

FIELD MODIFICATIONS INSTRUCTIONS  
FOR INSTALLING THE MFP OPTION  
IN A WJ-8716, WJ-8718, WJ-8718A or WJ-8718-9 HF RECEIVER  
*(STEP 1 of 2 - Rev. 5, May 2020)*

by Paolo Viappiani, La Spezia, Italy, 2020

***Preliminary requirements:***

The following tools and parts are needed to perform the modification steps:

- Phillips screwdriver;
- Soldering gun and solder;
- Wire-wrapping tool (optional) and thin PTFE-insulated MAG wire;
- A 3-Socket + 1-Plug 64 contacts flat cable jumper (the plug termination is only required if a full upgrade to MFP is planned, a 3- Socket flat cable jumper is sufficient for use of the MFP-A3 and MFP-A4 cards in a non-MFP environment ).

The above jumpers are not required if the needed PCB tracks are already present in the A6 motherboard, see text.

- AGC Card 796175-X (Figure 01);
- *IF Interface* MFP-A3 Card 794308-1 (provided with the three TUNING, DISPLAY and BFO side connectors, Figure 02);
- *Synthesizer Interface/Memory* Card 794275-X (provided with a non-MFP U1 EPROM, Figure 03); the U2 EPROM is not used in this first step;

***Perform the following upgrades in order to complete the “Step 1” for installing the Microprocessor Front Panel (MFP) option in the “plain” W-J Receiver:***

1. Remove power from the unit.
2. Remove top and bottom covers from the unit.
3. Place the unit with the bottom side facing up.
4. Check the Synthesizer Motherboard (A5) Type number 791570 revision level stamped on the bottom of the board. For A5 boards having revision level E or earlier, perform the following modifications:
  - a. Find A5 location;
  - b. Referring to Figures 04 and 05, install JW1 by wire

wrapping one end of a wire to XA1B, pin B9 (labeled as TP5). Solder the opposite end to terminal E36. To locate E36, find E30 and count down six more terminals.

- c. Referring to the above Figures, install JW2 by wire wrapping one end of a wire to XA2A, pin A55 (labeled as TP8). Solder the opposite end to terminal E57. To locate E57, locate E58 and count in one terminal.
- d. Install JW3 by wire wrapping one end of a wire to XA3, pin A7 (labeled as TP15). Solder the opposite end to terminal E34. To find E34, locate E30 and count four more terminals.

#### NOTES:

- E1 thru E59 are adjacent to the double row of capacitors C1 thru C58 of the motherboard. Terminals E1 thru E29 are located on the right side of the double row of capacitors (looking from the front of the unit with the unit flipped over). Terminals E30 thru E58 are located on the left side. E1, E29, E30, and E58 are labeled on the motherboard.

- Alternatively to wire-wrapping, the MAG wires may be soldered also to the involved socket pins, provided they are carefully placed near the motherboard PCB (at the base of each pin).

- The number following a card ID (i.e.: 794308-1) identifies a precise card version. Whenever in the text a card ID is followed by “-X”, any card version is suitable.

5. Apply power to the receiver and check that everything works OK as before;
6. Locate the IF Motherboard (A4) Type number 791569 and check the revision level stamped on board. For boards having revision level G or later, reposition jumper plug JP1 at J3 for AGC Dump. For boards having earlier revision levels (most A4 motherboards, in which the JP1 jumper is not present), perform the following modification to install AGC Dump:  
Referring to Figure 06, install a wire by wire wrapping one end to XA6, pin 18. Solder the opposite end to E5. See the pin labels at XA1 and XA11 for guide to XA6 pin locations;

Check also that pins 17 and 18 of XA6 are NOT connected together by any PCB track in the A4 MB bottom and separate them by a cutter or a razor blade eventually;

7. Check that the pins 59 and 60 of the XA1 and XA2 sockets on the A4 IF Motherboard (look at Figure 06 for identification) are connected together and to the GND PCB track. If not, connect them using a copper strip (that has to be kept insulated by Mylar tape where it passes over the board circuitry). Then solder the strip to the PCB Ground plane near the pins 59 and 60 of both the XA1 and XA2 sockets, see also Figures 24, 25 and 26;
8. Remove the *AGC Amplifier* card (A4A6) type number 78112 from slot A6 on the IF Motherboard (A4) and discard.
9. Replace the above card with the *AGC Amplifier* (MFP-A5) card type number 796175, that has to be inserted into slot A6 on the A4 board;
10. Apply power to the receiver and check that everything works OK as before.

#### NOTES:

- Alternatively to wire-wrapping, the MAG wires may be directly soldered to the involved socket pins, provided they are carefully soldered near the motherboard PCB (at the base of each pin).

- After this mod it would no longer be possible to use the old *AGC* card A4A6 type number 78112 (that has to be replaced with the *AGC* card MFP-A5 type number 796175). The 78112 *AGC* card could still be used however (until the MFP conversion described in Step 2 is fully performed), provided that its electrical connection to Pin 18 is kept insulated from the comb connector at the base. This could be easily obtained by removing a short length of a PCB track on the top of the card (use a cutter or a razor blade), look at Figure 27;

- In Figure 29 are shown the differences in the *AGC/RF Gain/Meter* circuits between the plain version of the receiver and the upgraded version using the MFP-A3 & MFP-A4 Cards, while Figure 30 shows the schematic diagram of both the 78112 and the 796175-1 *AGC* Cards.

**11.** Locate the I/O Motherboard (A6) Type number 791580 revision level. For the very few boards having revision level M or later, reposition jumper plug A6JP1 from X8 pin 3 to X7 pin 59. For boards having earlier revision levels, perform the following modifications:

**a.** Connect E9 of the main chassis to A6X7-59 by a PTFE-insulated wire (Figure 07).

If the E9 standoff (Figure 08) is not present in the chassis sidewall, a 3-terminal insulated standoff can be fastened to the A6 MB using one of the mounting screw (Figure 09). Solder a 1/4W-1kOhm resistor to the existing (or to the new) standoffs and leave a 6" insulated and unterminated wire in the neighborhood (this wire could be eventually used later for an external backup battery fastened to the rear panel of the receiver).

**b.** Check the A6 MB in order to locate the PCB tracks that connect the X2 , X5 and X8 sockets (both in the bottom and in the top sides of the PCB, look at Figure 10 and 11). If the PCB tracks are not present (as it happens in many A6 MBs), carefully insert into the bottom pins of the X2,X5 and X8 sockets the 3-socket flat-cable jumper (terminated with a male plug only if a future upgrade to MFP of the receiver is planned, Figures 12, 13 and 14/a-14/b). Notice that the 64-contact sockets have some unused pins and ascertain that each female connector is properly installed; the flying male plug, if present, has to be left unconnected for now.

Please follow the recommendations in the NOTES below carefully in order to preserve the correct pin layout and to prevent unwanted row inversions among the various connectors, see also Figures 15, 16 and 17.

**c.** Connect a single PTFE-insulated or MAG wire (by soldering or wire-wrapping) from Pin 56B of the XA1 socket to Pin 52B of the XA2 socket, look at Figure 07 for details. This wire carries the +10V unregulated voltage to

the A8-791578 *Display Board* of the "plain WJ-8718"  
Front Pnl. Assy.

- d. Apply power to the receiver and check that everything works OK as before.
- 
12. Remove the *Manual Tuning Up/Down Counter* (A6A1) type number 791575-X card from slots X7 and X8 of the I/O Motherboard (A6), removing also the 37-pin REMOTE INPUT socket A6A1J1 if present in the receiver rear panel (see NOTES).  
Remove also the three TUNING, DISPLAY and BFO connectors from their plugs placed in the board left side (and properly label each of them in order to avoid confusion and to keep them clearly identified).  
Replace the old card with the *Synthesizer Interface/Memory* card (MFP-A4, type number 794275-X) that has to be plugged into slots X7 and X8 on the A6 board.
  13. Remove the *Front Panel Interconnect* card (A6A2, type number 791828) from its slot in the I/O Motherboard (A6) after having unplugged the flat cable connector from J1. Replace the old board with the *IF Interface* card (MFP-A3, type number 794308-1) that has to be plugged into slots X1 and X2 on the A6 motherboard. Insert the flat cable connector into the proper PCB plug that is present in the upper side of the MFP-A3 card. Carefully insert the three connectors TUNING, DISPLAY and BFO (that went to the old *Manual Tuning Up/Down Counter* 791575 card) into the three connectors in the left side of the newly installed MFP-A3 card and pay great attention not to exchange any of them, see also NOTES below.
  14. Apply power to the receiver and check that everything works OK as before modifications;.
  15. Replace top and bottom covers of the receiver.

This completes the "Step 1" of the upgrade and the receiver should now be fully operational as before.

Figures 18 and 19 roughly show the situation before and after having performed the “Step 1” upgrade.

The picture in Figure 22 represents a basic receiver still provided with a *Front Panel Interconnect* card (A6A2, type number 791828) and a *Manual Tuning Up/Down Counter* card (A6A1, type number 791575-X), while the one in Figure 23 shows an upgraded (not-MFP) receiver provided with an *IF Interface* card (MFP-A3, type number 794308-1) and a *Synthesizer Interface/Memory* card (MFP-A4, type number 794275-X).

#### NOTES:

- VERY IMPORTANT: Installation of the 3-socket flat-cable jumpers (terminated with a male plug only if a subsequent upgrade to full MFP is planned) is greatly recommended in any case: should the needed PCB tracks in the A6 mainboard be already present, they act only as duplicates and have no negative effect on the receiver circuits.

The needed flat cable assembly may be built from scratch using proper connectors and a 64-pole flat cable, look at Figures 14/a, 14/b, 15, 16 and 17. Please also notice that, due to dimensional constraints, the overall layout shown in Figures 14/a-14/b is the only one possible, so it is highly recommended to comply with the represented details and quotes.

The needed 64 contacts - 3 row (a + c) connectors are currently available from Farnell and from Distrelec (socket: <https://it.farnell.com/harting/09-03-264-7828/socket-idc-din41612-type-c/dp/1096868#>, plug: <https://www.distrelec.it/it/connettore-din-41612-compatibile-don-connex-a23d-64/p/30044088?queryFromSuggest=true->).

Take a great care in assembling the jumper cable also in order to preserve the correct pin assignment and to prevent row inversions between connectors.

As at Watkins-Johnson they did not care of the orientation of the 64-pin socket at one end of their MFP-W1 cable assy. (that socket had to be inserted into the XA2 pins on the A6 Motherboard bottom, not into a *polarized* plug as in our case!), there were two types (“A” and “B”) of MFP-W1 cables, different from each other for the opposite orientation of the 64-pin socket, look at Figure 14/b.

The correct final cable layout that is shown in Figure 15 is for use with a “Type A” MFP-W1 ribbon cable assy. So, if you plan to upgrade your WJ-8718 Series receiver to a “full MFP” unit, it is highly advisable to acquire an MPF-W1 cable assembly (shown in Part 2) first in order to know the required orientation of the 64-pin plug of the “ribbon cable” to build (look at Figure 14/b again).

Please also notice that, whichever is its orientation, the last four pins placed at the extreme right of the male plug have to be removed first (as per the front views shown in Figures 16 and 17) and that

the 64-pole ribbon cable always has to come out of the plug from its upper side (towards the three sockets, look at Figures 14/a and 14/b) .

The ribbon cable has to be aligned to the left of all connectors (the last four contacts at their extreme right remain unused) and also the three female socket have to be correctly oriented; this can be easily done using the red-colored lead of the flat cable as a reference (usually it corresponds to “pin 1”).

- IMPORTANT: Please notice that the three front connectors in the *MFP-A3 Interface Card 794308-1* are arranged in a different order than the ones that are mounted on the *A6A1 Manual Tuning - Up/Down Counter 791575-X Card* (look at Figure 20 carefully in order not to exchange any of the connections). However any error is easily avoided if the color dots present on the three P1 ribbon cable sockets (*Brown* from Encoder, *Orange* from BFO and *Red* from Display) match the ones shown on each plug of the card, look at Figures 02 and 21.

- The REMOTE INPUT socket is present only in the rear panel of the WJ-8718 Series receivers using the *A6A1 Manual Tuning Up/Down Counter 791575-2* card. In this case remove the cable connector A6A1J1 from the rear panel location marked REMOTE INPUT by removing the two nuts, lockwashers, flatwashers and screws that secure it to the rear panel, leaving the hole empty. If the receivers makes use of an A6A1 card of the 791575-1 type instead (i. e. not provided with the REMOTE INPUT cable and connector), the above step must be omitted.

- Before inserting the *MFP-A3 IF Interface Card 794308-1* (in place of the *A6A2 Front Panel Interconnect card 791828*) into the XA2B (X1) and XA2A (X2) slots of the A6 Motherboard it is advisable to slightly bend the *Faston* connectors placed on the Motherboard itself near the front of the receiver. This in order to avoid obstacles against the lowest front connector of the *MFP-A3 IF Interface Card 794308-1* and to allow the complete insertion of the card itself into its slots.

- In the *MFP-A4 (794275-X)* card there are two separate sockets (U1 and U2) for EPROMS, please notice that U2 is located above U1 and that its socket remains empty (no U2 EPROM is used) until the receiver is fully upgraded to “/MFP” version, look at Figure 03.

Both the EPROMS are used in the full “/MFP” version of the receiver instead. Of course, in this first step, the needed U1 EPROM is specially designed for the purpose (in the Step 2, when the receiver is converted to a full “/MFP” version, the U1 EPROM will be replaced and a proper U2 EPROM will be added).

Please also notice that in the *MFP-A4* board the IC socket XU17 remains empty in most cases (U17 IC is used for some options only, mainly 1-Hz and COR ones). Again, look at Figure 03.

- Some early versions of the A4 IF Motherboard require that pin 59 and 60 of both the A4A1 (XA1) and A4A2 (XA2) sockets are connected to the A4 Motherboard ground PCB track via a copper bus strip, look at the Figures 24, 25 and 26.

Should the ground link be needed, place a copper conductor bus strip (1.5 by 0.2 by 0.10 inches in size) over the ground plane at XA1 terminals 59 and 60; center the strip evenly on ground planes at XA1 and XA2.

The bus strip should be insulated with *plater's mylar* tape where it passes over the board circuitry. Then sweat-solder the bus strip to the ground plane at XA2 near terminals 59 and 60 and at XA1 near terminals 59 and 60; clean all the solder joints with *fluorocarbon* or *hydrocarbon* solvent.

In place of the copper strip a short length of a coaxial cable shield braid may be successfully used. Alternatively, a conventional PTFE-insulated piece of wire can be carefully soldered to the four involved terminals (just near their base) and to the A4 PCB ground plane in the vicinity of XA1 and XA2.

Terminals 59 and 60 of both the A4A1 (XA1) and the A4A2 (XA2) sockets are clearly identified in Figure 06, which shows also the GND link eventually required.

- In some cases the receiver meter needle (when the Signal Strength function is selected) could tend to deflect beyond full-scale. In order to prevent this issue it is possible to insert a series resistor (or a trimmer) in the meter circuit. Usually a 620-Ohm 1/4W resistor is good, but using a trimmer (1 kOhm, 2.2 kOhm or even 4.7 kOhm nominal values) would allow a more precise adjustment of the meter scale.

The resistive device could be placed on the *Upper Panel Control Board* or directly behind the front panel meter (Figure 28/a shows the schematic of this mod, while in Figure 28/b a series resistor soldered to one of the meter terminals is shown).

Alternatively, you can add a 3.3 kOhm series resistor between pin J1-20 (*MAN Signal Strength*) and pin 7 of the U24B-TL064 IC on the MFP-A3 *IF Interface card* (794308-X).

This can be accomplished on the MFP-A3 card directly by cutting a PCB track and soldering the resistor; in the schematic of Figure 28/c the interested areas (circled in red) of the 794308-X card are shown.

## ***END OF STEP 1 INSTRUCTIONS***

FIELD MODIFICATIONS INSTRUCTIONS  
FOR INSTALLING THE MFP OPTION  
IN A WJ-8716, WJ-8718, WJ-8718A or WJ-8718-9 HF RECEIVER  
(STEP 1 of 2 - Rev. 5, May 2020)

by Paolo Viappiani, La Spezia, Italy, 2020

FIGURES (01 to 30)

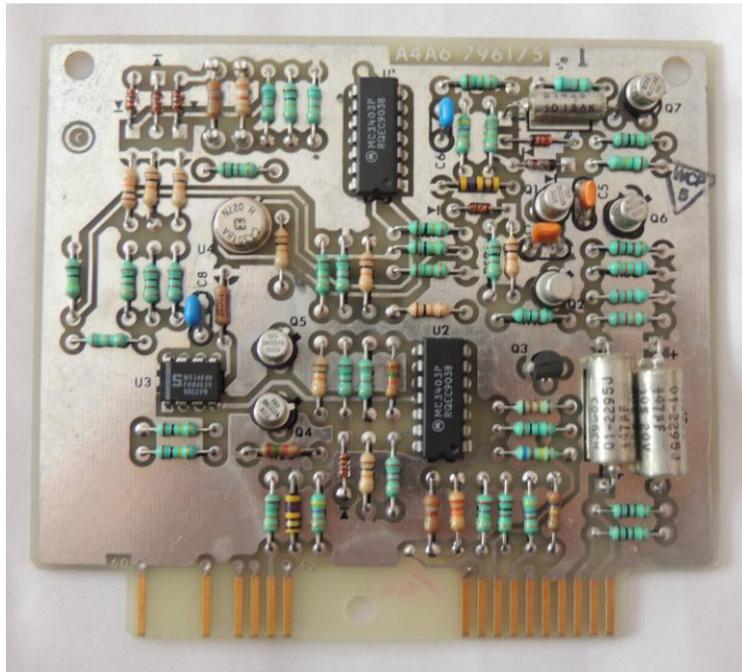
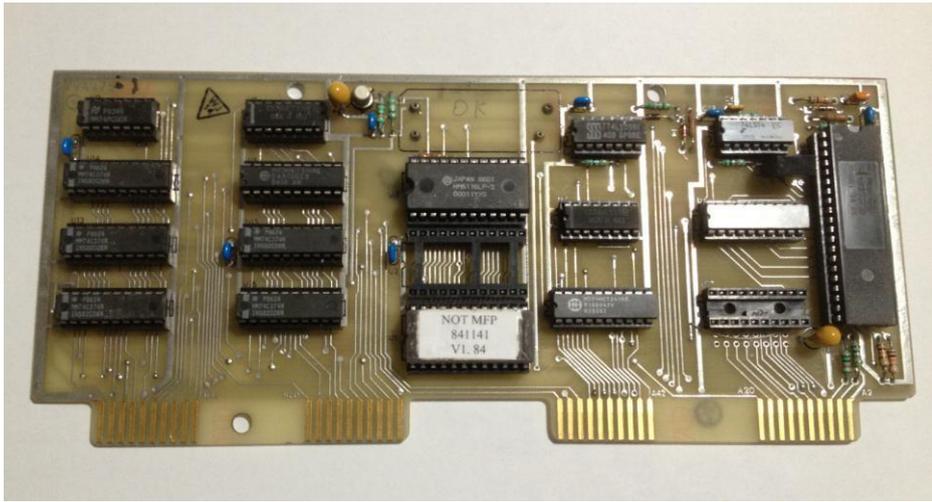


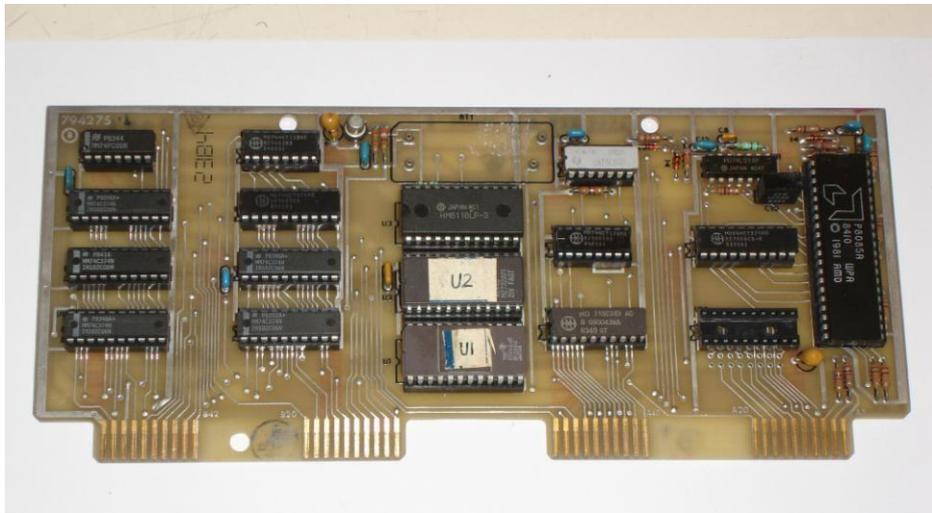
Figure 01: The A4A6 796175-1 AGC "Dump" card.



Figure 02: The MFP-A3 IF Interface Card 794308-1



a)



b)

Figures 03 (a/b): Two MFP-A4 Synthesizer Interface/Memory Cards 794275-X fitted with a non-MFP U1 and with both the U1 and U2 EPROMs for full /MFP upgrade.

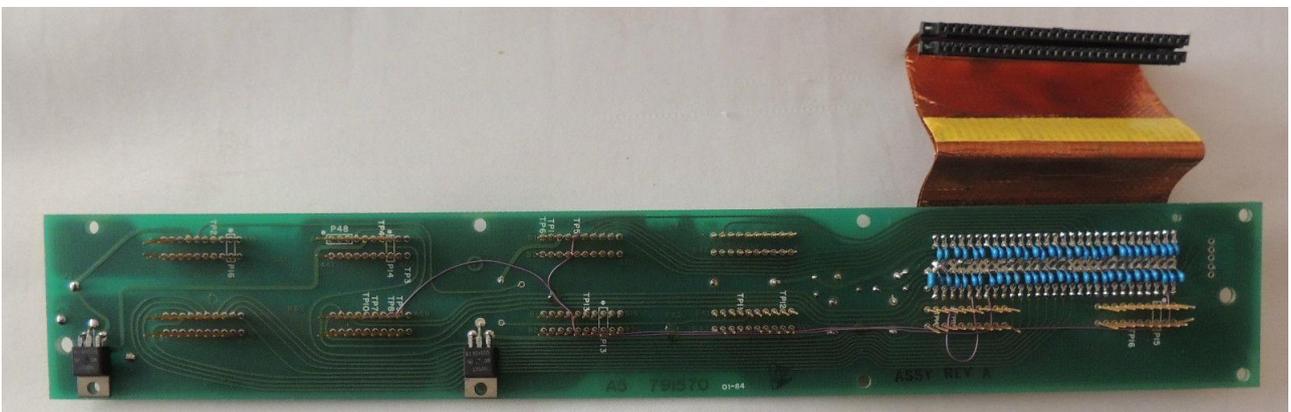


Figure 04: Additional wiring JW1, JW2 and JW3 installed in the A5 Synth. motherboard.



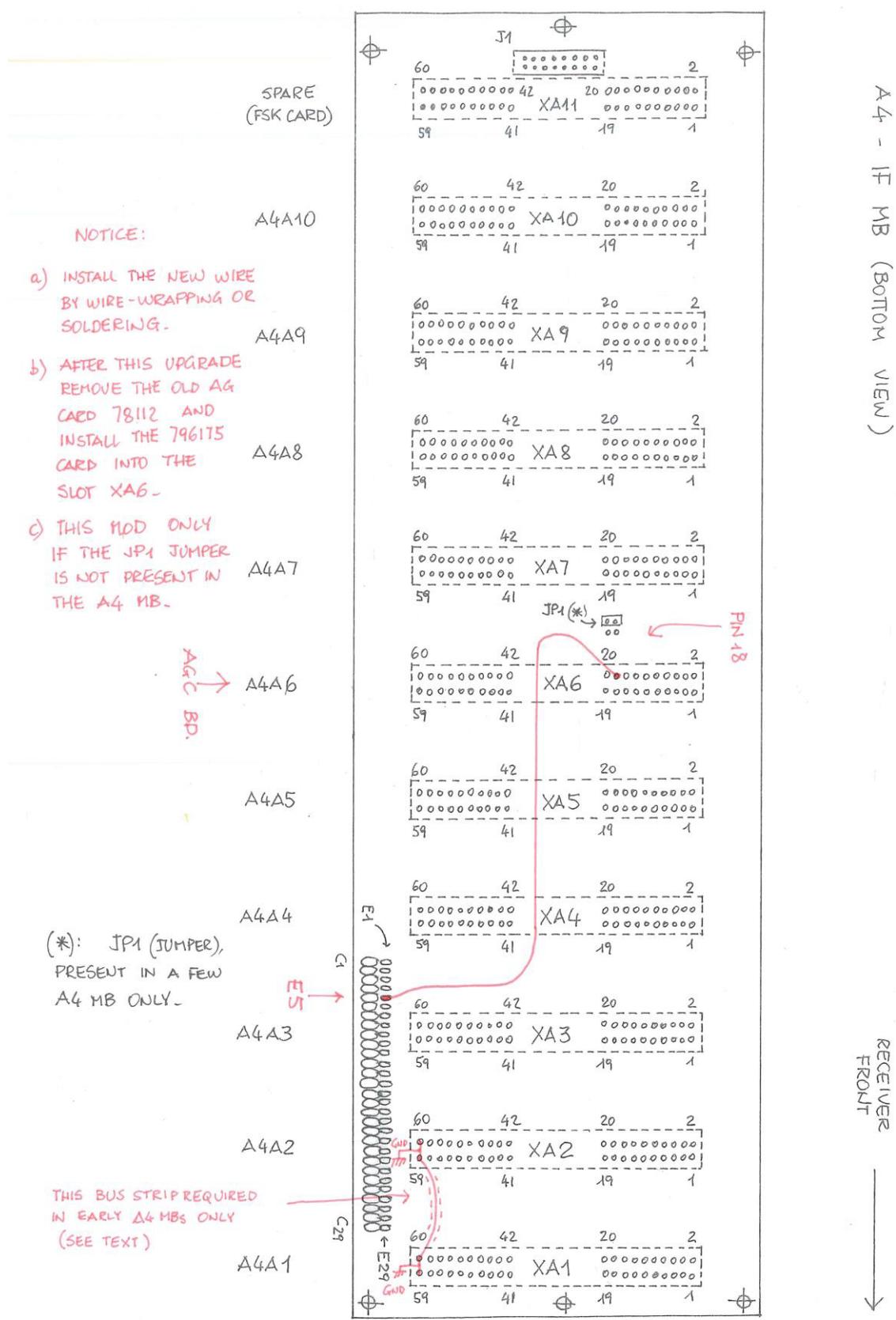
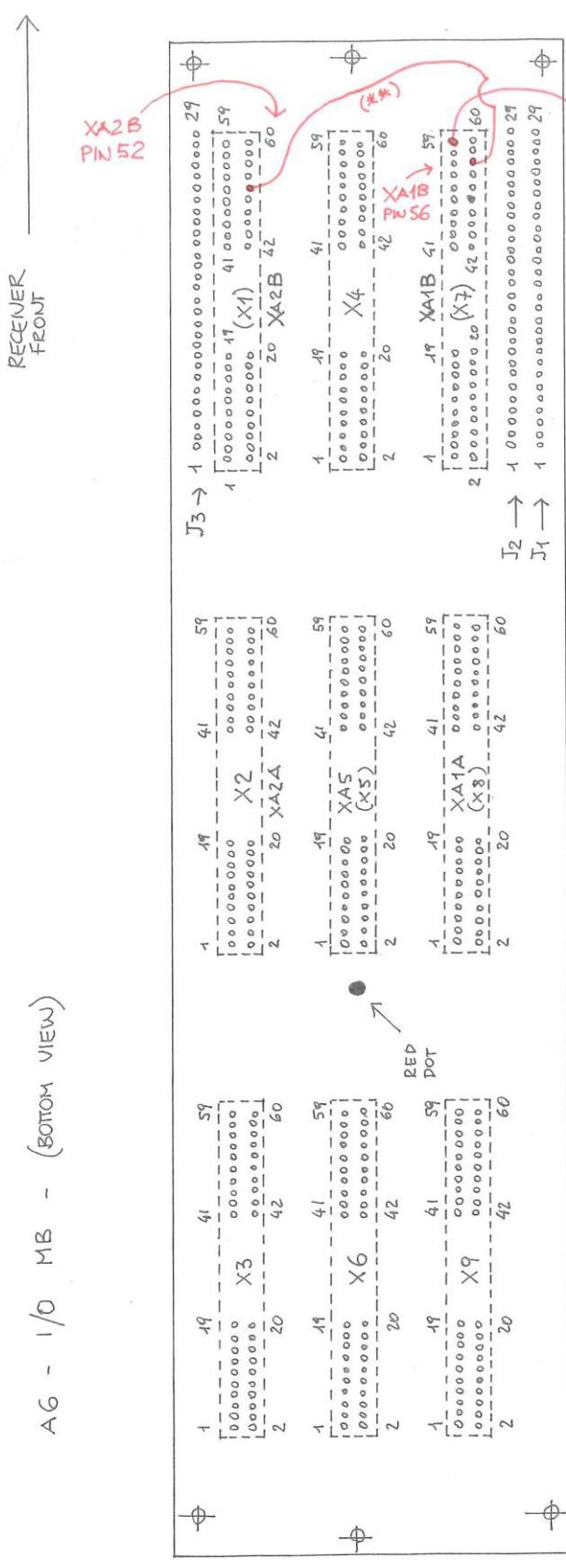


Figure 06: Upgrading the A4 IF motherboard.



A6 - I/O MB - (BOTTOM VIEW)

RECEIVER FRONT

OPTIONAL CONNECTION TO EXTERNAL BATTERY (IN THE RECEIVER REAR PNL.)  
 (\*  
 TO MAIN CHASSIS (IF EXISTS)  
 1KΩ-1/2W E9 (STANDOFF IN THE MAIN CHASSIS)  
 WHITE WIRE  
 EXT. BATTERY  
 PIN 59  
 PIN 59

NOTICES

- (\*  
 INSTALLATION OF THIS NEW CONNECTION IS OPTIONAL AND IS USEFUL IF AN EXTERNAL BATTERY IS ALREADY PRESENT IN THE RECEIVER REAR (OR IF THERE IS A PLAN TO ADD IT LATER) ONLY.
- (\*  
 THIS NEW WIRE CARRIES THE +10V UNREG FROM PIN B52 OF XA2(B) TO PIN B56 OF XA1(B)

CONVERSION TO /MFP [STEP 01]

Figure 07: Upgrading the A6 I/O motherboard.

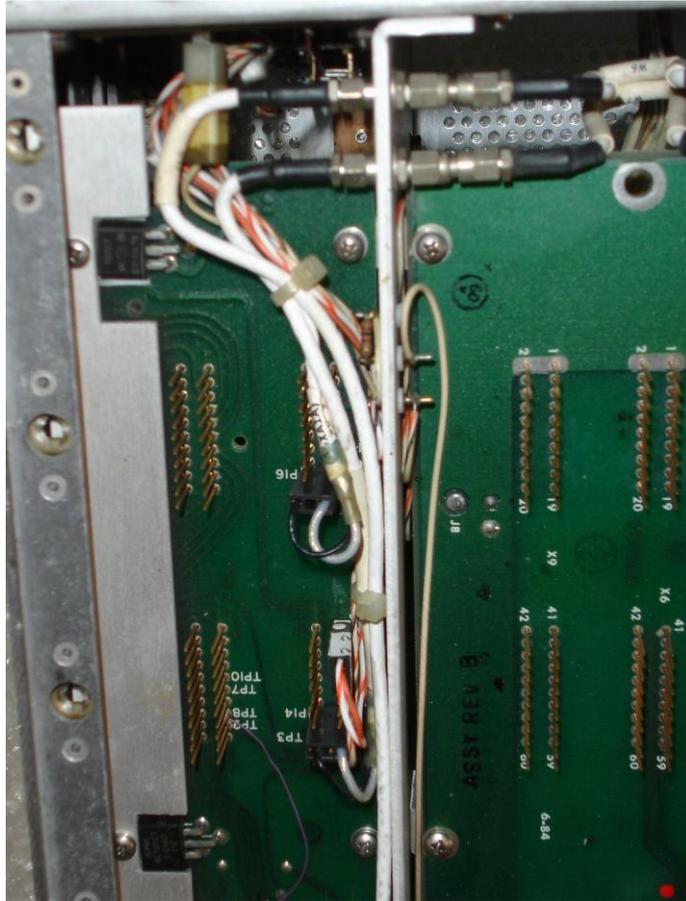


Figure 08: Original Factory-installed standoffs for the 1-kOhm resistor and external battery wiring in the chassis sidewall between A5 and A6 motherboards.

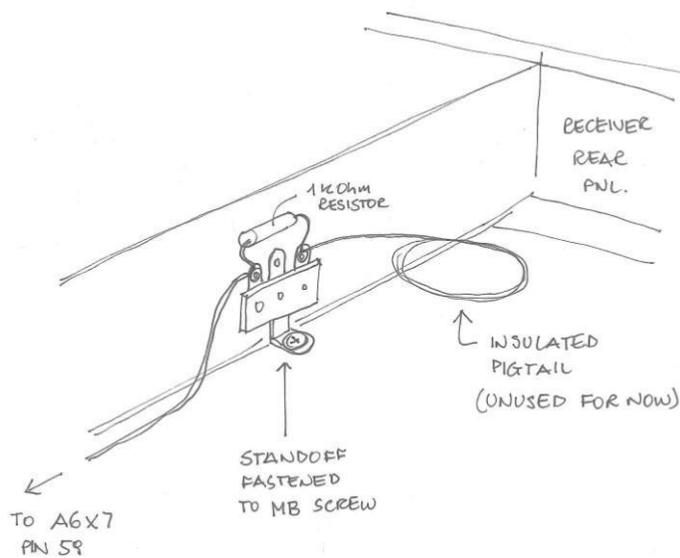


Figure 09: A 3-terminal standoff can be fastened to one of the A6 fixing screws.

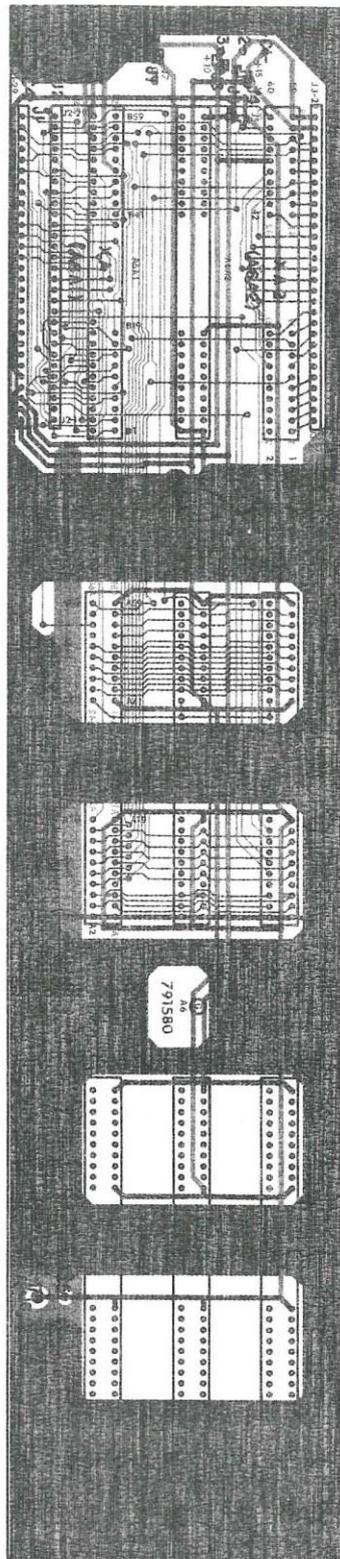


Figure 10: Tracks in the later versions of the A6 motherboard PCB (top side)

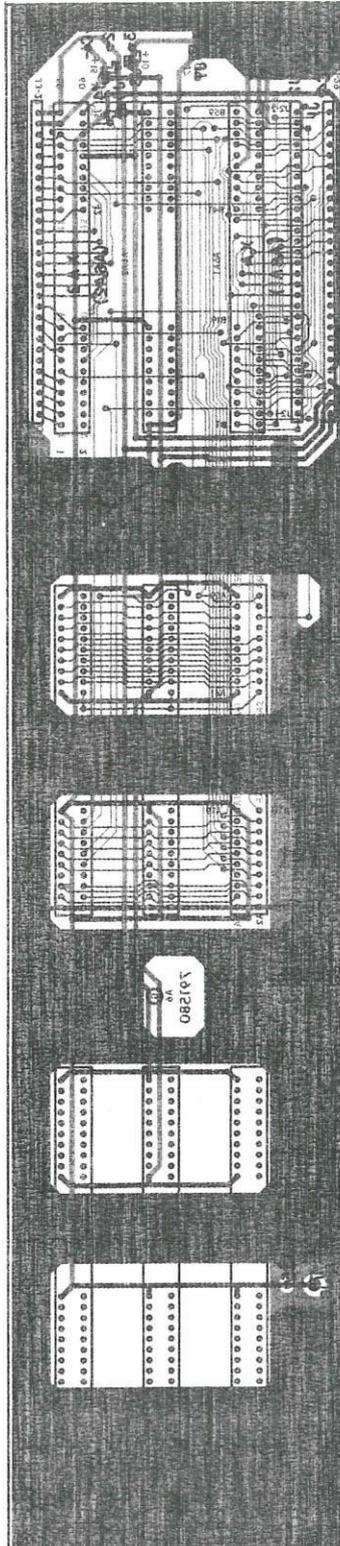


Figure 11: Tracks in the later versions of the A6 motherboard PCB (bottom side)

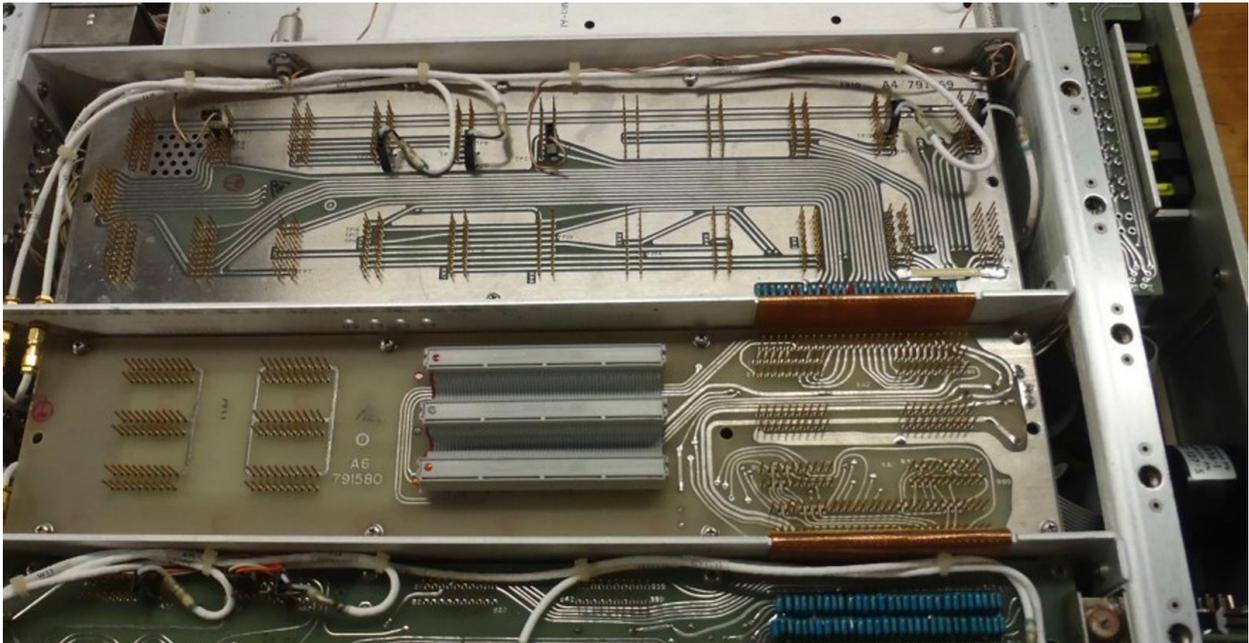


Figure 12: The X2,X5 and X8 flat-cable jumpers (Factory-installed) in a non-MFP environment.

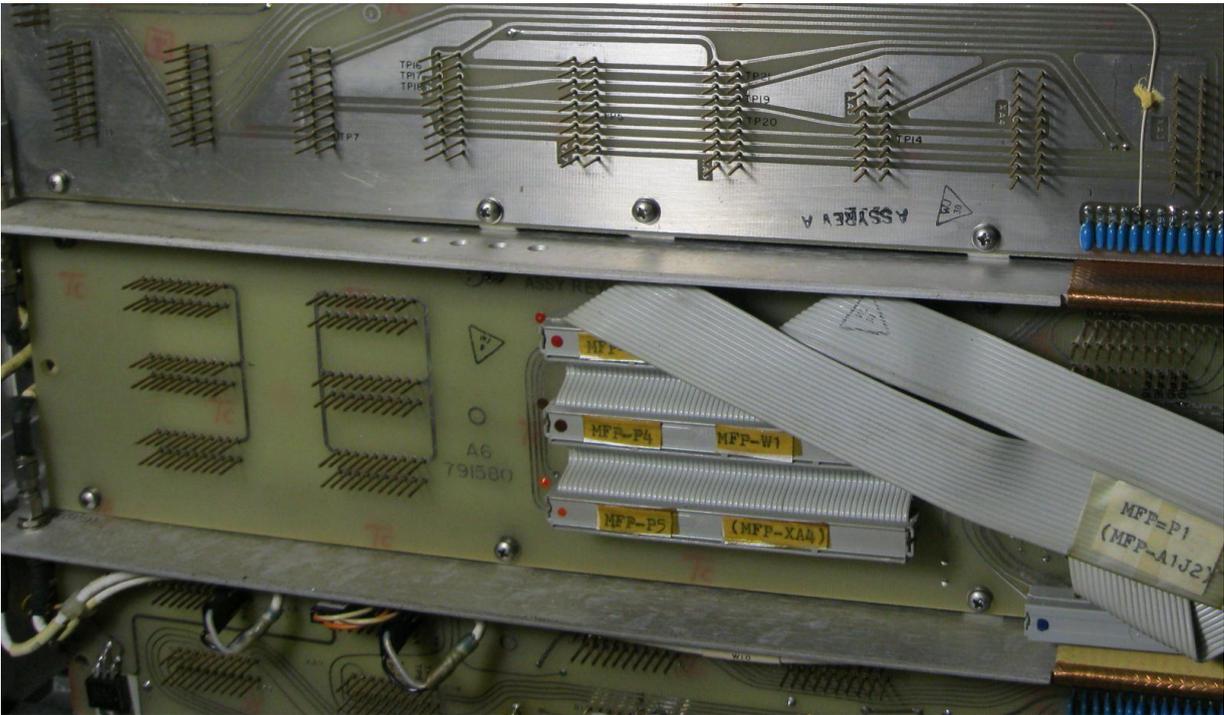
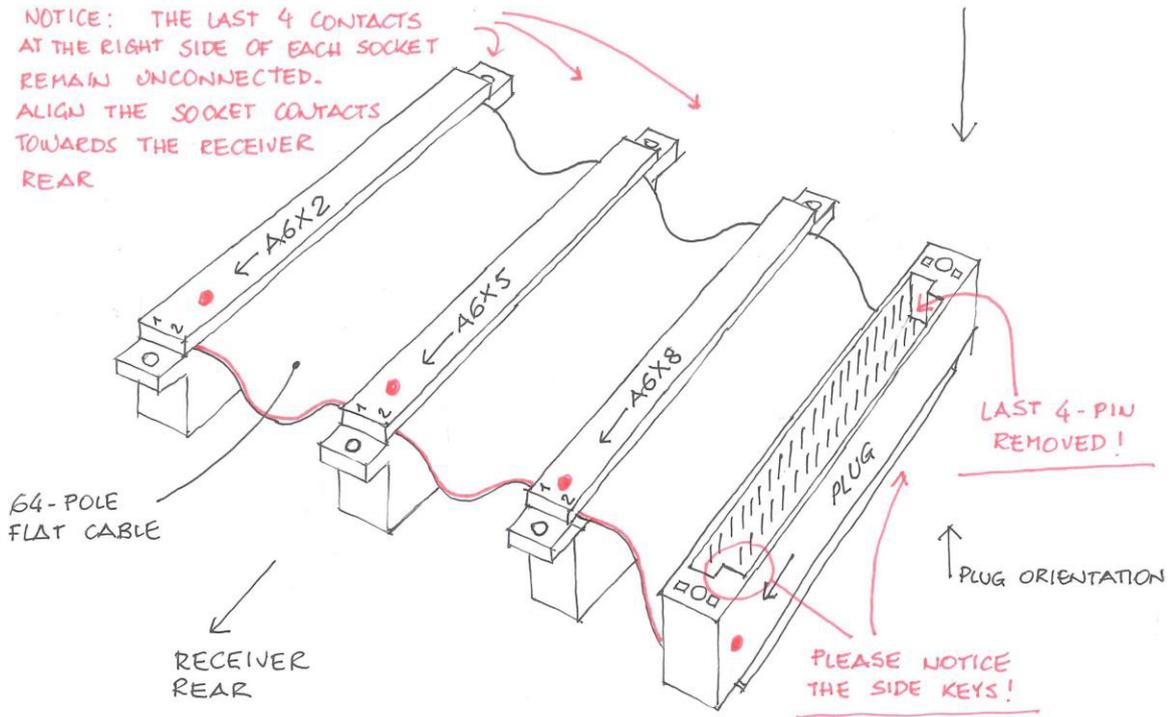


Figure 13: The X2,X5 and X8 flat-cable jumpers (Factory- installed) in an early MFP environment.

MALE 64-PIN PLUG (FOR MFP UPGRADE ONLY, TO BE LEFT UNCONNECTED IN STEP 1)



(THE REPRESENTED PLUG ORIENTATION IS FOR MFP-W1 CABLE ASSY. TYPE "A" ONLY, SEE TEXT AND FIGURES BELOW!)

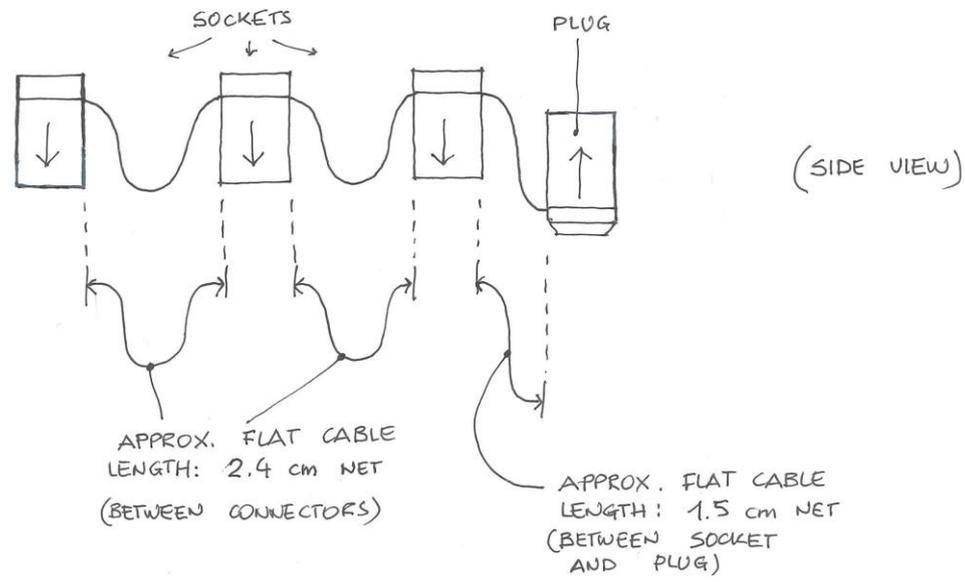


Figure 14/a: Custom building of the A6 X2-X5-X8 flat cable jumper (plug-terminated for MFP upgrade only). The plug orientation represented here is for an MFP-W1 cable assy. "Type A".

DIFFERENT ORIENTATION OF THE PLUG ACCORDING TO THE MFP-W1 CABLE ASSY, TYPE

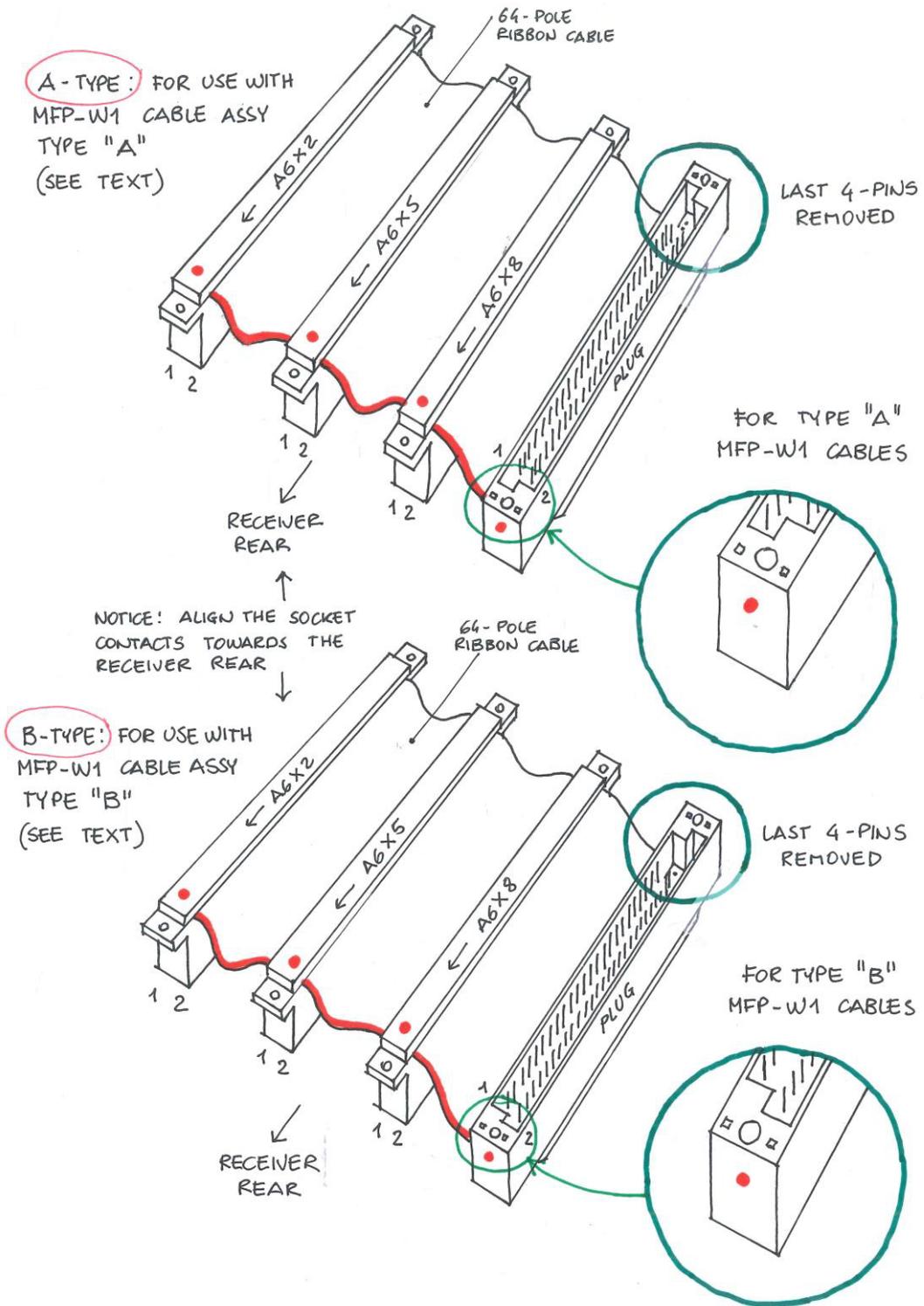


Figure 14/b: Orientation of the plug added to the A6 X2-X5-X8 ribbon flat cable jumper for MFP upgrading ("Type A" and "Type B" MFP-W1 cables).



Figure 15: The final layout of the flat-cable jumpers with the male “Type A” plug termination. Notice the last four right pins removed.

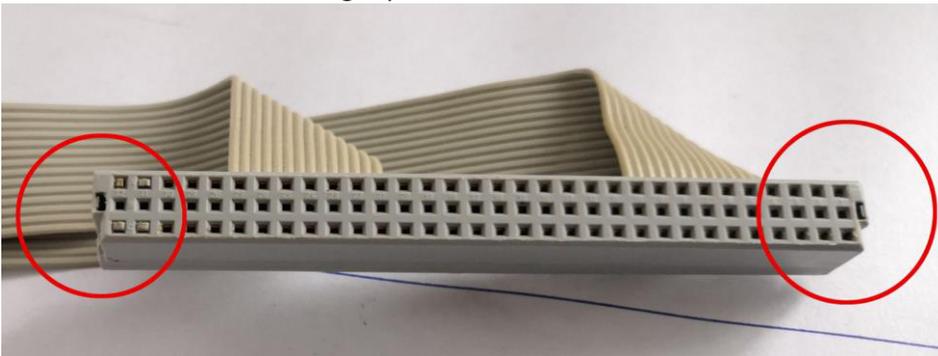


Figure 16: the MFP-W1 cable assy. of the “A” Type. Please notice the position of the side “keys”.

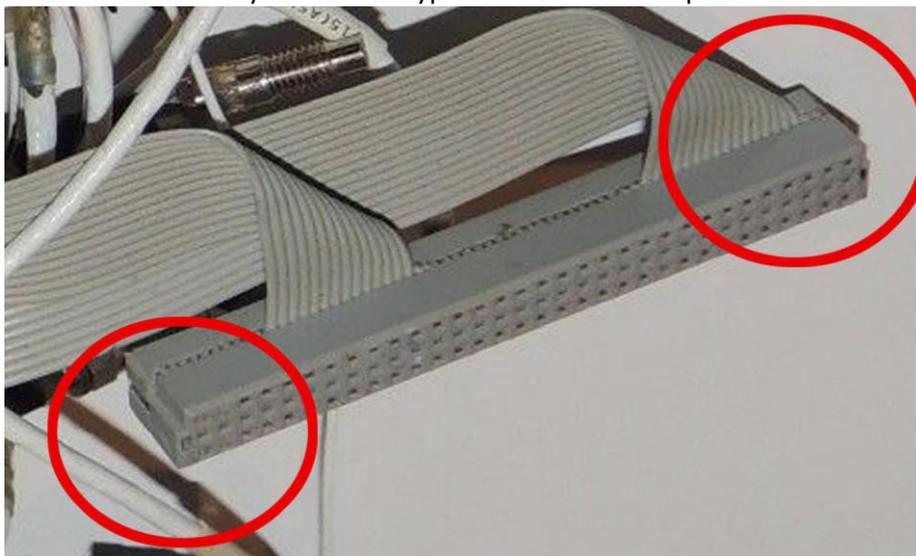
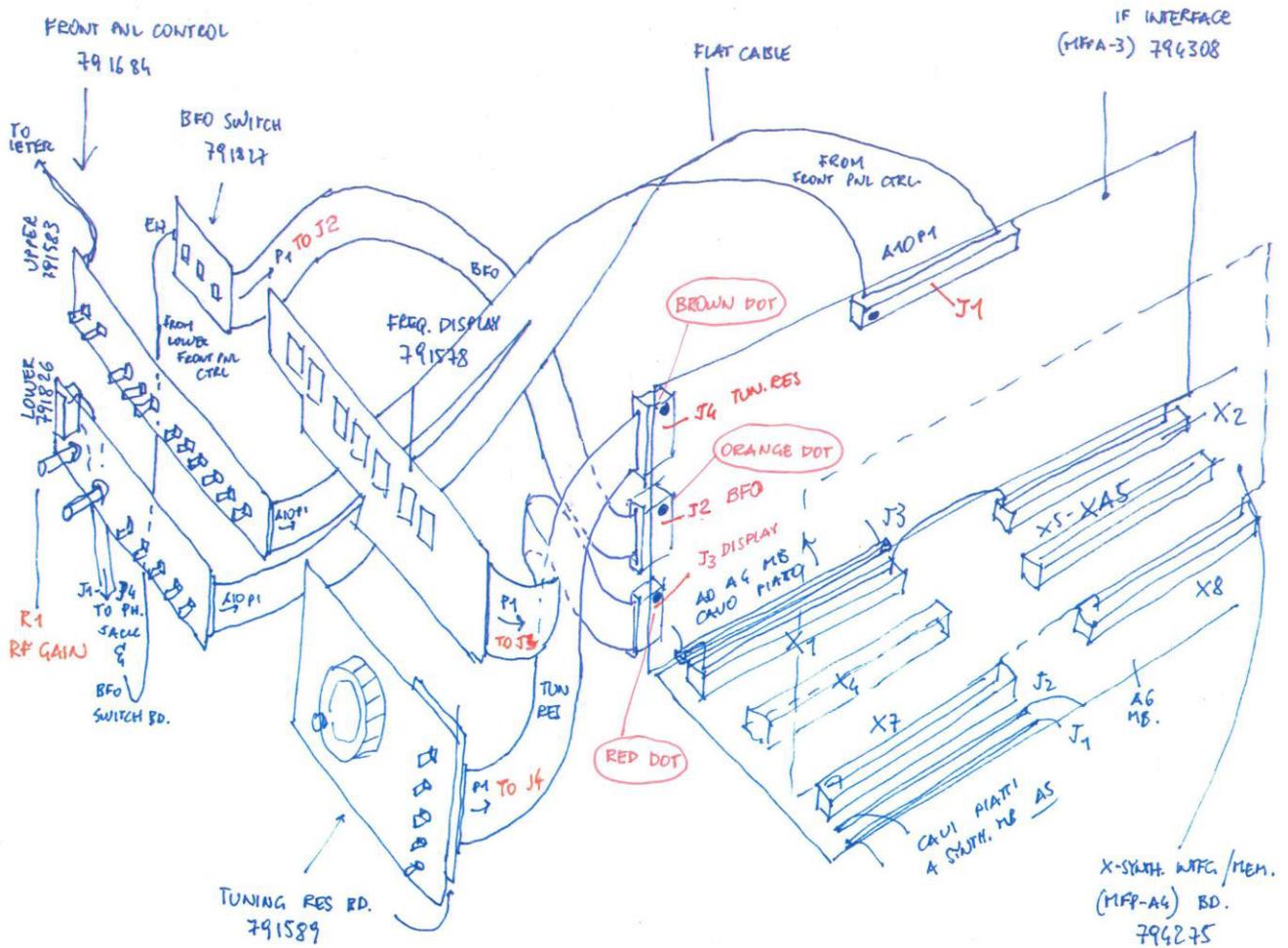


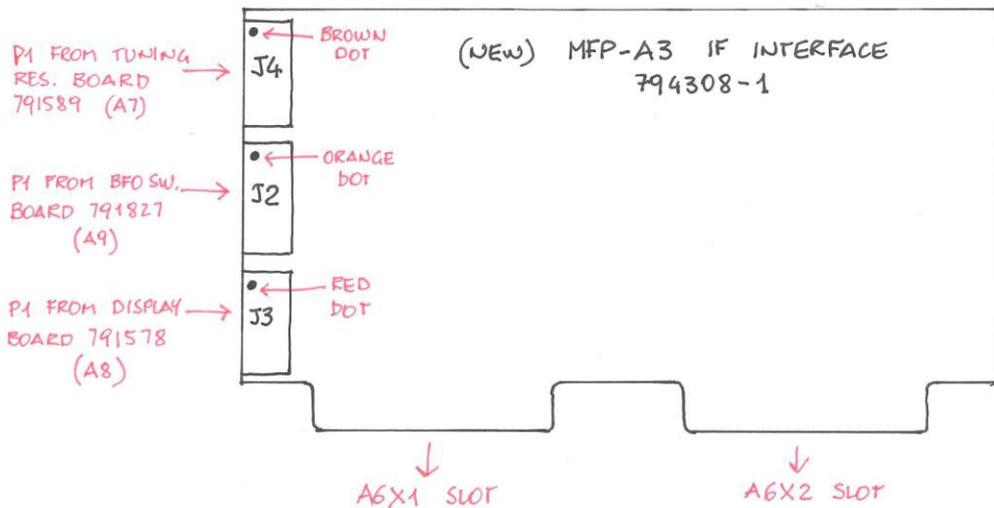
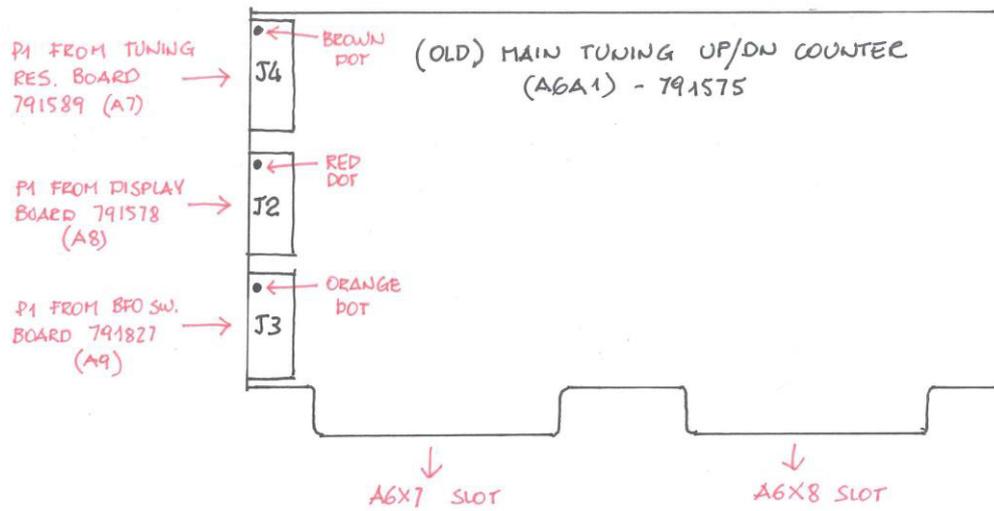
Figure 17: the MFP-W1 cable assy. of the “B” Type. Please notice the position of the side “keys”.





WJ 8718A NORM. VERSION WITH MFA-3 AND MFA-4 BDS.

Figure 19: A rough sketch of the configuration of a receiver using MFA-A3 and MFA-A4 cards (top side only).



NOTICE THAT THE CONNECTORS FROM DISPLAY BD. AND FROM BFO BD. ARE EXCHANGED IN THE OLD 791575 IN RESPECT OF THE NEW MFP-A3 794308-1 BD. PLEASE REFER TO THE DOT COLORS FOR CORRECT CONNECTIONS.

Figure 20: Differences between J2-J3-J4 connections on the A6A1-Main Tuning – Up/Dn. Counter 791575 and on the MFP-A3 – IF Interface 794308-1 Cards.

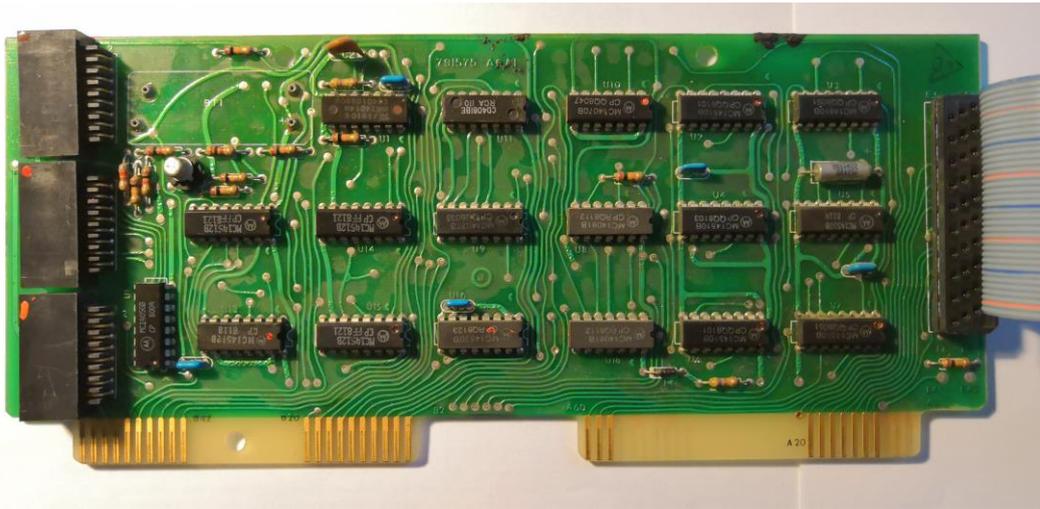


Figure 21: The A6A1-Main Tuning &Up/Dn. Counter 791575 Card used in the plain version of the receiver.

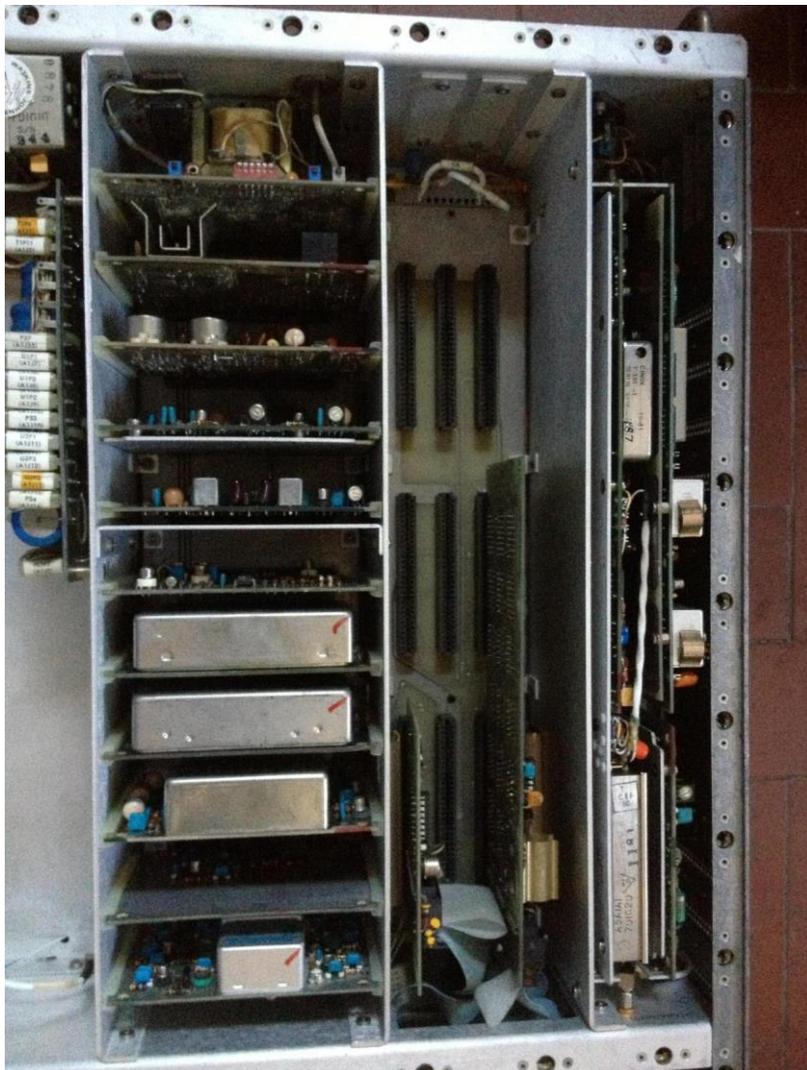


Figure 22: A basic receiver still provided with a *Front Panel Interconnect* card (A6A2, type number 791828) and a *Manual Tuning Up/Down Counter* card (A6A1, type number 791575-X)

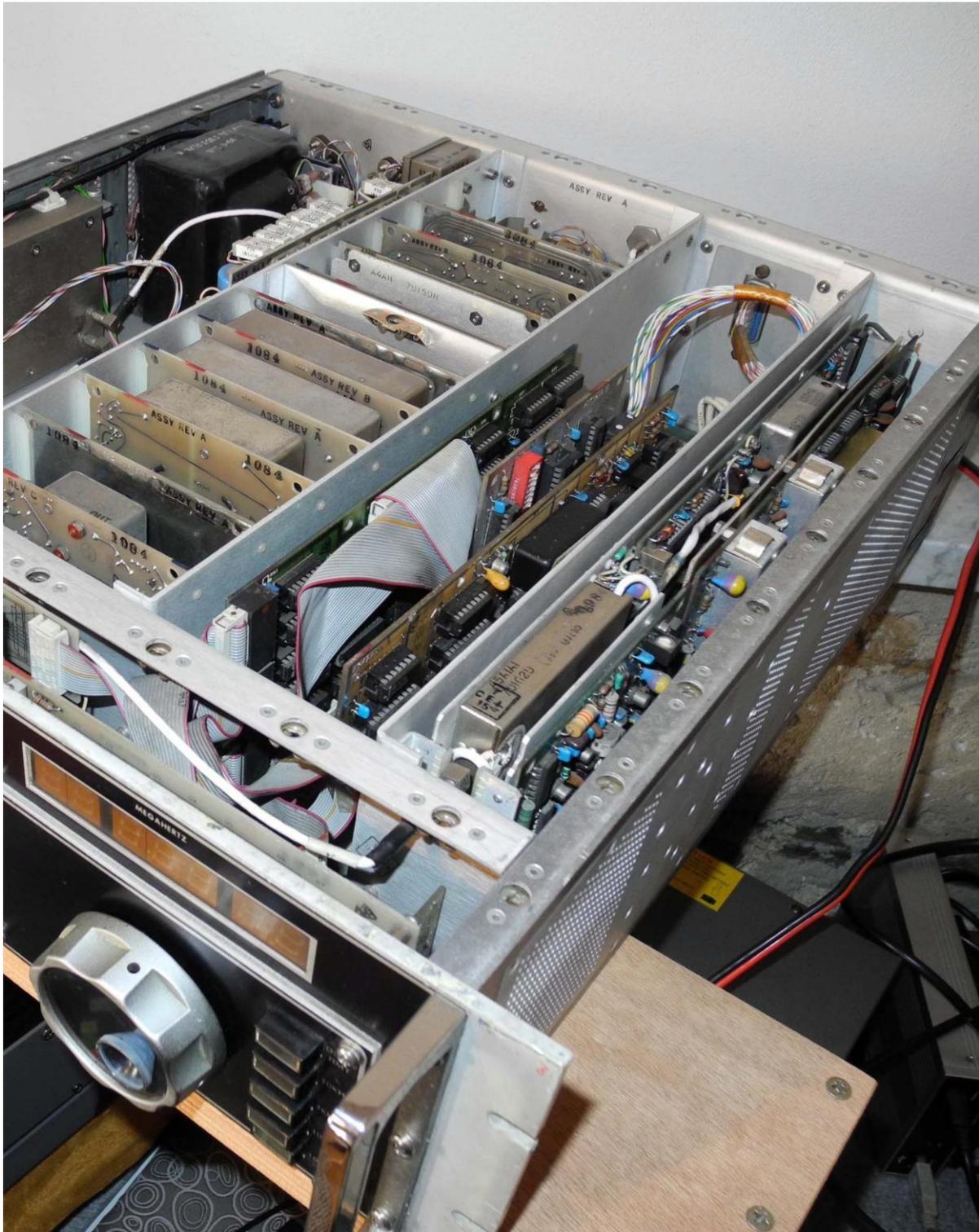


Figure 23: An upgraded (not-MFP) receiver provided with an *IF Interface* card (MFP-A3, type number 794308-1) and a *Synthesizer Interface/Memory* card (MFP-A4, type number 794275-X).

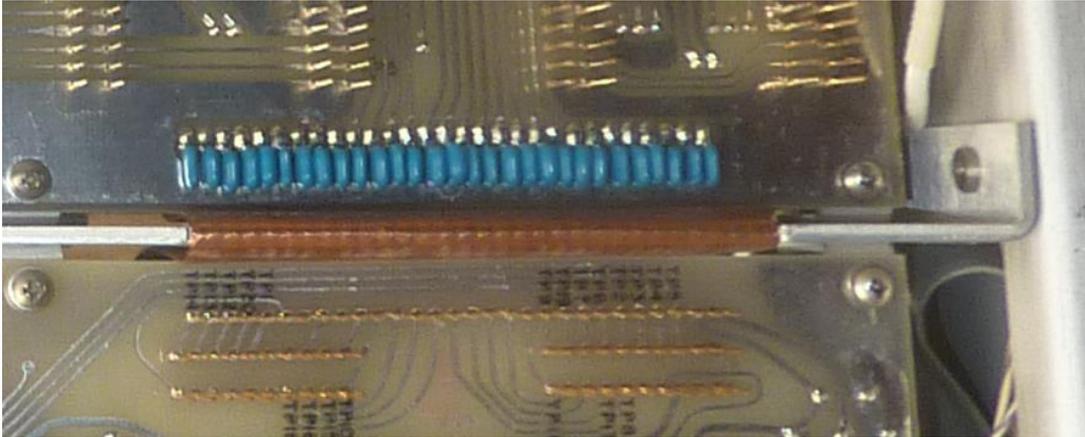


Figure 24: This A4 MB has the 59-60 terminals of both the XA1 and XA2 sockets already connected to the PCB ground track and it does not require any additional GND strip.

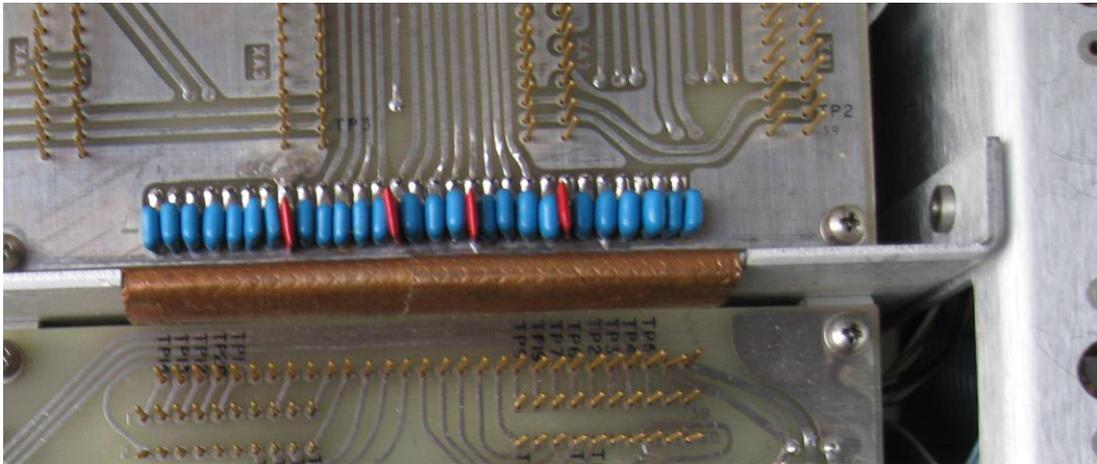


Figure 25: This A4 MB shows the 59-60 terminals of the XA2 socket not connected to the PCB ground track yet, thus it requires the additional GND strip.

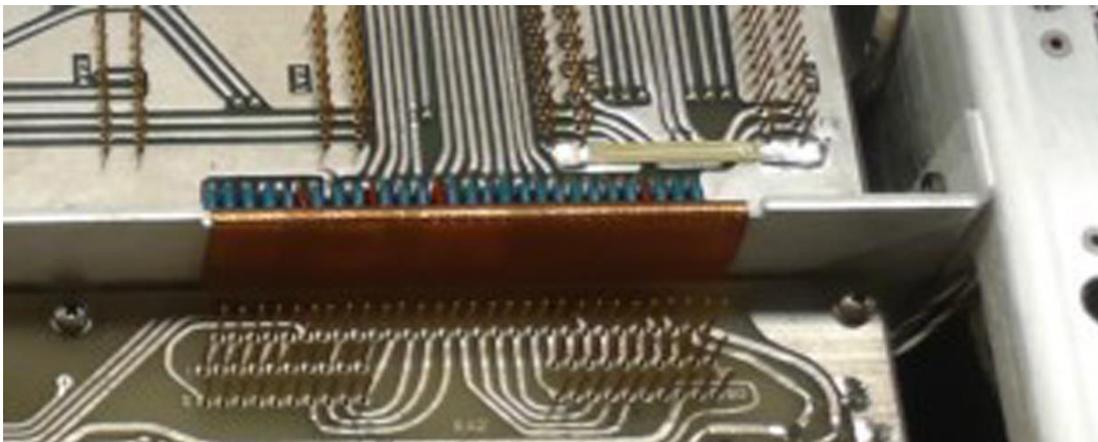


Figure 26: This A4 MB has the additional GND strip already installed.

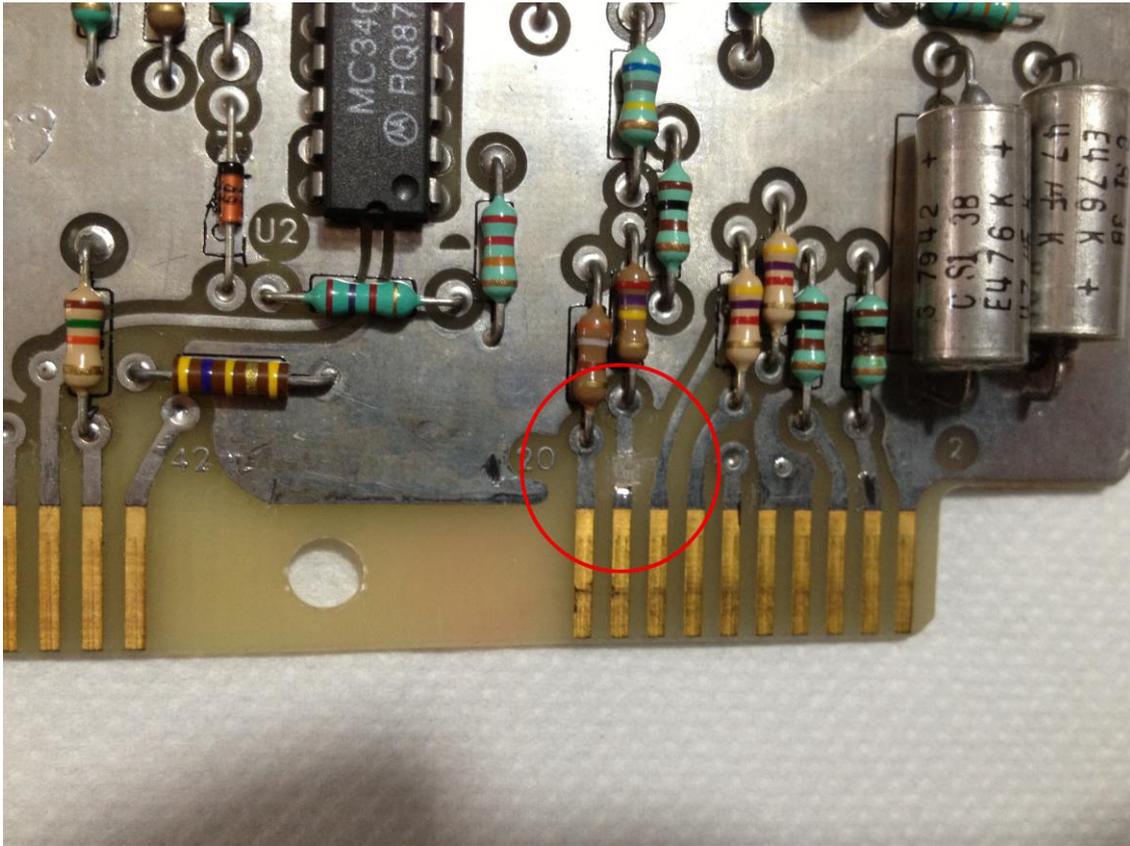
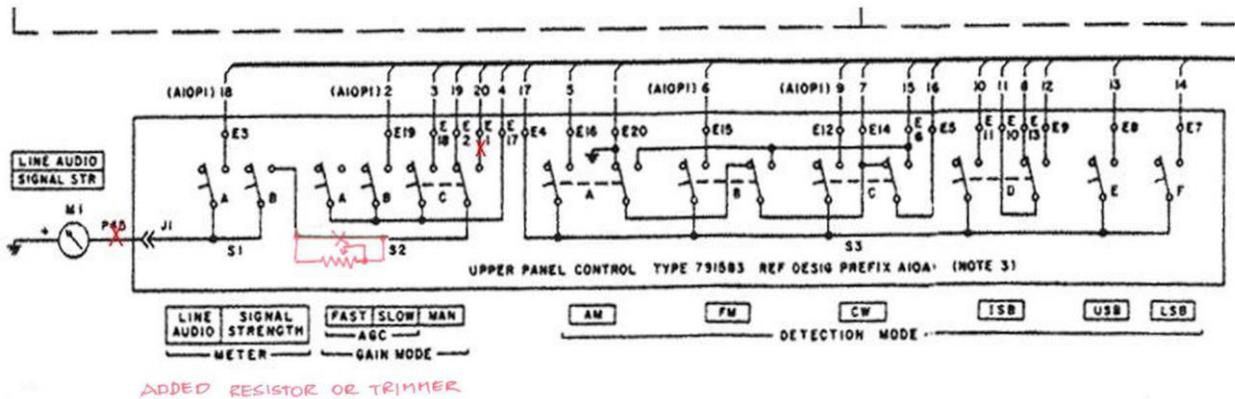


Figure 27: The 78112 AGC Card shown without its pin 18 connection (removed by cutting a track).

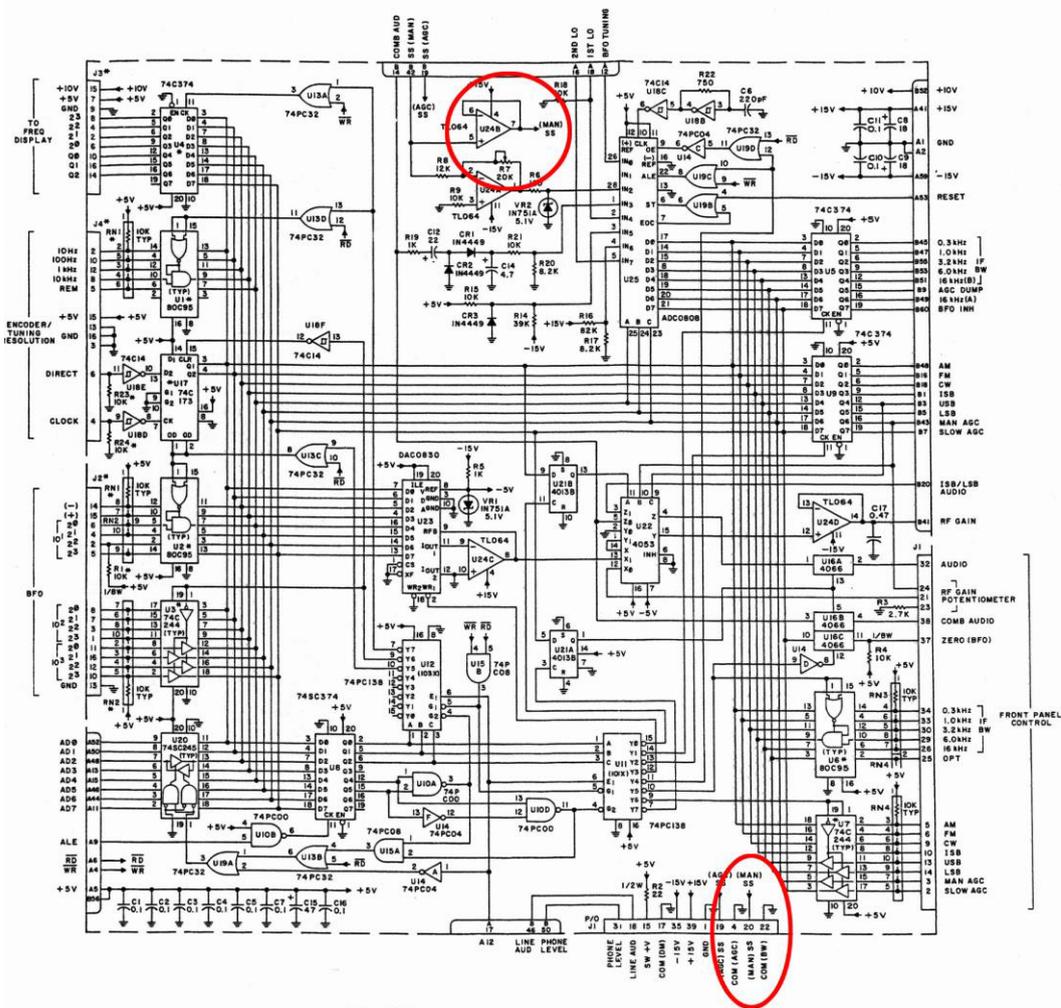


X: Insert the resistor (or trimmer) at E1 if the meter deflects beyond full-scale in "MAN" gain mode only, between S1 and S2 for reducing the meter deflection in all the gain modes and at the meter terminal for reducing the deflection also when measuring the line audio level.

Figure 28/a: The resistive device (resistor or trimmer) that has to be eventually put in series to the Signal Strength Meter circuit can be installed on the A10A1 Upper Panel Control board...



Figure 28/b: ...or soldered to one of the meter terminals directly.



Type 794308-2 IF Interface (MFP-A3)

Figure 28/c: Alternatively, a 3.3 kOhm resistor can be connected between J1-Pin 20 and U24B-TL064 IC Pin 7.

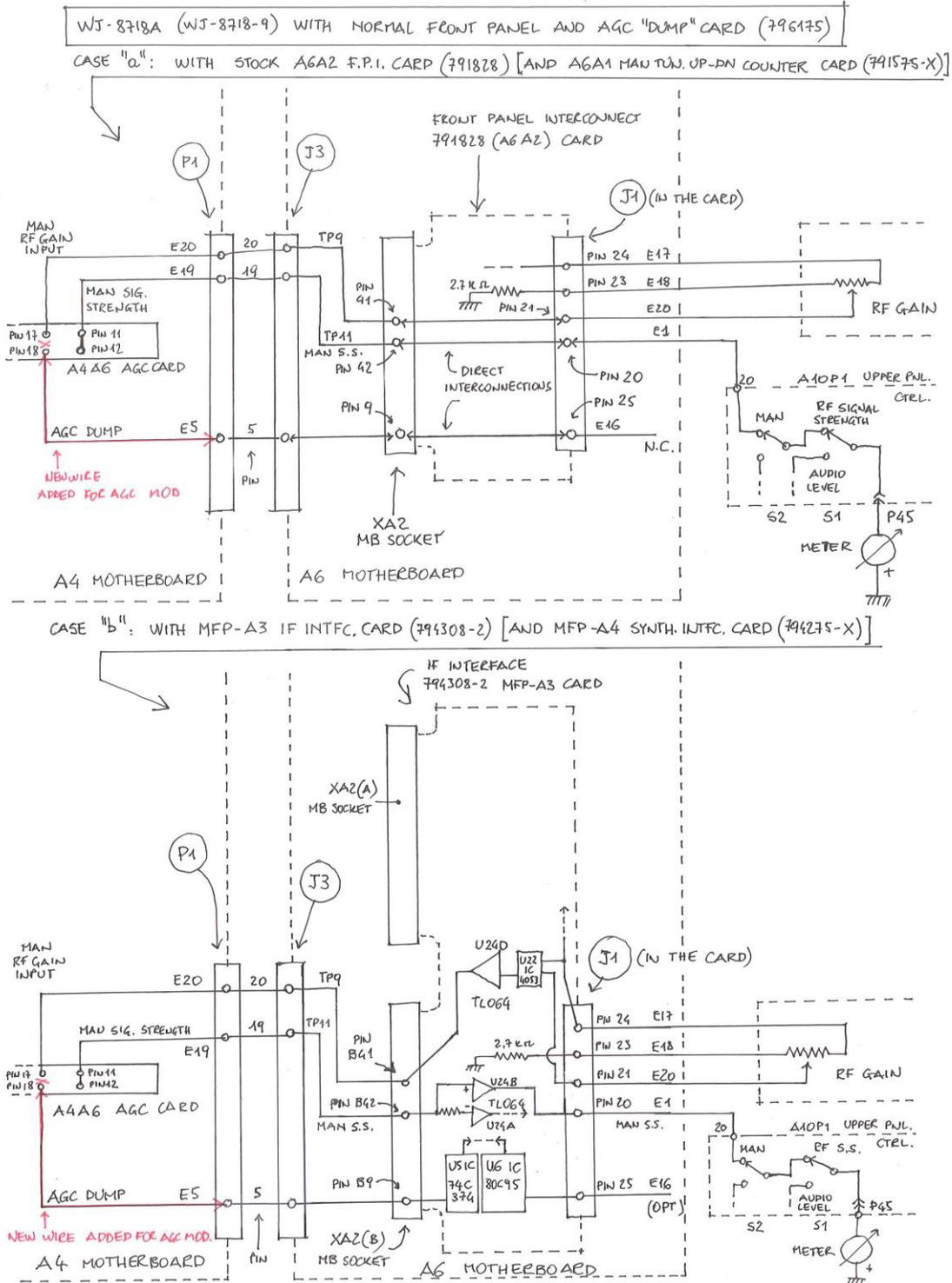


Figure 29: Differences in the AGC/RF Gain/Meter circuits between the plain version of the receiver and the upgraded version using the MFP-A3 and the MFP-A4 Cards.

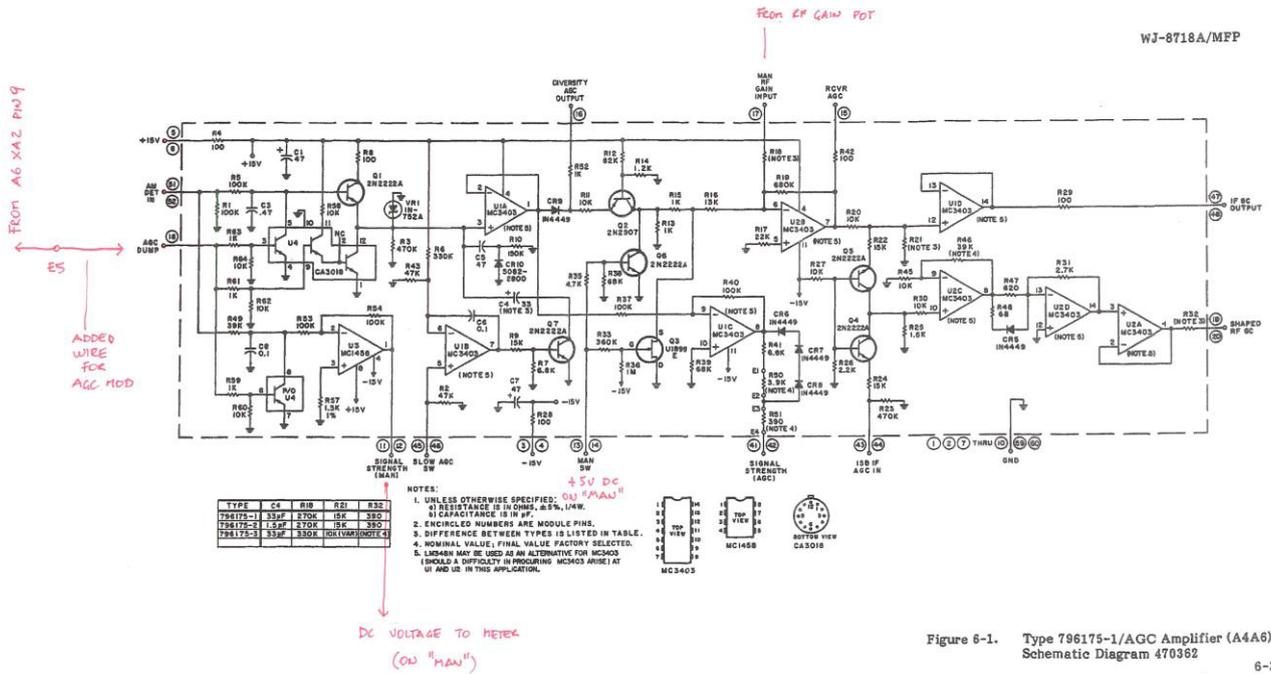
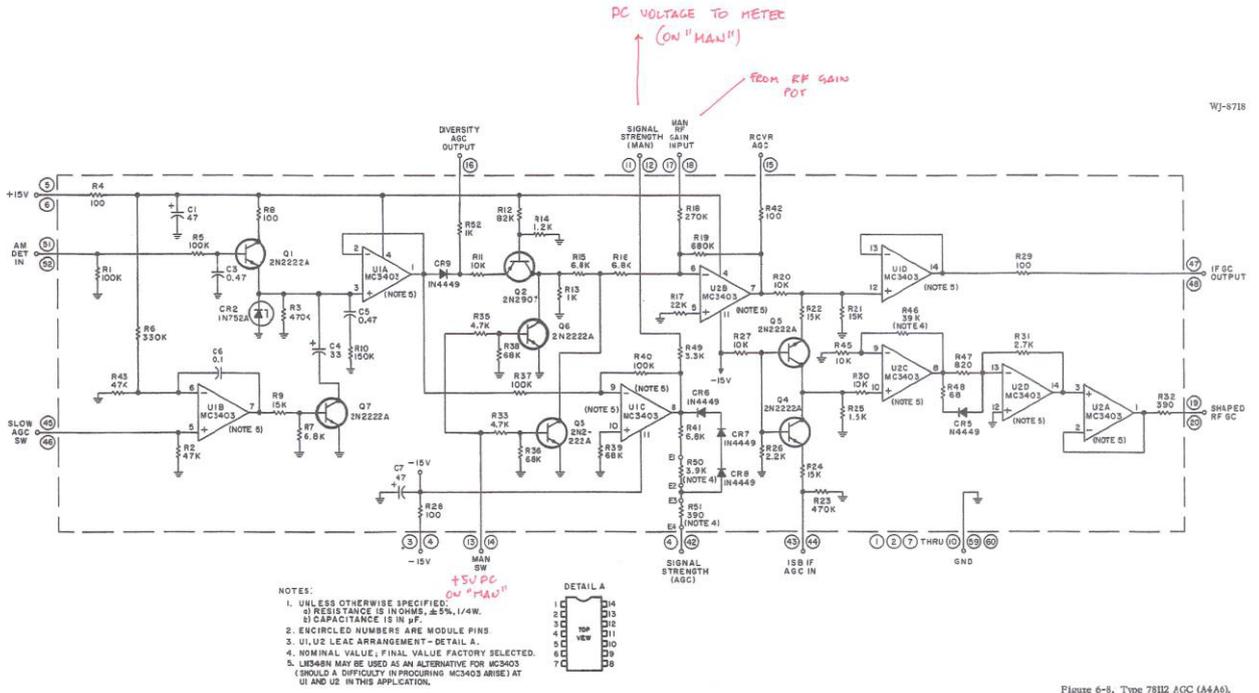


Figure 30: Comparison between the 78112 and of the 796175-1 AGC Cards schematics.

END OF STEP 1 FIGURES

FIELD MODIFICATIONS INSTRUCTIONS  
FOR INSTALLING THE MFP OPTION  
IN A WJ-8716, WJ-8718, WJ-8718A or WJ-8718-9 HF RECEIVER  
(STEP 2 of 2 - Rev. 6, Nov. 2020)

by Paolo Viappiani, La Spezia, Italy, 2020

***Preliminary requirements:***

The “Step 1” of the update must have been performed completely and successfully and the WJ-8716/8718 receiver must be fully functional.

The following tools and parts are needed to perform the new modification steps:

- Phillips screwdriver;
- Soldering gun and solder;
- A complete MFP Front Panel assembly (Figures 31 and 32, see also NOTES);
- If needed, some 2.8 mm Faston male and female connectors (Figure 33);
- One or more ground lugs (with center holes for chassis screw mounting);
- Some PTFE-insulated single connection wires of convenient lengths;
- A *Front Panel Encode* MFP-A1A1 Card 796056-1 complete with the MFP-P21 ground cable (Figures 34, 35 and 36);
- A MFP-W1 ribbon cable (64-pole socket at one end, 14 and 16 sockets at the other end, Figure 37);
- A MFP-W2 (40-pole ribbon cable terminated with sockets at both ends, Figure 39);
- If needed, a MFP-W3 (single jumper wire terminated with 2.8 mm sockets at both ends, look at Figure 53; normally this jumper is already present in the Front Panel assembly);
- A dedicated 3-pole shielded cable (PTFE insulated and of a convenient length) terminated with a 6-pole rectangular socket at one end and with a 16-pole rectangular socket at the other end (for connecting the Line Audio Level pot in the later version MFP Front Panel to the J1 connector in the bottom side of the A4 Motherboard, Figure 40). This cable is not needed when using an early version of the MFP Front Panel assembly (no Line Level front pot present in such a case, see NOTES); with a later MFP Front Panel its installation is not mandatory however.
- Proper U1 and U2 MFP EPROMS to be installed on the MFP-A4 *Synthesizer Interface/Memory* 794275-X Card;

***Other items optionally required:***

- A 488M-A3 *I/O Interface Card* 796075 or a 232M-A3 *I/O Interface Card* 796037 (with proper cable and connectors to be installed onto the rear panel of the receiver) for remote connecting the radio (bi-directional data transfer). Please notice that this also requires a proper U1 and U2 EPROM version in the MFP-A4 *Synthesizer Interface/Memory* 794275-X Card (Figures 41, 42 and 43);
- A FL2-32.205 MHz Xtal Filter Assembly (Figure 44) in order to replace the older L-C Filter used in early production receivers.

***Perform the following upgrades in order to complete the “Step 2” for installing the Microprocessor Front Panel (MFP) option:***

1. Remove power from the unit.
2. Remove top and bottom covers from the unit.
3. Place the unit with the top side facing up.
4. Disconnect the A10P1 socket from the J1 plug of the MFP-A3 *IF Interface* 794308-1 Card and all the flat cable wires that came to the J2, J3 and J4 sockets of the same card (refer to Figure 19 of the “Step 1” Instructions). Eventually the MFP-A3 794308-1 card might also be removed and replaced with a simpler MFP-A3 794308-2 version if available (the 794308-2 card is not provided with the three side sockets J2, J3, J4 and their associated circuits, look at Figure 59). In such a case the previously used 794308-1 Card can be set apart or discarded.
5. Temporarily remove the MFP-A4 *Synthesizer Interface - Memory Card* 794275-X from slots X7 and X8 of the A6 I/O Motherboard, carefully remove the U1 “non-MFP” EPROM from its socket and discard it. Insert the two proper U1 and U2 “MFP” EPROMS (see also NOTES below) into their sockets, remember that U1 is located at the bottom side of the MFP-A4 card.
6. Re-insert the updated MFP-A4 *Synthesizer Interface - Memory Card* 794275-X into slots X7 and X8 of the A6 Motherboard.
7. Place the unit with the bottom side facing up.
8. Route the two 14-pole and 16-pole ends of the MFP-W1 flat cable assembly (Figure 37) through one of the cutouts in the chassis of

the unit (towards the receiver front). Notice the red dot in the MFP-XA5 connector, that indicates the location of pin 1 on it.

9. Carefully insert the MFP-XA5 connector into the bottom pins of the XA5 socket in the A6 Motherboard (this if the motherboard is already provided with the proper PCB interconnecting tracks, in this case verify that pin 1 of MFP-XA5 is connected to pin 1 of XA5) or into the floating plug end of the flat-cable jumper (Figures 14, 15 and 16 of the “Step 1” Instructions, in this case the side keys in the floating plug prevent from any wrong connection).
10. Remove the six screws located at the base of the side handles in the receiver front panel (three screws on each side). Gently pull the front panel straight out from the receiver to free the ON/OFF Power Switch button and pay attention not to damage its shaft. The removed front panel assembly includes all the already unplugged ribbon cables and must be set apart or discarded.
11. Locate the pass-thru capacitors C11 and C12 in the receiver chassis (front side, Figures 45 and 46); solder a PTFE-insulated wire of about 4”-10 cm. in length and provided with an insulated 2.8 mm *Faston* female connector at the other end to the center pole of both the capacitors on the external side of the mainframe ( i.e. towards the front panel, more details in Figure 51). Clearly label each wire for a secure identification.
12. Connect the Ground lug of the short insulated wire terminated with the MFP-P21- 2.8 mm. *Faston* female connector at the other end (shown in Figure 35 above the MFP-A1A1 card) to ground using an existing screw in the mid of the front side of the receiver mainframe.
13. (*optional*). Just as we are in there, it’s now time to replace the old FL2 (32.205 MHz L-C filter) if desired. In order to do it, locate the circuit (placed in the bottom of the receiver towards the front panel, Figure 47) and remove it by unplugging two connectors (SMC and two-pole female) and unscrewing two fastening screws. Then discard the old L-C filter and reverse the whole procedure for installing the new Xtal one (Figure 44).
14. Carefully place the unit with the top side facing up.
15. The MFP Front Panel assembly is composed by a metal front

panel (in which are directly mounted the rotary encoder, the meter, one of the two voltage-regulators circuits and the Line Audio pot eventually), by a PCB (MFP-A1A2 *Front Panel Switchboard* ) that is screwed directly behind the front panel (and in which are located all the keys and the LED displays) and by a small Motherboard (MFP-A1 *Front Panel Encoder*, (in which are located most connector plugs and two slot sockets for the MFP-A1A1 *Front Panel Encode 796056-1* card). The small MFP-A1 Motherboard and the MFP-A1A2 *Front Panel Switchboard* are arranged at 90° with respect to each other, Figure 48 shows the Front Panel assembly from its rear. So, first check the assembly for completeness and also verify that all the connections concerning plugs A2J1, A2J2, A1J5, A1J6, A1J7 and A1J8 are present and correctly positioned (build the missing wire assemblies from scratch eventually, see Figures 49, 50 and NOTES). Then position the entire assembly in front of the receiver mainframe (at a convenient distance for ease of connecting all the various plugs) and rest the Front Panel on its side handles.

16. Connect the MFP-P12 cable (color coded blue-violet-white, terminated with a *Faston* 2.8 mm spade lug) to the wire terminated with a *Faston* socket coming from C11 (see above);
17. Connect the MFP-P13 cable (color coded black, terminated with a *Faston* 2.8 mm spade plug) to the wire terminated with a *Faston* socket coming from C12 (see above);
18. If present, screw the MFP-P11 (a single wire color coded black coming from the MFP assembly and terminated with a Ground lug) into a convenient hole present in the receiver mainframe neighborhood. Please notice that this “additional” Ground connection is not used in all the MFP assemblies (in the ones shown in Figures 48 and 54 it appears however).
19. Connect the MFP-P1 termination of the ribbon cable (that contains 16 sockets, see above) to the front panel connector A1J2 (placed in the small A1 Motherboard at the base of the MFP Front Panel assembly). Notice the brown dot at one end of the MFP-P1 connector (that indicates pin 1) and ensure that pin 1 of connector MFP-P1 is connected to pin 1 of A1J2. Please notice that ***MFP-***

**PI** has to be plugged into **MFP-A1J2**.

20. Connect the MFP-P2 termination of the ribbon cable (that contains 14 sockets, see above) to the front panel connector A1J1 (placed in the small A1 Motherboard at the base of the MFP Front Panel assembly). Notice the red dot at one end of the MFP-P2 connector (that indicates pin 1) and ensure that pin 1 of connector MFP-P2 is connected to pin 1 of A1J1. Please notice that plug **MFP-P2** has to be inserted into **MFP-A1J1** (again, a bit of irrationality from Watkins-Johnson!).
21. If a later version MFP Front Panel assembly is used, route the Line Audio pot cable thru a convenient hole in the receiver chassis (front side) in order it can reach the J1 multi-pole plug located in the upper side of the A4 IF Motherboard (see Figure 06 of the “Step 1” Instructions). Unplug the existing connector and plug this new one into place (the Line Audio Level control placed in the rear panel of the receiver will be disabled and replaced by the control present on the later version MFP front panel).
22. Insert the *Front Panel Encode* MFP-A1A1 Card 796056-1 (Figures 34, 35 and 36) into the proper slots of the A1 small Motherboard. Plug the red-dotted end of the MFP-W2 ribbon cable into its A1A1J1 connector (placed at the right side of the board) and route the flat cable through the front chassis hole so that its other end can reach the MFP-A3 *IF Interface* 794308-X Card in the upper side of the A6 I/O Motherboard . Figure 54 shows a *Front Panel Encode* MFP-A1A1 Card 796056-1 already inserted into the A1 small Motherboard of the MFP Front Panel assembly.
23. Plug the yellow-dotted end of the MFP-W2 ribbon cable into the J1 connector on the MFP-A3 *IF Interface* 794308-X Card.
24. Plug the 2.8 mm *Faston* female connector of the MFP-P21 cable coming from the Ground chassis into the J2 plug that is placed in the rear of the *Front Panel Encode* MFP-A1A1 Card 796056-1 (look at Figures 34, 35 and 36 again).
25. Carefully install the MFP front panel assembly on the receiver. Also check for trapped cables or wires and check the positioning of the Power Switch pushbutton for freedom of movement. Figure

55 shows a rough sketch of the final MFP configuration (Line Audio level cable not represented).

26. Secure the new MFP front panel using the 6 screws previously removed (see above).
27. (*optional*). If a remote control of the /MFP receiver is required (or if the radio has to be set as a “master” unit for controlling other remote “slave” receivers) a GPIB (*General Purpose Interface Bus*) IEEE-488 or a RS-232 *I/O Interface Card* must be inserted into the XA5 socket of the A6 I/O Motherboard (see Figure 07 of the “Step 1” Instructions). In Figures 41 and 42 is represented the 488M-3 *I/O Interface* 796075 card, while Figure 43 shows a 232M-A3 *I/O Interface* 796037 card. Please notice that using an IEEE-488 or a RS-232 card within the MFP receiver implies the insertion of special U1 and U2 EPROM versions (see NOTES). In addition, mounting the appropriate connector(s) on the receiver rear panel may require some mechanical modification to the holes that are present there, see Figures 56 and 57. The IEEE-488 and RS-232 I/O connectors pin layout is shown in Figure 58, further details about the proper connections and how to use the remote interfaces can be found in the MFP Manual referenced below (see NOTES)..
28. Apply power to the receiver and check that everything works OK; perform the basic BITE tests (and also the extended ones if it is possible, see NOTES). Check also all the new SCAN and MEMORY functions.
29. If everything seems to work OK, replace the top and bottom dust covers of the receiver. This completes the conversion to MFP.

#### NOTES:

- As from an electrical point of view there are no significant differences between early and later versions of the MFP Front Panel assemblies, for conversion of the receiver to the latest MFP version also an early-type front panel can be used eventually, provided that all other modifications are made in accordance with these instructions (“Step 1” and “Step 2”). No differences in receiver functions and/or performances will be found however.

While the latest version of the MFP front panel is shown in Figure 31, Figure 32 shows an

early type, easily identified by the wider numeric keyboard near the Tuning knob and some other details.

Please notice that no Line Audio Level pot is present in the early-type MFP front panel; hence the shielded cable terminated with a rectangular multi-pole connector at its end (shown in Figure 40) is no longer needed and the Line Audio level will continue to be adjustable by means of the potentiometer located in the rear panel of the receiver.

- Please also notice that only the appropriate versions of the U1 and U2 EPROMS must be used in the MFP-A4 *Synthesizer Interface-Memory* Card 794275-X, as there are many differences depending upon the options that are implemented in the receiver (and also upon the IEEE-488 or RS-232 remote I/O cards used eventually).

- Should any single-wire connection be missing in the Front Panel assembly, it can be easily built from scratch using pieces of PTFE-insulated wire and proper 2.8 mm. insulated *Faston* terminals (male or female as required).

Please also notice that the “additional” *Ground* connection (MFP-P11, single wire terminated with a *Ground* lug to be screwed to the receiver mainframe) is not present in all MFP Front Panel assemblies.

- Please take a great care in inserting the 6-pole connector of the Line Audio Level cable into the spade terminals of the potentiometer located in the later version of the MFP front panel, as they are easily broken. Sometimes that cable is already fastened in the right position and it is advisable not to disturb it.

- In order to access the BITE tests, turn the receiver ON and press the front panel LOCAL key first. Then for running the Basic BITE tests press the keys “1”, “7” and “\*” in sequence, all LEDs should lit and all the 7-segment displays should display the number "8".

The operation of all the front panel keys can be checked as specified in the W-J Manual: "***Instruction Supplement for WJ-8718A/MFP Microprocessor Front Panel Option***", pages from 4-2 to 4-4 (see below).

For accessing the Extended BITE tests press the keys “1”, “8” and “\*” in sequence: seven tests will run continually in a fixed order and any detected error will be displayed in a binary-weighted code at the end of the seventh test.

Further details can be found in the above mentioned W-J Manual on pages 4-5 and 4-6.

Pressing the “CLEAR” key will exit the BITE modes and will restore normal operation to the set.

Please notice that, while the Basic BITE tests are always available, the availability of the Extended

BITE tests depends upon the software stored in the U1 and U2 EPROMS of the MFP-A4 *Synthesizer Interface-Memory 794275-X* card.

Hence a number of MFP receivers, due to various situations (mainly not enough room in the EPROMS caused by implementation of various options) are not able to perform the Extended BITE tests. So please be aware of this common issue.

- For detailed instruction about using the many functions of the MFP receiver please refer to the above mentioned W-J Manual: "***Instruction Supplement for WJ-8718A/MFP Microprocessor Front Panel Option***", pages from 2-1 to 2-32. This manual is downloadable for free from the following addresses: [http://watkins-johnson.terryo.org/documents/manuals/WJ-8718A-MFP-manual-\(794308-&-794275\).pdf](http://watkins-johnson.terryo.org/documents/manuals/WJ-8718A-MFP-manual-(794308-&-794275).pdf) and: <https://bama.edebris.com/manuals/watjohn/wj8718>.

It contains also detailed circuit descriptions, maintenance instruction, parts list, layouts and schematics of the latest version MFP section of the radio; it is a "must-have" for every owner of an MFP receiver of the WJ-8716/WJ-8718 family consequently.

- A note on the extender boards: as the MFP-A1A1 *Front Panel Encode 796056-1* card used in the MFP receivers has more than the usual 40 comb contacts at its base (look at Figures 34 and 35), it is advisable for all users to get also a pair of type 791884 (60-pole) extenders for ease of servicing. In Figure 60 both the types of extender cards are shown.

- Finally, some advice about fixing a possible MFP issue: some users experienced unwanted "flickering" of one or more LEDs in the receiver front panel and/or bad responses from keys.

In my experience I can affirm that in most cases the culprits are a defective MFP-A1A1 *Front Panel Encode 796056-1* card (one or more bad Tantalum capacitors or some faulty IC), or else some bad contacts on the MFP-A1 "A" and "B" sockets (look at Figure 65). So, in the case check that card first, locate and replace its defective component(s) and try eventually to replace the entire card with a good one (if available); try also a deep cleaning of the socket contacts.

#### APPENDIX 1:

##### ***Procedures for thoroughly checking an MFP Front Panel Assembly before installation***

The following notes apply whenever the MFP Front Panel Assembly you make use of for the upgrade is used or taken from a not working receiver; of course you can skip all these checks if you are using a brand-new *MFP Upgrade Kit*, but this eventuality is rather rare nowadays.

Used MFP Front Panel Assemblies are often affected by some issues concerning bad contacts, not properly working switches, burnt LEDs, broken PCB tracks, etc.; so it is recommended to check

everything before attempting an upgrade.

The procedure is simple enough but time consuming indeed; it requires a good Ohm-meter (for continuity checks) and a fresh battery provided with proper leads (for checking the LEDs and the 7-segment displays an 1.5V AA-Size unit should suffice, look at Figure 77).

The only drawback is that a complete check requires dismantling the MFP Front Panel Assembly, but this is not too a complicate job when done with a great care.

The first step concerns the removal of the Line Audio potentiometer; this can be done from the front panel rear by *carefully* using long-nose pliers for unscrewing the rear exagonal nut. At the same time you can act from the panel front by blocking the bush outer ring by a wrench or pliers (please interpose a cloth in order to prevent any damage).

Figure 61 shows the outer bushing and the Line Audio potentiometer removed from an MFP front panel.

Once that the pot is removed, you can remove also all the knobs still present on the front panel, along with the phone jack and the rotary encoder (after having disconnected it from its 6-pin plug on the MFP-A1 *Front Panel Interconnect* board); then you can carefully unscrew also the front nuts of the PHONE LEVEL and of the RF GAIN pots.

After having saved every removed part and the various screws and washers, you may proceed unscrewing (from the panel rear) the *Front Panel Switchboard* (MFPA1A2-794309 PCB), after having eventually removed some jumpers and connectors (please save them all and take note of their pristine position).

After having removed and saved the 10 Phillips screws, you can remove and set apart the *Switchboard and Display* PCB (MFP-A1A2), whose bottom side is joint at a 90° angle to the MFP-A1 small motherboard.

Of course the meter and the regulator circuit MFP-U1 (placed on a “L-shaped” aluminium board) remain attached to the Front Panel assembly, but - unless for repair or component replacement – there is no need to remove them too.

Now you are able to remove the front black bezel by unscrewing all the small black-headed screws that fasten it to the aluminium panel below; the thin black bezel will be easily flowing on it .

It’s now time to carefully clean the black bezel, the front panel, the display windows (with warm water, neutral soap and a brush preferably) and to check all the pushbuttons mechanically.

Their structure is shown in the Figures 62, 63 and 64: each key is hinged to the switch below; unless they appear very clean, it could be useful to carefully remove and clean them all, checking also the integrity of each plastic cylinder that acts as a switch actuator; if it is damaged or broken, maybe the corresponding switch does not work.

Just a recommendation: when removing the white pushbuttons, please take a great care not to damage the two small side rings that act as hinges and proceed very carefully.

Now all the pushbuttons can be checked by pushing each of them and using an Ohmmeter whose terminals are properly connected to the MFP-A1 “A” or “B” sockets, look at Figure 65 (both the sockets in the figure are seen from the receiver top); also Figures 66 (*Front Panel Layout*), 67 (*Front Panel Switchboard schematic*) and 76 (*Front Panel Interconnect motherboard schematic and details*) can help in the checking process.

Once the pushbutton check is complete (and after having fixed all the issues eventually), it’s time to check the proper working of each LED (and of each segment of the 7-segment displays); again, Figures 65 (MFP-A1 *sockets*), 66 (MFP *Front Panel Layout*), 67 (MFP-A1A2 *Front Panel Switch Board schematic*) and 76 (MFP-A1 *Front Panel Interconnect motherboard schematic and details*) can be of some help.

Just for info, all the 7-segment displays on the MFP Front Panel are of the “Common-Cathode” type. Consequently the positive lead of the simple device shown in Figure 77 has to be connected to one of the “Anode” contacts (shown in RED color in Figure 65) of the “A” or “B” socket on the MFP-A1 *Front Panel Interconnect* small motherboard, while the negative lead must be connected to the corresponding “Cathode” contact in one of the above sockets (shown in BLUE in Figure 65).

I know, a complete check involves much time and frequent headaches, but this is the price to pay for a good working MFP receiver!

There is also a good piece of news however: all the checks can be simply performed from the top of a stand-alone MFP *Front Panel Assembly* resting on a table and not yet provided with the MFP-A1A1 *Front Panel Encode* card.

And... after having completed the switches and LED checking (and having fixed all the issues eventually), are we done and ready to proceed to the MFP upgrade?

Nope! We have also to check the *Front Panel Assembly* connections among J1 (14-pin) and J2 (16-pin) plugs - both at one edge of the MFP-W1 flat cable - and the A6X2, A6X5 and A6X8 sockets in the receiver chassis bottom (also look at Figures 37 and 38 ).

These checks can be performed with the help of Figures 65 (MFP-A1 sockets), 68 (A6 sockets), 69 (MFP-A3-794308-X *IF Interface* card schematic) and 70 (MFP *Main Assembly schematic*), that can be used for reference.

Eventually, also Figure 78 (that shows some connection details of the MFP-A4 794275-X *Synthesizer Interface* card to the XA1A (X8) socket on the A6 motherboard) can be of help for continuity tests.

A quick test of the MFP-W1 cable assy. connected to the 3-socket + 1 plug ribbon cable jumper (just as represented in Figure 71) can be preliminarily performed outside of the receiver; it is very useful also to identify on time any erroneous pin exchange between rows (*even/odd*) eventually.

Just as we are in there, it’s useful to check (by an Ohmmeter) also the connections between the J1 socket of the MFP-A1A1 796056-1 *Front Panel Encode* card (placed on the right card side) and the J1 socket of the MFP-A3-794308-X *IF Interface* card (on the upper card side); in practice, this is a

check of the MFP-W2 40-pole cable shown in Figure 39 when it is connected between the two cards. Figures 72 (details of MFP-A1 *Front Panel Switch/Encode* board and MFP-A1A1 *Front Panel Encode* card), 73 (MFP-A1A1 *Front Panel Encode* schematic), 74 (MFP-A3 *IF Interface* schematic), 75 (MFP *Main Assembly* schematic), 76 and 78 can be used as overall references.

Once all the above mentioned checks have been performed, you can keep for sure that the MFP *Front Panel Assembly* is fully functional and also that all the connections to other cards and sockets are properly working; it's now time to reassemble it (reversing step by step the disassembling procedure described above) and finally to install it on the receiver as per the former instructions.

This completes the MFP upgrade and you should have now a fully functional W-8718/MFP.

Just a final notice about some of the attached figures: I draw some sketches in a draft form only, but since they seem quite understandable I don't know if in the future I will replace them with better drawings.

So I consider this as the *final* release of my instructions for installing the MFP option, I sincerely hope they can be useful for all concerned.

#### APPENDIX 2:

##### ***Upgrading the WJ-8718 and the WJ-8718-9 to “plain” or “MFP” versions by replacing the A6 motherboard***

The WJ-8718 and WJ-8718-9 receivers are normally provided with early versions of the A6 Motherboard (Look at Figures A and B below) whose PCBs are missing of most of the tracks that are needed for using both the *IF Interface* MFP-A3 Card 794308-1 and the *Synthesizer Interface/Memory* Card 794275-X.



Figure A: Early A6 MB, Top view.

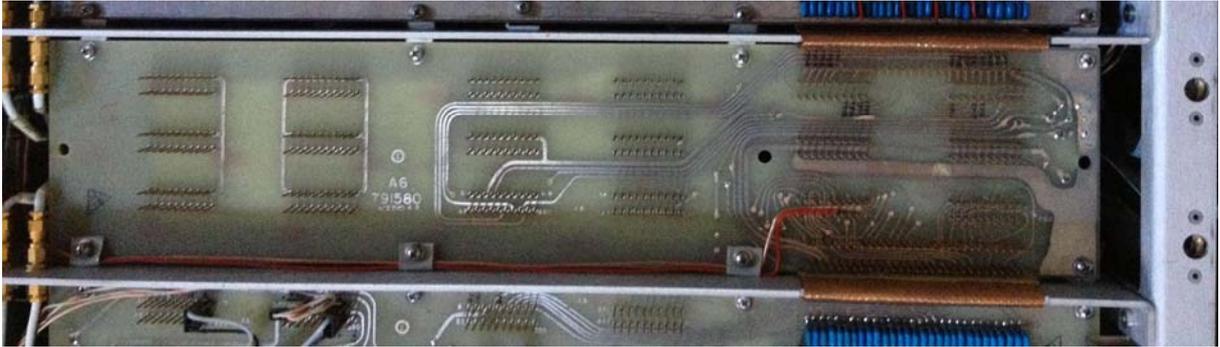


Figure B: Early A6 MB, Bottom view

Having one of the latest versions of that motherboard (Look at Figures C and D below) at hand, it is certainly advantageous to replace the existing one: it is an almost easy task that can be performed in less than an hour, with great benefits.

The latest versions of the A6 motherboard are already provided with ALL the PCB tracks that are needed for directly using the old A6A2 and A6A1 cards or the new MFP-A3 and MFP-A4 ones.

The motherboard replacement allows a quick upgrading of the receiver both to the latest “plain” and to the “MFP” version without any need to use the “flat- cable jumpers” between the XA2, XA5 and XA8 sockets in the A6 MB bottom.

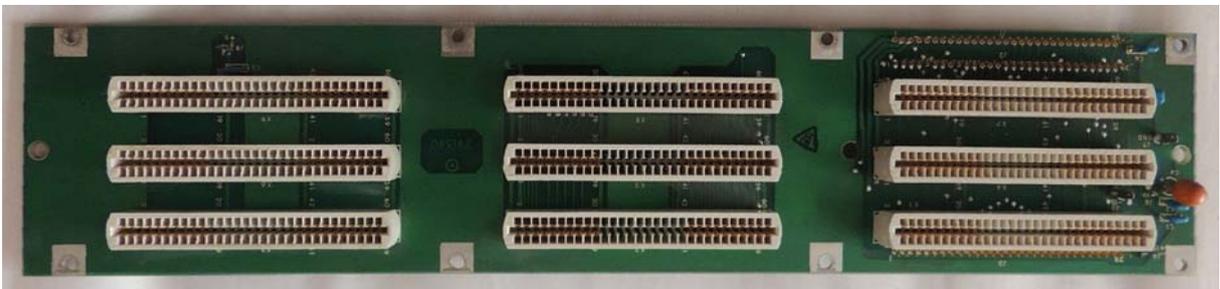


Figure C: Latest A6 MB version – View from Top



Figure D: Latest A6 MB version – Bottom view

Replacing the A6 motherboard involves the following steps:

- 1) Remove power from the unit, then remove top and bottom covers;
- 2) Place the receiver with the top side facing up and remove the *Manual Tuning Up/Down Counter* (A6A1, 791575-X) from the X7 and X8 slots of the old MB.  
Appropriately mark and remove the three TUNING, DISPLAY and BFO connectors from their socket at the left side of the card; remove also the REMOTE INPUT socket (A6A1J1) if present on the rear panel of the receiver;
- 3) Remove the *Front Panel Interconnect* (A6A2, 791828 card) from the same motherboard after having unplugged the ribbon-cable connector from J1.  
NOTE: Should the old cards had already been replaced with the *Synthesizer Interface* (MFP-A4, 794275-X) and the *IF Interface* (MFP-A3, 794308-1) cards respectively, remove the latter instead of the ones mentioned in the Steps (2) and (3) above.
- 4) From the top side of the A6 motherboard remove and properly mark each single connector plugged to J4, J5, J6, J7 and J8, taking a great care so as not to confuse them with each other.
- 5) Taking a great care again, remove the ribbon-cable female sockets (connecting the adjacent A4 and A5 motherboards) from J1, J2 and J3 of the A6 MB.
- 6) Place the receiver with the bottom side facing up.
- 7) Remove the A6JP1 plug (coming from the E9 standoff concerning the backup battery placed on the receiver rear) from X8-pin3 or from X7-pin59.
- 8) Unscrew and set apart the eight screws (including washers) that secure the A6 motherboard to the receiver main chassis; remove and discard the old A6 MB.
- 9) Position the new A6 MB in place and fasten it to the receiver main chassis by the same hardware set apart in the former Step (8).
- 10) Carefully reconnect the three ribbon-cable sockets to J1, J2 and J3 of the new A6 MB.
- 11) Connect the A6P1 plug (coming from the above mentioned E9 standoff) to X7-pin 59.
- 12) Place the receiver with the top side facing up and carefully reconnect all the single socket leads to plugs J4, J5, J6 and J7 on the new A6 MB.
- 13) Reinsert all the cards that have been previously removed (A6A1, 791575-X and A6A2, 791828 or MFP-A4, 794275-X and MFP-A3, 794308-1) into their respective places.
- 14) Plug all the connectors into their proper places on the above mentioned cards;  
Apply power to the receiver and check that everything works OK as before the A6 replacement.
- 15) Replace the receiver top and bottom dust covers eventually.

#### IMPORTANT NOTES

- Once the A6 motherboard has been replaced, it is no longer necessary (IN ANY CASE!!!) to install the flat cable jumpers between the X2, X5 and X8 sockets or to make additional connections in the lower part of the A6 MB PCB.

- If you wish to upgrade the receiver to the "MFP" version, the instructions in this Appendix 2 fully replace points 11 to 15 (pages 4 and 5) of "STEP 1" of the FIELD MODIFICATIONS INSTRUCTIONS; then, you can continue following what is indicated there (obviously neglecting any reference to the flat-cable jumpers of the lower part of the MB A6).

-In this situation, the MFP-XA5 connector of the MFP-W1 cable must be plugged directly into the XA5 socket pins on the bottom of the MB A6. About all the rest, the instructions contained in "STEP 2" of the aforementioned document apply.

-It is absolutely essential that the EPROM U1 and U2 on the MFP-A4 (794275-X) card are properly programmed according to the "Remote Control" board installed in the A6 XA5 (IEEE-488 or RS-232, look at Figures 41 and 42 of the FIELD MODIFICATIONS INSTRUCTIONS - Step 2).

The proper working of the receiver, both in the plain (EPROM U1 only) and in the "MFP" (EPROM U1 and U2) version depends on the correctness of the installed software.

- In the event of an upgrade to MFP, the MFP-A3 794308-1 board can be advantageously replaced with the 794308-2 version (see Figure E below), that is specifically optimized for MFP receivers.



Figure E: The MFP-A3 794308-2 card

Paolo Viappiani, Nov. 2020

***END OF STEP 2 INSTRUCTIONS***





Figure 33: 2.8 mm. *Faston* male and female connectors can be eventually used for replacing missing wires.



Figure 34: The *Front Panel Encode* MFP-A1A1 Card 796056-1 (front view).



Figure 35: The *Front Panel Encode* MFP-A1A1 Card 796056-1 (rear view); in the picture is also shown the MFP-P21 ground cable.



Figure 36: Front Panel Encode MFP-A1A1 Card 796056-1 (rear detail of "J2").



Figure 37: The MFP-W1 ribbon cable split into two sockets at one end.



Figure 38: The MFP-XA5 64-pole socket inserted into the floating plug of the home-built ribbon cable assembly.

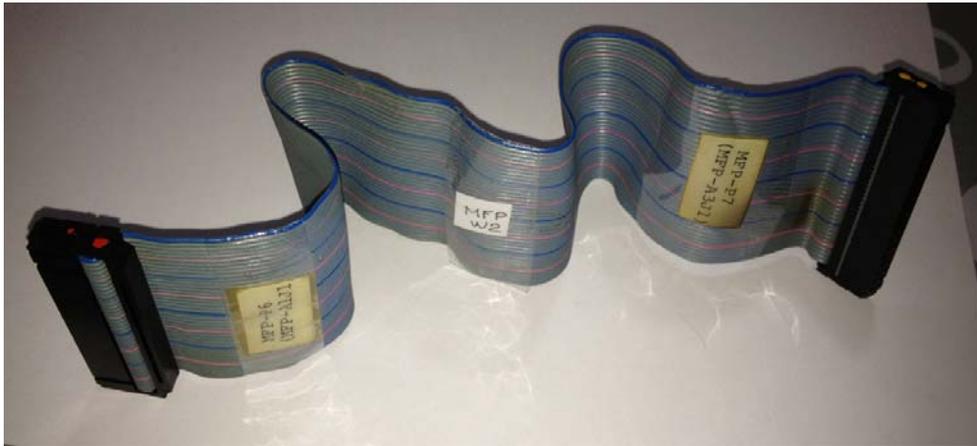


Figure 39: The MFP-W2 ribbon cable (red dot at one end, yellow dot at the other end).

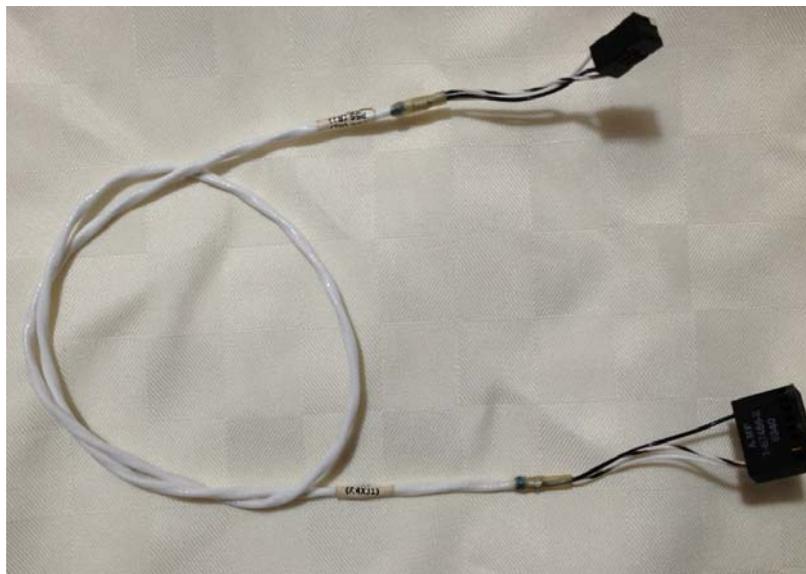


Figure 40: The Line Audio Level pot cable.

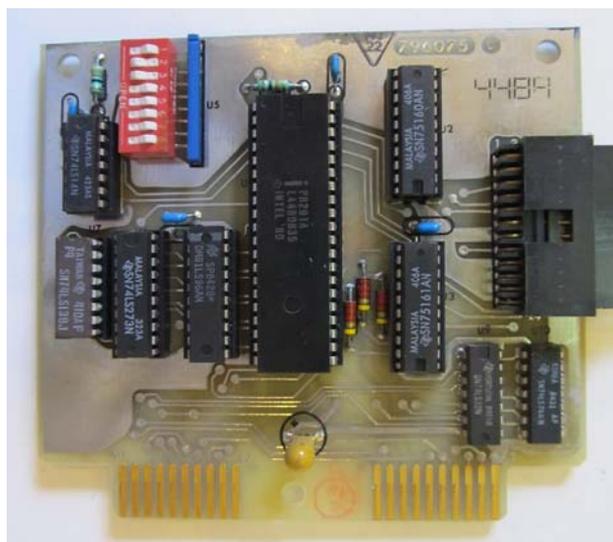


Figure 41: The optional 488M-A3 IEEE-488 I/O Interface Card 796075 (front view).

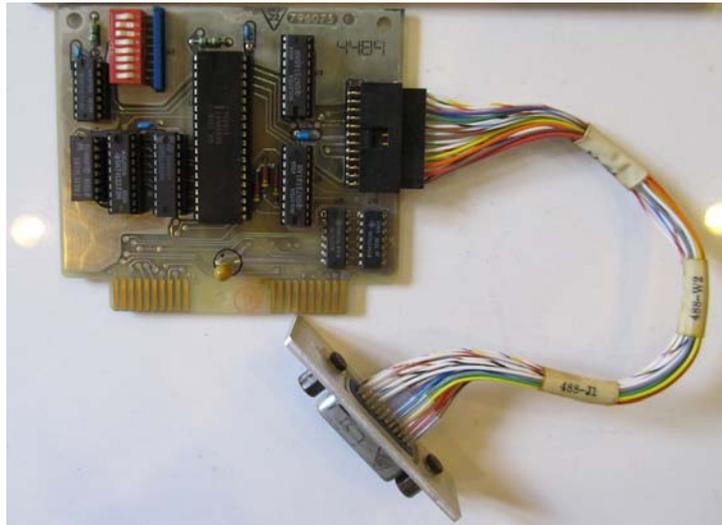


Figure 42: The 488M-A3 IEEE-488 I/O Interface Card 796075 (complete with its cable to rear panel).

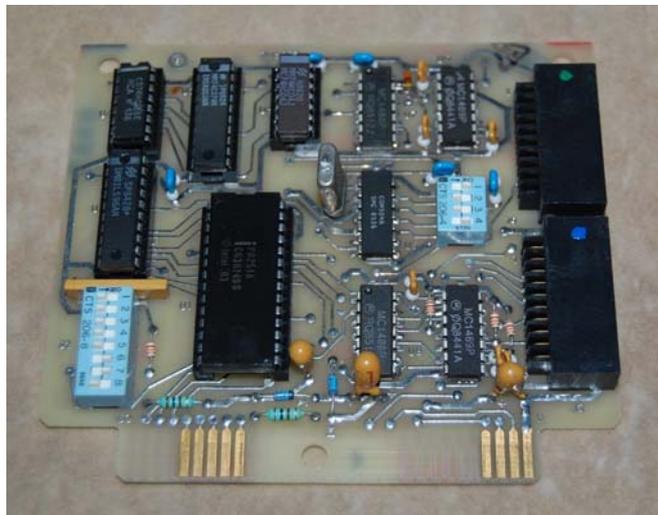


Figure 43: The optional 232M-A3 RS-232 I/O Interface Card 796037.



Figure 44: The new FL-2 (32.205 MHz Xtal Filter).

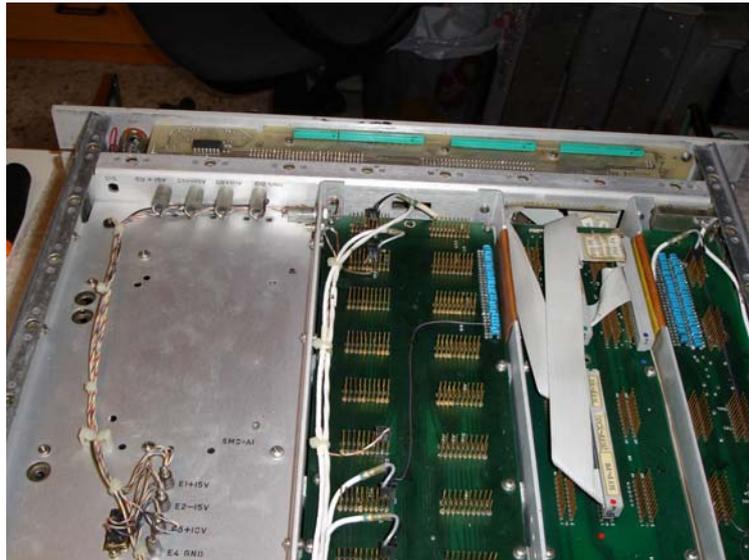


Figure 45: Locating C11 and C12 in the bottom side of the receiver mainframe.

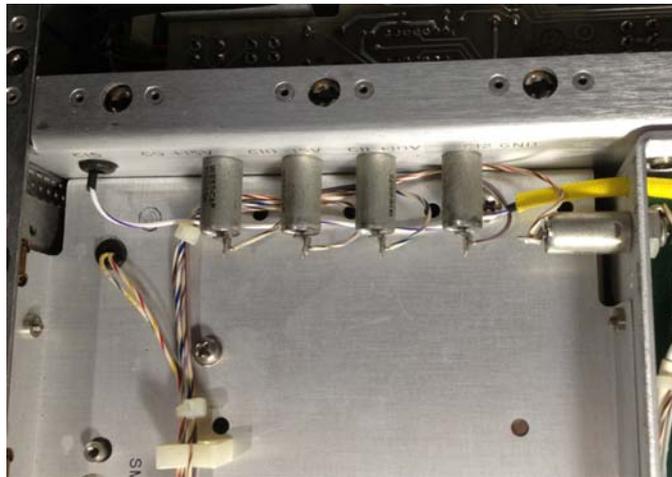


Figure 46: Locating C11 and C12 in the bottom side of the receiver mainframe (detail).

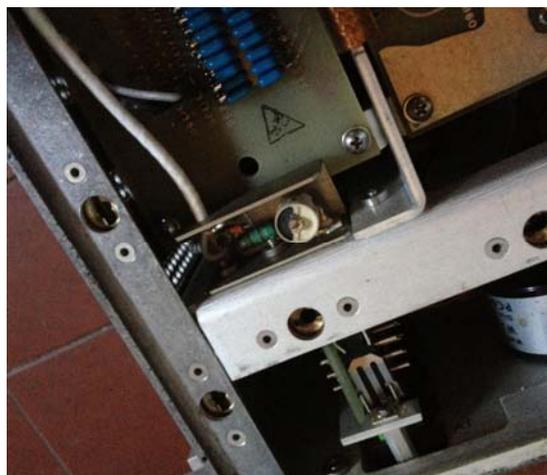


Figure 47: Locating the original FL-2, 33.205 MHz L-C filter.

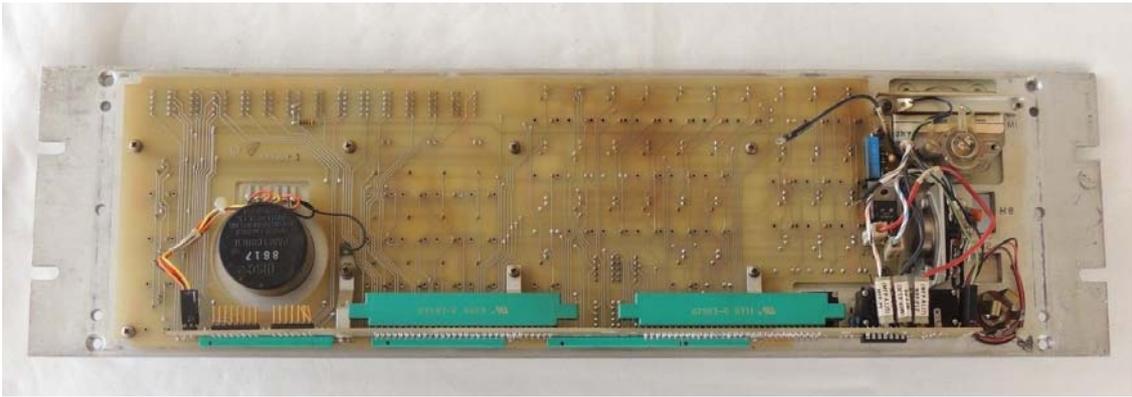


Figure 48: The whole MFP Front Panel Assembly (Rear view, see text).

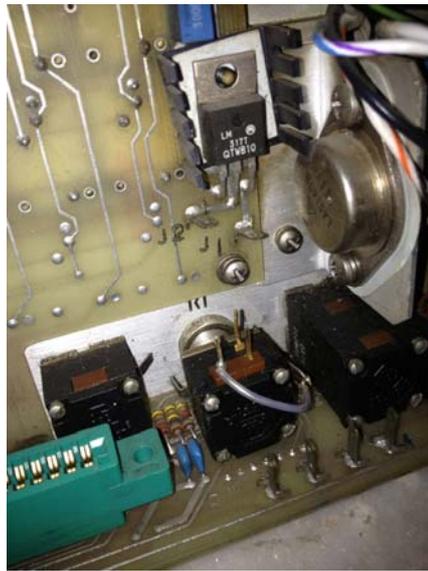


Figure 49: Locating the plugs A2J1, A2J2, A1J5, A1J6, A1J7 and A1J8 on the MFP Front Panel Assembly (all connections temporarily removed).

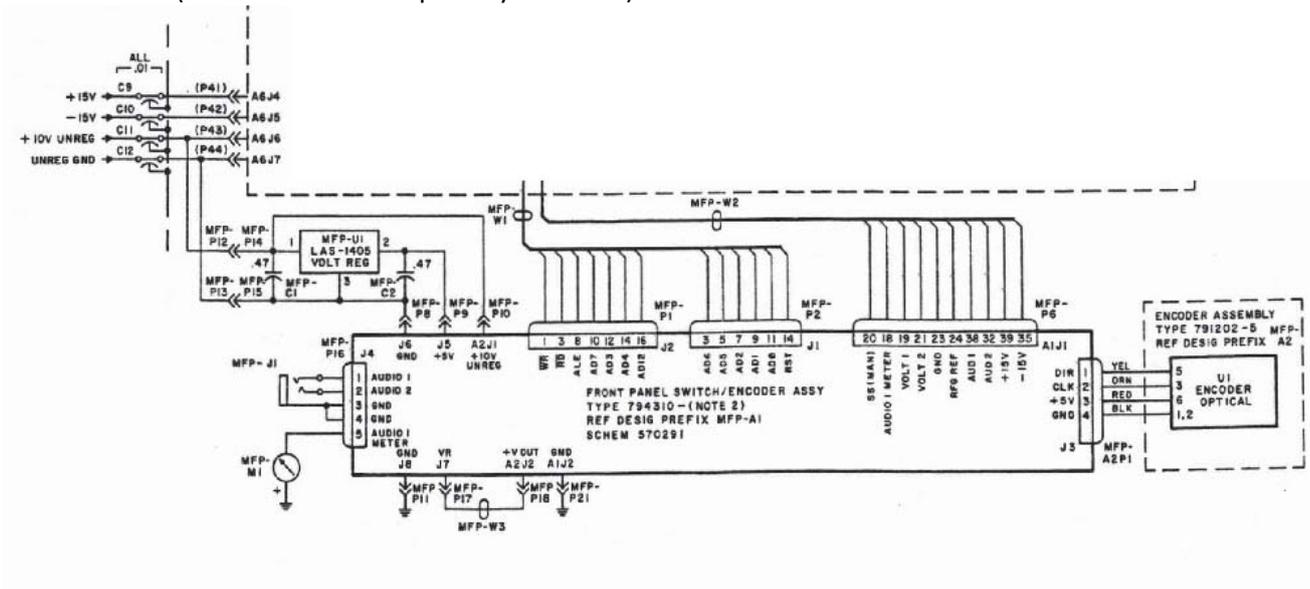
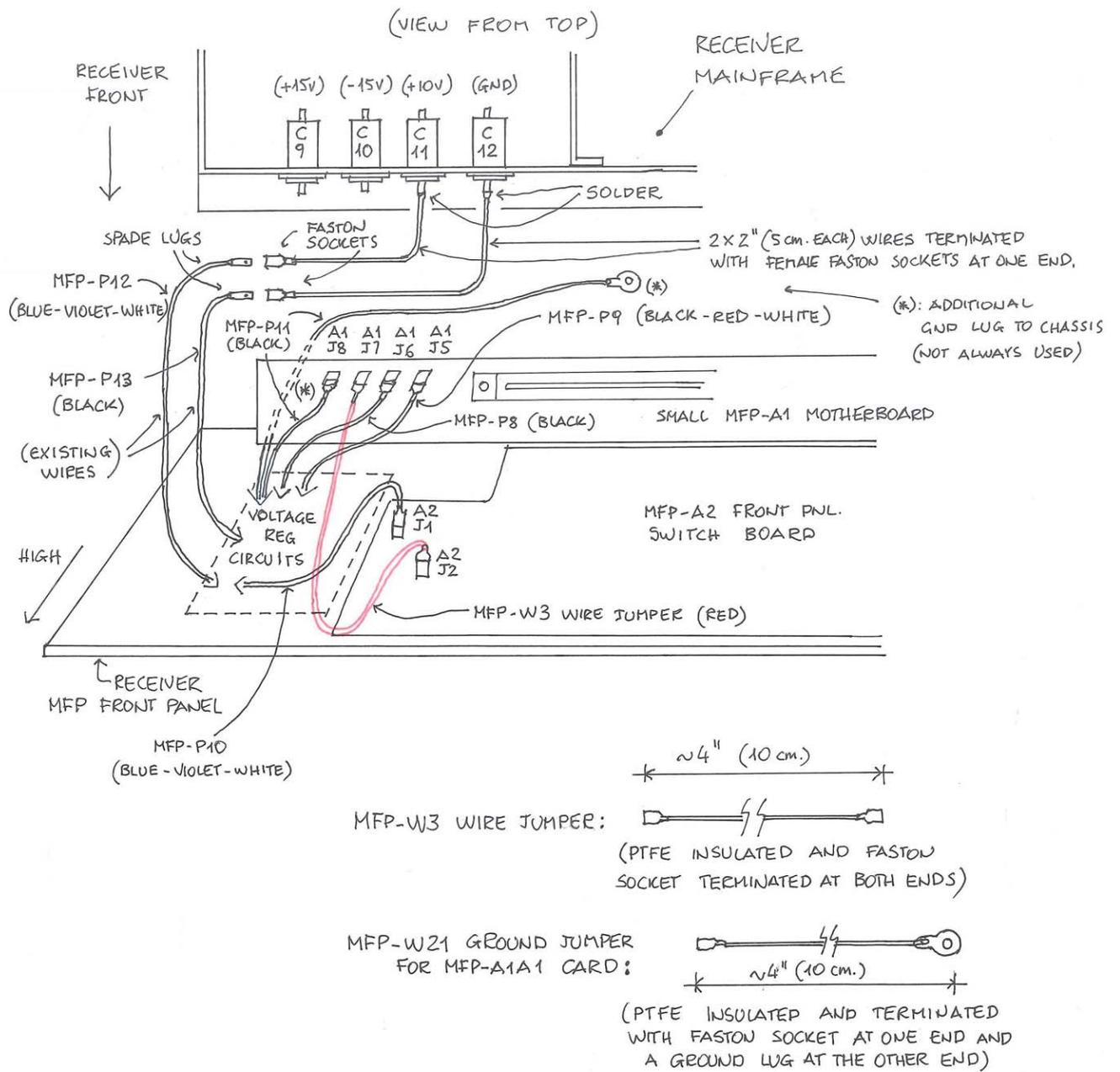


Figure 50: Overall diagram of the MFP Front Panel Assembly.



VARIOUS CONNECTIONS IN THE MFP FRONT PANEL ASSEMBLY.

Figure 51: Connections in the MFP Front Panel Assembly.

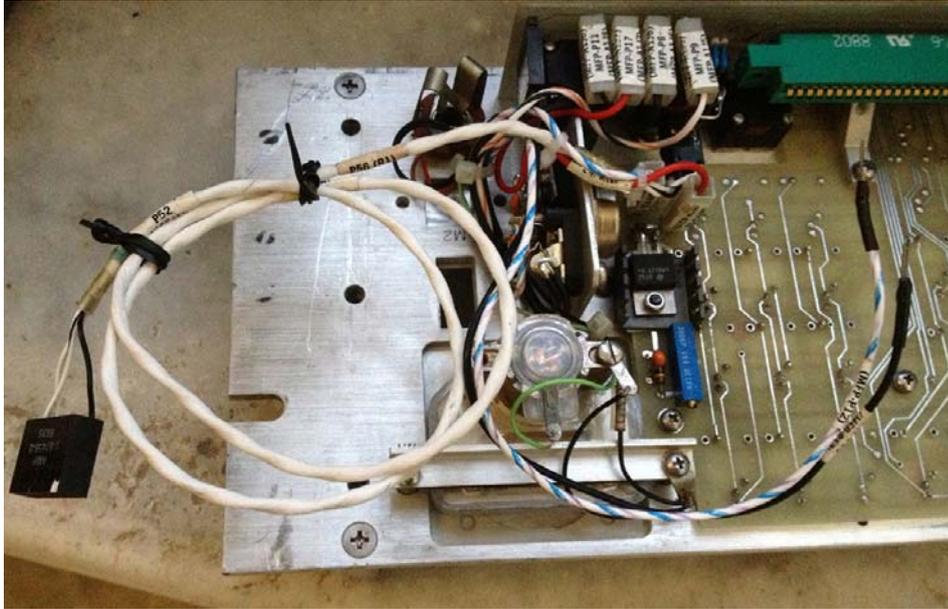


Figure 52: The *MFP Front Panel Assembly* with all the left-side connectors in place.



Figure 53: The *MFP-W3* single-wire jumper.

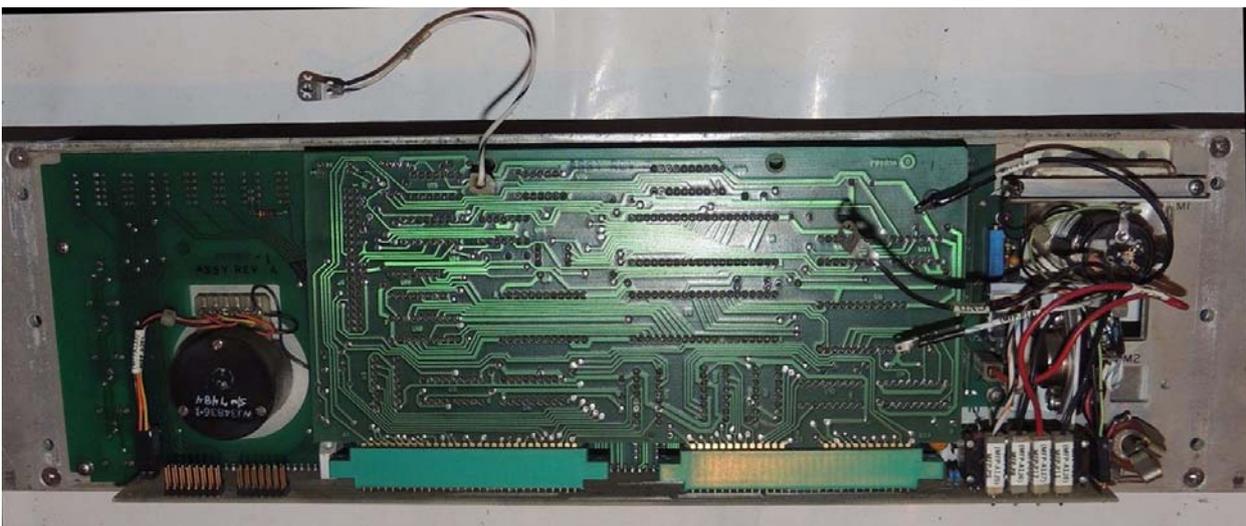


Figure 54: The *MFP-A1A1 Card* already inserted into the *MFP-A1 Small Motherboard* of a *MFP Front Panel Assembly*, please notice also the *MFP-P21* and the *MFP-P11* Ground leads.

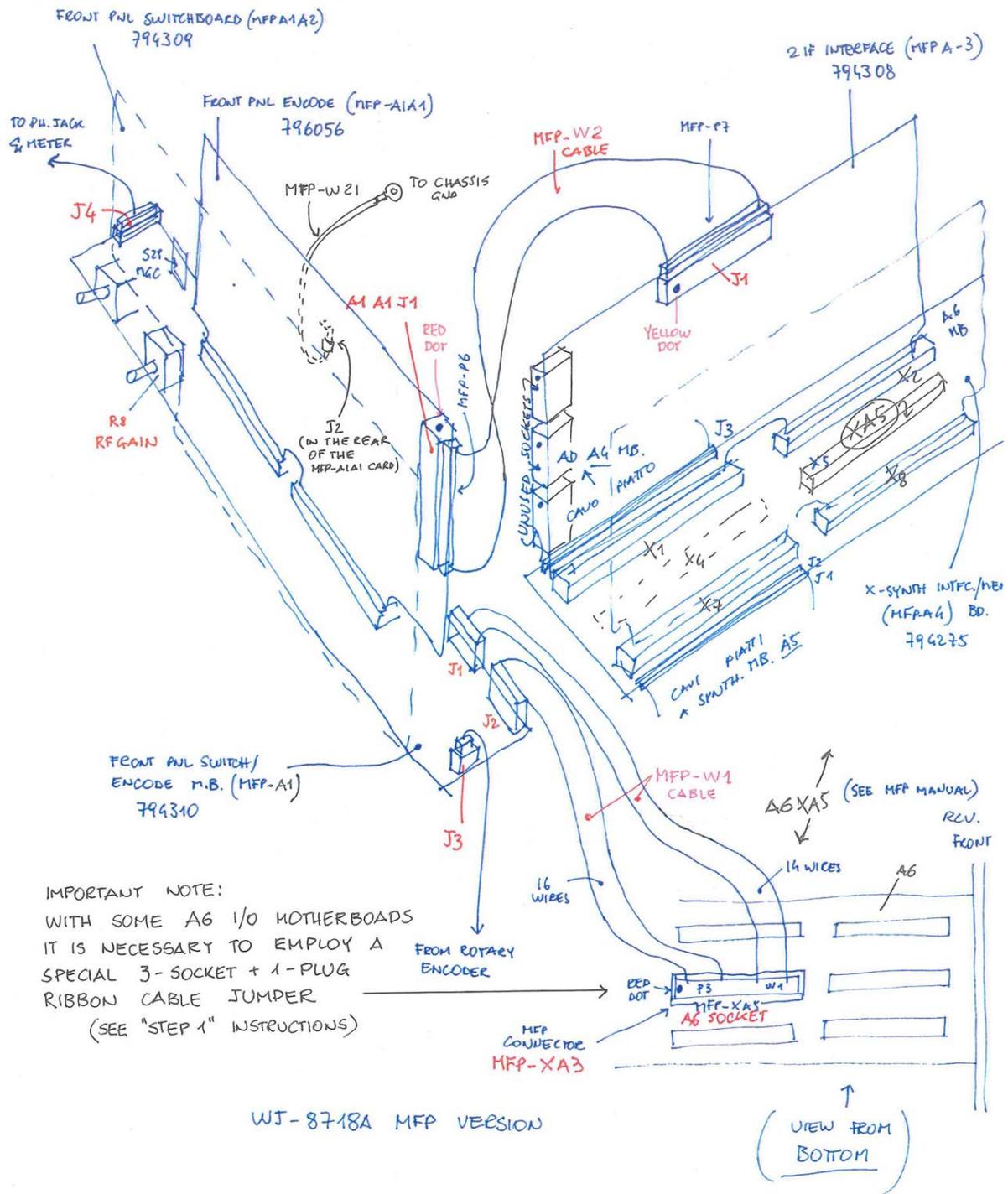


Figure 55: A rough sketch of the final MFP layout (the Line Audio level cable and some other single-wire connections are not shown for clarity).

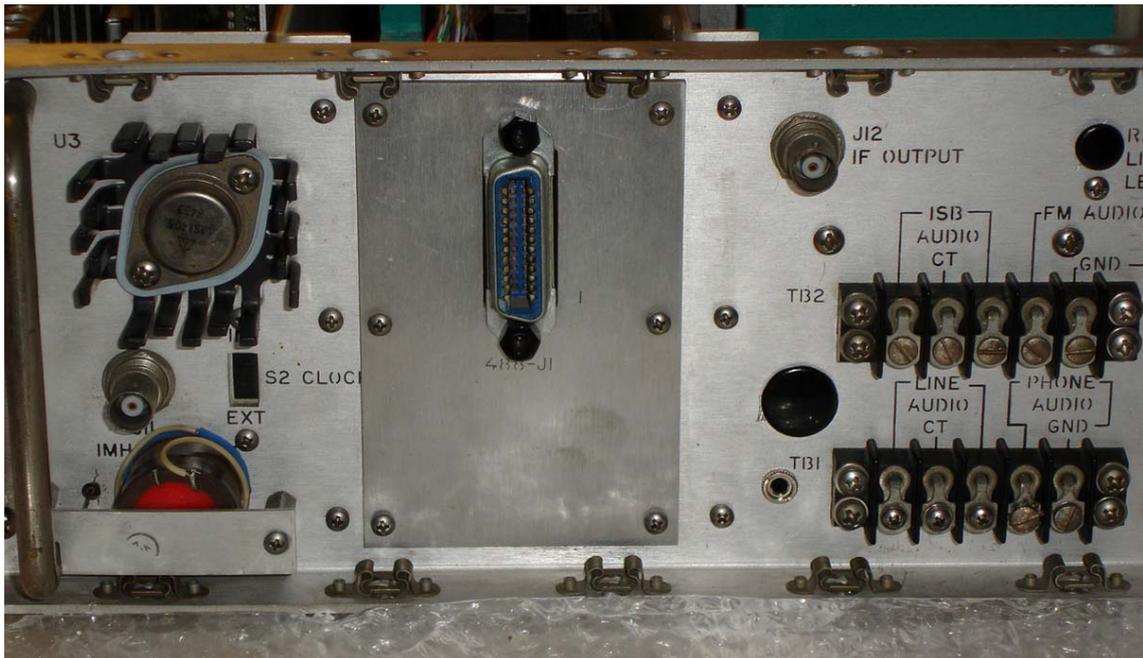


Figure 56: The IEEE-488 GPIB connector on the rear panel of a WJ-8718A/MFP receiver.

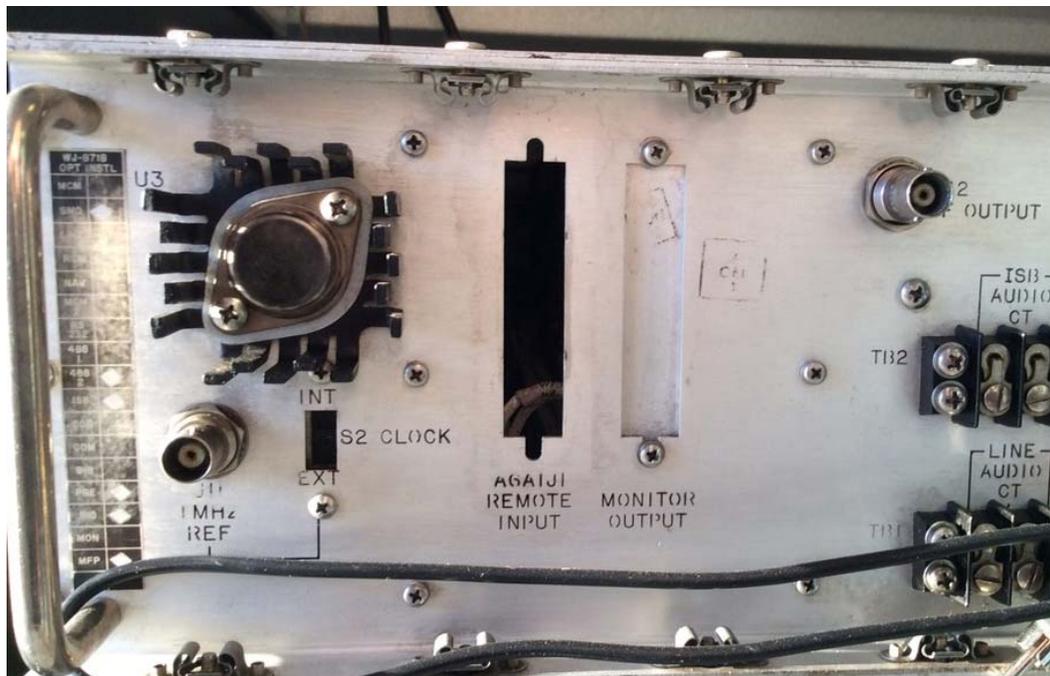


Figure 57: Holes for the RS-232 remote control connectors in the rear panel of a MFP receiver.

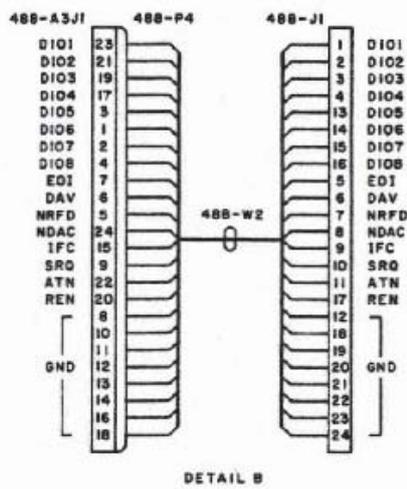
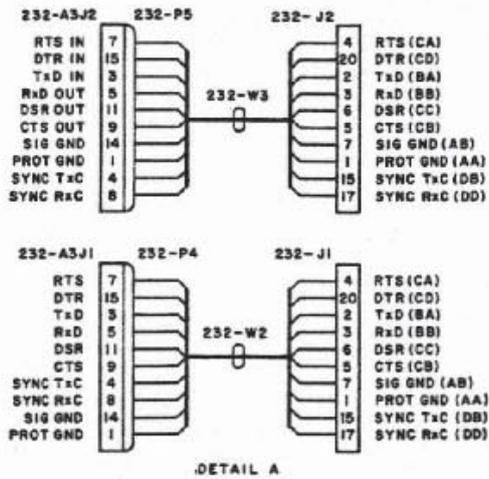


Figure 58: IEEE-488 and RS-232 I/O connectors pin layout (rear panel connectors shown at right).



Figure 59: A simplified MFP-A3 IF Interface 794308-2 Card (see text).

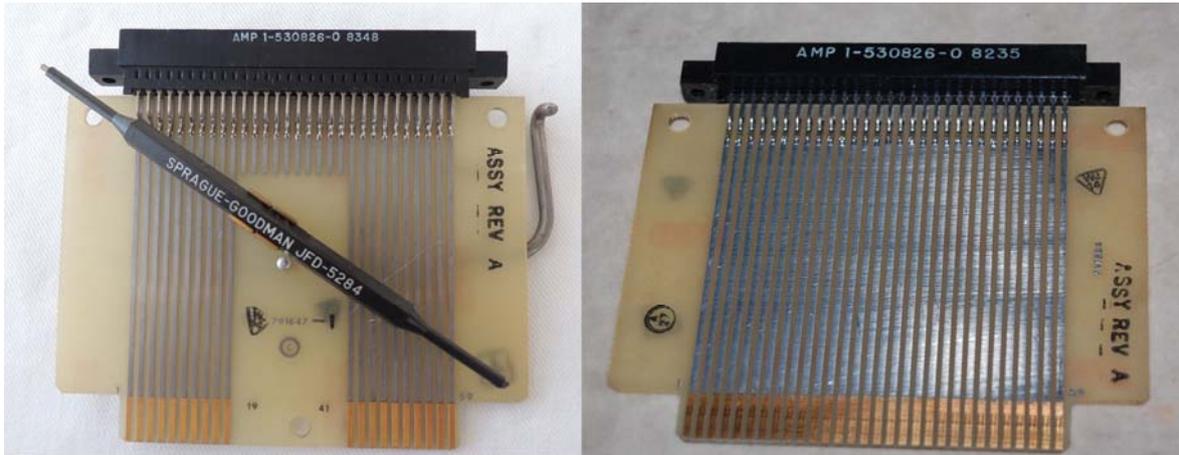


Figure 60: Two different types of extender boards: the 791647-1 card (40-pole, 20 of them split into two rows on each side of the board, adjusting tool and card removing handle) is shown at left and the 791884 card (60-poles total, 30 on each side) is shown at right.



Figure 61: The Line Audio potentiometer and its outer bushing removed from an MFP front panel.



Figure 62: Some key covers, with and without the hole for an LED. Please notice the two small side rings in the upper bottom sides of the keys, they act as hinges.

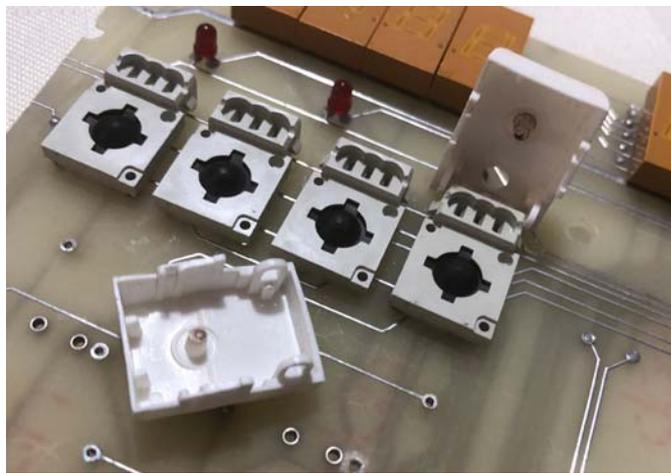


Figure 63: Some key covers and switches soldered to the front panel PCB.



Figure 64: Some of the switches are provided with an LED in the upper center.

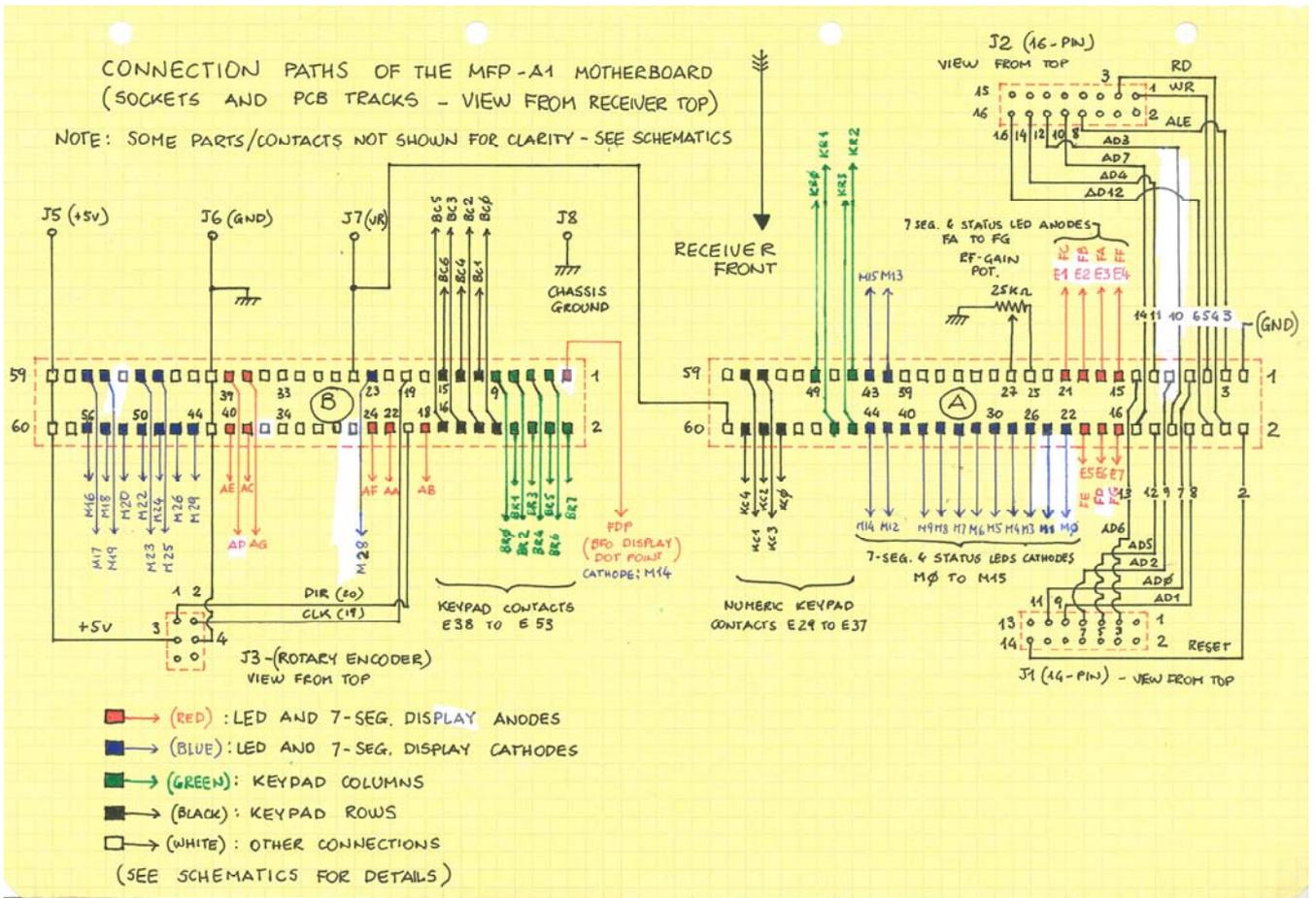


Figure 65: The main pin paths from the A and B sockets and from the J1 and J2 connectors located on the MFP-A1 Front Panel Switch/Encode small motherboard.

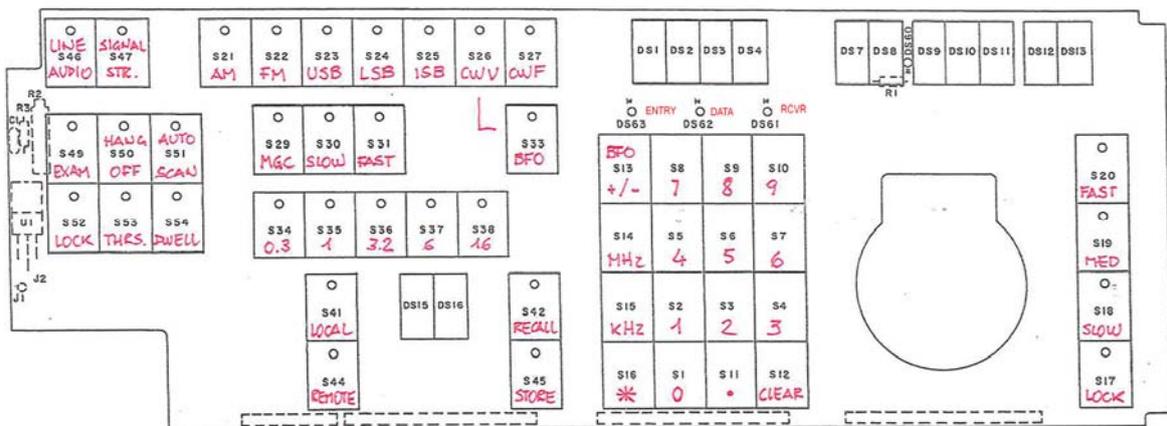
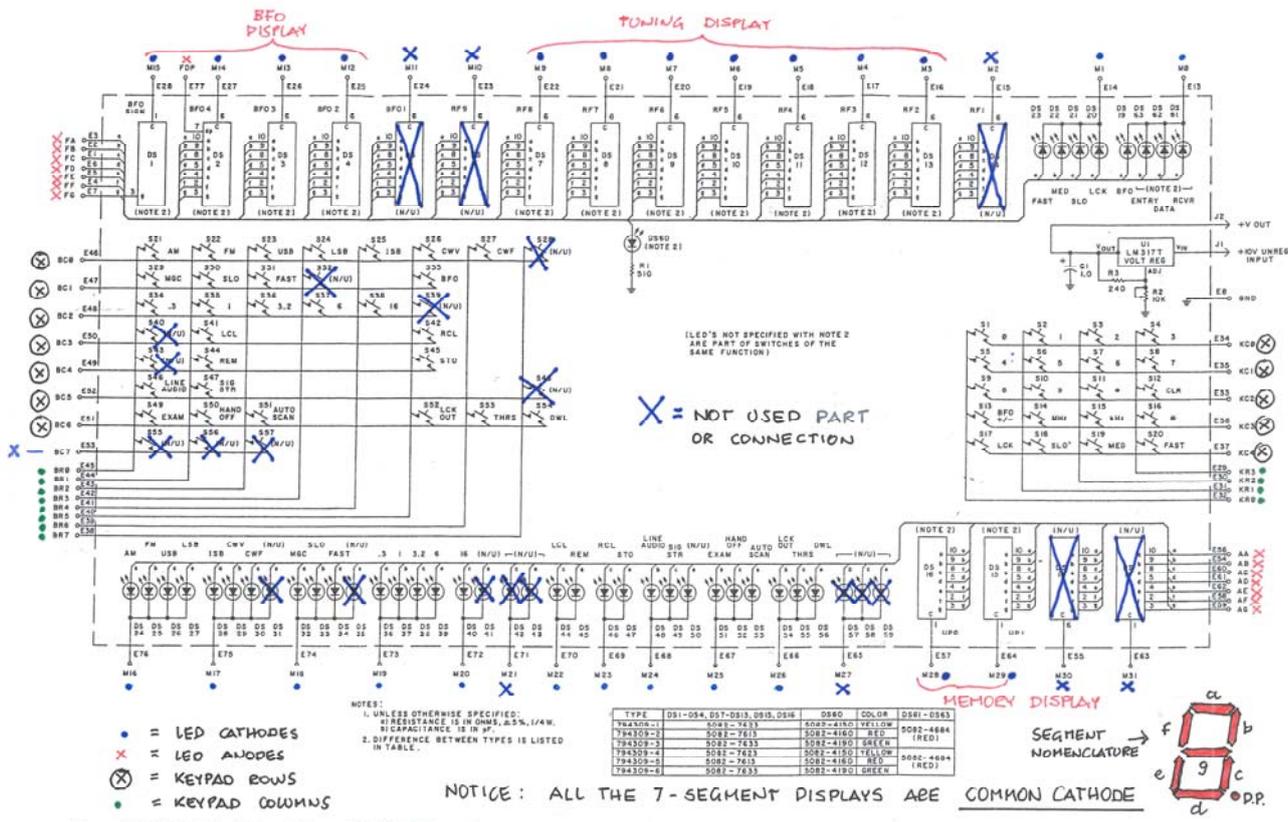


Figure 66: The MFP Front Panel Layout with key identification.



Type 794309-1-2-3 Front Panel Switch Board (MFP-A1A2), Schematic Diagram 570287

Figure 67: MFP-A1A2 Front Panel Switch Board Layout schematic diagram with some clarifications.

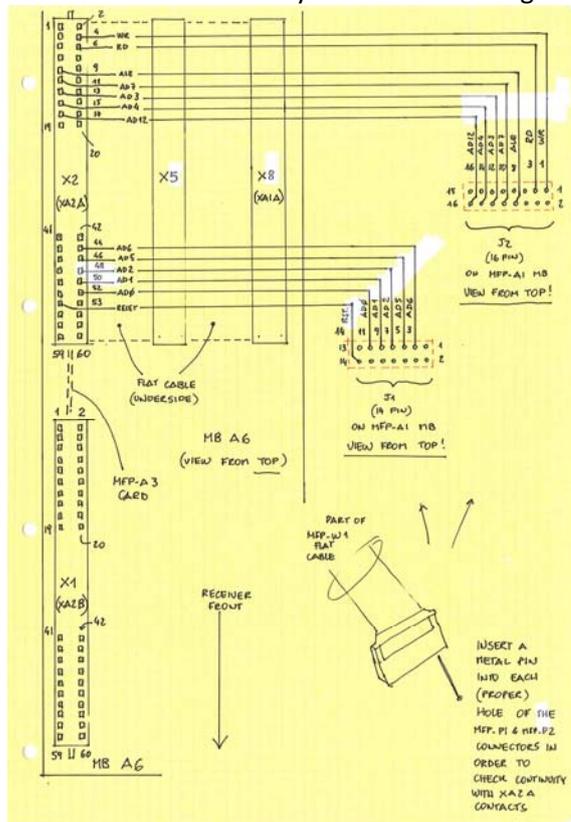


Figure 68: A6 MB sockets and paths to J1 and J2 on the MFP-W1 ribbon cable.



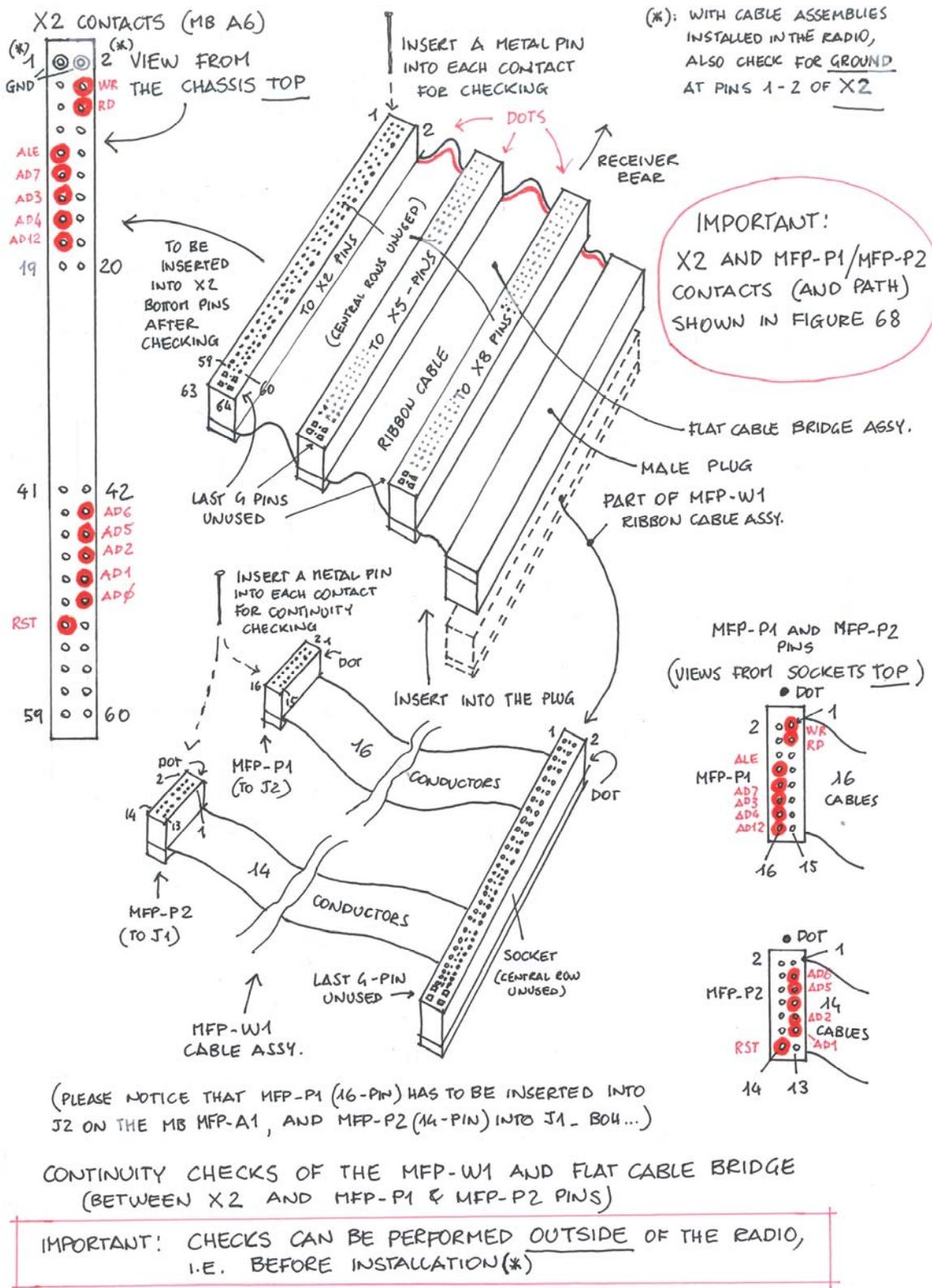


Figure 71: Quick check of the MFP-W1 and ribbon cable bridge assemblies; both must be connected together. This test can be performed outside of the receiver, before installation.

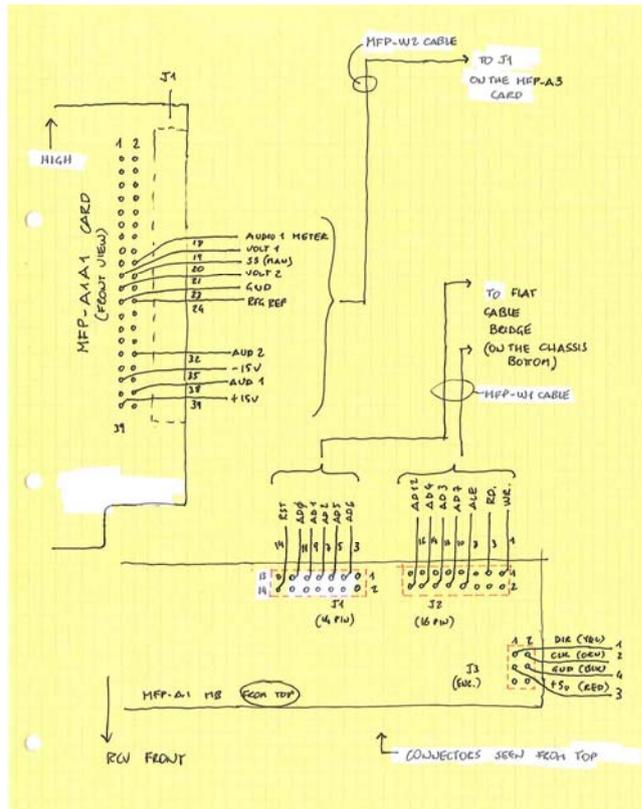
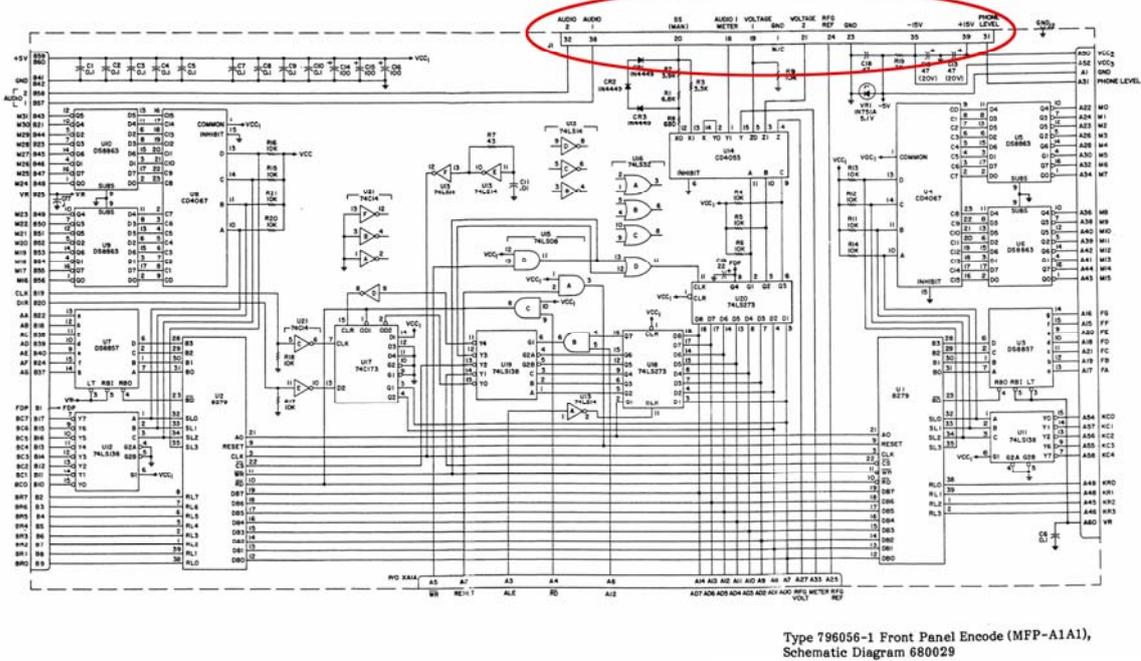


Figure 72: Details of MFP-A1 Front Panel Switch/Encode board J1 and J2 contacts and of the MFP-A1A1 Front Panel Encode card J1 contacts going to the MFP-A3-794308-X IF Interface card via the MFP-W2 ribbon cable.



Type 796056-1 Front Panel Encode (MFP-A1A1), Schematic Diagram 680029

Figure 73: MFP-A1A1 Front Panel Encode card schematic and details of the J1 socket contacts (only 10 used in the 40-pole MFP-W2 ribbon that goes to J1 on the MFP-A3-794308-X IF Interface card).

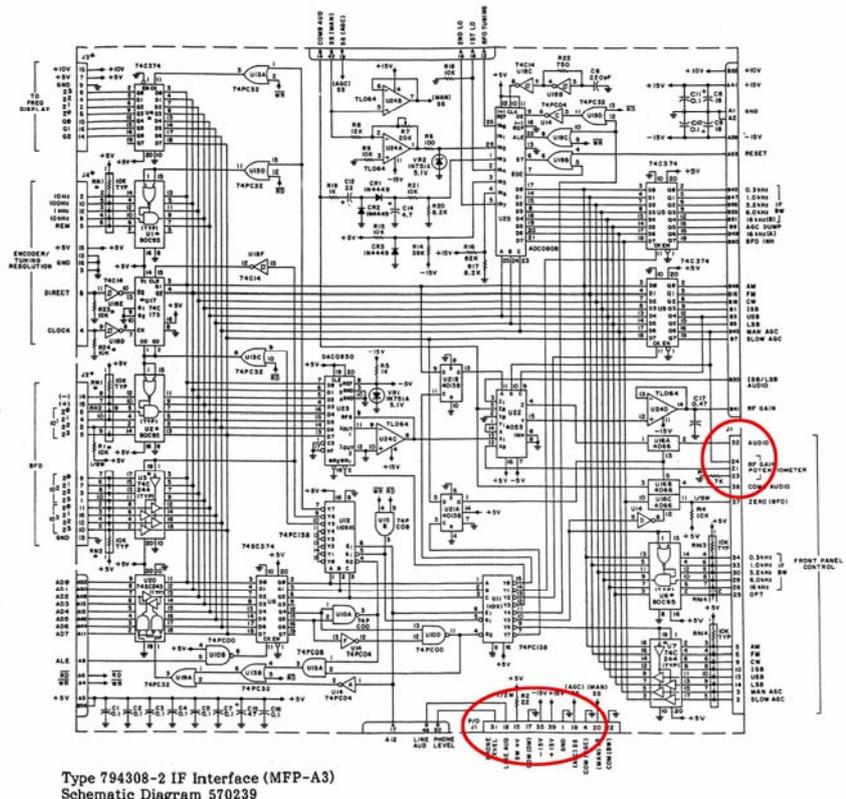


Figure 74: MFP-A3-794308-X *IF Interface* card schematic and details of the J1 socket contacts (only 10 used in the 40-pole MFP-W2 ribbon that goes to J1 on the MFP-A1A1 *Front Panel Encode* card).

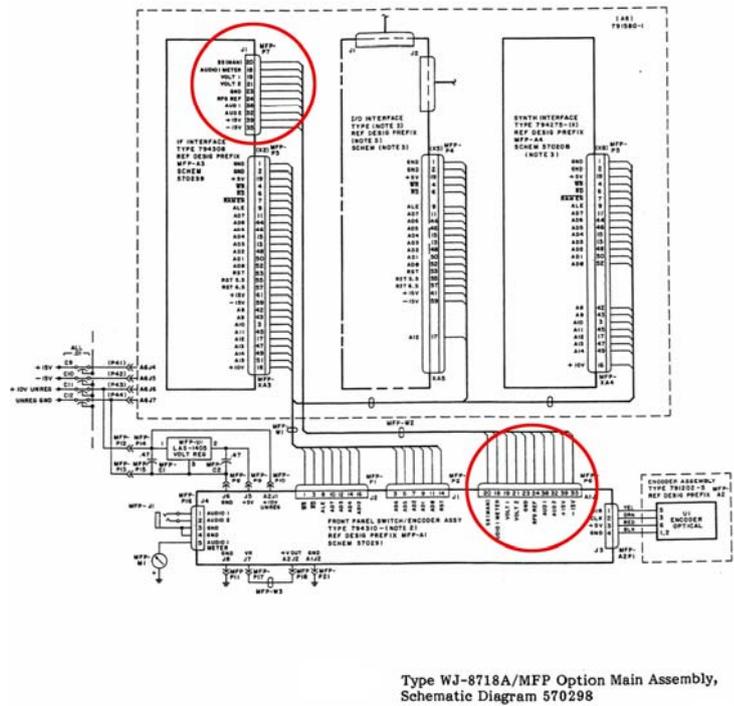
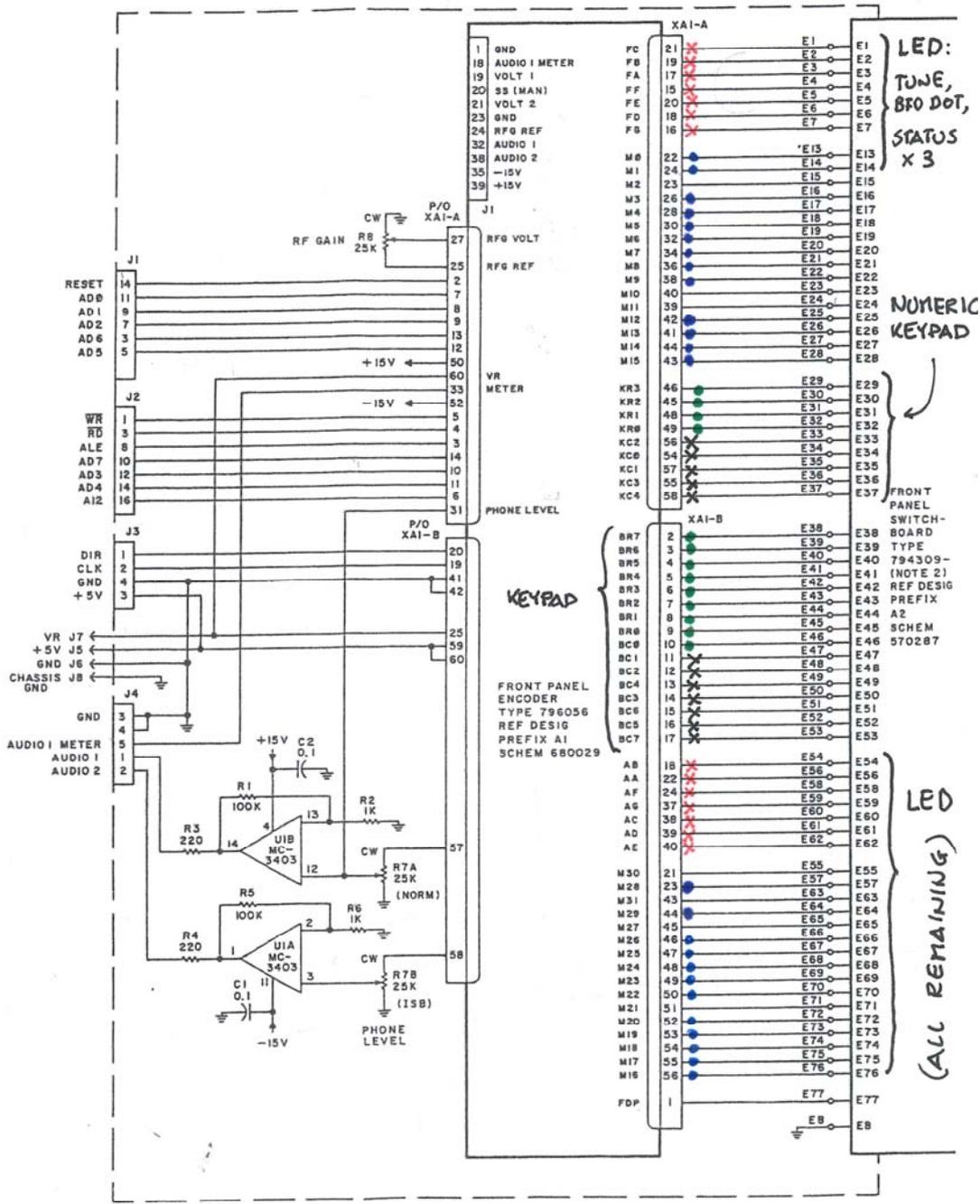


Figure 75: MFP-A3 794308-X *IF Interface* card J1 socket details and paths from J1 on the MFP-A1A1 *Front Panel Encode* card via the MFP-W2 cable (40-pole ribbon).



Type 794310-1-2-3 Front Panel Interconnect (MFP-A1), Schematic Diagram 570291

Figure 76: MFP-A1 794310-X Front Panel Interconnect motherboard schematic and details of the connections to the MFP-A1A1 796056-1 Front Panel Encode card.

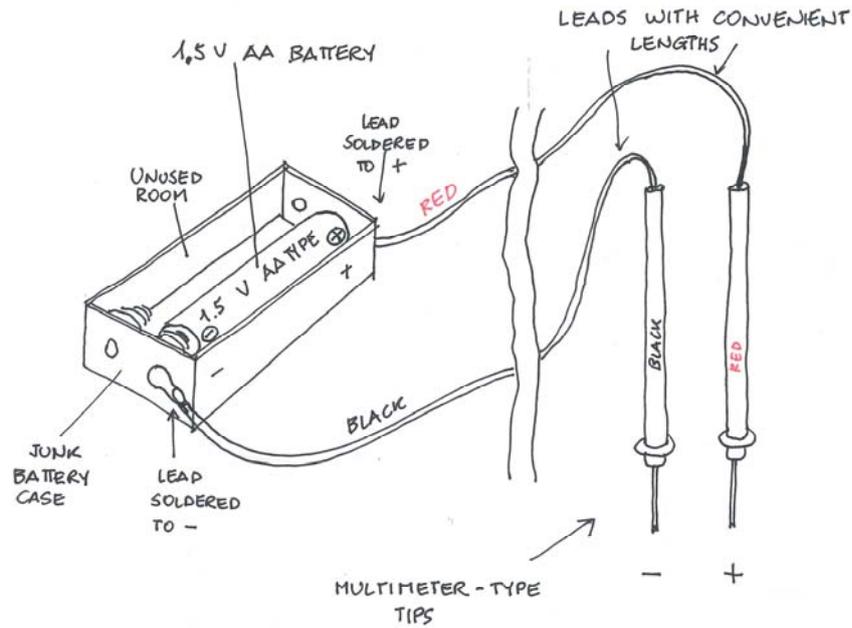


Figure 77: A simple device can be built for checking LEDs & 7-segment displays on the receiver front panel.

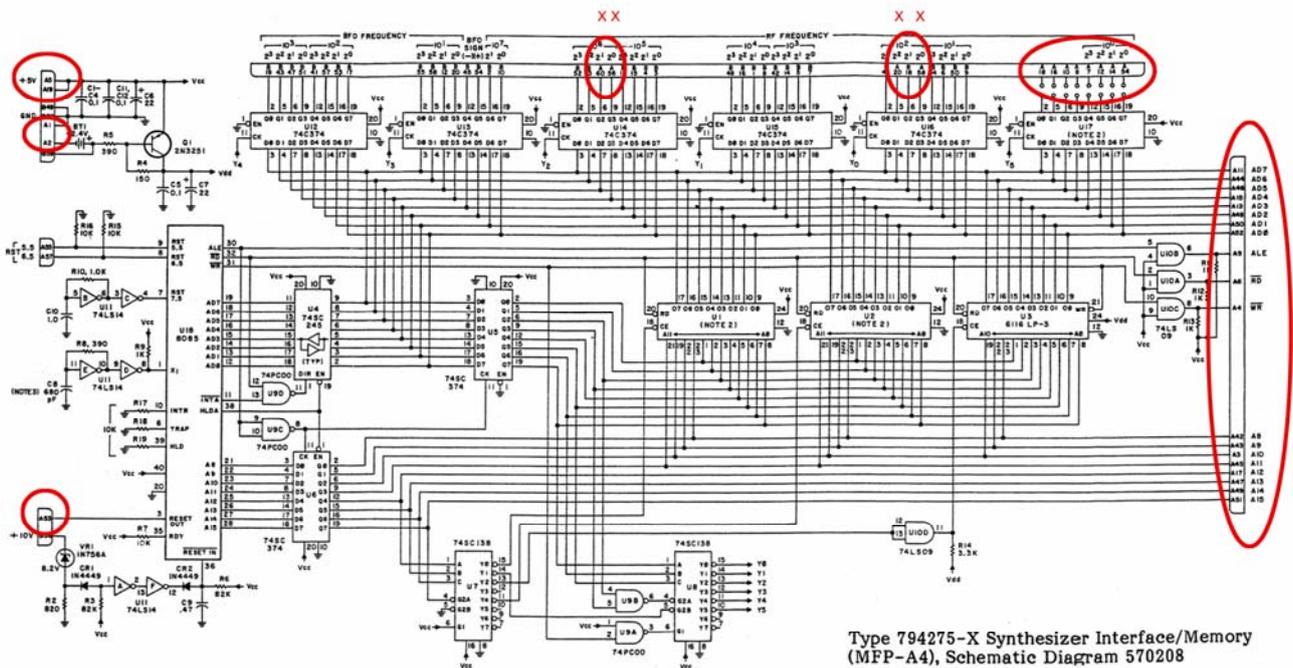


Figure 78: MFP-A4 794275-X Synthesizer Interface card connection details to the XA1A (X8) socket on the A6 motherboard.

END OF STEP 2 FIGURES