

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. 3, March 2019)

by Paolo Viappiani, La Spezia, Italy, 2019

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 mainboard. 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 mainboard.

- Alternatively to wire-wrapping, the Mag wires may be soldered also to the involved socket pins, provided they are carefully soldered 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 mainboards, 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.

7. Check that the pins 59 and 60 of the XA1 and XA2 sockets on the A4 IF Motherboard (look at Figure 6 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.
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 is no longer possible to use the AGC Card A4A6 type number 78112; that card has to be replaced with the AGC Card MFP-A5 type number 796175.

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). 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.** Apply power to the receiver and check that everything works OK as before.

- 11.** 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.
- 12.** 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.

13. Apply power to the receiver and check that everything works OK as before modifications;
14. 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”. The picture in Figure 20 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 21 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, 15, 16 and 17. Please also notice that, due to dimensional constraints, the overall layout shown in Figure 14 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. (The correct final cable layout is shown in Figure 15).

Please also notice that the last four pins placed at the extreme right of the male plug have to be removed first (as per the front view shown in Fig. 16); then, the male plug has to be oriented so that the two side-keys stay at its bottom (when viewed from the front as in Figure 16).

The 64-pole flat 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") and respecting the pin numbers that appear in the back of the female sockets, look at Figure 17.

- 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.

- 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 22, 23 and 24.

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 fluoro-carbon or hydrocarbon solvent.

In place of the copper strip a short length of a coaxial cable's 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, please refer to Figures 22 to 24 for further details.

END OF STEP 1 INSTRUCTIONS

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FOR INSTALLING THE MFP OPTION
IN A WJ-8716, WJ-8718, WJ-8718A or WJ-8718-9 HF RECEIVER
(STEP 1 of 2 - Rev. 3, March 2019)

by Paolo Viappiani, La Spezia, Italy, 2019

FIGURES (01 to 24)

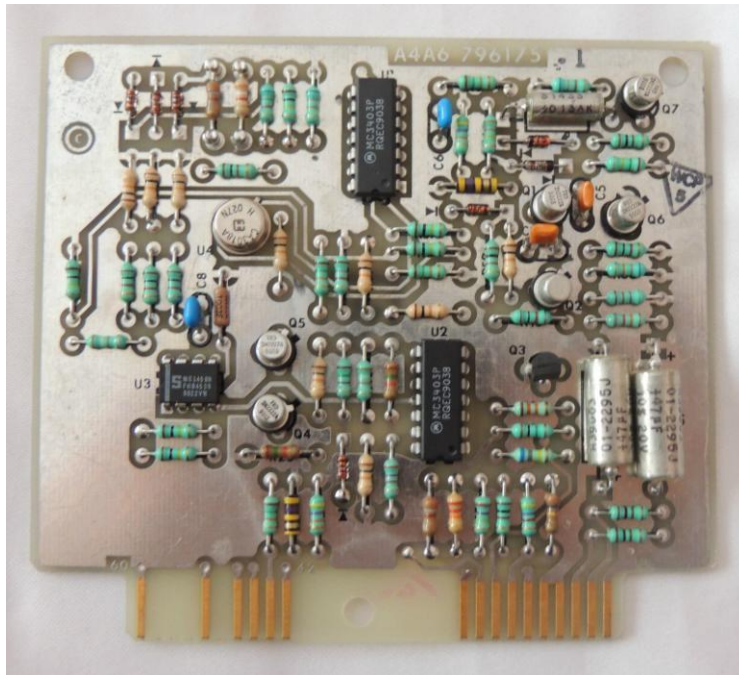
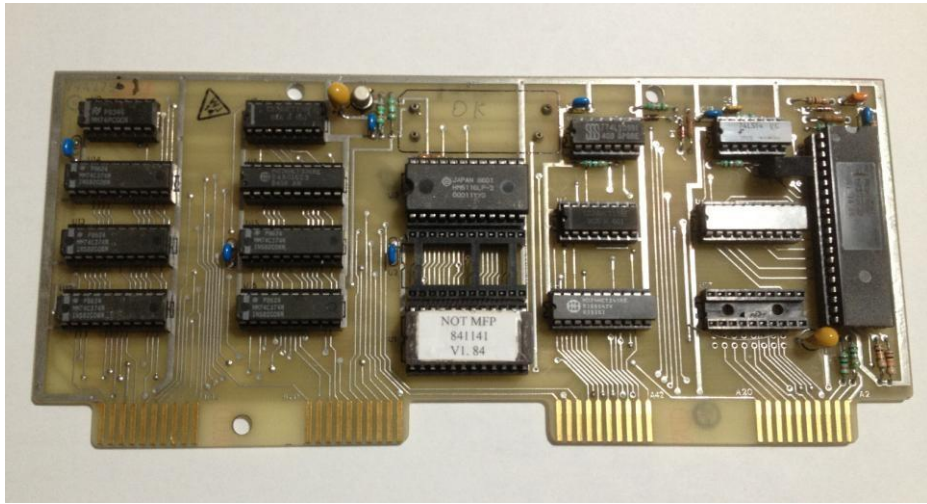


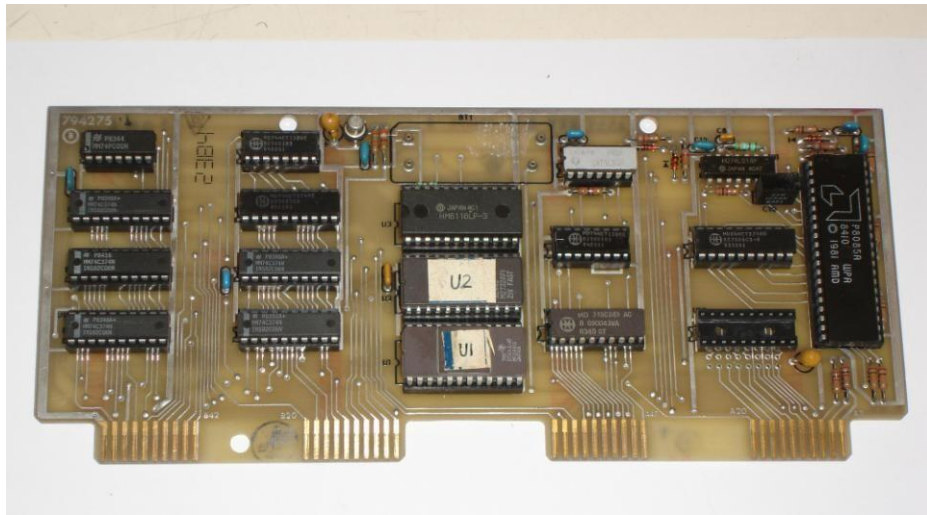
Figure 01: The A4A6 796175-1 AGC "Dump" card.



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.

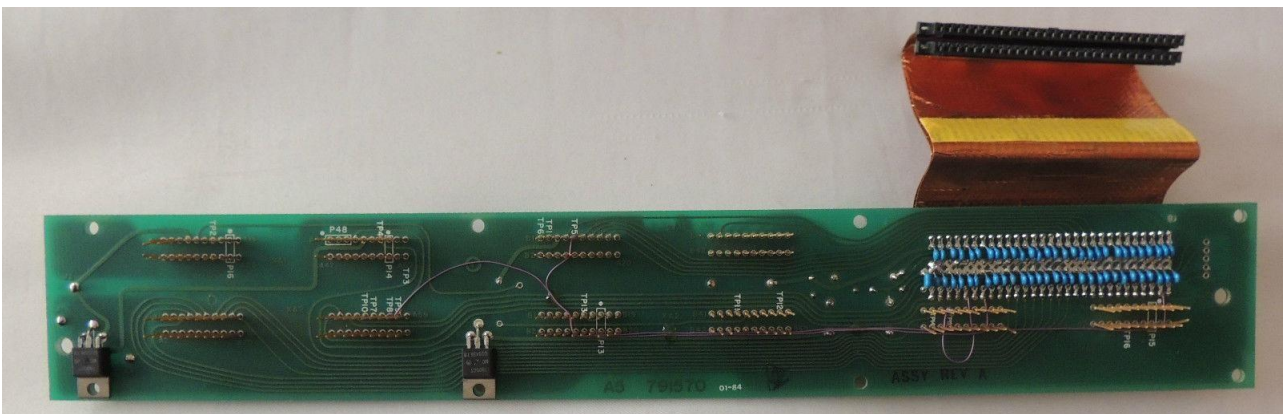
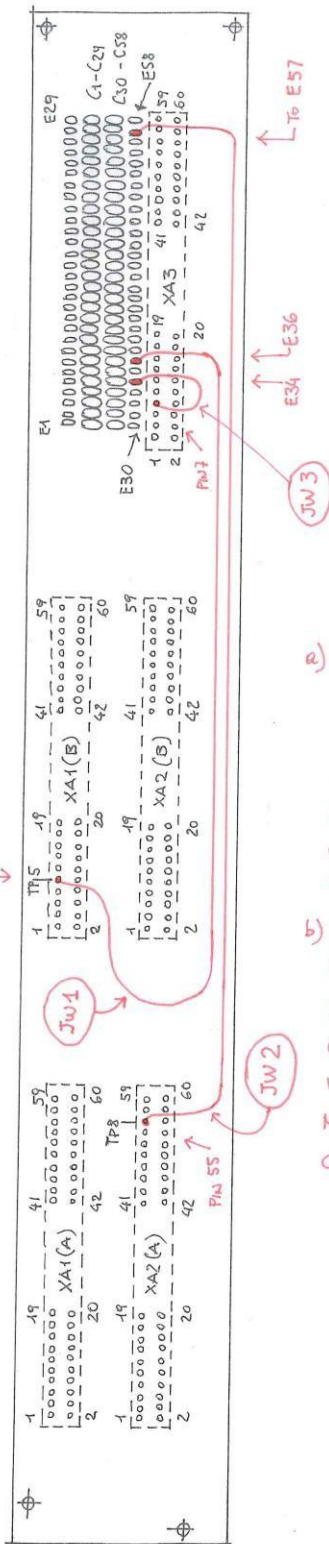


Figure 04: Additional wiring JW1, JW2 and JW3 installed in the A5 Synth motherboard.

A5 - SYNTHESIZER MIB - (BOTTOM VIEW)

RECEIVER FRONT →



NOTICE

- a) INSTALL THE THREE JUMPERS (JW1, JW2 AND JW3) BY WIRE-WRAPPING OR SOLDERING AT SOCKET END AND BY SOLDERING AT E30-E58 END. USE MAG WIRE AND TAKE A GREAT CARE WHEN SOLDERING.
- b) IMPORTANT: THE SHOWN UPGRADES DO NOT AFFECT IN ANY WAY THE PERFORMANCES OF A WJ-8718 (OR WJ-8716, OR WJ-8718A OR WJ-8718-9) AND MAY BE PERFORMED IN ANY CASE.

CONVERSION TO /MFP
[STEP 01]

Figure 05: Overall diagram of JW1, JW2 and JW3 in the A5 Synth. motherboard.

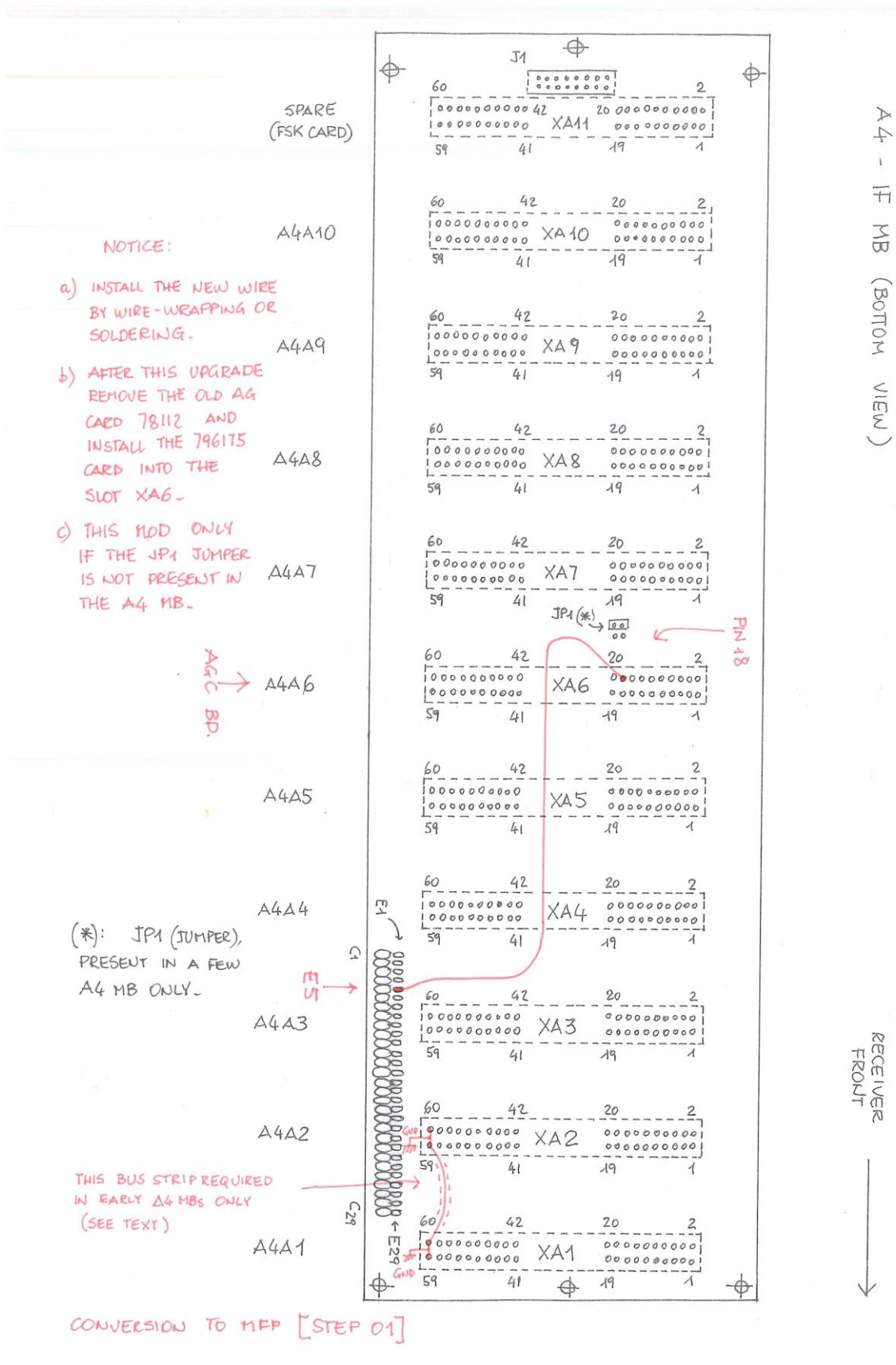
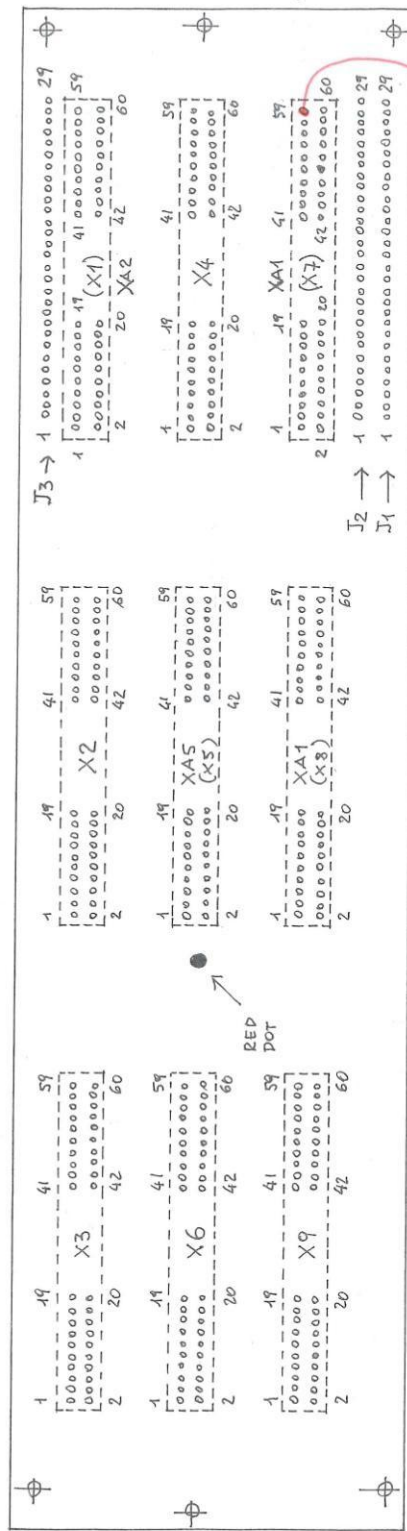


Figure 06: Upgrading the A4 IF motherboard.

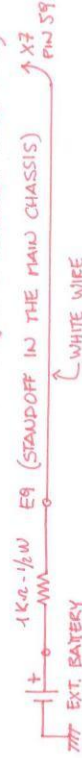
RECEIVER FRONT →

A6 - I/O MB - (BOTTOM VIEW)



TO E9
ON MAIN CHASSIS
(IF EXISTS)

OPTIONAL CONNECTION TO EXTERNAL BATTERY (IN THE RECEIVER REAR PNL.)



NOTICE
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.

CONVERSION TO /MPF
[STEP 01]

Figure 07: Upgrading the A6 I/O motherboard.

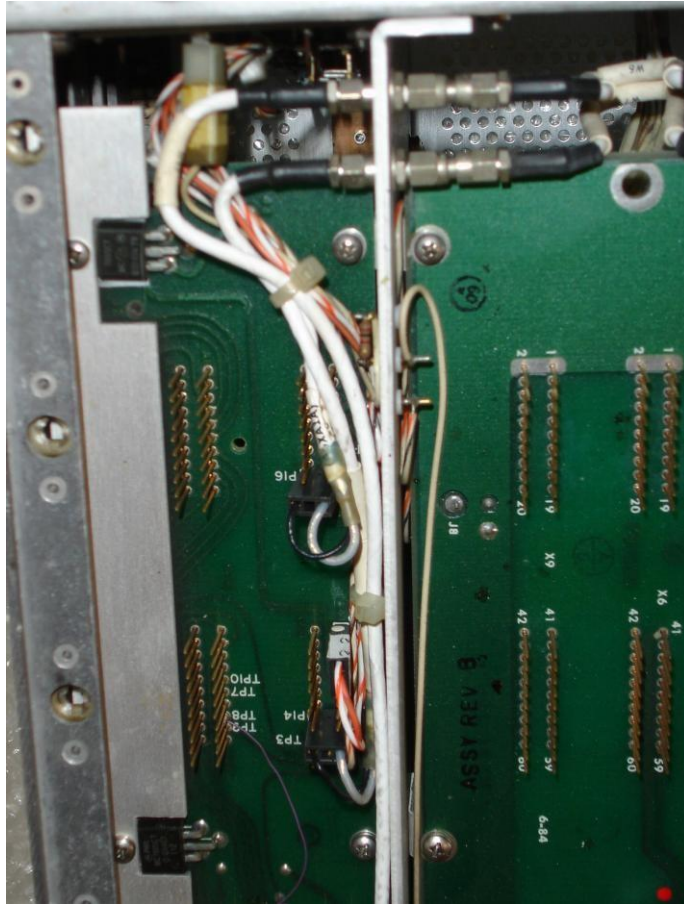


Figure 08: Original Factory-installed standoffs for the 1-kOhm resistor and external battery wiring in the chassis sidewall between A5 and A6 motherboards.

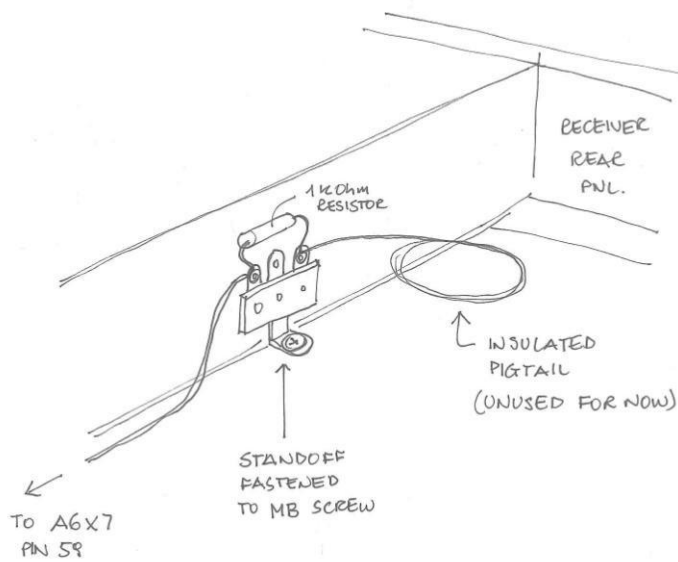


Figure 09: A 3-terminal standoff can be fastened to one of the A6 fixing screws.

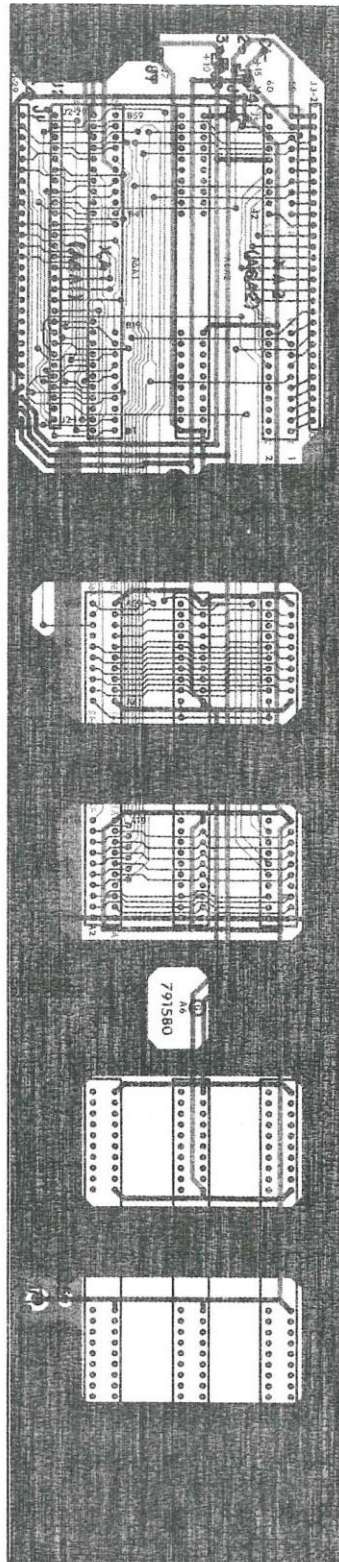


Figure 10: Tracks in the later versions of the A6 motherboard PCB (top side)

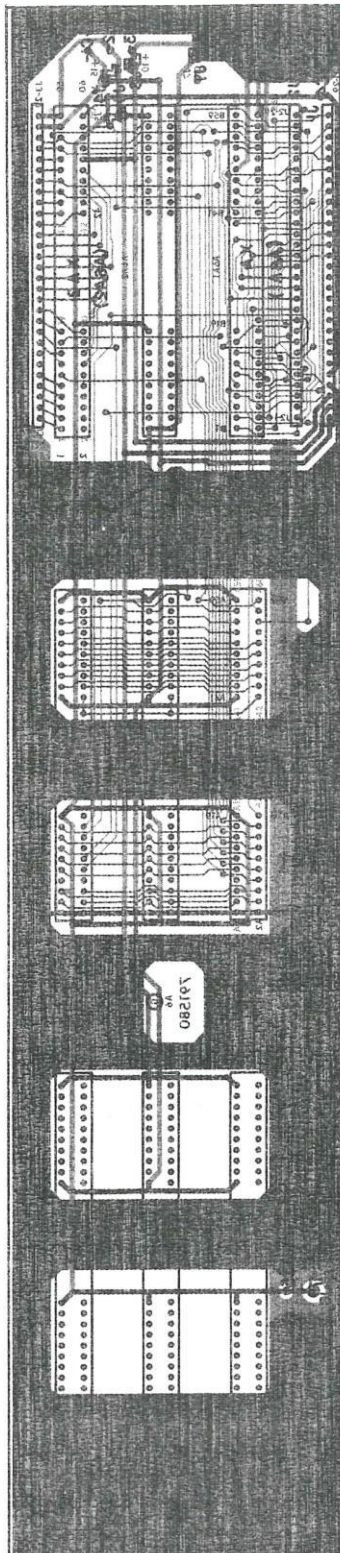


Figure 11: Tracks in the later versions of the A6 motherboard PCB (bottom side)

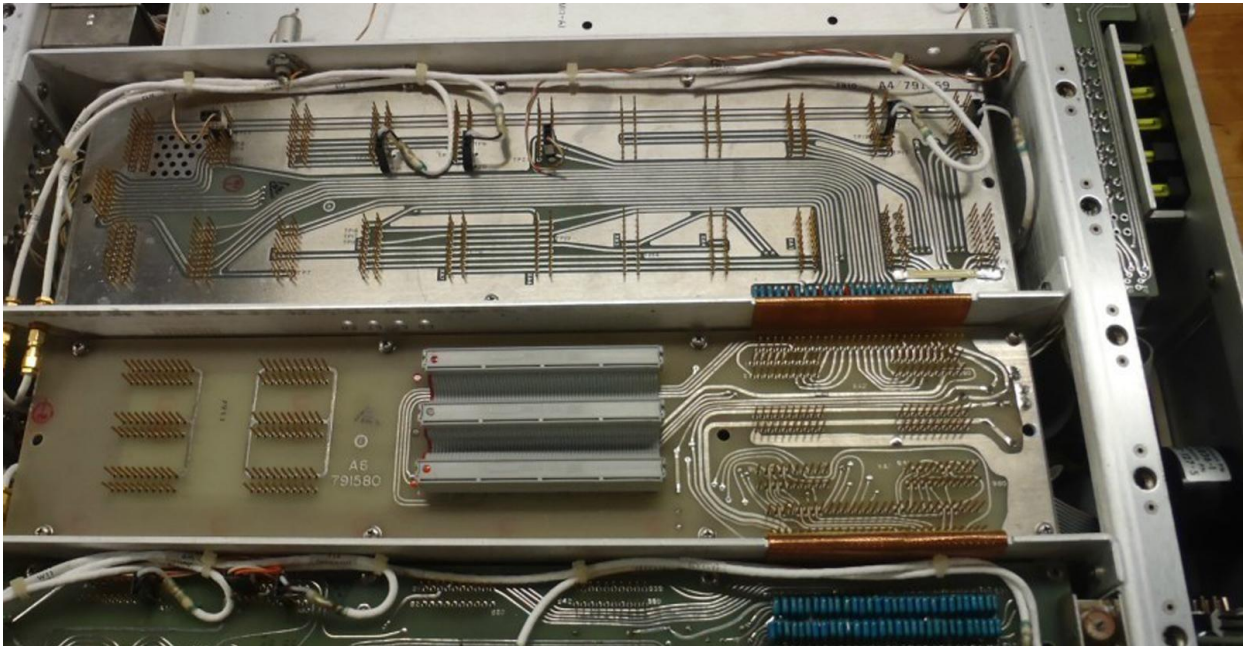


Figure 12: The X2,X5 and X8 flat-cable jumpers (Factory-installed) in a non-MFP environment.

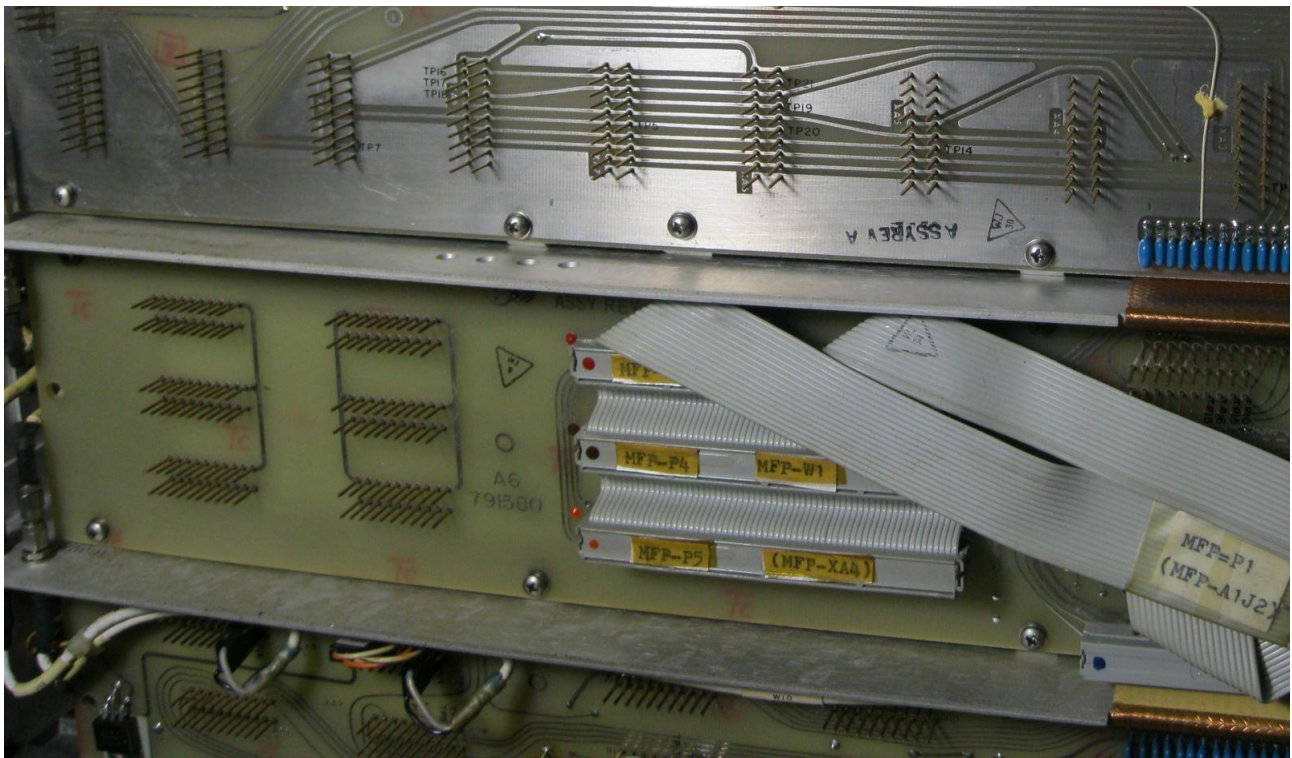


Figure 13: The X2,X5 and X8 flat-cable jumpers (Factory- installed) in the MFP environment.

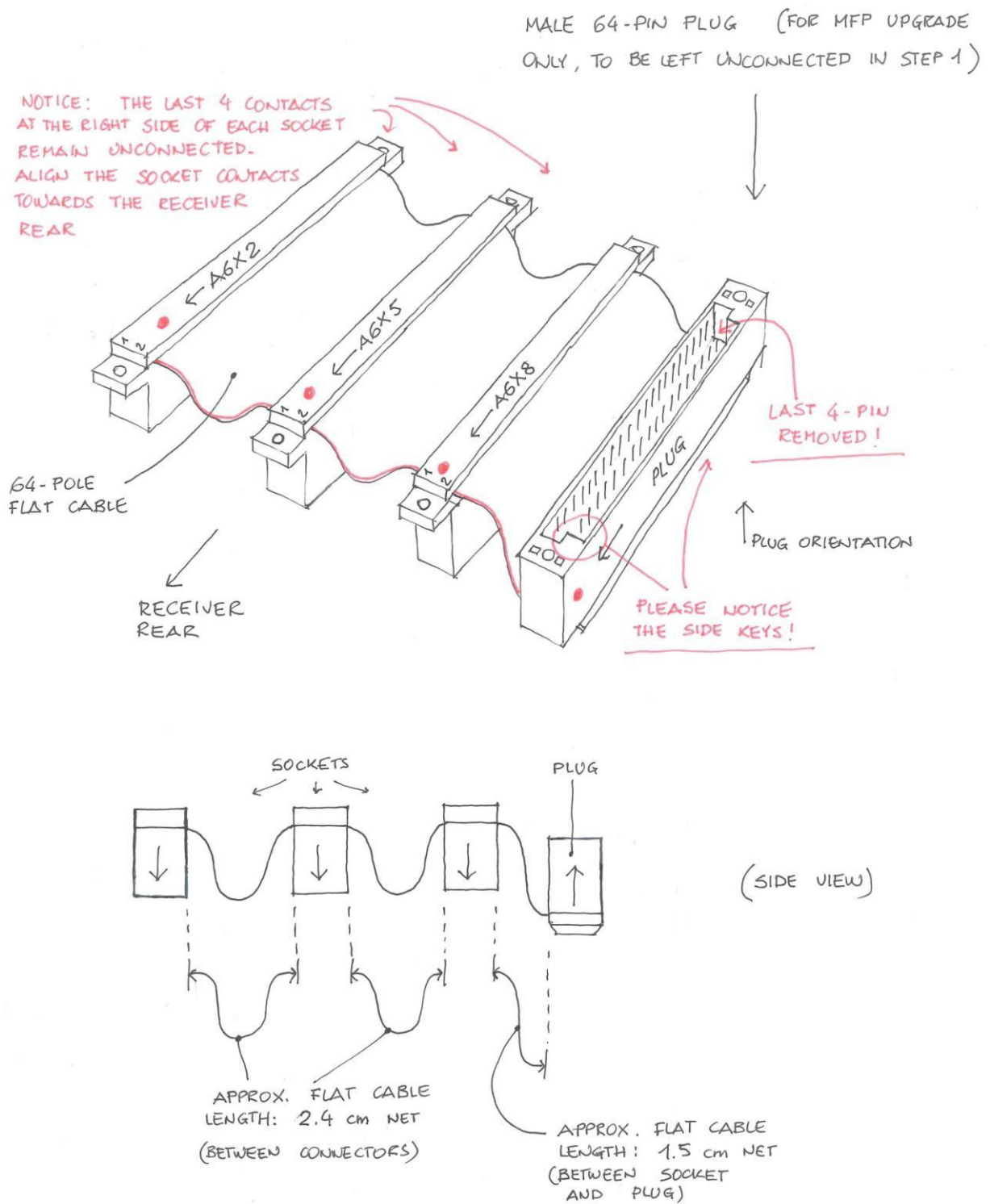


Figure 14: Custom building of the A6 X2-X5-X8 flat cable jumpers (plug-terminated for MFP upgrade)



Figure 15: The correct final layout of the flat-cable jumpers with the male plug termination.

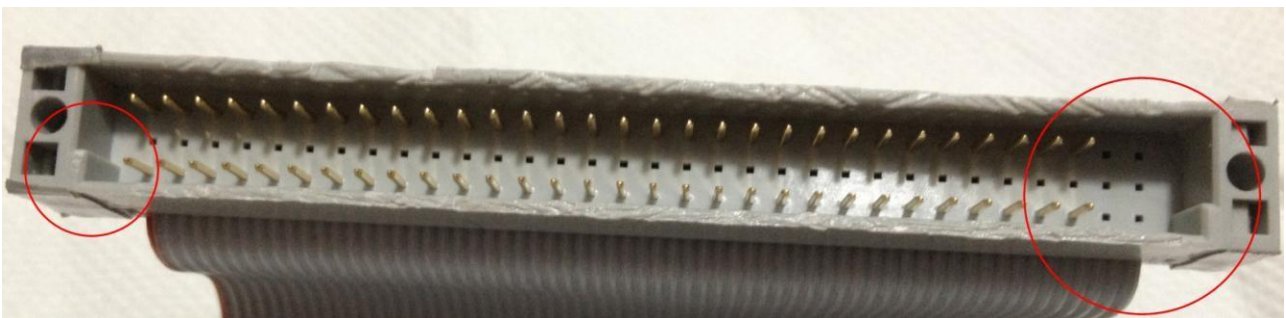
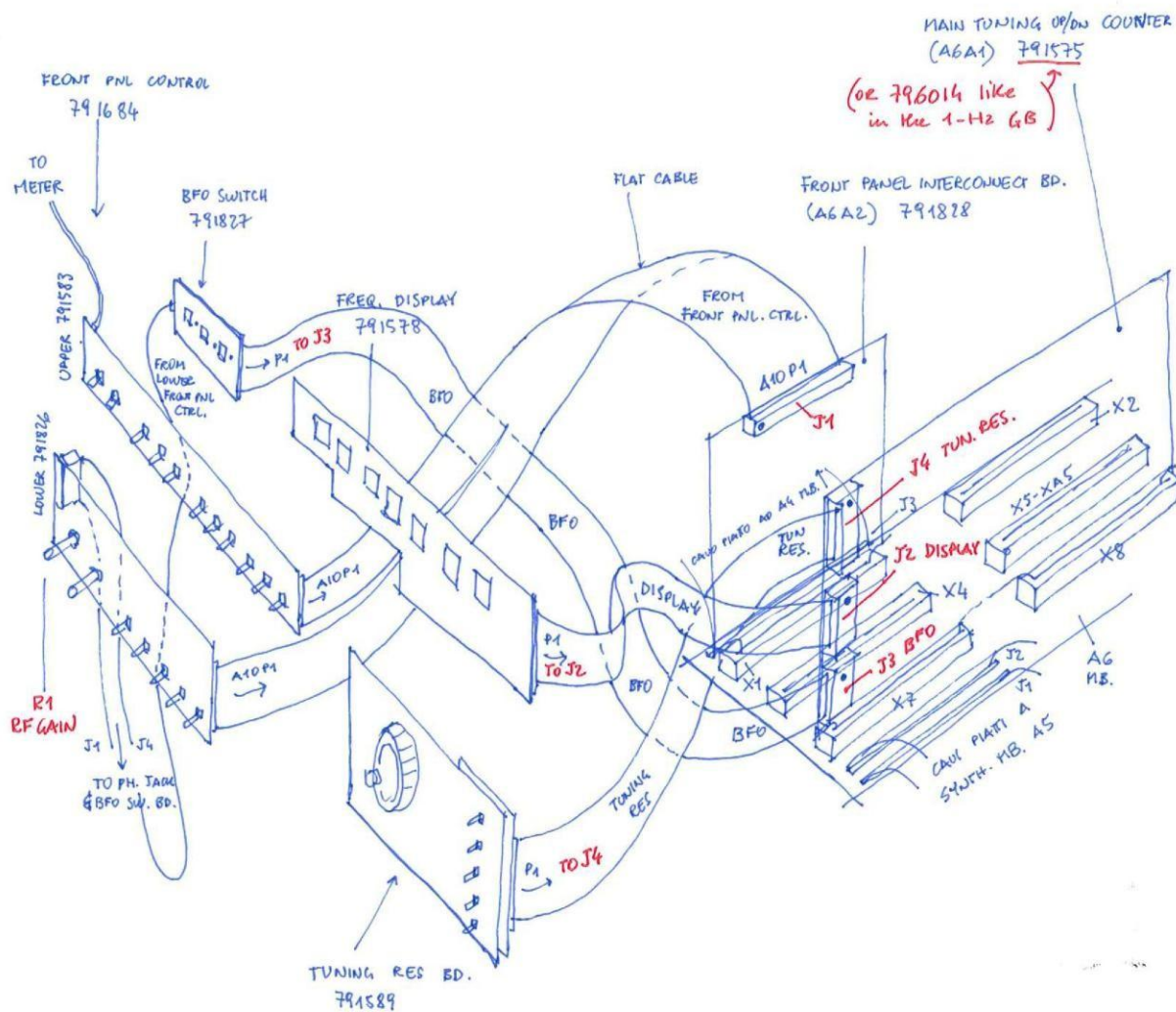


Figure 16: The male plug with the last 4 pins removed (front right). Please notice the two “keys” at both sides of the connector, they must be placed at its bottom for a correct pin and row orientation.

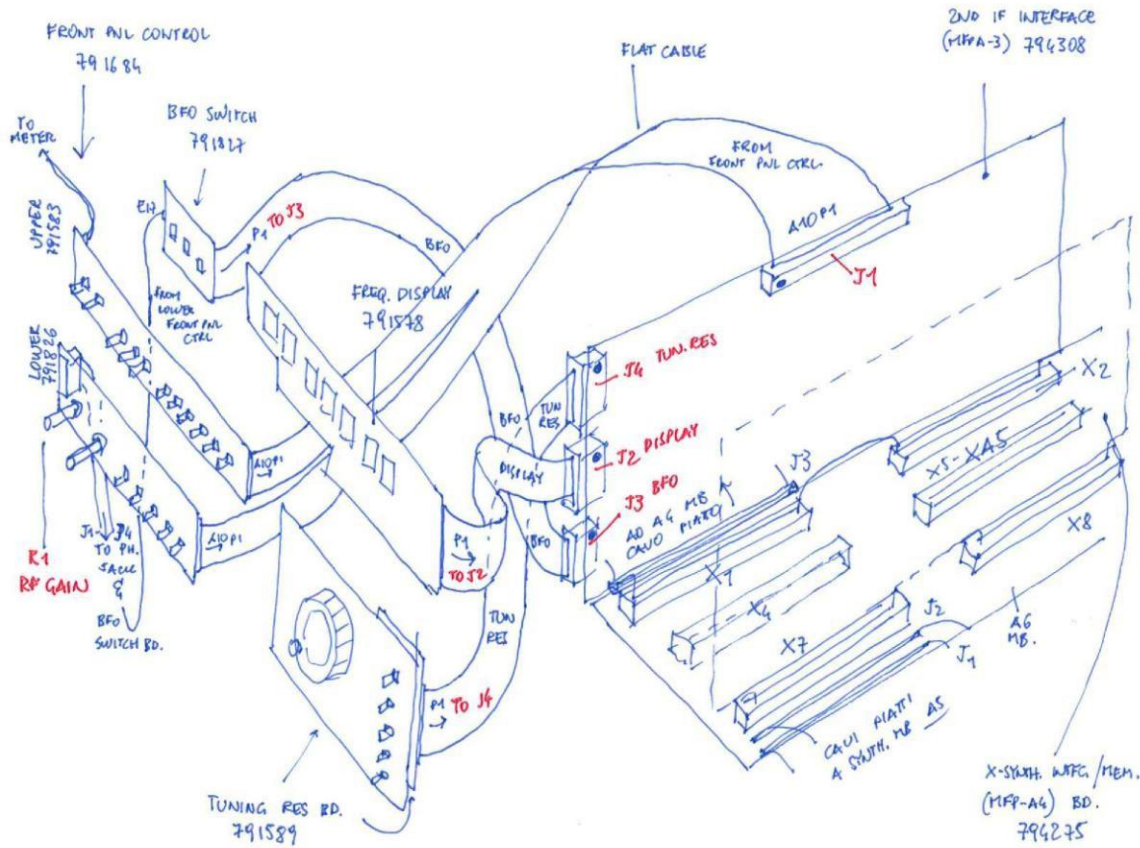


Figure 17: The pin numbers appear in the rear of the female sockets.



WJ 8718A NORM. VERSION

Figure 18: A rough sketch of the "plain" receiver configuration (top side only).



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

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

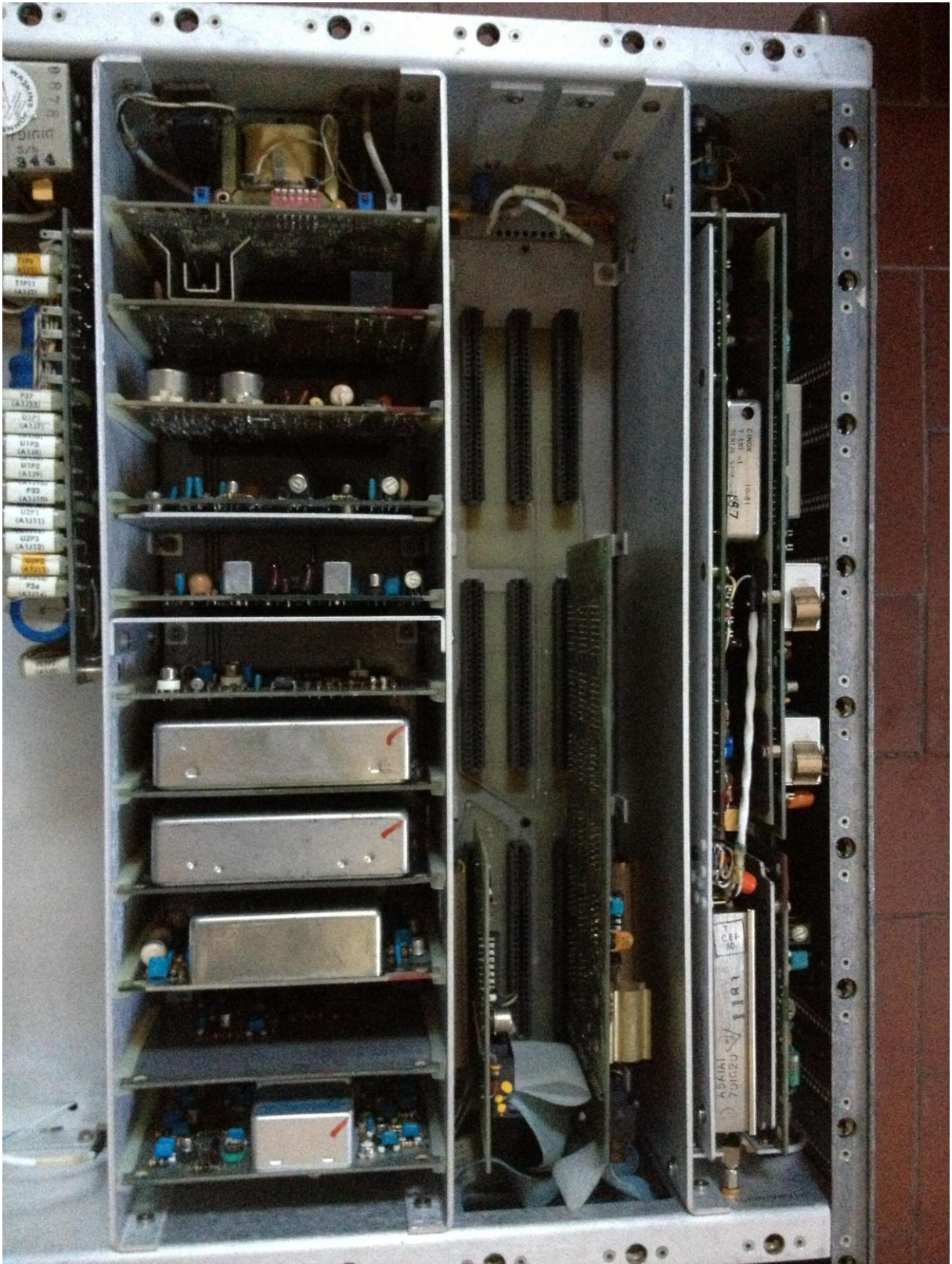


Figure 20: A basic receiver still provided with a *Front Panel Interconnect* card (A6A2, type number 791828) and a *Manual Tuning Up/Down Counter* card (A6A1, type number 791575-X)

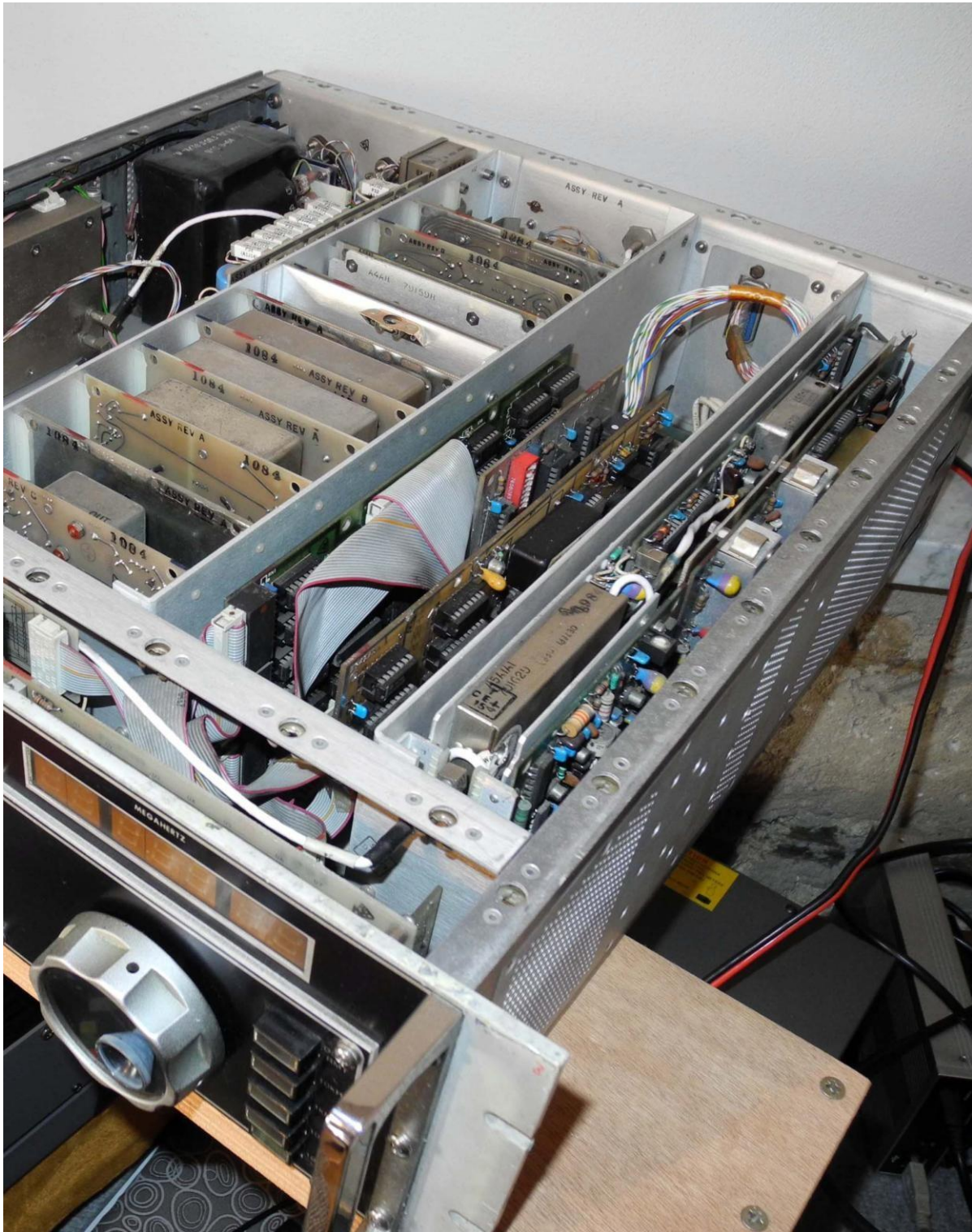


Figure 21: An upgraded (not-MFP) receiver provided with an *IF Interface* card (MFP-A3, type number 794308-1) and a *Synthesizer Interface/Memory* card (MFP-A4, type number 794275-X).

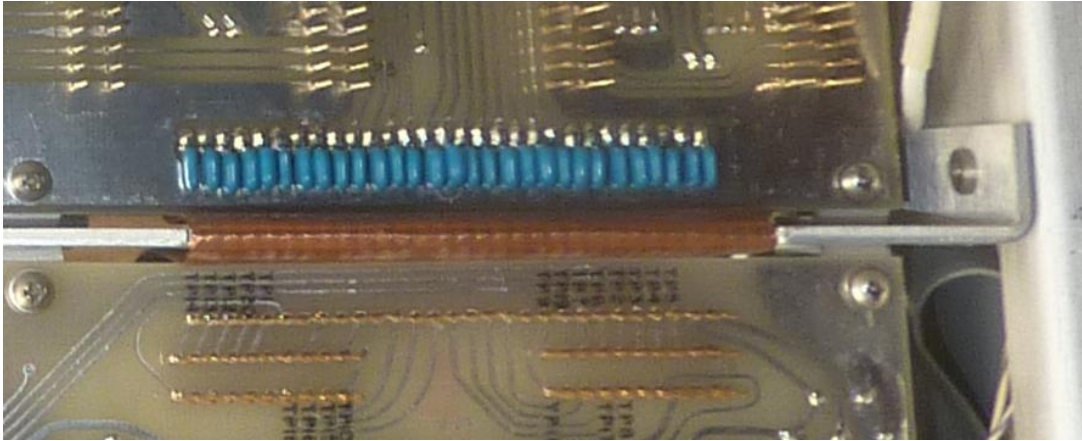


Figure 22: This A4 MB has the 59-60 terminals of both the XA1 and XA2 sockets already connected to the PCB ground track and it does not require any additional GND strip.

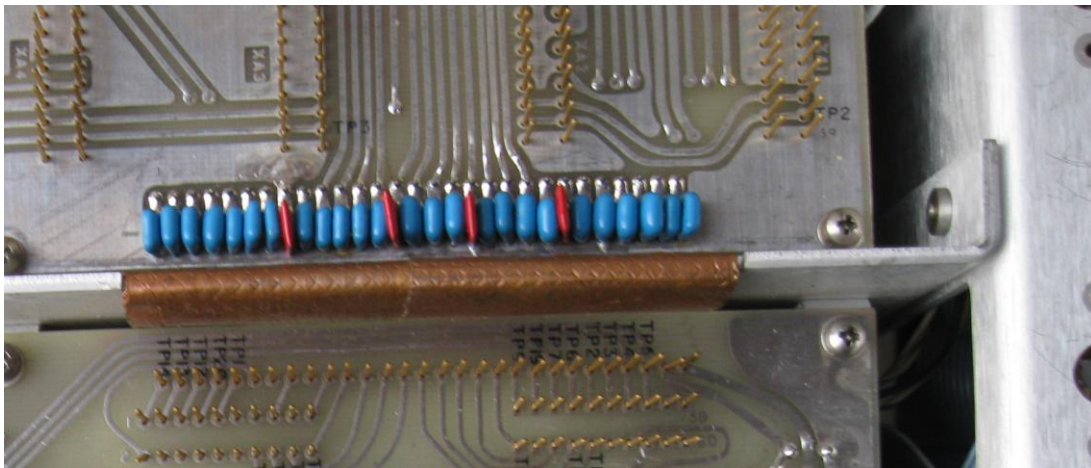


Figure 23: This A4 MB shows the 59-60 terminals of the XA2 socket not connected to the PCB ground track yet, thus it requires the additional GND strip.

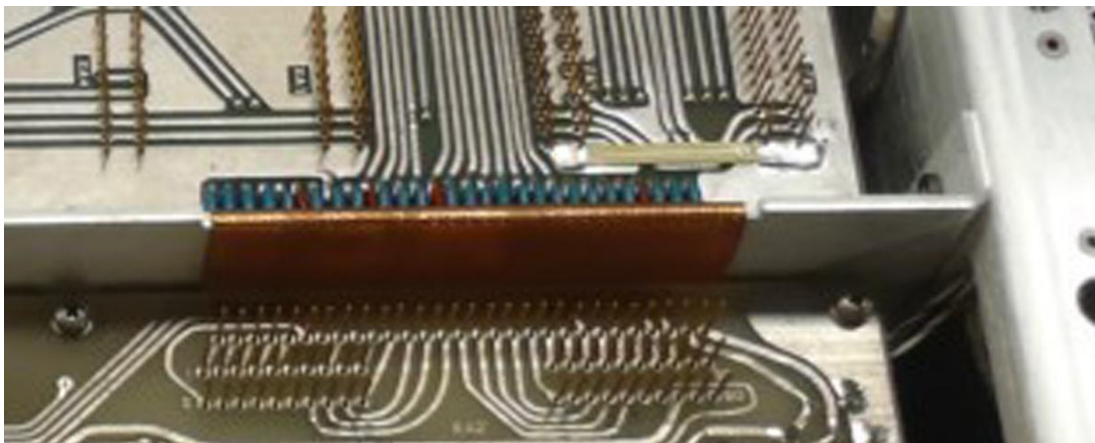


Figure 23: This A4 MB has the the additional GND strip already installed.

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. 3, March 2019)

by Paolo Viappiani, La Spezia, Italy, 2019

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 25 and 26, see also NOTES);
- If needed, some 2.8 mm Faston male and female connectors (Figure 24);
- 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 28, 29 and 30);
- A MFP-W1 ribbon cable (64-pole socket at one end, 14 and 16 sockets at the other end, Figure 31);
- A MFP-W2 (40-pole ribbon cable terminated with sockets at both ends, Figure 33);
- If needed, a MFP-W3 (single jumper wire terminated with 2.8 mm sockets at both ends, look at Figure 47; 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 34). 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 proper U1 and U2 EPROM version in the MFP-A4 *Synthesizer Interface/Memory* 794275-X Card (Figures 35, 36 and 37);
- A FL2-32.205 MHz Xtal Filter Assembly (Figure 38) 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 50). 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 31) 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 traces, in this case ensure that pin 1 of MFP-A5 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, look at Figure 32).
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 39 and 40); 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 Figures 44 and 45). 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 29 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 41) 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.

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 42 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 Figure 45 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 42 and 48 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.
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.
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 28, 29 and 30) 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 48 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 29, 30 and 48 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 49 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 needed (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 35 and 36 is represented the 488M-3 *I/O Interface* 796075 card, while Figure 37 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 49 and 50. The IEEE-488 and RS-232 I/O connectors pin layout is shown in Figure 52, 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 front panel can be used eventually, provided that all other modifications are made in compliance with these instructions ("Step 1" and "Step 2"). No differences in receiver functions and/or performances will be found accordingly.

While the latest version of the MFP front panel is shown in Figure 25a, Figure 25b shows an early type, easily identified by the wider numeric keyboard near the Tuning knob and 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 rectangular multipole connectors at its end (shown in Figure 34) 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 proper 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.

Thus 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 website:

<https://bama.edebris.com/manuals/watjohn/wj8718> and contains also detailed circuit descriptions, maintenance instruction, parts list, layouts and schematics of the latest version MFP section of the radio; consequently it is a “must-have” for every owner of a MFP receiver of the WJ-8716/WJ-8718 family.

- 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 poles comb contacts at its base (look at Figures 28 and 29), it is advisable for all users to get also a pair of type 791884 (60-pole) extenders for ease of servicing. In Figure 54 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. In my experience I can affirm that in most cases the culprit is a defective MFP-A1A1 *Front Panel Encode 796056-1* card (one or more bad Tantalum capacitors or some faulty IC). 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).

END OF STEP 2 INSTRUCTIONS

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. 3, March 2019)

by Paolo Viappiani, La Spezia, Italy, 2019

FIGURES (25 to 54)



Figure 25: A "MFP" front panel of the later version.



Figure 26: A "MFP" front panel of the early version.



Figure 27: 2.8 mm. Faston male and female connectors can be eventually used for replacing missing wires.



Figure 28: The *Front Panel Encode* MFP-A1A1 Card 796056-1 (front view).

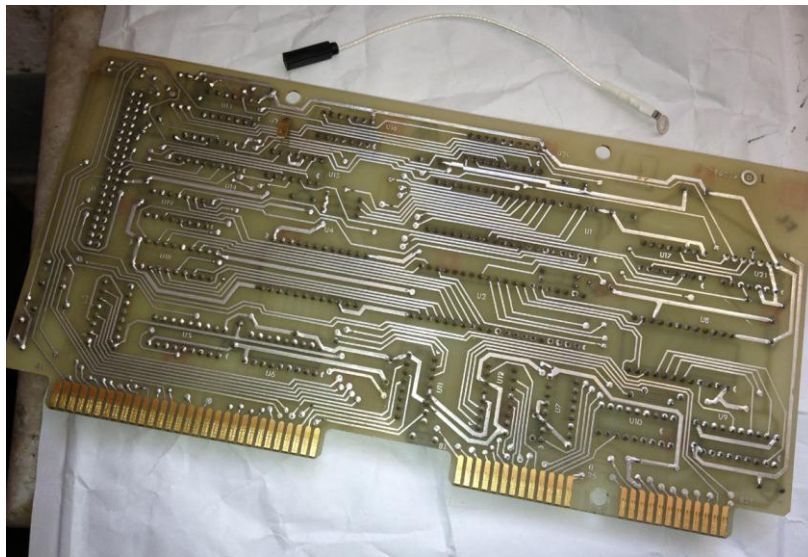


Figure 29: The *Front Panel Encode* MFP-A1A1 Card 796056-1 (rear view); in the picture is also shown the MFP-P21 ground cable.



Figure 30: Front Panel Encode MFP-A1A1 Card 796056-1 (rear detail of "J2").



Figure 31: The MFP-W1 ribbon cable, splitted into two sockets at one end.



Figure 32: The MFP-XA5 64-pole socket inserted into the floating plug of the home-built ribbon cable assembly.

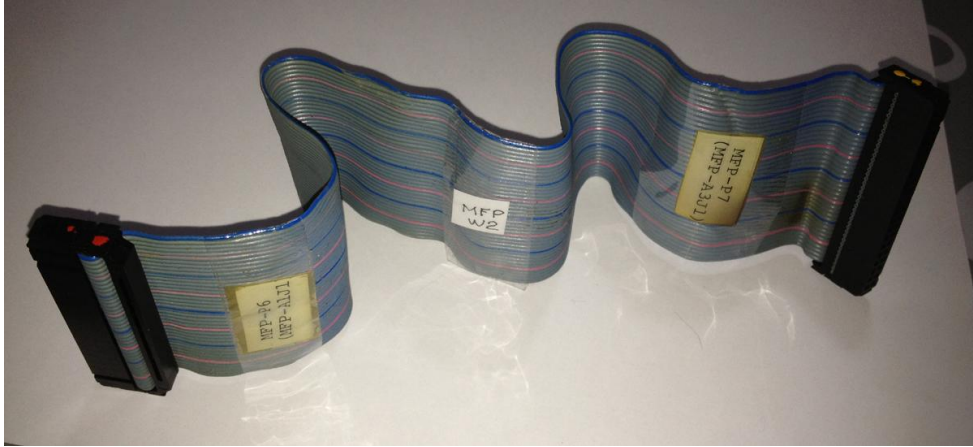


Figure 33: The MFP-W2 ribbon cable (red dot at one end, yellow dot at the other end).

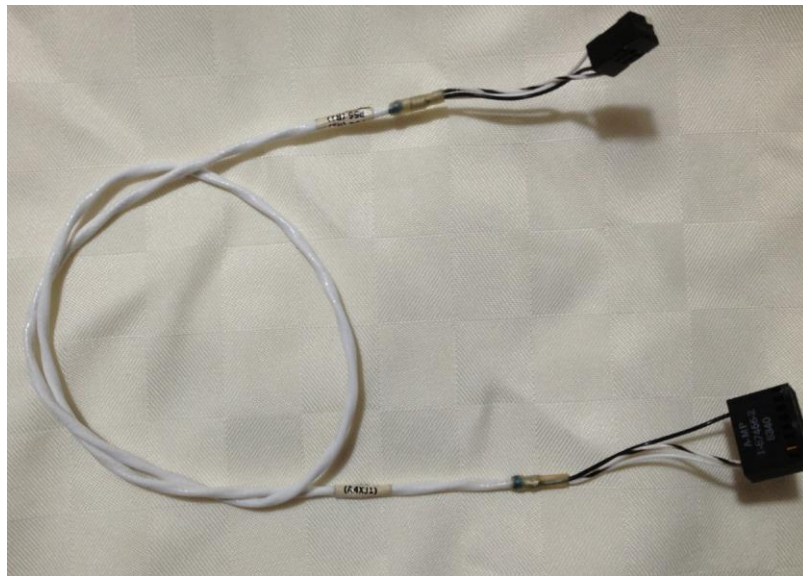


Figure 34: The Line Audio Level pot cable.

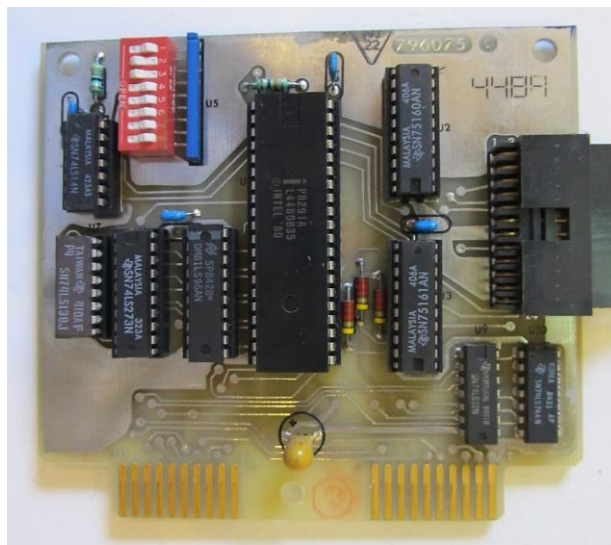


Figure 35: The optional 488M-A3 IEEE-488 I/O Interface Card 796075 (front view).

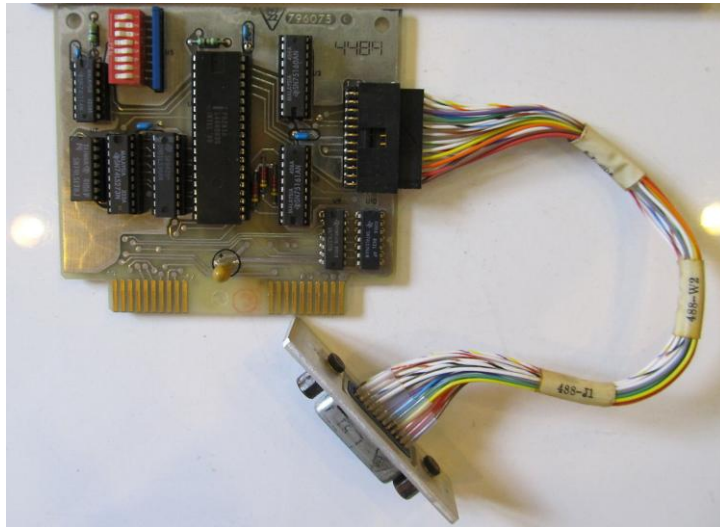


Figure 36: The 488M-A3 IEEE-488 I/O Interface Card 796075 (complete with its cable to rear panel).

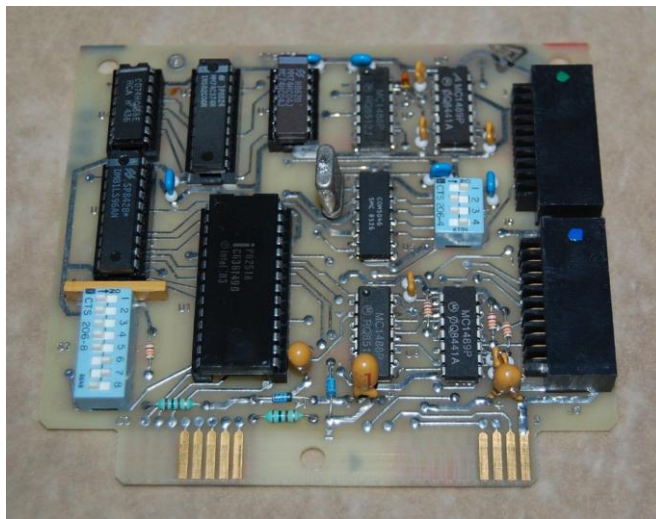


Figure 37: The optional 232M-A3 RS-232 I/O Interface Card 796037.



Figure 38: The new FL-2 (32.205 MHz Xtal Filter).

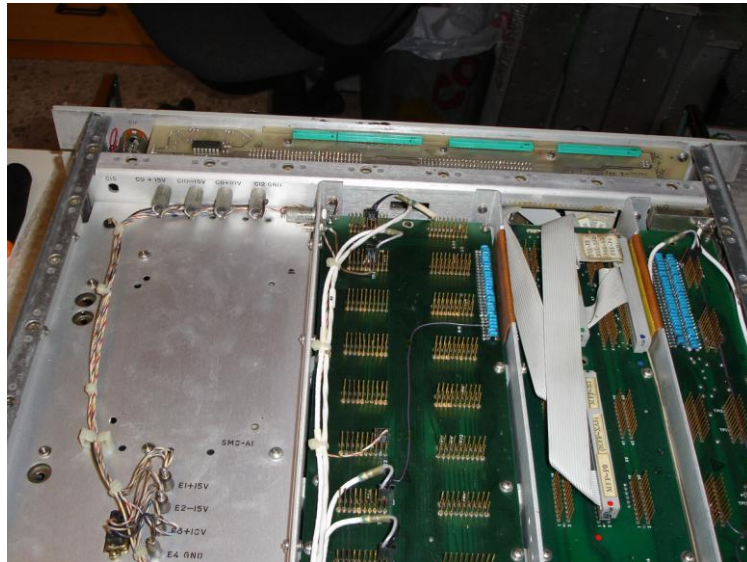


Figure 39: Locating C11 and C12 in the bottom side of the receiver mainframe.

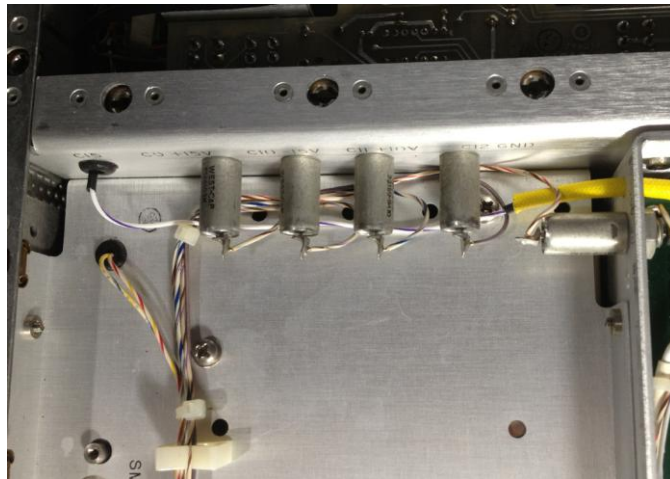


Figure 40: Locating C11 and C12 in the bottom side of the receiver mainframe (detail).

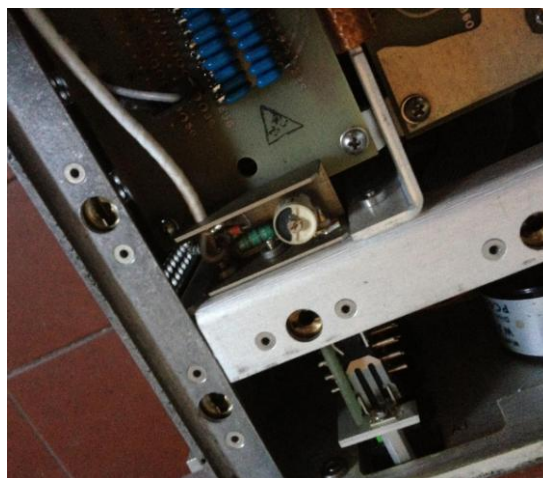


Figure 41: Locating the original FL-2, 33.205 MHz L-C filter.

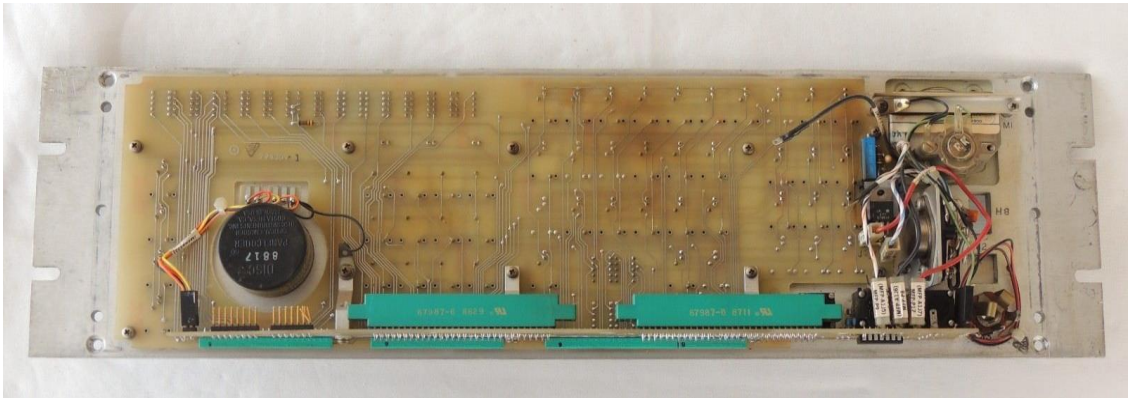


Figure 42: The whole MFP Front Panel Assembly (Rear view, see text).

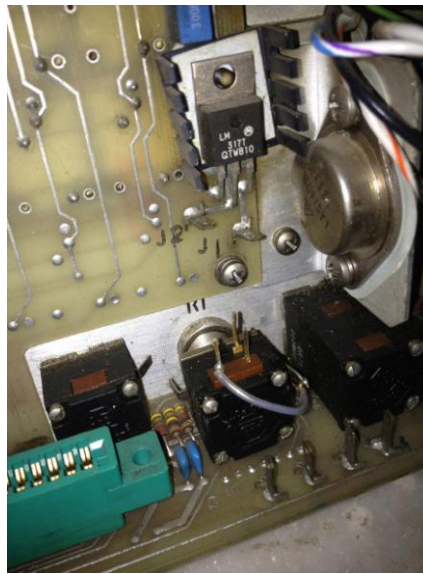


Figure 43: Locating the plugs A2J1, A2J2, A1J5, A1J6, A1J7 and A1J8 on the MFP Front Panel Assembly (all connections temporarily removed).

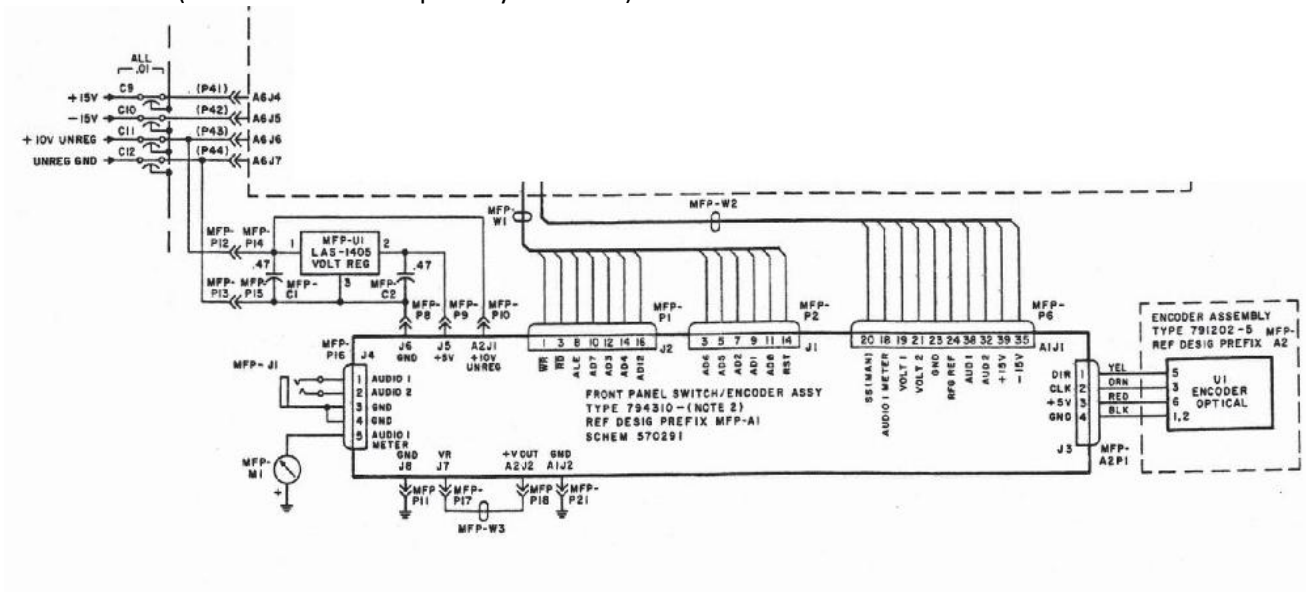
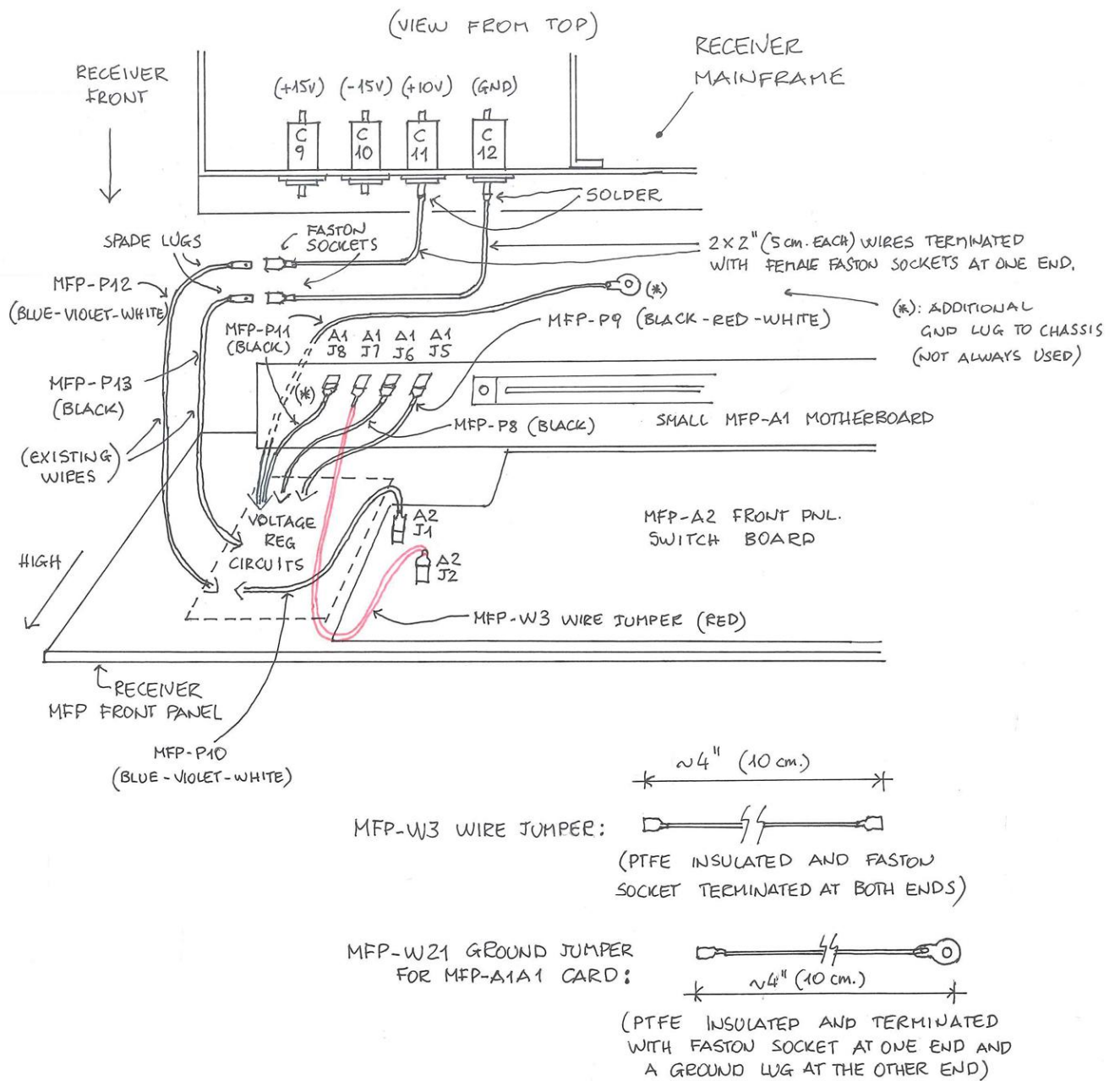


Figure 44: Overall diagram of the MFP Front Panel Assembly.



VARIOUS CONNECTIONS IN THE MFP FRONT PANEL ASSEMBLY.

Figure 45: Connections in the MFP Front Panel Assembly.

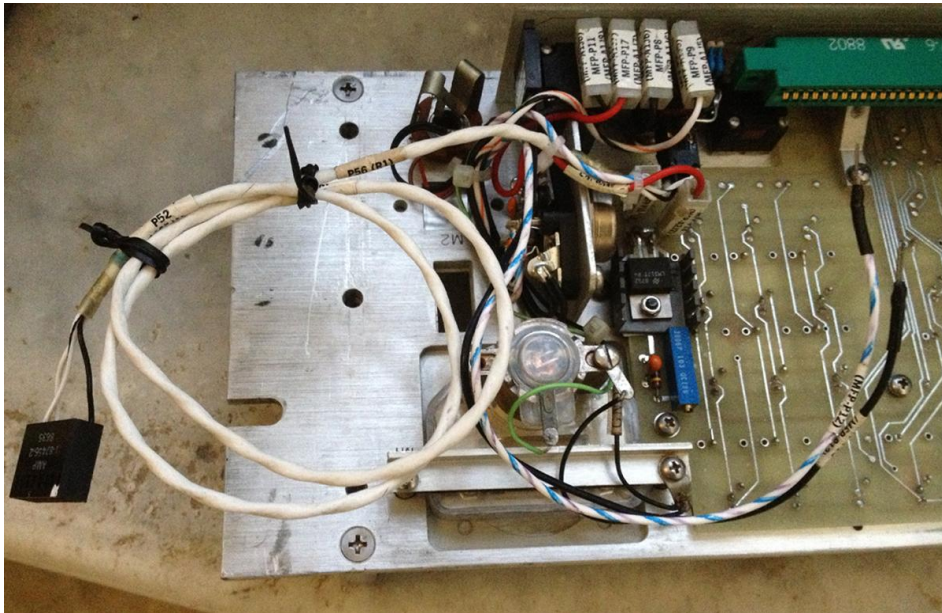


Figure 46: The MFP Front Panel Assembly with all the left-side connectors in place.



Figure 47: The MFP-W3 single-wire jumper.

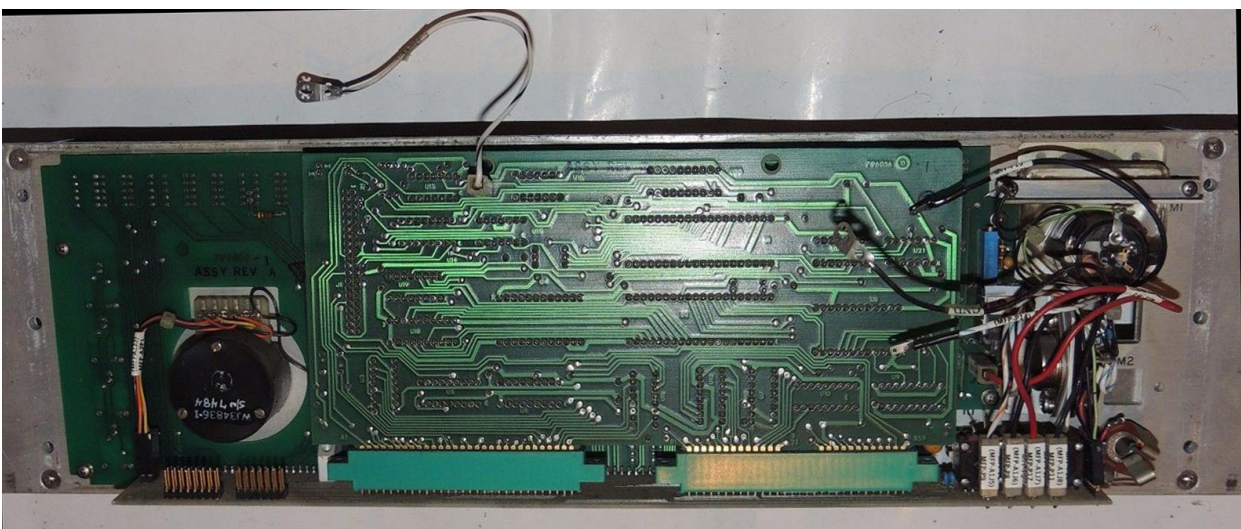


Figure 48: The MFP-A1A1 Card already inserted into the MFP-A1 Small Motherboard of a MFP Front Panel Assembly, please notice also the MFP-P21 and the MFP-P11 Ground jumpers.

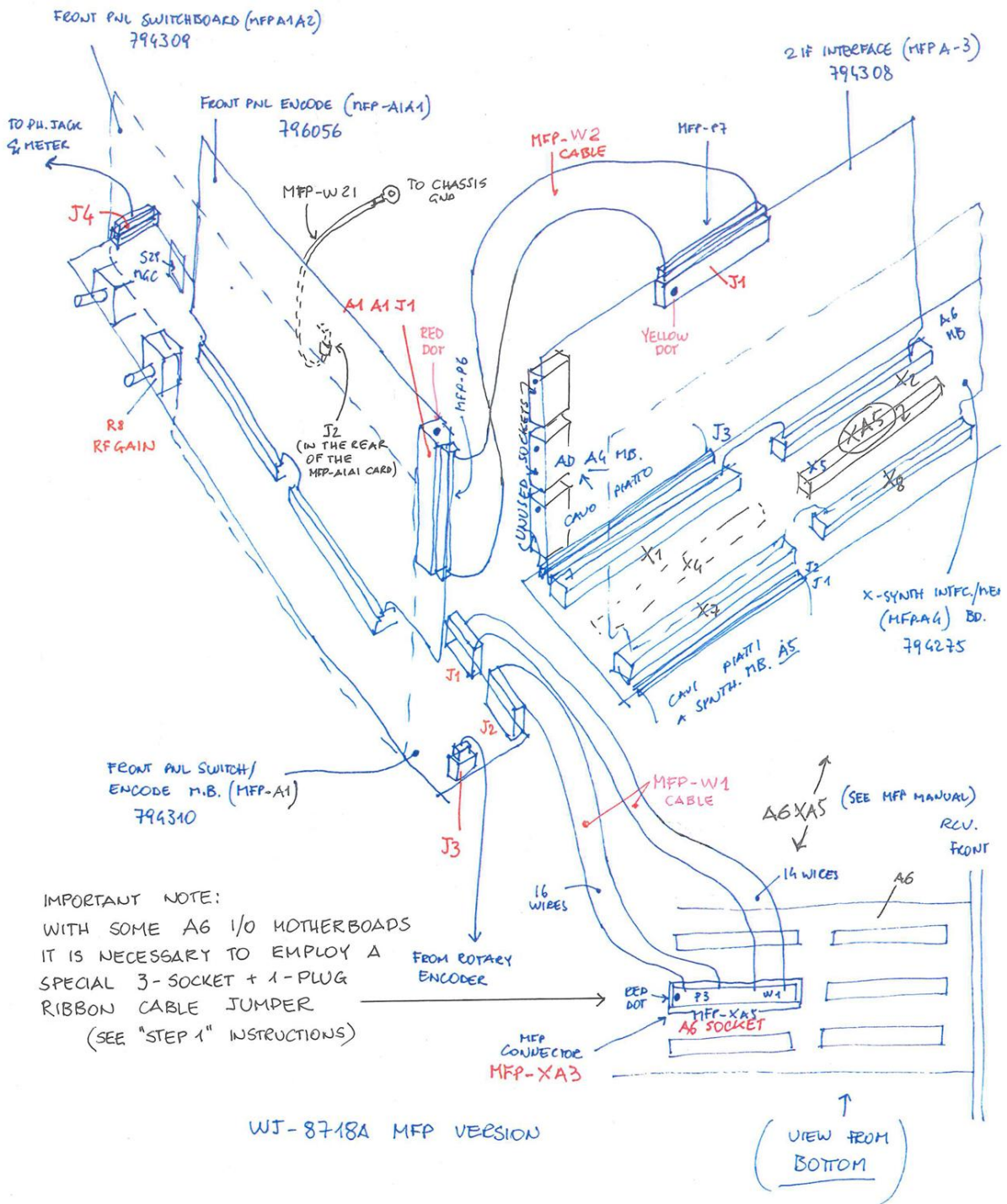


Figure 49: A rough sketch of the final MFP layout (the Line Audio level cable and some other single-wire connections are not shown for simplicity).

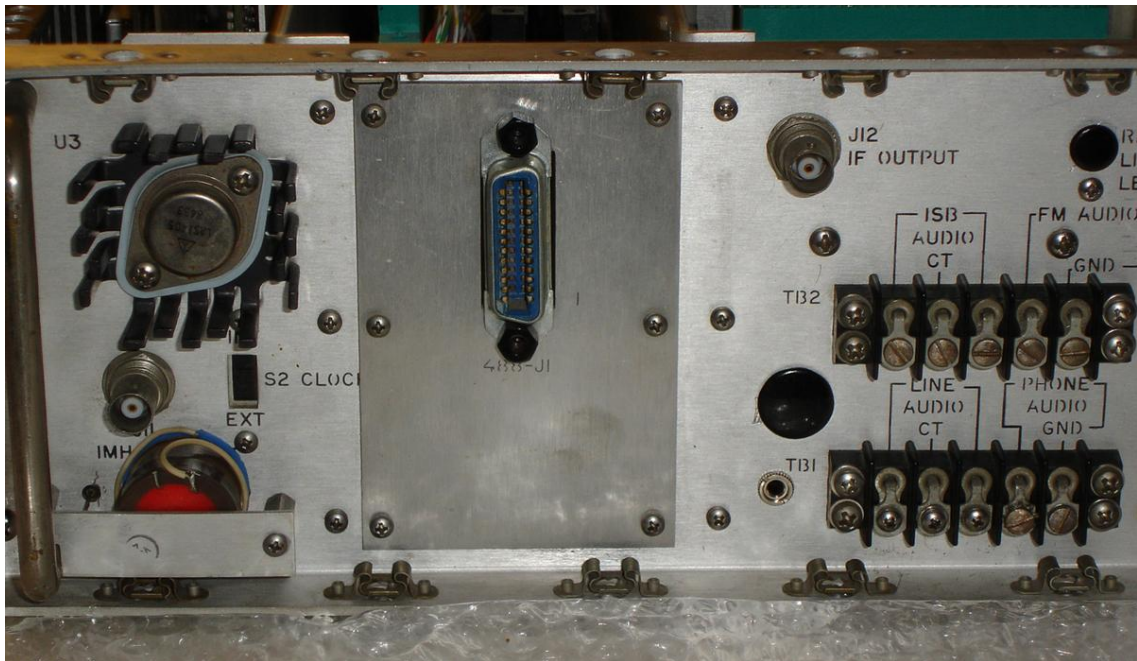


Figure 50: The IEEE-488 GPIB connector on the rear panel of a WJ-8718A/MFP receiver.

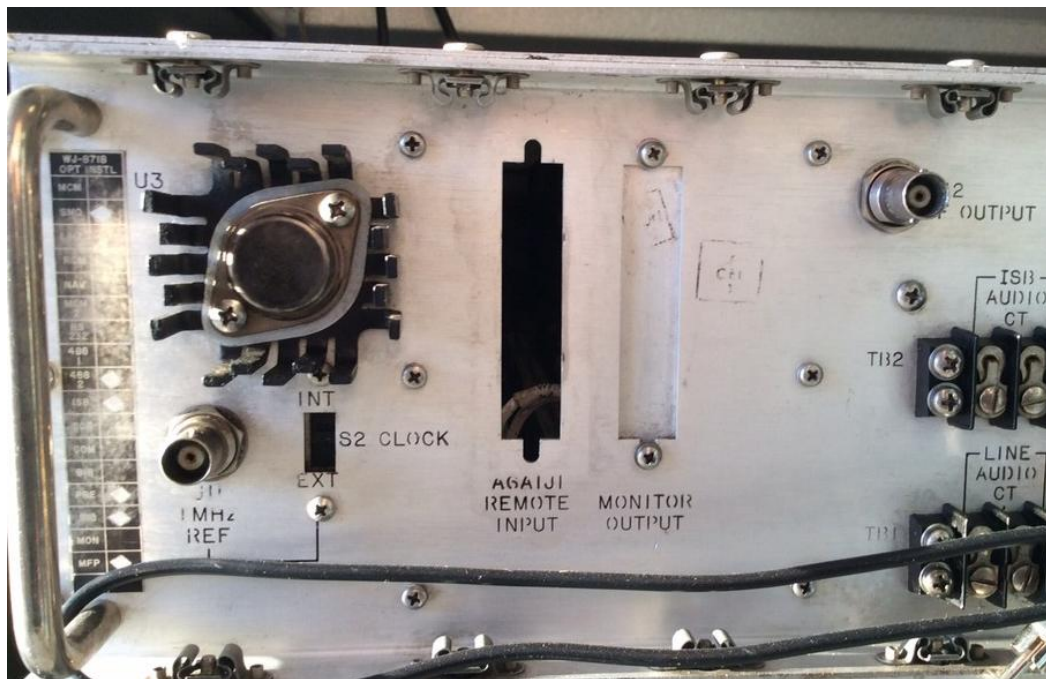


Figure 51: Holes for the RS-232 remote control connectors in the rear panel of a MFP receiver.

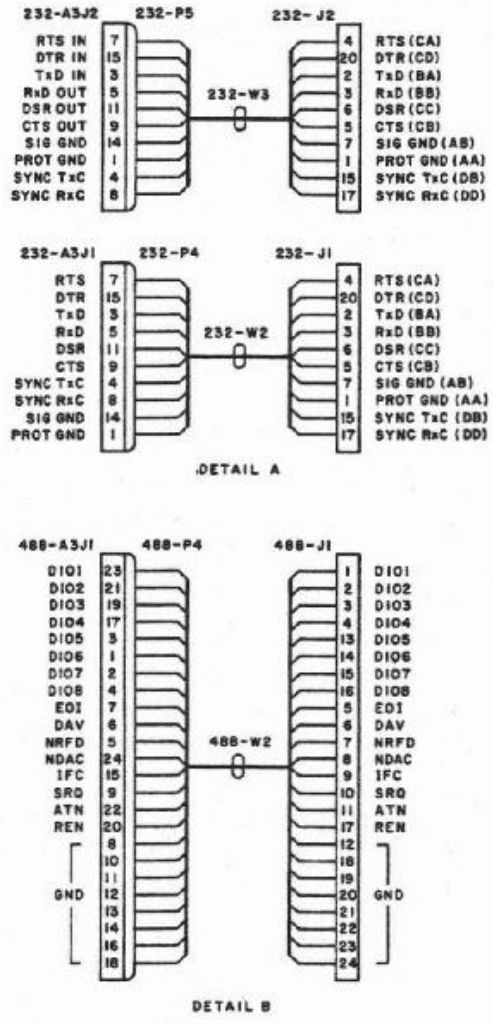


Figure 52: IEEE-488 and RS-232 I/O connectors pin layout (rear panel connectors shown at right).

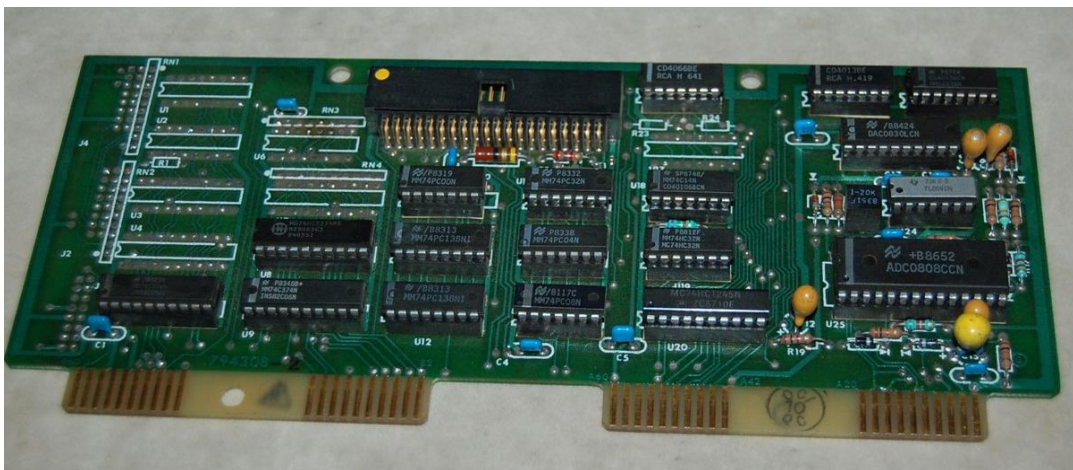


Figure 53: The MFP-A3 IF Interface 794308-2 Card (see text).

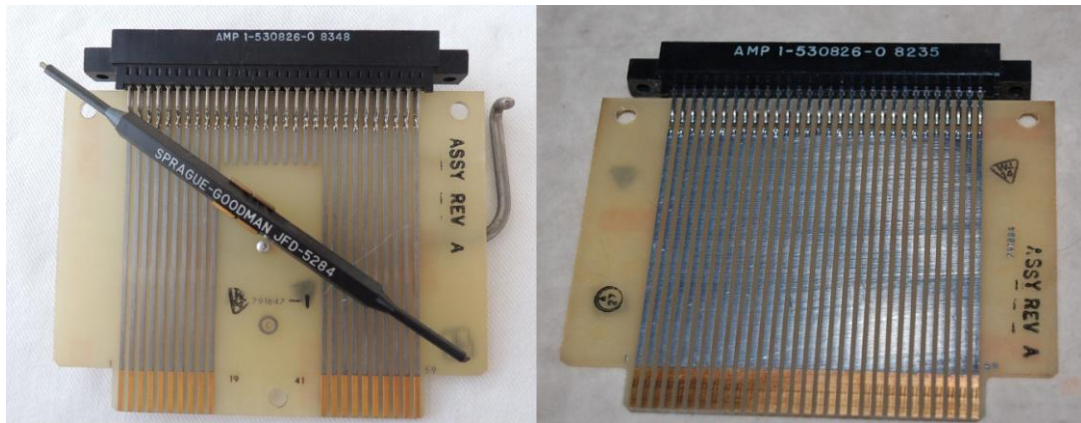


Figure 54: Two different types of extender boards: the 791647-1 card (40-pole, 20 of them splitted into two rows on each side of the board, adjusting tool and card removing handle) is shown at left and the 791884 card (60-poles total, 30 on each side) is shown at right.

END OF STEP 2 FIGURES