SUMMARY OF CHANGES IN 11/89 DUMAND SPECS. as of 4/10/90.

A. Roberts, HDC

I. POWER SUPPLY AND CABLE.

The DUMAND power will be supplied to the array at 350v. DC, not 700v as previously described. This has been made necessary by the following considerations:

1. Supply voltages above ca. 350v. require running power supplies in series; two 350v supplies were cascaded to obtain the 700v input supply previously envisaged. However, this scheme required that the 700v supply be in the junction box, and this entails a danger to the entire array in the event of failure. The change to 350v means that only the crowbar and regulator need be in the junction box, and these can be made extremely reliable and fail-safe. The JB thus remains essentially a passive device.

2. The change from 700v to 350v implies that the same power delivered to the array now requires twice as much current; thus the cable requirements are changed to allow higher currents. This means lower cable resistance, therefore more copper, and a larger, somewhat more expensive cable. The greatly improved reliability of the power supply system warrants this additional cost.

II. DUPLEXING OF C^2 AND C^3.

There appears to be no serious impediment to full-duplexing these on the same fiber, No. 10. Full duplexing means that the fiber can transmit simultaneously in both directions. This is feasible because different wavelengths can be used for the two directions.

The duplexing allows us to duplicate the entire transmission system on fiber No. 11. This gives us a complete standby communication system.

In addition, fiber No. 12 has been assigned to the JB EM, for use by the TV camera.

III. POSSIBLE SHIFT OF SITE.

New data, recently obtained, about the contours of the ocean bottom off Keahole point, indicate that there probably exists a route with a fairly wide, relatively gentle slope to the ocean bottom at 4700m, and an area at the base of the slope of about one square mile which appears uniformly flat. This location is approximately 10km closer to Keahole Point than the one previously selected. Final selection of the proposed new location must await the proposed cable route survey.

IV. SEPARATION OF HYDROPHONES FROM EM.

In order to facilitate the encoding and transmission of high-speed digital data from the hydrophones (which receive signals up to 50 khz), the hydrophones have been removed from the EM's, their original home, and installed as separate modules to be interpolated into the strings. The hydrophone will remain outside the module, but its electronics, which will be similar to that used for encoding the OM signals, will be inside the module. This allows us to treat the hydrophone data as though it were the signal fram another OM. Thus it goes to shore on the data fibers and is filtered out at the shore end.

V. EM DATA COLLECTION.

Since the hydrophones have now been removed, all remaining EM data can be transmitted to shore via the C^2 link.

VI. JUNCTION BOX EM PACKAGE.

The EM connected to the JB is really a package with diverse functions. It is described in a separate note.

VII. ADDITION OF TRASNPONDERS TO STRINGS.

In view of the fact that we have now inherited a considerable number of transponders from a defunct DOE project, we now propose to install transponders on each string; this will allow them to be tracked during deployment and recovery. They will also greatly augment the ocean-bottom transponder network, and make it more precise.

VIII. EMERGENCY BATTERY STRING POWER SUPPLIES.

As described in a separate memo, it is now proposed to consider seriously the installation of emergency storage battery power supplies on each string. This relatively simple and inexpensive step will have a dual purpose: it will allow each string to be tested in the ocean before deployment – something we had no way of doing before – and also during deployment. The rope by which the string is lowered will not be released until the string has passed all operational tests in place on the bottom. It should be recalled that strings are emplaced before being connected by RUM to the JB, which is a later operation.