



ALIGNMENT.

Alignment is very simple. Connect the input to a two-meter Exciter or Transmitting Converter, which has previously been tuned into a 50 ohm dummy load. Connect the output to a 50 ohm load of sufficient power rating. Connect vtvm or vom to test point pad on pc board (junction of R8 and C29). Apply moderate drive and B+. Tune the six (four) mica trimmer capacitors alternately for maximum output. Continue increasing drive lightly and repeaking capacitors until maximum output is achieved. At this point, the current drain should not exceed about 10 Amp, and the exciter or Transmitting Converter should be within proper current limit (e.g., no more than 350 mA for XV2). Of course, during normal operation you would not drive the PA to its limit such as this, you would stay in the near region. However, for alignment, you want to tune for absolute maximum output to establish the proper load for the pa transistors for best nearity on ssb.

Notes: Do not retune exciter or Transmitting Converter with PA connected. Once it is tuned into a 50 ohm load, it should never be tuned again. Leaving the input of the PA takes care of matching the pa to the Exciter or Transmitting Converter.

To check the idle bias of the pa, remove drive, and operate the pa with milliammeter in series with the B+ line. The pa should draw in the range of 100-250 mA total idle current. If less than this amount, R6 should be added in parallel with R5 to increase the idle current of the PA stage. exact idle current is not critical.

OPERATION.

Operation is quite simple. B+ can be applied either just during transmit or all the time if desired. Merely apply a signal to the PA when you want to transmit.

It is necessary to avoid overdriving the PA. Moderate overdrive will not damage the unit, but it will cause excessive intermodulation distortion of sub signals. About 1-1/2 - 2 Watts of drive should be sufficient to obtain 5 W. p.e.p. output. Do not drive the PA to the saturation point on ssb. Of course, avoid drive levels in excess of 2 Watts entirely, as PA transistor damage may occur on severe overdrive (over 3 - 4 Watts). (Drive required for full output of the LPA 8-45 is 8 - 10 W.)

A rf output meter detector circuit may be used during normal operation desired as an operating aid. A vtvm or vom, or even a sensitive panel microammeter, may be used to monitor output. An ammeter in the B+ line is handy too as an operating aid. Remember, though, that no meter movement can follow sideband peaks; so don't expect to watch the meter "talk" to full output on ssb. During ssb voice operation, the meter will probably only indicate about 1/5 the level of a full carrier signal because the average power level is much lower, even though the voice peaks are reaching near saturation. Increasing drive to make the meter read "nice" only produces distortion if you drive the PA into flat-topping.

For cw or fm operation, where linear operation is not necessary, the bias to the PA stages can be disconnected and the cold side of L2 and L6 can be grounded. This will change the mode of operation from class B to class C for slightly more efficiency. However, it is not recommended that this be done if you will be changing modes. There is very little difference in operation, and it is not worth the inconvenience of switching. However, it can be done. PA's you see on the market which feature a "linear/class C" switch are set up this way primarily as a sales gimmick.

TROUBLESHOOTING.

Since the unit has only two simple amplifier stages, there isn't much which can go wrong. It is helpful to know that the Q1 and Q2 base voltages should be about +0.5 to +0.7 Vdc and that the regulated voltage at the emitter of Q3 should be about +6 to +8 Vdc. The rest of the circuitry is straightforward, with shorted coax cables or incorrect or shorted pc board component connections being the first things to suspect should there be no output.

Should it be necessary to replace rf power transistor Q1 or Q2, be sure to use an exact replacement. There are other transistors rated at similar output levels, but they are rated for class C carrier operation, may have lower gain, different operating voltage, no emitter ballasting, etc. A proper replacement transistor will cost considerably more than one of the other types mentioned, especially if you consider surplus sources. When a transistor is replaced, carefully peel each lead away from the pc board while melting the solder. Then, remove the mounting hardware and gently push the old transistor out of the heatsink. Clean all the old solder off the pc board. Add new heatsink compound, and install new transistor with collector lead in correct location. Carefully tighten nut on Q1 transistor stud without over-torquing or tighten screws on Q2. Then, flatten leads, and sweat solder them to the board. Remember to resolder any components removed for access to the transistor leads.

A word about relay coils. Any relay coil connected to the same B+ line as solid state equipment should have a reverse diode connected across it to absorb the inductive kick back which occurs when the coil is de-energized. Relay coils and similar inductors can result in transients up to several hundred volts. This is the most common problem related to damaged semiconductors. You should also be sure that your power supply does not have an inductive surge when you turn it on or off. If in doubt, borrow an oscilloscope and watch the B+ line when you turn the switch on and off.

MOUNTING

If desired, the PA can be mounted to a panel with screws in the left and right hand edges of the heatsink as indicated in the component locating diagram. It can be mounted with standoffs to clear the components, or a cutout can be made in the rear panel to clear the pc board and the heatsink can then be mounted flush to the panel. Standard 6-32 or #6 self-threading screws can be threaded into the aluminum heatsink if 1/8 inch pilot holes are drilled, or screws can be used with nuts if you are careful to clear the fins.

However the unit is mounted, the fins should be in free air to allow for good convection cooling and keep the heat away from the oscillator on the Exciter or Transmitting Converter board. Do not mount the PA with the fins inside a cabinet.