

# **TELEPHONE HYBRID-1**

**USER  
MANUAL  
V.1.08**



Dear Customer,

Thank you for choosing the Telephone Hybrid-1.

This time you are not faced with a huge manual because it is simply not necessary because of the natural recognition of all functions on the user interface.

All functions are self-explanatory and you will certainly appreciate the ergonomics of this design.

We are confident that you will be using the Telephone Hybrid-1 for many years to come, and wish you a lot of success.

With kind regards,

Duco de Rijk  
md

D&R ELECTRONICA B.V.  
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# What is a Telephone hybrid?

Telephone hybrids provide the interface between professional audio equipment and the public telephone network. They provide protection for your equipment and the public telephone lines, allowing for varying line signals and line conditions. Automatically canceling out the unwanted signal they also facilitate two-way communication down a single telephone line.

Each hybrid has a telephone line connection, a handset connection and separate connectors for audio input and output from a broadcast mixer, or other professional audio source.

A large proportion of D&R hybrids are used in radio and television broadcasting applications allowing external callers to be connected to the studio mixing console. Most of the other units are supplied to communication operations allowing extremely effective conversion between 4-wire audio circuits and standard telephone lines.

## Specs:

Output: balanced mic level - 30db.

Input: Line level 0 dBu balanced.

R/C balance: fully adjustable

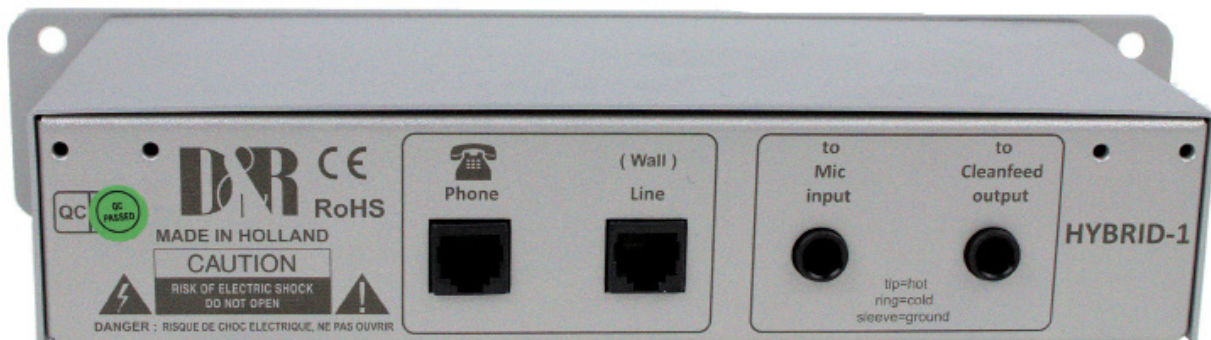
Separation: more than 30db.

## Front panel lay-out



- C-BALANCE** : 12 pole rotary switch to select the optimum side tone attenuation.
- R-BALANCE** : Internal potentiometer to adjust for optimum side tone attenuation.
- CONNECT** : Connect calls to the mixer and disconnect calls from the telephone line.

(without interrupting the phone line connection) **Back panel lay-out**



- PHONE** : RJ-11 connector to connect with a handset.
- LINE (wall)** : RJ-11 connector to connect with the public telephone network.
- TO MIC INPUT** : Stereo jack output to be connected to Mic input of the mixer.
- TO CLEANFEED OUTPUT** : Stereo jack input to be connected to a Mix Minus/Clean feed (N-1) output of the mixer.

# USER MANUAL

The D&R Telephone Hybrid-1 is designed to create an easy connection between the public telephone line and your studio equipment.

The Hybrid has to be inserted between your telephone and the telephone line. Connect the two wires of the telephone line's wall unit to the RJ-11 connector labelled LINE (wall) and connect the telephone appliance itself to the Hybrid's phone output on the RJ-11 connector labelled PHONE. This can be done with standard available cable assemblies from your local phone shop.

Now the Hybrid is interfaced (fully balanced) between your telephone appliance and its connection to the outside world. The hybrid can now split the send and return signals.

Now connect the hybrid's balanced audio input labelled TO CLEANFEED OUTPUT to a (preferable) balanced output of around +4dBu. This output has to be the mix of all signals except the signal coming from the hybrid itself to avoid feedback.

An Aux output on your mixer will do as well as long as you keep the Aux send of the channel you return the phone signal on closed (all other Aux sends need to be open), or in broadcast mixers a clean-feed is the best.

The Hybrid-1 stereo jack connector labelled TO MIC INPUT has to be connected to a Mic level input of your mixing console.

NOTE: The output of the Hybrid-1 has to be connected to a Mic input of the mixing console, because the outgoing level is very low because of the passive circuitry inside the Hybrid.

## WIRING SCHEME

<b>PHONE</b>	: RJ-11 connector to connect with a handset.
<b>LINE (wall)</b>	: RJ-11 connector to connect with the public telephone network.
<b>TO MIC INPUT</b>	: Stereo jack output to be connected to mic input of the mixer.
<b>TO CLEANFEED OUTPUT</b>	: Stereo jack input to be connected to Mix Minus/Clean feed (N-1)output of the mixer.

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## WIRING OF BOTH PHONE AND LINE RJ-11 CONNECTORS

PHONE/WALL RJ-11	FUNCTION	CONNECTION
Pin 1:	n.c.	
Pin 2	A (telephone line)	In/out
Pin 3	B (telephone line)	In/out
Pin 4	n.c.	

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## WIRING OF AUDIO IN AND OUTPUTS

STEREO JACK TO MIC INPUT	FUNCTION	CONNECTION
Screen	Screen (ground)	Audio ground
Tip	Phase (hot)	Audio +
Ring	Non-phase (cold)	Audio -

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STEREO JACK TO Clean feed output	FUNCTION	CONNECTION
Screen	Screen (ground)	Audio ground
Tip	Phase (hot)	Audio +
Ring	Non-phase (cold)	Audio -

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# SPECIFICATIONS AUDIO

## TO CLEAN FEED OUTPUT

Impedance	: 10k Ohm, electronically balanced
Common mode rejection	: >30dB
Maximum input level	: +26dBu
Nominal input level	: +4 dBu
Frequency response	: 20Hz – 15kHz
Connectors	: STEREO JACK

## TO MIC INPUT

Impedance	: < 50 Ohm, electronically balanced
Common mode rejection	: >30dB
Maximum output level	: -20dBu
Nominal output level	: -30dBu
Bandwidth to telephone line	: 250Hz – 4kHz, -3dB ref 1 kHz
Telephone line impedance	: Nominally 600 ohm
Telephone line impedance range	: 300 ohm to 1500 ohm
Connectors	: STEREO JACK

## GENERAL

Distortion	: Less than 0.1% (0 dBu out)
Power supply	: none (passive)
Power consumption	: none
Dimensions	: 1 HE front panel: 482 x 44 mm : Frame: 240 x 44 x 175 mm (width x height x depth)
Weight	: 1.5 kg net including packing

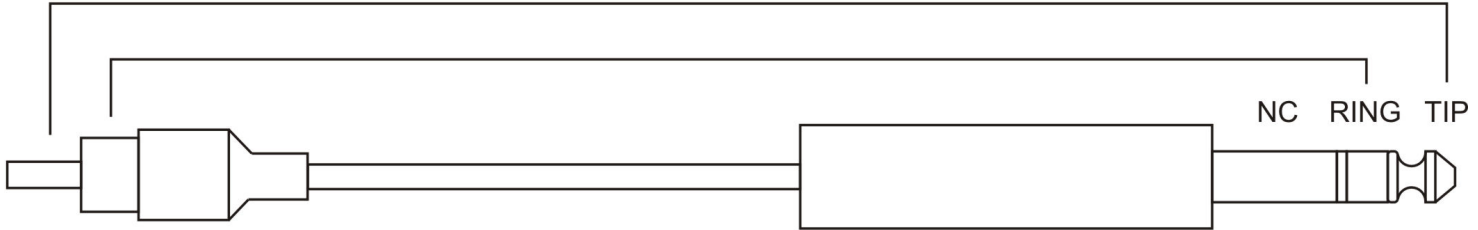
## PHONE CONNECTIONS (POT)

PHONE	: RJ-11 phone connectors
WALL (line)	: RJ-11 phone connectors

# AUDIO CONNECTIONS TELEPHONE HYBRID TO AIRMATE

## AIRMATE

## TELEPHONE HYBRID



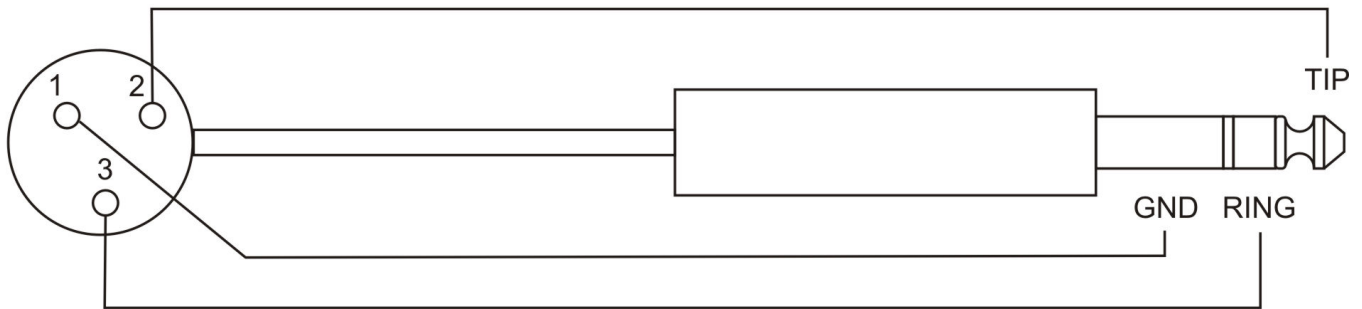
**From Cinch connector  
of the Clean feed output  
of the AIRMATE**

(Cleanfeed output could also be an AUX send output)

**Connect  
"To Clean feed output"  
of the HYBRID-1**

## AIRMATE channel 8

## TELEPHONE HYBRID



**Connect to  
MIC INPUT  
of your mixer**

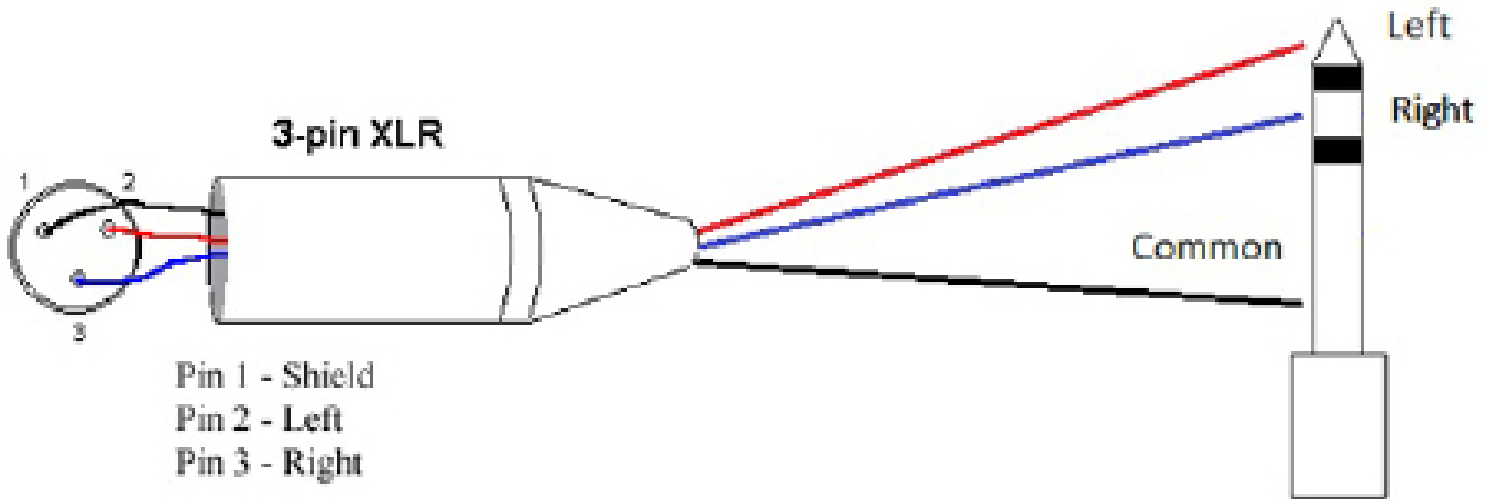
**Connect to  
" TO MIC INPUT"  
of HYBRID-1**

# AUDIO CONNECTIONS TELEPHONE HYBRID TO ANOTHER MIXER

In case you are not working with a D&R mixer the connections are pretty much the same.

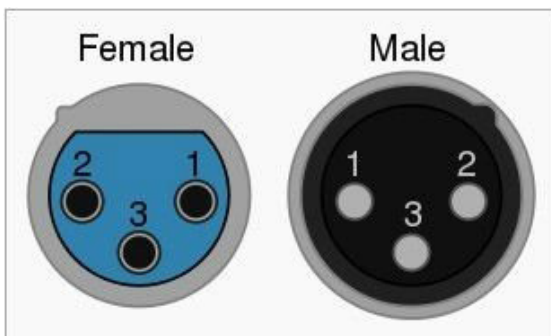
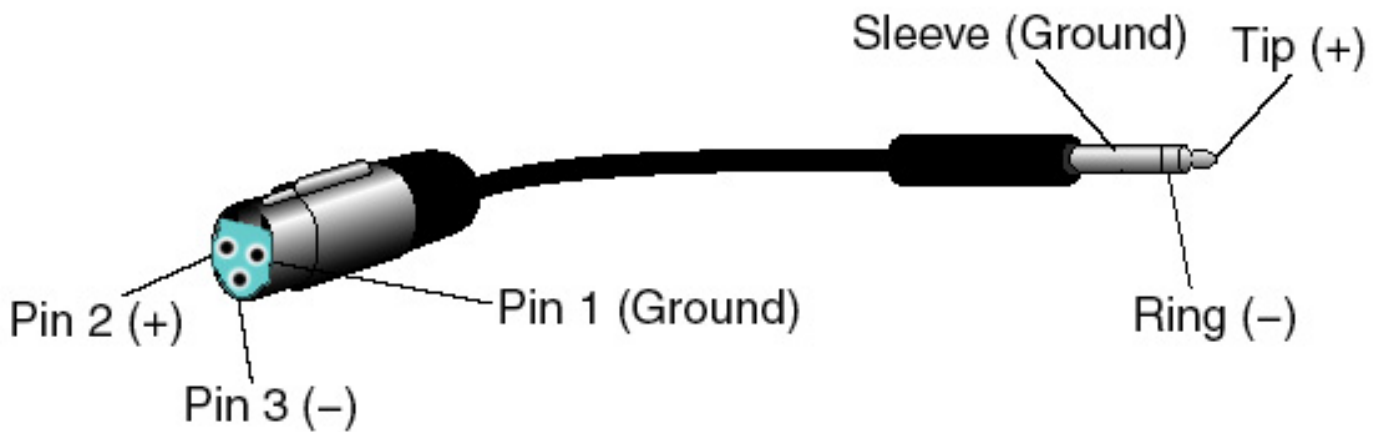
1. Clean feed output or AUX output to the mixer must be connected to "TO CLEAN FEED OUTPUT" of the Hybrid.
2. Mic input of the mixer must be connected to "TO MIC INPUT" of the Hybrid.

As the Hybrid-1 is a passive unit signal loss is to be expected so drive it with a maximum signal and connect the return telephone signal always to a mic input of your mixer.!



Above you see the XLR connections if your mixer has balanced or unbalanced XLR type of connectors on the mixer side. In case you have an unbalanced clean feed or you use an AUX output be sure that pin-3 is also grounded on the XLR side of the cable. This is for both male and female XLR connectors.

The pinning number is the same on both XLR type of connectors.

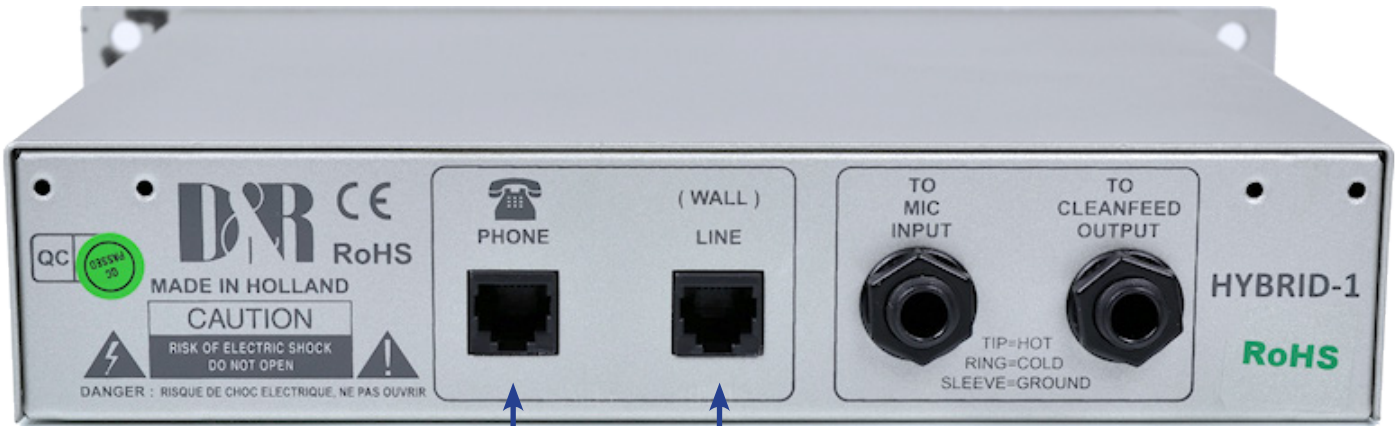


See mirrored pinning numbers in Male and Female XLR's below

Pin1= ground  
Pin2 =Hot  
Pin3=Cold

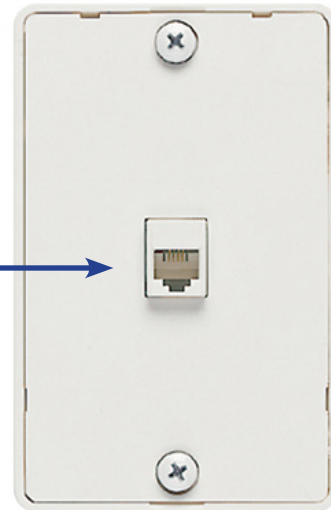


# TELEPHONE CONNECTIONS TO TELEPHONE HYBRID



telephone set to dial and pick up calls

wall outlet from phone company



RJ11 type of cable to do the wiring in between telephone set and the mixer and between the wall connector outlet from phone company and the Hybrid-1





## SETTING UP PROCEDURE

Connect a telephone appliance at the back of the Telephone Hybrid-1 (most left RJ11 connector) and connect the (wall) phone line RJ11 connector to the "wall". Now dial the caller to whom you want to talk.

If this connection is made you can connect the caller to the mixing console by pushing the connect switch. Now listen by means of a PFL (CUE) switch on your mixer to the caller and adjust, while talking, the C and R ADJUST (balance) so that the outgoing signal (your voice) is best attenuated.

A practical start is to put the C adjust in its mid (12 o'clock) position and the R adjust also on its mid position. Carefully adjusting afterwards can be realized by slowly adjusting the R adjust for optimum attenuation. Try the R adjust for various C settings and choose the combination with the best attenuation. This is the basic setting for most of your calls, because the line balancing to your own telephone station has to be performed one time only, when no changes are made to the telephone system in your place. The maximum attenuation will be around 22 to 26 dB.

The function of the "Connect" switch is to connect the hybrid to the telephone line instead of the phone itself (which is now switched off). The led indicates that a connection has been made.

# Declaration of Conformity

## acc to ISO/IEC leidraad 22 en EN 45014

Name Manufacturer D&R Electronica b.v.  
Address Manufacturer Rijnkade 15B, 1382 GS Weesp,  
The Netherlands

declares that the product

Name product TELEPHONE HYBRID-1  
Model number HYBRID  
Product options All

Complies with the following product specifications:

Security EN 60950: 1988 +A1, A2

EMC: CISPR-22: 1985 / EN 55022: 1988 klasse B (\*)  
EN 50082-1: 1992  
IEC 801-2:1991 / prEN 55024-2:1992 - 3kV CD, 8kV AD  
IEC 801-3:1984 / prEN 55024-3:1991 - 3 V/m  
IEC 801-4:1988 / prEN 55024-4:1992 - 0.5kV signal cables,  
1 kV power cables.

Additional info:

The product complies herewith to the following rules

Low voltage 73 / 23 / EEG  
EMC-rules 89 / 336 / EEG.

(\*) The product has been tested in normal users conditions.

## PRODUCT SAFETY

This product is manufactured with the highest standards and is double checked in our quality control department for reliability in the "HIGH VOLTAGE" section.

### CAUTION

Never remove any panels, or open this equipment. No user serviceable parts inside. Equipment power supply must be grounded at all times.

Only use this product as described, in user manual or brochure.

Do not operate this equipment in high humidity or expose it to water or other liquids. Check the AC power supply cable to assure secure contact.

Have your equipment checked yearly by a qualified dealer service center.

Hazardous electrical shock can be avoided by carefully following the above rules.

### PLEASE READ THE FOLLOWING INFORMATION

Especially in sound equipment on stage the following information is essential to know.

An electrical shock is caused by voltage and current, actually it is the current that causes the shock. In practice the higher the voltage the higher the current will be and the higher the shock. But there is another thing to consider and it is resistance.

When the resistance in Ohms is high between two poles, the current will be low and vice versa. All three of these; voltage, current, and resistance are important in determining the effect of an electrical shock.

However, the severity of a shock primarily determined by the amount of current flowing through a person.

A person can feel a shock because the muscles in a body respond to electrical current and because the heart is a muscle it can affect, when the current is high enough.

Current can also be fatal when it causes the chest muscles to contract and stop breathing. At what potential is current dangerous. Well the first feeling of current is a tingle at 0.001 Amp of current. The current between 0.1 Amp and 0.2 Amp is fatal.

Imagine that your home fuses of 20 Amp can handle 200 times more current than is necessary to kill. How does resistance affect the shock a person feels.

A typical resistance between one hand to the other in "dry" condition could well over 100,000 Ohm.

If you are playing on stage your body is perspiring extensively and your body resistance is lowered by more than 50%. This is a situation in which current can easily flow.

Current will flow when there is a difference in ground potential between equipment on stage and in the P.A. system.

Please do check if there is any potential between the housing of the mikes and the guitar synth amps, which will be linked by your body on stage. Imagine, a guitar in your hand and your lips close to the mike! A ground potential difference of above 10 volts is not unusual, in improperly wired buildings it can possibly be as high as 240 volts.

Although removing the ground wire sometimes cures a system hum, it will create a very hazardous situation for the performing musician. Always earth all your equipment by the grounding pin in your mains plug.

Hum loops should be only cured by proper wiring and isolation input/output transformers.

Replace fuses always with the same type and rating after the equipment has been turned off and unplugged.

If the fuse blows again you have an equipment failure, do not use it again and return it to your dealer for repair.

And last but not least be careful not to touch a person being shocked as you, yourself could also be shocked.

Once removed from the shock, have someone send for medical help immediately

**Always keep the above mentioned information in mind when using electrically powered equipment.**

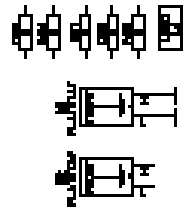
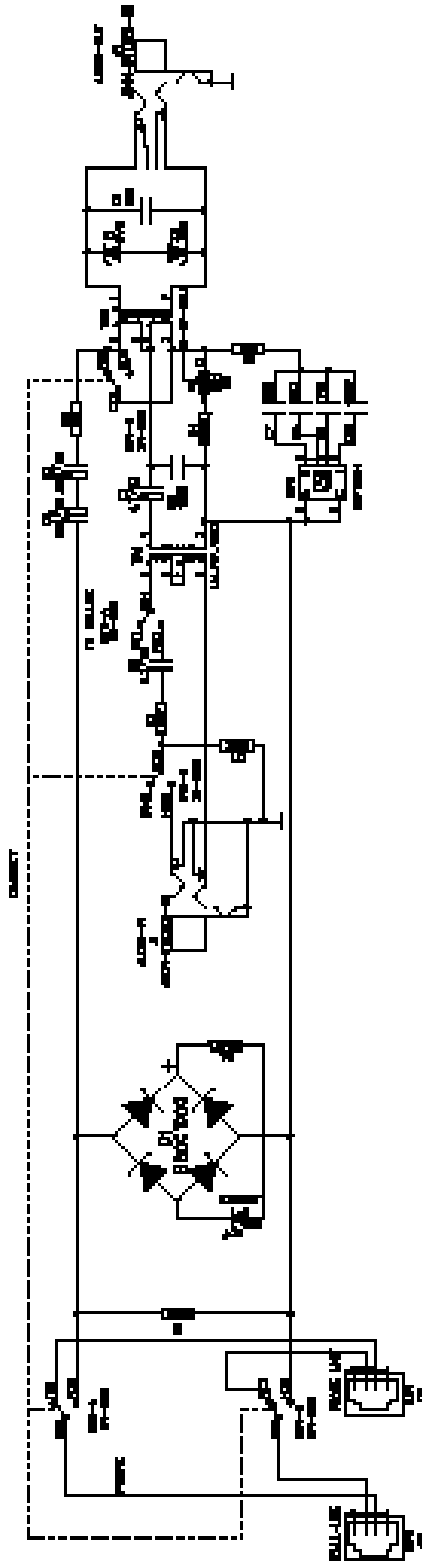
# TELEPHONE HYBRID SERVICE MANUAL


Date: 07-12-2011 [ [16:17] BILL OF MATERIAL

D & R Electronica Weesp BV ( SERVICE-MANUAL )

Comp: 60898508 Telephone Hybrid-1g 9.5"

Article code	Description	Quantity	Unit
10250345	Bridge rectifier B80C1000 (round)	1.0000	st
10400234	Condensator ker 680p R2.5	1.0000	st
10401249	Condensator poly 3n3 R5.0	1.0000	st
10401251	Condensator poly 6n8 R5.0	1.0000	st
10400278	Condensator poly 8n2 R5.0	1.0000	st
10400280	Elco 2.2uF / 50V radiaal R5.0	1.0000	st
10400293	Elco 220uF / 63V radiaal R5.0	2.0000	st
10400281	Elco 4.7uF / 50V radiaal R5.0	1.0000	st
10600432	Jack chassis break	2.0000	st
10600445	Conn Chass 805-D 4p (RJ11)	2.000	st
10300164	Trimmer 1KA lin	1.0000	st
10200530	PCB Telephone-hybrid-G	1.0000	st
10550400	Switch Alps 2p-ns (2 x om)	1.0000	st
10550963	Switch Alps 4p-sh (4 x om)	1.0000	st
10550195	Switch NFDR16H Nikkai	1.0000	st
10950018	Transformer LM-NP-1003-B (PTT line)	2.0000	st
10350517	Resistor 0E 5% 1/4W	1.0000	st
10350718	Resistor 120E 5% 1/4W	1.0000	st
10350792	Resistor 604E 1% 1/4W	2.0000	st
10350728	Resistor 820E 5% 1/4W	1.0000	st
10250351	Zenerdiode 5V6 / 400mW	2.0000	st
10700631	Cap 11.0mm rond zwart	1.0000	st
10700665	cap 14.7mm (12.7x11.3)gat	1.0000	st
10700975	Tape 12mm dun	20.0000	cm
10100371	Front 9.5" Telephonehybrid/E	1.0000	st
10500084	Isolation panel 9.5" randapp.PVC	1.000	st
10600436	Jack Nut	4.0000	st
10700685	Washer M 10 potmeter dun	2.0000	st
10150093	Frame 9.5" 1HE version D	1.0000	st
10450251	Knob Pushbutton 3.3 black square	1.0000	st
10450010	Pushbutton CS12 Black	1.0000	st
10250387	Led 3mm red SLR-03A510-020	1.0000	st
20850531	PCB inserted Telephone hybrid	1.0000	st
10700790	Taptite M3x6 verzkop/pozidr/zw	4.0000	st
10800924	Packaging 9.5"	1.0000	st
10800956	Foamblock 9.5"	2.0000	st



 <b>D&amp;R</b> Electronics B.V. Blijkste 120 1105 BX The Netherlands phone: 020-661-1000 fax: 020-661-1001		TITLE: WORK Date: 3-11-2003 Sheet: 1 of 1 Scale: 0.1:1
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