

MD-7

A Cheap, simple plate modulator

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AS the title implies, this modulator is an inexpensive unit requiring a minimum of construction time and chassis butchery. It is just the thing for modulating most Novice or CW carrier controlled phone rigs having anywhere from 50-to 120 watts input. These include the DX 20-60 series transmitters, HT-40, Globe Chief, Navigator, and especially ARC-5 rigs converted for ham use, because these were originally used with this modulator. Using carrier control I found that I could barely get through the first layer of QRM, but now I can push through almost anything. Even more important, the all too familiar report "You're 40db over S-9, but can't you bring up the audio just a little?" isn't heard in my shack any more.

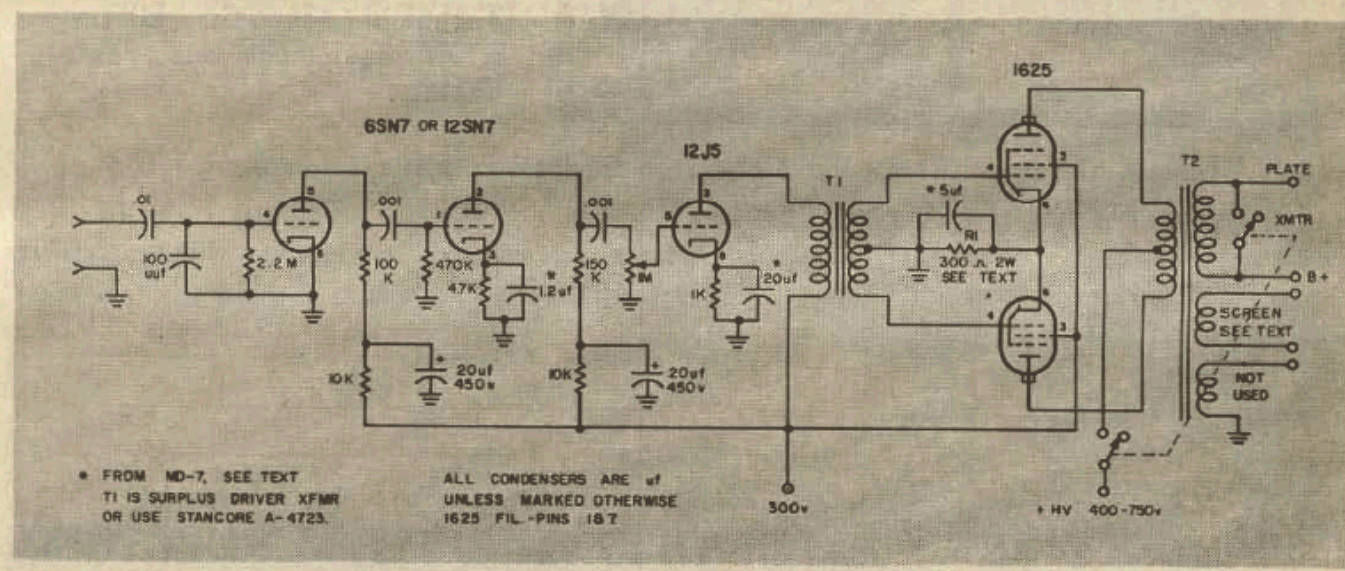
The heart of this modulator is a surplus MD-7, ARC-5 plate modulator which is available locally for about eight or nine dollars, depending on your patience and ability to argue price. One word of caution though, make sure you get an MD-7 and not a BC-456 screen modulator. It is possible to mistake one for the other because of the similarity in their chassis. The MD-7 has two 1625's which are visible when you remove the unit's top plate, the BC-456 has only one. Also, their positions are marked on the unit's cover.

The main part of the conversion consists of adding a speech amplifier to the modulator to make possible the use of a crystal mike or other low output type. A dual triode, a 6SN7, is mounted in the socket originally occupied by the 12J5, while the 12J5 driver tube is placed in the VR-150's socket. This is done to facilitate the parts layout. I had both a 6SN7 and a 6 volt supply available, so I used them. It

would probably be wise to use the 12 volt equivalent of the 6SN7, the 12SN7, and the existing 12 volt supply. Also, you can build the unit on a regular chassis. I didn't for two reasons: the tube sockets and transformer were already mounted, and the chassis looked pretty good as it was.

To begin construction, remove the cover plate and remove the tubes to prevent their breakage, then remove the bottom plate. Unscrew all components from the side of the chassis except for one 1.2 mfd condenser, and the dual 5 mfd and 20 mfd condenser; the tube sockets and the two 620 ohm resistors soldered to the 1625 sockets also remain. Remove all wires connected to the plugs at the rear of the chassis and all others necessary to free the components you just released. Leave the wires connected to the output transformer and also leave the wires connecting pins 3, 5, 6, and 7 of the two 1625 sockets together.

Next, remove the mike and key jacks from the rear panel and replace the mike jack with an Amphonol type 75-PC-1M mike connector or its equivalent. (the connector fits right into the original hole.) Remove both fuseholders and their covers, and fit the driver transformer in two of the holes left by the fuseholder on the left of the chassis. My pot fit in one of the holes left towards the front of the driver transformer, right in the corner, and I mounted the dual 20 mfd can on the right of the chassis. All directions referred to are looking at the underside of the chassis with the 1625 sockets to the rear. Mount the AM-CW switch on the front panel to the left of the square condenser, and mount your output socket in the space previously occupied by the three-prong dynamotor



connector. This connector is easily removed by prying it up with a screwdriver. The actual wiring of the unit is straightforward; follow the usual wiring procedures and run the long lead from the 6- or 12SN7 to the gain control with shielded wire. The wires can be laid out for convenience in lacing if you wish, but this is not necessary.

As a final note I would like to say that the switching arrangement I have shown is most suited for my rig; however, all that is required is that the AM-CW switch shorts out the secondary of the modulation transformer during C.W. operation and that there is provision for removing the high voltage from the plates of the tubes at the same time.

There are two outputs available on the transformer; one is roughly 6000 ohms and is a close enough match for most tubes operating in the vicinity of 600 volts at 150 mils such as the 807, 6146, 1625, and 6DQ5. This is only a partial list. The reason that you can match quite a few tubes is that the 1625's are running at about half their rated output and as such are very non-critical as to loading. The second output is a screen winding and this can also be used for most tubes with no ill effects. I used this winding when modulating my HT-40 because it has the screen tied to its own supply, and I came up with excellent results.

This ends the list of gory details associated with building the modulator; so, if you have dispensed with the proverbial smoke test, connect the rig, modulator and power supply and let everything warm up. Tune the rig in the CW position into a dummy load and turn the modulator on, making sure that the unit is in the AM position and that the transformer is not shorted out. When you talk into the mike, the lamp's brilliance should vary with your voice intensity. Adjust the gain control until it just brightens on voice peaks. The best way to properly adjust the unit is with a scope, but since most of us don't have one, here is an alternate method. Have someone with a crystal filter in his receiver listen to your signal as you bring the gain up. When you just begin spluttering, reduce the gain a trifle and you're in business.

In general, you should have no trouble building the unit or getting it into operation, and you will find that the modulator has plenty of reserve punch, even when delivering a full 60 watts of audio. Also it will make an excellent driver for any high level modulator, so the unit really will be a good, long term investment.

... WA2PGX



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