

# DCS Technical Team Repair/Installation Request



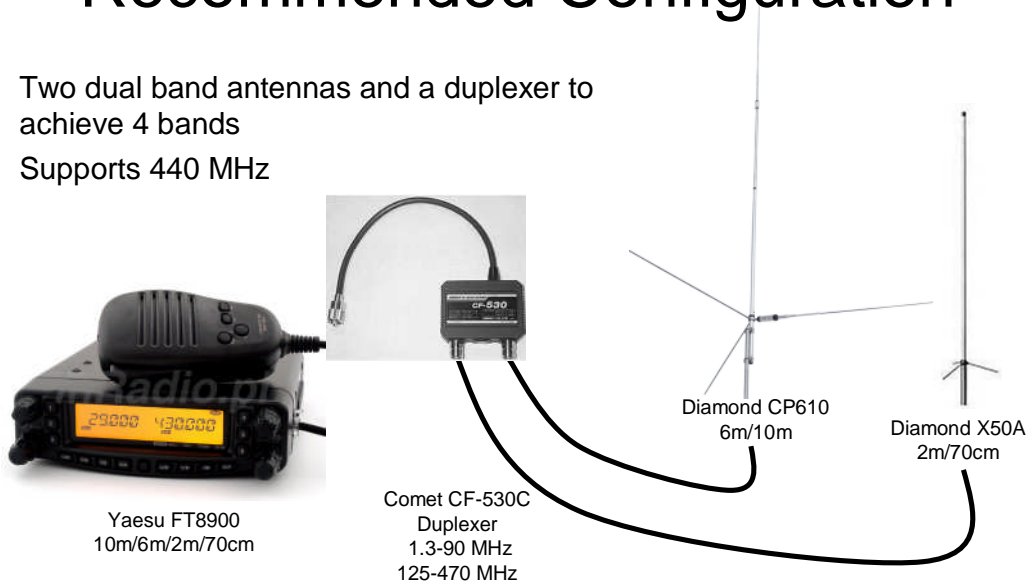
<b>1.</b>	<b>Location(s)</b>	<b>Control #</b>
	West Hollywood Station DCS room 780 N San Vicente Blvd, West Hollywood CA 90069	WHD-01
<b>2.</b>	<b>Statement of the Problem(s)</b>	
	<p>A. One of the two Astron 20 amp power supplies (the one in the locked cabinet on the far right, with a warning sticker over the power switch) went up in smoke.</p> <p>B. The Kenwood 2 meter ham radio was removed and scrapped, leaving one station no frequency agile 2m radio.</p> <p>C. West Hollywood can't support HF NVIS and all required bands. The Kenwood TM-641, TM-741, and the 2 ICOM IC726s are not functioning properly.</p>	
<b>3.</b>	<b>Recommended Solution(s)</b>	
	<p>A. Replace the failed Astron RS-20A power supply with an Astron RS-50A power supply.</p> <p>B. Install an ICOM IC-2200H from stock in the rightmost operator position as a one for one replacement for the Kenwood 2m frequency agile radio previously removed. Connect it to the Astron RS-50A power supply provided in step A above. See the power supply summary chart below assigning radios to power supplies.</p> <p>C. Numerous actions are required to provide HF NVIS and the other required bands.</p> <ol style="list-style-type: none"> <li>a. Remove the two ICOM IC726s. For HF NVIS, install a new Yaesu FT897D all band transceiver from stock with a new LDG AT897+ tuner. Install new B&amp;W BWDS-90N antenna, connect to the HF/50 MHz antenna port on the FT897D. Install new Diamond X50A 2m/70cm antenna and connect to the 144/430 antenna port on the FT897D to complete its capability. See diagram below. Add an Astron RS-35A power supply dedicated to the FT897D.</li> <li>b. For 6 and 10 meter coverage, install a Yaesu FT8900 radio from stock. Add Diamond CP 610 and add a Diamond X50A 2m/440 antennas and Comet CF-530C duplexer to complete FT8900 4 band capability. See diagram attached. Connect the FT8900 to the Astron RS-50A provided in step A above.</li> <li>c. Remove the Kenwood TM741 and TM641. Replace the TM 641 with an Alinco DR 235 MkIII 220 radio from stock. Use the 220 MHz antenna from the TM641. Connect the DR 235 to the Astron RS-50A provided in step A above.</li> <li>d. A suggestion to reuse and combine components from the TM-641 and TM-741 and create a fully functioning tri-band radio is provided at the end of this Repair Request.</li> </ol>	
<b>4.</b>	<b>Concurrences</b>	<b>Date</b>
	<b>Technical Team Contact</b>	Mark Stevenson, K-220, <a href="mailto:mes90265@gmail.com">mes90265@gmail.com</a>
	<b>DCO</b>	Robert Sussin, S-10, <a href="mailto:RobertWK6W@gmail.com">RobertWK6W@gmail.com</a>
	<b>Technical Ops Officer</b>	Deane Bouvier, S-50, <a href="mailto:n5dq@arrl.net">n5dq@arrl.net</a>
<b>5.</b>	<b>CFMB Approval</b>	



Position of the Removed 2m radio

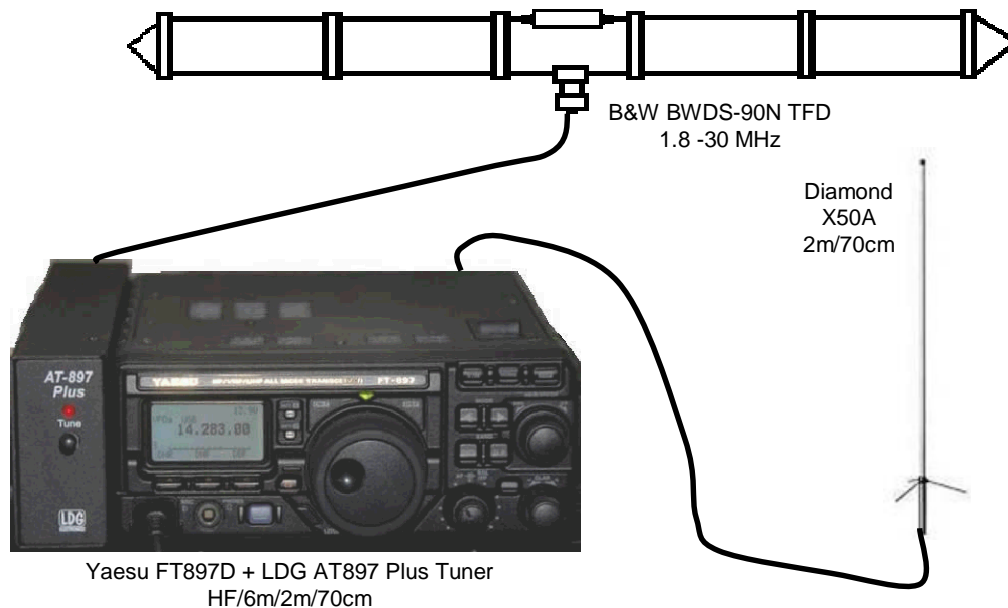
## FT 8900 for 6m and 10m Recommended Configuration

- Two dual band antennas and a duplexer to achieve 4 bands
- Supports 440 MHz



- Radios are in stock, but not the duplexer or antennas

# HF Position



- HF bands with horizontal polarization to support NVIS
- Second antenna port for 2m/70cm dual band antenna
- Radio in stock, but not the tuner or other antennas

## Power Supply Summary

<i>Power Supply</i>	<i>Continuous Rating</i>	<i>Radios Connected</i>	<i>Peak Load</i>
Astron RS-20A	16 amps	Motorola CDM 1250	13.5 amps
Astron RS-50A	37 amps	Alinco DR 235 + ICOM IC-2200H + Yaesu FT-8900	31.5 amps
Astron RS-35A	25 amps	Yaesu FT 897D	22 amps

## Reuse of the Removed TM-641 and TM-741

The Kenwood TM-641 has two RF slices, one for 2m and one for 220 MHz, with an option for a third band. The radio functions on both bands with rated power out. The front panel "Memory" button does not write the VFO contents into memory, so operation from the VFO is all that is possible.

The Kenwood TM-741 has two RF slices, one for 2m and one for 440 MHz, with an option for a third band. The radio does not power up and the main board was probably destroyed by the power supply that failed.

Using the front panel from the TM-741 on the TM-641 could solve the stuck "Memory" button. Installing the internal 440 MHz RF slice in the TM-641 could create a fully functioning tri-band 2m/220/440mhz radio. The attached excerpt from the TM-641/741 User's Manual describes the band unit and front panel installation. If successful the newly created fully functioning tri-band radio could be used elsewhere. If ISD is not interested in this project, the Technical Team could perform the operation.

## 7-6 BAND UNITS

Any of the following optional band units may be installed in the TM-741A/741E.

The same instructions apply for the Tri-Bander as for the Dual-bander.

	OPTIONAL BAND UNIT
TM-641A	UT-28S UT-50S UT-440S UT-1200
TM-741A U.S.A.version	UT-28S UT-50S UT-220S UT-1200
TM-741A	UT-28S UT-50S UT-1200
TM-741E	UT-28S UT-50S UT-1200

### 7-6-1. Installation

#### CAUTION

Before installing any band unit be sure to unplug the DC power cable.

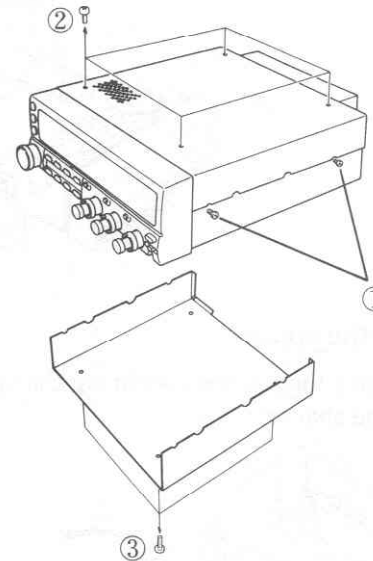
#### TOOLS;

2.6mm Phillips screwdriver

3.0mm Phillips screwdriver

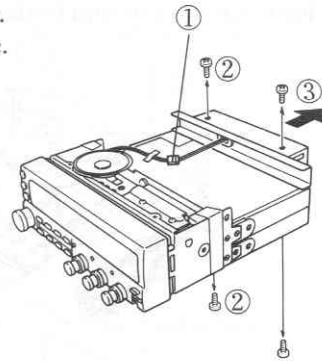
### ①. Remove the cases.

- ① Loosen the 4 screws on the top and bottom cover.
- ② Remove the 4 screws securing the top case.
- ③ Remove the 4 screws securing the bottom case.
- ④ Remove the top and bottom case.



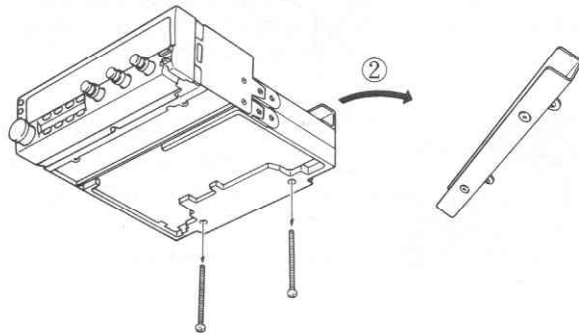
②. Remove the cooling fan assembly.

- ① Disconnect the connector.
- ② Remove the 4 screws securing the fan case.
- ③ Remove the fan case.



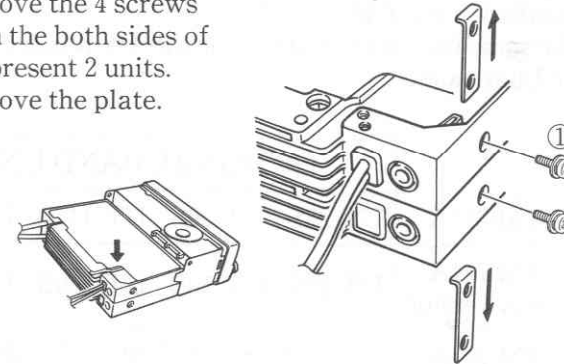
③. Remove the spacer.

- ① Remove the 2 long screws securing the spacer.
- ② Remove the spacer.



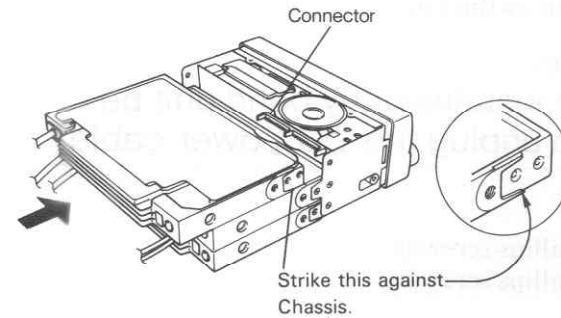
④. Be sure to unplug the dc cable before removing the terminal plate.

- ① Remove the 4 screws from the both sides of the present 2 units.
- ② Remove the plate.



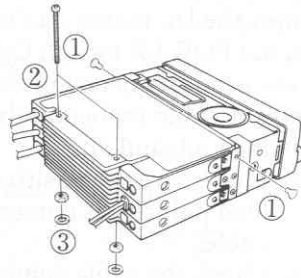
⑤. Insert the new band unit.

- ① Insert the new band unit as shown in the accompanying diagram.



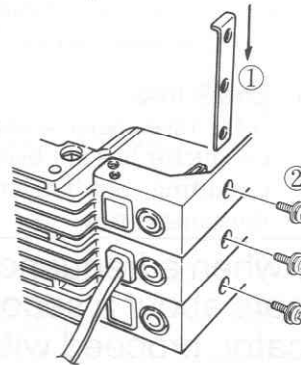
⑥. Tighten the new band unit.

- ① Tighten the 2 side screws to secure the new band unit in place.
- ② Insert the 2 long screws.
- ③ Tighten the 2 long screws while holding the nuts and lock rings from the opposite side.



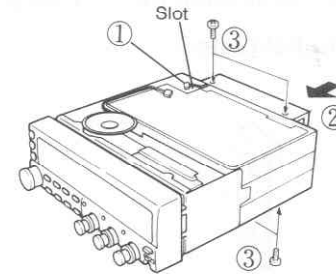
⑦. Attach the 3 unit terminal plate.

- ① Insert the 3 unit terminal plate.
- ② Tighten the 6 screws from each side of the 3 units.



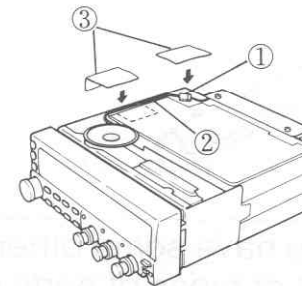
⑧. Replace the cooling fan assembly.

- ① Align the fan cable with the slot of the rear case.
- ② Replace the cooling fan assembly.
- ③ Tighten the 4 screws.



⑨. Attach the connector.

- ① Attach the connector.
- ② Route the cable in the slot of the chassis.
- ③ Attach the supplied 2 sheet on the cable.



⑩. Replace the cases.

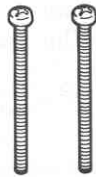
- ① Attach the top and bottom case.
- ② Tighten the 4 screws to secure the top case.
- ③ Tighten the 4 screws to secure the bottom case.
- ④ Tighten the 4 screws of the both sides.

### 7-6-2. Notes

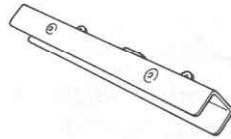
After installation the following parts will be remained.

Terminal plate

2 screws for bracket



A bracket



If you have some other number of parts or types of parts re-check your installation **BEFORE TURNING** the **POWER switch ON**.

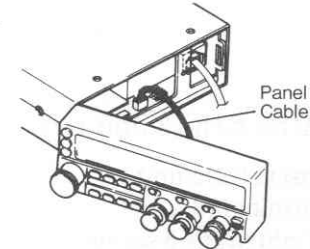
### 7-6-3. Preliminary arrangement

We recommend the use of a DC power supply when checking the following points.

1. Connect the DC power cable.
2. Turn the POWER switch ON.

If there is no frequency in the display, disconnect the DC power cable immediately. Then check the following ( a,b,and c).

- a. Make sure the positive (+) and negative (-) lead polarity is correct when connecting the cable.
- b. Check the cable connecting the front panel unit and the main unit.



- c. Check fuse.

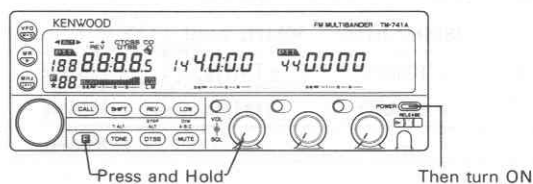
If the fuse opens be sure to check that each conductor has not been damaged by short circuiting , etc. Then replace with a new fuse of the same rating.

Only when a frequency display appears about a second after the **-ON-**indicator, proceed with the next step.

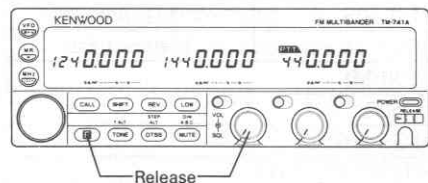


3. To activate the optional band unit, reset the memory for the band.

1. Turn the POWER switch OFF.
2. Press and hold the F key and the BAND SEL key for the band, then turn ON the POWER switch. After 1 second all the indicators for the band will light.



3. Confirm the indicators, then release the F key and the BAND SEL key. The initial settings will be displayed, the PTT indicator will flash three times, and a beep will sound, then the memory reset will be finished.



The clock can be displayed in a frequency position ( See page 58 ).

#### 7-6-4. Additional Band Unit Functions

Instructions for the Tri-bander are the same as the Instructions for Dual bander.

Optional band unit will add the following functions to the transceiver.

#### 4-2-3. Frequency step selection

Use conventional labeling in charts, ○ = YES, × = NO.

Step Size [kHz]	5↔	10↔	15↔	20↔	12.5↔	25↔
28MHz band	○	○	○	○	×	○
50MHz band	○	○	○	○	×	○
220MHz band	○	○	○	○	○	○
1200MHz band	×	○	×	○	○	○

#### 4-2-3. Frequency Step Selection

In the 28MHz band and the 50MHz band, the frequency step size will not adjust to it's original step size.

#### 4-2-4. Programmable VFO Tuning Limits

In 28MHz band, the Programmable VFO Tuning limit is 100kHz.



4-2-7. Attenuator ON/OFF  
(With the UT-28S/50S) See page 25.

4-2-8. ALT (Automatic Lock Tuning)  
(With the UT-1200) See page 26.

4-3-4. Bandwidth Selection  
(With the UT-28S) See page 28.

4-4-2. Microprocessor Initialization

band	28MHz	50MHz	1200MHz
VFO, Call and Memory channel 1 frequency	29.000 MHz	51.000 MHz	1240.000 MHz
Frequency step	10kHz	10kHz	25kHz
Tone frequency	88.5Hz	88.5Hz	88.5Hz

4-1-1. MHz key (With the UT-28S except U.S.A. and Canada)

The chart below illustrates the way the displayed frequency will change when you increase or decrease the operating frequency in 1 MHz increment.

For ex. 29.6 ← 28.1 ← (decrease) 29.1 (increase) → 28.0

4-6-1. Transmitter Offsets

	28MHz band	50MHz band	1200MHz band
+	+ 100kHz	+ 1MHz	+ 12MHz
-	- 100kHz	- 1MHz	- 12MHz
--	-	-	- 20MHz

7-6-5. Specifications

		UT-28S	UT-50S	UT-1200	
GENERAL	Frequency range	28 ~ 29.7	50 ~ 54	1240 ~ 1300	
	Mode	F3(FM)			
	Antenna impedance	50Ω			
	Operating temperature	-20°C ~ +60°C			
	Power requirements	DC13.8V ± 15% (11.7 ~ 15.8V)			
	Ground	Negative			
	Frequency stability	Less than ±10ppM		Less than ±3ppM	
	Current drain	Transmit mode	Less than 11.5A		Less than 6.5A
		Receiver mode	→ Less than 1.2A		

		UT-28S	UT-50S	UT-1200
T R A N S M I T T E R	Output Power	HI	50W	10W
		MID	10W	-
		LOW	Approx. 5W	1W
	Modulation	Reactance modulation		
	Spurious radiation	Less than -60dB(※)		Less than -50dB
	Maximum frequency deviation	±5kHz		
	Audio distortion (at 60% modulation)	Less than 3%		
	Microphone impedance	600Ω		
R E C E I V E R	Circuitry	Double conversion superheterodyne		
	Intermediate frequency 1st/2nd	8.83MHz	10.595MHz	59.7MHz
		455kHz		
	Sensitivity (12 dB SINAD)	Less than 0.16μV(-16dBμ)		
	Selectivity -6 dB	More than 10kHz	More than 12kHz	
	Selectivity -60 dB	Less than 24kHz		Less than 36kHz
	Squelch sensitivity	Less than 0.1μV(-20dBμ)		
	Output (5% distortion)	More than 2W(8Ω load)		
	External speaker impedance	8Ω		

NOTES: 1.Circuit and ratings are subject to change without notice, due to developments in technology.

2.Recommended duty cycle: 1 minute Transmission, 3 minutes Reception.

(※) Hi Power position ; Less than -70dB