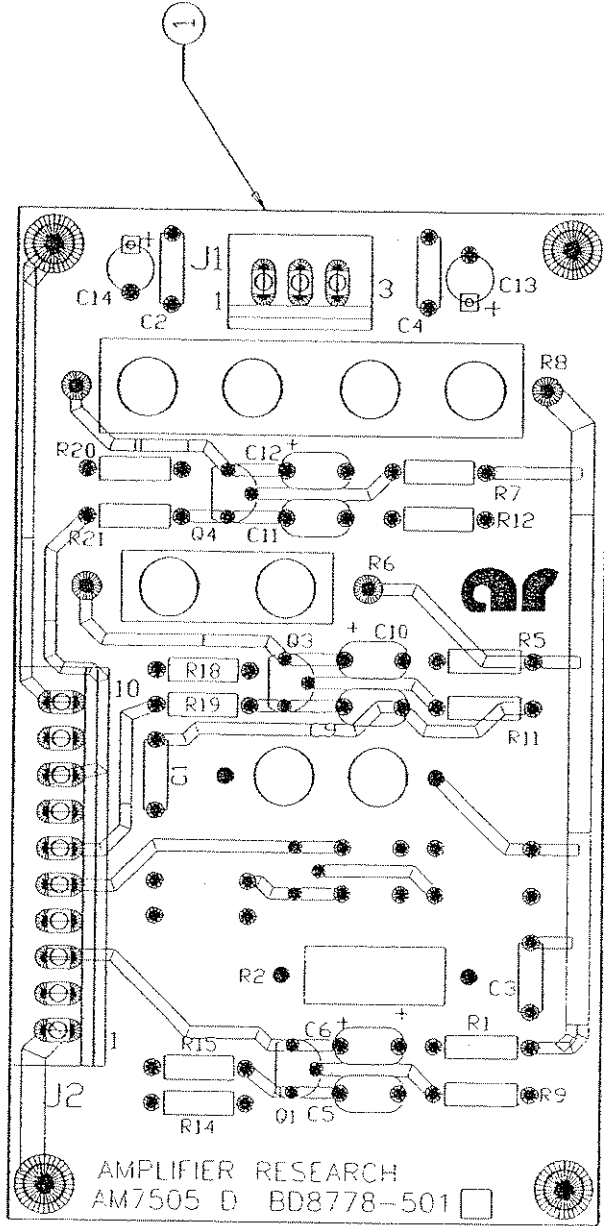




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ECN	DATE	REV
00000	01/00	1

REL. NO. 1105-12



AMPLIFIER RESEARCH  
AM7505 D BD8778-501

FOR BOM, SEE 1011248-501

MATERIAL		DESCRIPTION	PART NO.	PARTS LIST
QTY.	REQD.			
		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESSES DIMENSIONS ARE UNIFIED NATIONAL STRAIGHT SIZES REMOVE ALL BURRS AND SHARP EDGES		
		BASIC DIMENSIONS	2 PLACE DECIMALS	3 PLACE DECIMALS
		UP TO 6	±.02	±.005
		ABOVE 6 TO 24	±.03	±.010
		ABOVE 24	±.06	±.015
		ANGULAR DIMENSIONS 1/2"		
55164		USED ON MODEL		
		DRAWN	J.H. REED	
		DATE	18 MAR 00	
		CHKD	J.H. REED	
		DATE	31 JULY 00	
		MECH	J. MAGNIN	
		DATE	01 AUG 00	
		ELEC	J. ALDERFER	
		DATE	01 AUG 00	
		SCALE	2/1	SHEET 1 OF 1
		DWG. NO.	1011248	REV. 1
		 <b>AMPLIFIER RESEARCH</b>		
		<b>ASSEMBLY DRAWING</b> <b>BIAS CTRL. 1W S. MOD.</b>		



BILL NO: 1011248-501

REV: -

U/M: EA

DRAWING NO: ARC-B\1011248

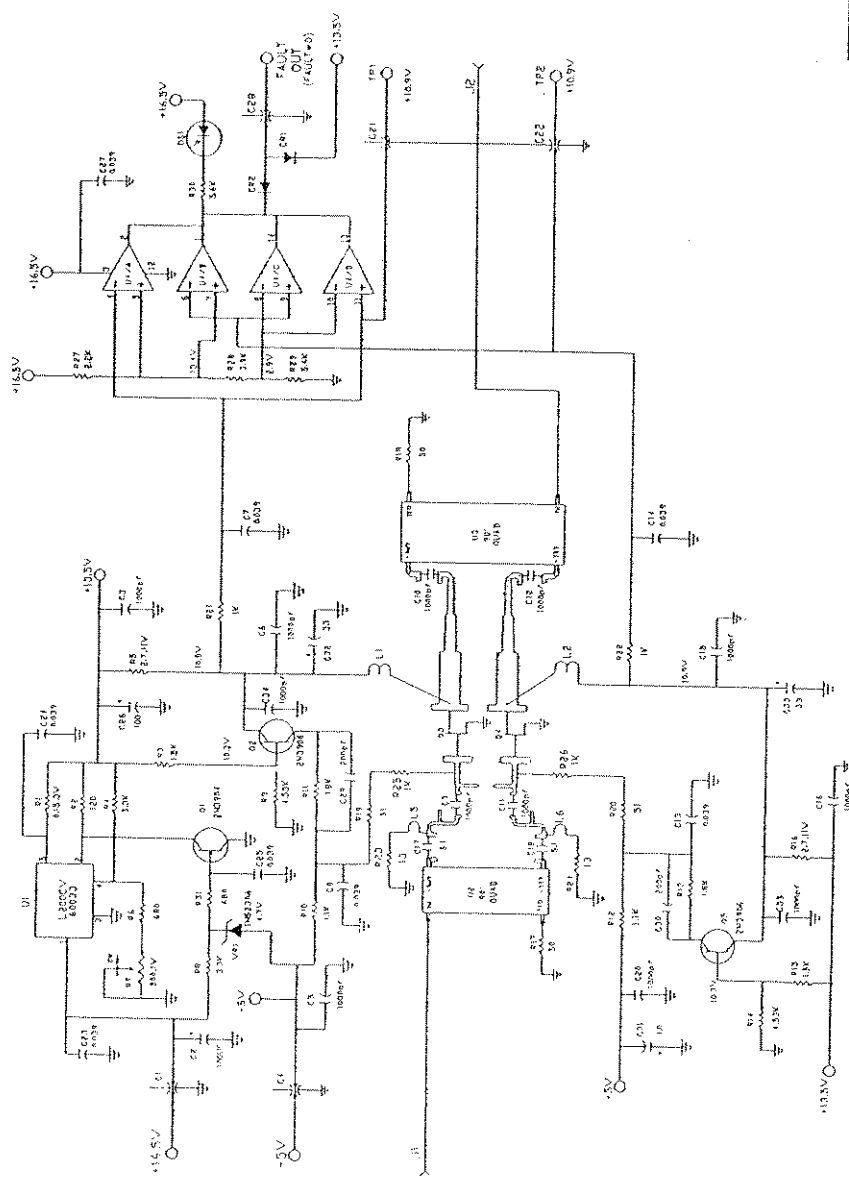
PWB ASSY.BIAS CONTROL,1W S MODULE

SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY-PER DRAWING NUMBER	REF-DSGN
0010	1011248	-	ASSY DWG.BIAS CONTROL,1W S MODULE	EA	REF	ARC-B\1011248
0020	1011214	B	SCHEM DIAG.BIAS CONTROL,551G4	EA	REF	ARC-B\1011214
0400	27236		CAPR,FXD,DIP SPACED CER,.1UF,50VDC	EA	4.000	AVX\MD015C104MAA C1 ,C2 C3 ,C4
0410	27179		CAPR,CER,1000pF,1000V,10%,CHAR Z5F	EA	3.000	NIC\NCD102K1KVY5F C5 ,C9 C11
0420	27051		CAPR,TANT,33UF,35VDC,EPOXY	EA	3.000	AVX\TAP336K035HSB C6 ,C10 C12
0430	27055		CAPR,TANT,6.8UF,50V	EA	2.000	MAL\TDC685K050NLF C13 ,C14
1500	41082		CONN,STR,3 PIN	EA	1.000	PNT\MLSS156-3 J1
1510	41084		CONN,LOCKING HEADER,STR.10 PIN,SQR POSTS	EA	1.000	PNT\MLSS156-10-L J2
2500	2N3906		XSTR,SWNG,PNP,40V,0.2A,1W	EA	3.000	ARE\2N3906 Q1 ,Q3 Q4
2700	55612-3301J		RES,FXD,METAL FILM,3.3K,5%,1/4-1/2W	EA	1.000	TRW\GP55-3301+/-5% R1
2730	55514-1800J		RES,FXD,CARBON COMP,180,5%,1W	EA	1.000	R2
2740	55612-2401J		RES,FXD,METAL FILM,2.4K,5%,1/4-1/2W	EA	2.000	TRW\GP55-2401+/-5% R5 ,R7
2750	55515-51R0J		RES,FXD,CARBON COMP,51,5%,2W	EA	1.000	R6
2760	55756-27R0J		RES,FXD,WW,27 OHM,5%,11W	EA	1.000	OHM\90J27R R8
2770	55612-1801J		RES,FXD,METAL FILM,1.8K,5%,1/4-1/2W	EA	1.000	TRW\GP55-1801+/-5% R9
2780	55612-2201J		RES,FXD,METAL FILM,2.2K,5%,1/4-1/2W	EA	2.000	TRW\GP55-2201+/-5% R11 ,R12
2800	55612-3901J		RES,FXD,METAL FILM,3.9K,5%,1/4-1/2W	EA	2.000	TRW\GP55-3901+/-5% R14 ,R15
2810	55612-2701J		RES,FXD,METAL FILM,2.7K,5%,1/4-1/2W	EA	2.000	TRW\GP55-2701+/-5% R18 ,R20
2820	55612-4701J		RES,FXD,METAL FILM,4.7K,5%,1/4-1/2W	EA	2.000	TRW\GP55-4701+/-5% R19 ,R21
5000	1007505-101	D	PWB,BIAS CTRL,1 WATT AMP	EA	1.000	ARC-B\1007505 1



REV. NO.	1
DATE	10/15/57
BY	W. J. ...
CHKD BY	...
APPROVED	...
REVISIONS	...

SCHEMATIC No. 1011064-1



REFERENCE DESIGNATION TABLE

DES	QTY	351	32	L4	Q5	R21	TP2	U4	UR
C25	C22	C21	C2	L4	Q5	R21	TP2	U4	UR
C19	DESIGNATIONS NOT USED								
Subjects Designators: +16.5V -16.5V -5V +13.5V -5V									

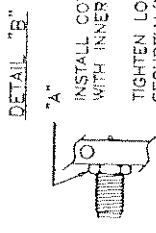
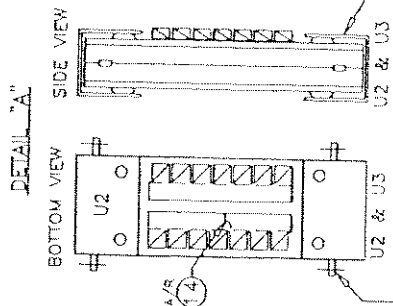
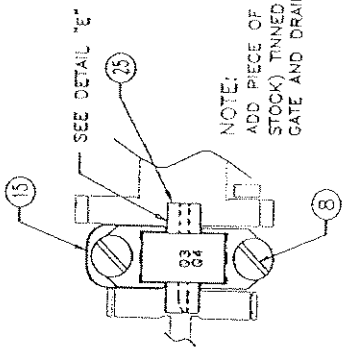
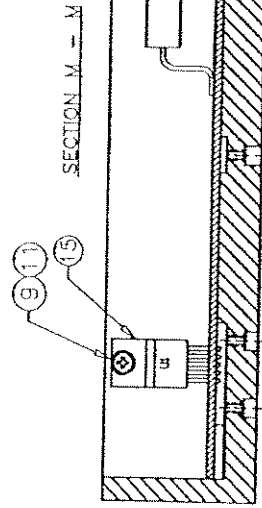
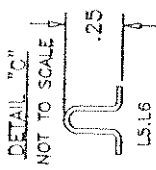
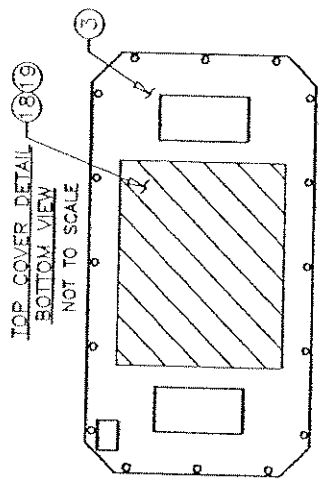
REV. NO.	DESCRIPTION	DATE	BY	CHKD BY	APPROVED
1	SCHEMATIC	10/15/57	W. J. ...	...	...
2	...	...	...	...	...
3	...	...	...	...	...
4	...	...	...	...	...
5	...	...	...	...	...

PART NO. PARTS LIST  
 QUANTITY  
 UNIT PRICE  
 TOTAL PRICE  
 ORDER NO.  
 ORDER DATE  
 ORDER TIME  
 ORDER PLACE  
 ORDER METHOD  
 ORDER TYPE  
 ORDER STATUS  
 ORDER COMMENTS  
 ORDER HISTORY  
 ORDER TRACKING  
 ORDER CANCELLATION  
 ORDER REFUND  
 ORDER RETURN  
 ORDER EXCHANGE  
 ORDER WARRANTY  
 ORDER SUPPORT  
 ORDER TRAINING  
 ORDER CONSULTING  
 ORDER REPAIR  
 ORDER MAINTENANCE  
 ORDER INSPECTION  
 ORDER TESTING  
 ORDER CALIBRATION  
 ORDER REWORK  
 ORDER SCRAP  
 ORDER DISPOSE  
 ORDER REUSE  
 ORDER RECYCLE  
 ORDER SUSTAINABILITY  
 ORDER COMPLIANCE  
 ORDER SECURITY  
 ORDER PRIVACY  
 ORDER ACCESSIBILITY  
 ORDER INCLUSIVITY  
 ORDER EQUITY  
 ORDER JUSTICE  
 ORDER FAIRNESS  
 ORDER INTEGRITY  
 ORDER HONESTY  
 ORDER COURTESY  
 ORDER RESPECT  
 ORDER EMPATHY  
 ORDER KINDNESS  
 ORDER PATIENCE  
 ORDER SELF-CONTROL  
 ORDER MODERATION  
 ORDER TEMPERANCE  
 ORDER VIRTUE  
 ORDER WISDOM  
 ORDER COURAGE  
 ORDER PERSEVERANCE  
 ORDER DETERMINATION  
 ORDER RESOLVE  
 ORDER COMMITMENT  
 ORDER ACCOUNTABILITY  
 ORDER RESPONSIBILITY  
 ORDER ETHICS  
 ORDER MORALS  
 ORDER VALUES  
 ORDER BELIEFS  
 ORDER OPINIONS  
 ORDER ATTITUDES  
 ORDER BEHAVIORS  
 ORDER ACTIONS  
 ORDER REACTIONS  
 ORDER RESPONSES  
 ORDER FEELINGS  
 ORDER THOUGHTS  
 ORDER BELIEFS  
 ORDER OPINIONS  
 ORDER ATTITUDES  
 ORDER BEHAVIORS  
 ORDER ACTIONS  
 ORDER REACTIONS  
 ORDER RESPONSES  
 ORDER FEELINGS  
 ORDER THOUGHTS



ECN	DATE	REV.
REL 24MAY 65		

REL NO. 1196-09



TRIM ALL LEADS ON U2 AND U3. 0.100" (IN) (8 PLACES)

- NOTES:
- 1.0 INSTALL PWB INTO HOUSING, CENTER THE CUTOUT FOR THE FET'S OVER THE 2-56 FET MOUNTING SCREW HOLES.
  - 2.0 TIGHTEN ALL MOUNTING SCREWS FOR PWB BEFORE BEGINNING INSTALLATION OF COMPONENTS.
  - 3.0 INSTALL ALL COMPONENTS INTO HOUSING BEFORE FET INSTALLATION. THIS MUST BE DONE LAST.

CAUTION

4.0 THE FET INSTALLATION MUST BE DONE AT A STATIC APPROVED WORK STATION. PERSONS HANDLING AND INSTALLING THE FET'S MUST BE FAMILIAR WITH GoAs FET HANDLING PROCEDURES. THE GoAs FET CAN BE DESTROYED, ELECTRICALLY AND MECHANICALLY.

5.0 DO NOT PUSH THE GATE OR DRAIN LEADS DOWN TO THE P.C. BOARD WHEN INSTALLING THE FET. USE SOLDER TO FILL THE AREA BETWEEN THE LEAD AND THE P.C. BOARD.

FOR BOM, SEE: 1014377-501

QTY. REQD.	T E M	PART NO.	DESCRIPTION	PARTS LIST	DRAWN	DATE	CHKD	DATE	MECH	DATE	ELEC	DATE	SCALE	SHEET	OF	REV.	
																	UNLESS OTHERWISE SPECIFIED DO NOT SCALE DRAWING DIMENSIONS ARE IN INCHES AND FRACTIONS ARE SHOWN UNLESS OTHERWISE SPECIFIED. ALL THREADS ARE UNFED UNLESS OTHERWISE SPECIFIED. ALL EDGES ARE TO BE SHARP.
					J. REED	24 MAY 65		24 MAY 65									
					J. REED	24 MAY 65		24 MAY 65									



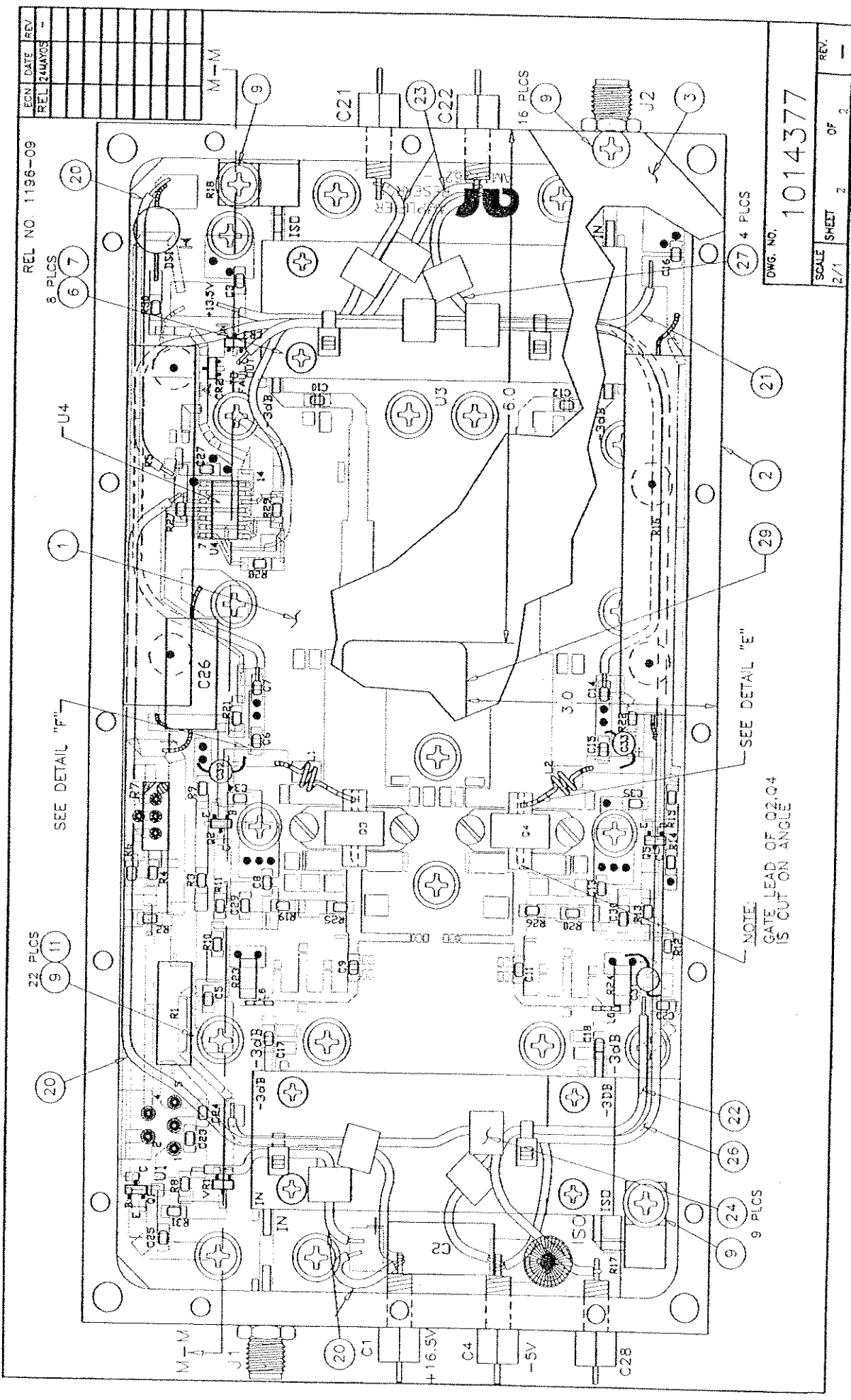
ASSEMBLY DRAWING  
QUAD AMP

SWG. NO. 1014377

SCALE 2/1 SHEET 1 OF 2 REV. —







REL NO: 1196-09

6 PLCS

6 7 20

22 PLCS

9 11 20

SEE DETAIL "F"

1

U4

9

20

9

20

20

9

24

9

26

22

29

2

21

27

3

+16.5V

-5V

-30B

16 PLCS

9

6.0

3.0

926

926

926

926

27 4 PLCS

3

21

29

2

21

29

22

26

24

9

9

9

9

9

9

NOTE: GATE LEAD OF Q2, Q4 IS CUT ON ANGLE

SEE DETAIL "E"

ECN	DATE	REV
REL 144AY03		

DWG. NO. 1014377

SCALE	SHEET	OF
2/1	7	2

REV. -



BILL NO: 1014377-501

REV: .

U/M: EA

DRAWING NO: ARC-B\1014377

PWB, ASSY, QUAD COUPLED, AMP, 0.8-4.2GHz

SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY-PER DRAWING NUMBER	REF-DSGN
0010	1011064	A	SCHEM DIAG, QUAD AMP, 200S1G4	EA REF	ARC-D\1011064	
0020	1014377	.	ASSY DWG, PWB, QUAD AMP, 4.2GHz	EA REF	ARC-B\1014377	
0400	27099	.	CAPR, FEED-THRU, FILT, 2500PF, 500V	EA	5.000 MET\51-719-011	C1 ,C4 C21 ,C22 C28
0410	27068	.	CAPR, ELECT, 100uF, 50VDC, AXIAL	EA	2.000 JCI\107TTA050M	C2 ,C26
0420	27039	.	CAPR, CHIP, CER, 1000pF, 10%, 50V	EA	12.000 ATC\700B102MCA50X	C3 ,C5 C6 ,C9 C10 ,C11 C12 ,C15 C16 ,C20 C34 ,C35
0425	27251	.	CAPR, CHIP, 0.039uF, 20%, 50V	EA	8.000 ATC\200B393MP50	C7 ,C8 C13 ,C14 C23 ,C24 C25 ,C27
0430	27024	.	CAPR, CHIP, 5.1pF, 0.5%, 500V	EA	2.000 DIL\C17AH5R1D500NT	C17 ,C18
0450	27028	.	CAPR, CHIP, 200pF, 1%, 300V	EA	2.000 DIL\C17AH201F3TXL	C29 ,C30
0460	27047	.	CAPR, TANT, 1UF, 50V	EA	1.000 MAL\TDC105K050WSE	C31
0470	27051	.	CAPR, TANT, .33UF, .35VDC, EPOXY	EA	2.000 AVX\TAP336K035HSB	C32 ,C33
0700	30044	.	DIODE, SW, 30mA, SM	EA	2.000 D-K\MA704ACT-ND	CR2 ,CR3
1000	33003	.	LED, RED, T1 3/4(5mm)	EA	1.000 H-P\HLMP-3001-009	DS1
1500	41243	.	CONN, COAX, BULKHD JACK, SMA, (F)	EA	2.000 DTA\1321000K82165	J1 ,J2
1800	1007507-105	.	INDUCTOR, AIR WOUND, .125ID, 28GA, 2T	EA	2.000 ARC-A\1007507	L1 ,L2
1810	66251	.	WIRE, BUSS, TINNED COPPER, 28 AWG	IN A/R	WEI\9028	L5 ,L6
2500	54561	.	XSTR, NPN, GEN PURPOSE	EA	1.000 MOT\MMBT3904LT1	Q1
2510	54562	.	XSTR, PNP, GEN PURPOSE	EA	2.000 MOT\MMBT3906LT1	Q2 ,Q5
2520	1000034-182A	BL	XSTR, RF, PWR, GaAsFET, SELECTED	EA	2.000 ARC\1000034	Q3 ,Q4
2700	55716-R150F	.	RES, FXD, WW, 0.15, 1%, 3W	EA	1.000 VIS\LVRO3R1500F	R1



BILL NO: 1014377-501

REV: -

U/M: EA

DRAWING NO: ARC-BV1014377

PWB ASSY, QUAD COUPLED, AMP, 0.8-4.2GHz

SEQ	PART NUMBER	REV	DESCRIPTION	U/M	QUANTITY PER DRAWING	DRAWING NUMBER	REF-DSGN
2705	55647-1200J		RES, FXD, CHIP, 120, 5%, 1/8W	EA	1.000	D-KVP120-ECT-ND	R2
2720	55647-1501F		RES, FXD, CHIP, 1.5K, 1%, 1/8W	EA	2.000	D-KVP1.5K-FCT-ND	R3 ,R15
2730	55647-3301J		RES, FXD, CHIP, 3.3K, 5%, 1/8W	EA	2.000	D-KVP3.3K-ECT-ND	R4 ,R8
2740	55724-2R70J		RES, FXD, WW, 2.7, 5%, 11W	EA	2.000	OHM\90J2R7	R5 ,R16
2750	55647-6800J		RES, FXD, CHIP, 680, 5%, 1/8W	EA	2.000	D-KVP680-ECT-ND	R6 ,R31
2760	55916		RES, VAR, CERMET, MULTITURN, TOP ADJ, 500, 10%, 1W	EA	1.000	MEP\8024EKW-501	R7
2780	55647-4531F		RES, FXD, CHIP, 4.53K, 1%, 1/8W	EA	2.000	D-KVP4.53K-FCT-ND	R9 ,R14
2790	55647-1101J		RES, FXD, CHIP, 1.1K, 5%, 1/8W	EA	2.000	D-KVP1.1K-FCT-ND	R10 ,R12
2795	55647-1801J		RES, FXD, CHIP, 1.8K, 5%, 1/8W	EA	3.000	D-KVP1.8K-ECT-ND	R11 ,R13 R27
2800	56072		RES, FXD, PRECISION, FLANGE, MOUNT, 50	EA	2.000	RFP\RFP-20-50TP	R17 ,R18
2810	55647-51R0J		RES, FXD CHIP, 51 OHM, 1/8W, 5%	EA	2.000	D-KVP51-ECT-ND	R19 ,R20
2815	55647-1001J		RES, FXD, CHIP, 1K, 1/8, 5%	EA	4.000	D-KVP1.0K-ECT-ND	R21 ,R22 R25 ,R26
2820	55649-13R0J		RES, FXD, CHIP, 13, 5%, 1W	EA	2.000	D-KVP13XCT-ND	R23 ,R24
2840	55647-3901J		RES, FXD, CHIP, 3.9K, 5%, 1/8W	EA	1.000	D-KVP3.9K-ECT-ND	R28
2850	55647-5601J		RES, FXD, CHIP, 5.6K, 5%, 1/8W	EA	2.000	D-KVP5.6K-ECT-ND	R29 ,R30
3700	60033		INTEGRATED CKT, LINEAR, POS., ADJ, V, 2A	EA	1.000	SGS\1200CV	U1
3710	25117		COUPLER, 90 DEG, HYBRID	EA	2.000	ARN\JC0220-3	U2 ,U3
3720	60135		IC, LINEAR QUAD COMPARATOR, SM	EA	1.000	NSI\LM339AM	U4
4000	30043		DIODE, ZENER, 4.7V, SM	EA	1.000	D-KVMA3047CT-ND	VR1
5000	1011262-101	D	PWB, QUAD AMP	EA	1.000	ARC-BV1011262	1
5010	1009165-101	B	HSG, QUAD AMP	EA	1.000	ARC-DV1009165	2
5020	1009164-101-M1	B	COVER, QUAD AMP	EA	1.000	ARC-CV1009164	3
5050	11166		SCREW, MACH, PAN HD, CROSS-REC, S/S, 2.56 X .50	EA	8.000		6





MODEL NO. 5S1G4  
 SERIAL NO. 25110  
 TESTED BY P.J.G.  
 DATE 3/9/1999

TEST DATA SHEET

FREQ. (GHz)	POWER OUTPUT @ 1dB COMPRESSION (WATTS)	POWER OUTPUT SATURATED (WATTS) @ 0dBm INPUT	HARMONIC DISTORTION @ 4 WATTS
0.8	6.67	7.38	-44
1.0	7.80	8.41	-33
1.5	8.32	9.22	-38
2.0	6.68	7.67	-28
2.5	8.71	9.17	-41
3.0	5.72	6.16	-40
3.5	5.51	6.26	-41
4.0	7.53	8.48	-50
4.2	5.75	7.24	-51

MINIMUM GAIN 41.1 dB @ 0.30 WATTS OUTPUT (at 2GHz)

FLATNESS ± <2.0 dB

OPEN TEST √ (√)

SHORT TEST √ (√)

STABILITY √ (√)

INPUT VSWR <2.0 : 1

INPUT ATTEN. RANGE √ (√)

LINE VOLTAGE PERFORMANCE √ (√)

TEST EQUIPMENT

S/N

SIGNAL GENERATOR TEC-SG -----

NETWORK ANALYZER TEC-NA 1843

POWER METER TEC-PM 1410

SPECTRUM ANALYZER TEC-SP 1756

OSCILLOSCOPE TEC-OS -----

FIXED ATTEN. ----- dB TEC-AT 1694

FIXED ATTEN. ----- dB TEC-AT -----

TEST EQUIPMENT CALIBRATED TO NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY. (NIST)

1007673  
REV0797





AMPLIFIER RESEARCH  
 In compliance to IEC 1010-1  
 Safety requirements of electrical equipment for laboratory use  
 Annex K

ROUTINE TESTS

Model : 5S1G4  
 Serial No. : 25110  
 Date : 3-9-99  
 Inspected By : PJG

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.	$\leq 0.1$ ohms	<u>0.5</u> ohms

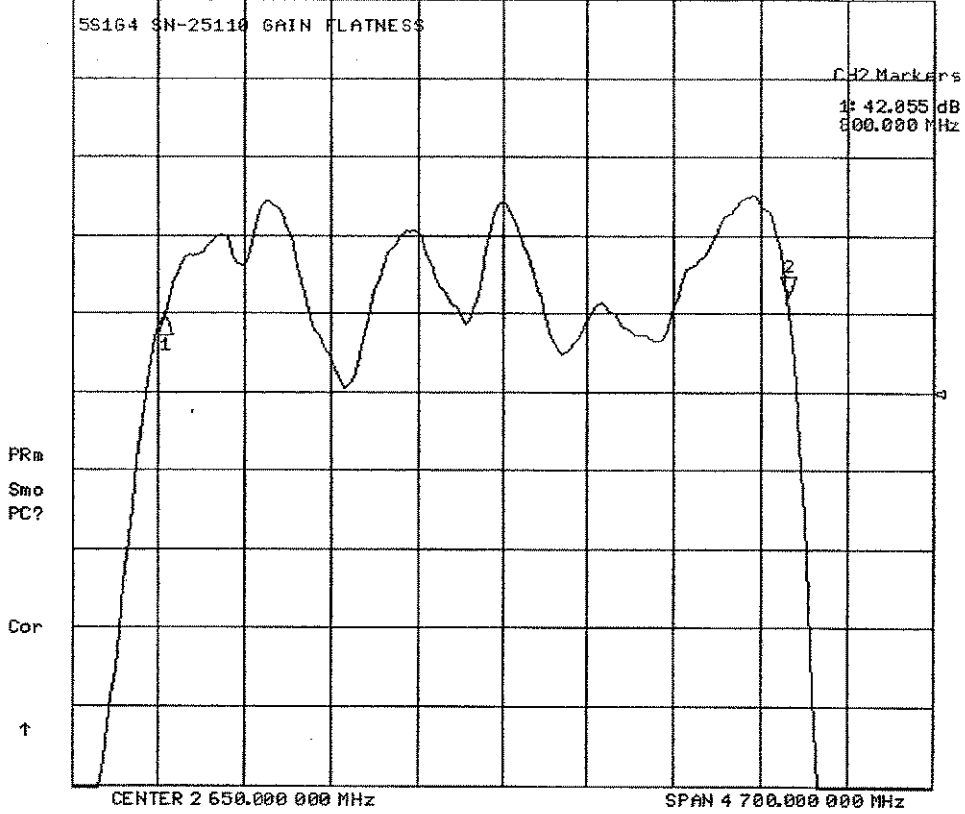
Mains circuit insulation	(Circle one)	(✓)
Apply voltage from the mains input to chassis for a period of time greater than two (2) seconds. No arcing or breakdown should occur.	1350 VAC 1900 VDC	✓

Floating input terminals	Record Voltage	(✓)
Apply 1.5 times working voltage to floating input terminals, where applicable. No arcing or breakdown should occur.	—	—



8 Mar 1999 16:18:35

CH2 S21 LOG 1 dB/REF 41.1 dB 2: 42.327 dB 4 200.000 000 MHz

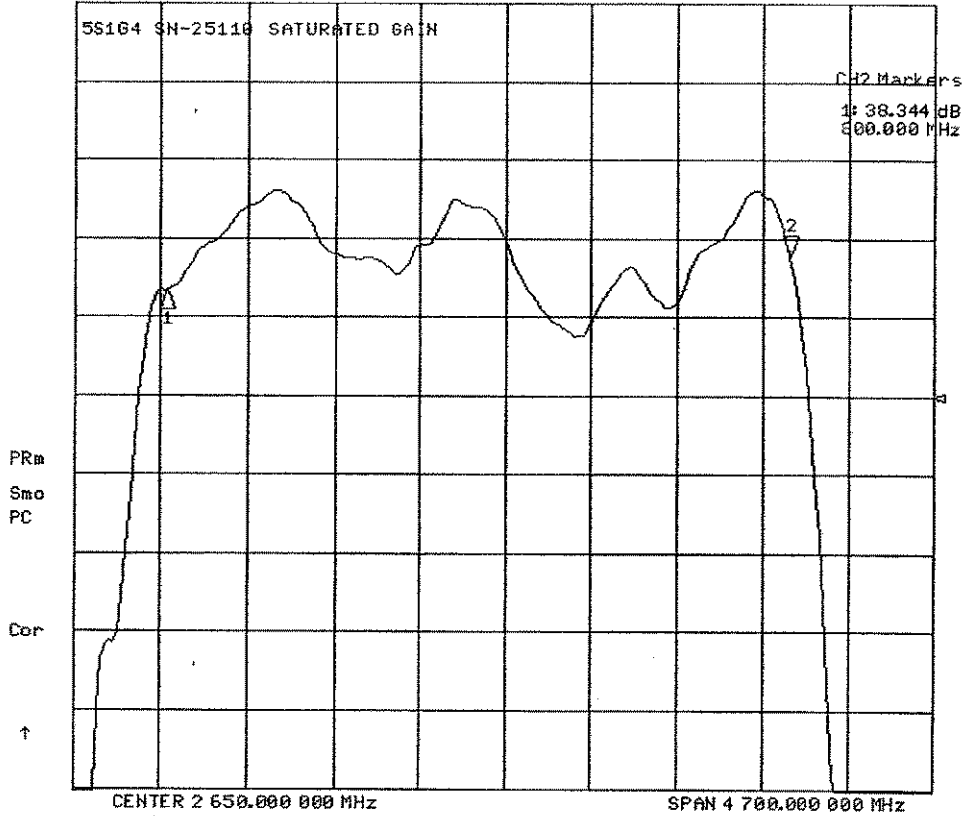




8 Mar 1999 16:28:08

CH2 S21 LOG 1 dB/REF 37 dB

2: 38.793 dB 4 200.000 000 MHz





8 Mar 1999 16:28:55

[CH2] S11 SWR 500 m / REF 1.9 3: 1.7984 1 834.720 048 MHz

