

from the doubler board returns to the Main board at J1304, pin 8 and goes to reference point "G" and then to the base of transistor Q102. Q102 turns on. The +5 volt normally present on the collector of Q102 changes to a low (ground) which is applied to pin 1 of Attenuator Driver IC129. The driver circuit normally converts the +5 volt input at pin 1 to a +12 volt output to the attenuator. When the +5 volt input at pin 1 goes low, so does the +12 volt signal at pin 18. The RF breaker (relay) in the Programmable Attenuator is held on by the +12 volt signal at pin 7 of P103. When the 12 volt signal is removed, the breaker trips, removing RF power.

1.5.2.6 Shift registers IC121 and IC122, DAC IC120 and 1/2 of Dual Op Amp IC133 comprise the Internal Modulation select and fine tune circuitry shown on the Mod/Carrier Level schematic (Figure 4-3). The shift registers provide control data to the DAC and provide enable signals to select either the 1 kHz or 400 Hz internal modulation source. The outputs from pins 4 and 5 of shift register IC122 enable the 1 kHz and 400 Hz internal modulation sources, respectively, shown on the Mod Source/Ref Freq schematic (Figure 4-2; see text Section 1.5.1.5). Enables are positive logic, with a logic 1 (5 volts) providing the select signal. The truth table is shown in Table 1-1.

TABLE 1-1.
INTERNAL MODULATION SOURCE
SELECT TRUTH TABLE

	1 kHz Select	400 Hz Select	CW
IC122, pin 4	1	0	0
IC122, pin 5	0	1	0

External modulation and internal modulation can be applied simultaneously (complex modulation). When the unit is in the CW mode or when only external modulation is applied, neither internal source is enabled. The selected 400/1000 Hz internal modulation source input (signal E) from the Mod Source/Ref Freq circuitry (Figure 4-2) is applied to pin 15 of DAC IC120 (on Figure 4-3). This signal provides the reference voltage for the Internal Modulation circuitry. The internal modulation output at pin 7 of IC133 is applied to pin 16 of the DAC for a feedback reference and also to pin 6 of Quad Analog Switch IC130 and pin 11 of Quad Analog Switch IC131 for use as an internal AM or internal FM source. Switches IC130 and IC131 are controlled by software through shift registers IC122 and IC125. Action of these switches is described in detail in Section 1.5.2.8.

1.5.2.7 Shift registers IC124 and IC125, DAC IC123, and 1/2 of Dual Op Amp IC133 comprise the External Modulation select and fine tuning circuitry shown on the Mod/Carrier Level schematic (Figure 4-3). These shift registers provide control data to the DAC. Outputs from shift register IC125 also control the Analog Switches IC130 and IC131 used to route AM and FM signals to their proper destinations. The external modulation source (signal D from the Mod Source/Ref Freq circuitry; Figure 4-2) is applied to pin 15 of DAC IC123 (Figure 4-3). This input provides the voltage reference for the external modulation circuitry. The external modulation output at pin 1 of IC133 is fed to pin 16 of the DAC for a feedback reference and also to pin 3 of Quad Analog Switch IC130 and pin 6 of Quad Analog Switch IC131 for use as an external AM or external FM source.

1.5.2.8 Quad Analog Switches IC130 and IC131 are controlled by software through shift registers IC122 and IC125. An internal AM signal at pin