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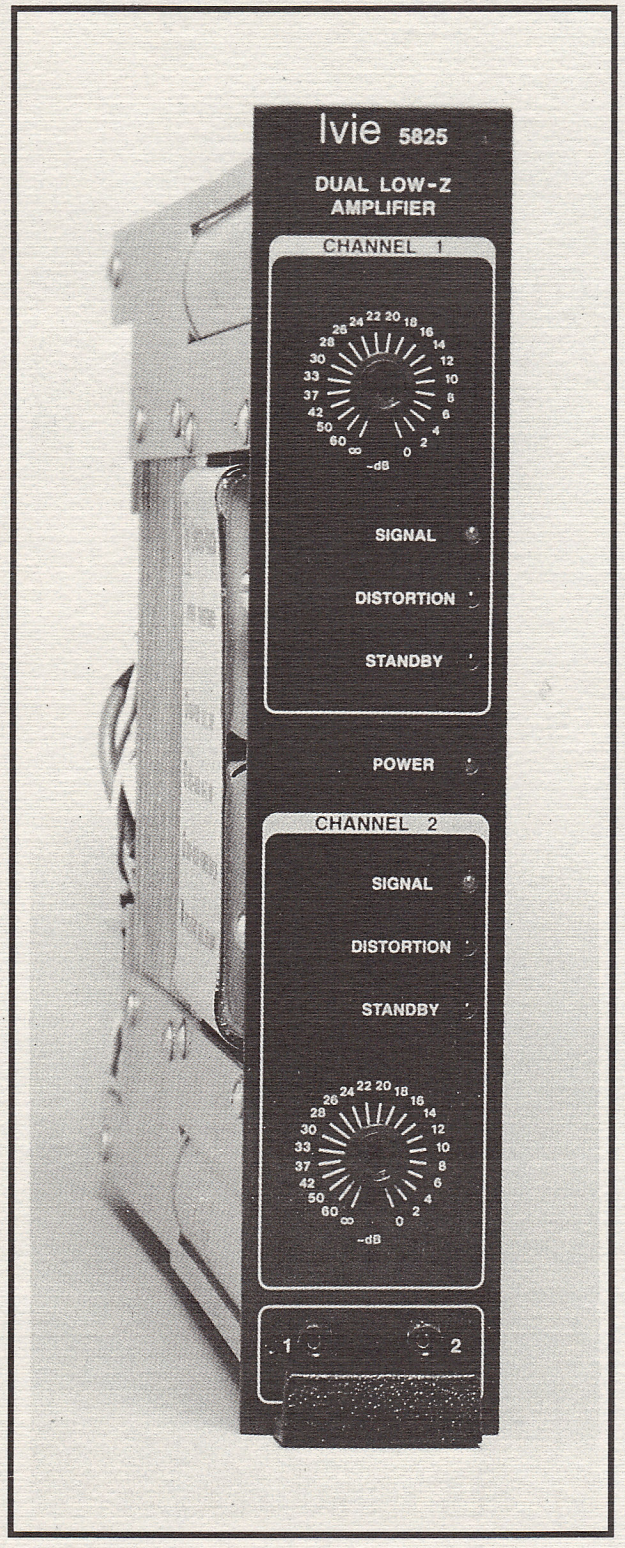
5825 MANUAL



Operation and Owners Manual for the 5825 Amplifier 5000 Modular Sound System

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INTRODUCTION

The 5825 Dual 50 Watt, Low Impedance Amplifier has the smallest power rating of all the power amplifiers available for the Ivie 5000 Modular Sound Reinforcement System. As it's name suggests, the 5825 is a two channel power amplifier, capable of delivering 50 watts per channel into an 8 Ω load.

The 5825 has many innovative features including front panel LED status indicators, audio test points, stepped attenuators, and I/O ports that allow remote monitoring of the amplifier's operational status.

The 5825 exhibits excellent frequency response, slew rate, low noise, and low distortion - all typical of a state-of-the-art design. A major performance goal for the 5825 is reliability. Special attention has been given to the design of safe operating area protection (SOA) circuitry of the 5825. This circuitry protects the amplifier from problems caused by extreme variations in load impedance. The 5825 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 5825 should fail, a DC crowbar protection circuit prevents the speakers the 5825 is driving from damage.

Another strength of the 5825 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 supplies. This provides redundancy and prevents failure of the entire system, should one supply fail.

AMPLIFIER INPUT

The input impedance of the 5825 amplifier is 10k Ω. Each of its channels will provide a 50 watt output (8 Ω) when a signal level of .775 volts is applied to the input. Each channel has two signal input paths. One path is via a 10 position Bus Assign Switch, and the other is the Direct Input, accessed at the TB-40. Terminal X on the TB-40, is the Direct Input terminal for channel 1, and terminal 20 is the Direct Input terminal for channel 2. The Direct Input is always connected to the amplifier, but the input from the Bus Assign Switches may be isolated by cutting the appropriate wire jumpers (Note page 10), as shown by Figure 1 on the following page:

AMPLIFIER INPUT BLOCK DIAGRAM

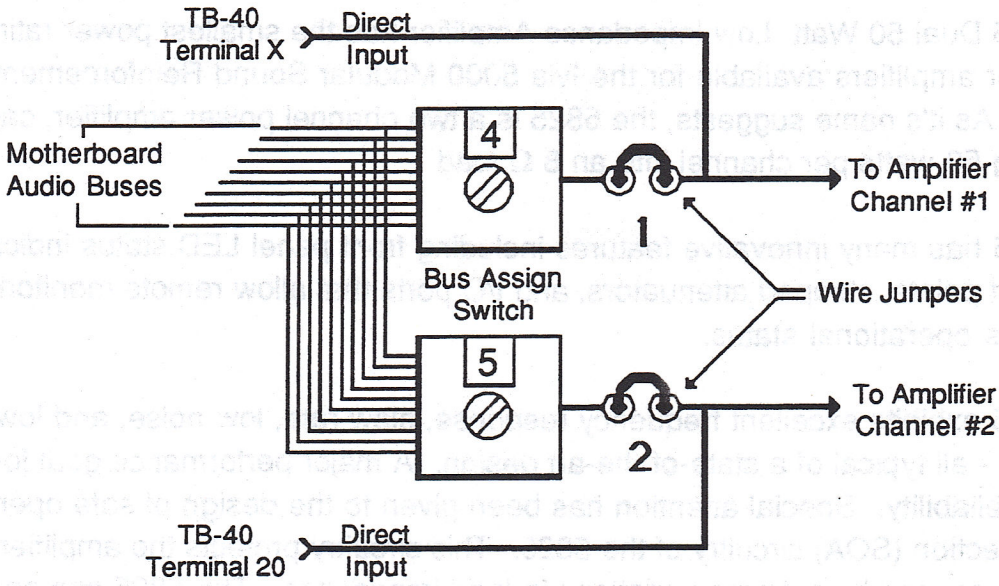

Figure 1

AMPLIFIER OUTPUTS

There are nine, two-position terminal blocks located on the rear of the 5001 Mainframe, or one terminal block per universal 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. This is true for the 5825 as well, but with one major difference: The 5825 has two outputs, so a second set of output terminals is required for the second channel.

The output terminals for the second channel are provided by the existing amplifier terminal block, and the TB-40 that is supplied with the 5825. This may sound confusing, but in application, is really quite simple. Channel 2 uses the regular amplifier terminal block on the rear of the Mainframe. Channel 1 gets its common (-) from the (-) side of the amplifier terminal block, the same as channel 2. However, the (+) side of the channel 1 output comes from terminals 7 and 8 of the TB-40. *Terminals 7 and 8 should both be used to provide sufficient current handling capability.* This output terminal scheme is actually a benefit. By sharing this common terminal, the crosstalk separation between channels is enhanced by 10dB. Figure 2 on the following page illustrates the connection procedure:

AMPLIFIER OUTPUT CONNECTIONS

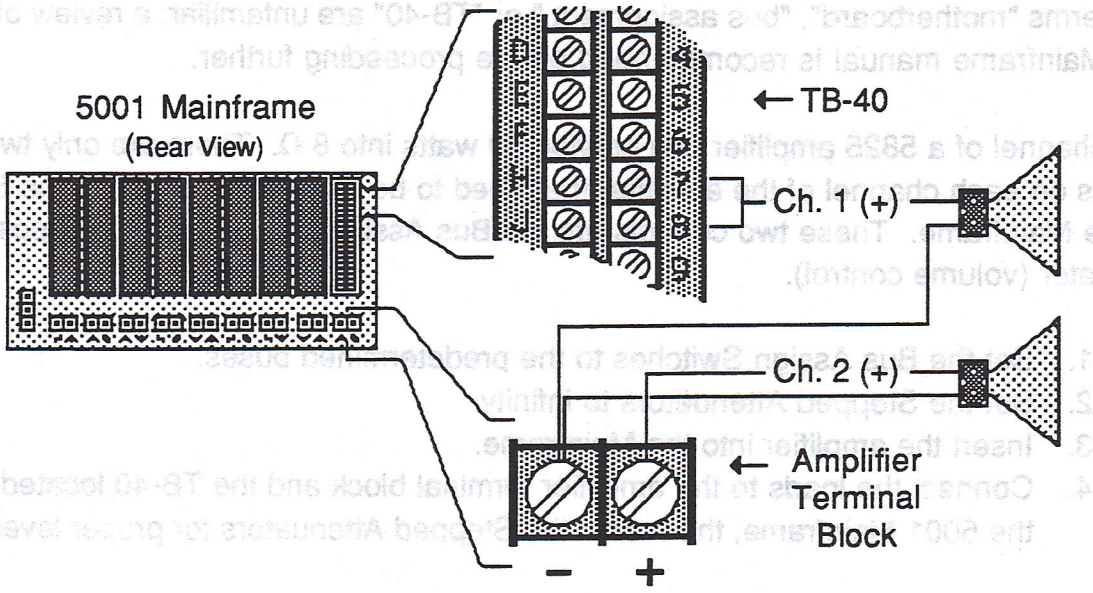

Figure 2

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.

When facing the front of the Mainframe, the air flow is from left to right. Cool air is drawn in from the left and exhausted to the right. The Mainframe cabinet is not pressurized by the fan forcing air into the enclosure. 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 a minimum of 1.75 inches 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. Mount all amplifiers adjacent to the 5101. If this is not possible, then be certain to cover all unused slots between amplifier modules and the 5101.

INSTALLATION INSTRUCTIONS

If the terms "motherboard", "bus assignment," or "TB-40" are unfamiliar, a review of the 5001 Mainframe manual is recommended before proceeding further.

Each channel of a 5825 amplifier can provide 50 watts into 8 Ω. There are only two controls on each channel of the amplifier that need to be set prior to inserting the 5825 into the Mainframe. These two controls are the Bus Assign Switch and the Stepped Attenuator (volume control).

1. Set the Bus Assign Switches to the predetermined buses.
2. Set the Stepped Attenuators to infinity.
3. Insert the amplifier into the Mainframe.
4. Connect the loads to the amplifier terminal block and the TB-40 located on the 5001 Mainframe, then reset the Stepped Attenuators for proper level.

Figure 3 below details the location of the Bus Assign Switches:

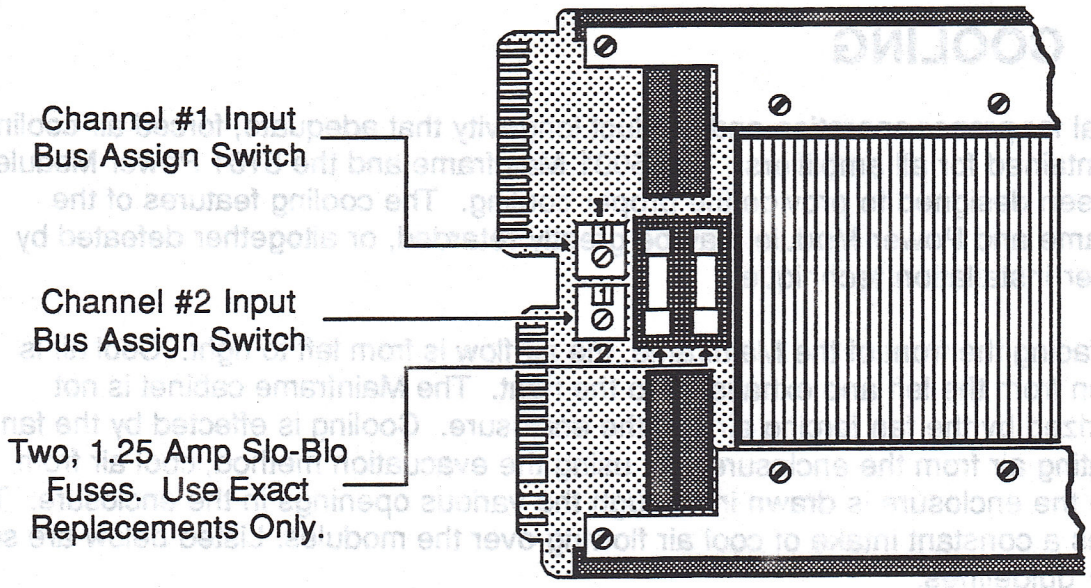

Figure 3

LED STATUS INDICATORS

All amplifier modules have LED status indicators to provide front panel indication of

the operational status of the module.

The status of the amplifiers may also be remotely monitored, either as individual amplifiers, or as a Mainframe group. This is covered in the section of this manual entitled "REMOTE STATUS MONITORING" on pages 7 through 9.

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 1.25 amp slow-blow fuses inside the amplifier to see if they are blown. The 5825 has a common AC power supply for both channels, therefore, there is only one Power LED on the 5825.

THD (TOTAL HARMONIC DISTORTION) **LED**

This red LED is illuminated when the total harmonic distortion in the amplifier channel exceeds one percent (1%). This LED functions as a clipping 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 only illuminated when the amplifier channel is placed in the standby mode. The channel will automatically place itself into standby if the temperature of the heatsink exceeds 180 degrees Fahrenheit. This is to prevent destruction of the amplifier due to thermal runaway. The amplifier may be manually placed in the standby mode from a remote location by the user. This will also illuminate the LED.

SIG (SIGNAL PRESENCE) **LED**

This yellow LED is illuminated whenever there is voltage present at the amplifier's output terminals. In other words, it indicates the presence of a signal at the output of the amplifier. The brightness of this LED will vary in intensity with the level of the program material.

This LED can also indicate the presence of signals other than program material, for example, noise and oscillations. Oscillations that are inaudible to the ear will still be

indicated by the Signal Presence LED.

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

TEST POINT

All amplifiers have a test point located on the front panel. Because the 5825 is actually two amplifiers, its front panel has two test points. These test points are connected to the output of the amplifiers 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. A 28 volt signal at the output of the amplifier will be 2.8 volts at the test point. In other words, the signal at the test point is 20dB below the output of the amplifier.

REMOTE STANDBY

To manually place an amplifier channel in standby, connect terminal A on the TB-40 (for channel one), or terminal 1 (for channel two), to CT or chassis ground (terminal B or terminal 2). This is a low voltage, DC control line.

More than one amplifier can be connected to a common standby switch. The remote terminals of all involved amplifiers would be paralleled together, connected to an SPST switch, and then to CT or chassis ground. Figure 4 below details these connections:

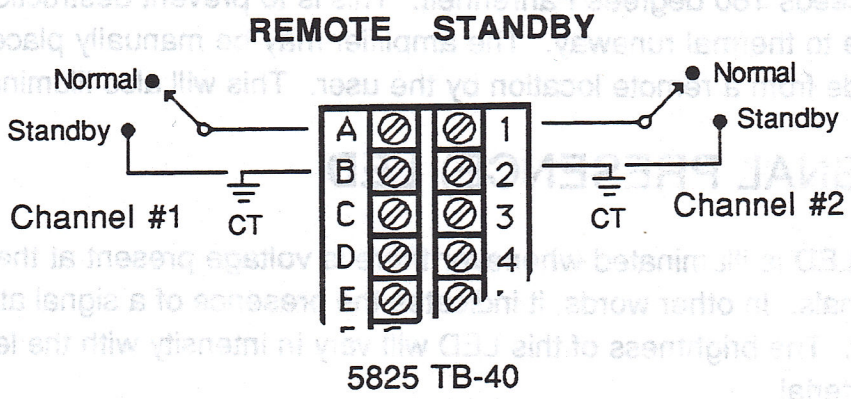

Figure 4

REMOTE STATUS MONITORING

Using the TB-40, the operational status of each individual amplifier channel 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: 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 entitled "INTERNAL WIRE JUMPERS" on page 10.

The summary fault will provide indication if any amplifier in the Mainframe experiences a power, thermal, or sustained THD fault. This bus, therefore, 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 5 on the following page.

EQUIVALENT CIRCUIT FOR REMOTE STATUS PORTS

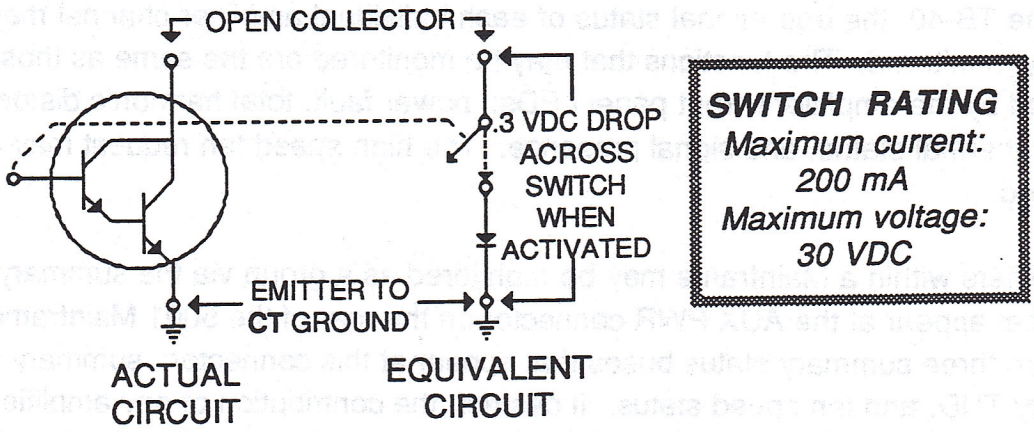

Figure 5

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.

On the following page, Figures 6 and 7 show several examples of remote status indicators. The connectors on the rear of the 5001 Mainframe are illustrated.

REMOTE STATUS INDICATION

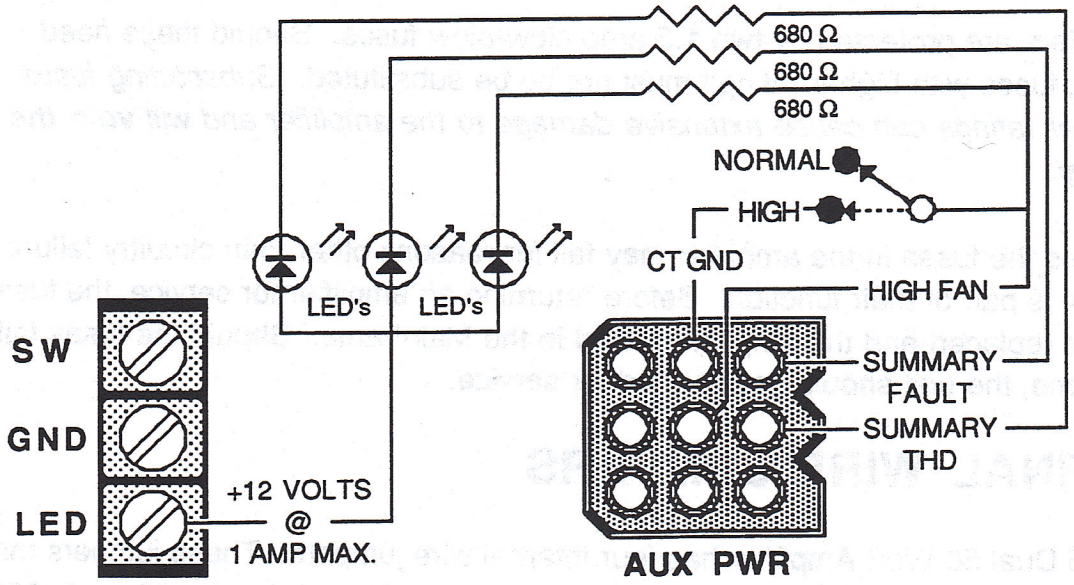

Figure 6

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 below is a circuit showing the various combinations of power sources and monitoring devices that can be used for remote status monitoring.

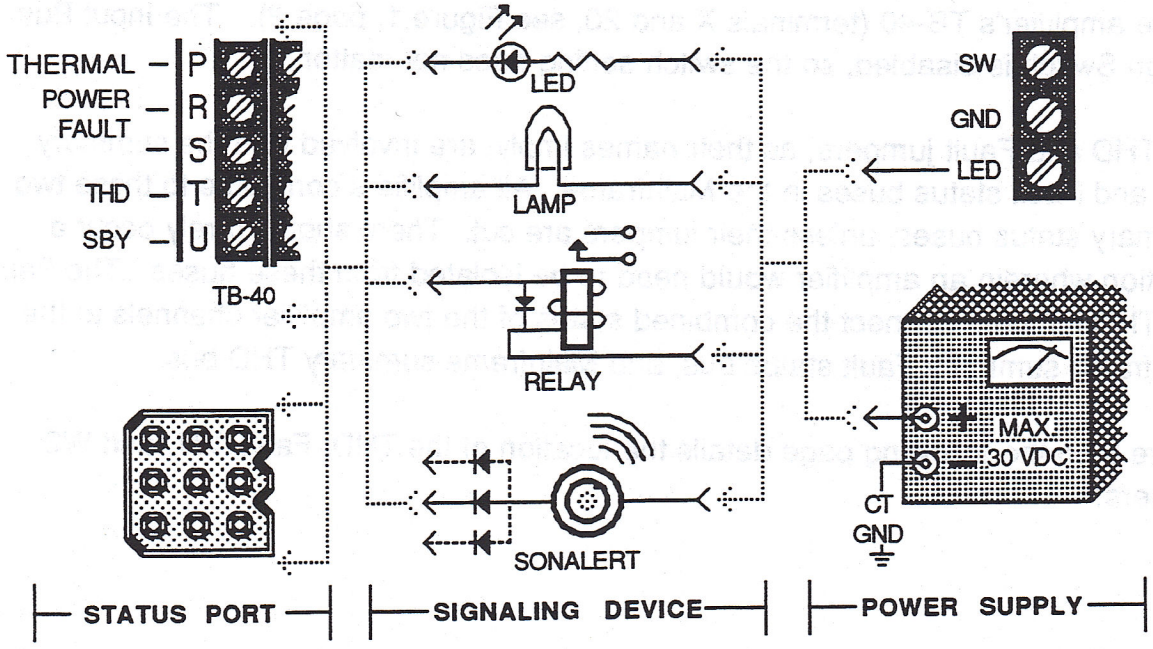

Figure 7

FUSES

All amplifiers are protected by two 1.5 amp slow-blow fuses. Should these need replacing, fuses with higher ratings must not be 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.

INTERNAL WIRE JUMPERS

The 5825 Dual 50 Watt Amplifier has four 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 .*

Jumpers W1 and W2 are similar to jumpers found on other modules. These jumpers allow isolation of the amplifier's input from the Input Bus Assign Switch (W1 is the input jumper for channel 1, and W2 is for channel 2). When one of these jumpers is cut, the input to that amplifier channel can only come from the channel's Direct Input on the amplifier's TB-40 (terminals X and 20, see Figure 1, page 2). The Input Bus Assign Switch is disabled, so the switch setting does not matter.

The THD and Fault jumpers, as their names imply, 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 Fault and THD jumpers connect the combined status of the two amplifier channels to the Mainframe summary Fault status bus, and Mainframe summary THD bus.

Figure 8 on the following page details the location of the THD, Fault, W1, and W2 jumpers:

INTERNAL WIRE JUMPERS

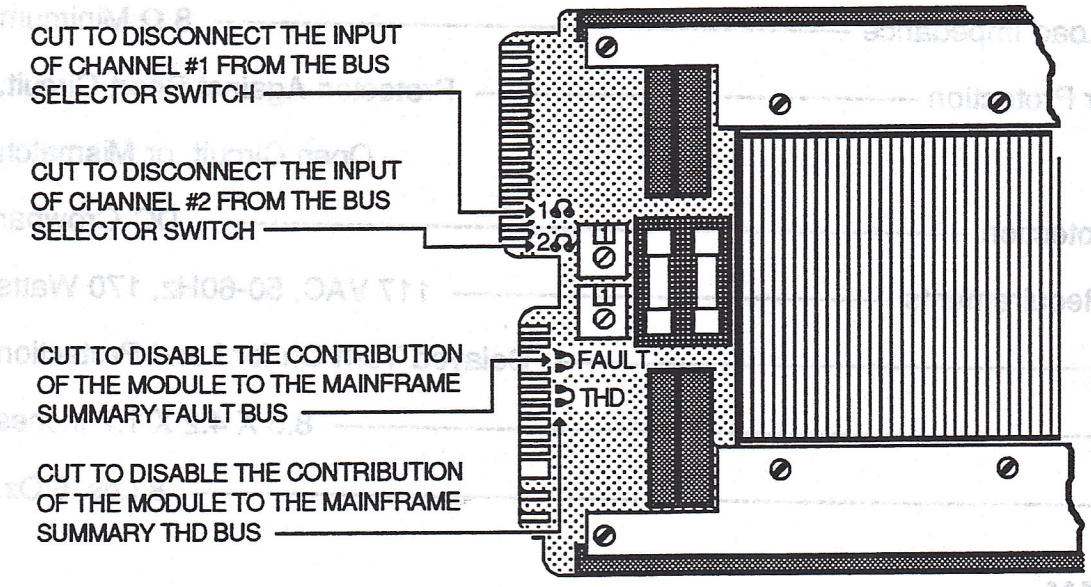

Figure 8

SPECIFICATIONS

Power Output	Continuous Average Sine Wave Power into 8 Ω: 50 Watts per Channel, Both Channels Driven
Frequency Response	+0, -1dB: 20Hz to 20kHz
Total Harmonic Distortion	50 Watts @ 1kHz = .025 % Typical (.05% Maximum) 50 Watts @ 20kHz = .08% Typical (.15% Maximum)
Hum and Noise	105 dB(A) Below Rated Output
Input Impedance	10k Ω
Input Sensitivity	.775 Volts for 50 Watts
Damping Factor	Greater Than 200 with 8 Ω Load
Slew Rate	20 Volts per Microsecond

SPECIFICATIONS CONTINUED

DC Offset	0 Millivolts, ± 25 mV
Output Load Impedance	8 Ω Minimum
Amplifier Protection	Protected Against Short Circuit, Open Circuit, or Mismatch
Load Protection	DC Crowbar
Power Requirements	117 VAC, 50-60Hz, 170 Watts
Turn On	Delayed Turn On for Load Protection
Size	8.5 X 4.2 X 1.7 Inches
Weight	8 Lbs. 6 Oz.

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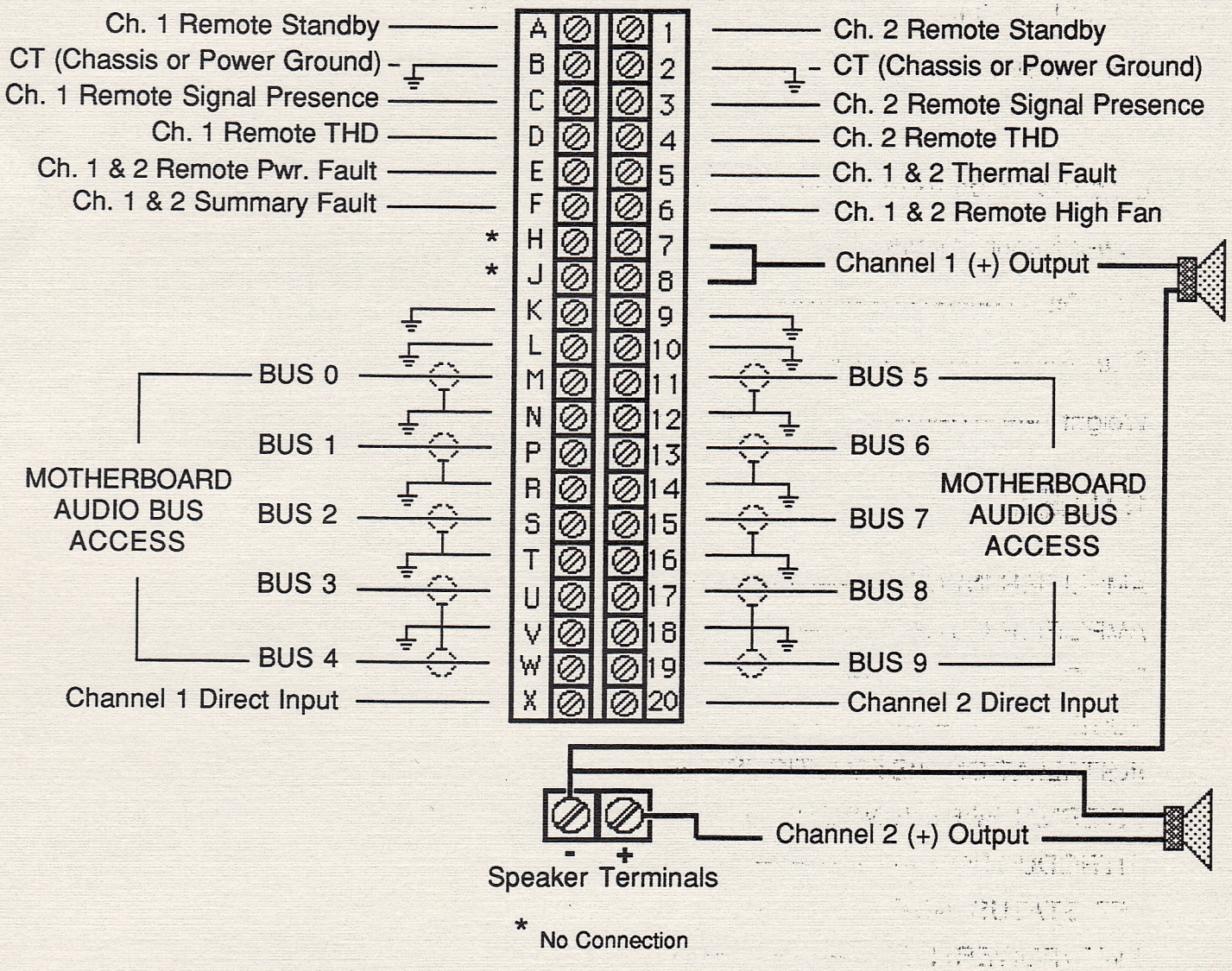

5825 TB-40 Connections