Agilent Technologies

How To Float, or Series, Agilent 3070 DUT Supplies

(Date: 1/23/97, Revision: E)

The Agilent 3070 development software does an amazing job of calculating the wiring needed to build fixtures. Even so there are occasionally cases which require wiring that the standard Agilent 3070 software can not handle; for example where two DUT supplies are to be used in series, or where a floating supply is wanted. The procedure below can easily be used in those types of cases.

There are two small problems. The first is that the system will not necessarily add the needed PROBES for any DUT supplies handled in this fashion. The easiest way to insure that enough probes are added by IPG is to go into board_xy (or use Board Consultant) and add the word MANDATORY on as many power supply locations as desired. Note that each Agilent 3070 DUT supply 100 mil probe, on both the high and low side, should normally not carry over one amp. Similarly P-Pins should not carry over three ampseach.
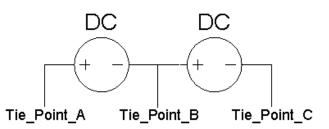
The second problem is really applications related, but should not be overlooked; that is safety. IEC 1010 regulations require a safety cover on any fixture where voltages over 60 volts dc (or 30 V rms) are operator accessible. Also the maximum voltage to ground allowed with the standard Agilent 3070 DUT power supply wiring is 100 Vdc. If voltages higher than 100 Vdc are needed, perhaps an Agilent Performance Port option should be considered. It is also recommended that the voltage rating of any wires added in the fixture be considered. Finally it is probably worth mentioning that tying a 1 megohm resistor to ground inside the fixture from either side of any totally floating supply is a good precaution.

1. Mark at least two power supply board_xy locations as mandatory for each power supply to board connection. Remember to use as many probes as necessary to carry the desired supply current, plus additional probes for the sense leads (if separation is desired). For a normal series type connection only ONE node needs to be considered. For a floating supply remember both supply sides needs to be considered, or TWO different nodes.
2. If you want series supplies, go into board forms, or Board Consultant, and enter the two (or more) supplies as if they were parallel supplies.
   For example:
   FIXED NODE OPTIONS
   VRGEN Family ALL is X;
   GND Family ALL is 0;
   VRGEN Supply 17 At 30 Volts, .2 Amps;
   VRGEN Supply 18 At 30 Volts, .2 Amps;
   GND GROUND;
3. Run Test Consultant in the normal Single Step fashion through and including Generate Initial Fixture Files. Once Test Consultant has PAUSED, open Fixture Consultant.
4. Select Tasks, View/Edit Fixture Electronics, Add/Delete Nodes. Enter a phantom node name for each point where BRC's will be joined to BRC's in the custom wiring you are adding. In the case of two series power supplies, you would need THREE new nodes. Convenient choices might look as follows:

WARNING : node names over 15 characters long are TRUNCATED in the fixture/wires file leading to mass confusion. Keep node names under that limit.

5. Select Tasks, Design Fixture, Change Wires. Enter the power supply node name under Node, the appropriate phantom nodes entered in step 4, the BRC's of the supplies you are using, and ground (assuming one side of one supply connects to ground, if not, enter the name of the second node being used.)

NOTE : The BRC's of the supplies mentioned above are easily found in chapter four of the Cards in the Testhead manual, under The ASRU Card, Numbering of the Module Interface Pins. There is a confusion point however; you will need to check the board config file first in order to identify the correct supply number. In step 2 above, supplies 17 and 18 were used. One of the entries in the config file for Module 3 is:
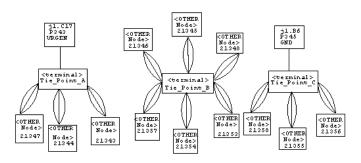
supplies hp6634 18 asru channels 6
supplies hp6634 17 asru channels 5

Thus in this example you need to identify the P-Pins (BRC's) for channels 5 and 6 of module 3. Checking the manual shows that the columns (pins) used by PS #6 (channel 6) on the high (most positive) side are 55, 56, and 58 for bank 2, while the low side uses columns 53, 54, and 57. The ASRU card in module 3 is row 13 of bank 2. Thus one of the BRC's of interest for channel 6 is; 2 (bank 2) 13 (row 13) 55 (column 55). This is written 21355. The remaining BRC's for channel 6 are 21356, 21358, 21353, 21354, and 21357. Note each Agilent 3070 power supply will ALWAYS have six BRC's.
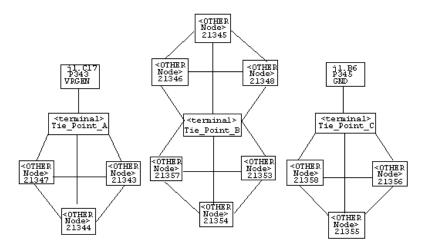
6. Add the necessary wiring between the unwired DUT personality pins and the desired power supply probes. Don't forget any needed intermediate wiring. There are THREE very IMPORTANT THINGS to remember. You MUST DO THESE!

a) Be sure that each personality pin has THREE wire wraps on it.
b) Be sure to enter all SIX personality pins for EVERY supply custom wired.
c) Be sure each "custom" node has a TERMINAL (fixture electronic node) connected to it.

Two example wiring methods are shown below. The second method involves the least thought by the fixture vendor.

i) Each P-Pin Has 3 Wires To A Terminal.

ii) P-Pins Are Interconnected.

7. Save the file, then exit Agilent Fixture Consultant.
8. Go back to the PAUSED Test Consultant, and Execute All Steps To Stop Mark (this should allow Test Consultant to complete through the end).
9. It is recommended that Fixture Consultant be used to review the custom wiring before building the fixture, just in case a typing error was made. Make sure that all SIX P-Pins PER SUPPLY are checked.

NOTE : FIXTURE/FIXTURE should show the custom wiring in the PROTECTED UNIT. Unfortunately the PINS will not be in the protected unit. That is why each P-Pin that was custom wired was given three wraps; to avoid unwanted wires being added by fixture tooling.

It is not uncommon for a few warnings to appear on the nodes with the custom wiring. Consider them, but don't be surprised when they appear. Fixture Tooling will almost certainly produce numerous warnings such as the following:

The protected personality pin 21343 is assigned to node "VRGEN" and will be moved to that node. This means that the pin will no longer be considered protected. (WARNING FXT62)

***** W A R N I N G*****

This program was unable to connect power supply 17 to node "VRGEN".

Action must be taken to correct this condition or the power supply will not be connected to the board.

***** (W A R N I N G FXT61)*****

NOTE : Wires in the Protected Unit of fixture/fixture do not usually appear in the fixture/trace file, although any fixture nodes that were added will.

The added wires from the Protected Unit DO appear in the fixture/wires file however, so they can be used by the fixture vendor. It may be necessary to explain what a tie point (or whatever name you have chosen for the terminals) is, but the problem should not be insurmountable. Note that the XY Coordinates for terminals are phony, and will not actually be on the board. This helps prevent "mistakes", but should also be explained. The fixture/wires file will look similar to:

0.0	28	Blue	Tie_Point_A	[2 18.24 31.2]		-1889	85275	89805 38983
0.0	28	Blue	(2 13.00 45.0)		Tie_Point_B	69111	2275	-1889 85275
0.0	28	Blue	(2 13.00 44.0)		Tie_Point_A	70611	2275	-1889 85275

The fixture vendor just needs to find a way to join all the wires connected to a particular tie point together. Normally this is quite easy, but does require at least a little thought. Usually the P-Pins themselves provide adequate connection points.