



FSG 5W

**VHF/AM WATERPROOF
HANDHELD TRANSCEIVER**

Operation Manual

*Before operating the Transceiver,
please read this manual thoroughly!*

Keep for future use!

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Book Descriptions:

Dittel Fsg 5 Manual

If anything is missing or damaged, contact the dealer from whom you purchased the camera. Digital camera Strap FSG 90 System Airband Transceiver Page 2 November 2000 W. Dittel GmbH WARRANTY COPYRIGHT SERVICE INFORMATION Warranty The details and data in this operators manual correspond to the respective state of technology on the day of printing. PARTICULAR REMARKS TO FSG 90X TRANSMITTER MODULATION. 15. 3.5 Manual as a RECORD OF REVISIONS. Revision. Dittel. Reason Click and View Funke Avionics Walter Dittel F10003 Compatible Items, Primary or OEM Accessories, Options Dittel FSG 71M 760 CHANNEL VHF COM AIRBAND TRANSCEIVER In mid2016, TQ took over the avionics branch of Dittel Avionik, Landsberg am Lech. Download the manual. Development of momentfree balancing heads and more compact designs. 2000 Intr. Before installing and operating the transceiver, Please observe the Safety Information! Keep for further use! Document No. ArticleNo. Date of Issue Avionics Division Airband Transceiver. W. Dittel GmbH. Warranty Copyright Service. Warranty. The details and data in this operators manual correspond to the respective We reserve our right to change Walter Dittel GmbH takes no guarantee for these documents with respect to Warrantor carry the standard warranty 12 month of the manufacturer This warranty does not cover equipment which has been This warranty shall not extend to incidental or consequential damages arising Copyright 1998 Walter Dittel GmbH. All rights reserved. This document contains proprietary information and such Walter Dittel GmbH, Luftfahrtgeraetebau, D86899 Landsberg am Lech. Germany. In this document no mention is made of patents, trademark rights, or other The absence Service. The information in this Operators Manual does not profess to include all the Should any unusual problem arise or further information be desired, please D86899 Landsberg am Lech, Germany. Subject to technical changes. Page. Printed in Germany Table of Content. W. Dittel GmbH. Table of Content. <http://kleiberit.ru/files/canon-eos-400d-manual-free.xml>

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Page. Warranty Copyright Service. 2. Table of Content. 3. List of Illustrations. 5. Abbreviations. 6. Section 1, Safety Information. 7 Section 2, General Description. 9 Section 3, Installation. 17 Compass deviation. 20. Antenna installation. 23. Airborne wiring. 24 General recommendations. 24. Microphone Connection. 28. Intercom IC. 28. AF External Operation. 29. Lighting the Frequency Display. 29. Connection to a 28 Vdc airborne system. 30. Postinstallation Check. 30 Ground checks with engine running. 30. November 2000. Page Table of Content. W. Dittel GmbH. Table of Content. Page. Section 4, Functional Description. 33 Section 5, Setup Procedure. 39 Adjusting the Intercom volume. 42. Adjusting the Sidetone volume. 43. Adjusting the headset volume. 43. Deleting occupied channel memories. 44. Selecting CHANNEL MODE ONLY or NO RESTRICTION. 45. Entering a password. 46. Reset. 47. Section 6, Operating Instruction. 49 Page. November 2000 Table of Content. W. Dittel GmbH. Table of Content. Page. Appendix A, Technical Summary. 57. A1 General. 57. A2 Dimensions, Weight, Fuses. 58. A3 Approvals. 58. A4 Receiver Characteristics. 59. A5 Transmitter Characteristics. 61. Appendix B, Environmental Performance Classification. 62. Appendix C, ICAO Frequency Channel pairing plan for combined. Appendix D, Certificates. 64. List of Illustrations. Fig. Page Deviation of a compass by an operating FSG 90FX, dependent on FSG 90FX, Dimensions, Installation Drawing. 21 Hookup Diagram using wire harness F10189, 12 dynamic microphones. 25. Hookup Diagram using wire harness F10190, Operators Controls and Indicators. 33. November 2000. Page Abbreviations. W. Dittel GmbH. Abbreviations. Aircraft Article Number DITTEL Nanowatt 109Ah.

Ampere hour Assy. Assembly Picowatt 1012 Counterclockwise turn left Effective value root mean Clockwise turn right Decibel Diameter. Rx D. Receive data Signal to Noise Ratio Tx D. Transmit data Vdc. Volts, direct current Watt. Ohm. Degrees Centigrade. <http://www.harteron.ee/userfiles/canon-eos-400d-digital-camera-manual.xml>

Degrees Fahrenheit Acceleration due to gravity Hz. Hertz Kilohertz Modulation Milliampere MHz. Megahertz Milliwatt. Page. November 2000 W. Dittel GmbH. Section 1. Safety Information. Every radio, when transmitting, radiates energy into the atmosphere that may, under All users of our radios should be Do not operate this radio in an explosive atmosphere petroleum fuels, During normal use, the radio will subject you to radio frequency energy substantially TO ENSURE PERSONAL SAFETY, please observe the following simple rules Always operate. Assure appropriate It should also be noticed that the use of a Regulations in certain countries. Transmit and receive Increasing speaking levels while the lips are facing the November 2000. Page W. Dittel GmbH Therefore, observe while transmitting the This TX symbol must disappear After 2 minutes continuous TX the builtin transmit time Then, the whole display warns by continuous flashing. Refer to appropriate hints in Investigate the cause. In this manual the following symbols are used Failing to observe the note Failing to observe the note may Failing to observe the note. Page. November 2000 W. Dittel GmbH. Section 2 Introduction. This installation and operating manual IM 034.00 contains instructions and descriptions Dittel GmbH, Luftfahrtgeraetebau, D86899 Landsberg, Germany. The maintenance manual MRM 034.00 contains detailed circuit description, repair This manual refers to 2 out of 8 models available up to now. The equipment is well suited for operation in powered aircraft and helicopter with Ultra low power consumption in conjunction with extremely wide DC supply voltage November 2000. Page Brief Description. Both radios out of the FSG 90F System are miniaturized, lightweight, panel mounted Case dimensions of all models will fit into a standard ARINC NORM rectangular opening Depth including All control and display elements are located on the front panel.

Connections to the SETUP information are all indicated at a twoline Liquid Crystal Display LCD, can be Three display modes are user selectable. Active channel name or frequency, associated preset channel. With the Dual Mode models FSG 90F and FSG 90FH1, up to 99 channel memories in After change to the other Preset channel memories remain available also after manual or automatic poweroff. The nonvolatile channel memories of the FSG 90FX can easily reprogrammed also Deleting channel memories is only possible during SETUP. For ground applications, limitation to use preset channels only can be determined in Both Transmit and Receive use the same digital frequency synthesizer and one The dual Superhet receiver offers very high immunity against inband and outofband An audio low pass filter for areas using Climax operation in 25 kHz spacing is The solid state transmitter is wideband tuned from 118 to 137 MHz and delivers at least Page W. Dittel GmbH A keyed transmitter is indicated by a transmit symbol at the LC display. Two independent microphone inputs separate pins allow universal accessory Dynamic microphones. The microphone inputs may also be continuously activated. This allows during Receive A separate AF input allows interconnection of external audio sources especially in This external. AF OFF function may be selected in SETUP. This reduces the standby current In aircraft without onboard electric power generation system UL, Glider etc., operation The DC supply voltage is monitored continuously while the radio is ON. When supply Below 8.5 to 9.5 Vdc, the FSG 90FX turns OFF itself automatically, and will resume A voice processor is incorporated to achieve identical acoustic voice quality during. Transmit and Receive, as well as Audio Leveling in Receive, and in addition prevents Usual testing employs The radios are equipped with a time out timer. This avoids blocked channel after 2 Should the malfunction continue the.

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FSG 90FX is ready for another 2 minutes transmission period when turning OFF and. ON again e.g.

for emergency transmissions. The transmitter blocking feature avoids transmission on a busy channel. TransmitterNovember 2000. PageSystem and Type Approval InformationThis also includes Immunity according to ICAO ANNEX 10 against FM Broadcast. Interference. This also includes fulfillment of specific audio filtering required in areas with CLIMAXReg TP No. A132937J, stringent German Type Approval requirements Reg TPDFS Deutsche Flugsicherung No.BZT No. B132705J, CE Conformity,PageW. Dittel GmbHDepending on national regulations,Authorities, using suitable application forms.Description. Walter Dittel. Article number. Operation manual, Operating instructions, Warranty card to coverPageDescription. Page. W. Dittel GmbH. Article no. Connector kit, SUBD 25pin, incl.W. Dittel GmbHTechnology demand after installation completion proper acousticsTherefore, please do not use low performance acoustics accessories.Essential requirement isOther grounds for. DC input and output, speaker, phone, PTT and external AF may beSimilar requirements are applicable for headphone characteristics.Verify this effects possibleNovember 2000. PageW. Dittel GmbHW. Dittel GmbH. Section 3General. This section contains instructions and suggestions to be considered before installing theClose adherence to these suggestions will assureInformation in this section are intended for certified avionics shops only. Work such asIt is the responsibility of thoseFAATSO standards.

If not within the FAATSO standards, the articleUnpack the equipment carefully and inspect each item for evidence of damage incurredIf a damage claim must be filed, save the shipping container and all packing materials toThe claim should be filed with the transportation company asIf a damage is noted after the first test, notify the transportation company in writing withA copy of such a claim including all information from the type label is to be forwardedBefore installing the radio into an aircraft or vehicle, a short but comprehensiveFSG 90FH1 set supply to 14.0 Vdc at radio input terminals. Turn ON the radio with. Switch OFF the Squelch push SQ button.On all channels within 118.The squelch threshold depending onNovember 2000. PageW. Dittel GmbHWith 100 mV rms input, the transmitter shall achieve more than 70% AM. Increase AFDynamic Microphone Input. With some 1 mV rms input, the transmitter shall achieve more than 70% AM dependingIncrease AF input to 10 mV rms and observe modulationFor the combined 8.33 kHz and 25 kHz channel spacing airband radio technology,PROCESSOR, which is matched best to meet the requirements of the particularThis does however referIt will be therefore higher than the usual 2%. 10% sineSuch measurementsPageW. Dittel GmbH. Counter. Analyzer. Dummy load,Analyzer. Generator. AF Millivolt. Meter. Audio MicDynamic Microphone LO. AF External. Loudspeaker OUT. Power Ground. Headphone HI OUT. Microphone GND. Pushto Talk Switch. Intercom. Display Lighting HI. Display Lighting LO. Power Ground. Headphone LO OUT. Amp Mic. Dyn. Mic open. Amp Mic. Audio MicAudio Gen. Audio. Generator. EquivalentSpeaker 2200. AF Phone. Headphone 4 600. AF Speaker. Scope. Distortion. Analyzer and. Millivolt Meter. DO NOT wire otherPower SupplyDynamic Microphone LO. AF External. Loudspeaker OUT. Power Ground. Headphone HI OUT. Microphone GND. Pushto Talk Switch. Intercom. Display Lighting HI. Display Lighting LO. Power Ground. Headphone LO OUTAudio Mic. Dyn. Mic open.

Amp Mic. Audio MicDyn. Mic Audio Gen. EquivalentSpeaker 2200. Headphone 4 600. Audio. Phone. Audio Speaker. Power Supply. DO NOT wire otherFig. 31. November 2000. FSG 90F System. Test Setup. PageMechanical InstallationAny radio installation into an aircraft shall be coordinated with both, the licensedCertifying the aircraft installation may be subject to specific National Regulations.Fixing is made by four DZUS fasteners ARINC. NORM SIZE. All dimensions to install the FSG 90FX refer to Figure 33. For installationIf there is no suitable cutout, one can be made following the dimensions given in FigureSelect a radio location distant to heat sources. All equipment controls shall be readilyCompass Deviation. Distance. Compass. DeviationW. Dittel GmbHW. Dittel GmbHPanel. Flat aluminiumInstallation of the Fastener Strip. PageW. Dittel GmbHYour radio FSG 90FX is only as good as the antenna! For operation, a vertical polarized 50

Ohm broadband aircraft COM antenna is required. The antenna must be able to radiate RF energy evenly and omnidirectional. It would be the best to In order to achieve best results into all The antenna is mounted vertically as possible on or under the fuselage. Location COM antennas is sufficient. The electrical contact shall remain continuously F10057, is suitable. Installation is made best during A installation drawing is available on request. IMPORTANT Carbon fiber is conducting and may shield the antenna! Make sure, that AC currents, and distant to any aircraft controls. A whip antenna is tested for low resistive contact between Solder joints shall be supported by Cable connector case mounting shall not clamp or For 6 Watt models, we suggest a 3.15 Amp. quick acting fuse For 10 Watt models suffix "H1, we suggest Without proper fuse In transmit mode, the operator may even be faced Slight improvement may be Perhaps, short but bulky grounding contacts between all Further measures to improve RF immunity may be obtained from variometer Page W. Dittel GmbH Antenna cable.

Antenna. Headphone HI out. Headphone LO out. AF External. Dynamic Microphone HI. Dynamic Microphone LO. Intercom Display Lighting LO. Power Ground. Microphone GND. RX Signal. AF Sum. PTT Key. AF Modem out Tx D. Switched 13.3 Vdc OUT. Power Ground To connect a 2 PTT key or a 2 Dynamic Dimmer or. Lighting switch Headphone Supply. Lead Calcium. Battery Headset or dynamic FSG 90F System W. Dittel GmbH Antenna. INTERCOM Switch. Headphone HI out. Headphone LO out. AF External. Dynamic Microphone HI. Dynamic Microphone LO. Intercom Display Lighting LO. Power Ground. Microphone GND. RX Signal. AF Sum. PTT Switch. AF Modem out Tx D. Switched 13.3 Vdc OUT. Power Ground To connect a 2 PTT switch or a Dynamic. Microphone Dimmer or lighting Headphone Supply. Lead Calcium. Battery. Headset or handheld dynamic PTT switch Intercom operation requires a microphone which provides audio OUT with the PTT key W. Dittel GmbH Headphone LO out. AF External. Dynamic Microphone HI. Dynamic Microphone LO. Intercom Display Lighting LO. Power Ground. Microphone GND. RX Signal. AF Sum. PTT Switch. AF Modem out Tx D. Switched 13.3 Vdc OUT. Power Ground. Audio OUT to Audio Panel Antenna cable. Antenna Headphone. Jack Microphone. Jack Headphone Plug PJ055. Microphone. Jack PTT switch. Copilot. Headphone. Copilot. PTT switch. Microphone Plug. PTT switch Jack Microphone Plug Headphone Unless otherwise noted all Power Grounds are airframe grounds. Intercom operation requires a microphone which provides audio OUT with the PTT key Intercom operation requires a selector switch, double pole, double throw. Terminate audio shields at one end only. If more than one AF source, isolation resistors 470 Ohm shall be installed. Fuse 3.15 Amp, quick acting, or circuit breaker 3 Amp. FSG 90F System W. Dittel GmbH Independent of each other, almost any non amplified dynamic microphone, or amplified. Electret or amplified dynamic or carbon standard microphones can be connected to the. FSG 90F System, without internal jumper setting or soldering.

Avoid any ground loop in Up to two IDENTICAL microphones for pilot and copilot can be operated in parallel However, for microphones with less than 30 Ohms, it may The associated microphone ground shield for dynamic microphones must be DC input or DC output, AF input and AF output like speaker, phone, PTT and external. Audio. In this context, due to the extremely wide mike input level adjustment range, it is This is especially Intercom is suitable for twin seater aircraft with noisy cockpit. Intercom as well as radio OFF by the PTT function. Keying the mike audio may cause awful cracks, depending on To control the intercom capability, aircraft radio wiring must have a two pole toggle The intercom switch disconnects the loudspeaker Simultaneously, pin 7 of the 25 pole connector During receive, while IC is ON, both the IC loudness and external audio volume are Receiving volume is set on the FSG 90FX front panel VOL, while intercom volume Page W. Dittel GmbH. Two separate audio outputs are provided. The speaker output pin 1 can continuously When no speaker is installed, this Pin 1 may remain not connected, no spare load is The AF external input pin 4 may be connected to any external selectable audio output Higher AF input may cause audio distortion. External AF will be audible only in Receive During transmit, the external AF input is

disabled. Continuous interconnection of an external audio sources will be suitable especially in the NAV headphone output may be. This allows in addition to the receiving and intercom function also the simultaneous interconnection of more than one external audio source requires additional external. The individual audio volume is set directly at the particular external equipment.

The 30 mA current saving in To achieve in External Audio operation the maximum FSG 90FX AF output power, a interconnecting AF wiring must use shielded wires in order to avoid interference from a possible magnetic interference coupling shall be especially. The FSG 90FX includes a display which can be backlit. Pin 23 may be connected. Page W. Dittel GmbH Interconnection of the FSG 90FX transceivers to a 28 Vdc supply requires a capable. For lighting interconnection refer to Section 3.5.6. Verification after installation completion. After installing the unit, check all aircraft control movements to be sure no electrical. All aircraft and radio functions shall be tested after. This must be performed by an Authorized Aircraft Electronics Inspector. Testing of antenna matching between the FSG 90FX antenna socket BNC and the. BNC antenna cable connector is required, using a suitable 50 Ohm VHF Reflectometer. The VSWR must be less than 3:1 over the full frequency range, tested at least in 1. MHz steps reflected power shall be less than 25% of the forward RF power output. In order to optimize radio range, it is suggested to care for an VSWR of less than 2:1. After completion of the antenna matching measurements, perform the following test. SETUP refer to Section 5. This avoids. It must be ensured that the aircrafts electrical DC system voltage at the FSG 90FX Battery only supplied systems operate from 10 to 16.5 Vdc. Such testing requires. With cruising RPM, cabin noise. Instead, loud and clear communications shall. The microphone shall be in both transmit and intercom mode placed right at the lips in. Speak loud and. Page PDF Version 1.3. Linearized No. Create Date 20010914 090358. Author Administrator. Producer Acrobat PDFWriter 4.0 for Windows NT. Page Count 30. Please upgrade to a newer version or try a different browser. Since then, we have become one of the UKs leading suppliers for light aviation equipment.

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