

# Crumar Multiman (-S) -1975 (1977) Weight = 42

Lbs. Number manufactured = ? MSR = £649

User Manual:

Reset Procedures: N/A

Operating System code: N/A

MIDI or other control protocol: N/A

Software related Links: N/A

Patches or knob settings:

Circuit Overview: [below](#)

Scematics/Service Manual: [old gear link](#), [Multiman-S pdf](#) or [DB serv man.](#)

Common Service Issues/Tips: [below](#)

Parts Sources: [Keys](#) [knobs](#) [semiconductors](#) [misc](#)

Uncommon chips/modules used:TCA350Y BBD, MK50240 TOS, DIVIDERS:

\*orig. Multiman- SAJ110 \*MM-S - HBF4727 Orchestrator - SAA1004N (These are all equiv. it appears along with TMS3614, ECG2040, SAJ210, MC1302)

Modifications:[Bees in keys!](#) Don't you wish yours had this mod!!

General Info Links: [Nostalgia](#)

Circuit Overview:

Another divide down oscillators synth and the first one to have layering of totally different types of preset standard sounds and a preset split point. Each half of the keyboard has independent volumes for Brass, Piano, Cello and Violin voicings. There is a switch for Piano and Clavichord elements therein, and for some reason Cello and Violin also so that you don't have to..use..the slider both at once I guess in performance. Then the Brass can be independently cancelled on right and left via the big rocker switches as well. AD envelope, Emph. and Contour sliders for brass. And there is a bass pedal board that also can trigger bass sounds into the mix with a switch/volume again. And length/speed/depth for LFO.

There are two cards on the lower left with TCA350Y BBD's and the dividers are on board to right in sockets. TOS is far right on same board. Each key has

a plug in board with 2 transistors and misc caps and resistors and diodes. Back board is all discrete so the Brass filter appears to be transistor based on this unit.

The diagrams I have are for the -S model which has more stuff like a string timbre control and independent volumes for piano and clavichord. The Orchestrator also does this but may also have more control through footpedals from description on this [demo record](#) from keyboardmuseum.org! (And also has three instead of two BBD boards for a richer string effect) Totally different boards except for the BBD boards it appears. But similar designs of course. Another difference is that there are three spring switches on the original multiman and two I guess from the diagram on the "S" model and Orchestrator.

The original Multiman has signals from the dividers coming to the appropriate keyer cards (P213's) and jumpering down to the next octaves upper footage so that each card has two footages. The keyer cards are triggered by the gate signal on blue wires on the other side of the keyer card's mother board (P216) and the white wire next to it on each one is the output signal which goes to the summing bus switch wire. (The bottom most switch.) The middle switch charge dumps a .022 400V white capacitor onto the upper or lower brass envelope trigger buss and on release returns to the charging buss. The upper wire creates a decay envelope for piano and bass apparently through a RC series network. These parts are all on the board that holds the spring contacts.

The AR circuit is different than the "S" model and I may finish drawing it out and post it if I can't get diagrams. The moog type ladder filter is present on the left side of the back board. The two trigger lines come in at the far left by the volume pots and the trigger circuitry is to the right of the vcf.

Let me just dissect the "S" model in detail while I have the diagrams here because it is a bit confusing. Nothing is labelled and it's all transistor circuitry except the tone generation of course and BBD's. The 10 divider chips send all the appropriate signals to the keyer cards as above. But then a 2 switch key contact setup controls the flow of signals through the slightly more complex keyer cards who PB buss triggers the brass filter which is on DWG 4. DWG 2 has the TOS and dividers. DWG 3 the keyboard switching and keyer cards.

These are beautiful sounding synths to me. The volume matrix of simplicity with some good analog sounds at the base...it's nice to have a synth like this around. I'm already hearing a lot of possibilities for creating things that can be done. I don't know how many of these were made but again I'm seeing low serial number on mine. A124. Let me know if you have a number higher than a

few hundred. I think this is yet another case of Crumar releasing a small number of the initial model then doing some enhancements and coming out with something improved (EG. DS-1/DS-2, Composer/bye bye all analog :-)

### Service Tips:

(PREFACE: BEWARE THE INTERCONNECTS. In Orchestrator recently I was quite puzzled as to why I was getting a missing footage on two lower octaves. In trying to track down a crack in the keyer motherboard, I'd gotten one of the pins bent into another pin and wow it was hard to figure out since you don't immediately think of that being able to happen on an interconnect after doing some other things. lol) The one I received was in horrible condition. These must be a really psychedelic instrument...because this one holds the record for cigarette burns in the keys. Whoever was playing it..the thing so entranced them that they obviously did it over...and over....and never learned their lesson! 7 keys with significant burn damage including C prime! I ground the burns out and filled with a white epoxe that did a decent enough job on that repair. Water damage on the particle board sides. I made new plywood ones for it and cut the plastic surround in just like stock. Except now nice wood on sides which I won't cover with the black vinyl! The bottom was still strong enough..the cover needed some work but got the mud dauber's nests out of it and repaired some of that damage and cleaned off the tape that had hardened all over the front.

Also I found the nest shown in the 'mod' above when I was gluing down key tops. The glue was falling apart and over half of them fell off with little force pulling up! I used goop automotive adhesive to hold them down and if they have to be pulled up they can be..but they won't come up unless someone really wants them to now :-).

Some breaks in the key spring loom restraining track dropping lower notes out. Melted that rod back together in good form by just heating the interfaces w/soldering iron simultaneously then jamming the pieces together and melting around the outside carefully.

Also there were some frayed key springs, .050" diameter. I used .060" to replace a few and they worked great after reaming the holes in the guides a bit. The circuit board is good to 1/16" it appears though so no need to drill it.

Aside from a couple broken connections that were easy to see, other problems included an SAJ110 jammed into the socket with a bent pin killing the "D"'s. Got that back and found there was a missing footage because someone

had jammed one of the keyer cards down wrong also and bent pins together so that they shorted and to fix the problem they cut one of the footage wires! hehe. When I initially connected the wire as it fit in the pattern all the A's died. But examining things found the bent pins and all was well..except...

Remaining was the problem that all G's above center and one B don't trigger the brass filter. With diagrams from the multiman-S I was totally confused because all was different so I drew out [that part of the schematic](#) And here is a board diagram I got somewhere that escapes me now. [Drawing of old Brass board](#) Here we see the charge dumping trigger described above and yes those hi reliability looking 400V .022uf capacitors were the culprit! Legs fell off when I tried to remove them. Happy synth now! A QUICK NOTE re: SAJ110's. From what I've seen these HAVE to be the flakiest of all dividers. If you want to tour I'd swap out all SAJ110's for SAA1004 probably. I just went through it with a solina and wow. I scrapped so many and none of them would work right in a couple locations. Just amazing. I subbed in SAA1004 and they worked great.

Parts:

Lots of discrete parts. I have the TOS chip but dividers use Vintageplanet.nl . I'd like to find a source for the odd slider caps. I just have a few for my own repairs now BUT HERE IS WHAT I've done on SOME MACHINES SUCCESSFULLY!

- 1) Get the mouser electronics 'eagle' brand slider caps that are fairly large..I think the number 450-0155 on those if I'm not mistaken.
- 2) Get a soldering tip that will go inside the 'slot' on those without moving too much plastic
- 3) heat them to where all the plastic in that area is pliable without getting the outside too hot :-) OTHERWISE it'll bulge and look ugly
- 4) Slam (ie. get it on there quickly. hehe..Don't do it so hard you break the thing obviously) it onto the pot shaft and it'll form into a perfect pop on knob if you get it right! I've done this many times. It really really works.

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