HARRIS Communications

SERVICE BULLETIN

Maintenance and Modification Data

BULLETIN NO: AM-450-TLH **DATE:** April 1995

EQUIPMENT: MW-1/1A

SUBJECT: NRSC-2 Modification Kit

This bulletin covers installation of the modification contained in kit 992-9216-001. These modifications reduce the occupied bandwidth for compliance with NRSC-2.

Although you may simply proceed with the modifications as described below, we highly recommend that, before you do so, you perform some simple checks of the transmitter's operation, using the enclosed bulletin AM-138-TLH. In particular, use the procedure entitled "Testing for Modulator Problems". Some component and connection problems can otherwise be fairly obscure, and may not illuminate a fault lamp. These component and connection problems can affect both the occupied bandwidth of the transmitter and its reliability.

Tools required for Modification: screwdrivers, soldering iron, wire cutters, Needlenose pliers, drill, Xacto knife

Modification Procedure

1. Turn the transmitter off, and disconnect the primary power.

2. Access the modules in the front of the transmitter by opening the front doors, and removing the cover in front of the PA modules.

3. Loosen the screws which secure the modules in position.

4. Remove the RF Driver module, A13. It will not be modified to the extent that the others will be, so it is best to modify it before you get into the routine required for the rest of the modules.

   Important! For the RF Driver (A13), there WILL NOT be any changes to the L1/R8 circuit.

5. Refer to the attached PA Module drawings for the details of the changes, but disregard that which pertains to L1 and R8 for the RF Driver only.

6. Label the RF Driver module as such by using a marking pen or stick-on label.

7. Install the RF Driver, then proceed with the PA modules. Include the removal of R8 and the replacement of L1 as described on the drawings.

   Note: If there are two people working together on these modifications, one can be designated to remove the modules and loosen the screws, while the other performs the modifications. The first person can then tighten the screws, and install the modules. This will reduce the down time.

   Also, since the modifications are repetitive, it helps to group the components that you remove from the PA modules into separate piles, one for each module. Making a quick visual check of these piles as you go or when finished serves as a check on the completeness of the modifications.

8. Remove the Audio Driver module by pulling the plug from P16, and removing the four mounting screws (accessed inside the small compartment which has the drop-down door).

9. Refer to the attached drawing for the Audio Driver, and install the 5.23K resistor and 5100 pf capacitor. The resistor will be in-line with the base of Q1, and the 5100 pf capacitor is a replacement for C2.

10. After completing the modifications, put all modules and covers back in place, close the transmitter doors, and apply AC power.

11. Turn the transmitter on. The power will be slightly lower due to the addition of the 5.23K resistor on the Audio Driver. Turn the High Power control upward to the normal level.

12. If you are unable to compensate by adjusting the power upward, then it will be necessary to decrease the amount of overall negative feedback. Shut the transmitter down, and decrease C17 or C18 on the Directional Coupler board by about 1000 pf.

    Note: Access to the foil side of the Directional Coupler board is difficult. The best approach is via removal of the right side of the transmitter (when viewed from the front). Otherwise, you can remove the mounting screws for the Directional Coupler, then pull the board forward enough to get a soldering iron around to the back side of the board.

13. Check the occupied bandwidth. Adjust the RF Driver Volts and RF Driver Bias controls for the best results. Based on experience gain during in-house and field tests, the optimum setting is likely to be at or near the full clockwise setting for both controls. This results in only a small amount of modulation of the RF Driver.

14. If you have AM stereo, it would be advisable to check and adjust the high frequency equalization. The modifications affect both the amplitude and phase response of the transmitter at higher audio frequencies.

15. As you know from performing the modifications, the RF Driver module is now somewhat different from the others. As a result, the RF Driver is not immediately interchangeable with the others. To do so would not create a reliability problem, however the occupied bandwidth would revert to something less than the NRSC-2 specification. This is because the large filter choke that is installed on the PA modules creates too much audio phase shift for the RF Driver, thus improperly affecting the relationship of the RF Drive with the modulation.

If you have any questions or comments concerning this bulletin, please contact:

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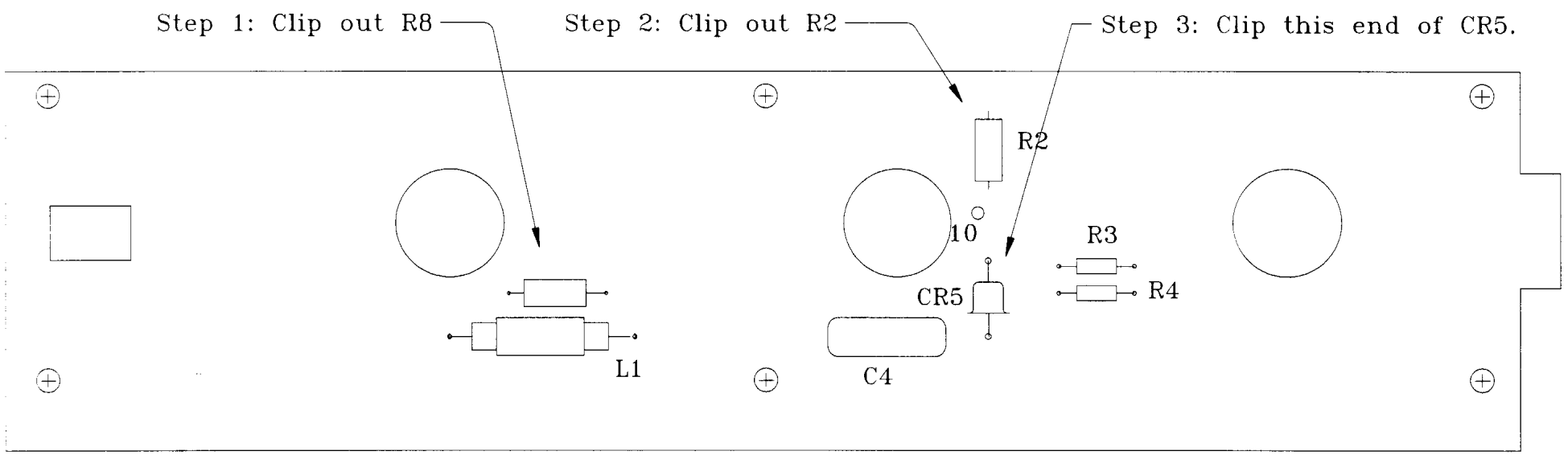
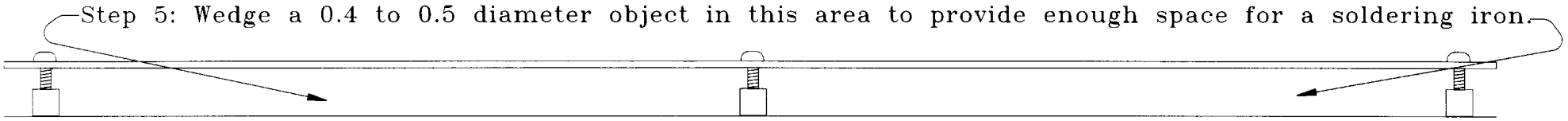
MW-1/1A PA Module



Step 4: Loosen all six mounting screws, almost to the point of removal.

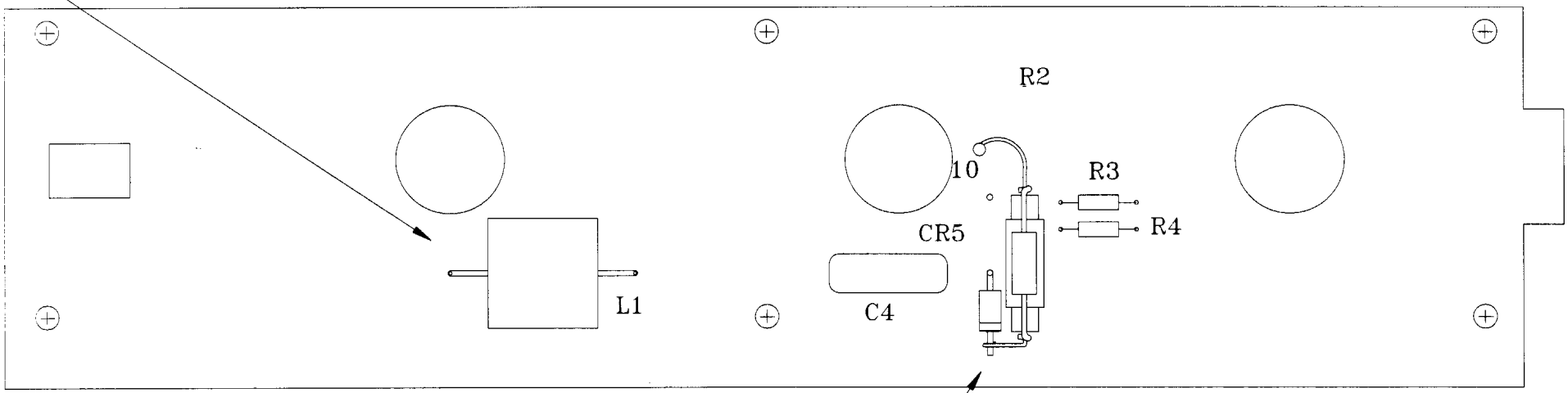


Side View

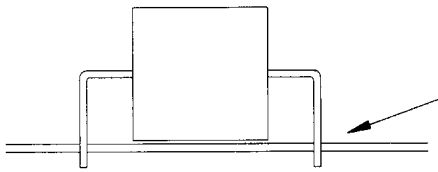
Step 6: Remove choke L1 and the anode end of CR5 with a soldering iron and needlenose pliers.
This can be accomplished by wedging an object between the PA board and the heatsink,
such that there is a large enough gap between the board and heatsink to accommodate a slender soldering tip.

MW-1/1A PA Module

Step 6: Drill larger holes for L1, using the .059 drill bit supplied with the kit. Be careful not to force the bit through the board. This would cause damage to the circuit foil.



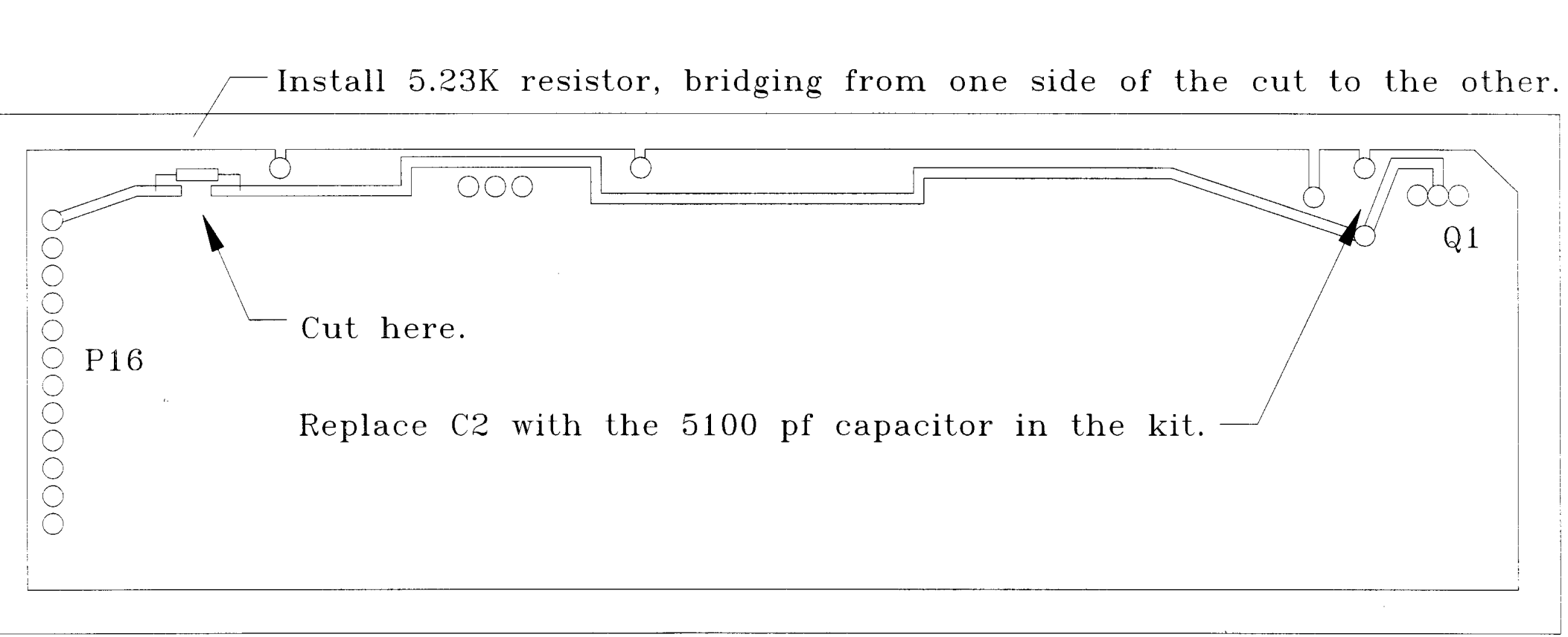
Step 7: Trim the leads of the new choke to the right length. You can gauge the length by holding the choke against the side of the board, with the leads folded down.



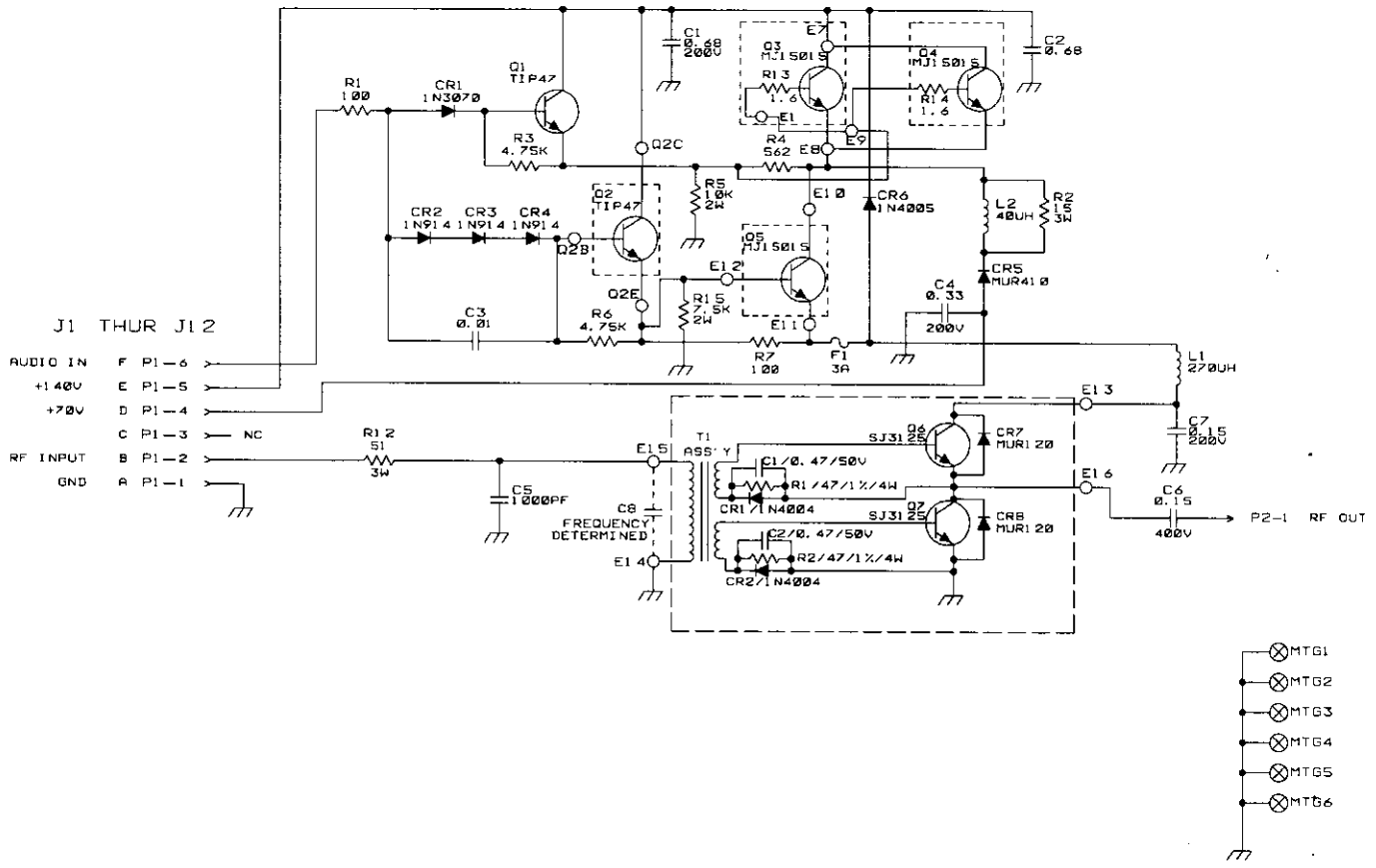
Side View

Step 8: Install the new CR5 assembly as shown, with the new CR5 oriented outward, and the choke connected to terminal 10.

Audio Driver



DWG # 843-5400-141



NOTES

4. INDUCTANCE IN UH.
3. CAPACITANCE IN UF.
2. RESISTANCE IN OHMS.
1. ALL RESISTORS ARE 1/2 WATT, 1%.

UNLESS OTHERWISE NOTED:

6. 5% RESISTORS MAY BE SUBSTITUTED FOR ANY RESISTOR UNLESS LABELED 1% ON THIS DOCUMENT.
5. (2/A1) SHEET NUMBER / ZONE — CONTINUATION SYMBOL

REVISION	LTR	ZONE	DATE	DFTM	ENG	ECO NUM
	C		4-5-99	DFD	DFD	42241
	REVISE CR1, CR2					
	B		3-21-96	DFD	TLH	4135
	REVISE C8					

HARRIS CORPORATION
BROADCAST SYSTEMS
P.O. BOX 4290
QUINCY, ILLINOIS 62305

DRAWN BY	DAVIDSON
DATE	12-15-95
ENG CHK	T. HOLLENBERG
PROJ ENG	T. HOLLENBERG
MFG ENG	
D	SHEET 1 OF 1

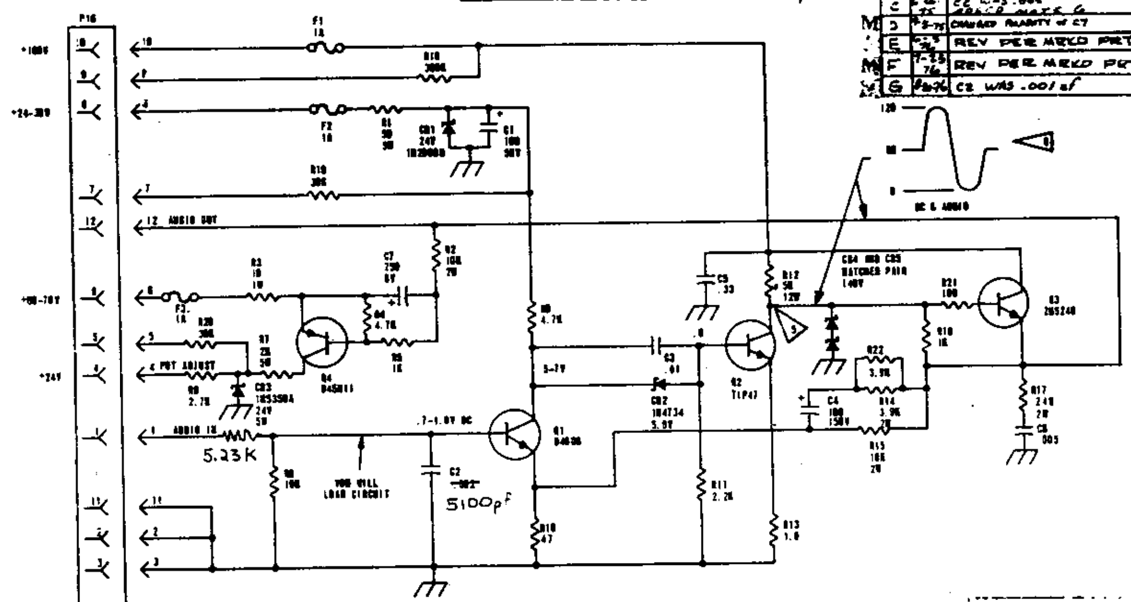
TITLE
SCH
MODULE, NRSC MODIFIED PA

DWG # 843-5400-141 REV C

H	[illegible]	CHG R17 FROM 27	[illegible]	[illegible]	22119	
J	9-7-77	REVISED Q3	DR	[illegible]	22789	
K	[illegible]	R7 WAS 1K	WB	[illegible]	24135	

828 8516 001

LTR	DATE	DESCRIPTION			
A	[illegible]	[illegible]	WP	[illegible]	[illegible]
B	[illegible]	REV PER MARKED PRINT	SD	[illegible]	[illegible]
C	[illegible]	C2 WAS .005 ADDED NOTE 6	[illegible]	[illegible]	[illegible]
D	5-5-75	CHANGED POLARITY of C7	[illegible]	[illegible]	[illegible]
E	[illegible]	REV PER MRKD PRT	CB	[illegible]	[illegible]
F	7-23-76	REV PER MRKD PRT	CB	[illegible]	[illegible]
G	[illegible]	C2 WAS .001 uf	[illegible]	[illegible]	[illegible]



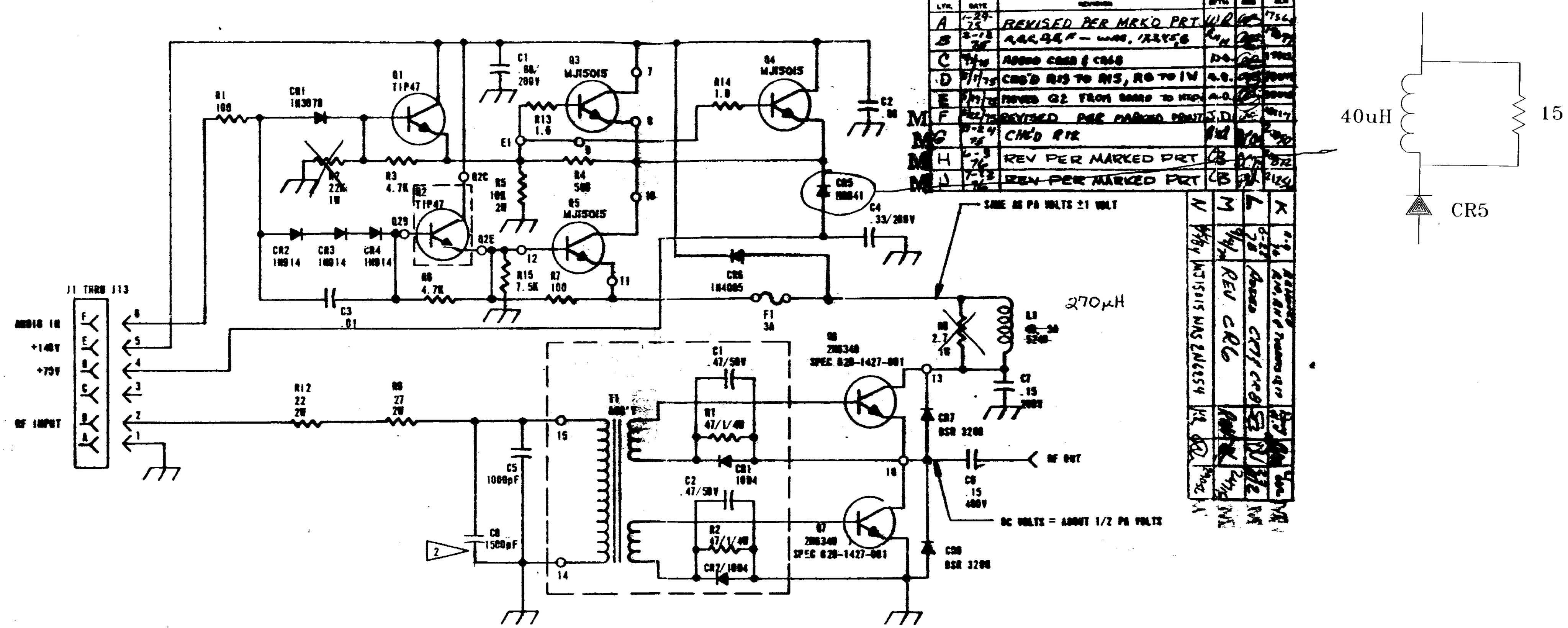
6. 100% MOD AT 1kHz
5. 5 VOLTS HIGHER THAN PA VOLTS
4. RESISTORS ARE 1/2WATT, 5%
3. RESISTANCE IN OHMS
2. CAPACITANCE IN uF
1. INDUCTANCE IN uH

UNLESS OTHERWISE SPECIFIED:

HARRIS

SCHEMATIC – AUDIO DRIVER
A17
MW-1

828 8516 001



020 0512 001

LTR.	DATE	REVISION	APPD		
A	1-29-75	REVISED PER MRK'D PRT	WR		
B	3-13-75	[illegible]			
C		ADDED CR6A & CR6B			
D		CHG'D R13 TO R15, R8 TO 1W			
E		MOVED Q2 FROM BOARD TO HTSK			
F		REVISED PER MARKED PRINT	J.D.		
G	9-24-75	CHG'D R12			
H	2-3-76	REV PER MARKED PRT	CB		
J	7-13-76	REV PER MARKED PRT	CB		
K	4-9-76	REMOVED R10, R11 & TURRETS 12, 13			
L	6-27-78	ADDED CR7 & CR8			
M	8/4/79	REV CR6			
N	4/5/84	MJ15015 WAS 2N6254	KR		

NOTE:

1. [1]
2. [2] C8 TO BE USED BELOW 1MHZ.
3. INDUCTANCE IN uH
4. CAPACITANCE IN uF
5. RESISTANCE IN OHMS
6. RESISTORS ARE 1/2WATT, 5% UNLESS OTHERWISE SPECIFIED.

HARRIS

HARRIS CORPORATION

SCHEMATIC
RF/AF MODULE
A1 THRU A13
MW-1

10-10-74

020 0512 001

10-25-74