SERIAL COMMUNICATION

6416 TO 6052

The IED backup power amplifier switching system consists of an IED 6416, an IED 6160-8 Power Amplifier Mainframe, and an IED 6052L/H CPU Card. The switching system backs up either 6272L/H and/or 6282L/H power amplifiers. The main and backup amplifiers in this system must either be all 6282L/Hs or all 6272L/Hs, since the backup amplifier must drive the same load which is connected to the main amplifiers. Serial communication is an option only available on the 6416 models with firmware version 1.3 or greater and 6052L/H firmware version 1.4s or greater. See figure 1 and figure 2 for 6416 and 6052 EPROM version number locations.

This backup system uses the 6052L/H processor card in the main power amplifier mainframe to poll all the dual amplifiers in its frame for faults. If it determines that an amplifier has faulted, it sends a message to the 6416, over the RS232 link, indicating the location of the failed amplifier in that frame. The 6416 then switches the channels in pairs, via corresponding relays, since the amplifiers that work with this system are all dual amplifiers. If the backup amplifier is currently being used and another main amplifier fails, the 6416 will not back up the newly failed main amplifier until the first failed main amplifier is working properly.

The 6416 switches relay pair combinations (1/9, 2/10, 3/11, 4/12, 5/13, 6/14, 7/15, 8/16) depending on which amplifier in the frame fails. The main dual amplifiers should be wired according to Figure 3. The amplifier in slot 1 should be wired to 6416 backup channels 1/9 for its channel A and B. The amplifier in slot 2 should be wired to backup channels 2/10 and so on up to a maximum of 8 main amplifiers in one rack. Depending on the DIP switch settings of the 6052L/H, the 6052L/H only monitors the main amplifiers in a single frame, the number of main amplifiers can be from 1 dual to 7 dual amplifiers. The “backup” amplifier for the “main” amplifiers in the frame is located in slot 8 and can only be in slot 8 of the frame when using one frame for both “main” and “backup” amplifier card locations.

In an application when all 8 amplifier slots are needed for the main amplifiers, the backup amplifier can be located in a separate 6160-8 frame as long as it is also properly wired externally into the 6416 high/low backup busses. Figure 4 shows a typical wiring connection for the external backup application. External backup is available with 6052L/H firmware version 1.4s or greater, only. See figure 2 for version number location.

To set up any valid number of main amplifiers in a single rack, the DIP switch on the 6052L/H must be set to monitor the number of main amplifiers in the single frame. See figure 2 for the DIP switch location and table 1 for DIP switch setting configuration. The processor polls only the slots that are indicated by the DIP switch setup. The main amplifier locations must always start in slot 1and progress toward slot 8 on the far right in the amplifier frame without skipping a slot. Slot 1 is the left most power amplifier to the right of the 6052L/H processor. The first slot on the left is dedicated to the 6052L/H, and cannot be used for an amplifier card. See figure 5 for amplifier slot 1 location.

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To set up the 6416 for serial communication with the 6052L/H processor card, the DIP switch on the 6416 MUST be set according to Table 2. See figure 1 for DIP switch location.

The RS232 interconnection between the 6160-8 and 6416 consists of a 9 pin standard null modem cable with a gender switcher on both ends. This feature is due to the fact that both devices are data carrier devices and have the same pinout and connector gender. This cable is provided with system. See figure 6 for connection of the RS232 cable between the 6416 and the 6160-8 housing. The two jumpers (shunts), P13 and P14, located just below the 9-pin sub D connector on the rear of the 6160-8, when in place, disable the I^2C bus. **These shunts must be removed for serial communications operation.** See figure 6.

DIP SWITCH POSITION								SLOTS CONTAINING AMPLIFIERS TO BE BACKED UP	SLOT CONTAINING BACKUP AMPLIFIER
1	2	3	4	5	6	7	8		
DIP SWITCH STATE									
1	0	0	0	0	0	0	0	1	8
1	1	0	0	0	0	0	0	1,2	8
1	1	1	0	0	0	0	0	1,2,3	8
1	1	1	1	0	0	0	0	1,2,3,4	8
1	1	1	1	1	0	0	0	1,2,3,4,5	8
1	1	1	1	1	1	0	0	1,2,3,4,5,6	8
1	1	1	1	1	1	1	0	1,2,3,4,5,6,7	8
1	1	1	1	1	1	1	1	1,2,3,4,5,6,7,8	Separate Frame

Table 1 - 6052 DIP Switch Setting Configuration
For Selection of Amplifiers to be Backed Up

6416 DIP SWITCH 1 POSITION					
1	2	3	4	5	6
OFF	OFF	OFF	ON	ON	ON

Table 2 - SW1 Settings for Serial Communications

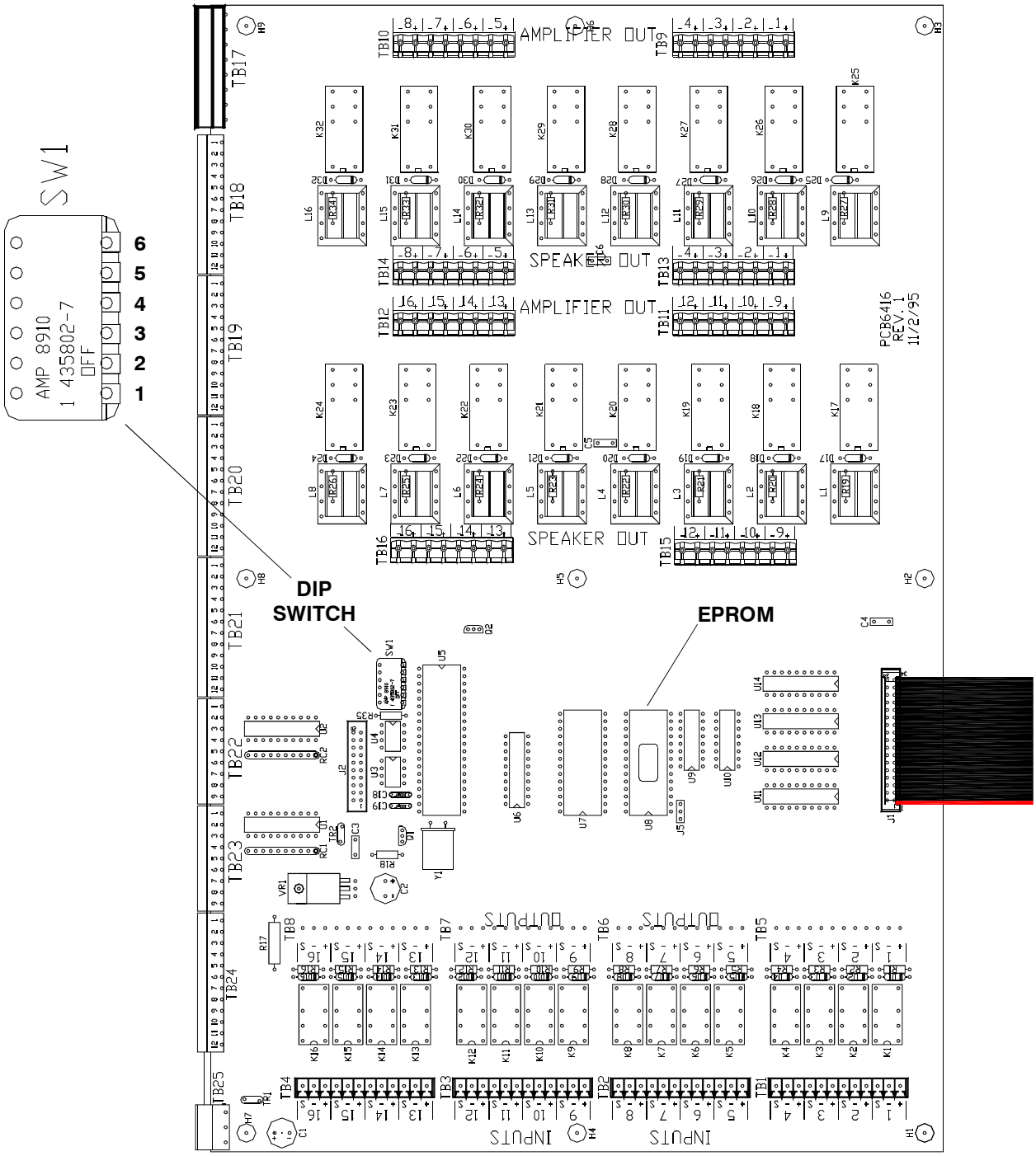

Figure 1 - 6416 Card Showing Location of EPROM and DIP Switch

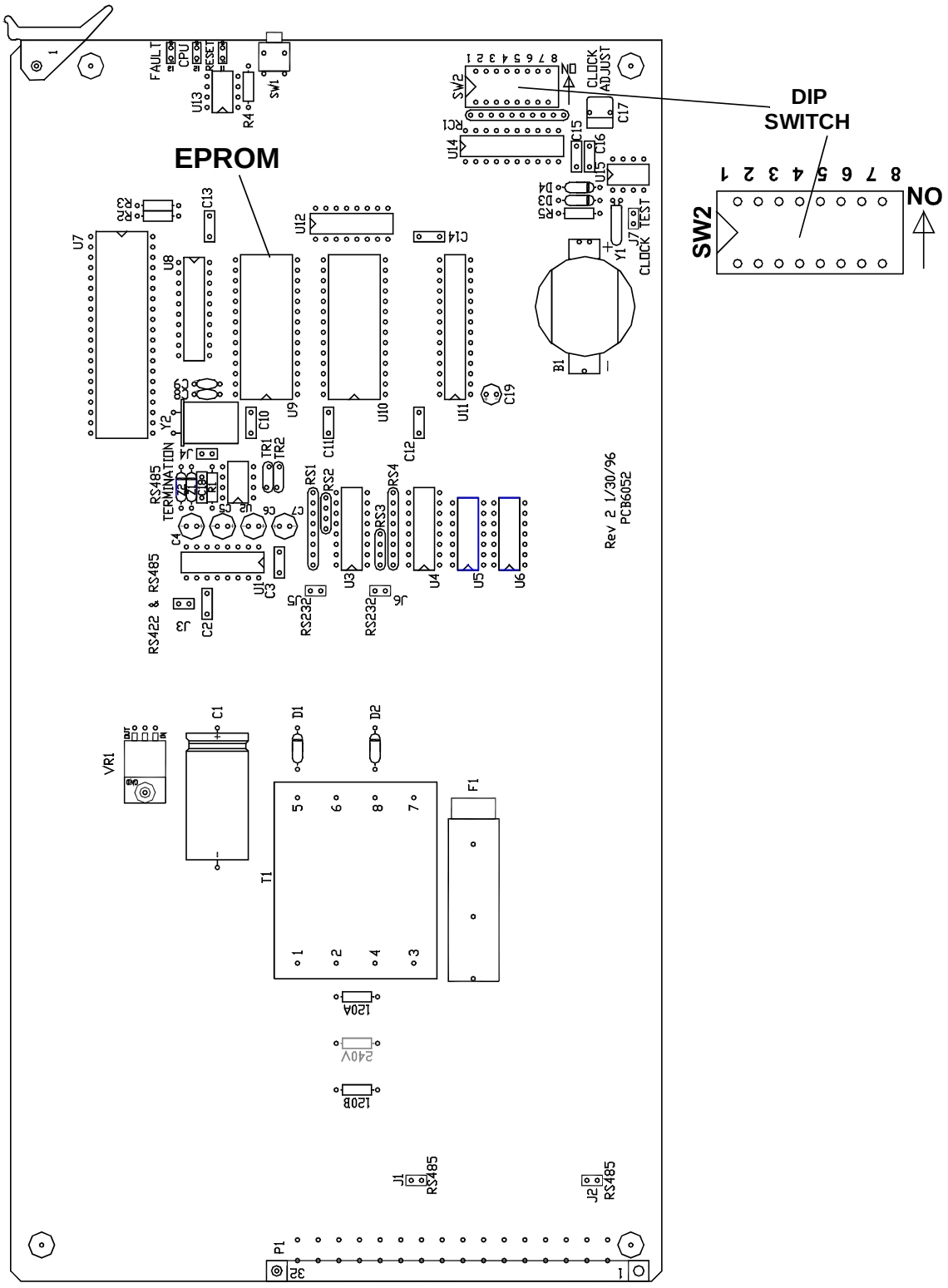

Figure 2 - 6052 CPU Card
Showing EPROM Location

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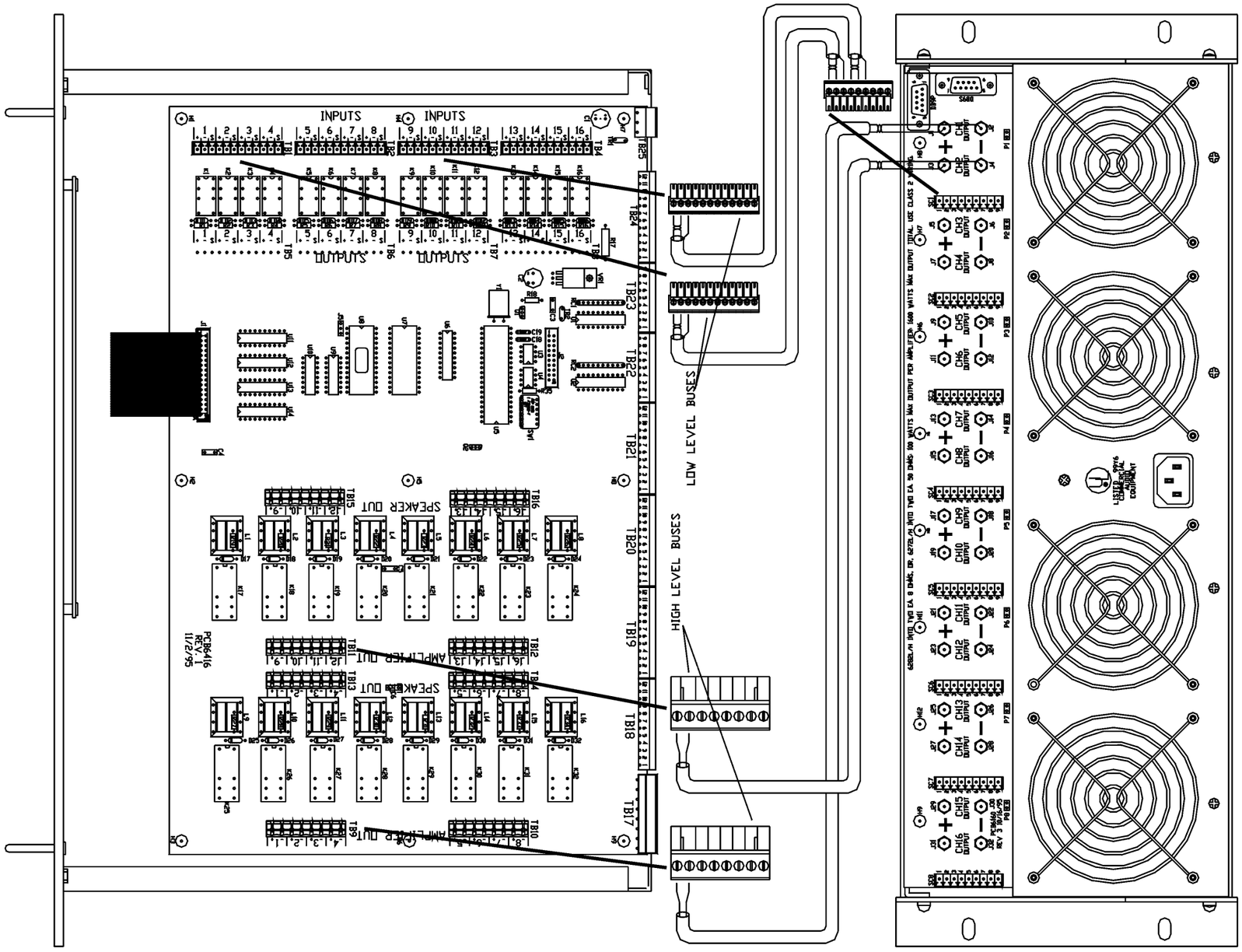
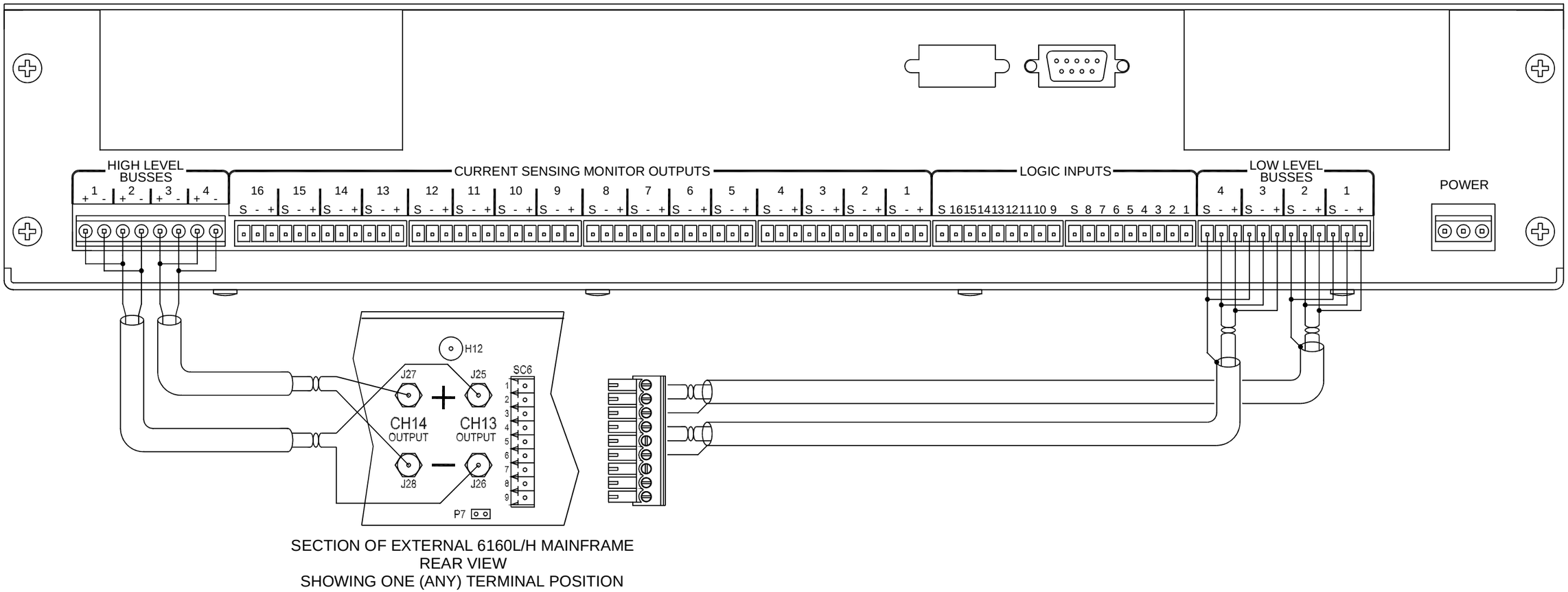


Figure 3 - Wiring and DIP Switch Settings for Serial Communications



SECTION OF EXTERNAL 6160L/H MAINFRAME
REAR VIEW
SHOWING ONE (ANY) TERMINAL POSITION

Figure 4 - External Backup Amplifier Wiring for Serial Communications

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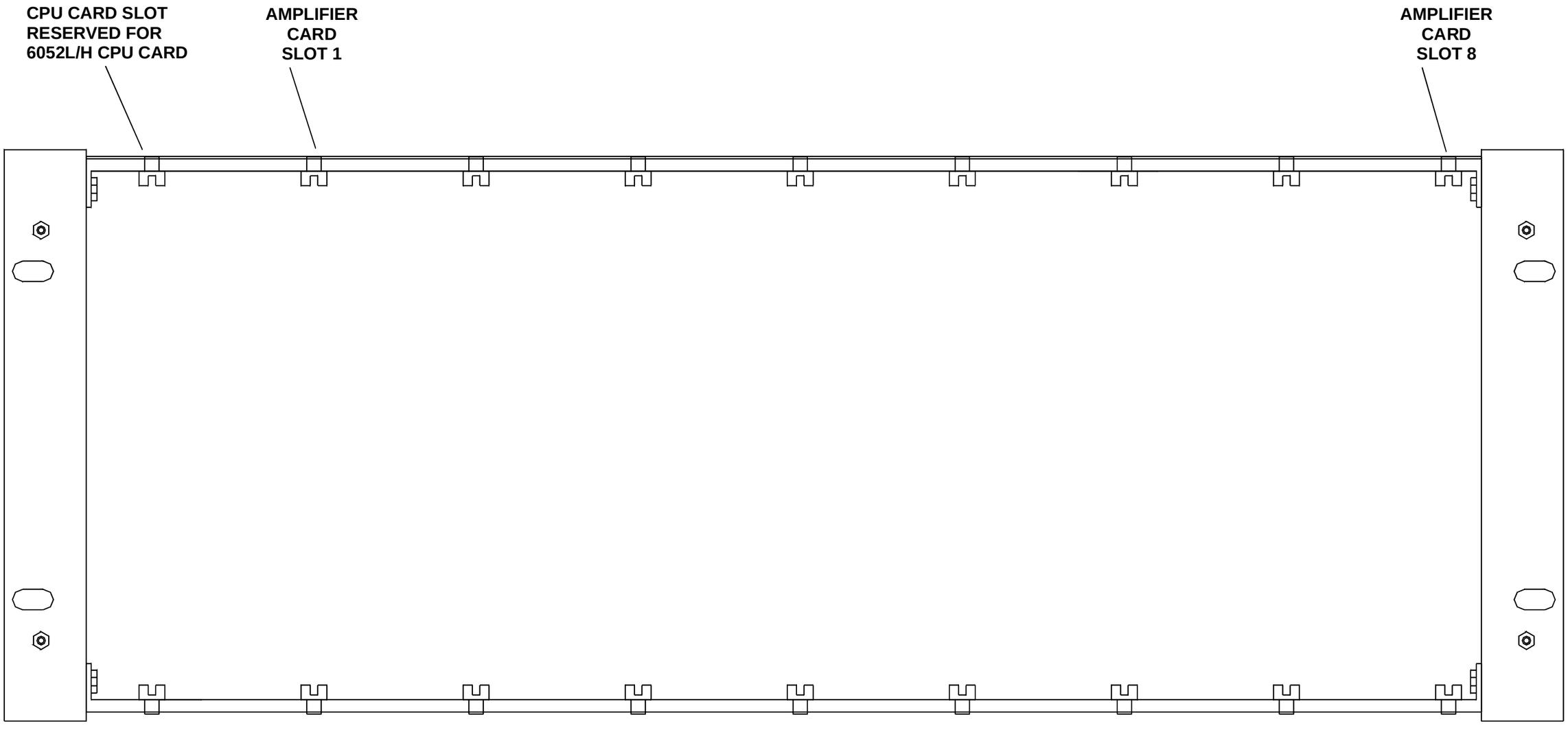

Figure 5 - Front View of Model 6160L/H Mainframe Showing Location of Slot 1

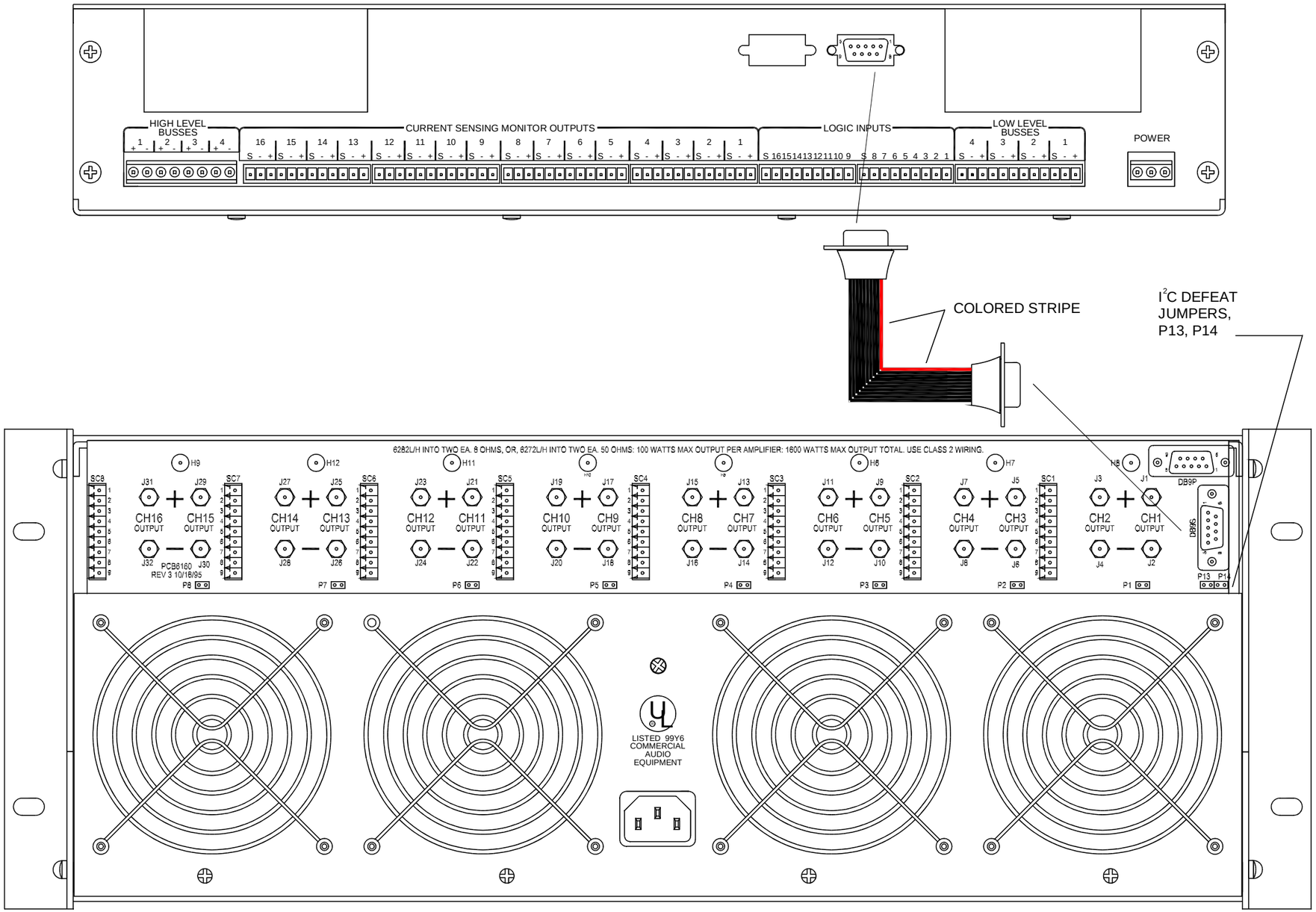

Figure 6 - Connection of Serial Communications Cable

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