

Notes on the Conversion of the WD8DAS Gates BC-1T Transmitter

I converted my BC-1T to use 807 tubes in the audio and RF driver stages instead of sweep tubes as per the Gates retrofit designs and board layouts. I used all new parts on those boards while I was at it.

I made all my initial repairs and confirmed full output into the internal dummy load in the broadcast band (1590 kHz) *before* moving to 160m. Efficiency was better than specified. Modulation was very low, however, and after much troubleshooting I had to replace the modulation transformer with one pulled from a Gates BC-1F (tnx WB9ECK). Then the modulation response and distortion figures were much better than usual for these rigs. That transformer has no tertiary winding for modulating the RF driver, though, which might be an issue at 1 kW, but I run at 375 watts carrier so no problem.

My Gates BC1T was already at the top of the broadcast band, 1590 kHz. For the move to 160m, I first double-checked that the frequency-determining parts for the top of the band, 1600 kHz in those days, were all in place or removed as called for in the manual.
<http://www.wd8das.net/Gates/GatesBC-1Tmanual.pdf>

Crystals for 1885 and 1985 kHz were ordered from Brian, AF4K <http://www.af4k.com/crystals.htm>

For better results on 160m I removed half the turns on adj oscillator/buffer coil L3 and preset it to 160m with a grid-dip meter. Also noticed the IPA plate tuning dip (PA grid peak) was out of range, so I moved the strap on IPA coil L8 to bring it into range.

For VFO input I bent a different tab on the crystal switch to access an existing third switch position, added a BNC jack on the crystal oscillator box, and wired in a 0.01 uF cap as shown on the oscillator drawing <http://www.wd8das.net/Gates/GatesOscSchem.jpg>

Works great with my low-impedance output DDS VFOs. See my web page for more info
<http://www.wd8das.net/DDSVFO/ddsvfo.html>

Amateur-style "Push-to-Talk" action was created simply by disconnecting the latching contacts on K2. The transmit switch is then connected across TB-1 terminals 8 & 9. To get the low and high B+ to both be keyed together, I simply wired the primary of T2 to be in parallel with the primary of T1.

To reduce vibration and noise from the transmitter, I changed the wiring of the fans in the top of the transmitter to be in series across 120VAC instead of 240VAC, and replaced the hummy plate and filament contactors to the following silent type:

SUPCO, Sealed Unit Parts Company, Part# DP252403
Definite Purpose Contactor, Coil Voltage: 208/240 VAC 50/60 HZ.
as sold on eBay by member john102561
http://stores.ebay.com/Frosty-Freeze-A-C-Products-Company_Contactors-Relays_W0QQcolZ2QQdirZ1QQfsubZ8108252QQftidZ2QQtZkm

I also converted the FIL and PLATE switch illuminating lamps to 120vac by putting a diode in series with each. This allows the more-commonly available "christmas light" or "nightlight" lamps to be used.

I sometimes had trouble with tripping my power distribution panel circuit breaker on occasional key-ups of the rig, so I made a step-start for the plate supply as shown at
<http://www.wd8das.net/Gates/step-start.jpg>

Steve WD8DAS