"NO AIS" problem.

The problem
In areas with sparse shipping, no AIS targets data may be received for a given period of time. Although the AIS receiver/transponder is operational and functioning normally, some chart plotters misinterpret the lack of AIS traffic and repeatedly produce an error "NO AIS" with associated alarm. This is a nuisance, but there is no way the chart plotter can distinguish between "no AIS traffic" and an AIS receiver/transponder that has stopped functioning.

A solution
Blue water sailor Steve Rakoczy has come with a suggestion for a smart solution for this problem, for AIS transponder users:

AIS transponders send NMEA !AIVDM sentences to the chart plotter or computer when AIS transmissions from other vessels (targets) are received, and in addition !AIVDO sentences with own vessel data are generated at short time intervals. For most chart plotters the VDO sentences have no meaning and are not recognized, but they do indicate that the AIS transponder is operational. Steve's suggestion was to "convert" these VDO sentences to VDM sentences, with GPS position the lat/lon of the North Pole. These 'fake' VDM sentences would generate AIS traffic and avoid the chart plotter alarms.

Steve asked Brookhouse if it was possible to implement this feature in the NMEA multiplexer. The answer was yes, all Brookhouse multiplexers can be programmed to edit the incoming data streams using a simple script language. Users can make their own scripts, but often scripts for certain functions are already available from Brookhouse

We have created the following sript for conversion of all VDO sentences to the same VDM sentence with an AIS target (MMSI 123) at the North Pole (lat/lon 90.0/0.0)

*S,4,AIVDO,AIVDM
*L,4,AIVDO,1
*R,4,AIVDO,1
*I,4,AIVDO,1,1,1,,
*I,4,AIVDO,1,A,100
*I,4,AIVDO,1,00Nw0
*I,4,AIVDO,1,00000
*I,4,AIVDO,1,00kOq
*I,4,AIVDO,1,P0001
*I,4,AIVDO,1,<050l
*I,4,AIVDO,1,,0*4F
*T,4,AIVDO,1
*E

The resulting AIS target info is displayed as follows in Seaclear, as a test.
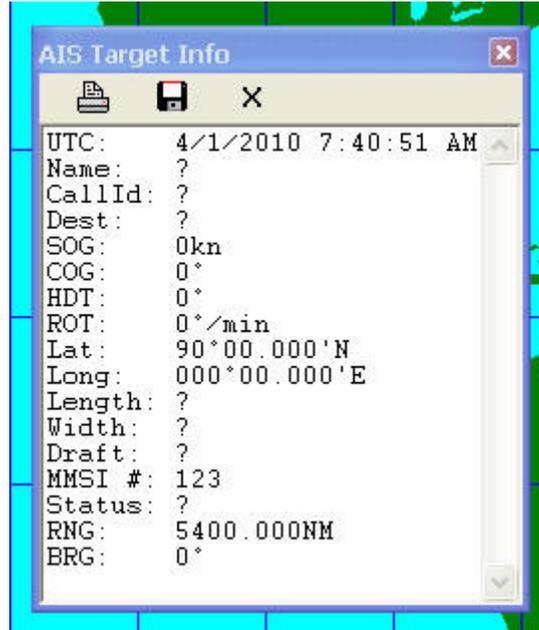
If for some reason, the user prefers a "fake" AIS target in another position, with own MMSI, a script can be created as explained below.

As the format of VDO and VDM sentences is the same, conversion from VDO to VDM without modification of the data is easy: Only the NMEA sentence formatter VDM has to be substituted for VDO and the checksum needs to be recalculated, an easy task for the editing feature in Brookhouse multiplexers. A short uploadable multiplexer script is available for this conversion. We sometimes use this for testing a new AIS transponder installation. However, the result is that the chart plotter plots the own vessel as an AIS target right on top of the vessel symbol in the electronic chart, which is not desirable.

The following method can be used to avoid plotting the AIS target on top of the own position.

While in port or at some other acceptable location, capture the AIS transponder VDO sentence, which includes the current position, with the aid of a (laptop) computer. Convert VDO sentences to VDM in the multiplexer, but substitute the entire data contents of the VDO sentence captured in port for the data in all received VDO sentences. The result is that the own vessel is identified by the plotter as a stationary AIS target with position the home port or whatever the GPS position was when the VDO sentence data for the conversion was captured.

The user can choose himself where the position of the own vessel will be plotted as an AIS target and install the script in any of the Brookhouse multiplexer models with AIS

support. The following example shows a captured VDO sentence, the script for the !AIVDO-!AIVDM conversion and the resulting VDM sentence.

Input multiplexer:
!AIVDO,1,1,,,B3aBKb@0AP@n=>5=5wlO7wlUsP06,0*67

Script:
*S,4,AIVDO,AIVDM
*L,4,AIVDO,1
*R,4,AIVDO,1
*I,4,AIVDO,1,**1,1,,**
*I,4,AIVDO,1,**,,B3aB**
*I,4,AIVDO,1,**Kb@0A**
*I,4,AIVDO,1,**P@n=>**
*I,4,AIVDO,1,**5=5wl**
*I,4,AIVDO,1,**O7wlU**
*I,4,AIVDO,1,**sP06,**
*I,4,AIVDO,1,**0**
*T,4,AIVDO,1
*E

Output multiplexer:
!AIVDM,1,1,,,B3aBKb@0AP@n=>5=5wlO7wlUsP06,0*65

The !AIVDM sentence results in the following AIS target info and plotted position in Seaclear: