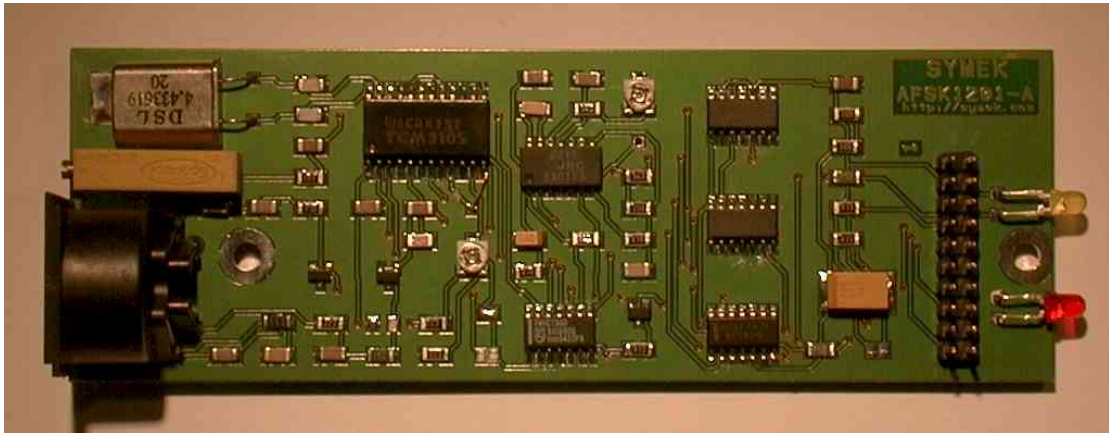


Users Manual

for the Packet-Radio-Modem

AFSK-1201

Layout Version AFSK1201-B



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Table of contents

Table of contents.....	1
Preface.....	2
Technical data AFSK1201-B.....	2
Short description.....	2
Bit-rate and baudrate	2
Copyright for Hard and Software.....	2
Digital interface - 20 pin connector	3
Signal description digital interface	3
Jumpers.....	3
Test points and adjustment.....	3
Connecting the radio to AFSK1201	4
Connection cables TNC/Transceiver.....	5
Amateur radio transceivers: Alphabetic order	5
CB and other radios.....	6
Cables for connection Modem - Radio:	6
Modem AFSK-1201-B (component location))	14
Schematics Modem AFSK1201-B	14
Index	14

Preface

This manual should help you to use the AFSK-Packet-Radio-Modem AFSK1201 in your TNC3 or TNC31 controller and to install the connection to your radio transceiver. If there are any problems, you may ask for help via a-mail at support@symek.com.

Technical data AFSK1201-B

Power supply: 5 volt DC, typ 10 mA

Dimensions: ca. Length=120mm, Width=40mm, Height=25 mm, mass approx. 30 grams

Radio interface: 5-pin DIN connector, same pinning as TNC2, TNC2S, TNC2H etc. 1200 bit per second AFSK (Audio Frequency Shift Keying) 1220/2200 Hz according to Bell 202 specifications.

AF-output level adjustable from 10 mV_{pp} to 0.3 V_{pp}, R_i=2kΩ, DC-free. Output is muted while reception. PTT : max. 16V 0,2A to ground, input sensitivity: 200 mV_{pp} to 10 V_{pp} at 25 kΩ, DC-free. (can be modified to increase sensitivity by factor 10)

Modem circuit: Texas-Instruments modem TCM3105. All frequencies are derived from a 4.433 MHz xtal.

Modem interface (digital): CMOS -level 5 volt. TXData, TXClock, RXData, RXClock, RTS CTS, DCD, + 5 volt, reset, ground. Connector: 20 pin (2x10) ribbon connector. Fits to TNC3, TNC31, TNC4 etc.

LED display: DCD (carrier detect), PTT (transmitter keying)

Jumpers and trimmers: Setting of output voltage with a 20 turn trimmer. Internal trimmers for DCD center and trigger level. Solder jumpers for DCD source and watchdog disable.

Data Carrier Detect (DCD): Separate tone detector circuit (XR2211)

Watchdog: The PTT-switch is time-limited to approx. 40 seconds. In case of failure of the TNC, the PTT is released after the maximum time. For tests or special applications (digipeaters with long transmission periods) the watchdog may be disabled by a solder jumper.

Measure Pins on board: DCD-PLL adjust and demodulator trigger level adjust.

Short description

A 'modem' contains **modulator** and **demodulator** circuits.

The FSK1201 converts the digital signals of a packet-radio-controller to low-frequent tones, which can be transmitted by a FM radio. Further, it decodes the tones received by a FM radio and sends them to the packet radio controller in digital form.

The modem AFSK1201 generates and receives audio frequency signals according the Bell 202 specifications, which is usual with amateur radio links (tone frequencies 1200 and 2200 Hz). All frequencies are quartz controlled, adjustments are not necessary. The audio bandwidth of the signal goes from 300 Hz to 2500 Hz.

The transmit clock frequency (1200 Hz) is generated in the modem. The modem includes also the circuitry for transmitter-keying (PTT) and transmit-time limiter (watchdog).

Bit-rate and baudrate

In this manual, the expressions bit-rate (bit/s, bit per second) and baud (Bd) are used for determining the transmission speed. With the FSK1201 both values are equivalent, as there is exactly 1 bit transmitted with every clock cycle. In general, it is possible to transmit more than 1 bit per clock, the speed (in bit/s) is then a multiple of the clock rate.

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The modem cannot be operated independently. So, it is a complex component and there is no need for a EMI certification (CE-sign). When the modem is to be used in systems other than TNC3 or TNC31, the EMI regulations have to be observed.

The contents of this manual may be copied as long as the author and the source is mentioned.

Digital interface - 20 pin connector

Pin	Signal	Function	Pin	Signal
1	+ 5 Volt	power supply 5 volt 150 mA (from TNC)	2	Ground
3	+ 5 Volt	power supply 5 volt 150 mA (from TNC)	4	Ground
5	Reset	(not used in FSK9600)	6	Ground
7	DCD	AF carrier detect (from modem to TNC)	8	Ground
9	CTS	transmitter is keyed (from modem to TNC)	10	Ground
11	PTT	transmitter keying (from TNC to modem)	12	Ground
13	TXD	transmit data (from TNC to modem)	14	Ground
15	RXD*	receive data (from modem to TNC)	16	Ground
17	TXC	transmit clock (from modem to TNC)	18	Ground
19	RXC*	receive clock (from modem to TNC)	20	Ground

*: RXD and TXD can be encoded NRZ as well as NRZI.

Signal description digital interface

Reset (pin 5): (modem input) normally high, is pulled low for 50 ms at power-on of TNC3. (not used in FSK1201)

DCD (pin 7) Data Carrier Detect: (modem output) High: modem receives no carrier, low: modem has detected a 1200 baud AFSK signal.

CTS (pin 9) Clear to Send: (modem output) Normally high. If the modem is ready to transmit data, the signal is low. With the FSK1200, CTS output is connected to PTT input. The TNC will wait for CTS=low before data transmission starts.

PTT (pin 11) Push to talk, or RTS (Request to send): (modem input) normally high. When the transmitter is to be keyed, the TNC pulls this signal to low.

TXD (pin 13) Transmit Data: (modem input): The data is latched at rising edge (low to high transition) of transmit clock.

RXD (pin 15) Receive Data: (modem output): The data output changes at the falling edge and is valid at the rising edge (low to high transition) of the receive clock.

TXC (pin 17) Transmit Clock: (modem output): The modem generates a clock frequency, which determines the transmit baudrate and the data speed between TNC and modem. Transmit data signal TXD has to be stable at the rising edge of TXC.

RXC (pin 19) Receive Clock: (modem output): the output of the receive clock recovery circuit is sent to the TNC to synchronise the received data signal. RXD is stable at the rising edge of RXC. The frequency of RXC corresponds to the transmit clock of the remote transmitter. If the internal clock of the modem and the clock of the remote transmitter differ by some percent, the receive clock is adjusted by 1/16 clock cycle to maintain synchronism.

Jumpers

Jumper J1 / J2 "DCD": AFSK-1201 has a carrier detect circuit using the XT2211 tone decoder. This circuit is called 'digital squelch' (however this expression isn't correct at all as the tone detection uses analog IC only). The modem is shipped with the jumper set to XR2211-DCD, the channel is busy if a audio signal within the normal bandwidth of a packet-radio signal is detected.

Sometimes it is desirable to define a channel to be busy if there is any audio frequency signal present (even noise). If you prefer this, you can disconnect the XR2211 carrier detect and use the TCM3105 carrier detect circuitry. Open the jumper J1 and close J2.

Jumper J3 "WATCHDOG": There is a time-limit for keying the transmitter. If the transwith time of approx. 40-50s is expired, the transmitter keying is released even when the controlling TNC keeps the PTT line LOW. So, it is made sure that the transmitter never 'hangs'. This kind of protection circuit is called *Watchdog*. For full duplex applications or digipeaters the watchdog may be disabled by installing a solder jumper to J3.

Test points and adjustment

Test point MP1 "DCD": The carrier detect with the ic XR2211 has to be set to the correct center frequency by adjusting trimmer P 2. Watch the voltage at MP1 (oscilloscope) and adjust for best 1:1 duty cycle (HI:LO ratio). The signal looks like a half way rectified sinewave, the adjustment is not critical.

Test pin MP2 "MODEM RX": Generate a test signal with a alternating 1200 / 2200 Hz tone (frequency alternates every 1/600 second). You may use a TNC2 in TAPR mode and start the CAL command in diddle-mode. Adjust the signal at MP2 to a 1:1 ratio (HI:LO) by careful tuning trimmer P3 (3105).

Connecting the radio to AFSK1201

Use a standard 5 pin (180°) DIN-connector. The pins are assigned as follows:

<i>pin 1: MIC</i>	<i>Microphone of the radio, audio output of TNC</i>
<i>pin 2: GND</i>	<i>Ground</i>
<i>pin 3: PTT</i>	<i>Push-to-talk contact, switched to ground to transmit</i>
<i>pin 4: SPK</i>	<i>AF-output of the radio (loudspeaker)</i>
<i>pin 5:</i>	<i>not connected</i>

Attention: the five pins are not enumerated in turn! The numbers of the contacts are printed on the black insulating body of the plug (almost invisible figures) and on the rear panel of the TNC3/31. The pins are arranged in the following order: 3 (PTT), 5 (n.c.), 2 (GND), 4 (DEM), 1 (MOD). The middle pin 2 (GND) is made as a soldering tag for attaching the screen wires of a microphone cable.

MIC (pin 1)

This is the AF output of the modem which is connected directly to the microphone input of the radio. You can adjust the voltage from approx. 10 mV to 300 mV according to the sensitivity of the microphone input of the radio.

The input impedance of the microphone input should be 10 k Ω or more. The output is decoupled (DC-free) by a 0.1 μ F ceramic capacitor. This is important when the modem is to be used with handheld radios using the same wire for PTT and microphone.

SPK (pin 4)

This is the AF input of the modem, connected directly to the speaker output of the radio. The audio signal should be 0,1 V_{SS} or more (35 mV eff.). At a 8 Ω speaker this sounds 'quite weak'. More amplitude is OK, turn the volume control to 1/4 or 'normal volume' for packet radio use with the AFSK1201.

Do not apply more than 6 volt (this is 'very loud' volume)', however you won't damage the modem as the input is protected by two diodes. The SPK-input of AFSK1201 is coupled with a capacitor (DC-free).

PTT (pin 3)

This pin is switched to ground when the modem is set to transmit mode. All radios use a switch to ground to key the transmitter (exception: some German police-radios). A N-channel VMOS-field effect transistor, with a switching capability of 25 Volt and 200 mA is used.

The 'ON' resistance of the FET is only few Ohms, the leakage current less than 1 μ A.

For transceivers with other PTT circuits use an additional switching amplifier and a reed-relay with protection diode parallel to the coil.

Many (handheld) transceivers use the same wire for PTT switch and microphone. The dc signal for the PTT is decoupled by a capacitor. In series with the PTT-switch, there is a resistor (2 to 20 k Ω) so that the audio signal from the microphone isn't short circuited. When pressing the PTT-key, the direct current can flow through this resistor, keying the transmitter.

To connect such radios, you can simply connect pin 1 and pin 3 of the 5 pin DIN connector at the modem by a approx. 4.7 kOhm miniature resistor. The common MIC and PTT wire is soldered to pin 1 of the DIN connector. Do not install the resistor inside of the TNC (at the modem board) because the resistor might cause problems when the modem is to be used with other radios.

GND (pin 2)

Ground of the radio

Spare (pin 5)

This pin is not connected.

Connection cables TNC/Transceiver

Here you find a list of all common amateur and CB radios. If your specific radio type can not be found, you should refer to the manual to find the microphone, speaker and PTT connection.

Some of the cables need two separate connectors at the radio side (e.g. one for the microphone and PTT, the other one for the speaker connection). Solder a Y-shaped cable and fix and isolate the junction of the three cables with heatshrink tube. A total length of 60-80 cm would be OK in most cases. The distance between radio and modem should be not more than 1 meter (problems of interference). As long as cable length does not exceed 1 m, there is no need to use shielded cables (however, this is recommended).

We did not check all cable circuits listed below. Please inform us if there is anything to correct.

Do you have a radio type not mentioned in the list? Please write us the type and how to connect the modem to make the list complete.

Amateur radio transceivers: Alphabetic order

µ2E	1	FT290R II	26	IC275 (MIC)	3	TM441	6
µ4E	1	FT40	37	IC28	3	TM451	39
AOR Mini 400	31	FT470	1	IC281	40	TM455	39
AR240	31	FT4700	26	IC2E	1	TMV7E	39
AR446 ADI	16	FT480R	7	IC2WE	37	TM701	6
C108	1	FT50R	37	IC3200	3	TM731A	6
C401	1	FT51	1	IC3220	3	TM732A+Adapt	35
C408	1	FT5100	26	IC32E	1	TM732A MIC soc	41
C500	1	FT51R	1	IC45	3	TM733 Packet	39
C508	1	FT5200	26	IC45	3	TM733A/E MIC	41
C520	1	FT530	1	IC47	3	TM741	41
C5200ED	22	FT6200	26	IC471	3	TM742A+Adapt	35
C528	1	FT708R	21	IC475 (ACC1)	33	TM742A MIC soc	41
C558	1	FT709	1	IC475 (MIC)	3	TR2300	23
C55D	29	FT712RH	26	IC48	3	TR751	19
C5608	22	FT7200	26	IC481	40	TR9000	20
C568	1	FT727	1	IC4E	1	TRX4S (SYMEK)	74
C608	1	FT73	1	IC701	12	TS140S	17
C608	1	FT736	27	IC706MK2 RJ45	72	TS280	15
C7800	5	FT747GX	25	IC706MK2 DIN	39	TS430S	19
C8800	5	FT76	1	IC735 (ACC1)	33	TS711E (ACC2)	17
D410	3	FT767	32	IC735 (MIC)	3	TS711E mic+spk	28
DJ100E	4	FT790R	8	IC751 (MIC)	3	TS780	19
DJ120	4	FT790R II	26	IC820 (ACC1)	33	TS790E	11
DJ460E	34	FT8000	39	IC821 (ACC1)	33	TS811E (ACC2)	17
DJ560E	24	FT8100	39	IC821 (MIC)	3	TS811 MIC+SPK	28
DJ580	38	FT847	39	IC970 (ACC1)	33	TS930S	19
DJ-G5T/E	13	FT8500	39	PCS9600 Azden	39	TS940	17
DJS-1	13	FX440	36	RV400	24	TS950S	19
DJS-4E	13	IC D1E, Z1E	1	SRC430	30	TW4000A	16
DJSF-1	13	IC W31E	1	TH21	2	TW4100E	16
DR410	16	IC02E	1	TH25	2	Yaesu 227	10
DR510	16	IC04E	1	TH28	2	Yaesu 227R	9
DR570	16	IC1200	3	TH41	2		
DR590	16	IC1210	3	TH45	2		
DR605 T/E	73	IC1271	3	TH48	2		
EC10 Alinco 433	1	IC12E	1	TH55	2		
FT10	37	IC211	12	TH77	2		
FT208R	21	IC21A	14	TH78	2		
FT209	1	IC25	3	TH79	2		
FT212RH	26	IC27	3	TM221	6		
FT23	1	IC271	3	TM255	39		
FT290R	8	IC275 (ACC1)	33	TM421	6		

CB and other radios

Note: Not all CB radios can be used for packet-radio! Make sure, packet-radio is mentioned in the manual.

Alan 27e	51	DNT Carat Exkus	54	Kaiser KA9018/40	55	stabo xh8082	1
Alan 28d	53	DNT Cockpit	54	Kaiser KE9015/40	65	stabo xm3000	0
Alan 48d, 48d80	69	DNT <i>contact</i> III	54	Kenwood	64	stabo xm3082	75
Alan 78	53	DNT Formel 1	70	KF (BOS-radio)	71	stabo xm3400	51
Albrecht AE4100	53	DNT Highway	?	Kurier 5040	53	stabo xm3500	51
Albrecht AE4200	51	DNT Meteor 5000	59	Maxon 1000	53	stabo xm4000	65
Albrecht AE4400	53	DNT Saphir	59	Maxon 2000	53	stabo xm4012	65
Albrecht AE4450	53	DNT Scanner	54	Midland	51	stabo xm4042/82	51
Albrecht AE4500	53	DNT Scanner FM	54	Multitop (olt)	61	stabo xm5000	51
Albrecht AE4550	53	DNT speedy 8012	77	Multitop (LCD)	62	stabo xm5012	51
Albrecht AE4600	53	DNT Start 1	?	Pan	52	stabo xm6012	66
Albrecht AE4800	53	DNT Strato	54	President George	53	stabo xm7082	53
Albrecht AE5000	53	DNT Strato 1	54	President Grand	52	stabo xm8082	53
Albrecht AE5000	53	DNT Strato plus	54	Pres. Jackson old	52	stabo xrc Twinstar	66
Albrecht AE5100	53	DNT Titan	59	Prs. Jackson new	65	Team gen.,TS404	51
Albrecht AE5150	53	DNT Zirkon	59	President James	53	Team Mem 5002	57
Albrecht general	53	EC10 Alinco 433	1	President Lincoln	60	Wipe	56
Albrech Alpa4000	53	Emperor TS5010	60	President P1000	52	Yaesu	63
Albrech Alpa4000	53	Empire 2000	51	President PC40	52	Zodiac allgemein	56
Albrecht P1000	51	FuG (BOS-radio)	71	President PC404	52	Zodiac B40	56
Astracom	51	HR2510	60	stabo AE6080	66	Zodiac B4040	56
Conrad C-mobil	68	Hotline HL1040	53	stabo allgemein	51	Zodiac M244	56
CV2000	70	Jeffersn RCI2950	58	stabo SH8000	67	Zodiac M40	56
Danita 1240	52	Kaiser 9012	51	stabo xf4000	65		
Danita Mark 5	56	Kaiser 9040 FM	52	stabo xf4012	65		
DNT allgemein	54	Kaiser 9050 FM	65	stabo xf5012	51		
DNT Carat	54	Kaiser Giftzweg	55	stabo xf9082	76		

Cables for connection Modem - Radio:

Table 0: these radios have no microphone-connector and are NOT suited for packet-radio

Table 1: ICOM Handy transceiver IC2E, IC4E, IC12E, IC02E, IC04E, IC32E, μ 2E, μ 4E, Yaesu FT209, FT470, FT709, FT727, FT23, FT73, FT76, Standard C201, C401, C408, C500, C520, C528, C558 etc., Alinco LPD EC10, stabo xh8082

pin 1 (MIC)---
--- 2,5 mm ear-phone plug MIC inner contact
 pin 2 (GND) ---<wh>--- 2,5 mm ear-phone plug MIC outer contact
 pin 2 (GND) ---<wh>--- 3,5 mm ear-phone plug SPKR outer contact
 pin 4 (SPK) ---<gn>--- 3,5 mm ear-phone plug SPKR inner contact
 solder 2,2 k Ω between pin 3 and pin 1 in DIN-plug

Table 2: Kenwood Handy transceiver TH21, TH41, TH25, TH45, TH48, TH55, TH77 etc.

pin 1 (MIC)---
--- 3,5 mm stereo plug MIC middle contact
 pin 2 (GND) ---<wh>--- 2,5 mm ear-phone plug SPKR outer contact
 pin 3 (PTT) ---<yel>--- 3,5 mm stereo plug MIC outer contact
 pin 4 (SPK) ---<gn>--- 2,5 mm ear-phone plug SPKR inner contact
 <n.c.>-- 3,5 mm stereo plug inner contact

Table 3: ICOM Mobile radio with 8-pin audio screw-locking line plug, as IC735, IC751, IC25, IC27, IC28, IC821 etc.

pin 1 (MIC)---
--- pin 1 (MIC) (near the notch)
 pin 2 (GND) --<Schirm>-- pin 7 (MIC GND) (near the notch)
 pin 2 (GND) ---<wh>--- pin 6 (GND)
 pin 3 (PTT) ---<yel>--- pin 5 (PTT)
 pin 4 (SPK) ---<gn>--- pin 8 (SPKR) middle pin
 Solder a 2,2 k Ω resistor between pin 3 and pin 1 in DIN-plug.

IC45, IC47, IC48, IC1200, IC1210, IC3200 IC3220, Alinco D410 etc.

Cable 4: Alinco DJ100E and similar

pin 1 (MIC)---
--- 2,5 mm stereo plug MIC middle contact
pin 2 (GND) ---<wh>--- 2,5 mm stereo plug MIC outer contact
pin 4 (SPK) ---<gn>--- 2,5 mm stereo plug MIC inner contact
Solder a 2,2 kΩ resistor between pin 3 and pin 1 in DIN-plug.

Cable 5: Standard C7800, C8800 and similar with 7-pin audio screw-locking line plug

pin 1 (MIC)---
--- pin 1 (MIC)
pin 2 (GND) ---<wh>--- pin 7 (GND) middle pin
pin 3 (PTT) ---<yel>--- pin 2 (PTT)
pin 4 (SPK) ---<gn>--- pin 3 (SPKR)

Cable 6: Kenwood TM221, TM421, TM701, TM731A, TM441 and similar 8-pin audio screw-locking line plug

pin 1 (MIC)---
--- pin 1 (MIC)
pin 2 (GND) ---<wh>--- pin 8 (GND) middle pin
pin 3 (PTT) ---<yel>--- pin 2 (PTT)
pin 4 (SPK) ---<gn>--- pin 6 (SPKR)

TM421: do not connect to AUX-connector: There is no deemphasis. Better use MIC and SPKR connection.

Cable 7: Yaesu FT480R and similar with 8-pin audio screw-locking line plug

pin 1 (MIC)---
--- pin 8 (MIC) middle pin
pin 2 (GND) ---<wh>--- pin 7 (GND) near the notch
pin 3 (PTT) ---<yel>--- pin 6 (PTT)
pin 2 (GND) ---<wh>--- 3,5 mm ear-phone plug SPKR outer contact
pin 4 (SPK) ---<gn>--- 3,5 mm ear-phone plug SPKR inner contact

Cable 8: Yaesu FT290R, FT790R with round 7-pin audio screw-locking line plug

pin 1 (MIC)---
--- pin 2 (MIC)
pin 2 (GND) ---<wh>--- pin 1 (GND)
pin 3 (PTT) ---<yel>--- pin 3 (PTT)
pin 4 (SPK) ---<gn>--- pin 5 (SPKR)

Cable 9: Yaesu 227R with 6-pin audio screw-locking line plug & ear-phone plug jack

pin 1 (MIC)---
--- pin 6 (MIC) middle pin
pin 2 (GND) ---<wh>--- pin 5 (GND)
pin 3 (PTT) ---<yel>--- pin 4 (PTT)
pin 4 (SPK) ---<gn>--- 3,5 mm ear-phone plug (SPKR) middle contact
pin 2 (GND) ---<wh>--- 3,5 mm ear-phone plug (SPKR) outer contact

Cable 10: Yaesu 227 with round 4-pin audio screw-locking line plug & ear-phone plug jack

pin 1 (MIC)---
--- pin 2 (MIC)
pin 2 (GND) ---<wh>--- pin 1 (GND)
pin 3 (PTT) ---<yel>--- pin 3 (PTT)
pin 4 (SPK) ---<gn>--- 3,5 mm ear-phone plug (SPKR) middle contact
pin 2 (GND) ---<wh>--- 3,5 mm ear-phone plug (SPKR) outer contact

Cable 11: Kenwood TS 790 E and similar with 13-pin plug

pin 1 (MIC)---
--- pin 11 (MIC)
pin 2 (GND) ---<wh>--- pin 12 and pin 4 (GND)
pin 3 (PTT) ---<yel>--- pin 9 (PTT)
pin 4 (SPK) ---<gn>--- pin 3 (SPKR)

Cable 12: ICOM IC701 or IC211 with round 4-pin audio screw-locking line plug

pin 1 (MIC)---
--- pin 1 (MIC)
pin 2 (GND) ---<wh>--- pin 4 (GND)
pin 3 (PTT) ---<yel>--- pin 2 (PTT)
pin 2 (GND) ---<wh>--- 6.3 mm mono earphone jack outer contact
pin 4 (SPK) ---<gn>--- 6.3 mm mono earphone jack inner contact

Cable 13: Alinco DJS-1, DJSF-1, DJS-4E, DJ-G5T etc. with ear-phone plug jack

pin 1 (MIC)---
--- 2,5 mm inner contact
pin 2 (GND) ---<wh>--- 2,5 mm outer contact
pin 4 (SPK) ---<gn>--- 3,5 mm inner contact
pin 2 (GND) ---<bl>--- 3,5 mm outer contact
solder 4700Ω between pin 3 and pin 1 in DIN plug.

Cable 14: ICOM IC21A with 3-pin round plug and ear-phone plug jack

pin 1 (MIC)---
--- pin 1 (MIC)
pin 2 (GND) ---<wh>--- pin 3 (GND) and 3,5 mm ear-phone plug outer contact
pin 3 (PTT) ---<yel>--- pin 2 (PTT)
pin 4 (SPK) ---<gn>--- 3,5 mm ear-phone plug inner contact

Cable 15: TS280 with 8-pin DIN-plug

pin 1 (MIC)---
--- pin 1 (MIC)
pin 2 (GND) ---<wh>--- pin 3 (GND)
pin 3 (PTT) ---<yel>--- pin 2 (PTT)
pin 4 (SPK) ---<gn>--- pin 5 (SPK)

Cable 16: TW4000A, TW4100E, DR410, DR510, DR570, DR590, ADI AR446 with 8-pin audio screw-locking line plug and 3,5 mm ear-phone plug jack (35 cm length between MIC and SPK-plug)

pin 1 (MIC)---
--- pin 1 (MIC) near notch
pin 2 (GND) ---<wh>--- pin 7 (GND)
pin 2 (GND) ---<gr>--- pin 8 (GND) (middle pin)
pin 3 (PTT) ---<yel>--- pin 2 (PTT)
pin 4 (SPK) ---<gn>--- 3,5 mm ear phone jack inner contact
pin 2 (GND) ---<bl>--- 3,5 mm ear phone jack outer contact

Cable 17+18: TS140, TS940, TS811, TS711 with 13-pin DIN-plug ("ACC2")

pin 1 (MIC)---
--- pin 11 (MIC, DATA Input)
pin 2 (GND) ---<wh>--- pin 8, 12, 4 (GND)
pin 3 (PTT) ---<yel>--- pin 13 (PTT)
pin 4 (SPK) ---<gn>--- pin 3 (DATA)

Cable 19: TR751E, TS930S, TS430S, TS780, TS950S, with 8-pin audio screw-locking line plug

pin 1 (MIC)---
--- pin 1 (MIC)
pin 2 (GND) ---<wh>--- pin 7 (GND)
pin 3 (PTT) ---<yel>--- pin 2 (PTT)
pin 2 (GND) ---<bl>--- 6.3 mm mono ear phone jack outer contact
pin 4 (SPK) ---<gn>--- 6.3 mm mono ear phone jack inner contact

Cable 20: TR9000 with 6-pin audio screw-locking line plug

pin 1 (MIC)---
--- pin 1 (MIC)
pin 2 (GND) ---<wh>--- pin 6 (GND) (middle pin)
pin 3 (PTT) ---<yel>--- pin 2 (Stby)
pin 2 (GND) ---<bl>--- Speaker plug (ground)
pin 4 (SPK) ---<gn>--- Speaker plug (audio out)

Cable 21: Yaesu FT208R, FT708R with 6-pin mini round plug

pin 1 (MIC)---
--- pin 1 (MIC)
pin 2 (GND) ---<wh>--- pin 4 (GND)
pin 3 (PTT) ---<yel>--- pin 3 (PTT)
pin 4 (SPK) ---<gn>--- pin 2 (SPKR) or 3,5 mm ear phone jack (inner)

Cable 22: Standard C5200ED, C5608 with round 8-pin audio screw-locking line plug

pin 1 (MIC)---
--- pin 1 (MIC)
pin 2 (GND) ---<wh>--- pin 8 (GND)
pin 3 (PTT) ---<yel>--- pin 2 (PTT)
pin 4 (SPK) ---<gn>--- pin 3 (SPKR)

Cable 23: Trio TR2300 with round 4

pin 1 (MIC)---
--- pin 1 (MIC)
pin 2 (GND) ---<wh>--- pin 4 (GND)
pin 3 (PTT) ---<yel>--- pin 2 (PTT)
pin 2 (GND) ---<bl>--- 3,5 mm ear phone outer contact
pin 4 (SPK) ---<gn>--- 3,5 mm ear phone inner contact

Cable 24: Alinco DJ560E, Albrecht RV400 with ear-phone plug jack

pin 1 (MIC)---
--- 2,5 mm stereo ear-phone plug MIC middle contact
pin 2 (GND) ---<wh>--- 2,5 mm stereo ear-phone plug MIC outer contact
pin 2 (GND) ---<bl>--- 3,5 mm ear-phone plug SPKR outer contact
pin 4 (SPK) ---<gn>--- 3,5 mm ear-phone plug SPKR inner contact
solder a 470Ω resistor between pin 3 and pin 1 in DIN-plug
connect 2,5mm stereo ear-phone plug middle and inner contact

Cable 25: Yaesu FT 747 GX (KW) with 8-pin audio screw-locking line plug

pin 1 (MIC)---
--- pin 8 (MIC) middle pin
pin 2 (GND) ---<wh>--- pin 7 (GND) near notch
pin 3 (PTT) ---<yel>--- pin 6 (PTT)
pin 2 (GND) ---<wh>--- 6,3 mm ear-phone plug SPKR outer contact
pin 4 (SPK) ---<gn>--- 6,3 mm ear-phone plug SPKR inner contact

Cable 26: FT4700, FT5200, FT6200, FT7200, FT212RH, FT712RH, FT290 II , FT790RII with 8-pin audio screw-locking line plug

pin 1 (MIC)---
--- pin 8 (MIC)
pin 2 (GND) ---<wh>--- pin 7 (GND)
pin 3 (PTT) ---<yel>--- pin 6 (PTT)
pin 4 (SPK) ---<gn>--- pin 4 (SPKR)
the modification described in FT212 manual is not necessary (Burst/Sq).

Cable 27: FT736R with ear-phone plug jack

pin 1 (MIC)---
--- 3,5 mm stereo ear-phone plug inner contact
pin 2 (GND) ---<wh>--- 3,5 mm stereo ear-phone plug outer contact
pin 4 (SPK) ---<gn>--- 3,5 mm stereo ear-phone plug middle contact
pin 3 (PTT) ---<yel>--- Cynch plug inner contact
pin 2 (GND) ---<bl>--- Cynchplug outer contact

Cable 28: TS711E, TS811E with 8-pin audio screw-locking line plug

pin 1 (MIC)---
--- pin 1 (MIC)
pin 2 (GND) ---<wh>--- pin 7 (MIC GND)
pin 3 (PTT) ---<yel>--- pin 2 (PTT)
pin 2 (GND) ---<bl>--- 6.3 mm mono ear-phone jack outer contact
pin 4 (SPK) ---<gn>--- 6.3 mm mono ear-phone jack inner contact

Cable 29: Standard C55D with 8 pin DIN-plug

pin 1 (MIC)---
--- pin 7 (MIC)
pin 2 (GND) ---<wh>--- Plug-case (GND)
pin 3 (PTT) ---<yel>--- pin 6 (PTT)
pin 4 (SPK) ---<gn>--- pin 5 (SPKR)

Cable 30: Standard SR-C430 with 9 pin mini round plug

pin 1 (MIC)---
--- pin 2 (MIC)
pin 2 (GND) ---<wh>--- pin 1 (GND)
pin 3 (PTT) ---<yel>--- pin 3 (PTT)
pin 4 (SPK) ---<gn>--- pin 7 (SPKR)

Cable 31: AOR Mini 400, AR240 with 6 pin mini round plug

pin 1 (MIC)---
--- pin 6 (MIC) pin 2, 3, 4, 5, 6 count clockwise
pin 2 (GND) ---<wh>--- pin 1 (GND) (widest notch, view from solder side)
pin 3 (PTT) ---<yel>--- pin 2 (PTT)
pin 4 (SPK) ---<gn>--- pin 3 (SPKR) connect with pin 4 and pin 5, intern. MIC-disable

Cable 32: FT767 with 3 cynch plugs

pin 1 (MIC)---
--- Cynch plug 1 inner contact (MIC)
pin 2 (GND) ---<wh>--- Cynch plug 1 outer contact (GND)
pin 3 (PTT) ---<yel>--- Cynch plug 2 inner contact (PTT)
pin 4 (SPK) ---<gn>--- Cynch plug 3 inner contact (SPKR)

Cable 33: IC735, IC820, IC821 with 8-pin DIN plug ACC(1)

pin 1 (MIC)---
--- pin 4 (MOD)
pin 2 (GND) ---<wh>--- pin 2 (GND)
pin 3 (PTT) ---<yel>--- pin 3 (SEND)
pin 4 (SPK) ---<gn>--- pin 5 (9600 Baud) or pin 1 (1200 Mod)

Cable 34: Alinco DJ460E with ear-phone plug jack

pin 1 (MIC)---
--- 2,5 mm stereo ear-phone plug outer contact
pin 2 (GND) ---<wh>--- 2,5 mm stereo ear-phone plug inner contact
pin 2 (GND) ---<bl>--- 3,5 mm ear-phone plug outer contact
pin 4 (SPK) ---<gn>--- 3,5 mm ear-phone plug inner contact
solder a 3,3 k Ω resistor between pin 3 and pin 1 in DIN-plug

Cable 35: Kenwood TM732A/E, TM742 A/E with MJ88 adapter 8-pin. audio screw locking line plug and 3,5 mm ear-phone plug jack

pin 1 (MIC) ---
--- pin 1 (MIC)
pin 2 (GND) ---<wh>--- pin 7 and pin 8
pin 3 (PTT) ---<yel>--- pin 2 (PTT)
pin 2 (GND) ---<bl>--- 3,5 mm ear-phone plug outer contact
pin 4 (SPK) ---<gn>--- 3,5 mm ear-phone plug inner contact

Cable 36: FX440 Ramsey 70cm kit transceiver

pin 1 (MIC) ---
--- pin 1 (MIC)
pin 2 (GND) ---<wh>--- pin 2 (GND)
pin 3 (PTT) ---<yel>--- pin 3 (PTT)
pin 4 (SPK) ---<gn>--- pin 4 (SPK)

Cable 37: ICOM IC2WE, FT10/40/50R and similar with 3,5 mm stereo-ear-phone plug

pin 1 (MIC) ---
--- 3,5 mm stereo plug MIC middle contact (near outer contact)
pin 2 (GND) ---<wh>--- 3,5 mm stereo plug MIC outer contact
pin 4 (SPK) ---<gn>--- 3,5 mm stereo plug MIC inner contact
solder a 2,2 k Ω resistor between pin 3 and pin 1 in DIN-plug

Cable 38: Alinco DJ580 connect according cable 24. Sometimes, the PTT circuit makes problems as the transmitter keys only when PTT is pulled to ground with 470 Ohm or less. Use 220 Ω in this case between pin 1 and 3.

Cable 39: Kenwood TM255/455/451/733/V7E, Yaesu FT8100R, FT847, IC706MK2G with 6-pin mini DIN plug for packet

pin 1 (MIC) ---
--- pin 1 (MIC)
pin 2 (GND) ---<wh>--- pin 2 (GND)
pin 3 (PTT) ---<yel>--- pin 3 (PKS)
pin (SPK) ---<gn>--- pin 5 (PR1) 300 mV 1200 Baud

Problem: the opening at the radio is too narrow, so the connector cannot be inserted correctly. Use ready-made PS/2 keyboard cables and cut the plastic until the connector fits in place.

Cable 40: ICOM IC281 A/H/E, IC481 A/H/E with packet-connection (stereo ear-phone jack 2,5 and 3,5 mm)

pin 1 (MIC) ---
--- 2,5 mm stereo ear phone jack inner (Data Input)
pin 2 (GND) ---<wh>--- 2,5 mm stereo ear phone jack outer (GND)
pin 2 (GND) ---<wh>--- 3,5 mm stereo ear-phone jack outer (GND)
pin 3 (PTT) ---<yel>--- 2,5 mm stereo ear phone jack middle (PTT)
pin 4 (SPK) ---<gn>--- 3,5 mm stereo ear phone jack inner (AF out)

Cable 41: Kenwood TM732, 733, 742 with 8-pin Western plug (mikrophone)

pin 1 (MIC) ---
--- pin 3 (MIC)
pin 2 (GND) ---<wh>--- pin 4 (GND MIC)
pin 2 (GND) ---<wh>--- pin 6 (GND)
pin 3 (PTT) ---<yel>--- pin 5 (PTT)
pin 4 (SPK) ---<gn>--- pin 2 (Audio 100mV)

Cable 51: Stabo, Team TS404, Astracom, Albrecht P1000 with 4-pin audio screw-locking line plug

pin 1 (MIC) ---
--- pin 1 : Modulation
pin 2 (GND) ---<wh>--- pin 2 : GND
pin 3 (PTT) ---<yel>--- pin 4 : TX, PTT
pin 4 (SPK) ---<gn>--- pin 3 : SPKR, 'cold' end of speaker

Note: The loudspeaker is in series with pin 4 (SPKR). So you can hear a weak packet signal. If you don't like this, insert a 3,5 mm mono ear-phone plug in the speaker socket. Solder a 100 Ω resistor between both terminals of the connector (an empty connector would interrupt the path of the audio voltage to the modem)

If you do not want to run the AF output of the radio without load, solder a 100 Ω resistor between pins 2 and 3 in the 4 pin Japan plug.

Alternatively, you can use cable 65 with additional 3,5 mm SPKR ear-phone jack.

Cable 52: President, Kaiser, Danita 1240 with 4-pin audio screw-locking line plug

pin 1 (MIC) ---
--- pin 2 : Modulation
pin 2 (GND) ---<wh>--- pin 1 : GND
pin 3 (PTT) ---<yel>--- pin 3 : TX, PTT
pin 4 (SPK) ---<gn>--- pin 4 : SPKR

Cable 53: Albrecht AE5280, President, Alan (s.a. Cable 69), Stabo XM7082 DTMF, HL1040, XM8082 with 6-pin audio screw-locking line plug. (XM8082 has bad reception quality for packet-radio).

pin 1 (MIC) ---
--- pin 1 : Modulation
pin 2 (GND) ---<wh>--- pin 5 : GND
pin 3 (PTT) ---<yel>--- pin 3 : TX, PTT
pin 4 (SPK) ---<gn>--- pin 2 : SPKR
pin 5 (+12V) ---<rt>--- pin 6 : + 12 V

eventually connect SPKR via 3,5 mm ear-phone jack as the speaker cannot be switched off.
At AE5280, pin 2 is the ground connection of the speaker.

Cable 54: DNT Strato, Scanner, Carat with 5 or 8-pin DIN-plug (7+center pin)

For both sides, a 5 pin DIN connector may be used. Pins 2 and 4 are cross-wired (2 to 4 and 4 to 2), pins 1 and 3 are wired 1:1 (1 to 1 and 3 to 3). So, it doesn't matter which of the two ends is plugged in the modem or in the radio.

pin 1 (MIC) ---
--- pin 1 : MIC
pin 2 (GND) ---<wh>--- pin 4 : GND
pin 3 (PTT) ---<yel>--- pin 3 : PTT
pin 4 (SPK) ---<gn>--- pin 2 : constant Audio
(pin 5 (+12V) ---<red>--- pin 8 (middle pin) : + 12 V)

Cable 55: Kaiser KA 9018 / 40 Giftzweg with 5-pin DIN-plug and 3,5 mm ear-phone plug

pin 1 (MIC) ---
--- pin 3 : Microphone
pin 2 (GND) ---<wh>--- pin 1+4 : GND
pin 3 (PTT) ---<yel>--- pin 2 : PTT
pin 2 (GND) ---<wh>--- 3,5 mm ear phone jack outer (GND)
pin 4 (SPK) ---<gn>--- 3,5 mm ear phone jack inner (SPK)

Cable 56: Danita, Wipe, Zodiac with 5-pin DIN-plug

pin 1 (MIC) ---
--- pin 3 : Microphone
pin 2 (GND) ---<wh>--- pin 2 : GND
pin 3 (PTT) ---<yel>--- pin 1 : PTT
pin 4 (SPK) ---<gn>--- pin 5 : SPKR

Cable 57: Team Memory 5002 with 5-pin audio screw-locking line plug

pin 1 (MIC) ---
--- pin 1 : Microphone
pin 2 (GND) ---<wh>--- pin 2 : GND
pin 3 (PTT) ---<yel>--- pin 4 : PTT
pin 4 (SPK) ---<gn>--- pin 3 : SPKR, cold end of speaker

This type is very rare.

Cable 58: Jefferson RCI 2950 with 6-pin audio screw-locking line plug and 3,5 mm ear-phone plug jack.

pin 1 (MIC) ---
--- pin 2 : Microphone
pin 2 (GND) ---<wh>--- pin 1 : GND
pin 2 (GND) ---<wh>--- 3,5 mm ear-phone jack outer (GND)
pin 3 (PTT) ---<yel>--- pin 3 : PTT
pin 4 (SPK) ---<gn>--- 3,5 mm ear-phone jack inner (SPK)

Cable 59: DNT Zirkon, Saphir, Meteor with 6-pin Western-plug and 3,5 mm ear-phone jack.

pin 1 (MIC) ---
--- contact 6 : Microphone
pin 2 (GND) ---<wh>--- contact 1 : GND
pin 2 (GND) ---<wh>--- 3,5 mm ear-phone jack, outer contact
pin 3 (PTT) ---<yel>--- contact 4 : PTT
pin 4 (SPK) ---<gn>--- 3,5 mm ear-phone jack, inner contact (speaker)

Cable 60: President Lincoln HR 2510, Emperor TS5010 with 5-pin audio screw-locking line plug and 3,5 mm ear-phone

pin 1 (MIC) ---
--- pin 1 : Microphone
pin 2 (GND) ---<wh>--- pin 2 : GND
pin 2 (GND) ---<wh>--- 3,5 mm ear-phone jack, outer contact
pin 3 (PTT) ---<yel>--- pin 3 : PTT
pin 4 (SPK) ---<gn>--- 3,5 mm ear-phone jack, inner contact (speaker)

Cable 61: Multitop (old version) with 6-pin mini-DIN-plug

pin 1 (MIC) ---
--- pin 2 (?) : Microphone
pin 2 (GND) ---<wh>--- pin 1 (?) : GND
pin 3 (PTT) ---<yel>--- pin 4 (?) : PTT
pin 4 (SPK) ---<gn>--- pin 3 (?) : SPKR, cold end of speaker
(please compare to the radio manual)

Cable 62: Multi-Top (LCD-display) with 6-pin mini-DIN-plug

pin 1 (MIC) ---
--- pin 2 (?) : Microphone
 pin 2 (GND) ---<wh>--- pin 1 (?) : GND
 pin 2 (GND) ---<wh>--- 3,5 mm ear-phone plug, outer contact
 pin 3 (PTT) ---<yel>--- pin 4 (?) : PTT
 pin 4 (SPK) ---<gn>--- 3,5 mm ear-phone plug, inner contact (speaker)
 (please compare to the radio manual)

Cable 63: Yaesu with 8-pin audio screw-locking line plug

pin 1 (MIC)---
--- pin 8 (MIC) middle pin
 pin 2 (GND) ---<wh>--- pin 7 (GND) near the notch
 pin 3 (PTT) ---<yel>--- pin 6 (PTT)
 pin 4 (SPK) ---<gn>--- pin 4 (SPKR)

Cable 64: Kenwood with 8-pin audio screw-locking line plug

pin 1 (MIC) ---
--- pin 1 (MIC)
 pin 2 (GND) ---<wh>--- pin 8 (GND) middle pin
 pin 3 (PTT) ---<yel>--- pin 2 (PTT)
 pin 4 (SPK) ---<gn>--- pin 6 (SPKR)

Cable 65: Kaiser KA9040FM, 9050FM, KE9015/40 with 4-pin Mic and 3,5 mm SPKR ear-phone jack

pin 1 (MIC) ---
--- pin 1 : Modulation
 pin 2 (GND) ---<wh>--- pin 2 : GND and 3,5 mm ear-phone jack outer (GND)
 pin 3 (PTT) ---<yel>--- pin 4 : TX, PTT
 pin 4 (SPK) ---<gn>--- 3,5 mm ear -phone jack inner (SPK)

Cable 66: Stabo AE6080, xm6012, twinstar with 8-pin Western-plug

pin 1 (MIC) ---
--- contact 5 : Microphone
 pin 2 (GND) ---<wh>--- contact 4 : GND
 pin 3 (PTT) ---<yel>--- contact 6 : PTT
 pin 4 (SPK) ---<gn>--- contact 7 : Audio, NF
 pin 5 (+12V) ---<rt>--- contact 3 : + 12 V

Cable 67: stabo SH 8000 with 2,5 mm ear-phone (speaker) and 3,5 mm mikroph. stereo jack

pin 1 (MIC) ---
--- 3,5 mm stereo ear-phone jack middle contact : Microphone
 pin 2 (GND) ---<wh>--- 3,5 mm stereo ear-phone jack outer contact : GND
 pin 2 (GND) ---<wh>--- 2,5 mm ear-phone jack, outer contact : GND
 pin 3 (PTT) ---<yel>--- 3,5 mm stereo ear-phone jack, inner contact : PTT
 pin 4 (SPK) ---<gn>--- 2,5 mm ear-phone jack, inner contact (speaker)

Cable 68: Conrad C-mobil with 3,5 mm speaker jack and 8-pin DIN-plug (50cm distance between sockets)

pin 1 (MIC) ---
--- pin 8: Microphone
 pin 2 (GND) ---<wh>--- pin 1: GND
 pin 3 (PTT) ---<yel>--- pin 7: PTT
 pin 2 (GND) ---<wh>--- 3,5 mm ear-phone jack outer contact : GND
 pin 4 (SPK) ---<gn>--- 3,5 mm ear-phone jack inner contact (speaker)

Cable 69: Alan 48 plus D80 with 6--pin audio screw-locking line plug and 3,5 mm ear-phone jack (see cable 53)

pin 1 (MIC) ---
--- pin 1 : Modulation
 pin 2 (GND) ---<wh>--- pin 5 : GND and 3,5 mm ear-phone jack outer contact (GND)
 pin 3 (PTT) ---<yel>--- pin 3 : TX, PTT
 pin 4 (SPK) ---<gn>--- 3,5 mm ear-phone jack inner contact (speaker)

Cable 70: Conrad CV2000, DNT Formel 1 etc. with 5-pin DIN-plug

pin 1 (MIC) ---
--- pin 4 : Microphone
 pin 2 (GND) ---<wh>--- pin 2 : GND
 pin 3 (PTT) ---<yel>--- pin 3 : PTT
 pin 4 (SPK) ---<gn>--- pin 5 : Audio, SPKR

Cable 71: BOS radios (police, fire brigade, ambulance) FuG (e.g. FuG 8b-1), KF (e.g. KF802) etc. with 10-pin NF 'NATO-headset' connector (UG77/U). PTT is switched to +12 volt. A PNP-transistor and 2x 10 kΩ are required. These parts can be mounted inside the UG-plug.

pin 1 (MIC) ---
--- contact F (microphone A)
 pin 2 (GND) ---<wh>--- contact H (mikrophone B, ground) and contact D (ground speaker)
 pin 4 (SPK) ---<gn>--- contact E (audio speaker)
 pin 3 (PTT) ---<yel>--- R1 pin A
 connect R2 pin A with emitter and contact B (12 V). Connect collector with contact C (PTT);
 connect R1 pin B with R2 pin B and basis of transistor.

Cable 72: ICOM IC706 MK II with 8-pin Western-plug

pin 1 (MIC) ---
--- pin 6 Mic
 pin 2 (GND) ---<wh>--- pin 5 and GND
 pin 3 (PTT) ---<yel>--- pin 4 PTT
 pin 4 (SPK) ---<gn>--- pin 3 AF out

Cable 73: Alinco DR605T/E with 8-pin. Western 3,5mm mono-ear-phone plug

pin 1 (MIC) ---
--- Western pin 6
 pin 2 (GND) ---<wh>--- Western pin 7 and pin 5 and 3,5 mm mono outer contact
 pin 3 (PTT) ---<yel>--- Western pin 4
 pin 4 (SPK) ---<gn>--- 3,5 mm mono inner contact

Cable 74: SYMEK TRX4S Data transceiver with 6-pin mini DIN Plug (NARROW mode)

pin 1 (MIC) ---
--- pin 1 (Modulation, Data in)
 pin 2 (GND) ---<wh>--- pin 2 (GND)
 pin 3 (PTT) ---<yel>--- pin 3 (PTT)
 pin (SPK) ---<gn>--- pin 4 (Demodulator, Data out)

Cable 75: Stabo XM3082 with 4-pin audio screw-locking line plug

pin 1 (MIC) ---
--- pin 1 MIC
 pin 2 (GND) ---<wh>--- Plug case
 pin 3 (PTT) ---<yel>--- pin 4 PTT
 pin 4 (SPK) ---<gn>--- pin 3 SPK (found out by trying a sample transceiver)

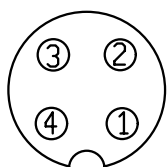
Cable 76: Stabo XF9082 Heimstation with 9-pin Sub-D Plug (female connector at the cable!) or 5-pin DIN

pin 1 (MIC) ---
--- pin 7 : Microphone
 pin 2 (GND) ---<wh>--- pin 5 : GND
 pin 3 (PTT) ---<yel>--- pin 8 : PTT
 pin 4 (SPK) ---<gn>--- pin 6 : constant audio output
 pin 5 (+12V) ---<rt>--- pin 4 : 10-12 V 0,1 A (Pins 1, 2, 3 and 9 not connected)
 Simply use a 1:1 wired 5 pin DIN cable.

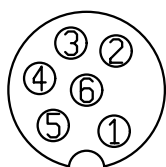
Cable 77: DNT speedy with 5-pin DIN-plug (similar to cable 70)

pin 1 (MIC) ---
--- pin 4 : Microphone
 pin 2 (GND) ---<wh>--- pin 1 : GND
 pin 3 (PTT) ---<yel>--- pin 3 : PTT
 pin 4 (SPK) ---<gn>--- pin 5 : Audio, SPKR

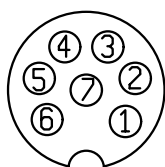
Connectors for radio and modem IMPORTANT: all connectors are shown viewing from the cable side. The pictures show the view to the socket of the radio.



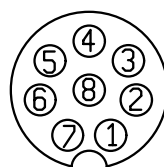
Japan 4-pin



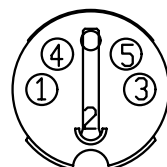
Japan 6-pin



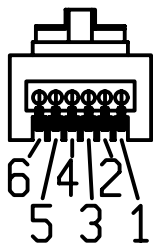
Japan 7-pin



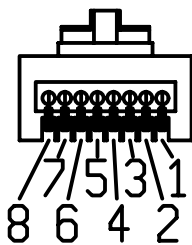
Japan 8-pin



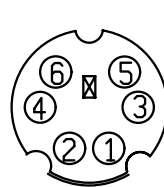
DIN 5-pin



Western 6-pin

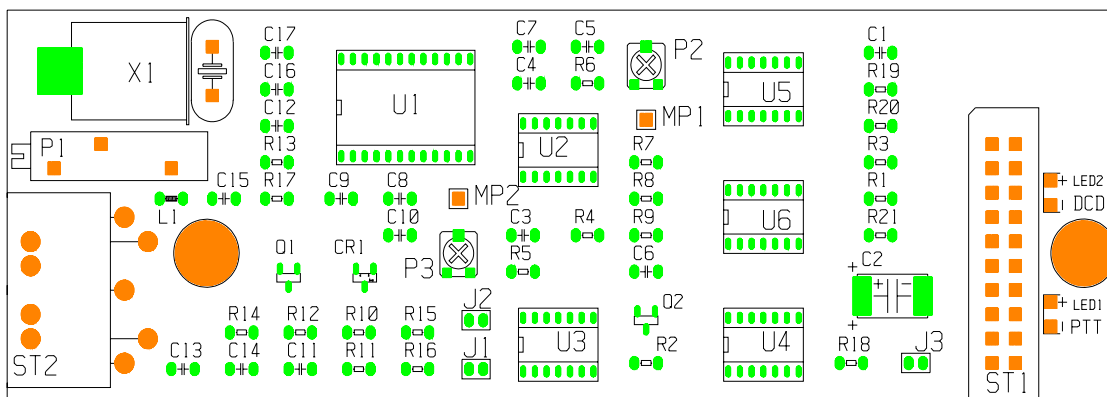


Western 8-pin



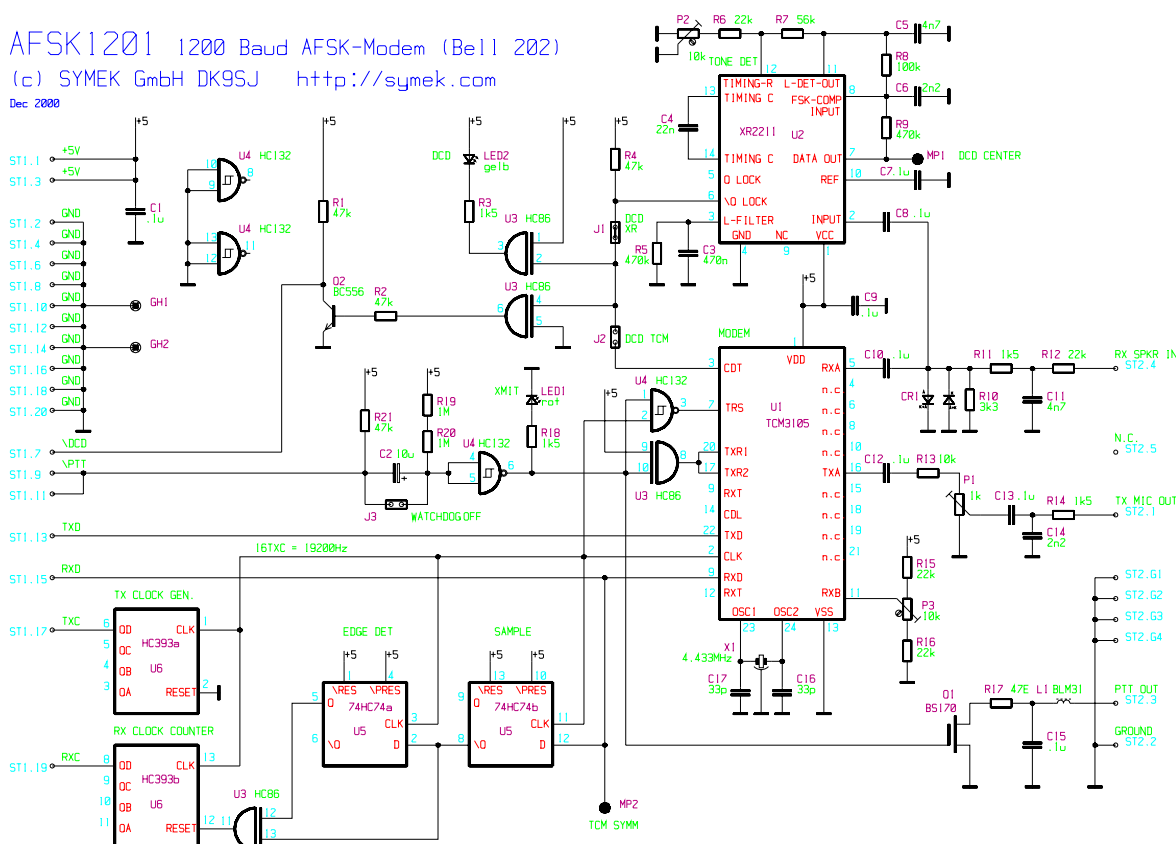
mini-DIN 6-pin

Modem AFSK-1201-B (component location)



Schematics Modem AFSK1201-B

AFSK1201 1200 Baud AFSK-Modem (Bell 202)
 (c) SYMEK GmbH DK9SJ <http://symek.com>
 Dec 2000



Index

- | | | | |
|-----------------------|---------------------|--------------------------|---------------------|
| AF-output 4 | DCD 3 | MIC (pin 1) 4 | schematics 14 |
| baud (Bd) 2 | DCD Data Carrier | mikrophone 4 | SPK (pin 4) 4 |
| bit-rate 2 | Detect 3 | power supply 2 | test points 3 |
| carrier detect 3 | digipeater 3 | printed circuit board 14 | TRX4S data |
| CB radios 5 | digital interface 3 | PTT 4 | transceiver 13 |
| center frequency 3 | DIN-connector 4 | PTT Push to talk 3 | TXC Transmit Clk 3 |
| component location 14 | FET transistor 4 | PTT-switch 4 | TXD Transmit Data 3 |
| connection cables 5 | fullduplex 3 | radio to AFSK1201 4 | volume 4 |
| copyright 2 | Jumpers 3 | RXC Receive Clock 3 | watchdog |
| CTS Clear to Send 3 | loudspeaker 4 | RXD Receive Data 3 | |

Users Manual AFSK-Modem AFSK1201-B
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