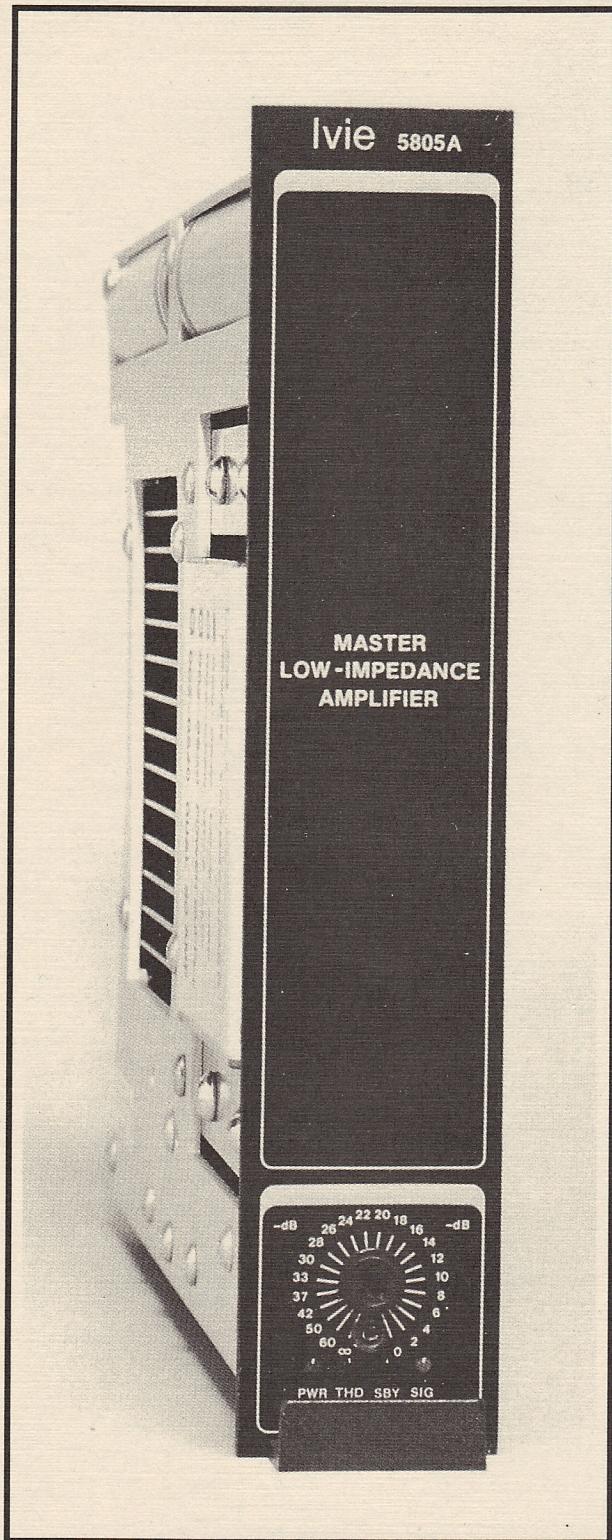




1366 West Center Street
Orem, Utah 84043
(801) 224-1800
FAX: (801) 224-7526

5805A MANUAL



**Operation and
Owners Manual
for the
5805A Amplifier
5000 Modular Sound System**

Printed in U.S.A.

INTRODUCTION

As part of the Ivie 5000 modular sound system, the model 5805A Low Impedance Master Amplifier introduces a new concept in power amplification. The 5805A is a self contained power amplifier capable of delivering 100 watts into an $8\ \Omega$ load, or 140 watts into a four Ω load. Two 5805A's may be bridged together to provide 280 watts for an $8\ \Omega$ load

The 5805A has many innovative features including the ability to drive another master in a bridge configuration. Other features include front panel LED status indicators, audio test point, stepped attenuator, and an I/O port that allows remote monitoring of the amplifier's operational status.

The 5805A exhibits excellent frequency response, slew rate, low noise, and low distortion - all typical of a state-of-the-art design. A major design goal for the 5805A was reliability. Special attention was given to the design of the safe operating area protection (SOA) circuitry. This circuitry protects the amplifier from problems caused by extreme variations in load impedance. The 5805A can operate into loads from a dead short to no load at all. Reliability is further enhanced by thermal overload protection. This is provided by a two speed, thermostatically controlled, forced-air cooling system. As a final precaution, in the unlikely event that a 5805A should fail, a DC crowbar protection circuit prevents the loudspeaker from being damaged.

Another strength of the 5805A is its on-board AC power supply. Unlike other modular amplifier systems that share one large common DC supply, all 5000 modules have their own independent power supply. This provides redundancy and prevents failure of the entire system should one supply fail.

AMPLIFIER INPUT

The input impedance of the 5805A amplifier is $10k\ \Omega$. The 5805A will provide a 100 watt output ($8\ \Omega$) when a signal level of .775 volts is applied to the input. The amplifier has two signal input paths. One path is via the 10 position, Bus Assign Switch, and the other is the direct input via the TB-40. There are two terminals on the TB-40 that are paralleled together for convenience. Terminals M and 11 are the direct input terminals. Terminals N and 12 are audio grounds. The direct input is always connected to the amplifier, but the input from the Bus Assign Switch may be isolated by cutting the wire jumper J3 as shown in Figure 1 on the following page:

AMPLIFIER INPUT BLOCK DIAGRAM

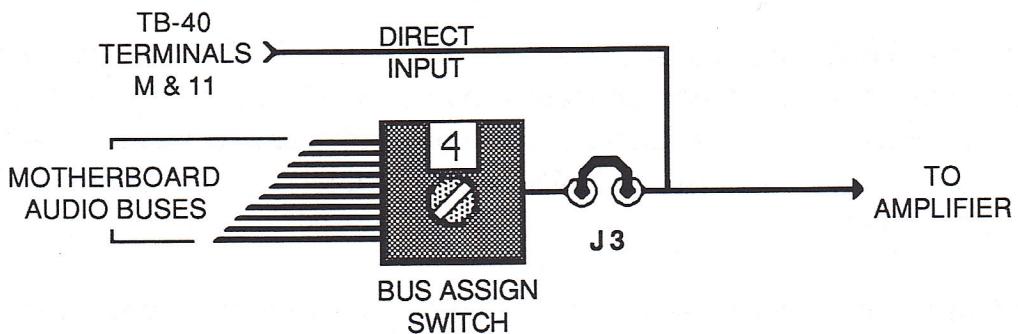


Figure 1

BALANCED INPUT

If a balanced input is required, a TBT-600 Input Transformer and Terminal Block should be used. See the 5001 Mainframe and TBT-600 manuals for more detailed information.

AMPLIFIER OUTPUT

There are nine sets of two-position terminal blocks located on the rear of the 5001 Mainframe. There is one terminal block per Mainframe slot. Each terminal block is connected to the output of the amplifier plugged into that slot. These terminal blocks are the output connections for the amplifiers, and are shown in Figure 2 below:

AMPLIFIER OUTPUT CONNECTIONS

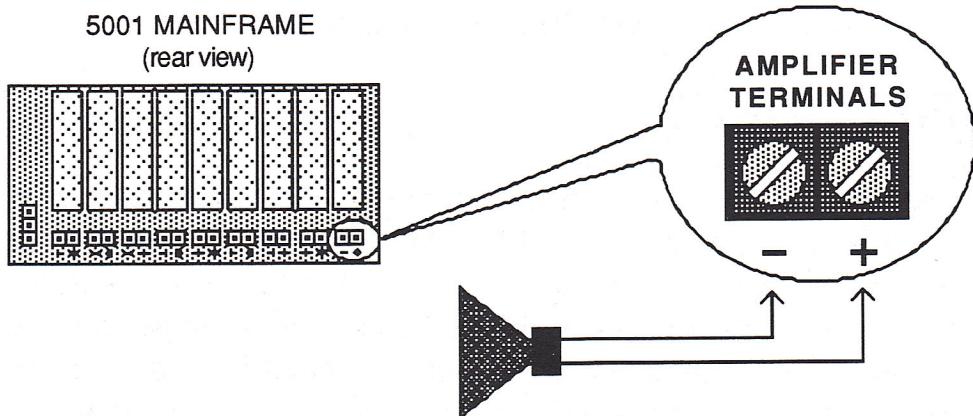


Figure 2

INSTALLATION INSTRUCTIONS

If the terms motherboard, bus assignment, or TB-40 are unfamiliar, please review the 5001 Mainframe manual before proceeding any further.

There are two different modes of operation for the 5805A. These are single master, and bridged masters, as has been previously discussed. Amplifier operation in either mode is very similar.

SINGLE MASTER

A single master 5805A can provide 100 watts (8Ω load). In this application, a single 5805A is connected to the load. This is the most common mode of operation.

There are only three controls that need to be set before inserting the 5805A into the 5001 Mainframe. These controls are: the Bus Assign Switch, the Bridge/Normal Switch and the Stepped Attenuator (volume control). Set these controls in the following order:

1. Set the input Bus Assign Switch to the predetermined bus, as show in Figure 3 below:

SINGLE MASTER SETUP

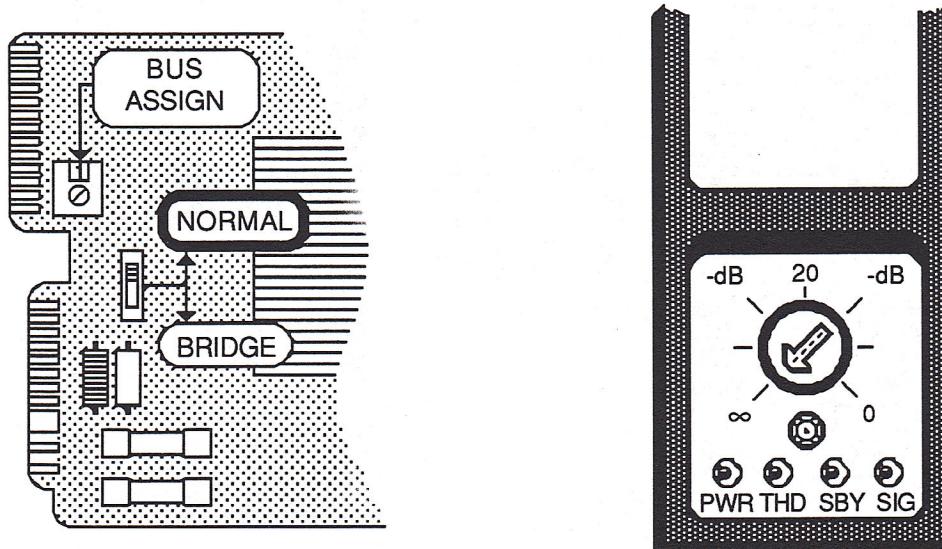


Figure 3

2. Check to make certain that the Bridge/Normal Switch is in the "Normal" position.
3. Set the Stepped Attenuator to $-\infty$.
4. Insert the amplifier into the Mainframe.
5. Connect load to the amplifier's terminal block on 5001.
6. Adjust the Stepped Attenuator for proper volume at the speaker.

BRIDGED MASTERS

Two masters may be placed in a bridged, or push-pull, configuration to provide a 280 watt output at $8\ \Omega$. Although two masters are used, only one of them will act as the master. The other master's Stepped Attenuator and Bus Assign Switch will be disabled. Set up is as follows:

1. Set up one of the two masters as outlined in the preceding examples. Hereafter, this module shall be designated as the **MASTER** - master.
2. Set up the second master with it's Bridge/Normal Switch in the "Bridge" position. This module now becomes the **SLAVE** - master.

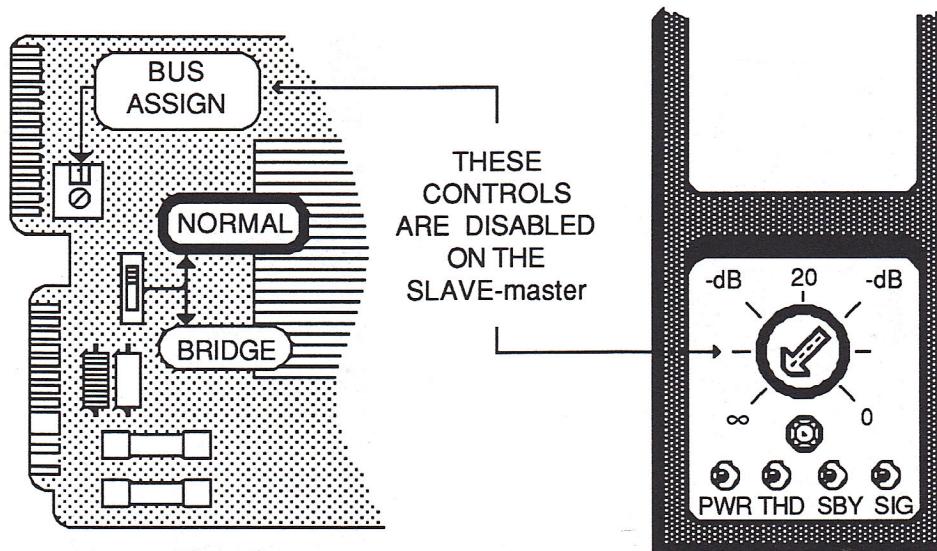


Figure 4

3. Insert the two amplifiers into the Mainframe. They must be in adjacent slots with the **MASTER** - master to the left of the **SLAVE** - master.
4. Connect the load across the two plus (+) terminals of the two amplifiers. **Do not** connect anything to the two minus (-) terminals. Figures 5 and 6 below detail these steps:

AMPLIFIER POSITION IN MAINFRAME FOR BRIDGED CONFIGURATION

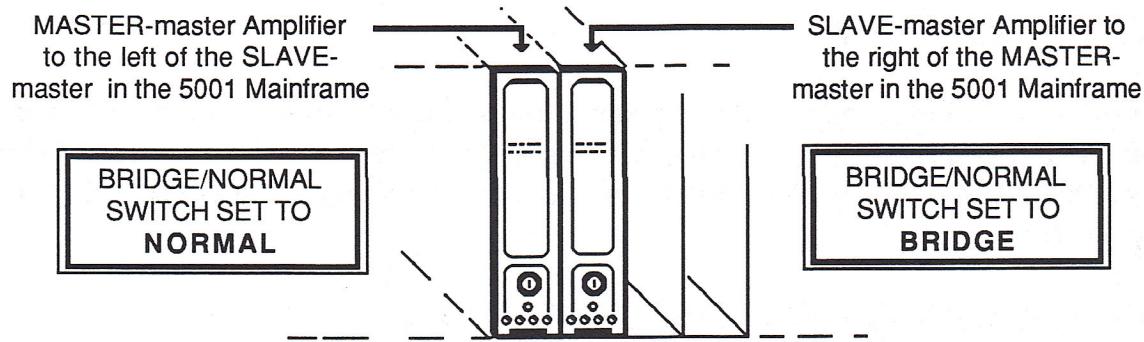


Figure 5

BRIDGED CONFIGURATION - Master and Master

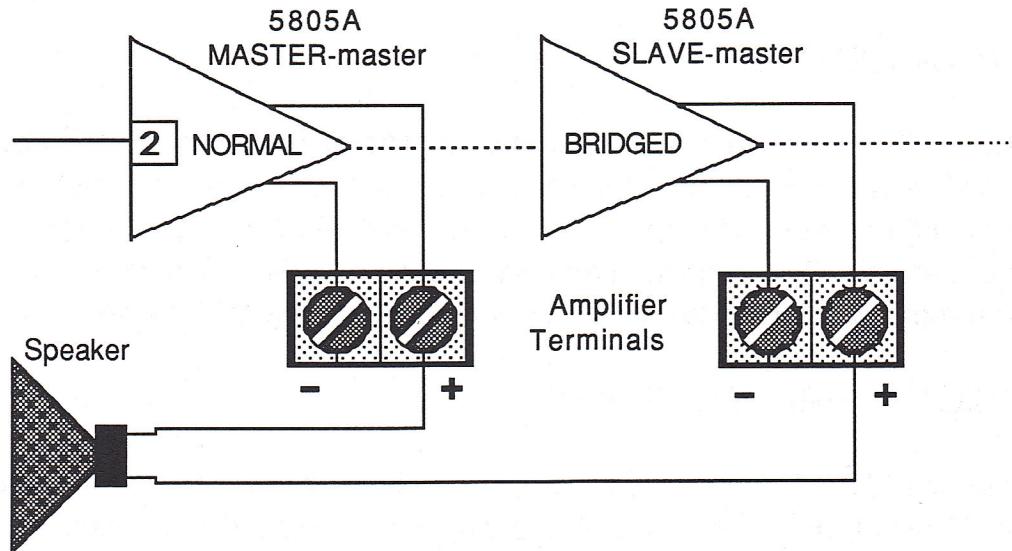


Figure 6

5. The status LEDs on both amplifiers will be operational. You may notice that one THD LED may come on slightly before the other. This is normal and indicates the clip point of the bridged pair.

LED STATUS INDICATORS

All amplifier modules have LED status indicators to provide front panel indication of the operational status of the amplifier. Additionally, the status of the amplifiers may be remotely monitored, either as individual amplifiers or as a Mainframe group. This is covered in detail in the section of this manual titled "REMOTE STATUS MONITORING, found on page 8.

PWR (POWER) LED

This green LED indicates that the module is receiving AC power, and that its power supply is operating properly. If this LED fails to light, check the 5101 power module to see that it is turned on. Also check the 1.5 amp fuses inside the amplifier to see if they are blown.

THD (TOTAL HARMONIC DISTORTION) LED

This red LED is illuminated when the total harmonic distortion in the amplifier exceeds one percent (1%). Essentially, this LED functions as a clip indicator. The input level to the amplifier should be set so that the THD LED flashes "on" only momentarily during peaks in the program material.

SBY (STANDBY) LED

This red LED is illuminated only when the amplifier is placed in the standby mode. The amplifier will automatically switch into standby if the temperature of the heatsink exceeds 180 degrees Fahrenheit. This prevents destruction of the amplifier due to thermal runaway. The amplifier can also be manually placed in the standby mode from a remote location, if desired. This will illuminate the LED as well.

SIG (SIGNAL PRESENCE) LED

This yellow LED is illuminated whenever there is voltage present at the amplifier's output. This indicates the presence of a signal at the output of the amplifier. The brightness of the LED should vary in intensity with the level of the program material.

This LED can also indicate the presence of signals other than program material. This would include noise and oscillations. Oscillations that may be inaudible to the human ear will still be indicated by the SIG LED.

Often the THD LED will be lit in conjunction with SIG LED if the signal is, in fact, a high frequency oscillation. *The SIG LED should not be lit when there is no signal input to the amplifier.*

TEST POINT

All master amplifiers have a test point located on the front panel. This test point is connected to the output of the amplifier via a divide-by-10 voltage divider. This divider reduces the voltage at the test point to a level that is consistent with other 5000 modules. The signal at the test point is 20dB below the output of the amplifier.

AMPLIFIER STANDBY MODE

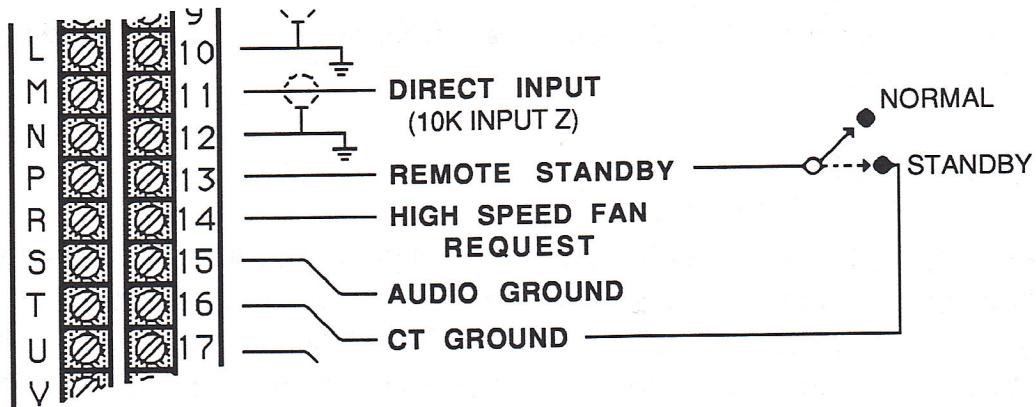
As heretofore mentioned, a 5805A amplifier can be placed in the standby mode two ways. The first occurs automatically if the amplifier becomes overheated. A thermal sensor on the heatsink initiates this function, and turns the amplifier back on when it has cooled. The 5805A can also be placed in the standby mode by choice through remote switching.

In the standby mode the DC bias voltage is turned off, and the amplifier will not pass an audio signal. This mode is not intended for use in paging systems where the amplifier is constantly being turned on and off. However, it may be used to mute an undesired channel.

To manually place an amplifier in standby, connect terminal number 13 of the TB-40, or TBT-600 terminal block (located directly behind the amplifier) to CT (chassis ground). This is a low voltage DC control line.

More than one amplifier can be connected to a common standby switch. The terminal number 13 of all involved amplifiers would be paralleled together and connected to a SPST switch, which would be tied to chassis ground, as shown by Figure 7 on the following page:

REMOTE CONTROL FOR THE STANDBY MODE



TB-40

Figure 7

REMOTE STATUS MONITORING

With the addition of a TB-40, the operational status of each individual master amplifier may be remotely monitored. The functions that may be monitored are the same as those displayed by the amplifier's front panel LEDs: power fault, total harmonic distortion, standby/thermal status, and signal presence. The high speed fan request may also be monitored.

All amplifiers within a Mainframe may be monitored as a group via the summary status buses that appear at the AUX PWR connector on the rear of the 5001 Mainframe. There are three summary status buses that appear at this connector. They are: summary fault, summary THD, and fan speed status. If desired, the contribution of any amplifier to the summary status buses may be disabled by cutting a wire jumper. For details refer to the section of this manual titled "INTERNAL WIRE JUMPERS" on pages 12 and 13.

The summary fault will provide indication if any amplifier in the Mainframe experiences a power, thermal, or sustained THD fault. Therefore, this bus provides an indication of a serious or complete malfunction of any amplifier in the Mainframe.

The summary THD bus will provide an indication whenever the THD LED of any amplifier in the Mainframe comes on. With this bus remoted to the mixing location, the system operator can "push" the system to the point just below clipping.

The fan speed status may be monitored and switched at the AUX PWR connector.

The status bus indicators, both individual and summary, are of the "open collector" type. This can be visualized as a SPST switch with one side connected to CT (center-tap or power) ground. This "switch" will handle approximately 200 mA @ 30 VDC. There is a .3 VDC drop across its contacts when it is closed. Typically, a Darlington transistor is used with the emitter connected to CT ground, and the collector connected to the indicator. The remote indicator is activated when the base of the darlington is biased on by the amplifier, thus connecting the collector to the CT ground. This completes the signal path. An illustration of this circuit is shown in Figure 8 below:

EQUIVALENT CIRCUIT FOR REMOTE STATUS PORTS

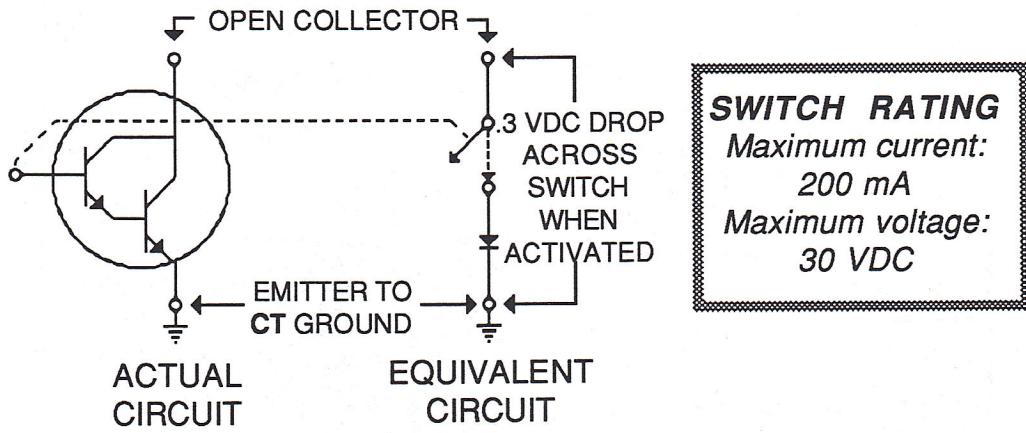


Figure 8

There are many different ways to interface to the remote status ports on the TB-40 and the 5001 AUX PWR connector. Depending upon the power requirements of the interface, an external power supply may be needed. *If an external supply is used, its negative side must be connected to CT ground.*

The 5101 Power Module can supply a nominal 12 VDC at up to 1 amp. This voltage

appears at the **LED** terminal of the three pin (remote on/off SW, GND, LED) terminal block on the rear of the 5001 Mainframe. This is very convenient to use because the negative side of its supply is already connected to CT ground.

When using the 12 VDC supply provided by the 5101, it should be remembered that any power drawn from this source must be accounted for when calculating total power consumption of signal processors from the 5101 Power Module. The maximum that the 5101 will provide is 100 watts, whether it is used to power signal processing modules in a Mainframe, or additionally used as a 12 VDC power supply to be used for remote monitoring functions.

Below, and on the following page, Figures 9 and 10 show several examples of remote status indicators. The connectors on the rear of the 5001 Mainframe are illustrated.

REMOTE STATUS INDICATION

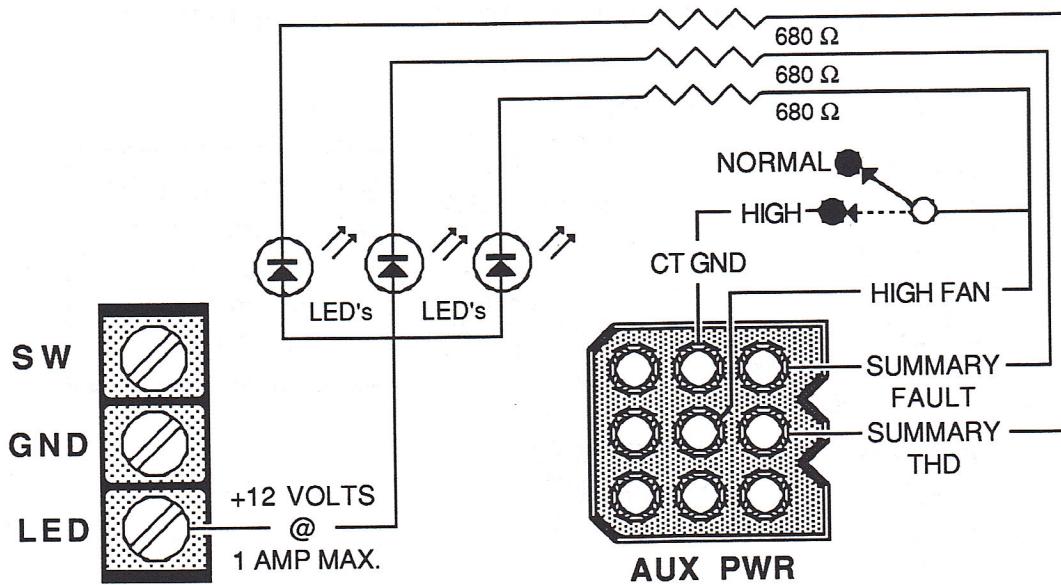


Figure 9

Illustrated above is a simple circuit utilizing the existing 12 VDC supply of the 5101 Power Supply Module, and three resistors and three LED's. Illustrated on the following page is a circuit showing the various combinations of power sources and monitoring devices that can be used for remote status monitoring:

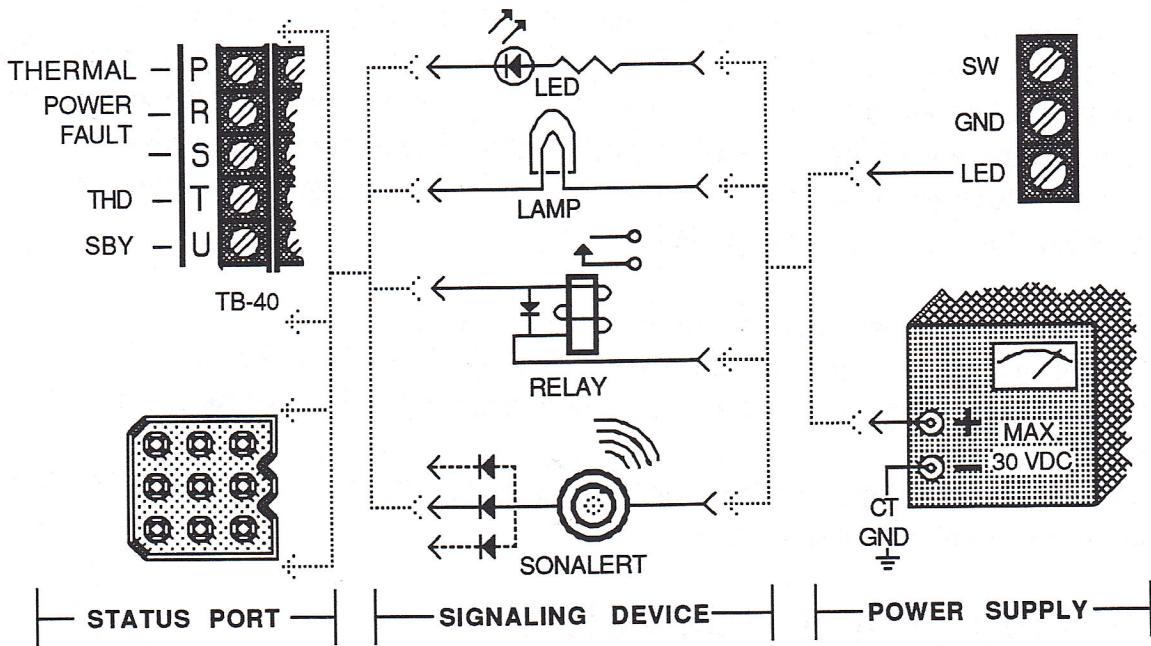


Figure 10

FUSES

All amplifiers are protected by two 1.5 amp slow-blow fuses. Should these need replacing, fuses with higher ratings must not be substituted. *Substituting fuses with higher ratings can cause extensive damage to the amplifier and will void the warranty.*

Sometimes the fuses in the amplifier may fail for reasons other than circuitry failure. Protection is part of their function. Before returning an amplifier for service, the fuses should be replaced and the amplifier tested in the Mainframe. Should the fuses fail a second time, the unit should be returned for service.

FAN COOLING

It is vital for proper operation and product longevity that adequate forced air cooling be maintained for all amplifiers. The 5001 Mainframe and the 5101 Power Module have been designed to provide the proper cooling. The cooling features of the Mainframe and Power Module may be greatly retarded, or altogether defeated by improper installation techniques.

As you face the front of the Mainframe the air flow is from left to right. Cool air is drawn in from the left and exhausted at the right. The Mainframe cabinet is not pressurized by the fan forcing air into the enclosure, but rather, cooling is effected by the fan evacuating air from the enclosure. By using the evacuation method, cool air from outside the enclosure is drawn in through the various openings in the enclosure. This provides a constant intake of cool air flowing over the modules. Listed below are some cooling guidelines.

1. Never block any ventilation holes on the Mainframe.
2. Provide minimum 1.75 inch clearance above and below Mainframe.
3. Do not mount Mainframes as to allow the exhaust from one to flow directly into the intake of another.
4. Cover all unused slots between amplifier modules and the 5101 Power Module to retain the integrity of the air flow.

INTERNAL WIRE JUMPERS

The 5805A amplifier has three internal wire jumpers. These jumpers may be cut by the installer to disable certain features or functions of the amplifier. *In 99% of all installations these jumpers should not be cut.*

Jumper J3 is similar to jumpers found on other modules. This jumper allows isolation of the input to the amplifier from the Input Bus Assign Switch. When this jumper is cut, the input to the amplifier can only come from the direct input on the amplifier's TB-40 (terminals M and 11). The Input Bus Assign Switch is disabled, so the switch setting does not matter.

Jumpers J1 and J2 are involved with the summary THD and FAULT status buses in the Mainframe. All amplifiers contribute to these two summary status buses, unless their jumpers are cut. There should rarely occur a situation wherein an amplifier would need to be isolated from these buses.

The jumpers are shown in Figure 11 on the following page:

INTERNAL WIRE JUMPERS

CUT TO DISCONNECT THE INPUT
OF THE MODULE FROM THE BUS
SELECTOR SWITCH.

CUT TO DISABLE THE CONTRIBUTION
OF THE MODULE TO THE MAINFRAME
SUMMARY FAULT BUS.

CUT TO DISABLE THE CONTRIBUTION
OF THE MODULE TO THE MAINFRAME
SUMMARY THD BUS.

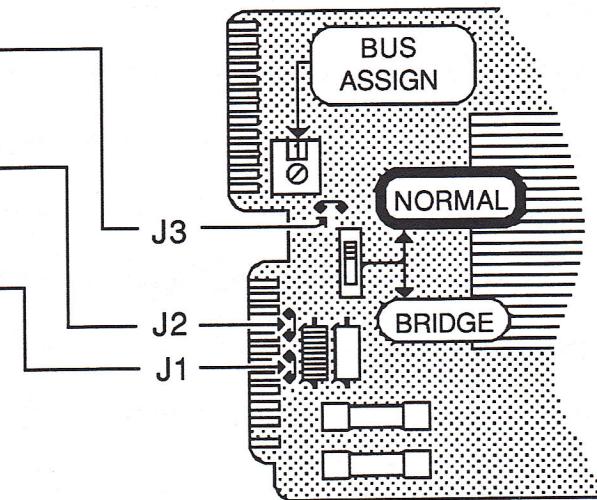


Figure 11

As shown by Figure 11 above, wire jumper J1 connects the amplifier to the Mainframe summary THD status bus. Wire jumper J2 connects the amplifier to the Mainframe summary fault status bus.

SPECIFICATIONS

Power Requirements ----- 117 Volts AC, 50-60 Hz 170 Watts

Power Output ----- 100 Watts Continuous Average Sine Wave
Power Into $8\ \Omega$, 140 Watts Into $4\ \Omega$

Frequency Response ----- +0,-1dB 20 Hz to 20kHz

Total Harmonic Distortion ----- 100 Watts @ 1 kHz=.025% Typical
(.05% Maximum)
100 Watts @ 20 kHz=.08% Typical
(.15% Maximum)

Hum and Noise ----- 105 dBA Below Rated Output

Input Impedance ----- 10,000 Ω

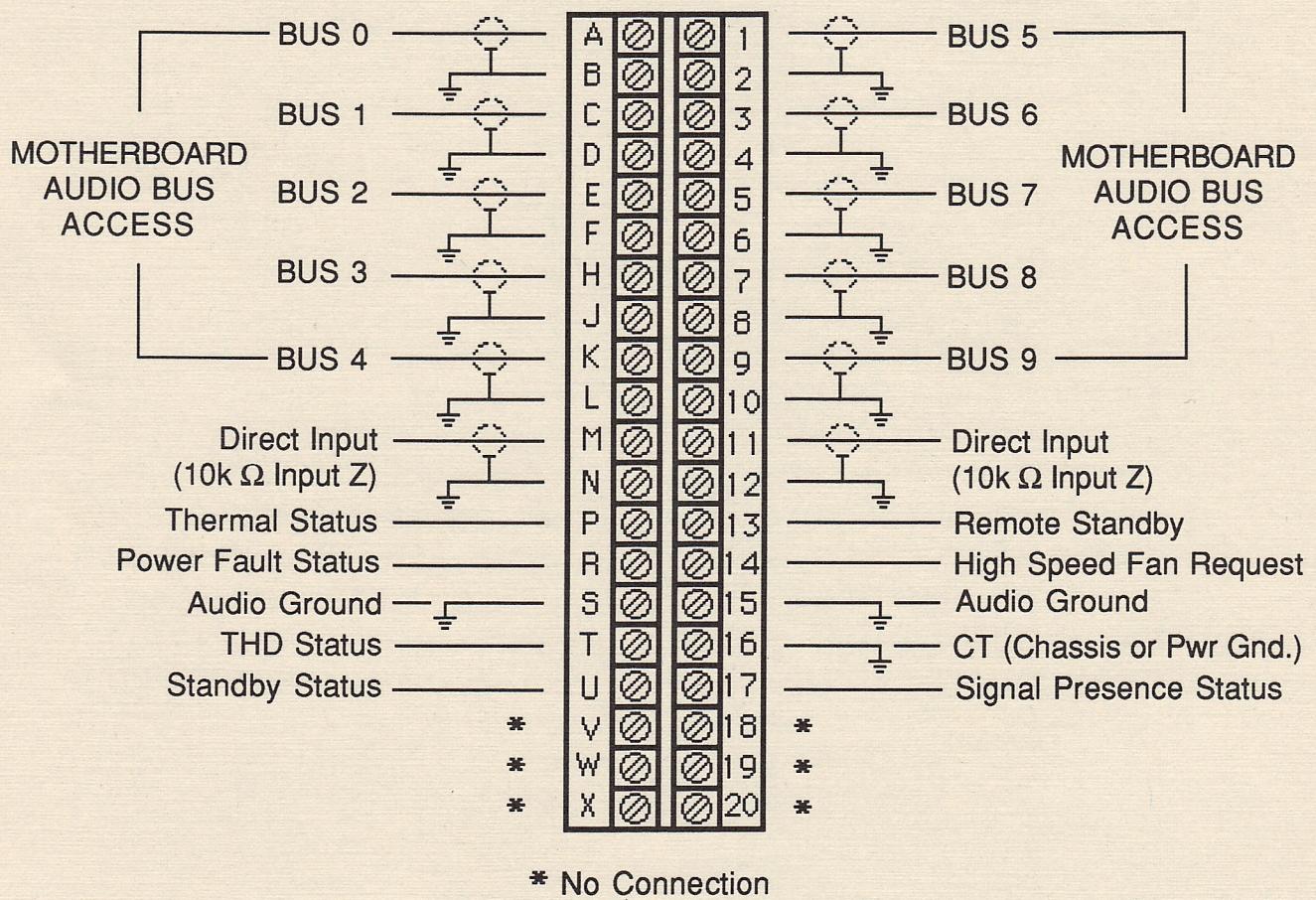
Input Sensitivity ----- .775 Volts for 100/140 Watts Output

SPECIFICATIONS CONTINUED

Damping Factor -----	Greater Than 200
Slew Rate -----	20 Volts per Microsecond
DC Offset -----	0 Millivolts, ± 25 mv
Output Load Impedance -----	4 Ω Minimum
Amplifier Protection --	Protected Against Short Circuit, Open Circuit or Mismatch
Load Protection -----	DC Crowbar
Turn On -----	The 5807A has Delayed Turn On for Load Protection
Size -----	8.5 X 4.2 X 1.7 Inches
Weight -----	8 lbs. 6 oz.

INDEX

AMPLIFIER INPUT -----	1
AMPLIFIER OUTPUT -----	2
AMPLIFIER STANDBY MODE -----	7, 8
BALANCED INPUT -----	2
BRIDGED MASTERS -----	4, 5
FAN COOLING -----	11, 12
FUSES -----	11
INSTALLATION INSTRUCTIONS -----	3
INTERNAL WIRE JUMPERS -----	12, 13
INTRODUCTION -----	1
LED STATUS INDICATORS -----	6
PWR (Power) LED -----	6
REMOTE STATUS MONITORING -----	8, 9, 10, 11
SBY (Standby) LED -----	6
SIG (Signal Presence) LED -----	6
SINGLE MASTER -----	3, 4
SPECIFICATIONS -----	13, 14
TB-40 -----	Inside Rear Cover
TEST POINT -----	7
THD (Total Harmonic Distortion) LED -----	6



5805A and 5807A TB-40 Connections