

HAL ST-8000A MODEM DIVERSITY OPTION KIT

INSTRUCTIONS

870-08007
September 29, 1994 Printing

HAL ST-8000A MODEM DIVERSITY OPTION KIT
P/N 870-08006

1.0 Introduction

The ST-8000A Modem Diversity Option Kit is designed to add diversity operation to the ST-8000A Modem. Diversity operation requires two ST-8000A modems, each with the diversity option installed. Also required is a diversity cable to connect the two modems together.

2.0 Unpacking and Inspection

Included with the ST-8000A Diversity Option Kit are the following:

Quantity	Part No.	Description
1	960-08002	A5W2 Internal Diversity Cable Assy.
1	390-10356	MS27473E10F35P Cable Connector
1	390-10506	MS27506B10-2 Cable Clamp
1	675-80620	A2 U4 ST-8000A ROM, V2.0
1	450-06000	#6 Solder Lug with Bend
1	870-08007	Diversity Option 01 Instruction Set (this document)

3.0 Installation of the Diversity Option in the ST-8000A

ST-8000A units are designed to be used in pairs for diversity operation, so you will need to install Diversity Option Kits in 2 units for each diversity operation planned.

Insure that the power cord is removed from each ST-8000A. Also, observe precautions to avoid static electric discharge from your body to the internal components of the ST-8000A.

Remove the top cover of the ST-8000A.

Locate the ROM (Read-Only Memory chip) A2 U4 (V1.9) on the upper circuit board (Control Board Assembly A2). The ROM is located at the right rear area of the Control Board. Remove A2 U4 carefully from its socket. This can be done with a removal tool or a thin-bladed screwdriver placed between the ROM and socket at the ends, alternately prying slightly up at one end then the other until the ROM can be removed by hand.

Replace the old ROM with the new A2 U4 (V2.0) ROM supplied in this kit. Be sure to install the new ROM so that the notched end is toward the rear of the cabinet. IT IS POSSIBLE TO INSTALL THE ROM INCORRECTLY, SO BE CAREFUL WITH THIS STEP. Place the ROM over the socket and be sure that all pins are lined up with the socket properly. Press down gently on the ROM to start all pins into the socket. Stop and check to see that all pins are properly seated. Continue to press directly down on the ROM until it is fully seated in the socket. Carefully inspect to insure that all pins go straight down into the socket (no pins bent under the ROM).

Remove the four screws holding down the rear area of the top circuit board. (Note that the front 3 screws are attached to hinged spacers - do not try to remove these.) Lift the rear area of the top board. It should pivot on the hinged spacers near the front of the board and stand upright and out of the way. This will allow access to the Modem Board Assembly A1.

Remove the small plate covering the Diversity Connector (J5) hole on the rear panel. It is held on by four screws and nuts. Save the screws and nuts for attaching the MIL connector.

Install the A5W2 cable assembly in the ST-8000A. The MIL connector end of the cable attaches to the rear panel inside surface at connector position J5 using the screws and nuts removed in the previous step. Be sure that pin 1 of the MIL connector is toward the top of the cabinet like all other MIL connectors on the rear panel.

Locate the DIV connector (J2) on the rear edge of the bottom circuit board (Modem Assembly A1) and plug the post connector of the A5W2 cable onto the DIV connector (J2). The connector is designed to plug-in in one direction only. The green wire should be on the right hand side as you face the front of the ST-8000A cabinet and look inside toward the rear panel.

Locate Jumpers J14 and J15 on the bottom circuit board (Modem Assembly A1). These are the two forward-most jumpers on the board. Move Jumpers J14 and J15 from the NDIV position to the DIV position. (Move both jumpers over one position to the right so that the jumper is over the two right-most posts on the jumper socket as you face the front panel of the unit.)

Lower the upper circuit board and replace the 4 screws which were removed.

Replace the top cover of the ST-8000A after insuring that all hardware has been sufficiently tightened.

4.0 Diversity Cable Assembly

Refer to the diagram on page 5 of this document. In addition to the parts supplied in this kit, you will need a length of shielded cable with at least 5 conductor wires (22 gauge stranded wire is recommended). Only 5 conductors and the shield wire will be used. Keep the length of the Diversity Cable to a minimum in order to reduce the possibility of interference from external sources. Ten extra feet of cable laying around in a radio comm center will act as an antenna to pick up noise and interference.

For the cable assembly, you will need the following items:

- | | | |
|---|--|------------------------------------|
| 2 | 390-10356 | MS27473E10F35P MIL Cable Connector |
| 2 | 390-10506 | MS27506B10-2 Cable Clamp |
| 2 | 450-06000 | #6 Solder Lug with Bend |
| 1 | Appropriate length of shielded cable | |
| 1 | MIL connector pin crimping tool (Such as a Panduit hand or machine tool ECT with ECT156F head) | |

Following the diagram, construct the cable by first attaching the solder lug to the cable shield wire with a length of wire which will extend back through the cable clamp as shown. Do this on both ends of the cable.

Now attach connector pins to 5 inner conductors of the cable using the MIL connector pin crimping tool. Maintain a record of your wire color code for pins 1-5. Maintain the same color code at both ends of the cable.

Attach the Cable Clamps (MS-27506B10-2) to the cable at each end as shown on the diagram but do not tighten the clamps completely.

Install the pins in the MS connector on each end of the cable by wiring pin 1 to pin 1, 2 to 2, etc.

Adjust and tighten the cable clamps on each end of the cable assembly.

Return the ST-8000A units to service and attach the diversity cable to connector J5 of each unit.

5.0 Diversity Operation

The ST-8000A Diversity feature allows the use of two completely independent radio and antenna systems for reception. For instance, one system may include a vertically oriented antenna and the other a horizontally oriented antenna. In some circumstances, one antenna will achieve better reception than the other due to changes in the signal from various causes.

Each of these radio & antenna systems is connected to a separate ST-8000A modem with Diversity Option installed. The two ST-8000A units are then connected together with a Diversity Cable from J5 on one unit to J5 on the other unit.

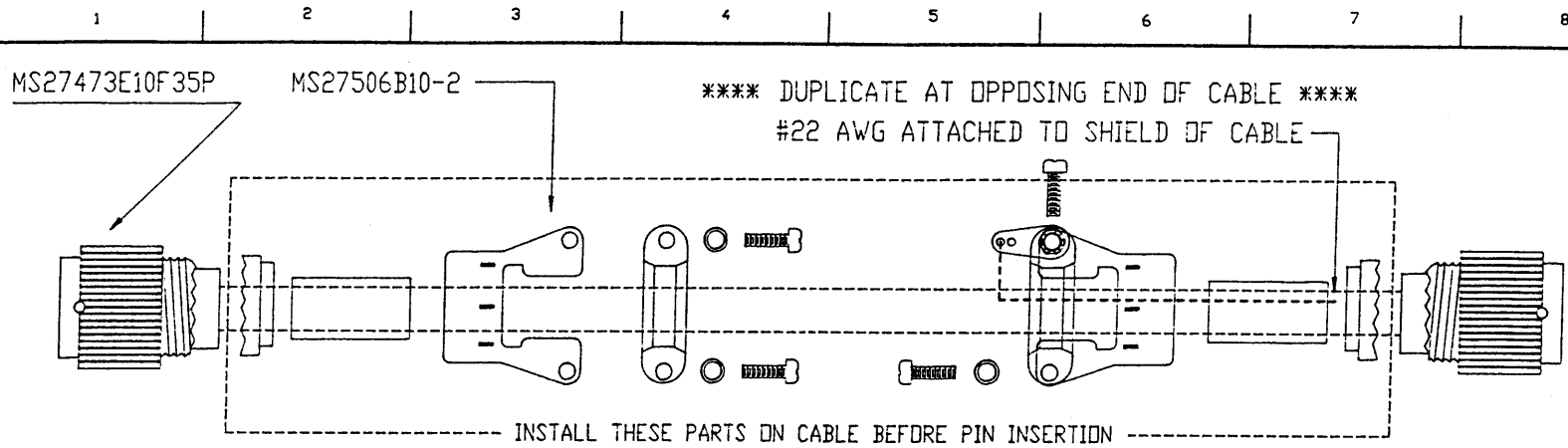
When diversity operation is selected by pressing the DIV key on the front panel of BOTH UNITS, the units will both produce output data streams dependent on the net result of reception by BOTH ST-8000A units. The ST-8000A uses a power combination diversity scheme whereby the stronger of the Mark and Space signals at any time will dominate the output data of the modem.

Connection of the data terminal can be to either modem, since the output data streams will be identical.

6.0 In Case of Difficulty

In case of difficulty in installation or operation of the ST-8000A Diversity Option Kit, contact the factory at:

HAL Communications Corp.
1201 West Kenyon Road
P.O. Box 365
Urbana, IL 61801-0365
Phone: 217-367-7373
FAX: 217-367-1701
Techline BBS: 217-367-5547
Internet: halcomm@prairienet.org



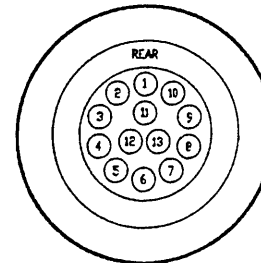
CABLE REQUIREMENT:

MINIMUM 5 CONDUCTOR WITH SHIELD #22AWG STRANDED WIRE.
CABLE LENGTH: KEEP TO MINIMUM FOR THE APPLICATION
TO REDUCE POSSIBLE INTERFERENCE.

WIRING:

PIN #1 TO #1
PIN #2 TO #2
PIN #3 TO #3
PIN #4 TO #4
PIN #5 TO #5

PINS 1-5 USED ONLY.



REV.	DATE	BY	HAL COMMUNICATIONS CORP. BOX 365, URBANA, IL 61801
			ST8000A TO ST8000A DIVERSITY CABLE
	DATE 09/28/94		SCALE NONE
	DRN BY SCH		
	APP BY <i>[Signature]</i>		NO.C1591