

## 4066K NETWORK

### DESCRIPTION AND SETTINGS

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#### 1. GENERAL

**1.01** This section contains a detailed description of the 4066K network, which is a plug-in unit for use in 24V4 repeater applications with 25-gauge H88 loaded metropolitan area trunk (MAT) cable. It also can be used in making structural return loss measurements of MAT cable facilities.

**1.02** When this section is reissued, the reason for reissue will be given in this paragraph.

**1.03** The 24V4C and 24V4D repeaters include space and a socket for mounting the 4066K network. When installed in the repeater shelf, the 4066K network is connected to the balance network port (terminals 10 and 11) of the 1-type terminating set through shelf wiring.

**1.04** The 24V4A and 24V4B repeaters do not contain provisions for mounting the 4066K network. When used with this equipment, the network is separately mounted and cross-connected to the repeater as required.

#### 2. EQUIPMENT DESCRIPTION

**2.01** The electrical components which make up the 4066K network are mounted on a printed circuit board. The board is connected to a 20-pin plug and a faceplate containing the six screw-type switches. An aluminum can encloses and holds

the individual parts in position. The network assembly is approximately 1.7 inches square by 7.5 inches long. Tabs on the end of the can permit easy removal of the network from the repeater shelf with a 602C or 602D extraction tool.

**2.02** The six screw-type switches are identified by the letters A through F. The switches insert (screw turned out) or short (screw turned in) build-out resistors in the network.

#### 3. CIRCUIT DESCRIPTION

**3.01** A schematic and faceplate diagram of the 4066K network is shown in Fig. 1. The circuit is composed of all passive electrical components which produce an impedance approximating that of 25H88 MAT cable when the cable is terminated in its characteristic impedance.

**3.02** The six screw-type switches on the face of the network can be set to match the impedance of end section lengths of 1500 feet to 4500 feet. Table A and Table B contain prescription settings of the switches for lengths in 250-foot increments.

**3.03** Figure 2 is a graphic illustration of the input return loss for a typical MAT facility when referenced to and terminated with 4066K networks. The networks and building-out capacitors (BOCs) are set to the prescription values shown in Tables A and B.

**3.04** Figure 3 illustrates the real and imaginary impedance components of the 4066K network simulating the midsection impedance of 25H88 MAT cable. The real (resistive) component is identified by R; the imaginary (reactive) component is identified by X.

#### 4. APPLICATIONS

**4.01** The 4066K network is normally used in conjunction with a 1-type terminating set

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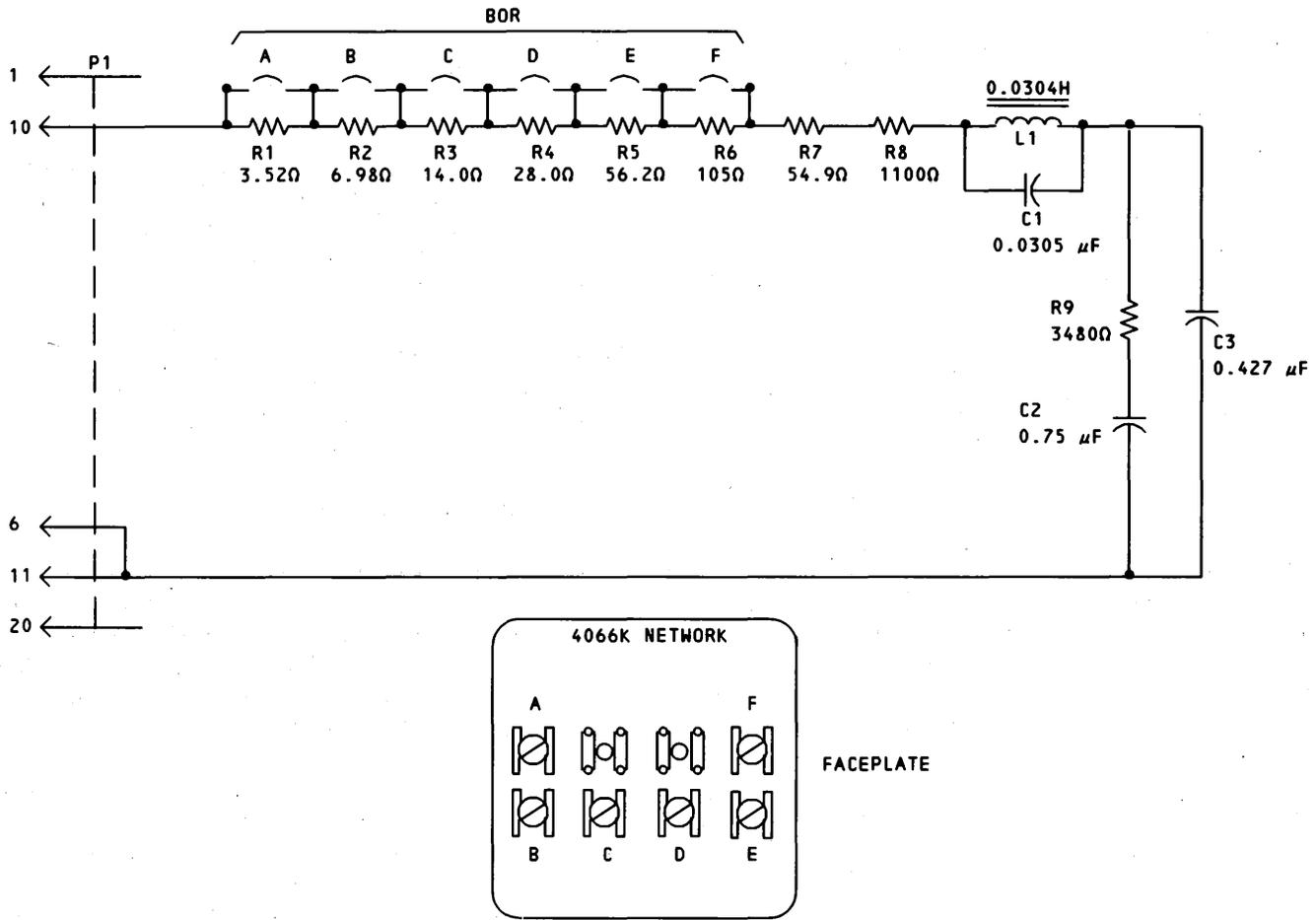


Fig. 1—Schematic and Faceplate Diagram of the 4066K Network

for precision balancing when the 2-wire facility is MAT cable (see Fig. 4A). The resulting hybrid balance produces a high loss from one side of a 4-wire circuit to the other side of the 4-wire circuit to minimize "singing" and undesirable oscillations in the 4-wire loops.

**4.02** The 4066K may also be used as a reference impedance and as a termination in making structural return loss measurements for MAT facilities. The diagram in Fig. 4B illustrates these

applications. The networks designated ① and ② are set using the values in Table A; the termination network ③ is set in accordance with Table B.

**4.03** A BOC is required in addition to the 4066K network in each application. The BOC can be either external, such as the 4066C, or the self-contained BOC in the 1-type terminating set. Tables A and B also include prescription settings for the BOC which is required with each application of the 4066K network.

\* TABLE A

## 4066K NETWORK AND EXTERNAL BOC SETTINGS

†END SECTION (kft)	*SCREWS TURNED IN	BOR (OHMS)	BOC REQUIRED ( $\mu$ F)
1.50	CDEF	10	.006
1.75	ABCEF	28	.009
2.00	ABEF	42	.012
2.25	BCDF	60	.015
2.50	ADF	77	.017
2.75	ACF	91	.020
3.00	AF	105	.022
3.25	ABDE	119	.025
3.50	BCE	136	.027
3.75	BE	150	.030
4.00	BCD	165	.032
4.25	AD	182	.034
4.50	BC	193	.036

\* These settings are applicable for 4066K networks used either as a precision balancing impedance with a 1-type term set ( ① in Fig. 4A) or as a reference termination when making structural return loss measurements ( ② in Fig. 4B).

† End nearest Repeater or Return Loss Measuring Set.

\* TABLE B

## 4066K NETWORK AND EXTERNAL BOC SETTINGS

†END SECTION (kft)	*SCREWS TURNED IN	BOR (OHMS)	BOC REQUIRED ( $\mu$ F)
1.50	BC	193	.036
1.75	AD	182	.034
2.00	BCD	165	.032
2.25	BE	150	.030
2.50	BCE	136	.027
2.75	ABDE	119	.025
3.00	AF	105	.022
3.25	ACF	91	.020
3.50	ADF	77	.017
3.75	BCDF	60	.015
4.00	ABEF	42	.012
4.25	ABCEF	28	.009
4.50	CDEF	10	.006

\* These settings are applicable to 4066K networks used to terminate MAT cable for making structural return loss measurements ( ③ in Fig. 4B). The 4066K network is located opposite the end of the cable in which the RLMS is located.

† Distant end from Return Loss Measuring Set.

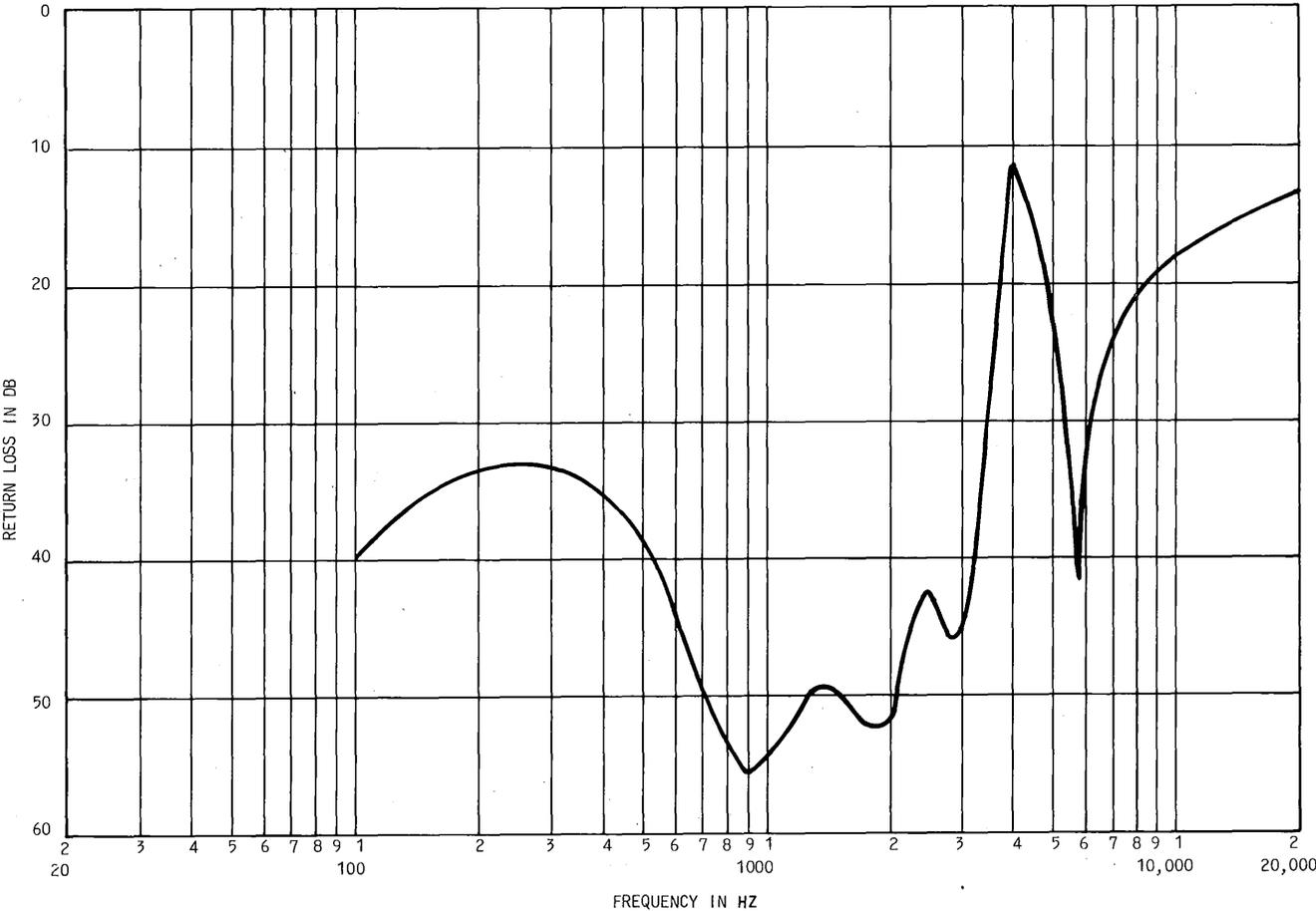


Fig. 2—4066K Network—Return Loss Vs 25H88 MAT Cable—End Section = 3000 Feet

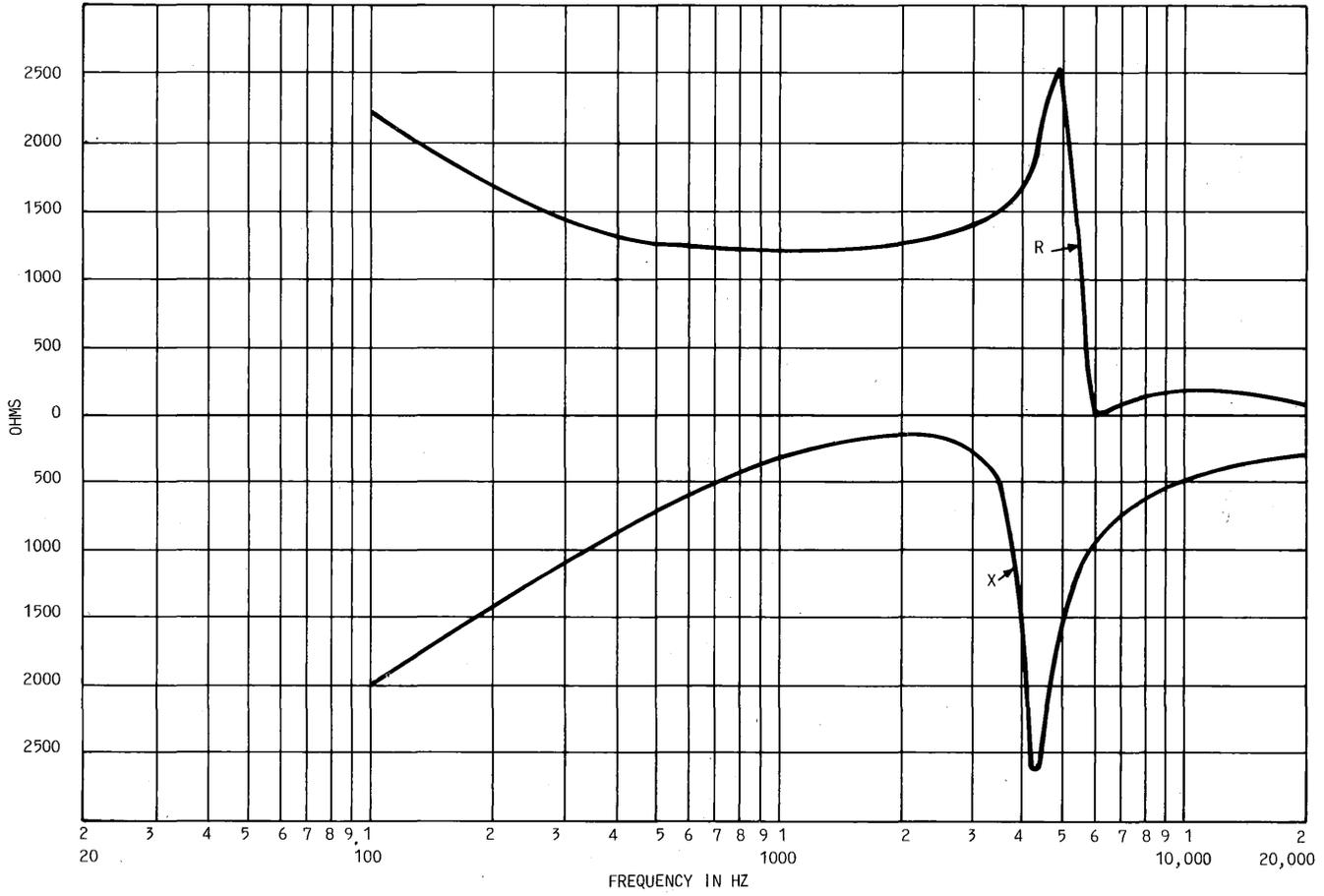
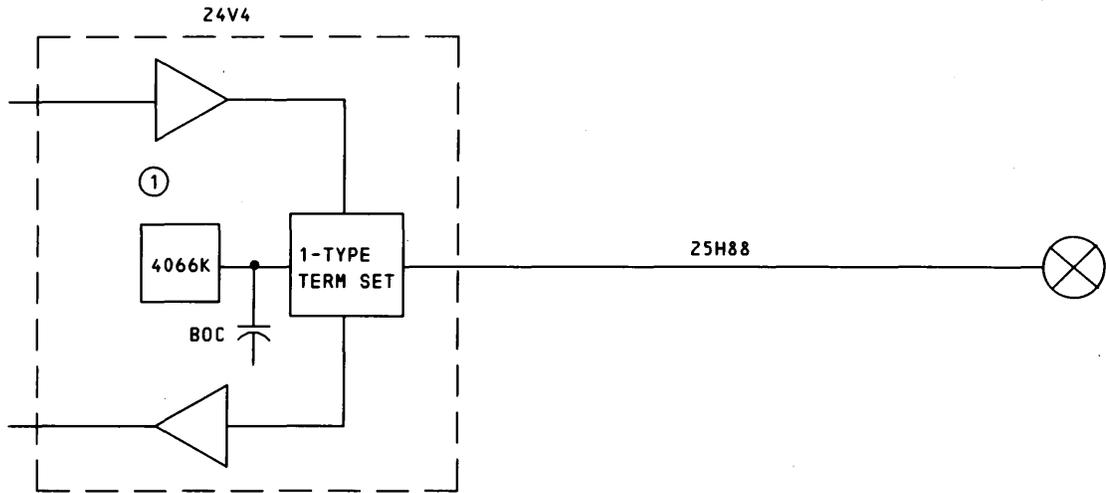
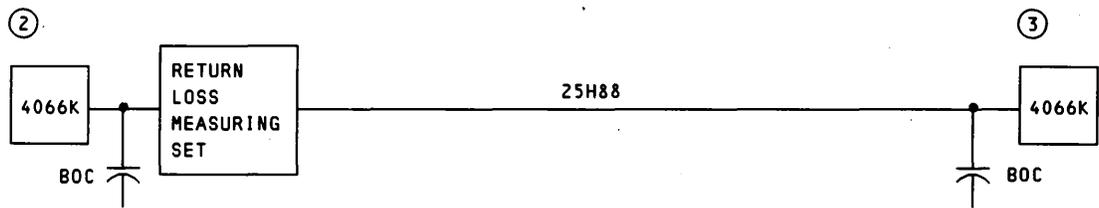


Fig. 3—4066K Network—Simulating Midsection Impedance of 25H88 MAT Cable



A. 4066K NETWORK USED AS PRECISION BALANCING IMPEDANCE WITH THE 24V4 REPEATER



B. 4066K NETWORKS USED IN MAKING STRUCTURAL RETURN LOSS MEASUREMENTS:  
 (2) AS A REFERENCE IMPEDANCE; (3) AS A TERMINATION

Fig. 4—Applications of the 4066K Network