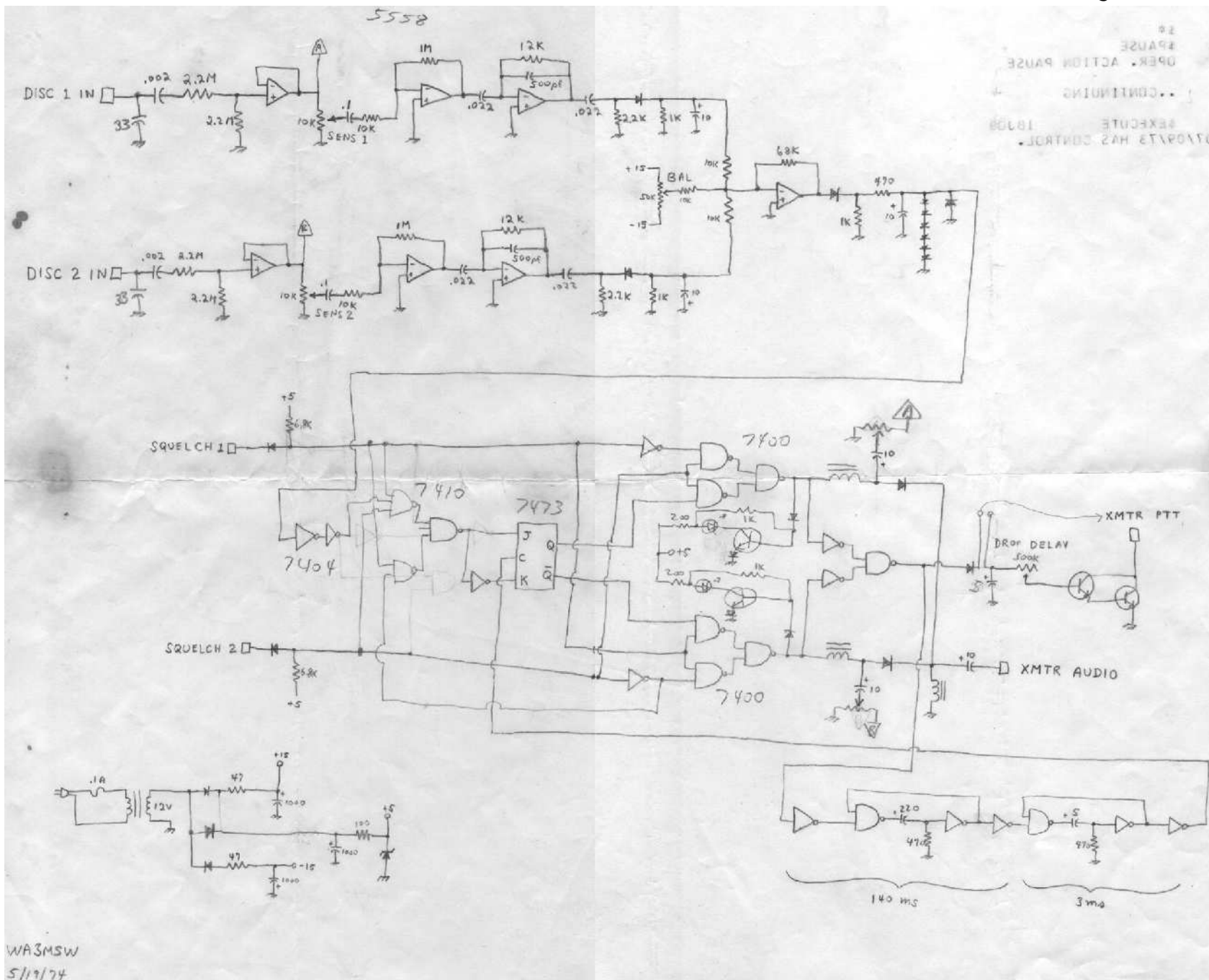


Voter Schematic

n3ic.ICEngineering.com



Undated, probably from 1979-1980?

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Ed,

Voting systems are perhaps the most difficult items to procure in a large repeater system. I will briefly tell you what I know.

There are three types of voters. The first type measures limiter current at each receive site, and encodes the signal strength into discrete levels onto the link path via subaudible tones. At the central site, the voter just decodes the readings from each site and chooses the one with the largest signal. This requires encoding equipment at each site. Additionally, if the link itself becomes weak, the voter will not know it and end up choosing the wrong receiver.

The second type samples audio from the discriminator, goes through a high pass filter, and assumes any high frequency energy is noise. The decision is then made so that the receiver with the lowest noise is chosen. This scheme becomes tricky when all remote receivers are not linked identically. For instance, if you wish one remote receiver and one local receiver, the characteristics of the link receiver and the local receiver will be quite different. However, it is possible, through tedious adjustment, to have this high pass technique operate properly.

The third method uses valley detectors. This is the General Electric scheme. The audio from each receiver is fed into a logarithmic amplifier and then a valley detector with a time constant on the order of one second. The assumption here, is that the lowest level the audio will approach will be the noise level, and this will occur between syllables of speech. Each of the valley detectors are weighed and the receiver with the lowest valley is selected. I highly recommend this method.

For extensive information on the GE system, order Maintenance Manual LBI-4292B from GE in Lynchburg, VA. If you can locate one of these voters, you will have it made. They are scarce on the ham market, as they are in current production and go for about \$3000 new. However, the manual will be useful in understanding how to build one of a similar principle.

I built a two channel voter of the high pass type about five years ago, which did work, though not as good as the GE voter. I am a bit ashamed of the circuit, and never went back and cleaned it up. If you would like, I could send you a copy of it, but I would suggest that a voter of the third type would be a better choice.

For simple systems, with only two receivers, a very crude method can be used. If one receiver is good, and the second low coverage for a specific fill-in area, the poorer one can be given priority if the squelch is set tight. This way, if a signal is received in the bad receiver, it is good copy, and it will be

selected. Otherwise, the normal repeater receiver will be utilized. Others have used an even cruder method, known as the "relay race". The voting is set up so that whichever receiver activates first, is selected for the duration of the transmission.

As you can see, there are a lot of considerations for voters. Do not be discouraged, as the cruder methods will increase repeater coverage with very little voting circuitry. Once the satellite receivers are in operation, you can always take the time and build a better voter.