MANUAL ADDENDUM
OPTION 3 UPGRADE FOR THE
OMNI VI, MODEL 563

Thank you for purchasing this factory installed upgrade for your OMNI VI transceiver. We hope you enjoy using the new noise reduction feature and the expanded user menu.

The two new circuit boards and upgraded software affect several areas of the transceiver's operation. Use these pages in place of the operating instructions in Chapter 3 of your Model 563 Manual.

CLOCK SET The time shown in the 24 hour clock display can be updated through the numeric keypad. To enter a new time, choose the USER MENU 1 as described in the USER OPTIONS MENU paragraph below. Select item CCd. Enter the hours and minutes, beginning with a zero if necessary. The clock will begin counting when the last digit is entered.

DSP LOWPASS FILTER Press the LP button to enable the DSP audio lowpass function. This adds a gradual treble cut type response to the audio path. The corner frequency of this filter is selectable by holding the LP button down for about 2 seconds. The frequency choices of 600, 800, 1000, 1200 and 1400 Hz are selectable with the up and down arrow keys. This feature can be used to limit the post-detection bandwidth of the audio path. A unique bandwidth setting is stored for each mode.

DSP NOISE REDUCTION The NR button activates the noise reduction algorithm in the DSP system. This system mathematically identifies the desired signals and tracks them with a set of adaptive filters. Broadband noise is attenuated by as much as 15 dB depending on band conditions.

IF FILTER SELECTION Five pushbuttons above the main tuning knob select the IF bandwidth. The first three buttons select one of three optional filter positions in the 6.3 MHz PBT (Pass Band Tuning) IF. A standard 2.4 kHz filter is already installed. To return to the standard bandwidth, press the currently selected filter button again. See section 1-8 for instructions on how to install these filters. Two more buttons, N1 and N2 select optional filters in the fixed 9 MHz IF. Both IF's are cascaded such that the resulting receiver bandwidth is a combination of both filters.

LOCK The LOCK button allows the user to prevent the main tuning knob from moving the selected VFO (either A or B). The other VFO is still available for tuning. This button also provides access to the USER OPTION MENUS as explained below.

USER OPTIONS MENU The items in these three menus permit the operator to tailor the transceiver to match their personal preference. To access the menus, press and hold the LOCK button for about 2 seconds. The display will ask "choose". Press either 1, 2 or 3 on the numeric keypad depending on which items you wish to modify. Once a menu has been selected, use the main tuning knob to scroll through the items. Use the UP/ DOWN arrow keys to modify the status of each item. To switch to another menu, press the LOCK button once then select the new menu. To exit completely, press LOCK twice.

Refer to Table 1 for a list of the items in each menu and a description of the settings.

TABLE 1 USER OPTIONS MENU

ITEM NAME	DESCRIPTION	SETTINGS
MENU 1		
Id	Station ID reminder. This activates an audio beep every 10 minutes as a notice to ID the station.	**OFF**, ON
ANC	Audio annunciator selection. This item controls the type of feedback for keypad button closures. ALL sets some buttons to provide a CW character when pressed. bp sets all buttons to report a single beep. OFF turns off the audio report.	**ALL**, OFF, bp
CCd	Continuous Clock Display. This item controls the clock readout. If it is set to OFF, then no clock readout will be shown.	**ON**, OFF
LCO	Linear Control Relay. This item enables the internal relay used for keying non QSK amplifiers.	**OFF**, ON
INt	Readout intensity. The brightness of the readouts and meter backlight can be set with this item.	0 -**15**
MENU 2		
bd	Baud rate selection for both the RS-232 and the "SPORT" serial port.	**1200**, 2400, 4800, 9600, 19200
C-Id	This sets the address byte for the transciever. This setting is checked by your third party logging software so that it can properly route its commands.	**04**, 00-64
CdE	Enable/Disable of the Continuous Date Echo mode. This controls whether the transceiver automatically reports changes from the front panel over the serial port.	**OFF**, ON
I CODE	Selects the operating mode of the built-in keyer.	A, **B**
MENU 3		
FEP	Frequency Entry Priority. This sets the primary function of the numeric keypad. LO sets the keypad to a bandswitch. HI sets the keypad for direct frequency entry.	**LO**, HI
bCP	Band Change Preference. If set to Full, band changes return to the last used frequency. If set to partial, band changes move to the same relative position on the next band. i.e. 21040 to 14040.	**F**, P
OdP	Offset Display Preference. If set to OFF, the main display always shows the transmit frequency. If set ON, the main display follows any RIT offset.	**OFF**, ON
SPD	Sets the tuning rate of the main tuning knob in SSB/FSK/FM modes. In kHz per turn.	**5.0**, 2.5, 1.67, 1.25, 1.0, .83
rSPD	Sets the tuning rate of the offset tuning knob in SSB/FSK/FM modes. In kHz per turn.	**4.8**, 2.4, 1.2, 0.6, 0.3, 0.15
CSP	Sets the rate of the main tuning knob in CW mode. In kHz per turn.	**5.0**, 2.5, 1.67, 1.25 1.0, .83
CrSP	Sets the rate of the offset tuning knob in CW mode. In kHz per turn.	**4.8**, 2.4, 1.2, 0.6, 0.3, .15

INSTALLING OPTIONAL FILTERS All optional filters install either on the 9 MHz IF board or the PBT (Pass Band Tuning) board. Refer to Figures 1 and 2. These boards are both located on the bottom side of the transceiver. To remove the bottom cover, set the transceiver upside down with the front panel facing forward. Remove two Philips screws from each side of the bottom cover and slide the cover back out from under the edge of the front panel extrusion.

Remove the bottom cover to expose two removable panels. The optional filters plug into circuit boards underneath these panels.

INSTALLING 6.3 MHz IF FILTERS
Remove the panel covering the PBT board. There are three dedicated positions on the board for the three optional filters. Referring to Figure 1, plug the filter into the appropriate position. The filters are non polarized and may be installed in either direction. Replace the panel and the bottom cover.

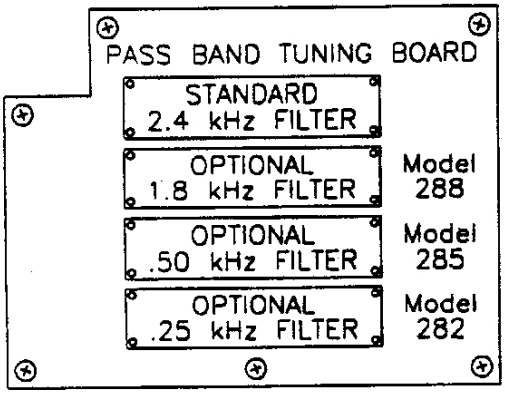


FIGURE 1
6.3 MHz IF FILTER INSTALLATION

INSTALLING 9 MHz IF FILTERS Remove the panel covering the 9 MHz filter board. There are two empty filter positions, Optional Filter 1 and Optional Filter 2 that correspond to the N-1 and N-2 buttons on the front panel. Plug the optional filter into the desired location. Like the passband tuning filters, these are also non-polarized and may be installed in either direction. Because the various filters have different amounts of loss, each position has a selectable gain jumper to compensate. Models 216, 217 and 219 require the high gain setting. Models 218 and 220 use the low gain setting. Position the jumper plug to connect the correct pins on JG1 and JG2 as shown in Figure 2.

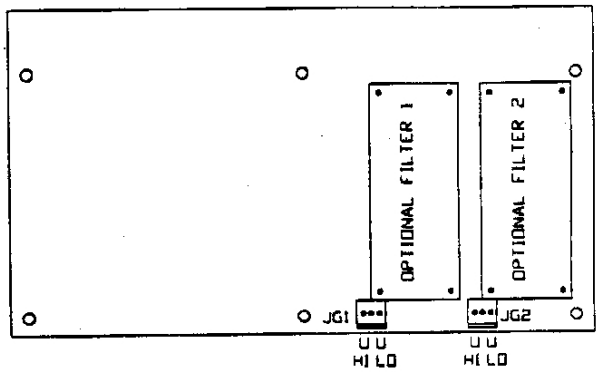


FIGURE 2
9 MHz IF FILTER INSTALLATION

9 MHZ MIXER / IF BOARD (81782)

The 9 MHz Mixer / IF module integrates several transmit and receive functions. On receive this board performs the first narrow filtering for both FM and SSB/CW. Noise blanker sampling and noise gate circuitry are also included. On transmit the automatic level control and all the metering circuitry is included.

Receive signals from the Front End / 1st Mixer enter at connector 25. Two tuneable pi networks match a 2 pole monolithic filter, Y1, into the 50 ohm system. This 15 kHz bandwidth filter protects circuits further down from strong out of band signals. This is especially important to the operation of the noise blanker and FM detector.

The band limited signals are amplified by Q1, which drives buffer stage Q2 and the LC bandpass filter of T2, T3 and C10 - C12. This filter adds the slight amount of group delay needed to get the noise blanker's output pulse ahead of the offending noise pulse. The noise gate T4, T5 and diodes D1 - D4, can then open in time to prevent noise spikes from reaching the narrow filter Y2. This eight pole 2.4 kHz ladder filter is the first stage of SSB/CW selectivity. Two additional filter position can be selected with the front panel N1 and N2 buttons. These optional filters are positioned in series with the standard filter so that the two responses add. Another low noise amplifier stage, Q4, between the two filters preserves the receiver noise figure and can be set to compensate for the loss of several different filters.

On transmit, single sideband generation is accomplished by using the standard 9 MHz filter to strip off one half of the double sideband signal at connector 37. This SSB signal is then amplified by Q7 and Q8. A voltage controlled attenuator, constructed from pin diodes D18 and D19, regulates the level of the transmit carrier at the output connector 27.

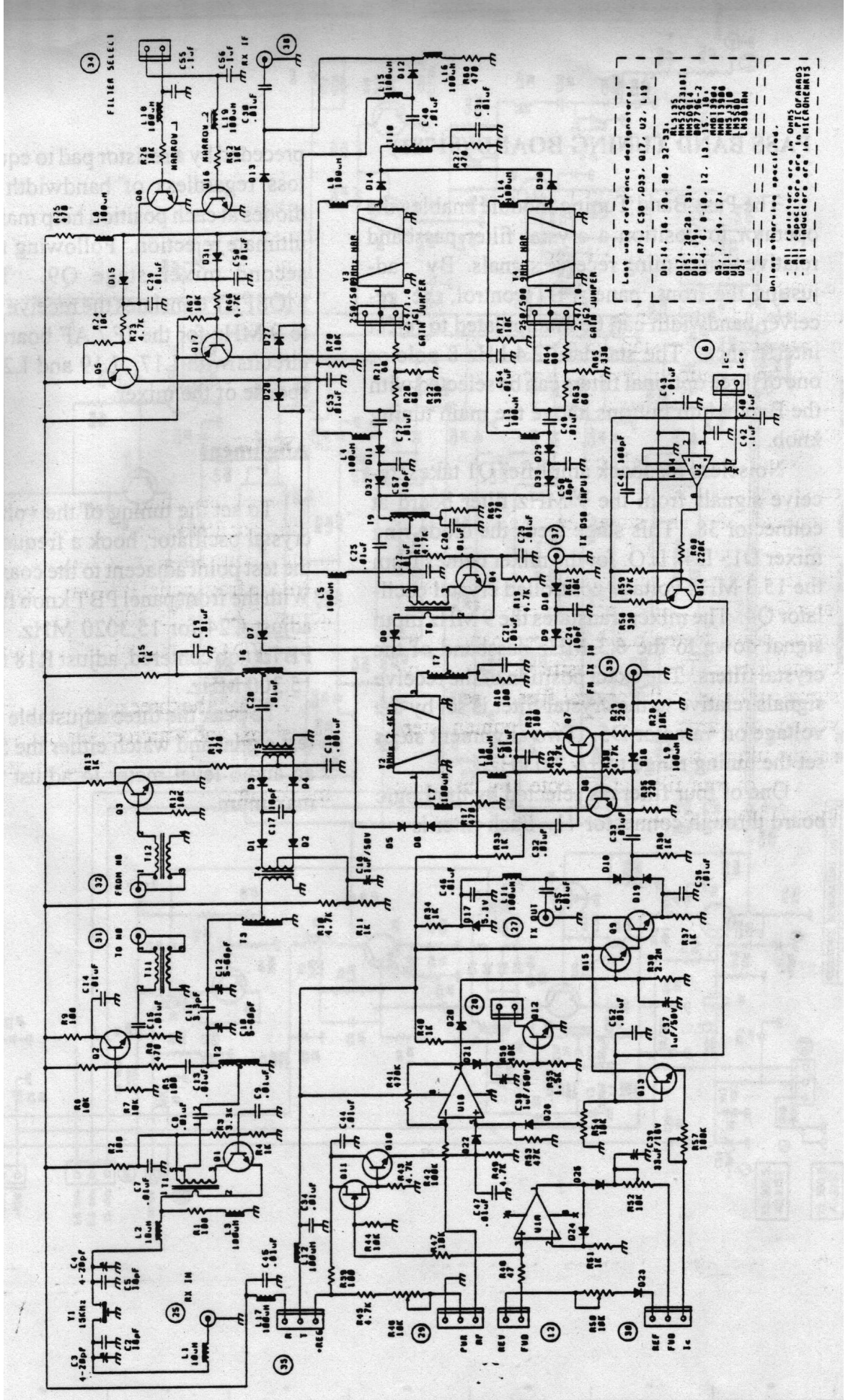
The control voltage for the attenuator is derived from the forward power voltage at connector 12. This arrangement provides negative feedback to hold the peak transmit output power constant under changing amounts of microphone drive. A separate circuit with U2 and Q14 monitors the Final Amplifier current consumption. The transmit carrier is cut back if the current drain exceeds a safe level. This feature gives the amplifier some tolerance to badly matched loads.

Alignment

In the receive path there are four tuned circuits to peak. C3 and C4 optimize the matching of monolithic filter Y1. C10 and C12 resonate the LC bandpass filter. These adjustments should be made using a signal generator and an audio level meter. Tune in the test signal and adjust each trimmer for peak output.

The transmitter alignment requires a 50 ohm dummy load, an accurate rf watt meter and a DC ammeter with 20 to 30 amperes full scale. Hook the ammeter in series with the DC supply to the transceiver. Using the 20M band, key the transceiver through the watt meter and into the dummy load. With the front panel RF PWR knob completely clockwise, adjust R46 for 100 watts. Set the Meter Switch to FWD and adjust R52 for a 100W indication. Set the meter switch to Ic and note the reading on the DC ammeter. Adjust R57 until the panel meter indicates 2 amperes less than the DC current measurement.

To set the current limiting, first turn back the RF PWR knob to about the 12 o'clock position. Now unplug cable #12. Slowly advance the RF PWR control while watching the DC ammeter. Adjust R54 so that the transceiver draws 22 amperes with the RF PWR control turned fully clockwise. Reconnect cable #12 and check that the output power returns to about 100 watts.



9 MHZ FILTER BOARD SCHEMATIC (81782)

PASS BAND TUNING BOARD (81781)

The Pass Band Tuning module enables the operator to position a crystal filter passband relative to incoming receive signals. By adjusting the front panel PBT control, the receiver bandwidth can be manipulated to reject interference. The standard 2.4 kHz 8 pole or one of three optional filters can be selected with the Bandwidth buttons above the main tuning knob.

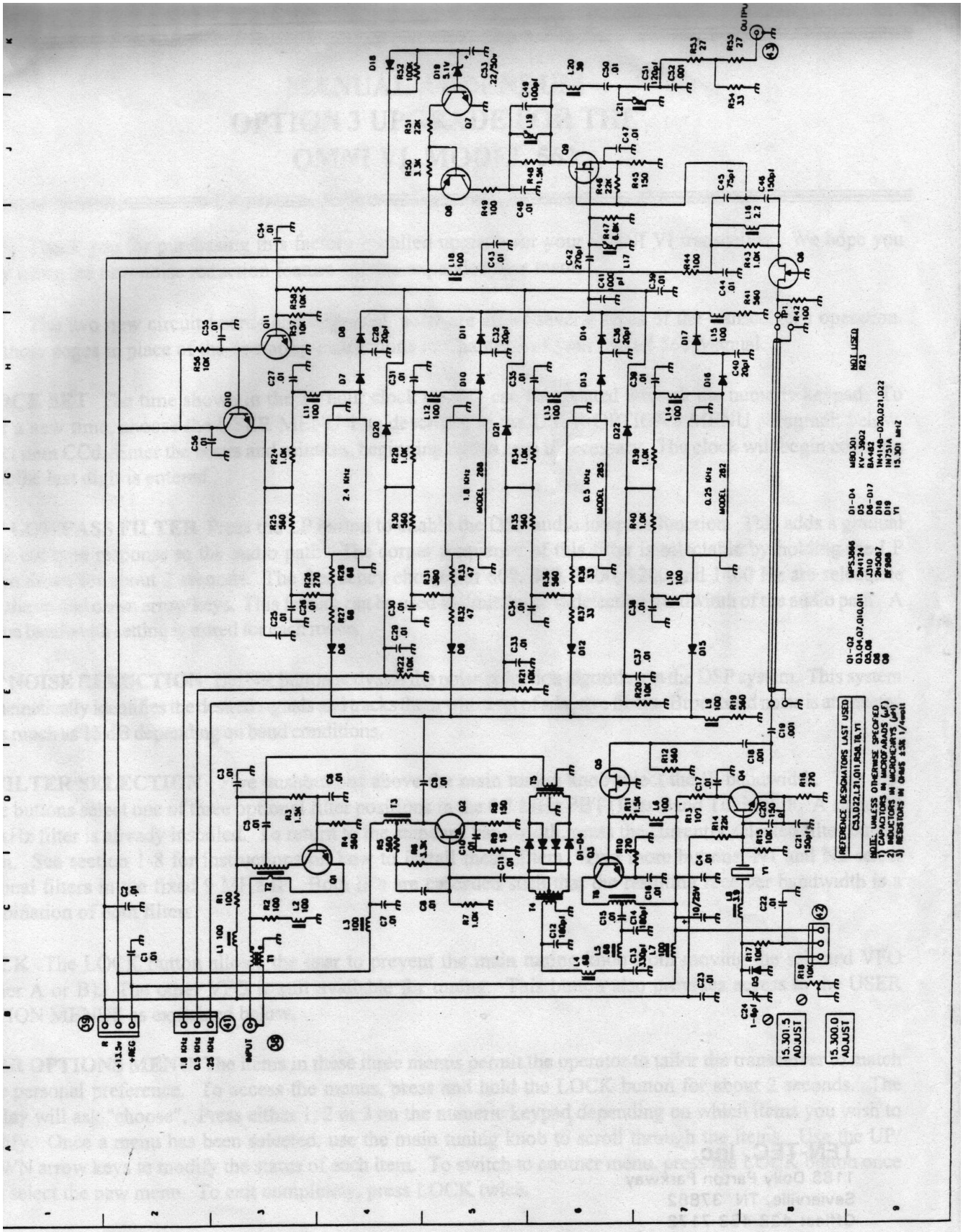
Noiseless feedback amplifier Q1 takes receive signals from the 9 MHz filter board at connector 38. This stage feeds the diode ring mixer D1 - D4. L.O. for the mixer comes from the 15.3 MHz voltage controlled crystal oscillator Q4. The mixer translates the 9 MHz input signal down to the 6.3 MHz passband of the crystal filters. The exact position of the receive signals relative to the crystal filter is set by the voltage on varactor D5. Two alignment steps set the tuning range to +/- 2.0 kHz.

One of four filters is selected by the Logic board through connector 41. Each filter is preceded by a resistor pad to equalize the signal loss regardless of bandwidth and three pin diodes at each position help maintain the 90 dB ultimate rejection. Following the filters is the second mixer stage Q9. The dual gate MOSFET translates the receive signals back up to 9 MHz for the IF / AF board. Three tuned circuits with L17, L19 and L21 peak the response of the mixer.

Alignment

To set the tuning of the voltage controlled crystal oscillator, hook a frequency counter to the test point adjacent to the coax jumper cable. With the front panel PBT knob fully clockwise, adjust C24 for 15.3020 MHz. Now with the PBT knob centered, adjust R18 for a reading of 15.300 MHz.

To peak the three adjustable coils, tune in a test signal and watch either the S-Meter or use an audio level meter to adjust the output for maximum.



PASS BAND TUNING BOARD (81781)