

# TMC SPECIFICATION

NO. S *S 895*

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OF

TITLE:

Typed 1/22/65 by SS.

RTRS-1 & RTPA-1  
TEST PROCEDURES

# TMC SPECIFICATION

NO. 5

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SHEET

1

OF

12

TITLE:

RTRS-1 &amp; RTPA-1 TEST PROCEDURES

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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 5244L or equivalent.
4. Reader Punch RTKY, or equivalent.
5. Interconnecting Cable, CA 944 or equivalent.
6. Interconnecting Cable, CA 973 or equivalent.

## B. PRELIMINARY -

1. This test procedure is designed to check the response of the programmer to the four types of input, as determined by the position of switch S1004.

2. Since the RTRS controls relays located in the RTPA, an RTRS is required to check the RTPA, hence test procedures for the two units are combined.

3. Prior to turning on the programmer power supply, carefully inspect the programmer unit for mechanical imperfections such as cold solder joints, broken wires and bent switch leaf springs.

4. Check for continuity with the VOM as follows:

a. With S1004 in the Manual position:

1. S1003, any violet wire to J1001-6
2. S1003, any orange wire to J1001-10
3. S1003, any yellow wire to J1007-30
4. S1003, any green wire to J1001-40
5. S1003, any blue wire to J1001-38
6. J1000-18 to J1005-12
7. J1006-38 to J1009-E

b. With S1004 in position Manual Program/Tape Punch:

1. Same as in paragraph (a.) 1. thru 7. above
2. J1001-18 to J1007-28
3. J1001-16 to J1007-29
4. J1001-12 to J1007-30
5. J1001-9 to J1007-31
6. J1001-3 to J1007-32

c. With S1004 in position Tape Punch:

1. Same as in paragraph (a.) 1. thru 5. and paragraph (b.) 2. thru 6.

d. With S1004 in position Tape Read:

1. J1000-6 to J1001-6
2. J1000-7 to J1001-10
3. J1000-41 to J1001-42
4. J1000-36 to J1001-40
5. J1000-30 to J1001-38
6. J1005-12 to J1005-28
7. J1004-38 to J1004-26
8. J1006-38 to J1009-E

# TMC SPECIFICATION

NO. 5

REV: 0 A B

COMPILED: HS

CHECKED:

APPD:

SHEET 2 OF 12

TITLE: RTRS-1 &amp; RTPA-1 TEST PROCEDURES

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**e. With S1004 in any position:**

1. J1000-4 to J1007-8
2. J1000-3 to J1007-9
3. J1000-42 to J1007-10
4. J1000-40 to J1007-11
5. J1000-32 to J1007-12

**C. RTRS TEST -**

1. Connect RTRS to RTPA with interconnecting cable CA 944.
2. Ensure that no PC boards are in the RTPA bin, then turn the programmer power switch to ON.
3. Depress REC-1 or REC-2 on RTRS and observe that relay K-1001 is energized. Also K1003 if REC-1 is depressed or K1004 if REC-2 is depressed.
4. Observe that either the PUNCH or NO PUNCH button is lit.
5. Depress whichever of the two buttons that is not lit and observe that the lighted button is extinguished and the button depressed is lit.
6. Depress the REC-1 button and observe that the button is lit and remains lit when the button is released.
7. Depress the TUNE button on the RTPA Programmer switch and observe that the REC-1 button is extinguished.
8. Depress the REC-2 button and observe that the button is lit and remains lit when the button is released.
9. Depress the TUNE button on the RTPA Programmer switch and observe that the REC-2 button is extinguished.
10. Turn the RTPA power switch to OFF.

**D. MANUAL PROGRAM INPUT -**

1. Ensure that all of the push buttons of S1003 are in the released position, and S1004 is in Manual Program position.
2. PC 119/A 3686
  - a. Insert extender card PC 129/A 3696 into Z-1001 and insert PC 119 into PC 129.
  - b. Turn the programmer power switch to ON, touch the oscilloscope probe to pins 6, 10, 42, 40 and 38 and observe a +12 V indication.
  - c. Depress REC-1 or REC-2 on RTRS and observe that relay K-1001 is energized.
  - d. Connect the oscilloscope probe to J1001-6, and, upon depressing the Ch A IFBW button, observe the +12 volt indication change to -12 volts.
  - e. Release the Ch A IFBW button, connect the oscilloscope probe to J1001-10, and, upon depressing the Ch A IFBW button, observe the +12 volt indication change to -12 volts.

# TMC SPECIFICATION

NO. 5

REV: 0 A B

SHEET 3 OF 12

COMPILED: HS

CHECKED:

APPD:

TITLE:

RTRS-1 &amp; RTPA-1 TEST PROCEDURES

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f. Release the Ch A IFBW button, connect the oscilloscope probe to J1001-42, and upon depressing the Ch A IFBW button observe the +12 volt indication change to -12 volts.

g. Release the Ch A IFBW button, connect the oscilloscope probe to J1001-40, and upon depressing the Ch A IFBW button observe the +12 volt indication change to -12 volts.

h. Release the Ch A IFBW button, connect the oscilloscope probe to J1001-38, and upon depressing the Ch A IFBW button, observe the +12 volt indication change to -12 volts.

i. Release the button depressed, connect the oscilloscope probe to pins 18, 16, 12, 9 and 3, each time depressing and releasing the Ch A IFBW buttons and observe a zero indication change to -12 volts.

j. Release the button depressed, connect the oscilloscope probe to pin 36 and upon depressing any button observe a zero indication change to -12 volts.

k. Release the button depressed, connect the oscilloscope probe to pin 28 and upon depressing the TUNE button, observe a -12 volts indication change to zero and return -12V.

1. Turn the programmer power switch to OFF, remove extender card PC129/A3696, and insert PC119 in Z1001.

3. PC 127/A 3694

a. Insert extender card PC129/A3696 in Z1003 and insert PC127/A3694 into the extender card.

b. Connect the oscilloscope probe to pin 4, and upon turning the programmer power switch to ON, observe a +12 volt pulse .6 MS long.

c. Turn the programmer switch to OFF, connect the oscilloscope probe to pin 6, and upon turning the programmer power switch to ON, observe a +12 volt pulse .6 MS long.

d. Turn the programmer power switch to OFF, remove extender card PC129/A3696 from Z1003 and insert PC127/A3694 in Z1003.

4. PC 161/A 3803

a. Insert extender card PC129/A3696 into Z1000 and insert PC159/A3793 into the extender card.

b. Insert another extender card PC129/A3696 into Z1005 and insert PC161/A3803 into the extender card.

c. Turn the programmer power switch to ON, and depress the REC-1 button on the RTRS.

# TMC SPECIFICATION

NO. 5

REV: OAB

COMPILED:

CHECKED:

APPD:

SHEET

4

OF

12

TITLE: RTRS-1 &amp; RTPA-1 TEST PROCEDURE

Typed 1/22/65

d. Connect the oscilloscope probe to pin 14 of PC161/A3803, depress any button on the S1003 and observe free-running clock pulses, 22 MS apart.

e. Adjust the frequency of TG-1 as follows:  
Connect the AC input of the electronic counter to pin 14 and adjust R2 on PC161/A3803 until the counter indicates 22 MS. The counter should be set on 1 volt sensitivity.

f. Turn the programmer power switch to OFF, disconnect the oscilloscope probe and counter, remove the extender card from Z1005 and insert PC161/A3803 into Z1005.

## 5. PC 128/A 3693

a. Insert extender card PC129/A3696 into Z1002 and insert PC128/A3693 into the extender card.

b. Turn the programmer power switch to ON, connect the oscilloscope probe to pin 40 and depress the REC-1 button on the RTRS.

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

d. Turn the programmer power switch to OFF, remove the extender card from Z1002 and insert PC128/A3693 into Z1002.

## 6. PC 181/A 3795

a. Insert extender card PC129/A3696 into Z1006 and insert PC181/A3795 into the extender card and turn the programmer power switch to ON.

b. Connect the oscilloscope probe to TP-2 and obtain an external oscilloscope trigger from J1006-24.

c. Depress the REC-1 button on the RTRS and observe the following waveform:



d. Depress the REC-2 button on the RTRS and observe the following waveform:



e. Depress the TUNE button on S1003 and observe the following waveform:



# TMC SPECIFICATION

NO. 5

REV: 0 AB

COMPILED: HS

CHECKED:

APPD:

SHEET 5

OF 12

TITLE: RTRS-1 &amp; RTPA-1 TEST PROCEDURES

Typed 1/22/65 by ss.

f. Release the button depressed, depress IFBW 1 button and observe the following waveform; after depressing the REC selector button.



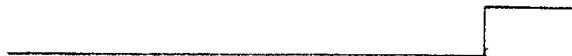
g. Release the button depressed, depress the IFBW 6 button and observe the following waveform:



h. Release the button depressed, depress the kilocycles 2 button and observe the following waveforms:



i. Release the button depressed, depress the AGC button and observe the following waveform:



j. Release the button depressed, connect the oscilloscope probe to J1009-C, and connect a jumper from J1009-E to any -12 V point in the programmer.

k. Depress each of the buttons on S1003 and observe a waveform as indicated in Figure 1 for the button depressed.

l. Connect the oscilloscope probe to J1009-A, and upon depressing each of the buttons on S1003, observe a waveform as indicated in Figure 2 for the button depressed.

m. Turn the programmer power switch to OFF, and remove extender card PC129/A3696 from Z1006 and insert PC181/A3795 into Z1006.

## E. MANUAL PROGRAM/TAPE PUNCH -

1. Turn S1004 to Manual Program/Tape Punch position, and insert PC162/A3804 into Z1004.
2. Connect the Reader/Punch RTKY to the RTPA with Interconnecting Cable CA 973.
3. Turn the Tape Read and programmer Power switches to ON and ensure that the Reader/Punch RTKY is properly supplied with blank tape and depress the REC-1 button on the RTRS.
4. Depress each button on S1003, in succession, and observe that the tape is punched in accordance with the bits present as indicated in Figure 3.
5. Connect the oscilloscope probe to J1009-C, with external trigger obtained as in Paragraph 4.4, and, upon depressing any button on S1003, observe the waveform for the button depressed as indicated in Figure 2.

# TMC SPECIFICATION

NO. 5

REV: **OAB**

COMPILED: HS

CHECKED:

APPD:

SHEET 6

OF 12

TITLE: RTRS-1 &amp; RTPA-1 TEST PROCEDURES

Typed 1/22/65 by ss.

6. Release the button depressed.

## F. TAPE PUNCH INPUT -

1. Turn S1004 to the Tape Punch position.
2. Repeat tests in Paragraph E. 3. and 4. and observe the same indications.
3. Repeat test E5. and observe no waveform.
4. Release the button depressed and turn the programmer and RTKY power switches to OFF.

## G. TAPE READ INPUT -

1. Turn S1004 to the Tape Read position and turn the RTPA and RTKY power switches to ON.
2. Insert a test tape, prepared in accordance with Figure 4, into the Tape Reader portion of the RTKY and observe the tape advance rapidly to the first message on the tape, and then continue at a 60 WPM rate.  
NOTE: It occasionally may be necessary to depress the Tape Read button, S1005, to initiate the rapid advance of the tape.
3. Observe that the tape reader stops upon reaching a character E (BIT 1).
4. Depress the Tape Read button and observe the tape rapidly advance to the next message and then continue at a 60 WPM rate until an E character is sent.
5. Short the contacts of Timer Jack J1011 and observe the tape rapidly advance until the end of the tape.
6. Turn the Programmer Power switch and Tape Reader power switch to OFF.
7. Remove extender card from Z1000 and insert PC159/A3793 into Z1000.

NOTE: When in the Manual Programming mode, it is necessary to depress a receiver select button on the RTRS each time the TUNE button has been depressed, in order to energize S1003.

# TMC SPECIFICATION

NO. 5

REV: 0AB

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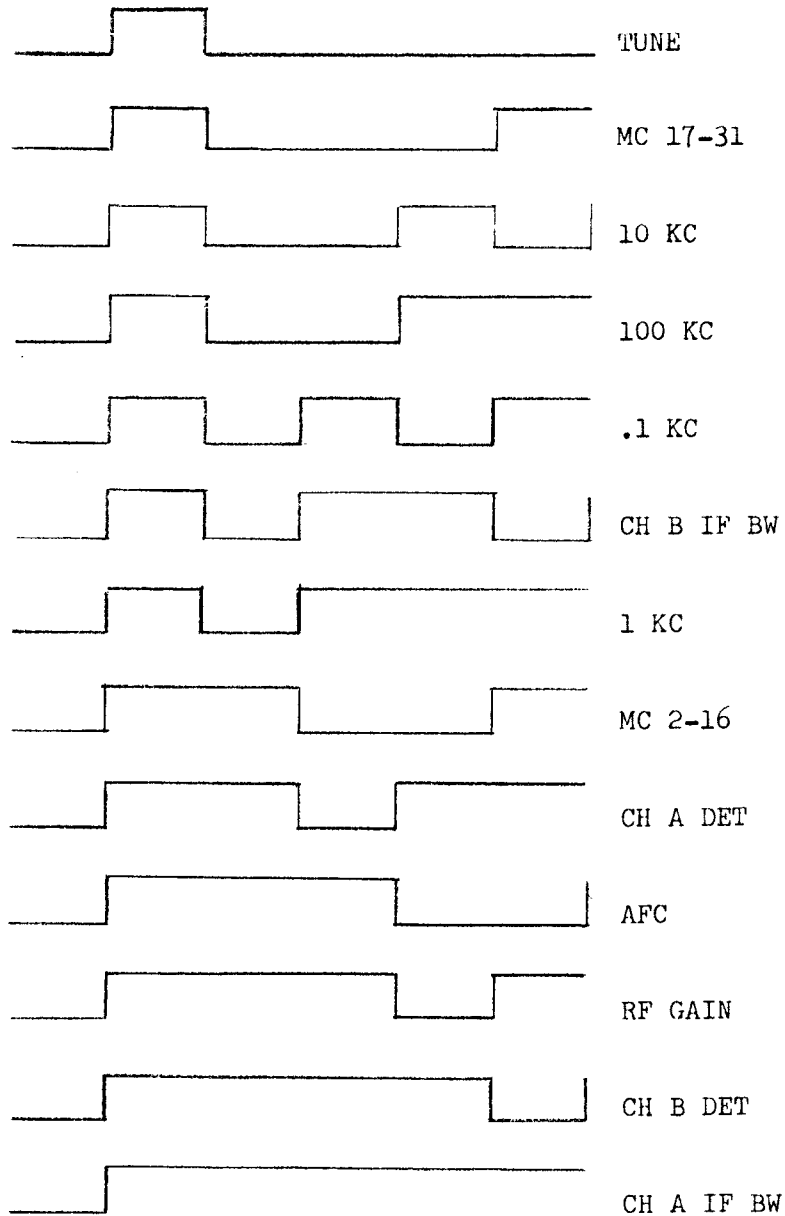
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APPD:

SHEET 7 OF 12

TITLE: RTPA TEST PROCEDURE

Figure 1 - Cont'd





# TMC SPECIFICATION

NO. 5

REV: 0 A B

COMPILED: HS

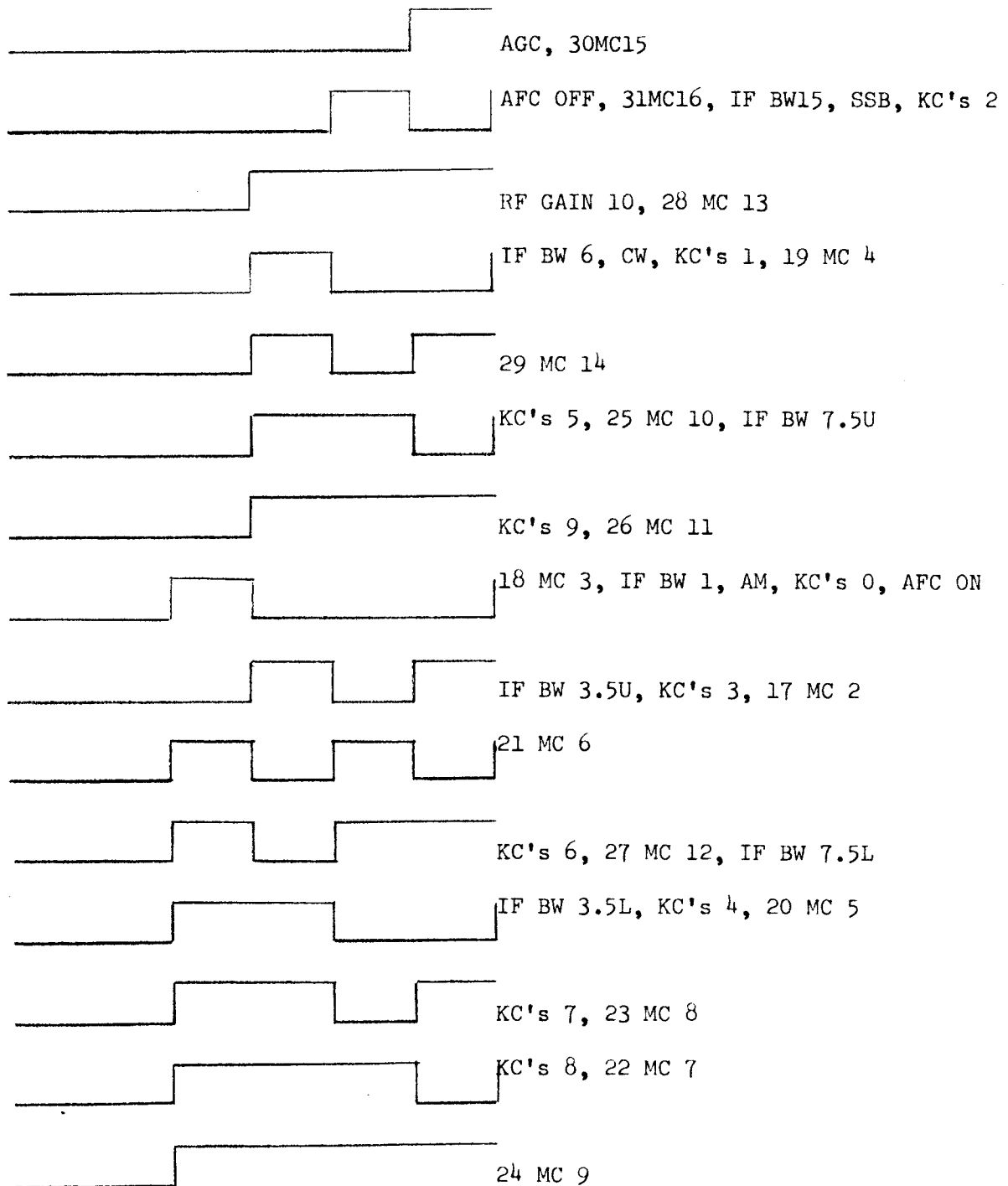
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APPD:

SHEET 8

OF 12

TITLE: RTPA TEST PROCEDURE

FIGURE 1

# TMC SPECIFICATION

REV: 0 A B

NO. 5

COMPILED: HS

CHECKED:

APPD:

SHEET

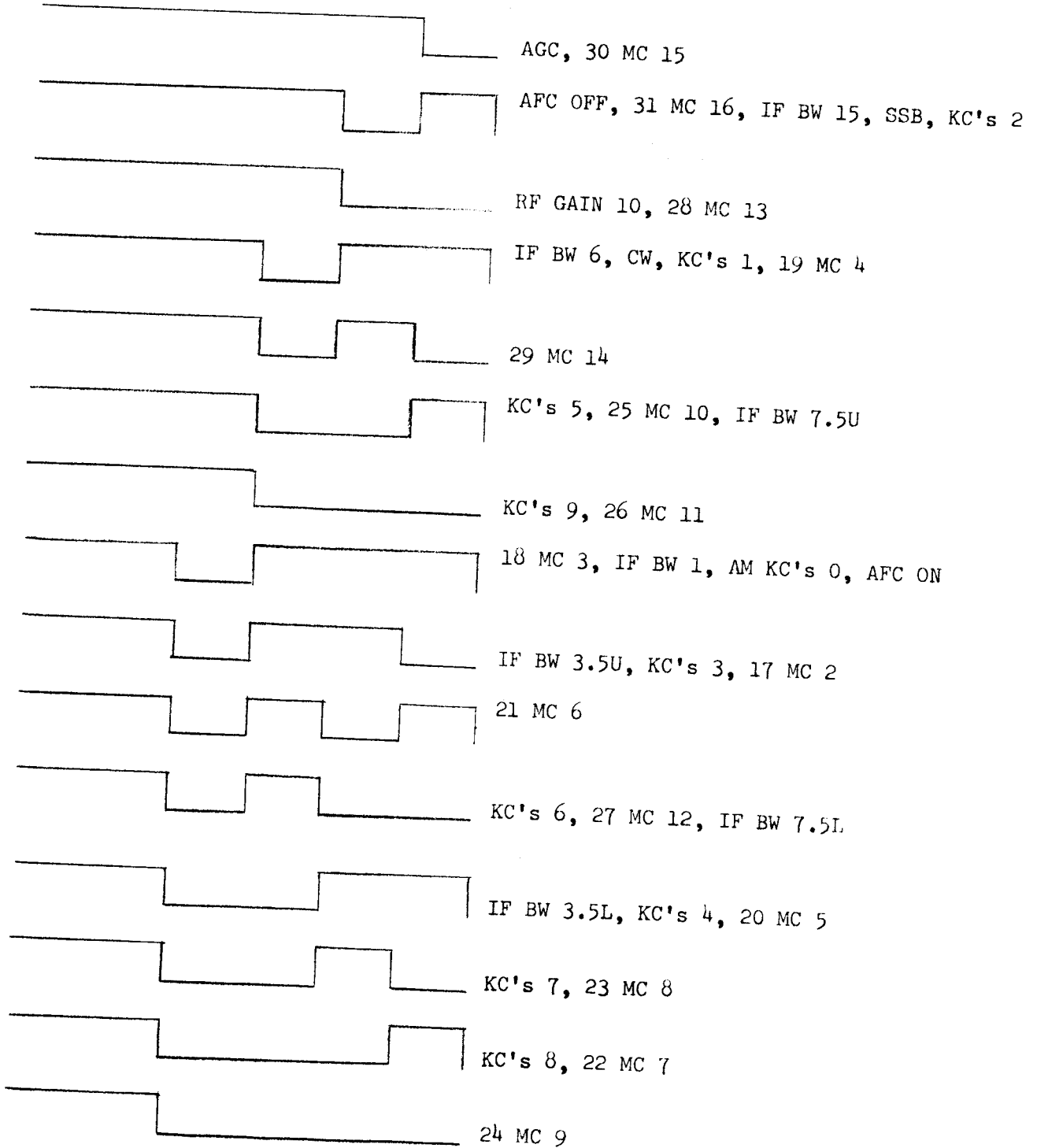
9

OF

12

TITLE: RTPA TEST PROCEDURE

FIGURE 2



# TMC SPECIFICATION

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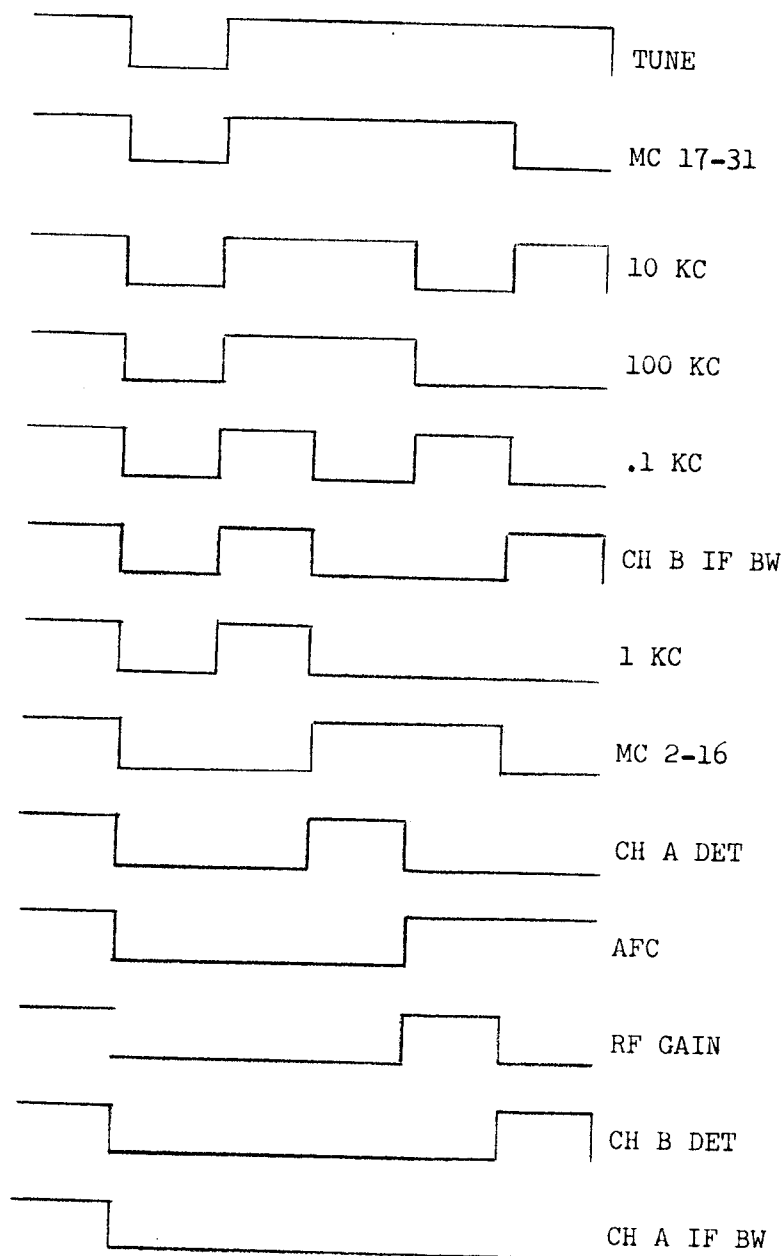
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APPD:

SHEET 10 OF 12

TITLE: RTPA TEST PROCEDURE

Fig. 2 - Cont'd



# TMC SPECIFICATION

NO. 5

REV: **0AB**

COMPILED: **HS**

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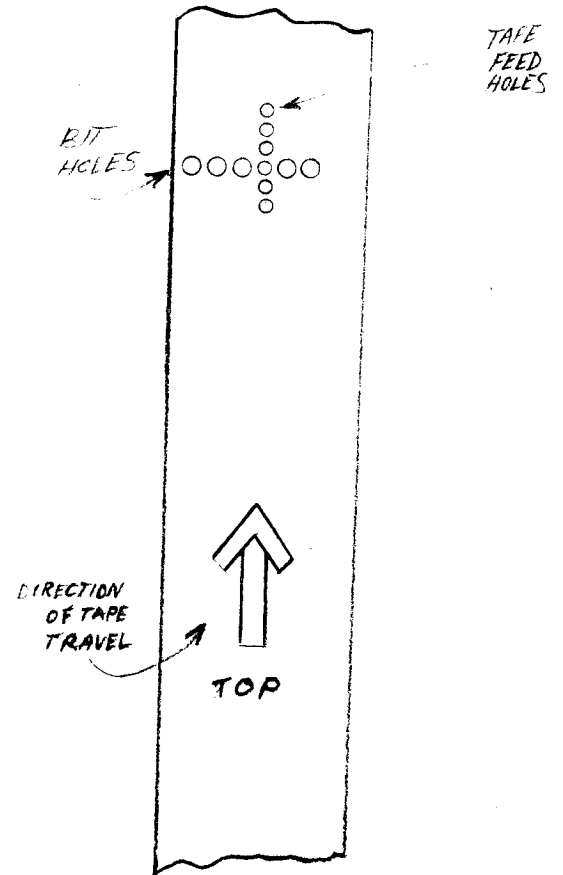
APPD:

SHEET **11** OF **12**

TITLE: **RTPA TEST PROCEDURE**

FIGURE 3

<u>BUTTON</u>	<u>BITS PRESENT</u>	<u>BUTTON</u>	<u>BITS PRESENT</u>
IFBW 1	2	MC 2-16	1, 2, 5
6	3	MC 17-31	1, 5
15	4	100 KC	1, 4, 5
3.5U	2, 5	10 KC	1, 4
3.5L	2, 3	1 KC	1, 3, 4, 5
7.5U	3, 4	.1 KC	1, 3, 5
7.5L	2, 4, 5	CHA IFBW	1, 2, 3, 4, 5
DET AM	2	CHA DET	1, 2, 4, 5
CW	3	CHB IFBW	1, 3, 4
SSB	4	CHB DET	1, 2, 3, 4
KC's 0	2	AFC	1, 2, 3
1	3	RF GAIN	1, 2, 3, 5
2	4	TUNE	1
3	2, 5		
4	2, 3		
5	3, 4		
6	2, 4, 5		
7	2, 3, 5		
8	2, 3, 4		
9	3, 4, 5		
RF GAIN 10	4, 5		
AGC	5		
AFC ON	2		
OFF	4		
17 MC 2	2, 5		
18 MC 3	2		
19 MC 4	3		
20 MC 5	2, 3		
21 MC 6	2, 4		
22 MC 7	2, 3, 4		
23 MC 8	2, 3, 5		
24 MC 9	2, 3, 4, 5		
25 MC 10	3, 4		
26 MC 11	3, 4, 5		
27 MC 12	2, 4, 5		
28 MC 13	4, 5		
29 MC 14	3, 5		
30 MC 15	5		
31 MC 16	4		



# TMC SPECIFICATION

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SHEET 12 OF 12

TITLE: RTPA TEST PROCEDURE

FIGURE 4  
TEST TAPE

