53A-342 DUAL RESISTANCE PROGRAMMING CARD

OPERATING MANUAL

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DESCRIPTION

The 53A-342 Dual Resistance Programming (DRP) Card is a printed circuit board assembly for use in a CDS 53/63 Series System. The DRP Card has two sets of programmable resistors, labeled "A" and "B", each programmable in one thousand resistance steps (three decades). The minimum step sizes may be adjusted from 10 ohms to 100 ohms. Using a minimum step size of 10 ohms, and 8 4 2 1 BCD weighting per decade, will result in a maximum output resistance of 9,990 ohms. If a 100 ohms minimum step size were used, and again 8 4 2 1 BCD weighting per decade, the maximum output resistance would be 99,900 ohms.

CONTROLS AND INDICATORS

The following controls and indicators are provided to select and display the functions of the 53A-342 Card's operating environment.

Address Select Switch

The 53A-342 Card has a miniature 10-position switch which selects the card's address (0-9) in the 53/63 Series System. Open the switch's cover and use a screwdriver with a narrow, flat blade to turn the cam-action wiper to the desired position.

Stop Jumper

The Stop jumper is used to select the state of the DRP Card after a STOP command is received by the 53A System. Place the jumper over the pins as indicated for the desired result:

    a.   In position Z, the programmable resistors will reset to ZERO output value after a STOP has been received.

    b.   In position H, the programmable resistors will HOLD their present output setting after a STOP has been received.

LED Indicator

Located above the front edge connector of the DRP Card is an LED indicator which will light when power is applied to the 53/63 system. The LED indicator will extinguish whenever this Card is addressed, and remain out until the Control Card detects another @ character.

SPECIFICATIONS

Type Resistors:
Two sets of three decade programmable resistors, each set consisting of 12 variable cermet resistors. Individual resistors are 3/4 watt, twenty turn resolution.

Minimum Resistance Step:
Variable from 10 ohm to 100 ohms.

Maximum Resistance:
Adjustable from 9,990 ohms to 99,900 ohms per set of programmable resistors.

Maximum Switching Current:
250 mA

Programming Speed:
100 steps/sec. Zero to full scale steps.

Resolution:
3 significant digits

Absolute Accuracy:
1.0% of full scale

Tempco:
$\pm.01\%/°C$

Power Requirements:
4.75 to 5.25 V DC at 1.5 amps maximum

Temperature:
-10°C to +65°C, operating (assumes ambient temperature of 55° and airflow to assure less than 10°C temperature rise).
-40°C to +85°C, storage.

Humidity:
Less than 95% R.H. noncondensing, -10°C to +30°C.
Less than 75% R.H. non-condensing, +31°C to +40°C.
Less than 45% R.H. non-condensing, +41°C to +55°C.

Dimensions:
197 mm High, 220 mm Deep, 13 mm Wide
(7.75" x 8.66" x 0.5")

Dimensions, Shipping:
When ordered with a 53/63 Card Cage, the card is installed in one of the card cage's function-card slots.

When ordered alone the shipping dimensions are:
254 mm x 254 mm x 127 mm
(10" x 10" x 5")

Weight:
0.23Kg. (0.5 lbs.)

Weight, Shipping:
When ordered with a 53/63 Card Cage, the card is installed in one of the card cage's function-card slots.

When ordered alone the shipping weight is:
0.64 Kg. (1.4 lbs.)

Mounting Position:
Any orientation.

Mounting Location: Installs in any function-card slot of the 53/63 Series Card
Cage.

Required Equipment: A 53A-780 Hooded Connector is required with this card.

Equipment Supplied: 53A-342 Dual Resistance Programming Card
Spare Fuse (Part #42202-52001)
Operating Manual (Part #00000-13420)
Service Manual (Part #00000-23420)

OPERATION

The 53A-342 Card is programmed by ASCII characters issued from the system controller to the 53/63 System's communications card. The 53A-342 Card is interfaced to the communications card through the 53 Series or 63 Series Card Cage's backplane.

To address a function card for the first time, the system command @XY must be issued. X is the card cage address (0-9) selected on the 53A-171 Control Card in the addressed card cage; Y is the 53A-342 Card's address (0-9) within the addressed card cage. The 53A-342 Card's address is selected using the card's Address Select switch. Once a function card is addressed, it remains addressed until the system receives another @ character. After the 53A-342 Card is addressed, the commands listed below may be issued until another function card is addressed.

Command	Description

@XY   The @XY (Address) command addresses a function card in the 53/63 Series System.

@ is a delimiter used by the 53/63 Series System.

X is a card cage address (0-9) defined by the Address Select switch on the 53A-171 Control Card in the addressed card cage.

Y is a function-card address (0-9) defined by the Address Select switch on the function card. Once a card cage/function-card combination is addressed, it remains addressed until the 53/63 Series System detects a new @ character.

S   This command is used to select the programmable resistance.

Syntax: $@XYNZ_1Z_2Z_3S$

N   selects the resistors. If the upper set is to be programmed, N = A. If the lower set is to be programmed, N = B.

$Z_1Z_2Z_3$ A three-digit number (000 to 999) represented by $Z_1Z_2Z_3$ selects the resistance value to be programmed.

S   The S is used to STROBE the information to the output of the card.

STOP   The STOP command is not a string of ASCII characters. This command is hard-wired from the system controller to the 53/63 System's communications card in each card cage. When the system controller issues a STOP command, each function card (including the 53A-342 Card) reacts as if it had received the @XH command described above.

How the system controller executes a STOP command depends on the communications card used. For example, when using the 53A-128 IEEE-488 Communications Card, a STOP command is executed whenever the system controller asserts the IEEE-488 bus line IFC (Interface Clear) true.

Power Up

When power is initially applied to the 53A-342 DRP Card, the output value of both the A and B programmable resistors is zero ohms.

CAUTION:

The maximum allowable power dissipation in any of the variable cermet resistors is 3/4 watts. This is equivalent to 2.7 mA, worst case, through an 80K variable resistor (the maximum variable resistor value for the card when a 100 ohm step size is used).

INSTALLATION

The 53A-342 DRP Card is a function card; therefore, it may be plugged into any <u>blue</u> card slot. Setting the Address Select switch defines the card's programming address. To avoid confusion, it is recommended that the slot number and the programming address be the same.

CAUTION:
To avoid plugging the card in backwards, observe the following:

a. Match the keyed slot on the card to the key in the backplane connector. The component side should be to the <u>right</u> for a 53 Series Chassis and to the <u>top</u> for a 63 Series Chassis.

b. There are two ejectors on the card. Make sure the ejector marked "53A-342" is at the <u>top</u> for a 53 Series Chassis and to the <u>left</u> for a 63 Series Chassis.

CAUTION:
The 53A-342 Card is a piece of electronic equipment and therefore has some susceptibility to electrostatic damage (ESD). ESD precautions must be taken whenever the module is handled.

APPENDIX A

OUTPUT CONNECTOR

The programmed resistance value may be accessed at the card edge connector using a hooded edge connector such as the 53A-780. The connector pin assignments are as follows:

PIN NUMBER/LETTER	SIGNAL
P	Contact 1, A Resistor
B	Contact 2, A Resistor
R	Contact 1, B Resistor
AA	Contact 2, B Resistor

APPENDIX B

CALIBRATION

The 53A-342 Card must be calibrated every 12 months in order for the card to meet its published accuracy specifications. Calibrate the 53A-342 Card in an environment where the temperature is between 21° and 25°C. If this is not feasible, or the card will be operating under a wide temperature variation, consult the temperature drift specifications. Allow a ten minute warm-up period before performing the calibration.

Calibrate both the A and B resistor sets using the following procedure:

1. Choose a minimum step size.

2. Program a 001S and adjust potentiometer #1 to the minimum resistance step size.

3. Program a 002S and adjust potentiometer #2 to twice the minimum resistance step size.

4. Using this same procedure, program a 004S, 008S, 010S, 020S, 040S, 080S, 100S, 200S, 400S, 800S and adjust potentiometers #3 through #12 to 4, 8, 10, 20, 40, 80, 100, 200, 400 and 800 times the minimum step size.

NOTE: The A set is the top twelve resistors on the card.

APPENDIX C

APPLICATION INFORMATION

The DRP card may be used to resistively program power supplies for both voltage and current.

If Hewlett Packard supplies are to be programmed, the supplies must be ordered with Option #040. This option prevents excessive current from flowing in the DRP Card resistors. Programming a Hewlett Packard supply without this option will cause extensive damage to the DRP Card.

If other manufacturers supplies are to be used, it is recommended the vendor be contacted regarding the total power and current handling requirements of remote programming resistors. Current handling requirements must take into account any capacitive input filtering on the supply connections. Current transients in excess of the maximum switching current rating of the DRP Card will damage the card.