Chapter 2

OPTION 010
MODEL 44421A
20 CHANNEL RELAY MULTIPLEXER ASSEMBLY

OPTION 020
MODEL 44422A
20 CHANNEL RELAY MULTIPLEXER ASSEMBLY WITH THERMOCOUPLE COMPENSATION

GENERAL INFORMATION

2-1. INTRODUCTION

2-2. This chapter contains service information for the -hp- Model 44421A 20 Channel Relay Multiplexer Assembly (Option 010) and for the -hp- Model 44422A 20 Channel Relay Multiplexer Assembly with Thermocouple Compensation (Option 020). Options 010 and 020 are used with the 3497A Data Acquisition/ Control Unit and/or 3498A Extender.

2-3. DESCRIPTION

2-4. Option 010 is a 20 channel analog signal multiplexer assembly which is used to switch (multiplex) up to 20 input signals to the 3497A DVM or to other assemblies or instruments. Option 020 uses the same relay card as the Option 010 assembly, but has a terminal card with thermocouple compensation networks built-in.

2-5. Each of the 20 channels use reed-relays to switch the High, Low and Guard lines. The channels are organized into two decades of 10 channels and one channel can be closed in each decade. Relays can be closed in a random fashion or can be incremented between programmable limits.

2-6. Because the 20 Channel Relay Multiplexer has low thermal offset characteristics, it is ideal for precise low-level measurements of transducers and temperature measuring devices. Since two channels (one per decade) can be closed at a time, one assembly can be used to make four-wire resistance measurements.

2-7. The Option 020 assembly can be hardware or software compensated and can be used for measuring the outputs of up to 20 B, E, J, K, R, S or T type thermocouples. Since the Option 020 terminal card has a special isothermal connector block, voltages measured with the assembly can be directly converted to equivalent temperatures by using a standard lookup table.

2-8. Simplified Operation

2-9. As shown in Figure 2-1, the relay multiplexer assembly consists of a relay card and a terminal card. Inputs from system sensors, such as voltage sources, etc. are input to the terminal card connectors on channels A0 through B9 and are sent to the relay card relays. Each channel consists of a HIGH, LOW and GUARD line. Relays are divided into two groups of ten relays (decades): decade A and decade B.

2-10. In normal operation, a close channel (AC chan#,chan#,..) command from the 3497A closes the relay in the channel selected and simultaneously closes the tree switch relay. When this happens, the input signal is sent to four places: the A COMMON and B COMMON connectors on the terminal card and (through the tree switch relay) to the 3497A DVM and rear panel (HI COM, LO COM and GUARD COM) terminals.

2-11. For example, for an assembly in slot 0, channel A0 address is 0, channel A1 address is 1, ... and channel B9 address is 19. Thus, the command AC0 closes the relay in channel A0 and the tree switch and the voltage at channel A0 is sent to the A COMMON and B COMMON terminals on the terminal card, to the rear panel connectors on the 3497A and to the DVM.

2-12. Four optional configurations are available by removing jumpers JMP1 through JMP6. For example, by removing JMP1, JMP2 and JMP3, channel inputs are

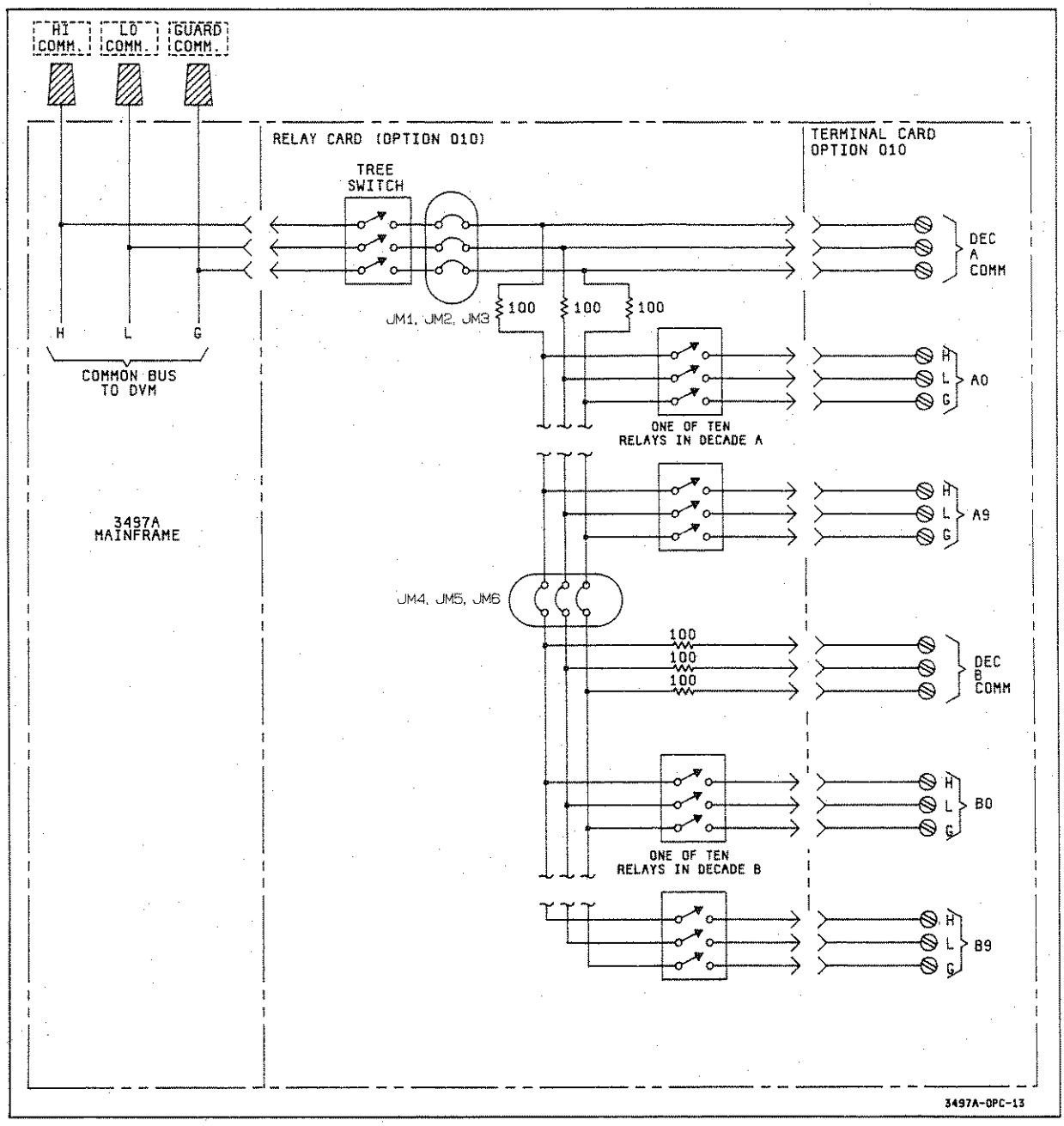

Figure 2-1. Relay Multiplexer Assembly Simplified Schematic

not sent to the 3497A. Or, by removing JMP4, JMP5 and JMP6, the A decade outputs can be separated from the B decade outputs (for four-wire ohms measurements).

2-13. COMMANDS FOR THE ASSEMBLIES

2-14. Commands to control the Option 010 and 020 assemblies are shown in Table 2-1. See the Command Directory in Chapter 6 of the 3497A Operating, Programming and Configuration Manual for details and examples.