

Mr. SMITH. The vehicle itself, of course, is all contracted by Marshall Space Flight Center. The Boeing S-IC, the North American S-II, and the Douglas S-IVB are built under separate contracts from Marshall.

We have working group meetings, and the interface documents are controlled by the Government. Anyone who makes a change or a request for a change, which would effect an interface, has a set procedure that we go through. Various testing programs are put together with joint participation of the contractors and the Government. I mentioned on the tour that we have tested the structural joints between the S-II and S-IVB here at Douglas, and I assume there are similar programs between North American and Boeing.

We have been involved and we have tested in our 39-foot space simulator chamber the complete Saturn instrument unit, the IBM instrument unit, and its interface with S-IVB upper skirt. They share a common thermoconditioning system. The instrument unit provides a refrigerant fluid that circulates through the cold plates that cool all the S-IVB electronics.

Mr. DOUGLAS. Well, is it true, too, that we make the master tools as a part of that interfacing?

Mr. SMITH. Yes, that's part of the interface, Don, and part of the implementation. An interface drawing is made and controlled by Marshall. Then they contract that out. Somebody makes the tool and they make a duplicate master. One goes to North American and one goes to us.

Mr. TEAGUE. Well, Ted, what about the part General Electric plays in this? In the checkout?

Mr. SMITH. Well, that is at the Cape.

Mr. TEAGUE. They are only at the Cape?

Mr. SMITH. Yes, actually the independence of the three stages is quite complete.

Mr. FREITAG. I think I might make one comment here, in addition to the contract that produces the first stage, Boeing also has a contract for certain total integration responsibilities.

Mr. SMITH. That's true.

Mr. FREITAG. The preparation of much of the common interface documentation and checkout list and so on, is a contract that Boeing has for the Saturn V. Chrysler has a similar contract on the IB. Marshall has the basic responsibility, but Boeing and Chrysler support Marshall in this area.

Mr. ABLE. It's worth pointing out too, Ted, that during qualification testing, where some peculiar phenomena comes out at any one of the contractors, the data is made immediately available to all of the contractors on the Saturn stack.

Mr. PETTIS. Behind my question, being a business type and knowing the fierceness of competition between corporate entities, I just wonder how you have the great grand love affair you see here.

Mr. ABLE. It wasn't to begin with, Jerry. Courting took place and it got better and better.

Mr. PETTIS. I see.

Mr. ABLE. Really, we have had an awful lot of experience with this through our Air Force programs. We have been quite used to the