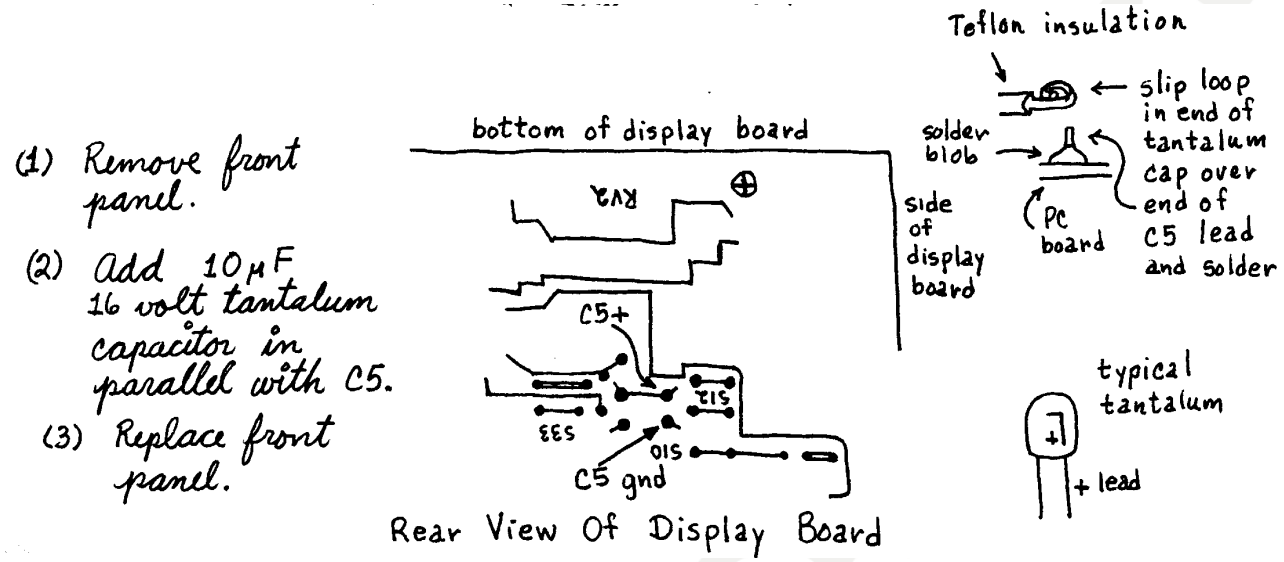
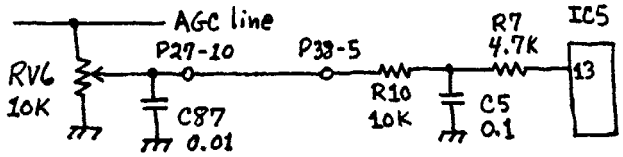
NRD-525 S-meter Damping

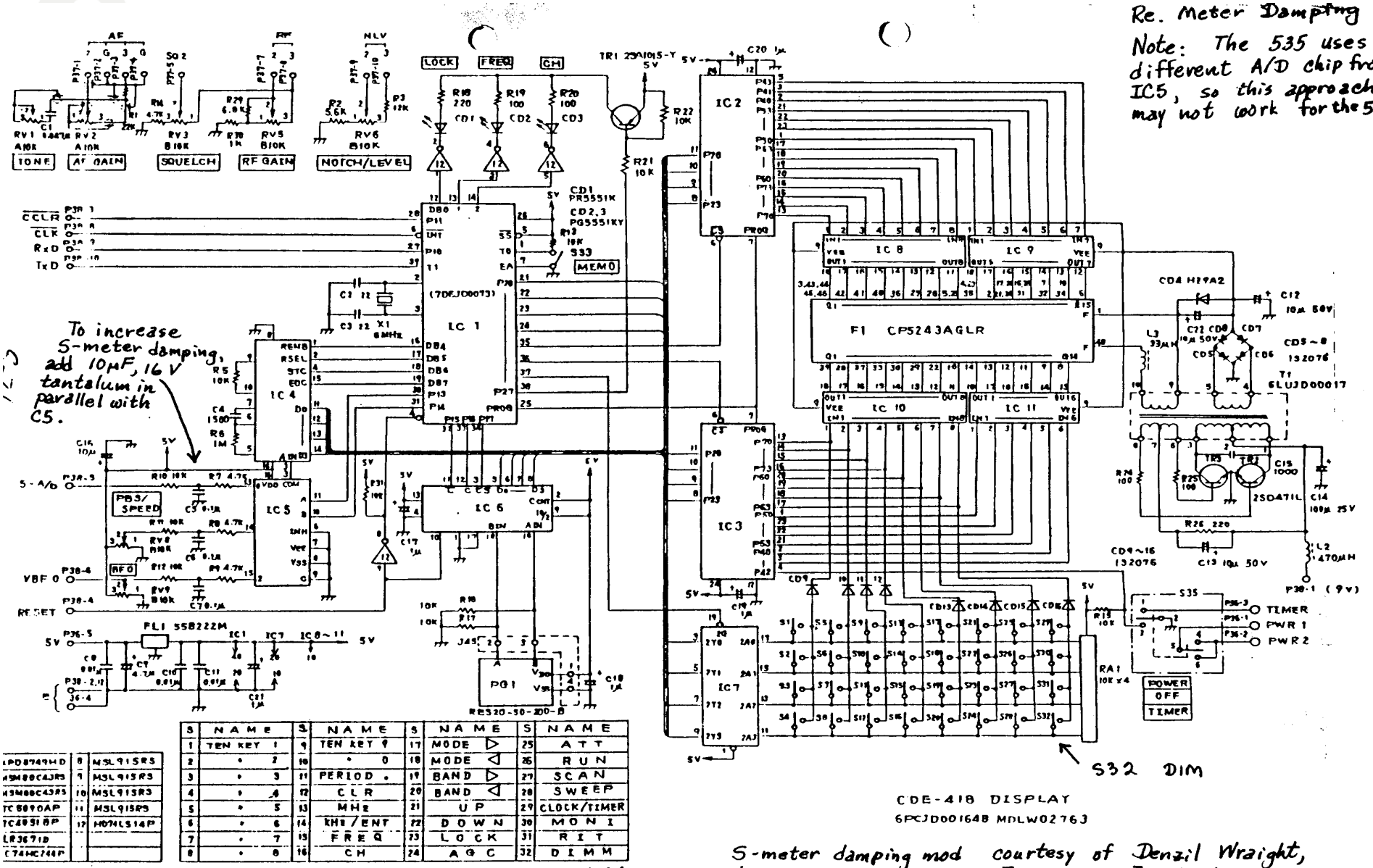
Dallas Lankford, 28 I 93



In his article "More on modifications for the NRD-525", Denzil Wraight remarked that the S-meter jumps about even on steady signals from a signal generator, and that this nervous activity can be tamed with extra capacitance across C5 on the display board. He used a 1uF tantalum capacitor. The S-meter behavior is determined by the voltage at the wiper of RV6 on the IF amp. PC board (RV6 is a 10K pot from the AGC line to ground), and by R10 (10K), C5 (0.1uF), and R7 (4.7K) ont he display PC board, plus IC5 internal components via pin 13. It appears that the S-meter time constant is determined mainly by R10 and C5, in which case the time constant about 1mS, as found from the time constant formula T = RC (when R is in ohms and C is in farads, T is in seconds).



Increasing the capacitance at C5 to 1uF increases the time constant to 10mS. It seemed to me that a meter time constant of even 100mS would not be unreasonable, so I decided to try 10uF in parallel with C5. The AGC line voltage varies from about 5VDC at no signal to about 1.9VDC for 100K uV at the antenna input, so the voltage at the junction of R10, C5 and R7 should not exceed 5VDC. Thus a 10uF 16V tantalum cpacitor conveniently available at my local Radio Shack was tried. Tantalum caps are polarized, so observe lead polarity and attach the tantalum to the C5 lead ends as shown on the PC board sketch above. If the lead ends of C5 do not stick straight up, unsolder them (remove solder with desoldering braid) and while applying heat with the soldering iron tip use a dental probe (or similar) to bend the lead ends straight up. Attach the tantalum cap as shown by the details above. Even with 10uF across C5, my 525 S-meter is still a little nervous.



S	NAME	S	NAME	S	NAME	S	NAME	S	NAME	S	NAME
1	TEN KEY 1	9	TEN KEY 9	17	MODE ▷	25	ATT
2	" 2	10	" 0	18	MODE ◁	26	RUN
3	" 3	11	PERIOD .	19	BAND ▷	27	SCAN
4	" 4	12	CLR	20	BAND ◁	28	SWEEP
5	" 5	13	MHz	21	UP	29	CLOCK/TIMER
6	" 6	14	kHz / ENT	22	DOWN	30	MONI
7	" 7	15	FREQ	23	LOCK	31	RIT
8	" 8	16	CH	24	AGC	32	DIMM

µPD8749HD	8	MSL915RS
M5M80C43P3	9	MSL915RS
M3M80C43P3	10	MSL915RS
TC8090AP	11	MSL915RS
TC40510P	12	M74LS14P
LR36710		
C74HC244P		

CDE-418 DISPLAY
6PCJD001648 MDLW02763

Note: Additional meter damping should be available by adding capacitance in parallel with C87 in the IF board, but this may slow the AGC time constants.

S-meter damping mod courtesy of Denzil Wraight, who suggested 1µF. I used 10µF, which seemed to give more damping without any bad side effects. DL
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