APPENDIX G - DCS ADDRESS ASSIGNMENTS -- THE 21/31 BCH CODE

Each Data Collection Platform is identified by one or more 31-bit addresses. Although one platform may utilize more than one such address, no two utilize the same address. All messages transmitted through the GOES/DCS are preceded by this 31-bit address. In addition, this same address is used to interrogate platforms.

The addresses utilized by the GOES/DCS are actually a 21/31 BCH Code which has a minimum Hamming distance of five. Interrogated radio sets utilize an error correction strategy which permits them to transmit any time they receive a sequence within two bits (Hamming distance) of its own address. Error correction on the reply channel data will be employed by the DCS/DAPS as follows:

1. When compared with the expected address, if the received address has one or two bits in error, the Wallops system will assume the correct address. A separate abnormal Platform Response message will also be generated (incorrect address received).

2. If the address of the received message is in error by more than two bits, the Platform Data Base shall be checked for an entry which contains the actual received address.

    a. If such an address is in the Platform Data Base, the data will be stored in the Message File with the address corrected by the DAPS. An "Unexpected Response" abnormal Platform Response Message will also be generated for the respective platform owner.

    b. If the Platform Data Base does not contain an entry for the Received Address, the message will be tagged as received in error; transmitted via DOMSAT and stored as a garbage message in the message file.

3. If an unexpected self-timed response is received, the Platform Data Base will be searched for that exact address. If not found, the message shall be stored with error identifiers in the message file.

Generation of the 31-bit address is performed by multiplying a 21-bit binary number (a 1 X 31 matrix), by a 31 X 21 matrix, which results in a 31-bit sequence (1 X 31 matrix). Figure 4.1 gives the generator matrix. Since the first 21 columns represent an identify matrix, the first 21 bits of the resultant address are the same as the original binary number.

Address Assignment Criteria:

Every DCPRS is uniquely assigned at least one 21/31 address. Only one address is used when data is to be transmitted from the platform to the DCS/DPS via GOES. The address always has the 21st bit zero. One or more additional addresses may be assigned to a DCPRS and are used primarily for commanding (initiate a change in operation of the DCPRS or its related sensors). These additional addresses are to be transmitted on the interrogate channel. However, they do not trigger reply from the DCPRS.

Some platforms have more than one address. It is referred to as the secondary address. The secondary address is always numerically the next highest possible address from the primary address (21st bit to be

a one).