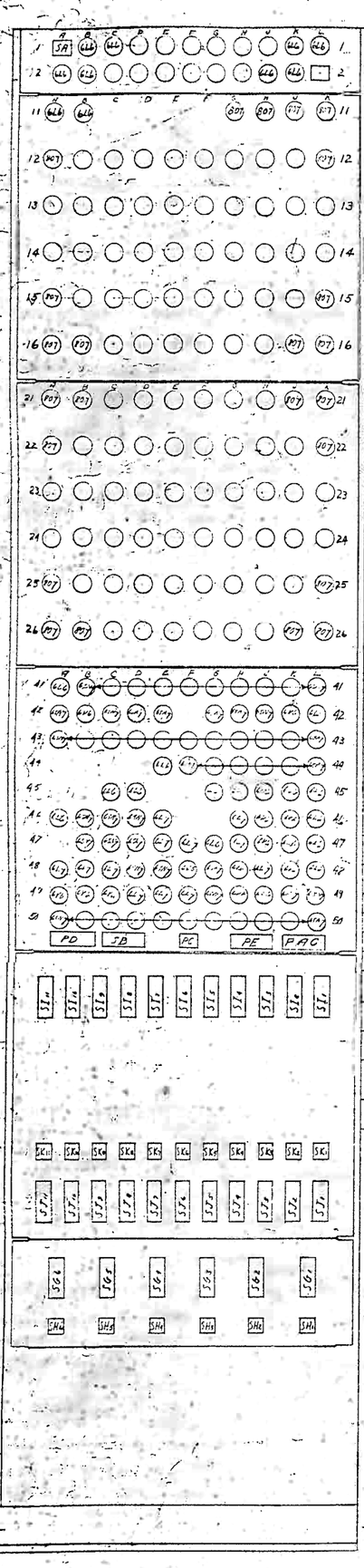
General Programming Instructions:

Set repeat switch at 1 on program 1 unless otherwise noted. Set program switch to -2 unless otherwise noted. Plug program output #1 to unused transceiver on any convenient accumulator and plug output of this transceiver to input of function table program #1 to form continuous cycle. Introduce initiating pulse to start cycle.

PANEL #1




| Tubes | Terminal | Dwell | Amplitude | Rise | Duration | Fall | Notes |
|---|---|---|---|---|---|---|---|
| G42, K42 | 5<br>3<br>6 | 1<br>1<br>1,2 | +20<br>-30<br>+50 | ---<br>---<br>1-19 | ---<br>---<br>--- | ---<br>---<br>2-19 | Number of pulses depends on argument; units digit appears at K42, tens digit at N42. |
| K46 | 3<br>5 | 1,2<br>1,2 | -40<br>+40 | 1-19<br>1-19 | ---<br>--- | 2-19<br>2-19 | |
| J46 | 3<br>5<br>Cap | 0-20<br>0-20<br>1,5 | +35<br>+45<br>-20 | ---<br>---<br>1-100 | ---<br>---<br>--- | ---<br>---<br>5-100 | CPP<br>CPP from cyc unit |
| N46,N47 | 5<br>5<br>Cap | 0-20<br>0-20<br>0,5 | -60<br>+45<br>+45 | ---<br>---<br>0-100 | ---<br>---<br>--- | ---<br>---<br>5-100 | CPP - Signals on pins 3 and cap appear only if clear switch<br>CPP - set to C(N47) or NC(N46) |
| E46, E47 | 5<br>4 | 0-20<br>0-20 | +125<br>+40 | --- | --- | --- | CPP Clear sw. at C - signals on E47<br>CPP Clear sw. at NC- signals on E46 |
| D-D-F49 | 3 | 0-20<br>1-20,2-4-20 | -40 | --- | --- | --- | CPP Pin 3 measurement on one tube only |
| | 5<br>Cap | 0-20<br>0, 5 | +25<br>+40 | ---<br>0-100 | ---<br>--- | ---<br>5-100 | CPP from cycling unit<br>Clear switch set to NC(F49), C(E49) or C(D49) |
| G42 | 1<br>2<br>4 | 2-4<br>2-4<br>2-4 | +25<br>-50<br>-50 | ---<br>---<br>--- | ---<br>---<br>--- | ---<br>---<br>--- | Pulses observed is the I pulse. Set program switch to -1 (either add or subtract); put argument of 9 into units ring. |
| L42 | 5<br>6 | 2-4<br>1-13,2-5 | +20<br>+40 | ---<br>5-60 | ---<br>--- | ---<br>5-100 | Note on G42 applies |
| G45 | 3<br>5<br>6 | 3-20<br>3-20<br>3,4 | -40<br>+25<br>+30 | ---<br>---<br>3-100 | ---<br>---<br>--- | ---<br>---<br>4-100 | CPP<br>CPP from cycling unit |
| E46, E47 | 3<br>5<br>Cap | 3-20<br>3-20<br>0,5 | -40<br>+30<br>+35 | ---<br>---<br>0-100 | ---<br>---<br>--- | ---<br>---<br>5-100 | CPP Pin 3 and cap - set program switch to add for E47;<br>CPP subtract for E46 |
| E46 | 4,4 | 0,5 | +25 | 0-100 | --- | 5-100 | Program switch to add for pin 4, subtract for pin 1 |
| C45,D45 | 5<br>5 | 4,5<br>4,5 | +25<br>+40 | 4-20<br>4-20 | ---<br>--- | 5-20<br>5-20 | Program switch to add for C45, subtract for D45 |
| F47 | 3<br>5<br>Cap | 2-13<br>2-13<br>2,3 | -20<br>+25<br>+40 | ---<br>---<br>2-65 | ---<br>---<br>--- | ---<br>---<br>3-65 | LP pulse<br>'1' pulse from cycling unit |
| A46 | 3<br>5 | 2-13,5<br>2-13,5 | -40<br>+40 | 5-40<br>5-40 | ---<br>--- | 8-40<br>5-40 | |
| J26 | 3<br>Cap | 1-4,2-4<br>1-4,2-4 | -40<br>+225 | 5-40<br>5-40 | ---<br>--- | 8-40<br>5-40 | 1 pulse in units ring |
| M26 | | 1-6,2-4 | +225 | 5-40 | --- | 8-40 | 2 pulse in units ring — Program switch set to -1, either add or subtract |
| O26 | - | 1-6,2-4 | +225 | 5-40 | --- | 8-40 | 3 pulse in units ring |
| P to R26 | - | 1-10,2-4 | +225 | 5-40 | --- | 8-40 | 4,5,6,7,8,9 respectively |
| S26 | 3<br>Cap | 2-4,5-20<br>2-4,5-20 | +40<br>-225 | ---<br>--- | ---<br>--- | ---<br>--- | 0 in units ring |
| A to K2, A11 | 3<br>5 | 2-13,5<br>1-13,5 | +110<br>-40 | 5-40<br>5-60 | ---<br>--- | 8-40<br>5-100 | Set program switch to -2, add or subtract<br>Argument 01,10,20 .....90,99 for tubes K to A2, A11 resp. |
| S to M11, A to M12 to 15, 21 to 25 | Cap | 2-13,5 | -500 | 5-40 | --- | 8-40 | For tubes K to A12 to 16, 21 to 25; set program switch to -2 add or subtract, and use arguments 00 to 99 resp. For tubes K to O11, use argument 90, and set program switch to -1,0,+1, +2 respectively, add or subtract. |
| O29 | 3<br>5 | 0-20<br>0-20 | +<br>-40 | ---<br>--- | ---<br>--- | ---<br>--- | CPPs each addition time- 3 and 5 may be revised on O29. |
| J29 | 3<br>5 | 0-20<br>0-20 | -60<br>+40 | | | | |
| G42,K42 | 3<br>5 | 0-20<br>0-20 | +<br>-30 | ---<br>--- | ---<br>--- | ---<br>--- | Number of pulses depends on argument; A41 and G42 pulse units ring, K42 and L42 tens ring |
| A41, L40 | 3<br>5 | 0-20<br>0-20 | -60<br>+40 | ---<br>--- | ---<br>--- | ---<br>--- | |
| N44 | 3<br>5 | 4,5<br>4,5 | -30<br>+35 | 4-100<br>4-100 | ---<br>--- | 5-100<br>5-100 | |
| L44 | 3 | 4-20 | -60 | --- | --- | --- | CPP |
| L44, O44 | 5 | 4-20 | +25 | --- | --- | --- | CPP from cycling unit |
| O44 | 3 | 4-20 | -40 | --- | --- | --- | CPP |
| L49, O49 | 3 | 4-20 | +50 | --- | --- | --- | Clear signal |
| L44 | 3 | 2 | -20 | --- | --- | --- | 0,1,2,-1,-2 pulses for program switch setting of -2, -1, 0, +1, +2 resp. either add or subtract |
| P to L44 | 5 | 2 | +25 | --- | --- | --- | Pulses from cycling unit as follows: 1 on L44, L45; 2 on L44, K44; 2+ on K44, M44 |
| H to L45 | 3<br>5 | 0,5<br>0,5 | +90<br>-25 | 0-120<br>0-120 | ---<br>--- | 5-100<br>5-100 | Program switch at +2, +1, 0, -1 (add or subtract) for tubes H,J,K,L45 resp. |
| O42 | 3<br>5<br>6 | 2<br>2<br>2,3 | -35<br>+25<br>+50 | ---<br>---<br>3-20 | ---<br>---<br>--- | ---<br>---<br>3-20 | Note on L44 applies |
| O47 | 3<br>5 | 0,3<br>0,3 | +40<br>+40 | 2-20<br>2-20 | ---<br>--- | 3-20<br>3-20 | |

To check operation of rings, use following procedure: Rheostat - use adapter to connect variable supply to PAC 16(+) and PAC 16(-). Remove tubes D-E-F49 and connect oscillator to pin 3 on one of these sockets through blocking condenser. Observe static output at G45 pin 6. Ring should count at frequencies as high as kcs., and at 5 kc should count at voltages from to .

Normal operation should also be checked (all tubes in place and normal voltages used without external oscillator) by setting repeat switch at each of its 3 positions, otherwise programming is shown under "General Programming Instructions." Ring should count as ring of 5 with repeat switch at 1, and mode of operating should change as switch is rotated, ring counting up to 13 with switch on 5.

To test argument ring, use adapter to connect variable supply to PAC 12 (+) and PAC 7 (-). Pull out tube L45; this will leave input gates open. Feed oscillator into SB21 (front panel) for units ring and SB 2 for tens ring; SB212 may be used as ground for other side of oscillator output. Observe static output of units ring at K2, pin 3, and tens ring at A11 pin 5. Rings should operate at frequencies up to kcs. and at voltages from to . Carry-over should also be checked at frequencies up to kcs. by feeding oscillator output into units ring and observing static output of tens ring.

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