911M MULTICLOCK UNIT

DESCRIPTION AND OPERATION

1. GENERAL

1.01 This section covers the description and operation of the 911M Multiclock Unit. The unit is used to provide reference frequencies to any of the following when reference frequencies from the common clock of a 145A1 regenerative repeater are not available:

- 911F Distortion Measuring Set
- 911G Test Sentence Generator
- 911J Distortion Introducing Set.

1.02 The 911M Multiclock Unit contains ten individual oscillators, each arranged for nine outputs. Crystal units are available for frequencies within the range of 4.000 to 30.000 kHz; they provide baud rates corresponding to 40 to 300 bits per second. Since the need for clock frequencies may vary among users, the multiclock unit may be equipped with one or more crystals, as required.

1.03 This multiclock unit is intended for use solely with test equipment and is not provided with an automatic transfer feature to switch in a spare in the event of failure. Therefore, the 911M should not be associated with the 145A1 regenerative repeater or any similar equipment involved in the transmission path.

2. DESCRIPTION

PHYSICAL DESCRIPTION

2.01 The 911M Multiclock Unit consists of ten similar circuit pack (CP) printed wiring board units mounted on a 3-inch by 19-inch steel mounting plate (Fig. 1). The circuit packs are nonplug-in units and each requires an approved crystal unit which must be ordered separately. The frequency range and the number of each wiring board is listed in Table A. Crystal frequencies used for existing systems are listed in Table B. Select crystals from those listed in Table B for wiring boards listed in Table A. Order KS-16515, L2 crystal units for frequencies in the 4.000 to 15.999 kHz range; order 34NA crystal units for frequencies in the 16.000 to 30.000 kHz range.

2.02 Three D5A terminal strips are provided on the mounting plate for making external connections.

2.03 External supply voltage and current required for operation of the 911M is as follows:

- +130 ±5 volts dc @ 40 mA per CP
- -48 ±3 volts dc @ 5 mA per CP.

Power supply ground for all circuit packs is connected to terminal 53 of terminal strip C. The -48 volt supply for all circuit packs is connected to terminal 33 of terminal strip C. The +130 volt supply is connected to four leads, as follows:

CP	Terminal on Terminal Strip C
1-3	11
4-6	31
7-9	51
10	13

FUNCTIONAL DESCRIPTION

2.04 The clock circuit of the 911M Multiclock Unit consists of three transistorized stages (Fig. 2). The first stage is a crystal-controlled blocking oscillator composed of transistor Q3 and associated circuitry. Oscillators in the frequency range of 4.000 to 5.599 kHz use an 1800 pf capacitor (C3), and oscillators in the 5.600 to 7.699 kHz range use a 1200 pf capacitor to coarse-tune the oscillator to the vicinity of the crystal resonant frequency. This prevents oscillation at a harmonic frequency.

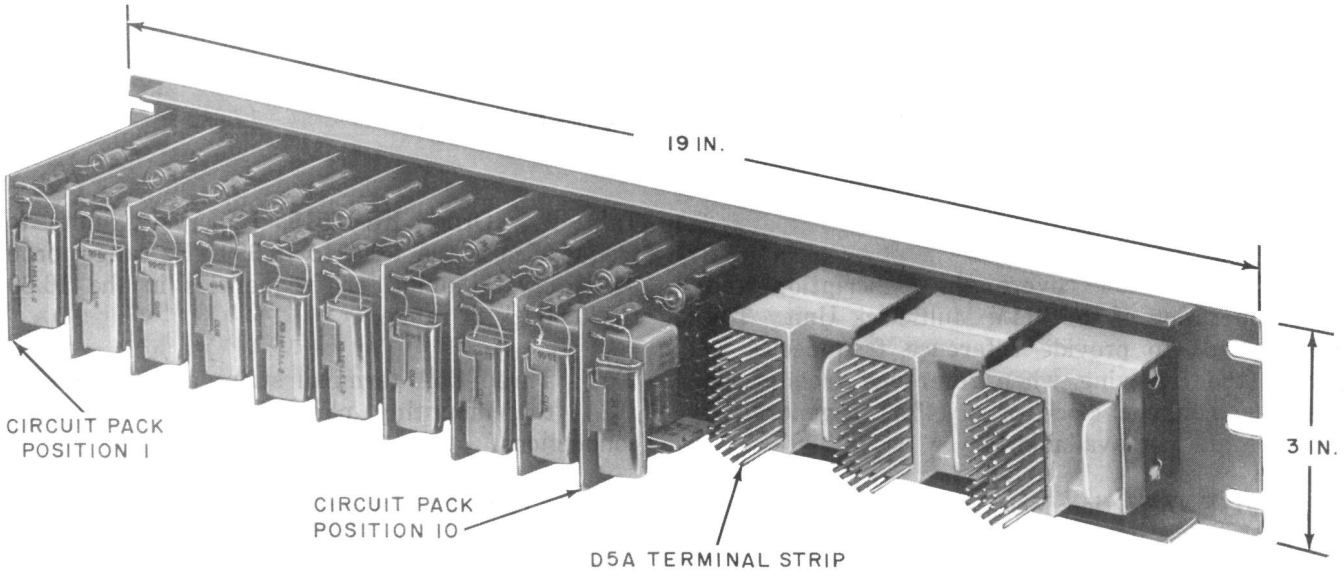

Fig. 1—911M Multiclock—Front View

TABLE A

FREQUENCY RANGE OF CLOCK UNITS

WIRING BOARD		CRYSTAL FREQUENCY RANGE, kHz
POSITION	NUMBER*	
1	ED-73320-30; GR1,2	4.000-5.599
2	ED-73320-30; GR1,2	4.000-5.599
3	ED-73320-30; GR1,3	5.600-7.699
4	ED-73320-30; GR1,3	5.600-7.699
5	ED-73320-30; GR1,3	5.600-7.699
6	ED-73320-30; GR1,3	5.600-7.699
7	ED-73320-30; GR1,3	5.600-7.699
8	ED-73320-30; GR1	7.700-30.000
9	ED-73320-30; GR1	7.700-30.000
10	ED-73320-30; GR1	7.700-30.000

* GR1 indicates basic wiring board; GR1,2 indicates basic board with 1800 pf capacitor; GR1,3 indicates basic board with 1200 pf capacitor.

TABLE B

CRYSTAL FREQUENCIES USED IN EXISTING SYSTEMS

SELECT UP TO	CRYSTAL FREQUENCY, kHz	BAUDS	WPM
2	4.555	45.55	60
	5.000	50.0	67
5	5.686	56.85	75
	6.112	61.1	(MIL)
	6.666	66.7	(UPI)
	7.423	74.23	100
	7.500	75.0	(MIL)
3	11.000	110.0	100
	13.446	134.0	(IBM)
	14.846	148.0	200
	15.000	150.0	150
	30.000	300.0	300

Oscillators in the 7.700 to 30.000 kHz range do not require this capacitor.

2.05 Output of the oscillator stage is ac coupled to the first amplifier stage, composed of transistor Q2 and associated circuitry. The output of the first amplifier stage is directly coupled to the second amplifier stage, composed of transistor Q1 and associated circuitry.

2.06 The output of the second amplifier stage of each clock circuit is dc coupled through isolation resistors to nine terminals of the terminal strip. The resistors are provided in each output lead, so that a ground on one lead will not affect operation of the other outputs.

2.07 Output wiring is limited to 200 feet maximum, using shielded 24-gauge solid wire in accordance with KS-19195, L2.

3. OPERATION

3.01 The 911M Multiclock Unit is permanently wired through local wiring to the 911-type units for which it will supply clock frequencies, and power is continuously on. Therefore, there are no controls to set, nor is patch-wiring required.

4. REFERENCES

4.01 For further details on the 911M Multiclock Unit, refer to SD- and CD-70966-01.

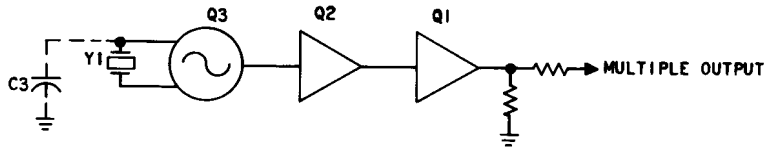

Fig. 2—Clock Unit—Functional Diagram