

TMC SPECIFICATION

NO. 5936

REV: 0 A

COMPILED: *[Signature]*

CHECKED: *JEE*

APPD: *MM 3/17/65*

SHEET COVER OF

TITLE:

Typed 3/17/65 by ss.

RTRS-1B & RTPE-1

TEST PROCEDURE

TMC SPECIFICATION

NO. S 936

REV: 0 A

COMPILED: *[Signature]*

CHECKED:

APPD:

SHEET 1 OF 13

TITLE: RTRS-1B & RTPE TEST PROCEDURES

Typed 3/17/65 by ss.

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, CA944 or equivalent.
6. Interconnecting Cable, CA973 or equivalent.

B. PRELIMINARY

1. This test procedure is designed to check the response of the programmer to the five types of input as determined by the position of switch S1004.
2. Since the RTRS controls relays located in the RTPE, and RTRS is required to check the RTPE, 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 J1001-42
 4. S1003, any green wire to J1001-40
 5. S1003, any blue wire to J1001-38
 6. J1000-28 to J1000-8
 7. J1000-18 to J1005-12
 8. J1006-38 to J1009-E
 - b. With S1004 in position Manual Program/Tape Punch:
 1. Same as in Paragraph (a.) 1. thru 8. 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 6. and paragraph (b.) 2. thru 6.

TMC SPECIFICATION

NO. S936

REV:

0A

COMPILED:

CHECKED:

APPD:

SHEET

2

OF 13

TITLE:

RTRS-1B & RTPe TEST PROCEDURE

Typed 3/17/65 by ss.

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

e. With S1004 in REGENERATE:

1. Same as paragraph 4.d.
2. J1000-28 to J1000-20

f. 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 RTPe with interconnecting cable CA944.
2. Ensure that no PC boards are in the RTPe bin, then turn the programmer power switch to ON.
3. Observe that either the PUNCH or NO PUNCH button is lit.
4. Depress whichever of the two buttons is not lit and observe that the lighted button is released and extinguished and the button depressed is latched and lit.
5. Depress the REC-1 button and observe that K1001 is energized and that the button is lit and remains lit when released.
6. Depress the TUNE button on the programmer switch S1003 and observe that relay K1001 is released and the REC-1 button is extinguished.

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.

TMC SPECIFICATION

NO. S 936

REV: 0A

COMPILED:

CHECKED:

APPD:

SHEET

3

OF

13

TITLE:

RTRS-1B & RTPE TEST PROCEDURE

Typed 3/17/65 by ss.

2. PC 119/A 3686

- a. Insert extender card PC 129/A 3696 into Z1001 and insert PC119 into PC129.
- 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 K1001 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.
- 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 to -12 volts.
- l. 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.

TMC SPECIFICATION

NO. s936

REV:

0 A

COMPILED:

CHECKED:

APPD:

SHEET 4

OF 13

TITLE:

RTRS-1B & RTPE TEST PROCEDURE

Typed 3/17/65 by ss.

- 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 PC200/A4124 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.
 - 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.

TMC SPECIFICATION

NO. S936

REV: 1A

COMPILED: _____ CHECKED: _____ APPD: _____ SHEET 5 OF 13

TITLE: **RTRS-1B & RTPE TEST PROCEDURE**

Typed 3/17/65 by ss.

6. PC 202/A 4210

a. Insert extender card PC129/A3696 into Z1006 and insert PC202/A4210 into the extender card and turn the programmer power switch to ON.

b. Connect the oscilloscope probe to *pin 13* 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:



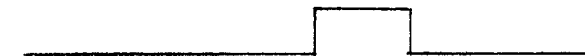
e. Depress the TUNE button on S1003 and observe the following waveform:



f. Depress the REC select button and then depress the 1/.1 button in the Audio Frequency row and observe the following waveform:



g. Release the button depressed, depress the 6/.25 button and observe the following waveform:



h. Release the button depressed, depress the ANTENNA/KCS 2 button and observe the following waveform:



i. Release the button depressed, depress the first OUT button in the Audio Filter row 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.

TMC SPECIFICATION

NO. S936

REV: 0A

COMPILED:

CHECKED:

APPD:

SHEET 6 OF 13

TITLE: RTRS-1B & RTPE TEST PROCEDURE

Typed 3/17/65 by ss.

- 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 RTPE with Interconnecting Cable CA973.
3. Turn the Tape Read Power switch and programmer power switch 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 a REC select button and 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 6.b. and upon depressing any button on S1003, observe the waveform for the button depressed as indicated in Figure 2.
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 E. 5. and observe no waveform.
4. Release the button depressed and turn the programmer and RTKY power switches to OFF.

TMC SPECIFICATION

NO. S 936

REV:

0A

COMPILED:

CHECKED:

APPD:

SHEET

7

OF 13

TITLE:

RTRS-1B & RTPE TEST PROCEDURE

Typed 3/17/65 by ss.

G. TAPE READ INPUT

1. Turn S1004 to the Tape Read position and turn the RTPE 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 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 PC200/A4124 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.

H. REGENERATE

1. Turn S1004 to the Regenerate position and turn the RTPE and RTKY power switches to ON.
2. Insert the test tape into the RTKY tape reader sections, and observe that tape is punched in accordance with the test tape. (When blank tape is rapidly advanced in the reader the puncher does not punch).

TMC SPECIFICATION

NO. s 936

REV:

0A

COMPILED:

CHECKED:

APPD:

SHEET 8

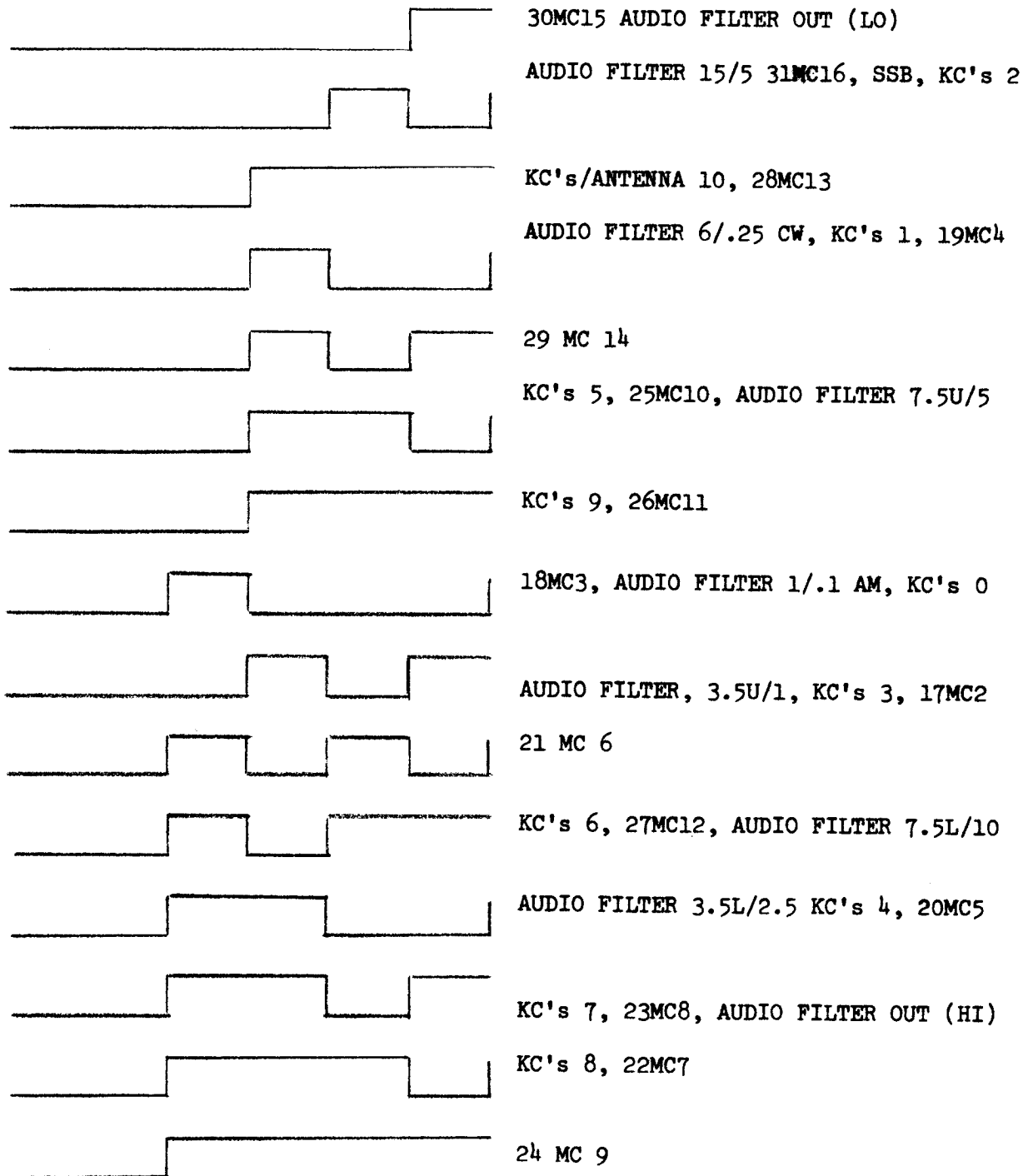
OF 13

TITLE:

RTRS-1B & RTPE TEST PROCEDURE

Typed 3/17/65 by ss.

FIGURE 1



TMC SPECIFICATION

NO. 5936

REV: 0A

COMPILED:

CHECKED:

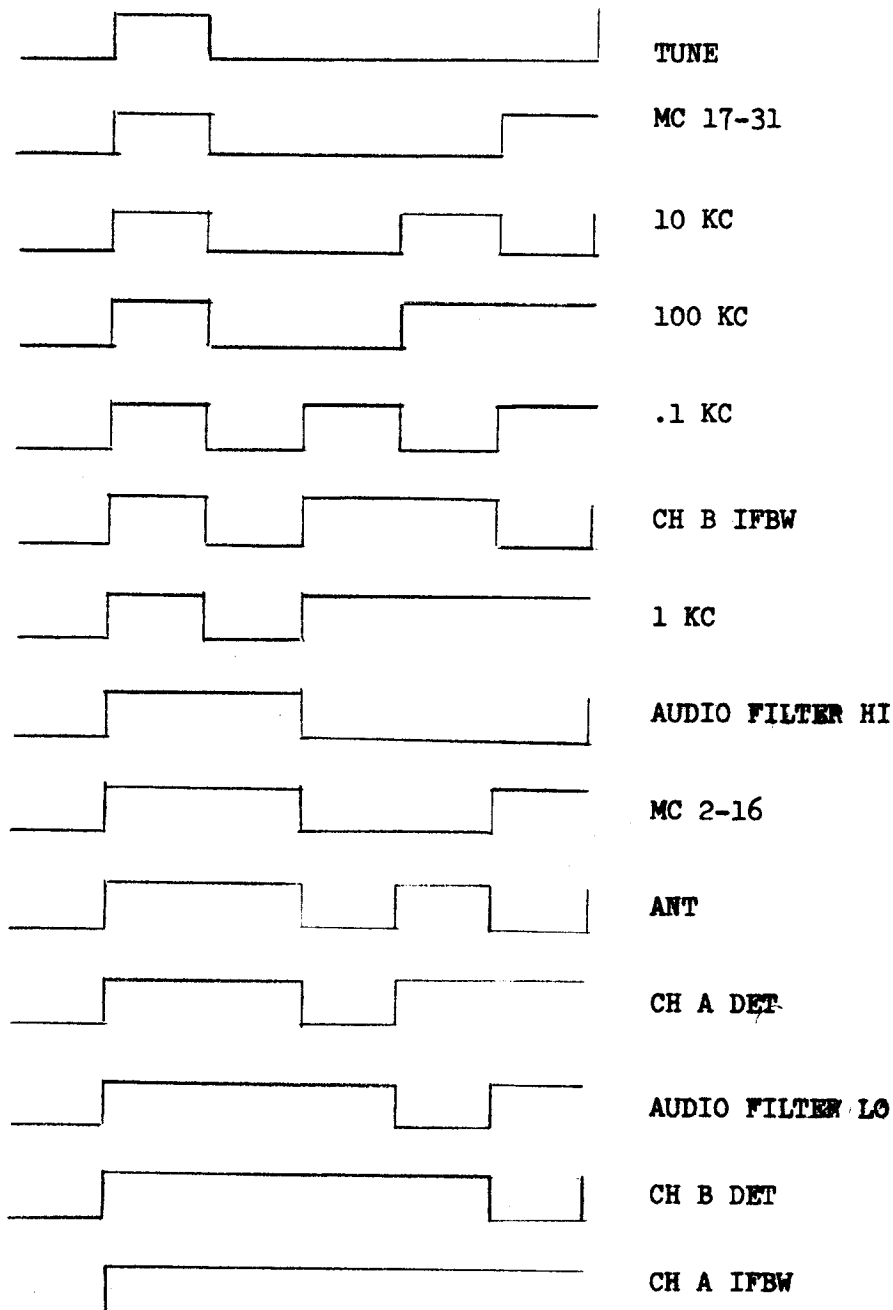
APPD:

SHEET 9

OF 13

TITLE: RTRS-1B & RTPE TEST PROCEDURE

Typed 3/17/65 by ss.

FIGURE 1 (CONT'D)

TMC SPECIFICATION

NO. S 936

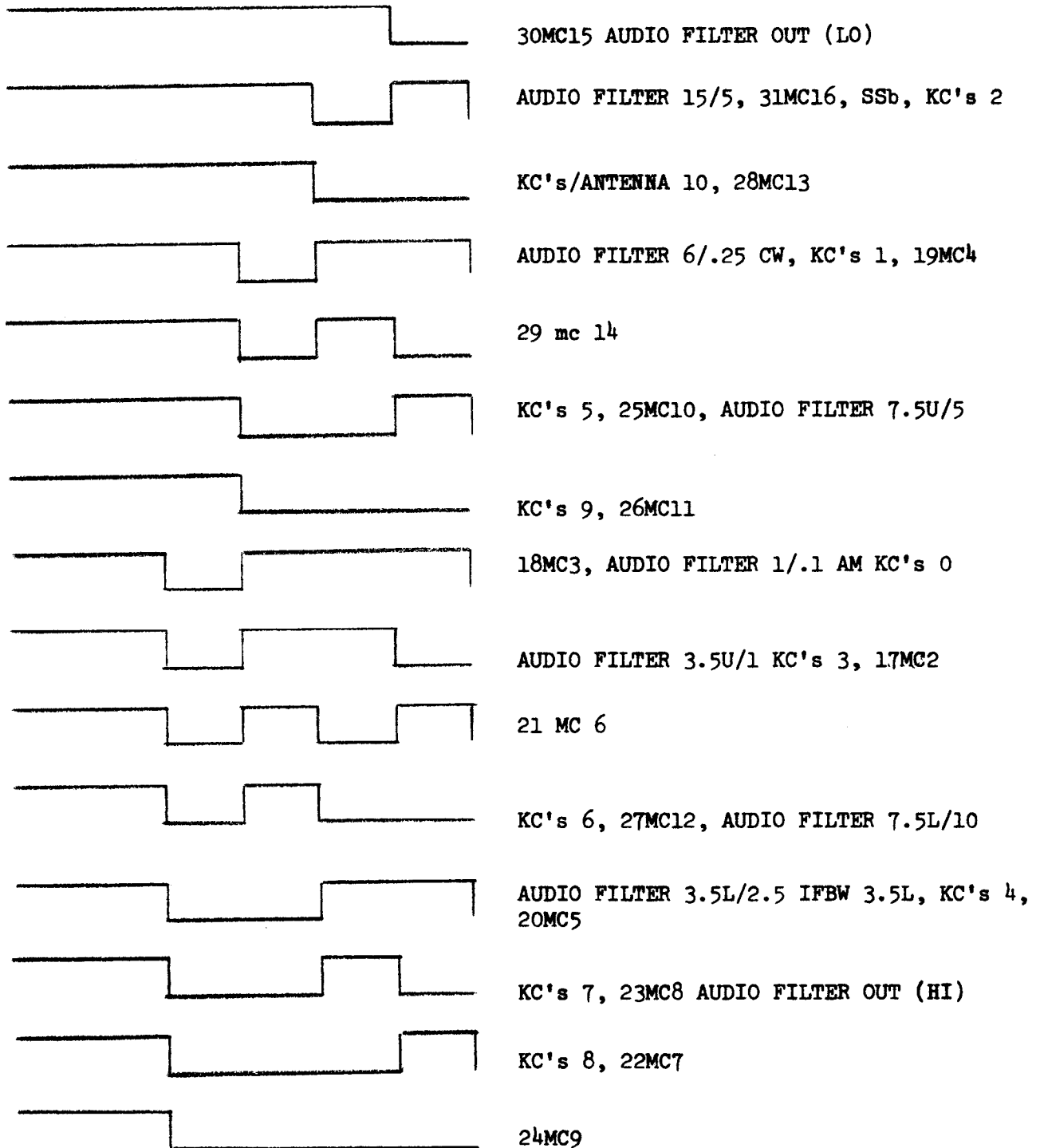
REV: 0A

COMPILED: CHECKED: APPD: SHEET 10 OF 13

TITLE: **RTRS-1B & RTPE TEST PROCEDURE**

Typed 3/17/65 by ss.

FIGURE 2



TMC SPECIFICATION

NO. S 936

REV: 0A

COMPILED:

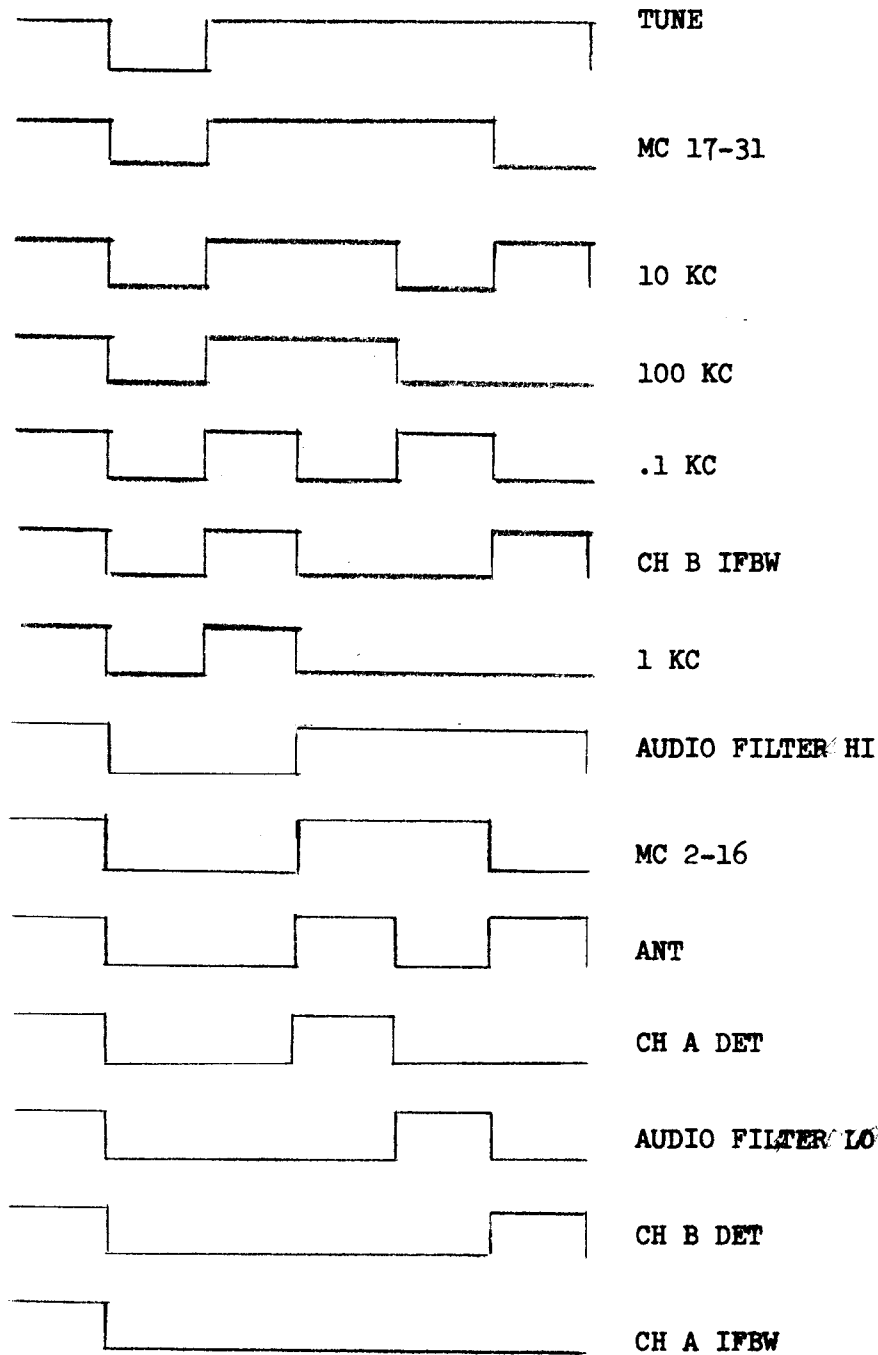
CHECKED:

APPD:

SHEET 11 OF 13

TITLE: RTRS-1B & RTPE TEST PROCEDURE

Typed 3/18/65 by ss.

FIGURE 2 (CONT'D)

TMC SPECIFICATION

NO. S 936

REV: **DA**

COMPILED:

CHECKED:

APPD:

SHEET 12 OF 13

TITLE: **RTRS-1B & RTPE TEST PROCEDURE**

Typed 3/18/65 by ss.

FIGURE 3

<u>BUTTON</u>	<u>BITS PRESENT</u>	<u>BUTTON</u>	<u>BITS PRESENT</u>
AUDIO FILTER OUT(LO)	5	MC2-16	1,2,5
1/.1	2	MC17-31	1,5
6/.25	3	100 KC	1,4,5
15/.5	4	10 KC	1,4
3.5U/1	2,5	1 KC	1,3,4,5
3.5L/2.5	2,3	.1 KC	1,3,5
7.5U/5	3,4		
7.5L/10	2,4,5	CH A IFBW	1,2,3,4,5
AUDIO FILTER OUT(HI)	2,3,5	CH A DET	1,2,4,5
KC's/ANTENNA 0	2	CH B IFBW	1,3,4
1	3	CH B DET	1,2,3,4
2	4	AUDIO FILTER LO	1,2,3,5
3	2,5	RF GAIN	1,2
4	2,3	AUDIO FILTER HI	
5	3,4	ANT	1,2,4,5
6	2,4,5	TUNE	1
7	2,3,5		
8	2,3,4		
9	3,4,5		
10	4,5		
DET AM	2		
CW	3		
SSB	4		
MEGACYCLES 17MC2	2,5		
18MC3	2		
19MC4	3		
20MC5	2,3		
21MC6	2,4		
22MC7	2,3,4		
23MC8	2,3,5		
24MC9	2,3,4,5		
25MC10	3,4		
26MC11	3,4,5		
27MC12	2,4,5		
28MC13	4,5		
29MC14	3,5		
30MC15	5		
31MC16	4		

