BROADCAST AND TELEVISION EQUIPMENT

RCA

Instructions

RADIO CORPORATION OF AMERICA,
Broadcast and Communications Products

Colorplexer Aperture Compensator

MI-40414

Tmk(s)®

IB-36243-2

EQUIPMENT LOST OR DAMAGED IN TRANSIT

When delivering the equipment to you, the truck driver or carrier's agent will present a receipt for your signature. Do not sign it until you have (a) inspected the containers for visible signs of damage and (b) counted the containers and compared with the amount shown on the shipping papers. If a shortage or if evidence of damage is noted, insist that notation to that effect be made on the shipping papers before you sign them.

Further, after receiving the equipment, unpack it and inspect thoroughly for concealed damage. If concealed damage is discovered, immediately notify the carrier, confirming the notification in writing, and secure an inspection report. This item should be unpacked and inspected for damage WITHIN 15 DAYS after receipt. Report all shortages and damages to RCA, Broadcast and Television Department, Camden 2, N. J.

Radio Corporation of America will file all claims for loss and damage on this equipment so long as the inspection report is obtained. Disposition of the damaged item will be furnished by RCA.

REPLACEMENT PARTS AND ENGINEERING SERVICE

RCA field engineering service is available at current rates. Requests for field engineering service may be addressed to your RCA Broadcast Field Representative or the RCA Service Company, Inc., Broadcast Service Division, Camden, N. J. Telephone: WOodlawn 3-8000.

When ordering replacement parts, please give symbol, description, and stock number of each item ordered.

The part which will be supplied against an order for a replacement item may not be an exact duplicate of the original part. However, it will be a satisfactory replacement differing only in minor mechanical or electrical characteristics. Such differences will in no way impair the operation of the equipment. Parts with no stock numbers are standard components. They are not stocked by RCA and should be obtained from your local electronic parts distributor.

The following tabulations list service parts and electron tube ordering instructions according to your geographical location.

SERVICE PARTS

LOCATION	ORDER SERVICE PARTS FROM:
Continental United States, including Alaska and Hawaii	RCA Parts and Accessories Department, P.O. Box 654, Camden, New Jersey or through your nearest RCA Regional Office. Emergency orders may be telephoned, telegraphed, or teletyped to RCA Emergency Service, Bldg. 60, Camden, N. J. (Telephone: WO 3-8000).
Dominion of Canada	RCA Victor Company Limited, 1001 Lenoir Street, Montreal, Quebec or through your local Sales Representative or his office.
Outside of Continental United States, Alaska, Hawaii and the Dominion of Canada	RCA International Division, Clark, N. J., U.S.A. or through your local Sales Representative.

ELECTRON TUBES

LOCATION	ORDER ELECTRON TUBES FROM:
Continental United States, including Alaska and Hawaii	Local RCA Tube Distributor.
Dominion of Canada	RCA Victor Company Limited, 1001 Lenoir Street, Montreal, Quebec or through your local Sales Representative or his office.
Outside of Continental United States, Alaska, Hawaii and the Dominion of Canada	Local RCA Tube Distributor or from: Tube Department RCA International Division 30 Rockefeller Plaza New York 20, New York, U.S.A.

RETURN OF ELECTRON TUBES

If for any reason, it is desired to return tubes, please return them through your local RCA tube distributor, RCA Victor Co. Ltd., or RCA International Div., depending on your location.

Please do not return tubes directly to RCA without authorization and shipping instructions.

It is important that complete information regarding each tube (including type, serial number, hours of service and reason for its return) be given. When tubes are returned, they should be shipped to the address specified on the Return Authorization form. A copy of the Return Authorization and also a Service Report for each tube should be packed with the tubes.

LIST OF RCA SALES OFFICES

Atlanta 3, Georgia
1121 Rhodes-Haverty Bldg.
134 Peachtree St. N.W.
524-7703

Dedham, Mass.
Dedham Office Park
866 Washington St.
DAvis 6-8850

Camden 2, N. J.
Building 15
WOodlawn 3-8000

Charlotte 4, N. C.
504 Charlottetown Mall
333-3996

Chicago 54, Ill.
Merchandise Mart Plaza
Room 2000 — 467-5900

Cleveland 15, Ohio
1600 Keith Bldg.
CHerry 1-3450

Dallas, Texas
7901 Carpenter Freeway
MElrose 1-3050

Detroit 39, Mich.
12605 Arnold St.
KEnwood 4-5100

Hollywood 28, Calif.
RCA Bldg., 1560 N. Vine St.
HOllywood 9-2154

Indianapolis, Ind.
501 N. LaSalle St.
MElrose 6-5321

Kansas City 14, Missouri
7711 State Line Road
EMerson 1-6770

Memphis, Tenn.
3189 Summer Ave.
FAirfax 4-4434

New York 20, New York
36 W. 49th St.
MU 9-7200

Portland 12, Oregon
1841 N.E. Couch St.
232-5343

San Francisco 2, Calif.
420 Taylor St.
ORdway 3-8027

Seattle 4, Washington
2250 First Ave., S.
MAin 2-8350

Washington 6, D. C.
1725 K St., N.W.
FEderal 7-8500

West Palm Beach, Fla.
645 S. Military Trail
683-2219

INSTRUCTIONS

Colorplexer Aperture Compensator

MI-40414

RADIO CORPORATION OF AMERICA

BROADCAST AND COMMUNICATIONS PRODUCTS, CAMDEN, N. J.

Printed in U.S.A.
GO 633

IB-36243-2

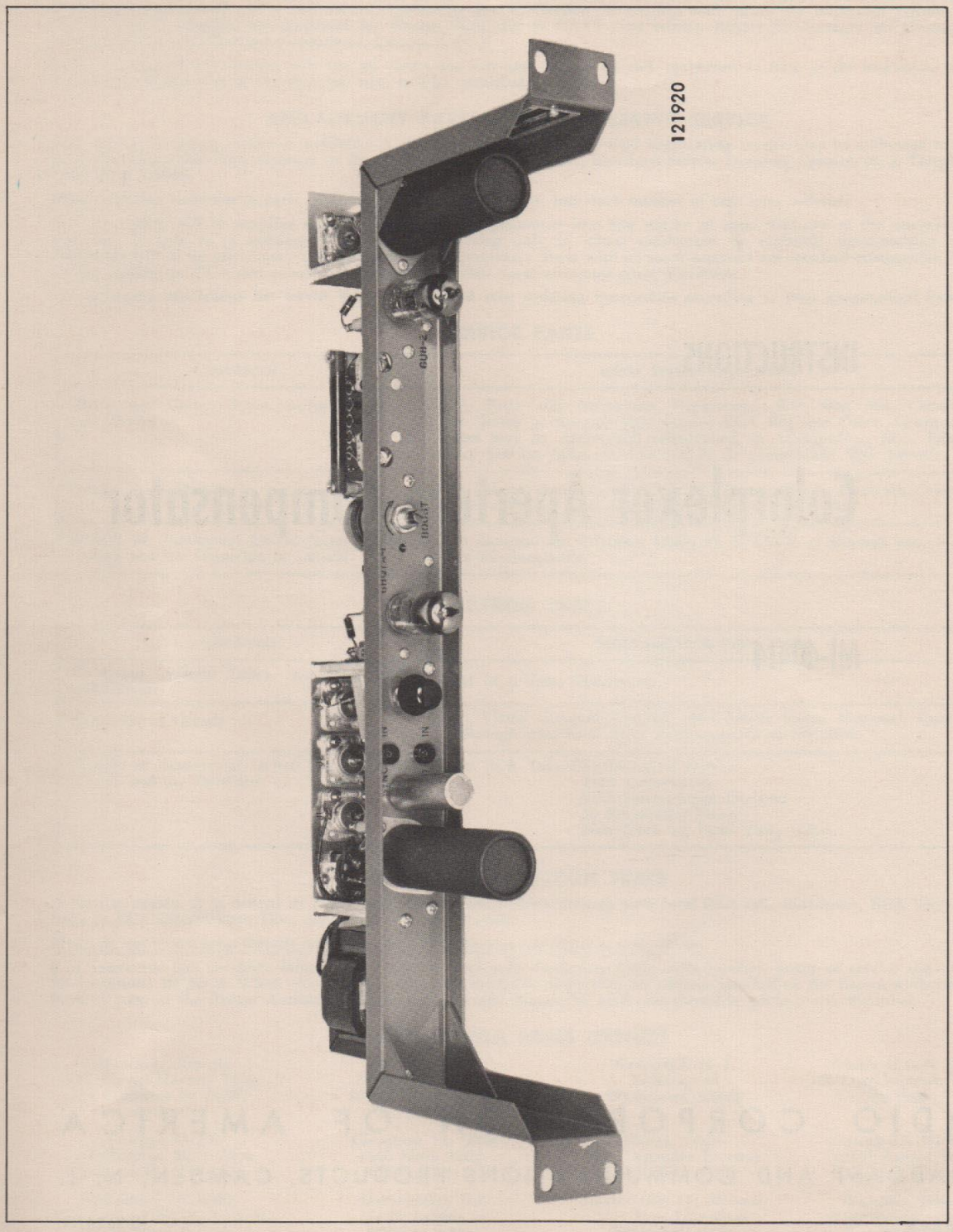

Figure 1—Front View, Colorplexer Aperture Compensator

TECHNICAL SUMMARY

ELECTRICAL SPECIFICATIONS

Input Power

AC: 117 volts, 50/60 cycles, 10 watts
DC: +280 volts regulated, 33 milliamperes

Input Signals

A. Sync
Impedance: High (bridging)
Level: 3.5 to 4 volts peak-to-peak (negative)

B. Monochrome Video (from Colorplexer output)
Impedance: 1000 ohms
Level: 0.5 volt black-to-white (approximately)

Output (Composite monochrome and sync)

Impedance: 1000 ohms
Level: 0.5 volt peak-to-peak (approximately)

MECHANICAL SPECIFICATIONS

Height:	1¾ inches
Overall Length:	19 inches
Depth:	7 inches
Weight:	3 pounds

TUBE COMPLEMENT

Symbol No.	*RCA Type*	*Function*
V1	6BQ7A	Differential Amplifier
V2	6U8A	Sync Mixer and Output Amplifier

EQUIPMENT

The Colorplexer Aperture Compensator, MI-40414, consists of the following:

1. Colorplexer Aperture Compensator including tubes in place.

2. Cable assembly.

RECOMMENDED TEST EQUIPMENT

The following test equipment is recommended to facilitate adjustment and maintenance of the RCA Colorplexer Aperture Compensator:

VoltOhmyst, RCA Type WV-97A
Oscilloscope, RCA Type TO-524
Sweep Generator and Detector
1000 ohm Termination

DESCRIPTION

General

The MI-40414 Colorplexer Aperture Compensator is for use in conjunction with the TX-1 series Colorplexers. The aperture compensator is used to compensate for the finite size of the electron scanning beam in a signal pickup device such as an image orthicon color camera, a flying spot scanner, or vidicon color film camera.

The compensator unit is connected electrically and mechanically with the colorplexer, and no other aperture compensator is necessary in the system.

Since the monochrome channel is a wide-band channel and the I and Q channels are narrow-band, it is necessary to apply aperture compensation only to the monochrome channel. It is not desirable to aperture compensate the sync signal, therefore provision is made for adding sync after compensation.

Circuit

The circuit consists of a differential amplifier, V1, which feeds an open circuit artificial transmission line (delay line), DL1. The open circuited end of the transmission line is connected to the grid of the output amplifier, V2, which drives the monochrome delay cable. Part of the plate load of the output amplifier is common to the sync amplifier tube, thus sync is added to the monochrome signal at this point.

INSTALLATION

Location

The colorplexer aperture compensator should be mounted in a standard 19-inch rack directly above the colorplexer chassis.

Wiring

Make the ac and dc input line connections to the 6-pin plug supplied with the aperture compensator. The other end of the wires from this plug may be connected to a suitable source of ac and dc power.

Interconnections

Interconnect the colorplexer aperture compensator with the colorplexer as shown on Figure 4.

The 14-inch cable is supplied with the aperture compensator; the other cable is supplied with the colorplexer.

Initial Adjustments

Sync Gain — Adjust this control to obtain a sync signal that is 40% of the black-to-white signal at the output of colorplexer.

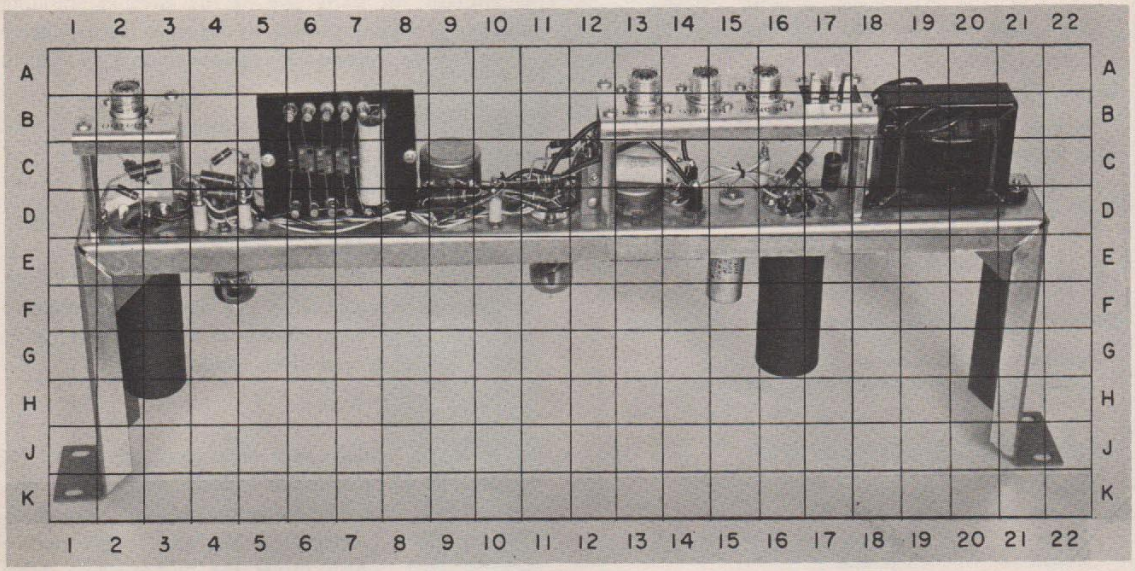

Figure 2—Rear View, Colorplexer Aperture Compensator

FIGURE 2. COMPONENT LOCATION TABLES

By Coordinates

A13 -J3	C4 -R21	C13-C1	D5*-C10
A14 -J2	C5 -R3	C13-C11	D8*-C6
A16 -J1	C6 -R8	C14-J6	D9 -R16
A17 -J5	C6 -C9	C16-R9	D9 -R12B
B2 -J4	C6 -C8	C17-R22	D11-R17
B6 -DL1	C7 -C7	C19-T1	D11-R19
B13*-R13	C7 -R11	D2 -R10	D11-XV1
C2 -L1	C7 -C5	D3 -R6	D13-R1
C3 -R4	C9 -R12A	D3 -C4	D14-J7
C3 -C2	C11-R2	D4 -R7	D15-C12
C4 -R5	C12-R14	D4 -XV2	D16-C13

* Cannot be seen in photograph.

By Symbol Number

Cap.	C13-D16	R3 -C5	R14-C12
C1 -C13	**Conn.**	R4 -C3	R15-D11
C2 -C3	J1 -A16	R5 -C4	R16-D9
C4 -D3	J2 -A14	R6 -D3	R17-D11
C5 -C7	J3 -A13	R7 -D4	R18-D11
C6 -D8*	J4 -B2	R8 -C6	R19-D11
C7 -C7	J5 -A17	R9 -C16	**Misc.**
C8 -C6	J6 -C14	R10 -D2	DL1-B6
C9 -C6	J7 -D14	R11 -C7	L1 -C2
C10-D5*	**Res.**	R12A-C9	T1 -C19
C11-C13	R1 -D13	R12B-D9	XV1-D11
C12-D15	R2 -C11	R13 -B13*	XV2-D4

The video signal level is adjustable by the OUTPUT GAIN control in the colorplexer.

Boost Control — This control should be adjusted for the best picture obtainable consistent with the maximum tolerable noise.

Delay Line — Capacitors C6 and C10 have been adjusted at the factory and should not require adjustment unless tubes are changed. For adjustment procedure, see the Maintenance section.

OPERATION

When connected as specified in the wiring instructions, the aperture compensator will be placed in operation when power is applied to the ac and dc input lines since there are no operating controls on the colorplexer aperture compensator.

MAINTENANCE

General

The MI-40414 Colorplexer Aperture Compensator has been designed for conservative operation of all components. With reasonable care and routine maintenance, long life and trouble-free operation should result.

Check the tubes regularly in a mutual conductance tube checker, replacing those below normal or otherwise defective. A log of readings for each tube will help to anticipate their failure by comparison with previous readings.

Adjustment of C6 and C10

Capacitors C6 and C10 have been adjusted at the factory and should not require readjustment except when tubes are changed. To adjust the capacitors proceed as follows:

1. Disconnect the "SYNC IN" cable, then connect the terminated sweep generator cable to the "MONO IN" jack, J3.

2. Using a diode detector and oscilloscope observe the output at the "MONO AND SYNC OUT" jack, J4, terminated in 1000 ohms.

3. Turn the BOOST control, R12, to its maximum counterclockwise position, adjust the output of the sweep for approximately 0.5 volt peak-to-peak. The gain at the one-megacycle point on the response curve should be approximately unity.

4. Adjust C6 and C10 to obtain a response curve similar to that shown in Figure 3.

5. Disconnect the test equipment and termination, reconnect the input and output cables, and readjust the BOOST control as explained under Initial Adjustments.

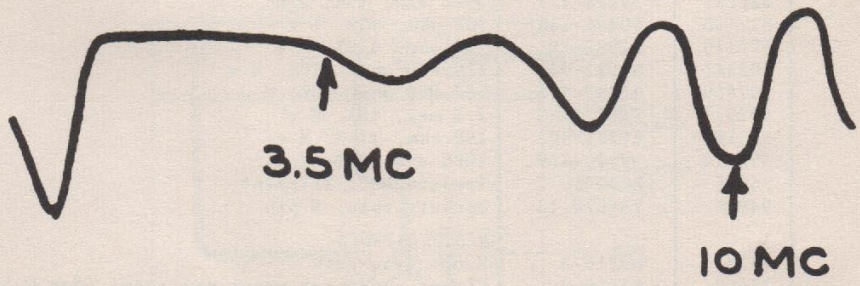

Figure 3—Response Curve for C6 and C10 (8905201, sub 0)

TABLE 1. VOLTAGE MEASUREMENTS

Tube	*Pin Number**								
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
6BQ7A (V1)	280	75	80	0	6.6*	280	70	80	–
6U8A (V2)	195	—0.02	114	0	6.6*	180	1.44	5.0	0

* All measurements are made between the indicated pin and ground. Measurements made at pin 5 of each socket are ac, all others are dc.

PARTS LIST

Symbol No.	Stock No.	Drawing No.	Description
COLORPLEXER APERTURE COMPENSATOR, MI-40414			
			CAPACITORS:
C1	206322	737816-15	paper, 0.22 mf, ±10%, 100 v
C2	98947	737817-327	mica, 68 mmf, ±5%, 500 v
C4	206013	458557-7	dry, electrolytic, 20 mf, +100% -10%, 450 v
C5	217265	737816-93	paper, 0.1 mf, ±10%, 400 v
C6	57602	984003-7	variable, 4.5/25 mmf, 500 v
C7 thru C9	206324	741632-127	mica, 68 mmf, ±1%, 500 v
C10	54221	984003-5	variable, 7/45 mmf, 500 v
C11	209076	737816-53	paper, 0.1 mf, ±10%, 200 v
C12	207343	737863-333	paper, 0.47 mf, ±10%, 400 v
C13	204706	458557-13	electrolytic, 30/20/10 mf, 350 v
DL1	207154	8901242-501	Delay Line
J1 thru J4	51800	255223-2	Connector: coaxial
J5	28507	181494-3	Connector: male, 6 contacts
J6,J7	205675	8825493-3	Connector: jack, black
L1	99299	8816186-1	Reactor: RF choke, inductance 13 microhenry, ±5%
P1 thru P4	66344	252868-1	Connector: coaxial
P5	95555	449614-7	Connector: female, 6 contacts
			RESISTORS:
			Fixed, Composition - unless otherwise specified
R1	95754	433196-11	variable, 2000 ohm, ±10%, 2 w
R2	502510	82283-98	1 meg, ±10%, ½ w
R3	512247	90496-175	4700 ohm, ±5%, 1 w
R4	512210	90496-62	1000 ohm, ±10%, 1 w
R5	512256	90496-177	5600 ohm, ±5%, 1 w
R6	512115	90496-139	150 ohm, ±5%, 1 w
R7	512247	90496-175	4700 ohm, ±5%, 1 w
R8	502110	82283-50	100 ohm, ±10%, ½ w
R9	512368	90496-84	68,000 ohm, ±10%, 1 w
R10	33572	82283-162	1300 ohm, ±5%, ½ w
R11	502510	82283-98	1 meg, ±10%, ½ w
R12A/B	99065	427966-14	variable, 250/250 ohm, ±20%, 2 w
R13	502210	82283-159	1000 ohm, ±5%, ½ w
R14	502110	82283-50	100 ohm, ±10%, ½ w
R15	522239	99126-173	3900 ohm, ±5%, 2 w
R16	512130	90496-146	300 ohm, ±5%, 1 w
R17	502110	82283-50	100 ohm, ±10%, ½ w
R18	502447	82283-94	470,000 ohm, ±10%, ½ w
R19	502456	82283-225	560,000 ohm, ±5%, ½ w
R20	502515	82283-235	1.5 meg, ±5%, ½ w
R21	502110	82283-50	100 ohm, ±10%, ½ w
R22	522210	99126-159	1000 ohm, ±5%, 2 w
T1	95915	8878960-2	Transformer: filament
XV1,XV2	94926	737870-14	Socket: tube, 9 pin
			MISCELLANEOUS:
	4323	69916-3	Knob: sync gain
	18468	85559-2	Plate: capacitor mounting, steel (for C3)
	28452	85558-2	Plate: capacitor mounting, phenolic (for C4)

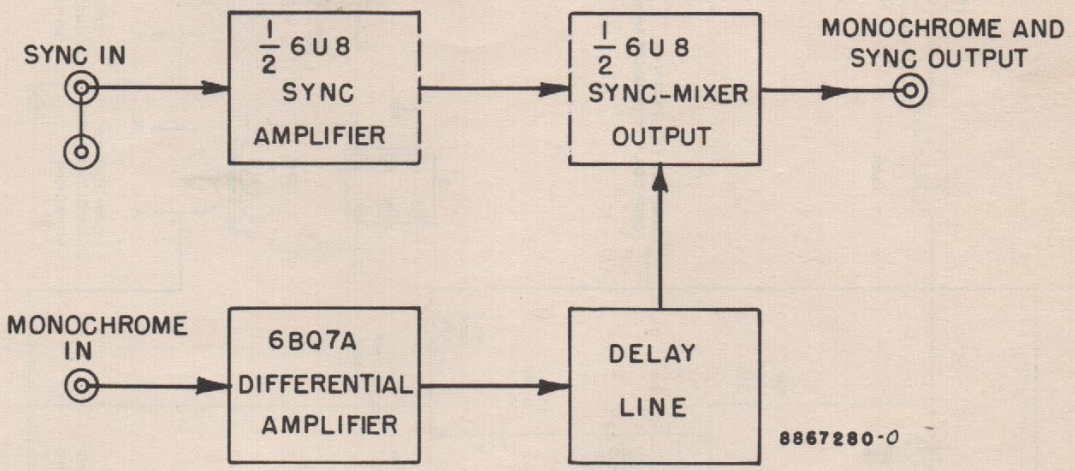

Figure 4—Block Diagram, Colorplexer Aperture Compensator (8867280, sub 0)

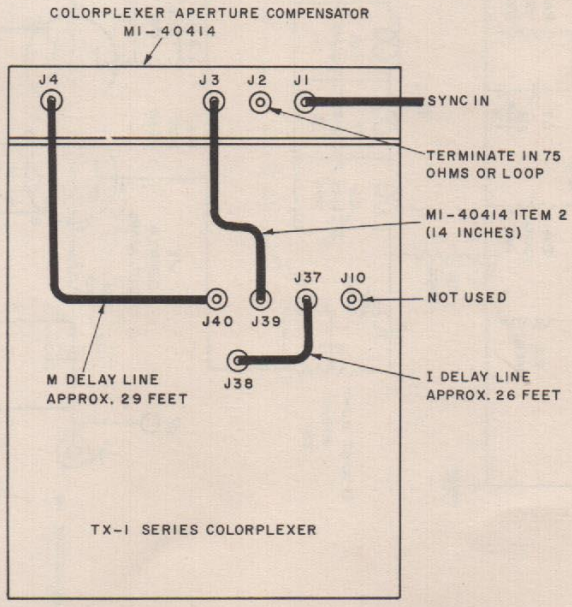

Figure 5—Interconnection Diagram, Aperture Compensator and Colorplexer (485243, sub 0)

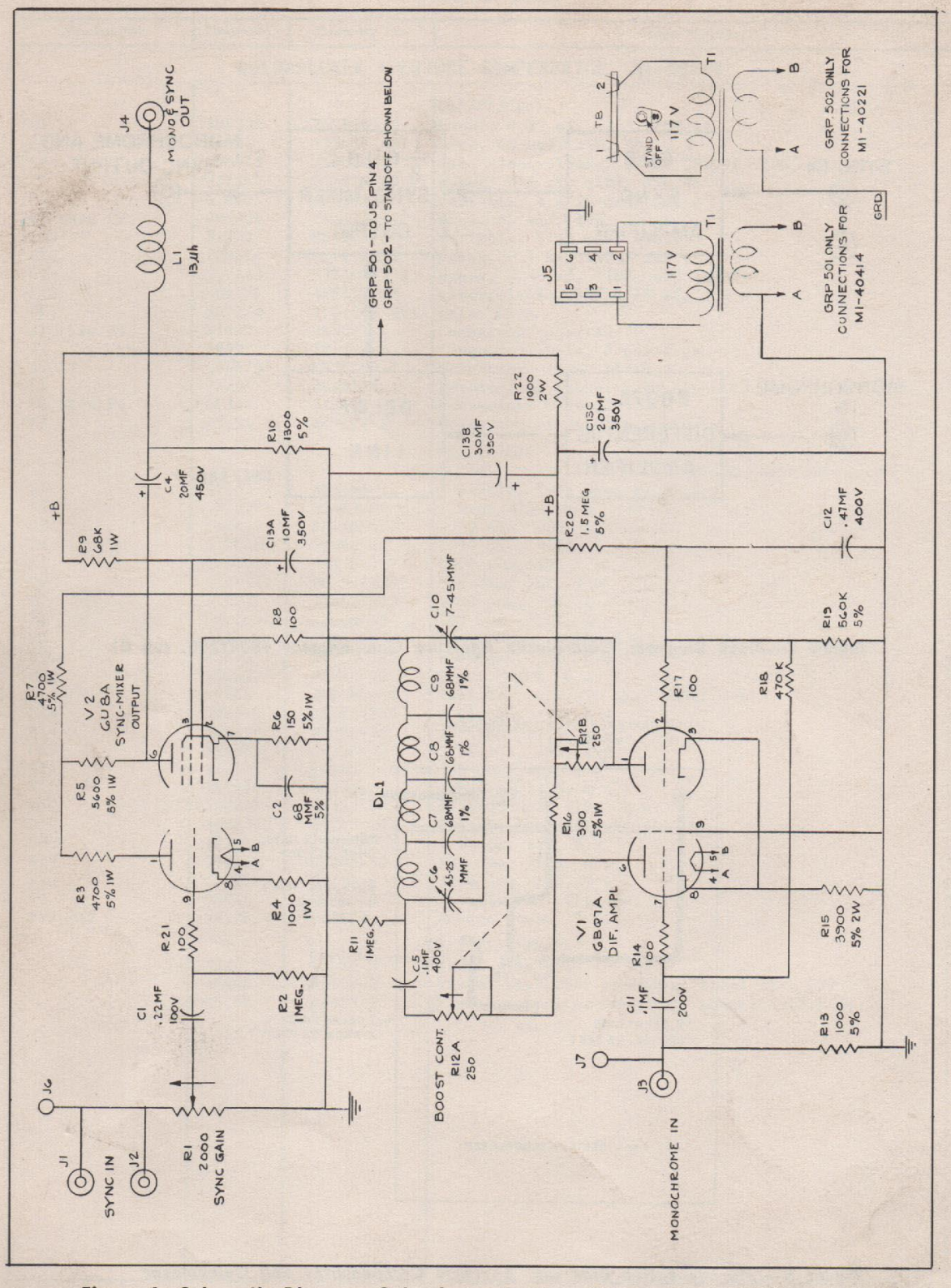

Figure 6—Schematic Diagram, Colorplexer Aperture Compensator (752083, sub 1)

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