TYPE O AND ON CARRIER TELEPHONE SYSTEMS—
O REPEATERS
MODIFICATION PROCEDURES FOR O-H OPERATION

This section contains the information required for field modification of O repeaters to use hybrid integrated network (HIN) devices. HIN devices are solid state devices designed as direct replacements for electron tubes. HIN-modified O equipment is designated O-H.

This section is reissued to provide installation information on surge (lightning) protection of HIN devices used with OA-H repeaters. Arrows normally used to indicate changes have been omitted due to general revision of the section. This reissue does not affect the Equipment Test List.

All repeater amplifiers associated with the same -48V or +130V filament fuse must be converted to HIN devices. That is, all tubes in the WE and EW amplifiers and associated oscillator for repeater 1 or 2 mounted in the same J98705B frame must be replaced with HIN devices before returning that group to service.

Note 1: When significant amounts of equipment in an office are to be HIN-modified, periodic checks of the -48 volt battery potential should be made to maintain potential within the desired range. This is due to a reduction in the total power consumption by eliminating the -48 volt filament requirement.

Note 2: The 521B diode surge protection unit is bipolar, therefore it may be mounted without regard to polarity.

Material requirements for modification are shown in Table A. This procedure is for out-of-service modification.

Caution: Do not test HIN devices on a KS-type tube tester. The reverse voltage, plate-to-ground, will damage HIN devices when they are inserted into the tube tester.

Apparatus:

Modification kits (see requirements per Table A).

521B Diode, For Surge Protection (require 2 per OA-H repeater)

STEP	PROCEDURE

A. OA-H, OB-H, OC-H, and OD-H Repeaters

Caution: This procedure must be performed with the repeater patched out-of-service and power removed.

1 Arrange for "make busy" or release of circuits or patch working circuits to maintenance equipment per local practice. Only one set of WE and EW repeater amplifiers and associated oscillator need be placed out-of-service at one time for modification.

2 Remove the +130V and -48V fuses (if applicable) from the repeater mounting fuse panel.

3 Remove the -48V fuse indicator pins (if applicable).

4 Remove all tube shields and tubes. Discard the tube shields.

Caution: Reuse of tube shields on HIN devices may result in improper operation of the repeater.

5 For OA-H repeaters only:

Note: The OA-H dummy repeater oscillator unit (J98705J or W, List 4) is not required for use with HIN-equipped OA-H repeaters and may be removed.

B. Modification of O-H Repeaters and Associated Oscillator

1 Complete all preliminary steps listed in Part A.

Caution: Before installing the HIN devices, ensure that insulator discs supplied are in place on the base of the 7-pin devices. Failure to do so may result in improper operation of the repeater.

2 Insert HIN devices. Use Fig. 1 to match the HIN codes to the appropriate sockets.

3 For O-H repeaters employing +130 volt filament battery, install option BJ of SD-95155-01. The option consists of removing part of the "X" wiring option and adding a strap for each repeater pair as follows:

(a) Disconnect end of R5 from terminal 4 of J5 (SD-95155-01, Fig. 2).

(b) Disconnect end of R12 from terminal 16 of J5 (SD-95155-01, Fig. 2).

(c) Ground the A lead by strapping terminal 4 to terminal 13 for WE and EW AMP 1 (SD-95155-01, Fig. 2).

(d) Ground the A lead by strapping terminal 12 to terminal 16 for WE and EW AMP 2 (SD-95155-01, Fig. 2).

(e) Install one 521B diode for surge protection across terminals 3 and 4 of 200P East line network for each amplifier pair, 1 or 2 (SD-95155-01, Fig. 12, BK opt).

STEP	PROCEDURE

(f) Install one 521B diode for surge protection across terminals 3 and 4 of the 200R West line network for each amplifier pair, 1 or 2 (SD-95155-01, Fig. 11, BK opt).

Note: If WE and EW 1 amplifiers only are to be modified for HIN devices, Steps 3a, 3c, 3e, and 3f shall be performed. If WE and EW 2 amplifiers only are to be modified for HIN devices, Steps 3b, 3d, 3e, and 3f should be performed.

4 Stamp each repeater unit, next to the J code, as follows:

L40 for J98705AC OA-H repeater amplifiers

L42 for J98705G OB-H, OC-H, and OD-H repeater amplifiers

5 Restore the +130V fuses, 70G 1/2 ampere.

Warning: The -48 volt filament fuses (if applicable) must not be replaced in HIN-modified O-H repeaters.

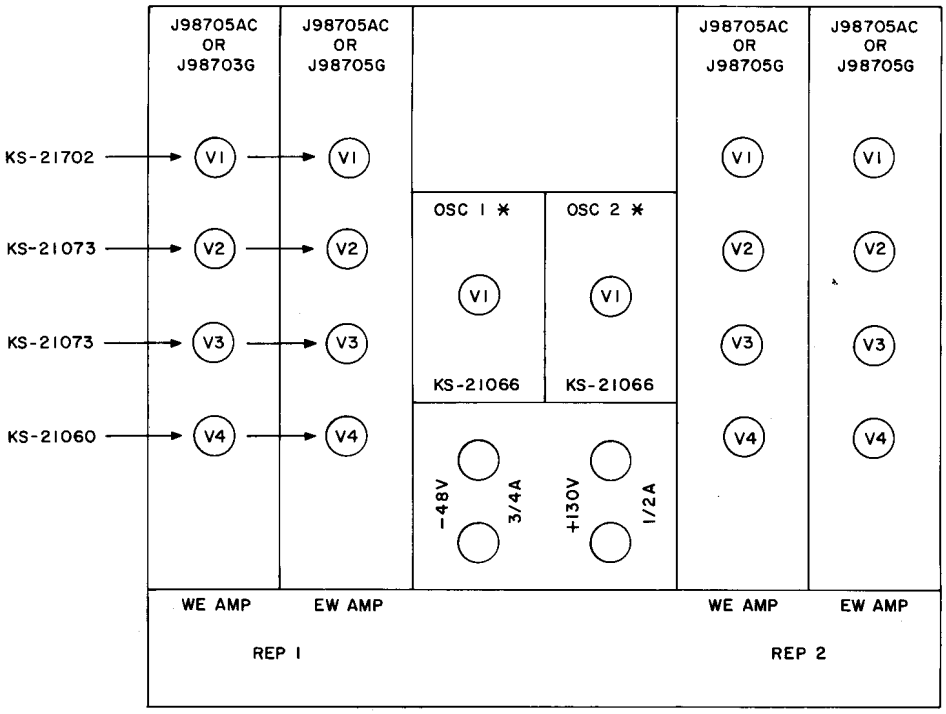
6 Modified equipment requires a realignment routining much the same as when new tubes are added. Refer to Section 362-210-503 for summary of lineup and maintenance tests to be performed prior to service restoral.

7 Repeat Parts A and B for remaining repeater groups.

TABLE A

HIN DEVICE ORDERING CODE

J98705G, L42	HIN devices required to modify one J98705G repeater amplifier unit
J98705J, L40	HIN required to modify one J98705J 01 repeater oscillator
J98705W, L40	HIN required to modify one J98705W 01 repeater oscillator
J98705AC, L40	HIN devices required to modify one J98705AC 0A1 repeater amplifier unit



* OA-H REPEATER MAY HAVE THE DUMMY OSCILLATOR REMOVED FROM THESE POSITIONS.

Fig. 1—O-H Repeater-Socket Identification and Equivalent HIN Device Codes