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*Home of the cheapest ATV transmitters and receivers in Europe!*

## 23cm transmitter and receiver technical notes

This document contains technical information to help you use your 23cm transmitter and/or receiver. La test technical information can be found at <http://www.G1MFG.com>.

### Power supply

The transmitter and receiver require a supply of 12 to 18V DC, **tip positive**. Reverse polarity will cause very serious damage. Do NOT use less than 12V.

- The transmitter gives best output power at 13.8V or more.
- The heatsinks on the receiver get very hot over 13.8V, and run coolest at 12V.

### Video and audio connections

Video and audio connections (inputs on the Tx and outputs on the Rx) are as follows:

- Yellow phono socket - composite video
- White phono socket - audio for/from 6.0MHz subcarrier
- Red phono socket - audio for/from 6.5MHz subcarrier

### Pre-emphasis/de-emphasis

The transmitter and receiver do not include video pre/de-emphasis. Simple pre-emphasis and de-emphasis circuits, plus a lot of other information and modifications are on the G1MFG.com website, or you can get the information by sending a stamped self-addressed large envelope marked "MODS" to the address at the end of this document.

### Setting up the 23cm transmitter

The pre-set pot on the board provides a video gain (=deviation) control. The input impedance is somewhere in the region of 220 ohms: if you need 75 ohm impedance then solder an 82 ohm resistor across the video input socket.

### Setting up the 23cm receiver

The yellow pre-set pot on the standard receiver is the video gain control, and you'll need to set it for proper amplitude video output. The control is a bit fierce and it can be hard to set it to the right value - if you change the pot for a 1k cermet trimmer then the control range is a lot smoother. Receivers modified by G1MFG.com have a blue 1k trimmer and are much tamer.

### Special note for Gold receivers

The 'Gold' receiver is modified to improve the sensitivity and picture performance. The '10k resistor' mod has the unwanted side-effect on some receivers of shifting the receive frequencies slightly from those in the tuning charts shown here. The frequency offset is constant across the band, so you may find you get best results by tuning (say) 2MHz lower or higher than whatever frequency you want to receive.

There is a wire link on the underside of the Gold receiver PCB which reduces the received noise level. This also affects the colour subcarrier amplitude. Most monitors we've tried work fine with the reduced level, but some refuse to display colour. If you find this is a problem with your monitor, please remove the link and colour should be restored (at the expense of slightly more noise).

**23cm transmitter and receiver operating frequencies**

The following tables show the DIP switch settings for both the transmitter and receiver. Note that 0=off and 1=on, and SW1 is the switch farthest from the metal box.

**Table 1 - Commonly used frequencies**

Frequency (MHz)	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8	Notes
1248.0	0	0	0	0	1	0	0	0	RT1-3 repeater input
1249.0	0	1	0	0	1	0	0	0	RT1-2 repeater input
1276.5	1	0	0	1	0	0	1	0	RT1-1 repeater input
1285.0	0	1	0	1	1	0	1	0	Simplex
1308.0	0	0	0	1	0	0	0	1	RT1-3 repeater output
1311.5	1	1	1	1	0	0	0	1	RT1-1 repeater output
1316.0	0	0	0	1	1	0	0	1	RT1-2 repeater output

**Table 2 - Complete frequency listing for 23cm Tx and Rx**

Please note that some of these frequencies will cause emissions outside the 23cm amateur allocation (1240MHz to 1325MHz) because ATV is a wide-band transmission. Refer to the band plans for details. As a rule of thumb, you should be OK if you don't transmit below 1248MHz or above 1316MHz, and you keep the transmit deviation reasonably low (compatible with other amateur stations). *Disclaimer: this is NOT a guarantee that you will not transmit out of band; please use the normal means of checking your transmitted signal bandwidth.*

Frequency (MHz)	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8	Frequency (MHz)	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8
1240.0	0	0	0	0	0	0	0	0	1254.0	0	0	1	1	1	0	0	0
1240.5	1	0	0	0	0	0	0	0	1254.5	1	0	1	1	1	0	0	0
1241.0	0	1	0	0	0	0	0	0	1255.0	0	1	1	1	1	0	0	0
1241.5	1	1	0	0	0	0	0	0	1255.5	1	1	1	1	1	0	0	0
1242.0	0	0	1	0	0	0	0	0	1256.0	0	0	0	0	0	1	0	0
1242.5	1	0	1	0	0	0	0	0	1256.5	1	0	0	0	0	1	0	0
1243.0	0	1	1	0	0	0	0	0	1257.0	0	1	0	0	0	1	0	0
1243.5	1	1	1	0	0	0	0	0	1257.5	1	1	0	0	0	1	0	0
1244.0	0	0	0	1	0	0	0	0	1258.0	0	0	1	0	0	1	0	0
1244.5	1	0	0	1	0	0	0	0	1258.5	1	0	1	0	0	1	0	0
1245.0	0	1	0	1	0	0	0	0	1259.0	0	1	1	0	0	1	0	0
1245.5	1	1	0	1	0	0	0	0	1259.5	1	1	1	0	0	1	0	0
1246.0	0	0	1	1	0	0	0	0	1260.0	0	0	0	1	0	1	0	0
1246.5	1	0	1	1	0	0	0	0	1260.5	1	0	0	1	0	1	0	0
1247.0	0	1	1	1	0	0	0	0	1261.0	0	1	0	1	0	1	0	0
1247.5	1	1	1	1	0	0	0	0	1261.5	1	1	0	1	0	1	0	0
1248.0	0	0	0	0	1	0	0	0	1262.0	0	0	1	1	0	1	0	0
1248.5	1	0	0	0	1	0	0	0	1262.5	1	0	1	1	0	1	0	0
1249.0	0	1	0	0	1	0	0	0	1263.0	0	1	1	1	0	1	0	0
1249.5	1	1	0	0	1	0	0	0	1263.5	1	1	1	1	0	1	0	0
1250.0	0	0	1	0	1	0	0	0	1264.0	0	0	0	0	1	1	0	0
1250.5	1	0	1	0	1	0	0	0	1264.5	1	0	0	0	1	1	0	0
1251.0	0	1	1	0	1	0	0	0	1265.0	0	1	0	0	1	1	0	0
1251.5	1	1	1	0	1	0	0	0	1265.5	1	1	0	0	1	1	0	0
1252.0	0	0	0	1	1	0	0	0	1266.0	0	0	1	0	1	1	0	0
1252.5	1	0	0	1	1	0	0	0	1266.5	1	0	1	0	1	1	0	0
1253.0	0	1	0	1	1	0	0	0	1267.0	0	1	1	0	1	1	0	0
1253.5	1	1	0	1	1	0	0	0	1267.5	1	1	1	0	1	1	0	0

Frequency (MHz)	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8	Frequency (MHz)	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8
1268.0	0	0	0	1	1	1	0	0	1293.5	1	1	0	1	0	1	1	0
1268.5	1	0	0	1	1	1	0	0	1294.0	0	0	1	1	0	1	1	0
1269.0	0	1	0	1	1	1	0	0	1294.5	1	0	1	1	0	1	1	0
1269.5	1	1	0	1	1	1	0	0	1295.0	0	1	1	1	0	1	1	0
1270.0	0	0	1	1	1	1	0	0	1295.5	1	1	1	1	0	1	1	0
1270.5	1	0	1	1	1	1	0	0	1296.0	0	0	0	0	1	1	1	0
1271.0	0	1	1	1	1	1	0	0	1296.5	1	0	0	0	1	1	1	0
1271.5	1	1	1	1	1	1	0	0	1297.0	0	1	0	0	1	1	1	0
1272.0	0	0	0	0	0	0	1	0	1297.5	1	1	0	0	1	1	1	0
1272.5	1	0	0	0	0	0	1	0	1298.0	0	0	1	0	1	1	1	0
1273.0	0	1	0	0	0	0	1	0	1298.5	1	0	1	0	1	1	1	0
1273.5	1	1	0	0	0	0	1	0	1299.0	0	1	1	0	1	1	1	0
1274.0	0	0	1	0	0	0	1	0	1299.5	1	1	1	0	1	1	1	0
1274.5	1	0	1	0	0	0	1	0	1300.0	0	0	0	1	1	1	1	0
1275.0	0	1	1	0	0	0	1	0	1300.5	1	0	0	1	1	1	1	0
1275.5	1	1	1	0	0	0	1	0	1301.0	0	1	0	1	1	1	1	0
1276.0	0	0	0	1	0	0	1	0	1301.5	1	1	0	1	1	1	1	0
1276.5	1	0	0	1	0	0	1	0	1302.0	0	0	1	1	1	1	1	0
1277.0	0	1	0	1	0	0	1	0	1302.5	1	0	1	1	1	1	1	0
1277.5	1	1	0	1	0	0	1	0	1303.0	0	1	1	1	1	1	1	0
1278.0	0	0	1	1	0	0	1	0	1303.5	1	1	1	1	1	1	1	0
1278.5	1	0	1	1	0	0	1	0	1304.0	0	0	0	0	0	0	0	1
1279.0	0	1	1	1	0	0	1	0	1304.5	1	0	0	0	0	0	0	1
1279.5	1	1	1	1	0	0	1	0	1305.0	0	1	0	0	0	0	0	1
1280.0	0	0	0	0	1	0	1	0	1305.5	1	1	0	0	0	0	0	1
1280.5	1	0	0	0	1	0	1	0	1306.0	0	0	1	0	0	0	0	1
1281.0	0	1	0	0	1	0	1	0	1306.5	1	0	1	0	0	0	0	1
1281.5	1	1	0	0	1	0	1	0	1307.0	0	1	1	0	0	0	0	1
1282.0	0	0	1	0	1	0	1	0	1307.5	1	1	1	0	0	0	0	1
1282.5	1	0	1	0	1	0	1	0	1308.0	0	0	0	1	0	0	0	1
1283.0	0	1	1	0	1	0	1	0	1308.5	1	0	0	1	0	0	0	1
1283.5	1	1	1	0	1	0	1	0	1309.0	0	1	0	1	0	0	0	1
1284.0	0	0	0	1	1	0	1	0	1309.5	1	1	0	1	0	0	0	1
1284.5	1	0	0	1	1	0	1	0	1310.0	0	0	1	1	0	0	0	1
1285.0	0	1	0	1	1	0	1	0	1310.5	1	0	1	1	0	0	0	1
1285.5	1	1	0	1	1	0	1	0	1311.0	0	1	1	1	0	0	0	1
1286.0	0	0	1	1	1	0	1	0	1311.5	1	1	1	1	0	0	0	1
1286.5	1	0	1	1	1	0	1	0	1312.0	0	0	0	0	1	0	0	1
1287.0	0	1	1	1	1	0	1	0	1312.5	1	0	0	0	1	0	0	1
1287.5	1	1	1	1	1	0	1	0	1313.0	0	1	0	0	1	0	0	1
1288.0	0	0	0	0	0	1	1	0	1313.5	1	1	0	0	1	0	0	1
1288.5	1	0	0	0	0	1	1	0	1314.0	0	0	1	0	1	0	0	1
1289.0	0	1	0	0	0	1	1	0	1314.5	1	0	1	0	1	0	0	1
1289.5	1	1	0	0	0	1	1	0	1315.0	0	1	1	0	1	0	0	1
1290.0	0	0	1	0	0	1	1	0	1315.5	1	1	1	0	1	0	0	1
1290.5	1	0	1	0	0	1	1	0	1316.0	0	0	0	1	1	0	0	1
1291.0	0	1	1	0	0	1	1	0	1316.5	1	0	0	1	1	0	0	1
1291.5	1	1	1	0	0	1	1	0	1317.0	0	1	0	1	1	0	0	1
1292.0	0	0	0	1	0	1	1	0	1317.5	1	1	0	1	1	0	0	1
1292.5	1	0	0	1	0	1	1	0	1318.0	0	0	1	1	1	0	0	1
1293.0	0	1	0	1	0	1	1	0	1318.5	1	0	1	1	1	0	0	1

Frequency (MHz)	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8	Frequency (MHz)	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8
1319.0	0	1	1	1	1	0	0	1	1343.5	1	1	1	1	0	0	1	1
1319.5	1	1	1	1	1	0	0	1	1344.0	0	0	0	0	1	0	1	1
1320.0	0	0	0	0	0	1	0	1	1344.5	1	0	0	0	1	0	1	1
1320.5	1	0	0	0	0	1	0	1	1345.0	0	1	0	0	1	0	1	1
1321.0	0	1	0	0	0	1	0	1	1345.5	1	1	0	0	1	0	1	1
1321.5	1	1	0	0	0	1	0	1	1346.0	0	0	1	0	1	0	1	1
1322.0	0	0	1	0	0	1	0	1	1346.5	1	0	1	0	1	0	1	1
1322.5	1	0	1	0	0	1	0	1	1347.0	0	1	1	0	1	0	1	1
1323.0	0	1	1	0	0	1	0	1	1347.5	1	1	1	0	1	0	1	1
1323.5	1	1	1	0	0	1	0	1	1348.0	0	0	0	1	1	0	1	1
1324.0	0	0	0	1	0	1	0	1	1348.5	1	0	0	1	1	0	1	1
1324.5	1	0	0	1	0	1	0	1	1349.0	0	1	0	1	1	0	1	1
1325.0	0	1	0	1	0	1	0	1	1349.5	1	1	0	1	1	0	1	1
1325.5	1	1	0	1	0	1	0	1	1350.0	0	0	1	1	1	0	1	1
1326.0	0	0	1	1	0	1	0	1	1350.5	1	0	1	1	1	0	1	1
1326.5	1	0	1	1	0	1	0	1	1351.0	0	1	1	1	1	0	1	1
1327.0	0	1	1	1	0	1	0	1	1351.5	1	1	1	1	1	0	1	1
1327.5	1	1	1	1	0	1	0	1	1352.0	0	0	0	0	0	1	1	1
1328.0	0	0	0	0	1	1	0	1	1352.5	1	0	0	0	0	1	1	1
1328.5	1	0	0	0	1	1	0	1	1353.0	0	1	0	0	0	1	1	1
1329.0	0	1	0	0	1	1	0	1	1353.5	1	1	0	0	0	1	1	1
1329.5	1	1	0	0	1	1	0	1	1354.0	0	0	1	0	0	1	1	1
1330.0	0	0	1	0	1	1	0	1	1354.5	1	0	1	0	0	1	1	1
1330.5	1	0	1	0	1	1	0	1	1355.0	0	1	1	0	0	1	1	1
1331.0	0	1	1	0	1	1	0	1	1355.5	1	1	1	0	0	1	1	1
1331.5	1	1	1	0	1	1	0	1	1356.0	0	0	0	1	0	1	1	1
1332.0	0	0	0	1	1	1	0	1	1356.5	1	0	0	1	0	1	1	1
1332.5	1	0	0	1	1	1	0	1	1357.0	0	1	0	1	0	1	1	1
1333.0	0	1	0	1	1	1	0	1	1357.5	1	1	0	1	0	1	1	1
1333.5	1	1	0	1	1	1	0	1	1358.0	0	0	1	1	0	1	1	1
1334.0	0	0	1	1	1	1	0	1	1358.5	1	0	1	1	0	1	1	1
1334.5	1	0	1	1	1	1	0	1	1359.0	0	1	1	1	0	1	1	1
1335.0	0	1	1	1	1	1	0	1	1359.5	1	1	1	1	0	1	1	1
1335.5	1	1	1	1	1	1	0	1	1360.0	0	0	0	0	1	1	1	1
1336.0	0	0	0	0	0	0	1	1	1360.5	1	0	0	0	1	1	1	1
1336.5	1	0	0	0	0	0	1	1	1361.0	0	1	0	0	1	1	1	1
1337.0	0	1	0	0	0	0	1	1	1361.5	1	1	0	0	1	1	1	1
1337.5	1	1	0	0	0	0	1	1	1362.0	0	0	1	0	1	1	1	1
1338.0	0	0	1	0	0	0	1	1	1362.5	1	0	1	0	1	1	1	1
1338.5	1	0	1	0	0	0	1	1	1363.0	0	1	1	0	1	1	1	1
1339.0	0	1	1	0	0	0	1	1	1363.5	1	1	1	0	1	1	1	1
1339.5	1	1	1	0	0	0	1	1	1364.0	0	0	0	1	1	1	1	1
1340.0	0	0	0	1	0	0	1	1	1364.5	1	0	0	1	1	1	1	1
1340.5	1	0	0	1	0	0	1	1	1365.0	0	1	0	1	1	1	1	1
1341.0	0	1	0	1	0	0	1	1	1365.5	1	1	0	1	1	1	1	1
1341.5	1	1	0	1	0	0	1	1	1366.0	0	0	1	1	1	1	1	1
1342.0	0	0	1	1	0	0	1	1	1366.5	1	0	1	1	1	1	1	1
1342.5	1	0	1	1	0	0	1	1	1367.0	0	1	1	1	1	1	1	1
1343.0	0	1	1	1	0	0	1	1	1367.5	1	1	1	1	1	1	1	1