SECTION 1
EQUIPMENT DESCRIPTION

INTRODUCTION

The Super 2MR Portable Microwave Receiver (Figure 1-1) is a self-contained, wideband, frequency agile Receiver that offers a combination of outstanding performance, reliability, and functional features unmatched by any other Receiver in the industry. The dual conversion Super 2MR Receiver provides full frequency agility across the 2 GHz and 2.5 GHz bands, all inclusive, meeting the needs of both domestic and international customers.

Low noise preamplifiers are standard providing a typical overall Receiver noise figure of 2 dB. Adjacent channel rejection is extremely high, and superior dynamic range permits high quality performance over a wide range of RF input levels.

The Super 2MR Receiver delivers a filtered video output, a composite baseband (or 70 MHz IF output) and two 600 ohm balanced audio outputs.

This self-contained unit is not only ideal for broadcast ENG applications that require high mobility and quick response, but its exceptional performance allows its use for network programming, emergency resotration, and airborne or intercity repeater applications where broadcast quality performance is essential.

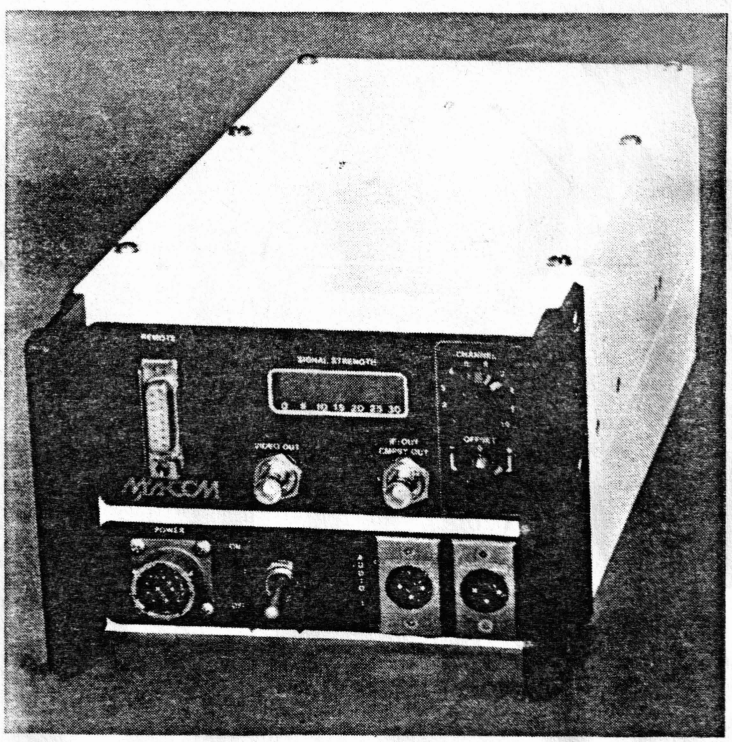


Figure 1-1. Super 2MR Receiver

DESCRIPTION

The Super 2MR features a superior RF front end design, which includes a high dynamic range LNA, and a tracking RF filter (Figure 1-2). This gives the user the ability to receive a weak desired signal, even in the presence of strong interfering signals.

A 30-channel synthesizer for multichannel flexiblity across the 2 GHz and 2.5 GHz bands, inclusive. M/A-COM's unique channel selection scheme provides the unit with a rapid and precise channel selection capability.

The Super 2MR Receivers are equipped with dual, frequency agile synthesized audio demodulators. The totally new synthesized demodulators not only provide the flexibility of field programmability to any subcarrier frequencies, but also provide exceptional audio performance.

AC/DC POWER

The Super 2MR Receiver can operate from an ac or dc power sources without the need for modification or external inverters. The built-in ac/dc power supply allows operation from 12 to 28 Vdc sources or 115/230 Vac sources.

RUGGED, WEATHER-RESISTANT ENCLOSURE

The Super 2MR Receiver electronics are enclosed in a rugged weather-resistant case designed to function reliably under the most adverse field conditions. All connectors, switches and indicators are weatherproof and designed to stand up to rugged use.

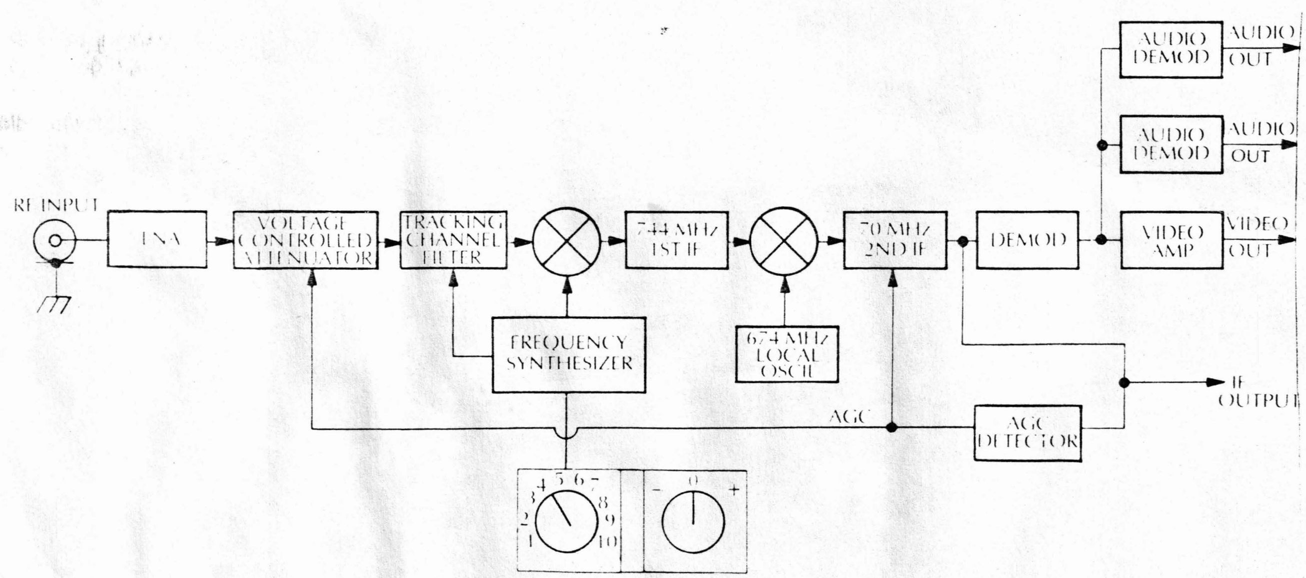


Figure 1-2. Super 2MR Receiver – Simplified Block Diagram

SECTION 2
SPECIFICATIONS

GENERAL

Type	superheterodyne, frequency agile, dual conversion
Radio Capacity	525/625 line video plus two audio channels
Frequency Range	
Domestic	1.990 to 2.110 and 2.450 to 2.5 GHz
International	2.3 to 2.7 GHz
Channels	
1.990 to 2.110 and 2.450 to 2.5 GHz	30 channels (10 basic channels w/offset)
2.3 to 2.7 GHz	10 channels
Local Oscillator	digital synthesizer
Frequency Stability	±0.005%
Receiver Noise Figure	2 dB typical, 2.5 dB maximum
IF Bandwidth (70 MHz IF)	
Standard	14 MHz
Optional	20 MHz
Video Outputs	2: one video and one composite baseband
Level	1V P-P
Impedance	75 ohms
IF Output (70 MHz)	
Level	+5 dBm
Impedance	75 ohms
Audio Outputs	2
Level	0 to +18 dBm
Impedance	600 ohms balanced

CONNECTORS (All Weatherproof)

Video	Type BNC
Composite Baseband/IF Output	Type BNC
Audio Output	XLR
RF Output	Type N
Power	Multiple Pin, MS Type
Remote Control	Rectangular Panel

ENVIRONMENTAL

Temperature Range	
Operating (Full Spec)	−20 to +55°C (case temperature)
Relative Humidity	95%
Altitude	
Operational	15,000 feet (4500m)
Storage	50,000 feet (15,000m)

AUDIO PERFORMANCE

Subcarrier Frequencies	Synthesizer controlled, independently field programmable)
Frequency Response	
40 Hz to 15 kHz	±1.5 dB maximum
100 Hz to 10 kHz	±0.5 dB maximum
Harmonic Distortion	0.5% maximum at 75 kHz peak deviation
De-Emphasis	
525 Line	75 μs
625 Line	50 μs
Optional	Flat
Audio Output Level	0 to +18 dBm (TT output)
Audio Impedance	600 ohms balanced
Audio Signal-to-Noise Ratio (RMS/RMS)	
With Pulse and Bar Video Test Signal	
At RCL = −40 dBm	65 dB minimum (w/de-emphasis)

VIDEO PERFORMANCE*

Signal-to-Noise	65 dB minimum
Signal-to-Hum (P-P/RMS)	56 dB

POWER REQUIREMENT

Input Range	11.5 to 32 Vdc inclusive or 115/230 Vac (50 to 60 Hz)

PHYSICAL CHARACTERISTICS

Case	self-contained enclosure w/handle, rugged weather-resistant construction
Color	white w/decorative trim
Controls	all controls and connectors mounted on front panel except RF connector
Size	5″ (h) x 6.5″ (w) x 12″ (d) (12.7 x 16.5 x 30.5 cm)
Weight	14.5 lbs. (6.6 kg)

*Based on 14 MHz IF BW, RCL of −40 dBm and 525 Line CCIR Weighting.
All specifications are subject to change.

Video Performance*

VIDEO PERFORMANCE	COMPOSITE OUTPUT	FILTERED OUTPUT
Frequency Response		
10 kHz to 5.5 MHz	± 0.25 dB maximum	± 0.5 dB maximum
Differential Phase (10-90% APL)	1°	1°
Differential Gain (10-90% APL)	2%	2%
Field Tilt	1 IRE unit	1 IRE unit
Chroma Delay Inequality (RCD)	± 20 ns	± 40 ns
Chroma Gain Inequality (RCL)	± 2 IRE units	± 1 IRE units
Luminance Non-Linearity	2% maximum	2% maximum
Chrominance Intermod	1% maximum	1% maximum
Chroma-Luminance Delay	± 20 nsec	± 20 nsec
Long-Time Distortion (Bounce)	35 IRE units	35 IRE units

SECTION 3
INSTALLATION

SCOPE

The scope of this section is to cover the receiving inspection and a typical installation. Mounting configurations, antenna sizes and shapes are optional and tailored to customer requirements.

UNPACKING AND HANDLING

UNPACKING. Each unit is shipped with all equipment assembled, wired, factory-system tested, and then packaged in appropriate shipping containers.

Care shall be taken when removing equipment from the container to prevent damage to the units. Ensure that all parts and accessories are removed from the container and packing material before they are discarded. Verify that equipment shipped agrees with the equipment list and sales order.

DO NOT discard the container or any packing material until mechanical inspection has been satisfactorily completed. This material must be available if a damage claim is made with the carrier.

MECHANICAL INSPECTION. Inspect the equipment for shipping damage. Make sure that the equipment is clean, and no wires, cables or connectors are broken, damaged or loose.

NOTE

> ***DO NOT*** operate any internal controls as the equipment has been factory adjusted for proper operation prior to shipment and may need only minor adjustment before being placed in service.

DAMAGE IN SHIPMENT. Should any damage be discovered after unpacking the system, immediately file a claim with the carrier. A full report of the damage shall be made and a copy forwarded to M/A-COM MVS, Inc. The company will then advise what disposition is to be made of the equipment.

RETURN AUTHORIZATION. Subject to standard terms of the warranty policy, M/A-COM MVS, Inc. will repair all defective equipment or component modules at its Burlington, Massachusetts factory.

Material forwarded to M/A-COM MVS, Inc. must be accompanied by a Return Authorization Tag which is available on request.

INSTALLATION PRACTICES

RECEIVER AGC VS RECEIVED CARRIER LEVEL (RCL). Figure 3-1 depicts an AGC vs RCL characteristics curve of a typical Receiver.

PATH ALIGNMENT. Basically path alignment should be line-of-sight (LOS). Avoid alignments with obstacles in path such as buildings, signs, bodies of water, and trees, wherever possible. When aligning the Receiver, try to obtain the predicted value on Receiver AGC.

INSTALLATION. The Receiver comes as a self-contained unit which is readily adaptable to individual customer requirements. Mounting configurations vary with customers, some supplying their own means of mounting and others procurring their mounting from M/A-COM MVS, Inc.

SIGNAL AND POWER CONNECTIONS

Except for the RF input signal connector, all signal and power connections are provided on the front panel of the Receiver chassis. Consult system data to determine which options apply (Table 3-1).

Table 3-1. Signal and Power Connections

LEGEND	FUNCTION
POWER	Connect to primary power source via appropriate line cord.
VIDEO OUT	Video output signal connection.
IF OUT COMPST OUT	Composite video output signal connection. (Alternate 70 MHz IF output signal connection.)
AUDIO 1	Audio output signal connection.
AUDIO 2	Audio output signal connection.
REMOTE	Remote control interface.

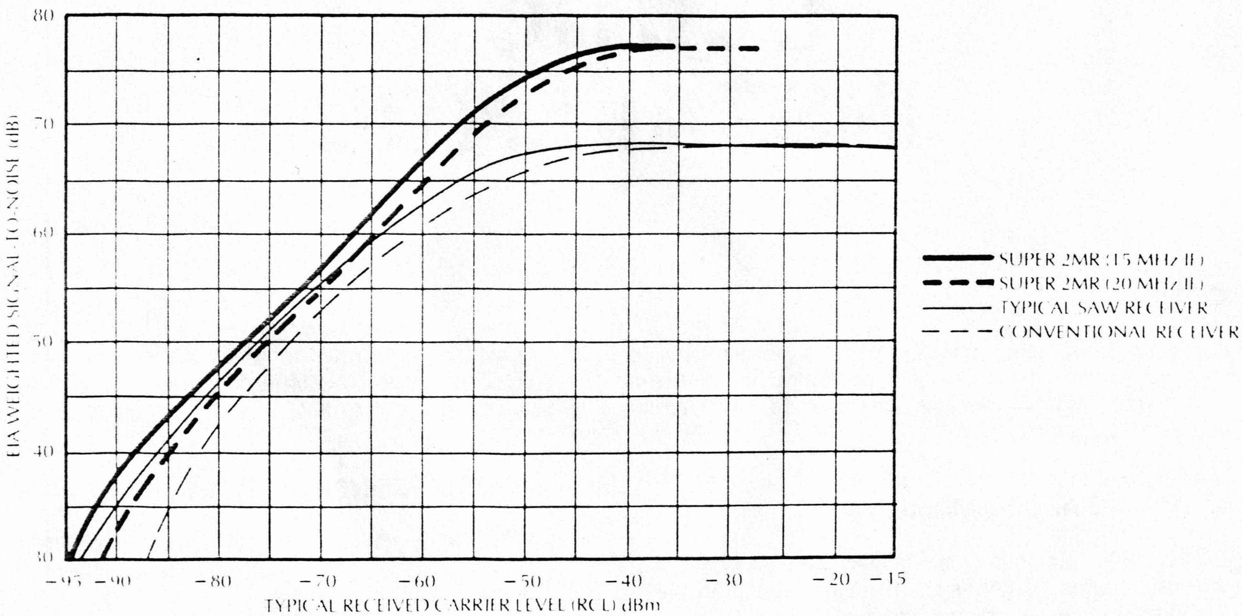


Figure 3-1. Typical Receiver Sensitivity

PRIMARY POWER

The Receiver will operate from 12 Vdc, 115 Vac or 230 Vac sources simply by selecting the appropriate line cord.

In an emergency, a single 12 Vdc car battery can be used to power the Receiver. An optional 12 Vdc battery pack with charger is available.

The primary power source should be turned OFF and remain OFF until all power circuits are connected and until initial turn-on of the equipment.

CAUTION

*With ac mains service, **DO NOT** use the multipin connector as a means of disconnecting power source from equipment. Perform disconnect at the ac mains power outlet first.*

ANTENNA CONNECTION

The RF input connector (Type N) located at the rear of the chassis provides the means for connection of the Receiver to the antenna.

SECTION 4 OPERATING INSTRUCTIONS

SCOPE

This section describes the operating controls and indicators of the Receiver (Figure 4-1) and contains the initial turn-on procedures for the equipment.

OPERATING CONTROLS AND INDICATORS

The operating controls and indicators for the Super 2MR are listed in Table 4-1.

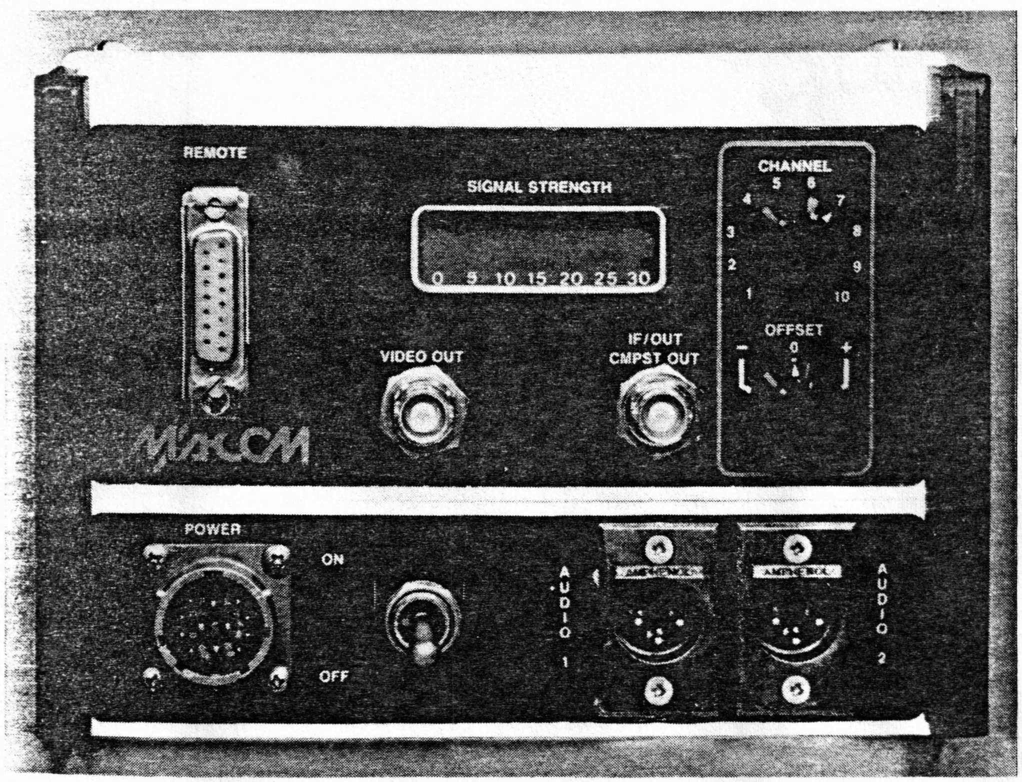


Figure 4-1. Front Panel Controls and Indicators

Table 4-1. Front Panel Controls and Indicators

CONTROL	LEGEND	FUNCTION
Meter, M1	SIGNAL STRENGTH	32-Bar LED bar graph receive carrier level indicator.
Power Switch (toggle switch)	ON-OFF	Power ON-OFF control.
CHANNEL SELECTOR SWITCH (Optional) (a 10 position rotary switch)	1 through 10	Selects one of ten RF channels
CHANNEL OFFSET SWITCH (Optional) (a 3-position rotary switch)	−, 0, +	Offsets carrier 4.25 MHz above (+) or below (−) channel frequency for 30 channel operation.
Fuse, F1*	AC2ASB	Provides overload protection when unit is operated from an ac power source.
Fuse, F2*	DC5A	Provides overload protection when unit is operated from a dc power source.

*Mounted on rear panel.

SYNTHESIZED AUDIO DEMODULATOR PRE-OPERATIONAL SETUP

The Receiver should be switched OFF at this point. Disconnect primary power cable from the Receiver.

Step 1. Place the Receiver on a clear work surface and turn it upside down (so that the Power Supply half of the chassis is on top).

Step 2. Remove four screws from recessed holes at each corner of chassis and loosen one of the front carry handles. Then carefully separate Power Supply section from chassis.

CAUTION

Be careful not to disturb wiring connections to main chassis.

Step 3. Turn Power Supply section over so that diagrams of internal controls are visible for ready reference and place adjacent to chassis.

Step 4. Refer to diagram of Audio Demodulator and locate DIP switch SW401. On each Audio Demodulator, program this switch for desired subcarrier frequency (Table 4-2).

Step 5. Restore Power Supply section to its original position. Secure by fastening four screws and tighten carry handles.

INITIAL TURN-ON PROCEDURE

Step 1. Verify that primary power voltage and polarity are correct and that the correct power line cord is used.

Step 2. Place power switch S1 to ON position.

Step 3. Using CHANNEL and OFFSET rotary switches, select the desired channel frequency (Table 4-3).

Step 4. Read and record SIGNAL STRENGTH bargraph meter.

Table 4-2. Subcarrier Frequency Programming

SUBCARRIER FREQUENCY (MHz)	SW401 SWITCH POSITIONS									
	1	2	3	4	5	6	7	8	9	10
4.83	ON	OFF	ON	ON	ON	OFF	ON	ON	ON	ON
5.8	ON	ON	OFF	ON	ON	OFF	OFF	OFF	ON	ON
6.2	ON	ON	OFF	ON	OFF	OFF	ON	ON	OFF	ON
6.8	ON	ON	OFF	OFF	ON	OFF	ON	OFF	OFF	ON
7.5	ON	ON	ON	OFF	OFF	OFF	ON	ON	ON	OFF
8.065	OFF	ON	ON	OFF	ON	OFF	ON	OFF	ON	OFF
8.3	ON	ON	ON	OFF	OFF	ON	OFF	OFF	ON	OFF
8.5	ON	ON	ON	ON	ON	ON	ON	ON	OFF	OFF

Table 4-3. Channel Select Control Chart

BASIC CHANNEL (S1)	1 CHANNEL OFFSET (S2)	CHANNEL SELECT FREQUENCY (MHz)
1	–	1994.75
	0	1999.00
	+	2003.25
2	–	2012.25
	0	2016.50
	+	2020.75
3	–	2029.25
	0	2033.50
	+	2037.75
4	–	2046.25
	0	2050.50
	+	2054.75
5	–	2063.25
	0	2067.50
	+	2071.75
6	–	2080.25
	0	2084.50
	+	2088.75
7	–	2097.25
	0	2101.50
	+	2105.75
8	–	2454.25
	0	2458.50
	+	2462.75
9	–	2471.25
	0	2475.50
	+	2479.75
10	–	2487.75
	0	2492.00
	+	2495.75

Note: International 2.5 GHz band channel frequencies are preset as specified by the user.

INTERNAL CONTROLS

The Receiver should be switched OFF and the primary power cable should be disconnected from the Receiver.

PART A. For access to Video Demodulator, Audio Demodulators, and Power Supply internal controls and test points, use the following procedures.

Step 1. Place the Receiver on a clean work surface and turn it upside down so that the Power Supply half of the chassis is on top.

Step 2. Remove four screws from recessed holes at each corner of chassis and loosen one of the front carry handles. Then carefully separate Power Supply section from chassis.

CAUTION

Be careful not to disturb wiring connections to main chassis.

Step 3. Turn Power Supply section over so that diagrams of Video Demodulator and Audio Demodulator internal controls and test points are visible for ready reference and place adjacent to chassis.

Step 4. The VIDEO GAIN control (R146) of the Video Demodulator is accessible through an access hole in the shielding plate mounted on four standoffs. For access to other Video Demodulator controls, remove the shielding plate.

NOTE

At this point, Video Demodulator and Audio Demodulator internal controls are accessible. Continue with Step 5 for access to Power Supply internal controls.

Step 5. Remove cover plate from Power Supply section by unfastening two screws at geometric center of cover and carefully lift cover off.

CAUTION

Be careful not to disturb wiring connections to main chassis.

NOTE

Power Supply internal controls are now accessible. Upon completion of the required adjustments or measurements, continue with Step 6.

Step 6. Replace Power Supply cover plate and fasten with two screws.

Step 7. If shielding plate was removed from Video Demodulator, remount it on the four standoffs.

Step 8. Restore Power Supply section to its original position on chassis. Secure by fastening four screws (one in each corner) and retighten handles.

PART B. For access to 1st and 2nd IF Filters, Synthesizer, and AGC/IF Amplifier internal controls and test points, use the following procedure.

Step 1. Place the Receiver on a clean work surface and remove top cover by unfastening six screws.

Step 2. Carefully lift off cover and place on bench. Diagrams of internal controls and test points are now visible for ready reference.

Step 3. Remove cover plate from individual modules for access to controls and test points.

NOTE

1st and 2nd IF Filter, Synthesizer, and AGC/IF Amplifier internal controls are now accessible. Upon completion of the required adjustments or measurements, continue with Step 4.

Step 4. Replace cover plates on modules.

Step 5. Replace top cover on Receiver chassis and tighten six screws securing cover to chassis.

SECTION 5 MAINTENANCE AND TROUBLESHOOTING

GENERAL

Maintenance includes both preventive and corrective maintenance.

Preventive maintenance consists of the semi-annual and annual procedures adopted to prevent minor problems from developing into major breakdowns. Initiate and carry out a preventive maintenance schedule which checks system operation and exercises all control functions to avoid malfunction occurrence. This insures optimum system performance.

Corrective maintenance is indicated when a fault or impairment to normal operation is noted. Troubleshooting procedures will isolate the fault to a subsystem or unit. Repair, replacement or adjustment of the subsystem or unit will correct the fault to restore normal operation.

MAINTENANCE LOG. Record measurements and corrective action taken in a maintenance log as reference information for use in future alignment, maintenance and troubleshooting.

NOTE

FCC Rules and Regulations mandate that whenever measurements or adjustments are performed that may effect the frequency, power or modulation of the radio system, pre- and post-measure measurements of the latter must be entered in the FCC Radio Station Log. Also, a log entry must be made anytime the Transmitter is removed from service or restored to service.

Measurements or adjustments that require turning RF ON or OFF or which may affect frequency, power or modulation must be performed only under the supervision of an FCC licensed Radiotelephone Operator, 1st or 2nd Class. Other measurements such as meter readings or test point measurements may be conducted by unlicensed personnel.

PREVENTIVE MAINTENANCE

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent occurrence of trouble, to reduce downtime, and to maintain the equipment in serviceable condition. Preventive maintenance procedures are normally performed semi-annually and annually; specific procedures are provided herein. The semi-annual checks should be also performed when the equipment is initially installed and when the equipment is reinstalled after removal for any reason.

PERIODIC MAINTENANCE. On a semi-annual basis, station personnel should record, in a maintenance log, the normal measurements of equipment operating parameters so that equipment performance overtime may be monitored. A comparison of the measurements entererd in the maintenance log is a means of determining any long-period changes in equipment performance. M/A-COM MVS, Inc. does not recommend periodic adjustment to the equipment. If operating policy requires the operational checks be made on a periodic basis, these checks should be limited to those which do not unnecessarily alter equipment adjustments. Adjustments should be made only in the event that the equipment fails to meet performance specifications. The periodic maintenance log should be examined to determine whether any failure that occurs is gradual or catastrophic. If the failure is of an abrupt nature, refer to the troubleshooting procedures before readjusting the equipment.

SEMI-ANNUAL CHECKS. If the equipment is in continuous use, perform only those steps that do not interfere with the equipment operation.

1. EXTERIOR SURFACES. Clean outside of case and front panel

2. CABLE CONNECTIONS. Check all cable connections and finger-tighten if necessary.

3. Measure Transmitter operating parameters and record the readings in the maintenance log. Any variance from previous measurements should be investigated.

ANNUAL CHECKS. Perform the follwoing checks on an annual basis. If the equipment is in continuous use, perform only those steps that do not interfere with equipment operation.

1. HARDWARE. Tighten loose screws and replace missing hardware as required.

2. INDICATOR LAMPS. Check and replace if defective.

3. CABLES. Inspect for wear and fraying, and repair if necessary. Replace cable assemblies in which wiring installation or connectors are damaged.

4. PAINTED SURFACES. Clean, and if necessary, paint bare metal spots, blistered, pitted or flaking areas.

5. ANTENNAS AND TOWERS. Check mounting hardware and guy wires. Tighten or replace as necessary.

CORRECTIVE MAINTENANCE

Corrective maintenance consists of troubleshooting, repair, adjustment, and test of the system or subassemblies to locate and fix faults.

Effective corrective maintenance can best be accomplished when the operating principles of both the overall system and the individual units comprising the system are fully understood. Therefore, the technical descriptions of the system and the individual units should be thoroughly read before attempting any corrective maintenance.

NOTE

Troubleshooting this system should be undertaken only by experienced personnel, with proper test equipment,who posesses a FCC 1st or 2nd Class Radiotelephone license.

After the trouble is isolated to a malfunctioning system, any faulted unit can be quickly isolated by functionally analyzing the indicated trouble. Here again, a thorough knowledge of all system functional loops is necessary.

M/A-COM MVS, Inc. does not recommend repairing all of the modules or subassemblies. Certain assemblies should not be repaired but must be replaced.

MEASUREMENT CONVERSIONS

A dBmV-to-dBm-to-μV conversion chart (Table 5-1) is provided to allow the user to convert any measurements listed herein to those his test equipment is calibrated in.

Table 5-1. Measurement Conversions (dBmV to dBm to μV) – 75 Ohms

dBmV	dBm	μV	dBmV	dBm	μV	dBmV	dBm	μV	dBmV	dBm	μV
-60	-109	1.00	-25	-74	56.23	10	-39	3,162	45	-4	177,800
-59	-108	1.12	-24	-73	63.10	11	-38	3,548	46	-3	199,500
-58	-107	1.26	-23	-72	70.79	12	-37	3,981	47	-2	223,900
-57	-106	1.41	-22	-71	79.43	13	-36	4,467	48	-1	251,200
-56	-106	1.58	-21	-70	89.13	14	-35	5,012	49	0	281,800
-55	-104	1.78	-20	-69	100.00	15	-34	5,623	50	+1	316,200
-54	-103	1.99	-19	-68	112.20	16	-33	6,310	51	+2	354,100
-53	-102	2.24	-18	-67	125.90	17	-32	7,079	52	+3	398,100
-52	-101	2.51	-17	-66	141.30	18	-31	8,913	54	+5	446,700
-51	-100	2.82	-16	-65	158.50	19	-30	8,913	54	+5	501,200
-50	-99	3.16	-15	-64	177.80	20	-29	10,000	55	+6	562,300
-49	-98	3.55	-14	-63	199.50	21	-28	11,220	56	+7	631,000
-48	-97	3.98	-13	-62	223.90	22	-27	14,130	58	+9	794,200
-47	-96	4.47	-12	-61	251.20	23	-26	14,130	58	+9	794,200
-46	-95	5.01	-11	-60	281.80	24	-25	15,850	59	+10	891,300
-45	-94	5.62	-10	-59	316.20	25	-24	17,780	60	+11	1,000,000
-44	-93	6.31	-9	-58	354.80	26	-23	19,950	61	+12	1,122,000
-43	-92	7.08	-8	-57	398.10	27	-22	22,390	62	+13	1,259,000
-42	-91	7.94	-7	-56	446.70	28	-21	25,120	63	+14	1,413,000
-41	-90	8.91	-6	-55	501.20	29	-20	28,180	64	+15	1,585,000
-40	-89	10.00	-5	-54	562.30	30	-19	31,620	65	+16	1,778,000
-39	-88	11.22	-4	-53	631.00	31	-18	35,480	66	+17	1,995,000
-38	-87	12.59	-3	-52	707.90	32	-17	39,810	67	+18	2,239,000
-37	-86	14.13	-2	-51	794.30	33	-16	44,670	68	+19	2,512,000
-36	-85	15.85	-1	-50	891.30	34	-15	50,120	69	+20	2,818,000
-35	-84	17.78	0	-49	1,000.00	35	-14	56,230	70	+21	3,162,000
-34	-83	19.95	1	-48	1,122.00	36	-13	63,100	71	+22	3,548,000
-33	-82	22.39	2	-47	1,259.00	37	-12	70,790	72	+23	3,981,000
-32	-81	25.12	3	-46	1,413.00	38	-11	79,430	73	+24	4,467,000
-31	-80	28.18	4	-45	1,585.00	39	-10	89,130	74	+25	5,012,000
-30	-79	31.62	5	-44	1,778.00	40	-9	100,000	75	+26	5,623,000
-29	-78	35.48	6	-43	1,995.00	41	-8	112,200	76	+27	6,310,000
-28	-77	39.81	7	-42	2,239.00	42	-7	125,900	77	+28	7,079,000
-27	-76	44.67	8	-41	2,512.00	43	-6	141,300	78	+29	7,943,000
-26	-75	50.12	9	-40	2,818.00	44	-5	158,500	79	+30	8,913,000
									80	+31	10,000,000

For 50 ohms = -1.7 dBm = 224,000 μV = +47 dBmV
For 600 ohms = +9.0 dBm = 774,000 μV = +58 dBmV

MEASUREMENTS AND ADJUSTMENTS

Measurement and adjustment procedures for the Receiver are outlined below.

Test equipment operating instructions are not included herein except for precautionary notes. Equivalent test equipment may be substituted if necessary. All test cables should be as short as possible, all impedances should be matched, and terminations correctly located.

NOTE

If difficulty is experienced in obtaining the proper performance during any adjustment, the test equipment (including all cables and terminations) should be disconnected and tested to determine whether the test setup is contributing to the system performance readings in any manner.

RECEIVER PRETEST SETUP

Either of two basic adjustment and checkout configurations may be used. The preferred method consists of operating the Receiver on a test bench with a mating test Transmitter using path-loss test attenuators to control the received carrier signal level. This method is similar to that used in factory testing and should provide comparable results. The second method uses the actual operating path as the RF attenuator.

The test Transmitter shall be operating at the same frequency as the Receiver channel under test and adjusted for proper deviation (±4 MHz at 1V P-P). Unless otherwise specified, standard CCIR weighting, a receive carrier level of −40 dBm and 525 line TV emphasis shall be used.

Allow at least one hour of operation for the equipment to stabilize before conducting any adjustments or tests.

Test configurations employed are shown in Figure 5-1.

PORTABLE RECEIVER ALIGNMENT

CAUTION

Do not insert or remove modules while power is applied to the unit.

Step 1. Equipment Setup

a. Connect the Transmitter RF output to a sufficient number of path-loss test attenuators to reduce the Transmitter RF power output level below 1 mW. Connect the Receiver RF input to the path-loss test attenuator output.

b. Place the Receiver on a clear work surface and turn it upside down (so that the Power Supply half of the chassis is on top).

c. Remove four screws from recessed holes at each corner of chassis and loosen one of the front carry handles. Then carefully separate Power Supply section from chassis.

CAUTION

Be careful not to disturb wiring connections to main chassis.

d. Turn Power Supply section over so that diagrams of internal controls are visible for ready reference and place adjacent to chassis.

e. Refer to diagrams of Video Demodulator and Audio Demodulator module internal controls for use during the following procedures.

Step 2. Turn ON test Transmitter and Receiver and position CHANNEL SELECTOR to a mid-band channel for the following steps.

Step 3. Video Output Level Adjustment – Connect the video signal generator to the test Transmitter video input and apply a multiburst video signal at 1V P-P. Connect the waveform monitor to the VIDEO output jack on the Receiver unit. If necessary, adjust the VIDEO GAIN (R146) control on the Video Demodulator module for 1V P-P (140 IRE units).

Step 4. De-Emphasis Adjustment – Apply a window video signal at 1V P-P to the video input jack of the test Transmitter and observe 140 IRE units on a waveform monitor scope at the video output of the Receiver. Adjust the de-emphasis potentiometers R143 and L109 if necessary for a square window response.

Step 5. Frequency Response

a. Connect the baseband signal generator to the Transmitter VIDEO jack.

b. Configure the baseband signal generator for 200 kHz at 1V P-P (140 IRE units).

c. Connect the terminated RMS voltmeter to the test Receiver output and record reading in the maintenance log.

NOTE

Calibrate the signal generator at each step prior to taking readings.

d. Holding the input signal level constant, take readings at 100, 200, and 500 kHz, and 1, 2, 3, 4, 4.5, 5.6, and 8 MHz. If required, adjust and variable capacitor C134 on the Video Demodulator module for flat response. These adjustments are factory preset and normally should not require readjustment. Record difference in decibels between each reading and the reference reading.

Step 6. Receiver AGC Calibration – The purpose of this test is to calibrate the Receiver SIGNAL STRENGTH meter reading and system signal-to-noise (S/N) ratio with a known RF signal input level. This information may be used for path loss testing and as an indication of received signal strength (Figure 5-2).

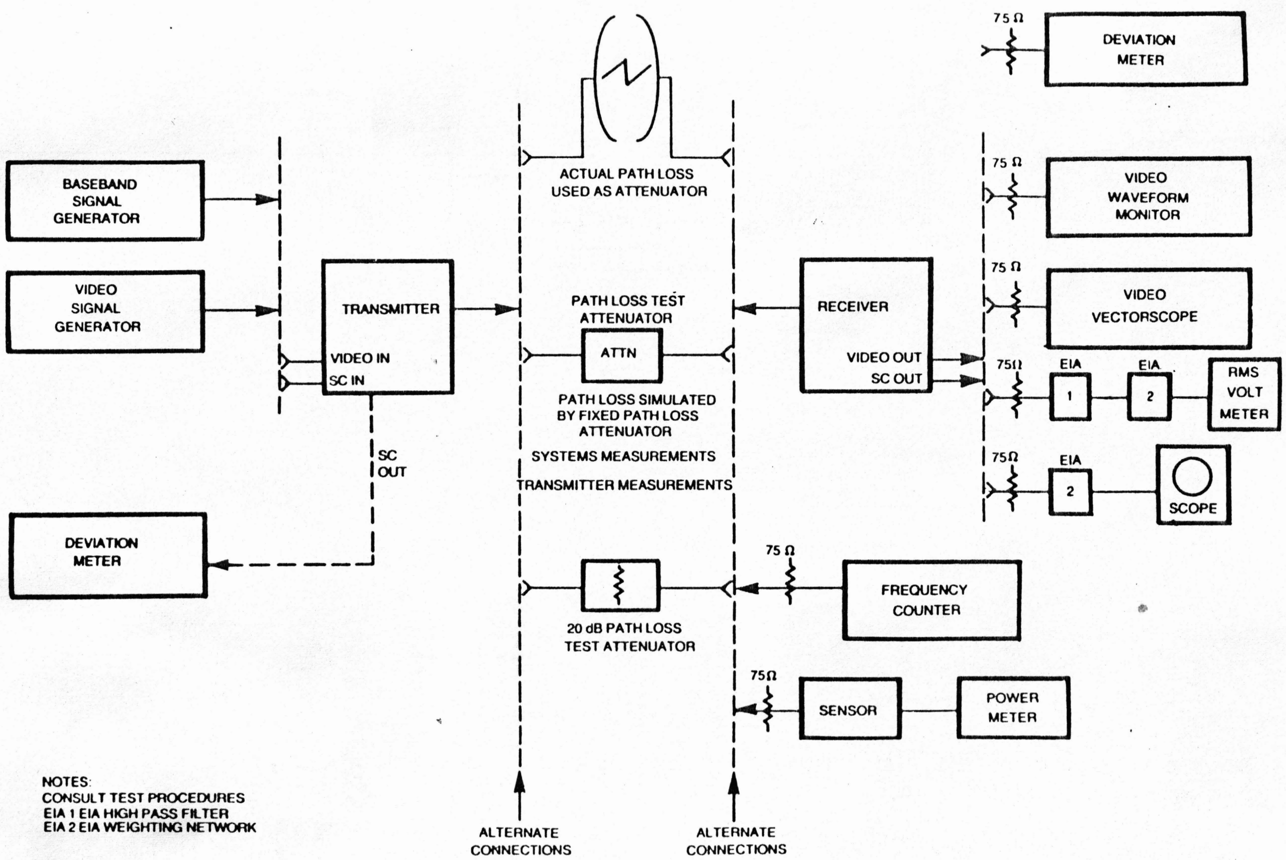


Figure 5-1. System Test Configurations

a. Connect the RF signal generator to the Receiver RF input connector with a calibrated coaxial cable.

b. Adjust the signal generator to the operating frequency.

c. Calculate the Receiver input power which is the mathematical sum of the interconnection cable loss plus the attenuator reading [i.e., −1 dB (cable loss) plus −30 dB attenuation setting, yields a Receiver input power of −40 dB].

d. Construct an AGC calibration chart (Table 5-2) of input versus SIGNAL STRENGTH meter reading in 10 dB steps from −20 to −80 dBm and at 33 dB signal-to-noise (Receiver threshold) point. Record this chart in the maintenance log.

Restore the Receiver to normal path loss.

Table 5-2. AGC Calibration Chart

RF INPUT LEVEL	METER AGC READING	S/N RATIO
−20 dBm		dB
−30 dBm		dB
−40 dBm		dB
−50 dBm		dB
−60 dBm		dB
−70 dBm		dB
−80 dBm		dB
dBm		−33 dB

Step 7. Audio Alignment

NOTE

Refer to synthesized Aduio Demodulator preoperational setup procedures in Section 4.

Verify that the test Transmitter is equipped with audio channels corresponding to the Audio Subcarrier Demodulators installed in the Receiver (i.e., same subcarrier frequencies; and emphasis).

The test Transmitter shall be adjusted for proper subcarrier deviation (75 or 100 kHz per system requirements) and level (14 IRE units of subcarrier on the video for each audio channel; dual audio will be 28 IRE units).

Set up one audio channel at a time.

a. Connect an audio distortion analyzer with appropriate load to the AUDIO 1 (2) output of the Receiver.

b. Apply multiburst at 1V P-P to video input jack of the test Transmitter and observe 140 IRE units on monitor connected to composite output of the Receiver.

c. Apply 1 kHz signal at required signal level to AUDIO 1 (2) of the test Transmitter.

d. Adjust audio gain control potentiometer R451 for desired output level (0 dBm to +18 dBm adjustment range).

e. Reference performance characteristics in Section 1. Check audio distortion, check frequency response (at −20 dBm below normal input level) and check signal-to-noise (at normal input level).

1) Method of Measurement – The audio channel shall be operated at standard input and output test tone (TT) level and the measuring equipment shall terminate the circuit in a standard load impedance. A test tone of 1000 Hz, having less than 0.1% rms harmonic distortion, shall be applied to the audio input of the system at 100% modulation at peak deviation.

2) Since pre-emphasis and de-emphasis are employed, the input level to the system shall be adjusted at each measurement to operate the system not to exceed peak deviation (75 or 100 kHz). This will require dropping the input audio level with increasing frequency as the pre-emphasis curve rises. The input and output level controls shall not be readjusted during this procedure.

Step 8. At conclusion of Receiver alignment, restore Power Supply section to its original position on chassis. Secure by fastening four screws (one in each corner) and retighten carry handles.

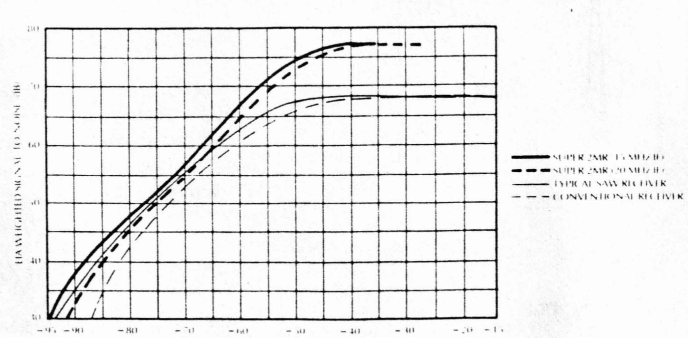
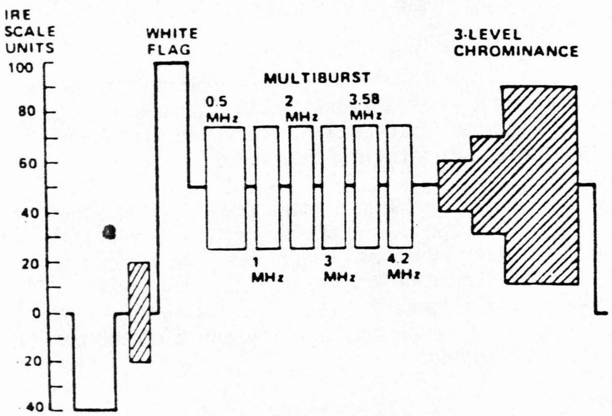


Figure 5-2. Typical Receiver Sensitivity

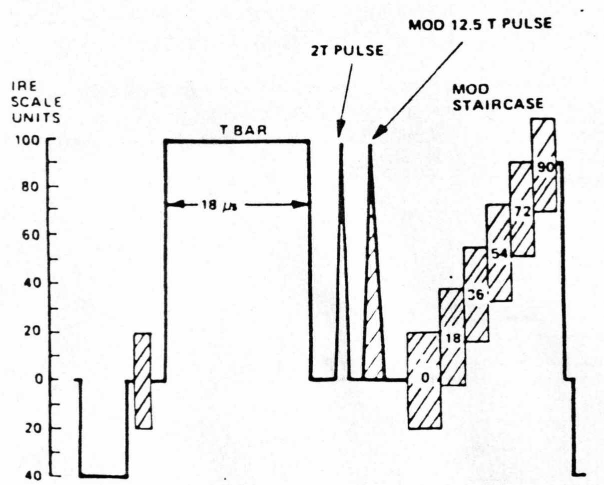
VIDEO SYSTEM PERFORMANCE TESTS

These tests are provided so that video system performance parameters can be properly met, and to insure compliance with operational requirements. Video waveforms are shown in Figure 5-3. The following tests should be performed.

- Video Unity Gain
- Video Frequency Response
- Video Differential Gain
- Video Differential Phase
- Video Signal-to-Noise
- Video Signal-to-Hum
- Chrominance-Luminance Gain Inequality
- Chrominance-Luminance Delay Inequality
- Field Squarewave Tilt
- 2T Pulse 'K' Factor



A. Composite Test Signal



B. Combination Test Signal

Figure 5-3. Video Test Waveforms

VIDEO UNITY GAIN. Prior to performing any other test, adjust the video system to unity gain at 1V P-P.

Step 1. Configure the video signal generator for multi-burst operation into a terminated video waveform monitor.

Step 2. Adjust the video signal generator for proper output at 1V P-P and connect it to the Transmitter video input.

Step 3. Connect the path-loss test attenuators (70 dB below 10 GHz and 60 dB above 10 GHz) between the Transmitter RF output and the Receiver RF input.

Step 4. Connect the terminated video waveform monitor to the Receiver output. Adjust the Receiver video gain control R146 on the Receiver Video Demodulator for a 1V P-P signal.

This completes the video unity gain adjustment.

VIDEO FREQUENCY RESPONSE

Step 1. Connect the baseband signal generator to the Transmitter video input.

Step 2. Configure the baseband signal generator for 200 kHz at 1V P-P.

Step 3. Connect the terminated rms voltmeter to the Receiver output. Configure rms voltmeter for upper third scale reading and record reading in the maintenance log.

Step 4. Holding the input signal level constant, take readings at 10, 100, 500 kHz and 1, 2, 3, 3.58, 4.0, and 4.3 MHz. Record difference in decibels between each reading and the reference reading at 200 kHz.

Video Frequency Response (Alternate Method No. 1)

A terminated video waveform monitor with the horizontal sweep on two-thirds position, may be used in place of the rms voltmeter. Record frequency response as percent difference referred to 100% at 200 kHz reference and convert to decibels.

Video Frequency Response (Alternate Method No. 2)

A video sweep from 50 kHz to 5 MHz may be connected at 0.7V peak-to-peak to the Transmitter video input. View the recovered signal on a terminated video waveform monitor. Record frequency response as percent difference referred to 100% at 200 kHz reference and convert to dB.

VIDEO DIFFERENTIAL GAIN

Step 1. Configure the video signal generator for stairstep signal with 3.58 MHz subcarrier at 50% average picture level (APL). Connect the video signal generator to the Transmitter video input.

Step 2. Connect a terminated video vectorscope to the Receiver video output. Measure and record differential gain. Repeat for 10% and 90% APL.

Video Differential Gain (Alternate Method No. 1)

A terminated video waveform monitor, with the vertical input selector at high pass position, may be used to measure differential gain at 10, 50, and 90% APL.

VIDEO DIFFERENTIAL PHASE

Step 1. Configure the video signal generator for stairstep signal with 3.58 MHz subcarrier at 50% APL. Connect the signal generator to the Transmitter video input.

Step 2. Connect a terminated video vectorscope to the Receiver output. Measure and record differential phase. Repeat for 10 and 90% APL.

VIDEO SIGNAL-TO-NOISE (S/N)

Step 1. Connect EIA weighting network plus the Low Pass Filter and the High Pass Filter between the Receiver video output and a 75 ohm termination.

Step 2. Connect an rms voltmeter across the termination.

Step 3. Remove the Transmitter video input signal and terminate the Transmitter video input signal.

Step 4. Read the residual noise voltage on the rms voltmeter and convert this reading to signal-to-noise (S/N) in decibels by reference in Figure 5-4. Filter loss has been included in the chart preparation and, therefore, if 1V peak-to-peak unity gain exists in the system, the solid-line conversion is the system signal-to-noise (S/N) ratio. Record this value in decibels in the maintenance log.

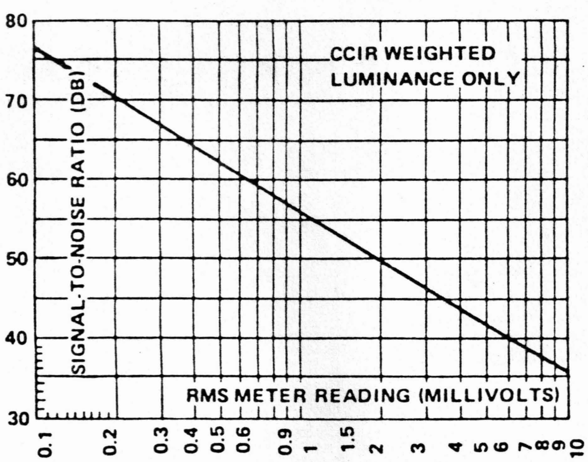


Figure 5-4. Signal-to-Noise (S/N) Conversion Chart

VIDEO SIGNAL-TO-HUM (S/H)

Step 1. Terminate the Receiver in 75 ohms.

Step 2. Connect EIA Low Pass Filter across the termination and connect the filter output to the oscilloscope.

Step 3. Remove the Transmitter video input signal and terminate the Transmitter video input terminal.

Step 4. Read the residual hum voltage on the oscilloscope in peak-to-peak amplitude and convert this reading in millivolts (mV) to signal-to-hum in decibels by reference to Figure 5-5. If 1V P-P unity gain exists in the system, the solid line conversion is the system signal-to-hum ratio. Record this value in decibels in the maintenance log.

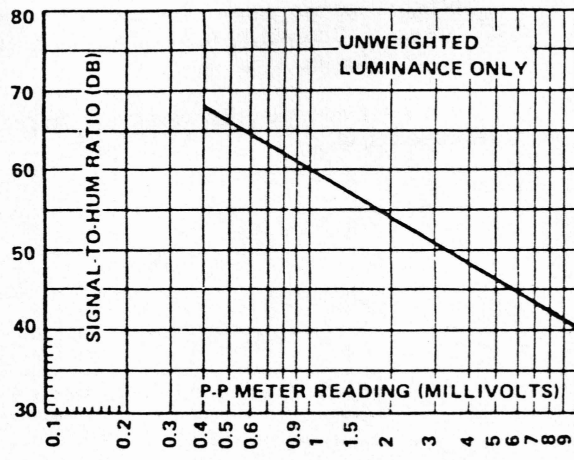


Figure 5-5. Signal-to-Hum (S/H) Conversion Chart

CHROMINANCE-LUMINANCE GAIN INEQUALITY

Step 1. Configure the video waveform generator for a sine^2 pulse and bar test signal. Connect the waveform generator to the test Transmitter video input connector.

Step 2. Connect a terminated video waveform monitor to the Receiver video output.

Step 3. Adjust the waveform monitor for a linebar amplitude of 100 IRE units.

Step 4. Measure the amplitude of the sine^2 pulse and record the difference from the line bar amplitude in IRE units.

CHROMINANCE-LUMINANCE DELAY INEQUALITY

Step 1. Configure the video waveform generator for a sine^2 pulse and bar test signal. Connect the waveform generator to the test Transmitter video input connector.

Step 2. Connect a terminated video waveform monitor to the Receiver video output.

Step 3. Adjust the waveform monitor for a $sine^2$ pulse amplitude of 100 IRE units.

Step 4. Expand the time scale and amplitude scale of the waveform monitor and observe the peak-to-peak envelope ripple at the base of the $sine^2$ pulse.

Step 5. Calculate the delay as follows:

Delay (ns) = 10D (for 12.5T modulated $sine^2$ pulse with half amplitude duration of 1.57 μs).

WHERE:
d is the peak-to-peak amplitude of baseline deviation in IRE units with gain errors normalized.

FIELD SQUAREWAVE TILT

Step 1. Configure the waveform generator for a field squarewave test signal. Connect the waveform generator to the test Transmitter video input.

Step 2. Connect a terminated video waveform monitor to the Receiver video output.

Step 3. Adjust the amplitude of the center of the bar for 100 IRE units on the waveform monitor display.

Step 4. Measure the peak-to-peak change in amplitude of the bar top in IRE units.

2T PULSE 'K' FACTOR

Step 1. Configure the video waveform generator for a window test signal. Connect the waveform generator to the test Transmitter video input.

Step 2. Connect a terminated video waveform monitor to the Receiver video output.

Step 3. Adjust the waveform monitor for a line bar amplitude of 100 IRE units.

Step 4. Measure the variation of the 2T pulse from the line bar in IRE units.

REVISIONS			
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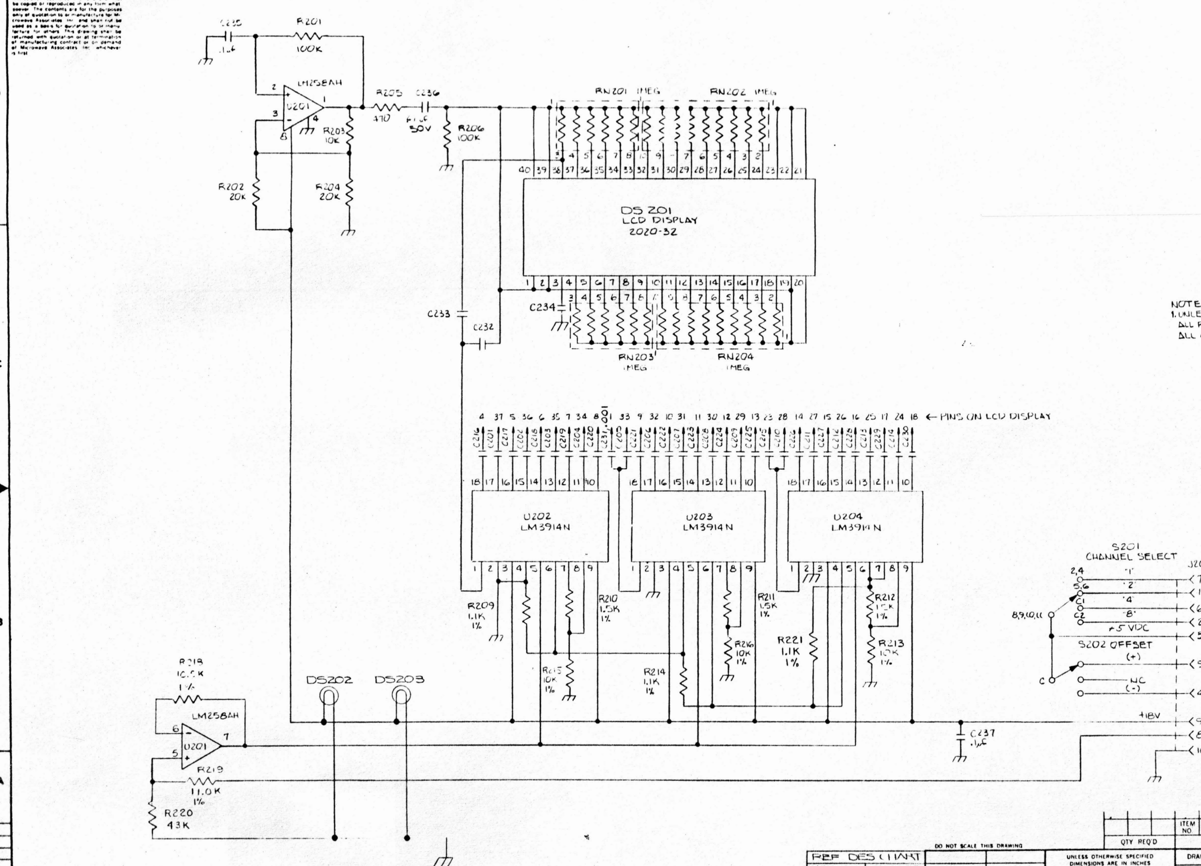

NOTES:
1. UNLESS OTHERWISE SPECIFIED:
ALL RESISTORS ARE IN OHMS, 1/4W ±5%
ALL CAPACITORS ARE .01μF

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DS203	
J201	
R221	R207, R208, R217
RN204	
S202	
U204	

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TOLERANCES ON	
DECIMALS	ANGLES
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ENG. APP'D	W Collier 2/10/84	
PROD. APP'D	J Anderson 2-2-84	
APPROVALS	A Norris 2-10-84	

M/A-COM VIDEO SYSTEMS VIDEO SATELLITE

TITLE ASSEMBLY & SCHEMATIC DISPLAY BOARD

SIZE	CODE IDENT NO.	DRAWING NO.
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SCALE NONE WGT —/— SHEET 2 OF 2

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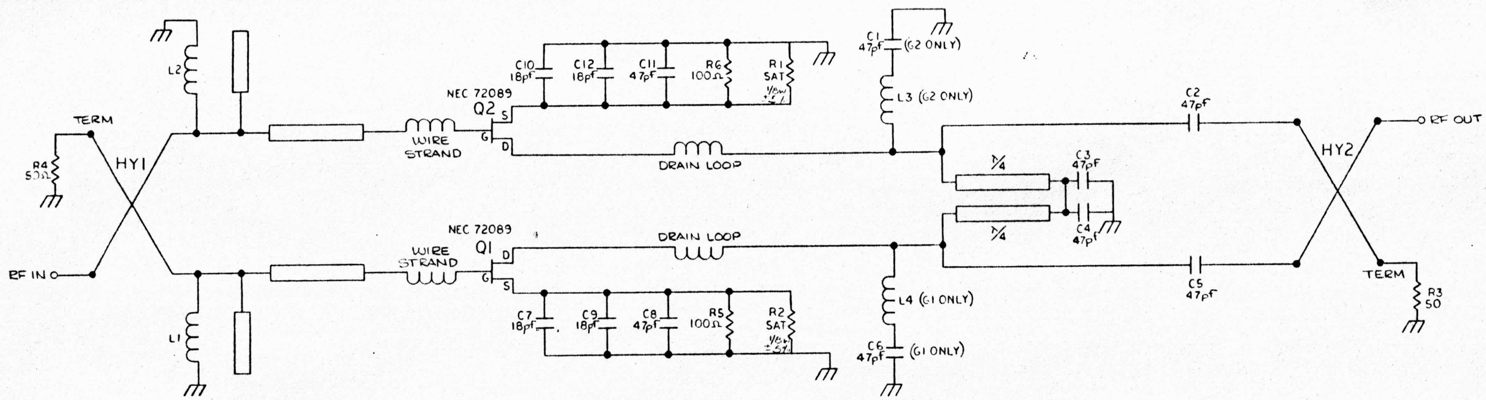

NOTE

1. ALL RESISTORS ARE CHIP RESISTORS UNLESS OTHERWISE NOTED.

2. ALL CAPACITORS ARE CHIP CAPACITORS.

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TOLERANCES ON

DECIMALS	ANGLES
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.XXX ± .005	

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CHECKED		3-6-84
ENG APP'D		3-13-84
PROD APP'D		JAN 31, 1984
	A Norris	3-6-84

M/A-COM VIDEO SYSTEMS VIDEO SATELLITE

TITLE: MSA & SCHEMATIC 2 GHz BAL. LNA

SIZE	CODE IDENT NO	DRAWING NO
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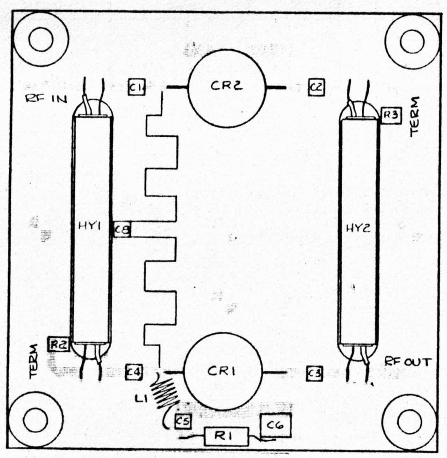
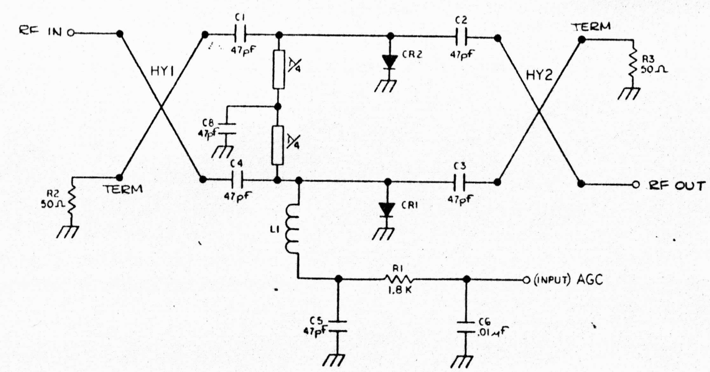
A	RELEASE TO PRODUCTION	3/6/84	AN





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2	7	89438-32	DIODE MA47201 CR1,CR2
A/R	6	89890-61	EPOXY, SILVER EPO-TECH H20E
6	5	89007-57	CAPACITOR, CHIP 47pF C1,C2,C3,C4,C5,C8
1	4	89007-26	CAPACITOR, CHIP .01μF C6,
2	3	189481-64	RESISTOR, CHIP 50Ω R2,R3
1	2	89260-19	RESISTOR, 1/8W 2K±5% R1,
1	1	D841354-1	MSB AGC AMP
-1			

D841355 AGC/LNA

SEE PARTS LIST

11-21-83 S. LANDERS
3-6-84
31 JAN 84
JAN 31, 1984
ANorris 3-6-84

M/A

MICROSTRIP ASSY
AGC AMPLIFIER

D 96341 841342

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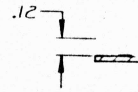
A	RELEASE TO PRODUCTION	3-6-84	KN



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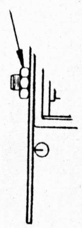

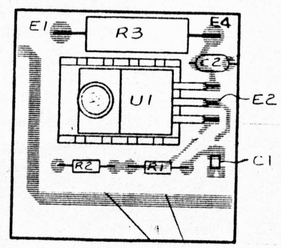

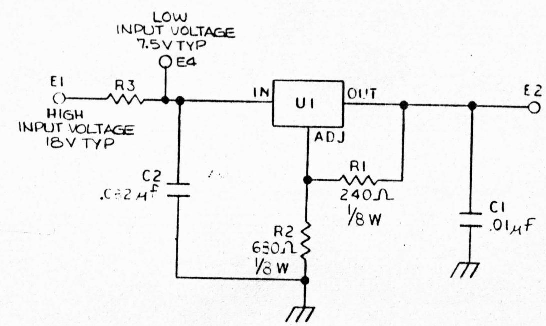

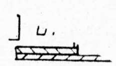

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NOTES
1. AL... ...UT LEADS MUST BE ...
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1		11	89460-4	NUT #4	
1		10	89424-2	SCREW #4-40 X .250LG.	
1		9	89442-87	WASHER, SHOULDER	
1		8	88509-41	HEATSINK	
1		7	89212-89	CAPACITOR, .082μF CK05 C2	
1		6	89007-26	CAPACITOR CHIP .01μF C1	
1		5	89260-84	RESISTOR 1/8W 680Ω ±5% R2	
1		4	89260-38	RESISTOR 1/8W 240Ω ±5% R1	
1		3	88541-53	RESISTOR 1W 68Ω ±10% R3	
1		2	89899-62	VOLTAGE REGULATOR, LM317 U1	
1		1	D841341-1	PWB VOLTAGE REGULATOR	
	-1				

LIST OF MATERIALS

D841355	AGC/LNA
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DECIMALS	ANGLES
X ± .1 XX ± .02 XXX ± .005	0° 30'

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APPROVALS		DATE
DRAWN	S. LANDERS	11-22-83
CHECKED		3-6-84
ENG APP'D		1 JAN 84
PROD APP'D		JAN 31, 1984
	A Norris	3-6-84

M/A-COM VIDEO SYSTEMS VIDEO SATELLITE

TITLE: ASSEMBLY VOLTAGE REGULATOR

SIZE	CODE IDENT NO	DRAWING NO.
C	96341	841340

SCALE 2/1 WGT — SHEET 1 OF 1

LTR	DESCRIPTION	DATE	APPROVED
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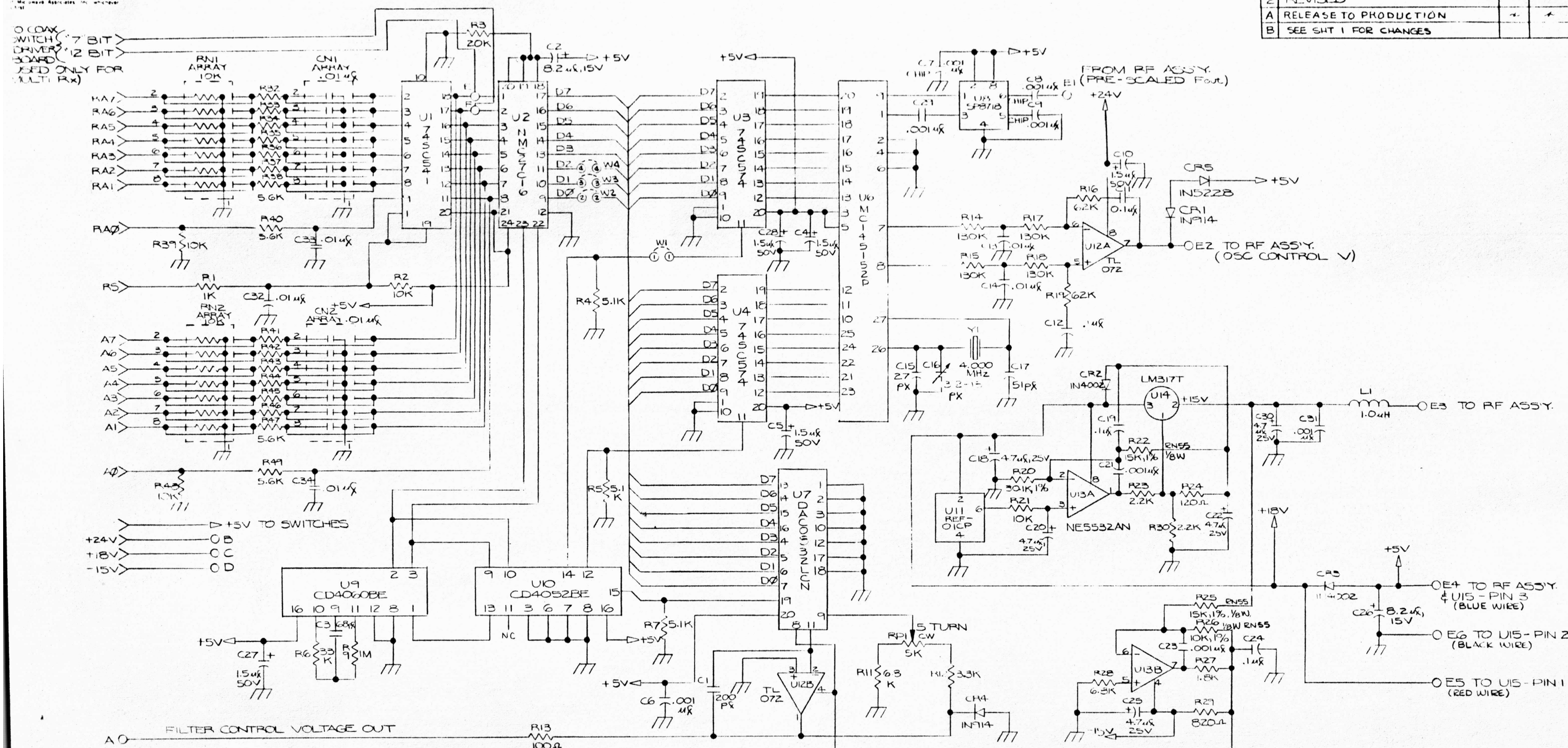
A	RELEASE TO PRODUCTION		
B	SEE SHT 1 FOR CHANGES		



NOTES:

1) ALL RESISTORS ARE 1/4W, CARBON TYPE.
2) RP1 - 5 TURN POTENTIOMETER
3) U15 & RF ASS'Y - PART OF NEXT ASS'Y.

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LAST USED	NOT USED
W4	
C34	
CN2	
CR5	
L1	
R49	R8, R10, R31
RN2	
U14	U5
Y1	
RP1	

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D841302	2MR

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M/A-COM VIDEO SYSTEMS VIDEO SATELLITE

TITLE: ASS'Y & SCHEMATIC SYNTHESIZER

SIZE D | CODE IDENT NO 96341 | DRAWING NO 841306

SHEET 2 of 2

LTR	DESCRIPTION	DATE	APPROVED
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2	REVISED		
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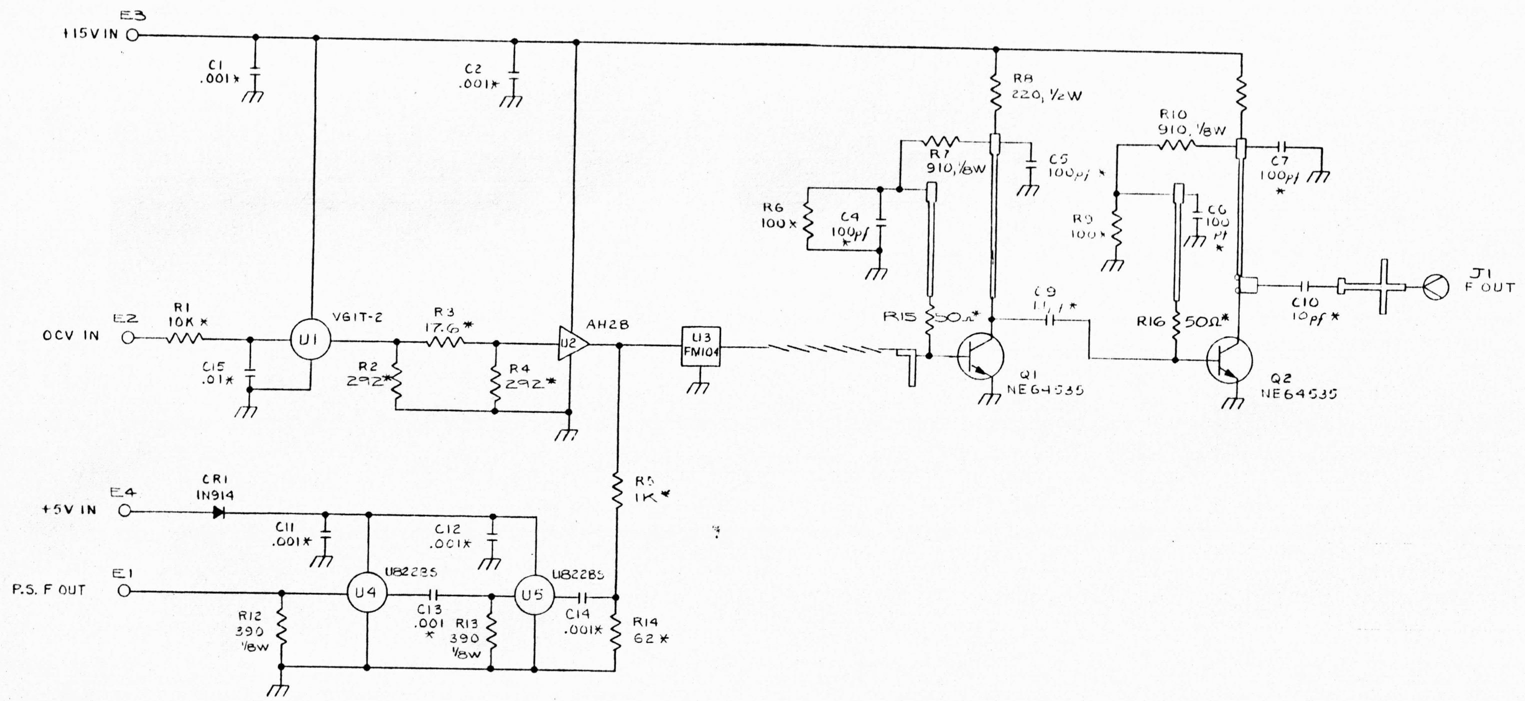

NOTES:

UNLESS OTHERWISE SPECIFIED

1. RESISTORS ARE IN OHMS, 1/2W, ±5%.
2. CAPACITORS ARE IN MICROFARADS.
3. * DENOTES CHIP COMPONENT.

FOR PARTS LIST SEE B-PL841348

LIST OF MATERIALS

M/A-COM VIDEO SYSTEMS VIDEO SATELLITE

TITLE: ASSEMBLY & SCHEMATIC, 3GHz OSCILLATOR

SIZE	CODE IDENT NO	DRAWING NO
D	96341	841348

SHEET 2 OF 3

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		2-17-84
		2-17-84

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TOLERANCES ON: DECIMALS .X ±.1, .XX ±.02, .XXX ±.005; ANGLES 0°-30'

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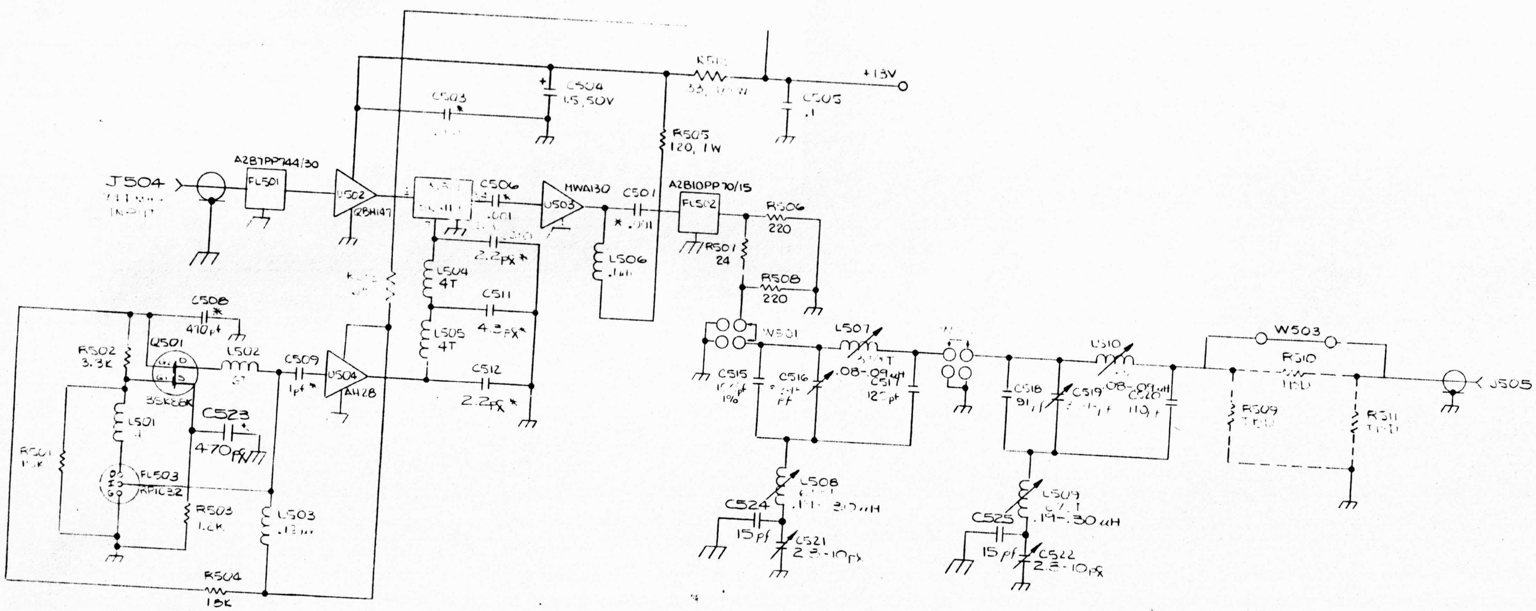

NOTES:
1. UNLESS OTHERWISE SPECIFIED:
ALL RESISTORS ARE IN OHMS 1/4W ±5% CARBON
ALL CAPACITORS ARE IN (uf) MICROFARADS
2. SIGNAL LINES ARE 50 Ω (.081" WIDE) MICROSTRIP
3. *-IDENTIFY CHIP COMPONENT.

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				LIST OF MATERIALS		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON: DECIMALS X ±.1, XX ±.02, XXX ±.005; ANGLES 0°-30'
UNLESS OTHERWISE SPECIFIED ALL OVER
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FINISH —
NEXT ASSY: SEE SHT 1 | USED ON: SEE SHT 1
APPLICATION

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PROD APP'D		
APPROVALS		2-10-84

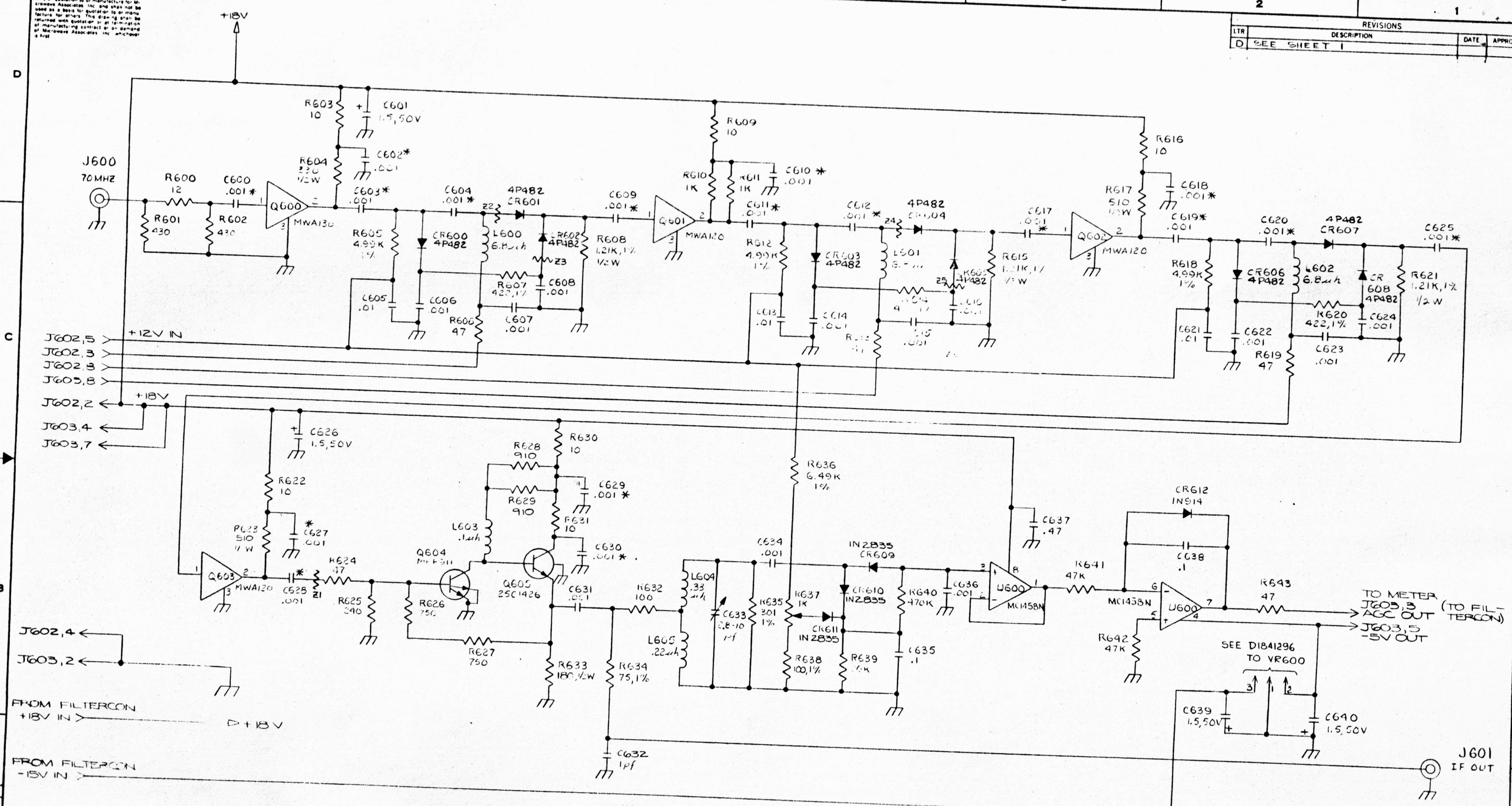
M/A-COM VIDEO SYSTEMS / VIDEO SATELLITE

TITLE: ASSEMBLY & SCHEMATIC 1ST & 2ND I.F. 2MR

SIZE: D | CODE IDENT NO: 96341 | DRAWING NO: 841282

SCALE: NONE | WGT: — | SHEET 2 OF 2

100% FC



NOTES:

UNLESS OTHERWISE SPECIFIED:

1. RESISTORS ARE 1/4W, 5% AND IN OHMS.
2. CAPACITORS ARE IN MICROFARADS.
3. *.001 CAPACITORS ARE CHIP CAPS.
4. CR600-CR608 ARE MA47111.
5. CR609-CR611 ARE HP2-35.

DRAWN	C. Smith	8-1-83
CHECKED		2-5-84
ENG APP'D		2-10-84
PROD APP'D		2-2-84
		2-10-84

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TOLERANCES ON: DECIMALS X ± .1, XX ± .02, XXX ± .005; ANGLES 0° 30'

NEXT ASSY: SEE SH.1 — USED ON: SEE SH.1 — APPLICATION

LIST OF MATERIALS

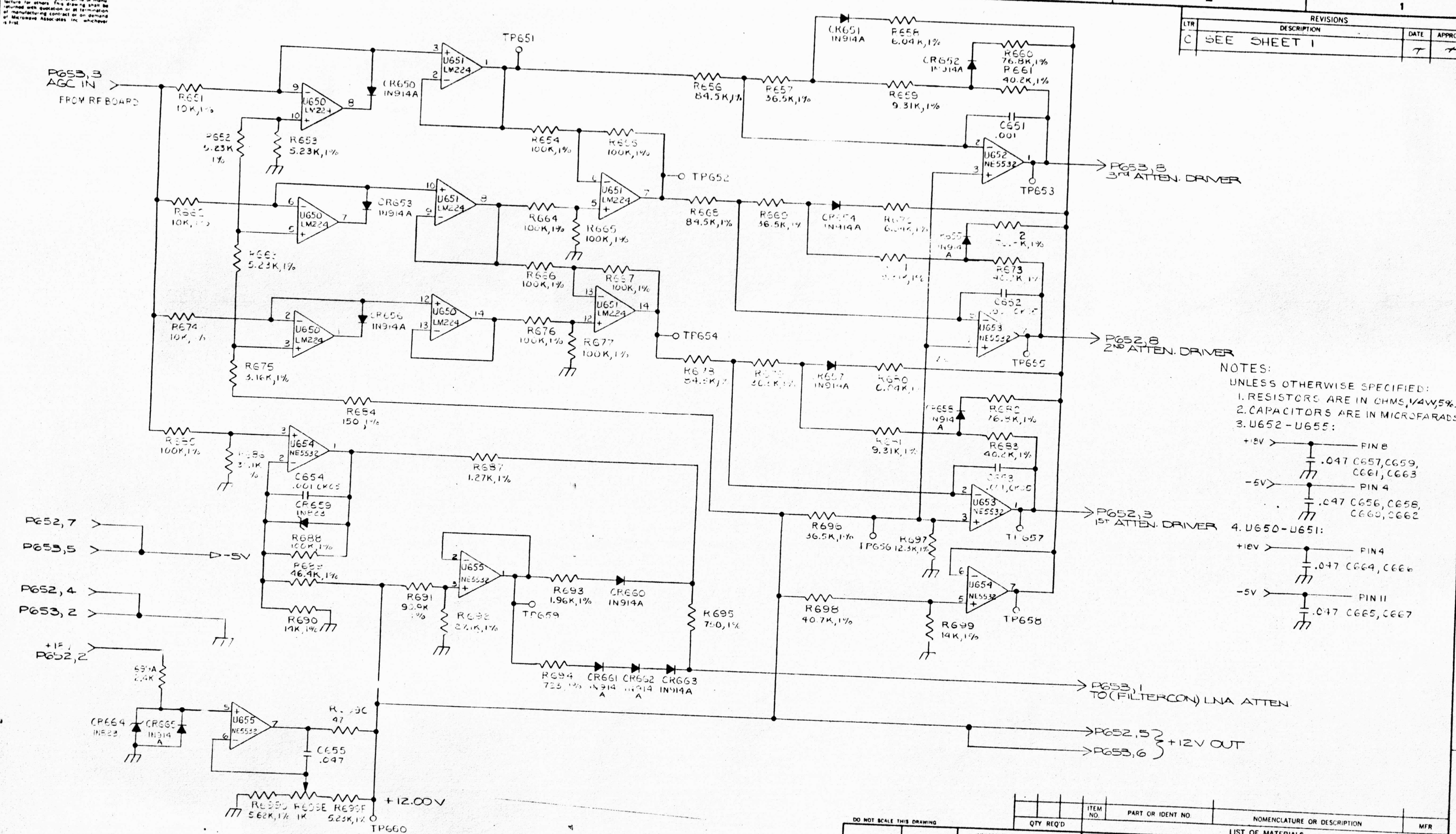
M/A-COM VIDEO SYSTEMS VIDEO SATELLITE

TITLE: ASSEMBLY, SCHEMATIC I.F. AMP

SIZE D — CODE IDENT NO 96341 — DRAWING NO 841352

SHEET 2 OF 2

REVISIONS: D — SEE SHEET 1



NOTES:
UNLESS OTHERWISE SPECIFIED:
1. RESISTORS ARE IN OHMS, 1/4W, 5%.
2. CAPACITORS ARE IN MICROFARADS
3. U652 - U655:
+18V > PIN 8 .047 C657, C659, C661, C663
-5V > PIN 4 .047 C656, C658, C660, C662
4. U650 - U651:
+18V > PIN 4 .047 C664, C666
-5V > PIN 11 .047 C665, C667

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
C	SEE SHEET 1		

DO NOT SCALE THIS DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON DECIMALS X ±.1, XX ±.02, XXX ±.005; ANGLES 0°-30'

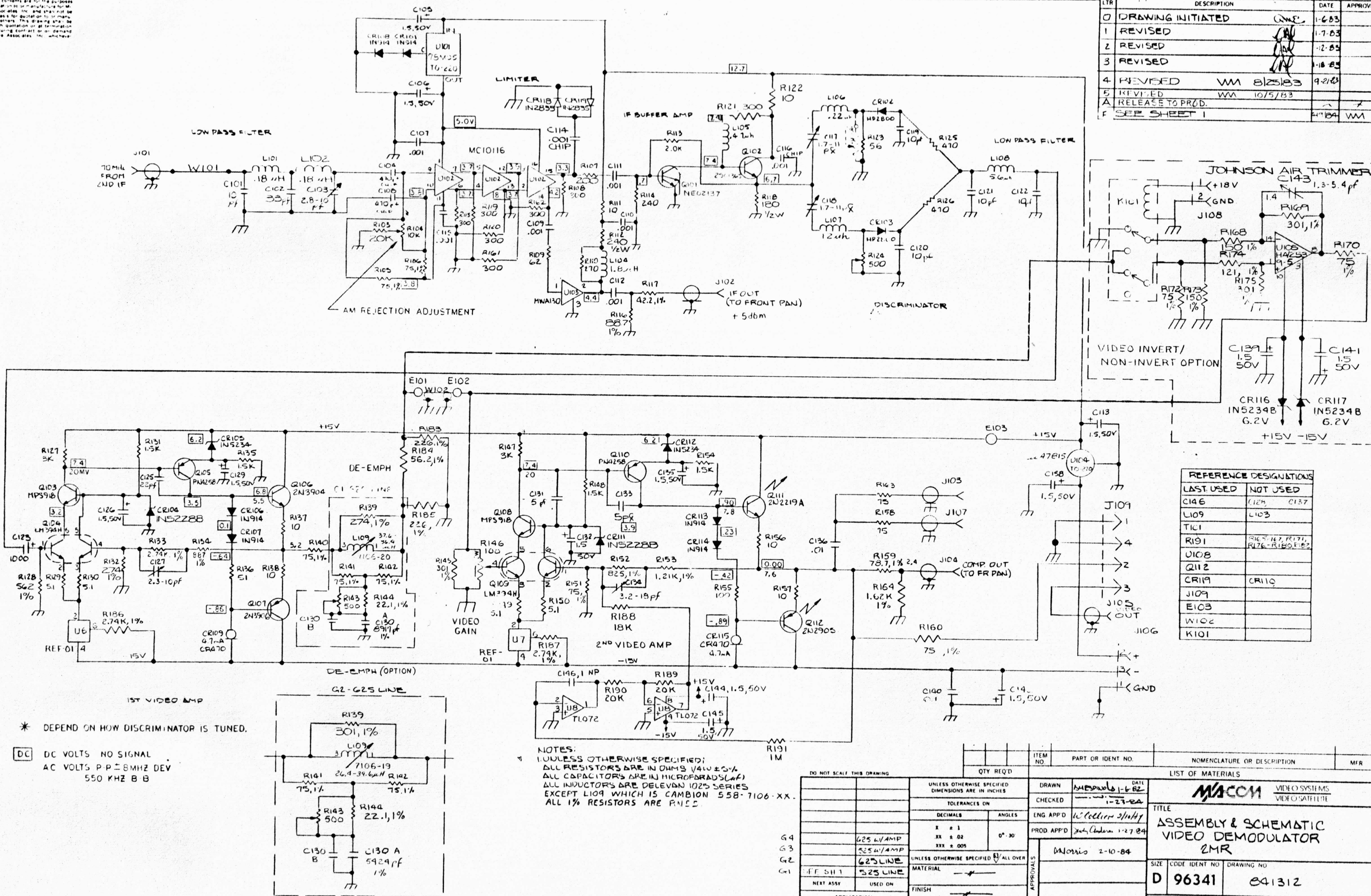
MATERIAL /
FINISH /
NEXT ASSY / USED ON — APPLICATION

DRAWN C. Smith 7-19-83
CHECKED 2-8-84
ENG APP'D
PROD APP'D

M/A-COM VIDEO SYSTEMS VIDEO SATELLITE

TITLE: SCHEMATIC & ASSEMBLY AGC CONTROL BD

SIZE D | CODE IDENT NO 96341 | DRAWING NO 841284
SCALE — | WGT — | SHEET 2 OF 2



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REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
0	DRAWING INITIATED	1-6-83	
1	REVISED	1-7-83	
2	REVISED	-12-83	
3	REVISED	-18-83	
4	REVISED VM 8/25/83	9-21-83	
5	REVISED VM 10/5/83		
A	RELEASE TO PROD.		
F	SEE SHEET 1	4-84	VM

REFERENCE DESIGNATIONS

LAST USED	NOT USED
C146	C128, C137
L109	L103
TIC1	
R191	R165-167, R171, R176-R180, R182
U108	
Q112	
CR119	CR110
J109	
E103	
W102	
K101	

* DEPEND ON HOW DISCRIMINATOR IS TUNED.

DC — DC VOLTS NO SIGNAL
AC VOLTS P-P = 8MHZ DEV 550 KHZ B B

NOTES:
1. UNLESS OTHERWISE SPECIFIED:
ALL RESISTORS ARE IN OHMS 1/4W ±5%
ALL CAPACITORS ARE IN MICROFARADS (µf)
ALL INDUCTORS ARE DELEVAN 1025 SERIES
EXCEPT L109 WHICH IS CAMBION 558-7106-XX.
ALL 1% RESISTORS ARE RN55

G4	625 L/AMP	
G3	525 L/AMP	
G2	625 LINE	
G1	525 LINE	SEE SH 1
APPLICATION	USED ON	NEXT ASSY

DO NOT SCALE THIS DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS .X ± .1, .XX ± .02, .XXX ± .005; ANGLES 0° 30'

MATERIAL: —
FINISH: —

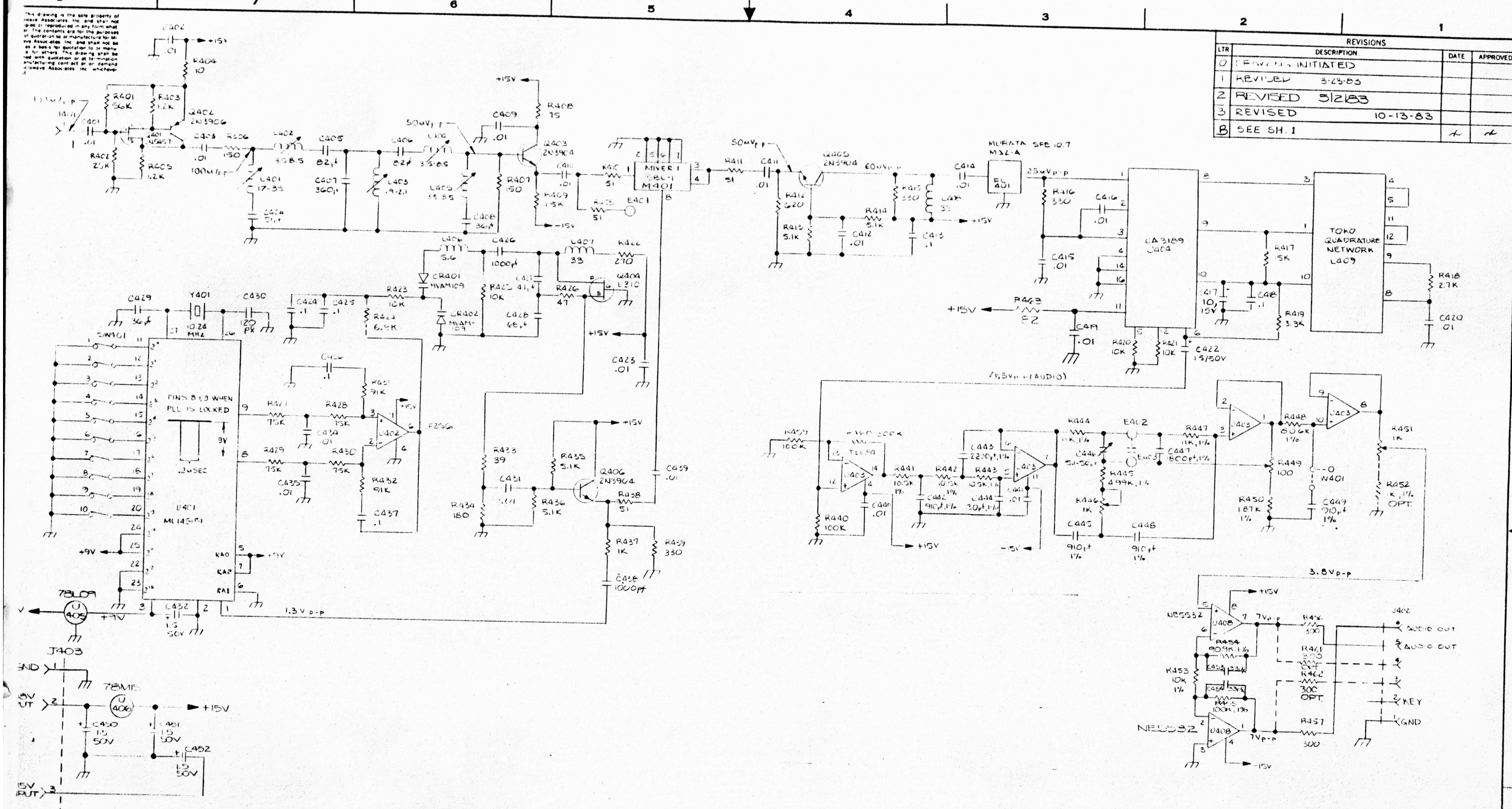
DRAWN	1-6-82
CHECKED	1-27-84
ENG APP'D	3/14/84
PROD APP'D	1-27-84
APPROVALS	2-10-84

QTY REQ'D | ITEM NO | PART OR IDENT NO. | NOMENCLATURE OR DESCRIPTION | MFR
LIST OF MATERIALS

M/A-COM VIDEO SYSTEMS VIDEO SATELLITE

TITLE: ASSEMBLY & SCHEMATIC VIDEO DEMODULATOR 2MR

SIZE D | CODE IDENT NO 96341 | DRAWING NO 841312
SCALE NONE | WGT — | SHEET 2 OF 2



LTR	REVISIONS DESCRIPTION	DATE	APPROVED
0	DRAWING INITIATED		
1	REVISED 3-23-83		
2	REVISED 5/2/83		
3	REVISED 10-13-83		
B	SEE SH. 1		

NOTES

1) UNLESS OTHERWISE SPECIFIED:
ALL CAPACITORS ARE IN MICROFARADS(μF),
ALL RESISTORS ARE IN OHMS(Ω) 1/4W ±5%,
ALL INDUCTORS ARE IN MICROHENRIES(μH),
2) ALL VOLTAGE READINGS ARE TYPICAL.
3) WHEN NOT USING R452 REPLACE WITH A JUMPER.

DO NOT SCALE THIS DRAWING

LIST OF MATERIALS

M/A-COM VIDEO SYSTEMS VIDEO SATELLITE

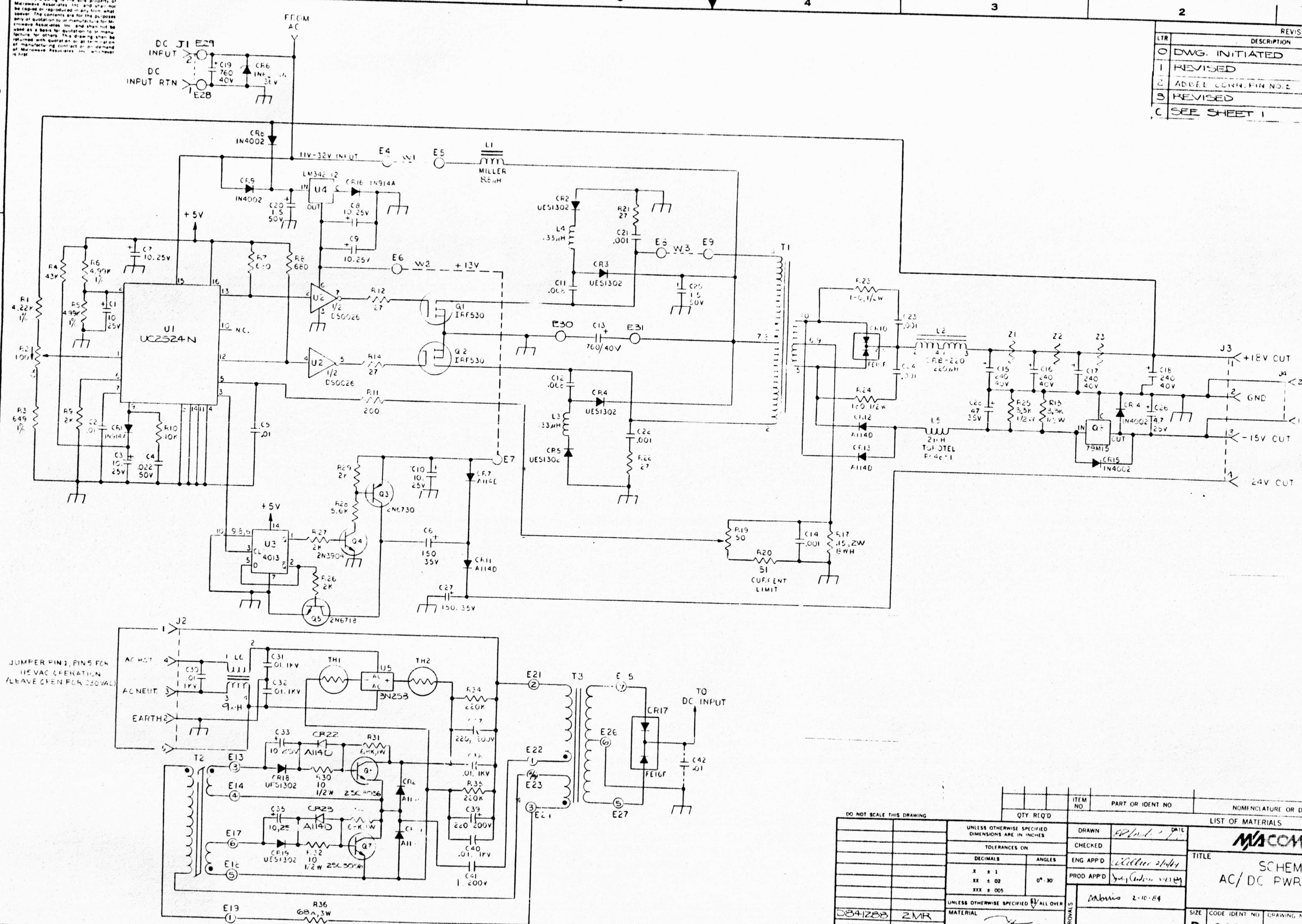
TITLE: ASSEMBLY & SCHEMATIC AUDIO BOARD 2MR

DRAWN Espinola 3-8-82; CHECKED 1-24-84; ENG APP'D 3/10/84; PROD APP'D 1/19/84; L Novis 2-10-84

SIZE D | CODE IDENT NO 96341 | DRAWING NO 841308

SCALE NONE | SHEET 2 OF 2

NEXT ASSY: SEE SHT 1 | USED ON: SEE SHT 1 | APPLICATION



REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
0	DWG. INITIATED		
1	REVISED		
2	ADDED CONN. PIN NO. 5	11/11/83	
3	REVISED		
C	SEE SHEET 1	~	

DO NOT SCALE THIS DRAWING

QTY REQ'D	ITEM NO	PART OR IDENT NO	NOMENCLATURE OR DESCRIPTION	MFR
			LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES ON

DECIMALS	ANGLES
X ± .1	0° 30'
XX ± .02	
XXX ± .005	

UNLESS OTHERWISE SPECIFIED ALL OVER

MATERIAL

FINISH

D841288	2MR
NEXT ASSY	USED ON
APPLICATION	

DRAWN		
CHECKED		
ENG APP'D		
PROD APP'D		
APPROVALS		2-10-84

M/A-COM VIDEO SYSTEMS VIDEO SATELLITE

TITLE SCHEMATIC AC/DC PWR SUPPLY

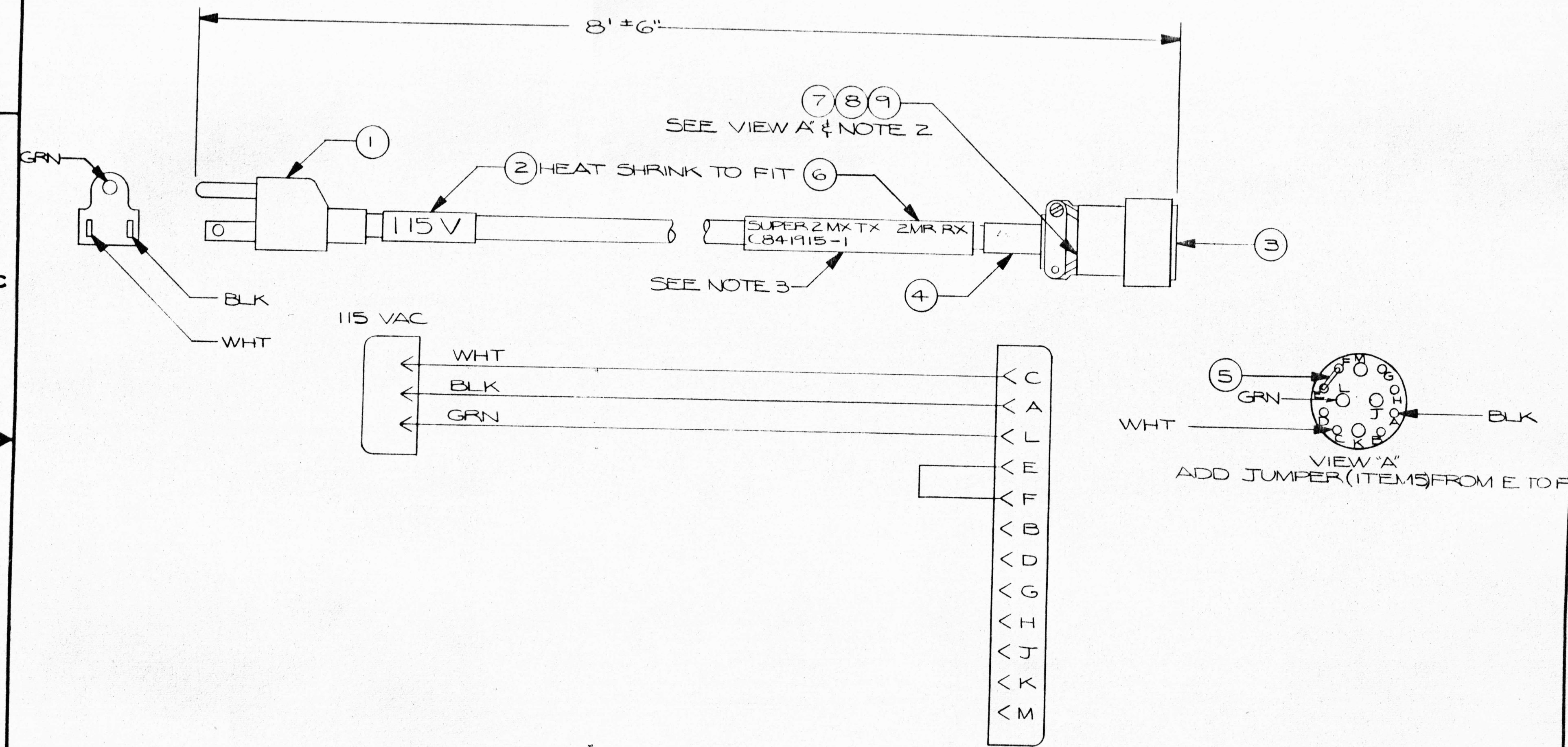
SIZE	CODE IDENT NO	DRAWING NO
D	96341	041290
SCALE	WGT	SHEET 2 2

DIST.

BRUNING 44 231 58021

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
O	DWG. INIT. WM 1/9/84		
A	PROD. REL.	1/16/84	AN
B	CN50734 WM 2/8/84	2-9-84	SB



FOR PARTS LIST SEE B-PL 84-1915

NOTES:

1.) STRIP & TIN LEADS .18
2.) PRIMER & RTV CONNECTOR INTERNALLY PER MFG. PROCEDURE DD0295
3.) MARK MVS PART & MODEL NO IN .10 HIGH CHARACTERS, CONTRASTING COLOR. MARKING TO BE PERMANENT & LEGIBLE

DO NOT SCALE THIS DRAWING

QTY REQ'D	ITEM NO.	PART OR IDENT NO.	NOMENCLATURE OR DESCRIPTION	MFR

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES ON

DECIMALS	ANGLES
.X ± .1 .XX ± .02 .XXX ± .005	0° 30'

UNLESS OTHERWISE SPECIFIED 63/ ALL OVER

		DATE
DRAWN	WM	1/9/84
CHECKED		1-16-84
ENG. APP'D		
PROD. APP'D	David Guthrie	1-16-84
	WNorris	1-16-84

M/A-COM VIDEO SYSTEMS / VIDEO SATELLITE

TITLE

POWER CABLE, 115 VAC

D84-1286 2MR

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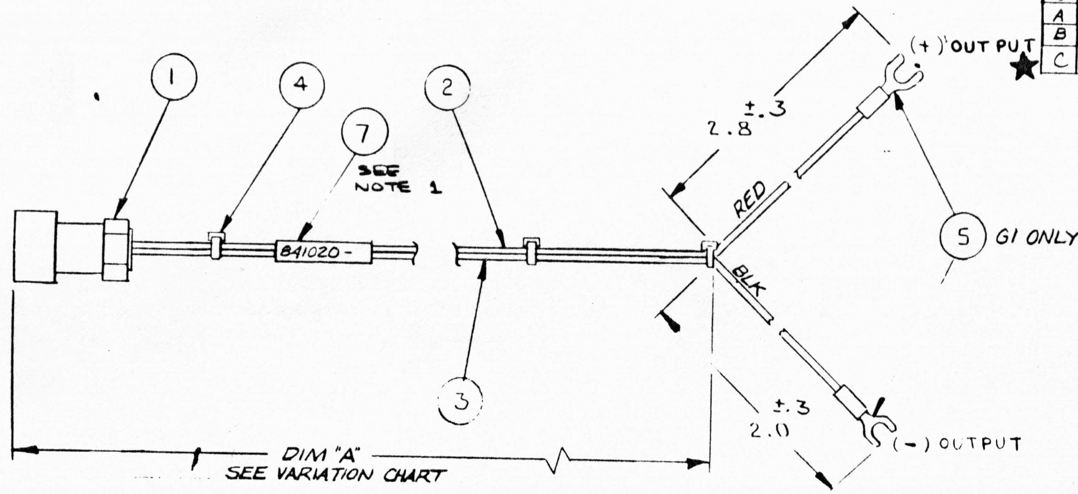
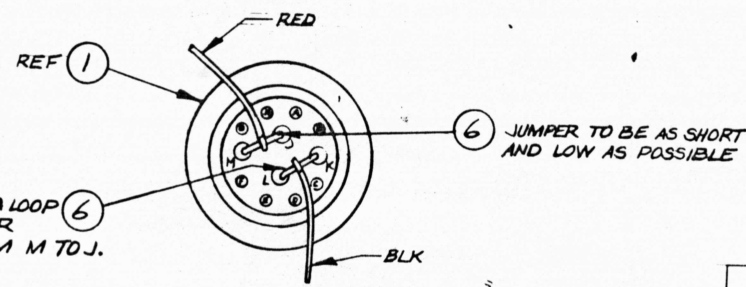
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
O	DWG INITIATED		
A	PRODUCTION RELEASE	10.11.82	
B	CN 11677 12.13.82 CM	12.13.82	
C	CN11738 ΔME 2.23.83	3.18.83	



VARIATION CHART		
GROUP #	DIM "A"	NOTES
-1	22" ±1.0"	AC VERSION
-2	10 FT ±3"	TOTAL LENGTH-SEE NOTE 2 DC VERSION



SOLDER SIDE VIEW
ATTACH WIRES TO JUMPERS AS SHOWN WITH FULL LOOP MECHANICAL CONNECTION BEFORE SOLDERING.
SHRINK TUBING NOT REQUIRED.
RED & BLK WIRES SHOWN ROUTED TO SIDE FOR CLARITY OF VIEW ONLY.
ROUTE WIRES STRAIGHT BACK FROM CONNECTOR.

QTY REQ'D G2	QTY REQ'D G1	ITEM NO.	PART OR IDENT NO.	NOMENCLATURE OR DESCRIPTION	MFR
A/R	A/R	10	89893-3	PRIMER 1200	
A/R	A/R	9	89893-4	CATALYST, TYPE S	
A/R	A/R	8	89893-2	RTV 3110	
A/R	A/R	7	88353-3	TUBING SHRINK 1/4 DIA BLK	
A/R	A/R	6	88300-16	WIRE, BUSS, 16AWG TINNED	
—	2	5	88380-75	TERMINAL SPADE (BB80706)	ETC
A/R	A/R	4	89924	TY-RAP	
A/R	A/R	3	88314-9	WIRE-#14 AWG-BLACK	
A/R	A/R	2	88314-4	WIRE-#14 AWG-RED	
1	1	1	89350-74	CONNECTOR 12S PLUG (PT06E-14-12SX)	BENDIX

LIST OF MATERIALS

NOTES:
1. MARK P/N IN CONTRASTING COLOR. MARKING TO BE PERMANENT & LEGIBLE
2. (G2 ONLY) TWIST ITEMS 2 & 3 TOGETHER TO FORM TWISTED PAIR.
3. (G2 ONLY) STRIP LEADS OF BLK & RED WIRES 1/2" AND TIN

DO NOT SCALE THIS DRAWING

D890650	SUPER 2MX
D890121	MA2.5MX

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON

DECIMALS	ANGLES
.X ± .1	
.XX ± .02	0° 30'
.XXX ± .005	

UNLESS OTHERWISE SPECIFIED 63/ ALL OVER
MATERIAL

DRAWN	MORRISON	10.4.82
CHECKED		10.11.82
ENG. APP'D		
PROD. APP'D		
		10.11.82

MICROWAVE ASSOCIATES, INC.
BURLINGTON, MASSACHUSETTS

TITLE
CABLE ASSEMBLY
POWER SUPPLY

SIZE | CODE IDENT NO. | DRAWING NO.