

# TMC SPECIFICATION

NO. S 1021

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APPD: *SECRET*

SHEET 1

OF 8

TITLE:

Typed by mtp 10/4/65

TEST PROCEDURE  
for  
RTRS-2 & RTPF-1

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## A. EQUIPMENT REQUIRED

1. VOM - Simpson Model 260 or equivalent.
2. Oscilloscope - Tektronix Model 515 or equivalent.
3. Electronic Counter - Hewlett-Packard or equivalent.
4. Reader, Punch, RTKY-1 or equivalent.
5. RTPF-1 to RTRS-2 Inter-connect Cable.
6. RTPF-1 to RTKY-1 Inter-connect Cable.

## B. PRELIMINARY

1. This test procedure is designed to check the response of the programmer (RTPF-1) to five types of inputs as indicated by selector switch S1004.
2. Since the RTRS-2 and RTPF-1 are inter-related in their functions, this test procedure covers both units.

## C. POWER SUPPLY

Check the RTPF-1 power supply NO LOAD voltages as indicated by CK882. J1007 should have 115V 60 cps on Pins 1 and 20. Pin 25 should have -24 VDC, Pin 3 should have -18 VDC, Pin 4 should have -18 VDC delayed, and Pin 2 should have +6 VDC.

## D. RTRS-2

1. Connect RTRS-2 to the RTPF-1.
2. Without any PC cards in bin, turn on the A-C POWER switch.
3. Depress Button "A" on the RTRS-2. Observe that relay K1001 in RTPF-1 latches Button "A" on the RTRS-2 lights.
4. Depress Button "1" on the RTRS-2. Button "A" should release, but the lamp should remain lit along with Button "1".

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## D. RTRS-2 - Cont'd

5. The same procedure as outlined in Steps 3 and 4 for Buttons A and 1 should be followed for Buttons B and 2, C and 3, D and 4.
6. When the TUNE button on the RTPF-1 is depressed, A and 1, B and 2, C and 3, D and 4 lights should go out and relay K1001 de-energize.
7. Observe on the RTRS-2 that either PUNCH or NO PUNCH button is lit.
8. Depress the button which is not lit, and observe that the lighted button is extinguished, and the button depressed is lit.
9. Turn the RTPF-1 A-C POWER switch OFF.

## E. MANUAL PROGRAM INPUT

1. Depress the TUNE button on the RTPF-1 to be sure that no buttons are depressed on switch S1003.

### 2. PC 119/A3686:

- a. Insert extender card PC 129/A3696 into Z1001, and insert PC 119. (Be sure to observe numerical sequences on extender card and Z1001 connector. All PC cards are even numbers on PC side of board, and odd numbers on component side of board.)
- b. Turn programmer (RTPF-1) power switch ON, then touch the oscilloscope probe to Pins 6, 10, 42, 40 and 38 and observe a +12 volt indication.
- c. Depress Buttons A and 1; then connect scope to J1001-6. Upon depressing the 1 KC button in FUNCTION row, observe the +12 volt indication change to -12 volts.
- d. Release the 1 KC button in FUNCTION row. Connect scope to J1001-10. Depress the AFC button observing the same voltage indication change as in Step c.
- e. Follow the procedure outlined in Step c for J1001-42, J1001-40 and J1001-38.
- f. Release the button depressed. Connect scope to Pins 18, 12, 9 and 3, each time depressing and releasing the 1 KC button in the FUNCTION row, and observing a zero indication change to -12 volts. To check output at Pin 16, depress AFC button.
- g. Release button depressed. Connect scope to Pin 36. Upon depressing any button on RTPF-1, observe indication change to -12 volts.

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## E. MANUAL PROGRAM INPUT - Cont'd

### 2. PC 119/A3686:

h. Release buttons depressed. Connect scope to Pin 28. Upon depressing the TUNE button, observe the -12 volts indication change to zero, then return to -12 volts when released.

i. Turn programmer (RTPF-1) power switch to OFF. Remove extender card PC 129, and insert PC 119 into Z1001.

### 3. PC 127/A3694:

a. Insert extender card PC 129 into Z1003, and insert PC 127 into extender card.

b. Connect scope to Pin 4. Observe a +12 volts pulse .6ms long when switching power ON and OFF. Repeat the procedure for Pin 6.

c. Turn power switch OFF. Remove extender card PC 129, and insert PC 127 into Z1003.

### 4. PC 161/A3803:

a. Insert extender card PC 129 into Z1000 and insert PC 200 into extender card.

b. Insert another extender card PC 129 into Z1005, and insert PC 161/A3803 into the extender card.

c. Turn programmer (RTPF-1) power switch ON and depress buttons A and 1 on RTRS-2.

d. Connect scope to Pin 14 of PC 161 and depress any button on S1003. Observe free-running clock pulses on scope approximately 22 ms apart.

e. Adjust the period of the timing generator as follows: Connect the a-c input of the electronic counter to Pin 14, and adjust R2 on PC 161 until the counter indicates 22 ms. The counter should be set on 1 volt sensitivity.

f. Turn power OFF. Remove extender card from Z1005 and insert PC 161 in Z1005.

### 5. PC 128/A3693:

a. Insert extender card PC 129 into Z1002 and insert PC 128.

b. Turn power ON. Connect scope to Pin 40 and depress Buttons A and 1 on RTRS-2.

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## E. MANUAL PROGRAM INPUT - Cont'd

### 5. PC 128/A3693:

c. Upon depressing any button on S1003, observe one 22 ms negative going pulse.

d. Turn power OFF. Remove extender card PC 129 from Z1002 and insert PC 128 into Z1002.

### 6. PC 202/A4210:

a. Insert extender card PC 129 into Z1006 and insert PC 202 into extender card. Turn power ON.

b. Feed -12 VDC into Pin E of J1009.

c. With scope, monitor Pins A and C of J1009. When buttons are depressed on S1003, Pin A will display negative going pulses from a zero level. Pin C will display positive going pulses from a negative level.

d. Turn power OFF. Remove extender card PC 129 and insert PC 202 into Z1006.

## F. MANUAL PROGRAM/TAPE PUNCH

1. Turn S1004 to MANUAL PROGRAM/TAPE PUNCH position and insert PC 162/A3804 into Z1004.

2. Inter-connect RTKY-1 to RTPF-1.

3. Turn tape reader and programmer (RTPF-1) power switches ON. Insert blank tape in punch side of reader.

4. a. Depress PUNCH button on RTRS-2. Depress A, B, C, D, 1, 2, 3, 4, on RTRS-2, and examine tape punched to see that it follows bit configuration outlined in Figure #1.

b. When the TUNE button is depressed, a bit #1 should be punched only.

5. Depress Buttons A and 1 on RTRS-2. Depress each button on S1003 (RTPF-1). Tape will show A and 1 code from Figure #1 followed by codes outlined in Figure 2.

6. Release buttons depressed.

## G. TAPE PUNCH INPUT

1. Turn S1004 to TAPE PUNCH position.

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## G. TAPE PUNCH INPUT - Cont'd

2. Depress Buttons A and 1 on RTRS-2 and AFC button on S1003; also 1 KC button on FUNCTION row of S1003. Examine tape for A and 1 code, 2 bit code from AFC button, and 1, 3, 4, 5 code from 1 KC button.

3. Release buttons depressed.

## H. TAPE READ INPUT

1. Turn S1004 to TAPE READ position.

2. Insert tape punched in Step F. Tape should advance to first bit character on tape, then stop. Upon depressing TAPE READ button, tape should step through until a single 1 bit is present (representing a tune character), then stop.

3. Insert tape as in Step 2 above, and short timer jack J1011. Observe tape step through reader.

4. Turn power OFF and remove extender card PC 129 from Z1000, and insert PC 200.

## I. RE-PUNCH

1. Turn S1004 to RE-PUNCH position.

2. Turn power ON.

3. Insert blank tape in PUNCH position in RTKY-1. Insert tape punched in Step F. Depress TAPE READ button. The tape will step through and, at the same time, a new tape will be punched.

4. Examine test tape and re-punched tape to be sure that they exactly duplicate each other.

5. The RTRS-2 and RTPF-1 are now ready to go into systems check.



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## FIGURE # I I

BUTTON	BITS PRESENT	BUTTON	BITS PRESENT
KC's		MEGACYCLES (Cont'd)	
0	2	24-9	2, 3, 4, 5
1	3	25-10	3 & 4
2	4	26-11	3, 4, 5
3	2 & 5	27-12	2, 4, 5
4	2 & 3	28-13	4 & 5
5	3 & 4	29-14	3 & 5
6	2, 4, 5	30-15	5
7	2, 3, 5	31-16	4
8	2, 3, 4		
9	3, 4, 5	FUNCTIONS	
AFC	2	2-16 MC	1, 2, 5
SYN	4	17-31 MC	1 & 5
MEGACYCLES		100 KC	1, 4, 5
17-2	2 & 5	10 KC	1 & 4
18-3	2	1 KC	1, 3, 4, 5
19-4	3	.1 KC	1, 3, 5
20-5	2 & 3	CAR.	1, 2, 3
21-6	2 & 4		
22-7	2, 3, 4		
23-8	2, 3, 5		



