

TMC SPECIFICATION

NO. S 1041

REV: A

COMPILED: RRH

CHECKED:

APPD: *M. H. 11/23/65*

SHEET 1 OF 9

TITLE:

typed by vab

11/22/65

KIT-275
S1041

MODIFICATION INSTRUCTIONS
CONVERSION OF ATS-2 TO ATS-2A
KIT-275

TMC SPECIFICATION

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TITLE: **MODIFICATION INSTRUCTIONS - CONVERSION OF ATS-2 TO ATS-2A (KIT-275)**

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I. EQUIPMENT AFFECTED:

- A. TMC Model TU-2 Tuner
- B. TMC Model MCU-2 Monitor Control Panel

II. PURPOSE:

- A. To improve alignment of the reactance tuning drive shafts in TU-2.
- B. To prevent over-ride of resistance control motor in TU-2 by providing dynamic braking.

III. It can be determined if this modification has been completed by noting the addition of terminal strip E208, mounted on bracket LD 2016 /MS4800 and bearing bracket PM1288 in the TU-2 and SW247 as the resistance control switch (S102) in MCU-2. Nameplates NP362-52 should be affixed to both the TU-2 and the MCU-2 units.

IV. This modification may be done either at the factory or as a field change.

V. DRAWINGS REQUIRED:

- TU-2A Schematic Diagram CK1062
- MCU-2A Schematic Diagram CK1063
- Installation Dwg. ID352

VI. MATERIALS REQUIRED:

<u>ITEM NO.</u>	<u>QTY</u>	<u>TMC PART. NO.</u>	<u>DESCRIPTION</u>
1	1	A5321	Component Mounting Ass'y.
2	1	CA409-194-24.00	Lead, Electrical (White/Red)
3	1	CA409-195-24.00	Lead Electrical (White /Green)
4	DELETED		

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<u>ITEM NO.</u>	<u>QTY.</u>	<u>TMC PART NO.</u>	<u>DESCRIPTION</u>
5	DELETED		
6	1	SW347	Switch, DPDT
7	1	PM1288	Bracket, Gear Mtg.
8	1	CU102-2	Clamp, Loop, 3/16
9	4	TE117-1	Spacer, Sleeve
10	1	PM1062-5	Collar, Shaft
11	4	SCBPO632BN32	Screw, Machine
12	1	SCBPO832BN12	Screw, Machine
13	1	FW08HBN	Washer, Flat
14	4	LWE06MRN	Washer, Lock, Ext.
15	1	LWE08MRN	Washer, Lock, Ext.
16	19"	MWC22(7)U95	Wire, Insulated (White/Gr n)
17	1	CA409-32-9.00	Lead, Electrical (Black)
18	2	NP362-52	Modification Nameplate

NOTE : SEE STEP 25 IN PROCEDURE FOR INTERCONNECT CABLE INFORMATION.

VII. MODIFICATION INSTRUCTIONS:

A. Dynamic Braking for Motor B202 of TU-2

1. If cables are connected between TU-2 and MCU-2, remove RF input cable from TU-2. Remove control cable from terminal strip E201 and from J101 of MCU-2. Disconnect the lead going to the inner terminal of RF feedthrough E202 of TU-2.

2. Remove the four nuts, lock washers and flat washers which mount the lower rails of the TU-s tuning unit to the protective case. Lift the tuning unit out of its case.

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3. Face the motor side of the panel to which the drive motors are mounted. Remove the upper right hand 6-32 machine screw which mounts RF feed through E206. Remove the 8-32 machine screws to the right of motor B201.

4. Place assembly A5321 (Item 1) in position and mount with the hardware removed in Step 3, above except place a cable clamp CU102-2 (Item 8) under the head of the lower 8-32 screw and replace the original screw in this position with SCBPO832BN12 (Item 12) and lockwasher LW08MRN (Item 15), and flat washer FW08HBN (Item 13).

5. Connect one end of CA409-32-9.00 (Item 17) to terminal #3 of new terminal strip E208 on Item 1. Pass the other end of this lead through the cable clamp (Item 8) installed by step 4, above, and connect it to terminal #5 of terminal strip E205.

6. Connect the spade lug end of CA409-195-24.00 (Item 3) to Terminal #1 of new terminal strip E208. Connect the spade lug end of CA409-194-24.00 (Item 2) to terminal #2 of E208.

7. Dress Items 2 and 3 through the cable clamp (Item 8), through the adjacent rubber grommet, along the lower edge of the sub-panel, along the right edge of the terminal board which mounts resistors R205, R202 and R204, through the opening at the top of the sub-panel, through the cable clamp at the center of the inner panel and through the rubber grommet adjacent to switch S204.

8. Disconnect the green lead from the common terminal of switch S204. Tap the terminal lug or otherwise insulate it to prevent accidental grounding. Connect Item 3 in place of the wire removed.

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9. Connect Item 2 to the "normally closed" terminal of S204.
10. This completes the Dynamic Braking modification of the TU-2 unit. Set TU-2A unit aside. Further modifications will be performed later. Now proceed to the Monitor Control Unit MCU-2.
11. In the MCU-2, disconnect the gray lead, the red/white lead and two red leads from Switch S102. Remove the switch and replace it with SW347 (Item 6). (Note: On SW347, Terminal 1 must be connected to Terminal 4, and Terminal 2 must be connected to terminal 6)
12. Connect the red leads, removed in step 11, above, to terminals 2 and 6 of Item 6. Connect the gray lead to terminals 1 and 4 and the red/white lead to terminal 5.
13. Connect one end of MCW22(7)U95 (Item 16) to terminal 3 of S102 and dress it along the existing cable harness. Connect the other end to terminal I of connector J101. This completes the modification of the MCU-2. Affix a modification nameplate NP362-52 (Item 18) to the front panel under the left hand Model nameplate.

B. Drive Shaft Alignment Modification of TU-2

1. Loosen the two set screws holding the flexible coupling on the shaft motor B201.
2. Remove the four (4) screws holding B201 to the panel and remove the motor. (Be careful not to allow the motor case to come apart).
3. With a drift punch, drive out the pin holding the worm to the motor shaft. Remove the worm.
4. Remove the bracket which contains the plastic bushing at the end of the shaft for potentiometer, R201, and discard this bracket.

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5. Remove the worm wheel and the two limit switch actuator arms from the potentiometer shaft.
6. Unsolder the four leads from the potentiometer, R201, and remove the potentiometer from its panel.
 - 6a. Bend locating tab flat to Potentiometer body.
7. Ream out the 3/8" hole, from which the potentiometer was removed, to 1/2" diameter.
8. Using 4 6-32 X 2" machine screws (Item 11) mount new bearing bracket, PM1288 (Item 7) to the inner side of the motor mounting. Use a spacer, TE117-1 (Item 9) for each screw, between the bracket and the panel. The 3/8 - 32 threaded hole in Item 7 must be adjacent to the potentiometer hole enlarged in Step 7, above.
9. Pass the motor shaft partially through the oilite bushing in Item 7 which can be seen through the large hole in the motor mounting panel. Replace the worm (removed by Step 3) with the pinning hole in the worm away from the motor.
10. Enter the end of the motor shaft into the flexible coupling and bring the motor case against the surface of the mounting panel. Tighten the screws mentioned in step 8, above.
11. Rotate the motor shaft until its flat portion is beneath one of the set screws in the flexible coupling. Tighten both sets screws in the coupling against the motor shaft.
12. Line up the pinning holes in the worm and the motor shaft and replace the pin removed in step 3, above.
13. If necessary, loosen the four machine screws which hold the potentiometer panel and move this panel into contact with, or as close as possible to, the side of PM1288 (Item 7) which has the 3/8-32 threaded hole.

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14. Pass potentiometer (R201) shaft through the thread d hol in PM1288 (Item 7), through the 3/8-32 nut (removed when R201 was removed), and through the two limit switch actuator arms are placed so that the heads of their locking screws are accessible when the arms are against their respective micro-switches.

15. Place the worm wheel (removed by step 5) into mesh with the worm and pass the potentiometer shaft through the worm wheel and then into the oilite bushing on the far side of PM1288 (Item 7). DO NOT LOCK WORM WHEEL TO SHAFT AT THIS TIME.

16. Screw the potentiometer bushing into PM1288 (Item 7) as far as it will go; then back it off until the connection lugs are vertical, pointing toward terminal strip E201. Potentiometer must not bind against the side panel. (If the potentiometer should happen to tighten into PM1288 initially with connection lugs pointing up, back it off a full turn.)

17. Screw the 3/8-32 nut onto the potentiometer bushing and tighten.

18. Pull on the potentiometer shaft to remove all end play and slip collar PM1062-5 (Item 10) on the end of the shaft. Secur it on the shaft in contact with the outer side of the oilite bearing in PM1288. When this operation is completed, there should be no perc ptibl end play of the potentiometer shaft.

19. Rotate the potentiometer shaft to its extreme clockwise position (view d from the shaft sid .) Rotat th motor shaft until th contact wh l within the variabl coil L201 is 90 from th xtreme counterclockwise end of its travel.

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20. Make sure that the worm wheel is centered over the worm and tighten the set screws on the worm wheel.

21. Swing the limit switch actuator for S203 around the shaft until it rests on top of the switch. Press it down until the limit switch trips, then tighten the locking screw of the actuator arm.

22. Rotate the motor shaft until the contact wheel inside L201 is 90° from the extreme counter clockwise end of its travel. Swing the actuator arm for limit switch S202 around the shaft into contact with the switch. Press it up until the switch trips, then tighten the locking screw on the actuator arm.

23. Run the motor shaft until the contact in L201 has travelled over its entire range and inspect to see that the actuator arms do not strike or rub against anything in the course of their travel. Also check for proper mesh of the worm and worm wheel. Slight readjustment of the actuator arms may be necessary after the MCU-2 is connected electrically to the TU-2, in order that the meter, M102, in MCU-2 will read zero at the extreme clockwise end of the coil contact travel; also that the contact stops approximately 10° - 15° before it reaches the mounting strap on L201 at the clockwise end of travel and approximately 10 - 15° before it reaches the electrical tap at the counter-clockwise end of travel.

24. When it has been ascertained that the TU-2 is functioning properly, and all adjustments have been made, recheck all machine screws and reinstall the unit into its protective case reversing the disassembly procedure in PART A.

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25. New interconnect cables (including new wires) to connect the models TU-2 with the MCU-2 may be purchased from TMC if desired. They are CA541-XXX for standard application, or CA729-XXX for armored type. Length must be specified as required. If new cables are not desired for field installation, new wires may be added external and parallel to existing cable. Customer may use Alpha Wire Corp. No. 1244 two conductor cable (TMC No. WI112-1) or an equivalent, and use only one of the two conductors. Connect one end to the TU-2 unit, Terminal 1 of E208, and the other end to the MCU-2 unit, Pin I of J101.

26. Affix an NP-362-52 Modification Nameplate (Item 18) at any convenient point on the motor mounting plate of TU-2.

