HAMTRONICS® HS-220 KIT TO MODIFY TA901 & R901 FOR HIGH SPEED DATA

GENERAL INFORMATION.

This sheet provides information on modifications to the TA901 Transmitter and the R901 Receiver when used with the MO-96 Packet Radio Networking Modem for 9600 baud networking of TNC's. It is intended to give specific information on parts changes and alignment details peculiar to these versions of the transmitter and receiver, and it should be used along with information in the regular manuals for the transmitter and receiver. General system information, interconnections, etc. are contained in the MO-96 manual along with information on construction and alignment of the MO-96 unit. Refer to TA901-HS and R901-HS diagrams attached for locations of connection points.

PARTS INCLUDED.

If you bought both the transmitter and receiver, this kit will include parts to modify both. If just one, then only the parts for the one are provided.

Transmitter Parts, 1 each:

1 uF electrolytic capacitor
MV2111 varicap diode
47K resistor
socket pin

Receiver Parts, 1 each:

0.15uF polyester capacitor (red)
30 pf NP0 disc capacitor
47K resistor
MV-2101 varactor diode
10.7MA ceramic filter*
SFH455D ceramic filter*

**Note: The crystal filters and ceramic filter normally used in a receiver kit are not supplied when this option is ordered.*

TA-901 TRANSMITTER MODIFICATIONS.

If you are building a kit, please mark the parts list with the following changes before beginning construction and use the attached parts location view in place of the one which comes with the kit. If you ordered a wired unit, these changes have already been made.

a. Remove C12 and C13 from the standard unit, and replace C13 with varicap diode MV2111, orienting with polarity as shown.

b. Solder one lead of a 47K resistor to "hot" hole normally used by C59. Leave the other end free and trim it to about 1/4 inch to allow a wire to be soldered to it as a connection from the MO-96 or other source of data used to modulate the transmitter.

If an oven will be used, then leave that end of the 47K resistor free, and trim it to about 1/4 inch to allow a wire to be soldered to it as a terminal.

c. Change value of C18 to 1 uF. *Observe polarity.*

d. Remove R17 to break the normal audio path to the modulator.

e. If voice audio will not be used, set R15 fully clockwise. If you wish to use voice transmissions occasionally, for testing, etc., connect output from C10 to the optional voice audio input on the MO-96 board. *(See MO-96 instructions for method of providing voice operation.)*

f. Because of the high multiplication factor from the oscillator frequency to 900 MHz, it may be necessary to reduce the deviation adjustment of R1 on the MO-96 unit more than the 50K pot allows. If necessary to adjust the deviation to a low enough setting, change R1 on the MO-96 to a 500K pot. If you don't have a pot to use, the value of R2 can be changed to a higher value instead.

R901 RECEIVER MODIFICATIONS.

If you are building a kit, please mark the parts list with the following changes before beginning construction and use the attached parts location view in place of theone which comes with the kit. If you ordered a wired R901-HS unit, these changes have already been made.

a. Remove or do not install regular i-f filters FL1-FL5 and capacitors C53-C55.

b. In positions for FL1, FL2, and FL3, install pieces of #24 bus wire (lead clippings from some components) between the two end holes *(don't use ground hole)*. Make the jumpers as short as possible to minimize inductance.

c. Install "10.7MA" ceramic filter (small 3 lead device) in position FL4. You may have to use something like a dental pick to enlarge the holes slightly.

d. Install SFH455D (5-lead) ceramic filter in position FL5. This is a special filter having low group delay characteristics.

e. If not already this value, replace C60 with 0.15uF metalized mylar (red) capacitor for quicker squelch action. *(Some R901's already use this value).*

f. Remove R28 in the squelch circuit. The open collector of Q4 which results is wired to the squelch input of the TNC to provide carrier detect lockout. (This also causes the "DCD" led on the TNC to illuminate.)

g. Install MV-2101 varactor diode CR1 in unused holes of board, orienting polarity as shown in component location diagram.

h. Install 47K resistor R1 in unused hole of board as shown in component location diagram. The upper lead should be trimmed to 1/4 inch to be used as a terminal for connection of the "fast AFC" output from the MO-96 unit to the open end of R1. (The hole just below the body of R1 is not used.)

i. Change the value of C1 to 30 pf. This compensates for the added capacitance of varactor diode CR1.

Note that it is necessary to make tradeoffs to use the special filter system for high speed data. Since a wider bandwidth is necessary for high speed data reception, the receiver is more prone to interference. The crystal filter normally adds a considerable amount of selectivity to the receiver, in addition to that provided by the ceramic filter. In this receiver, the normal 100 dB adjacent channel selectivity is reduced to about 50 dB. This is still adequate in most amateur installations; since they usually are located in suburban locations where interference is less of a problem.

ALIGNMENT.

Refer to the manuals for the exciter and receiver and the MO-96 Modem for proper alignment procedures. It is important, if you align the units without connecting to the modem, that proper bias voltage must be applied to the varicap diode circuits in the receiver and exciter or off-frequency operation will result. For simple testing purposes, a +4Vdc bias can be connected until final frequency alignment is required.

